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NEXT CONVENTION AT ATLANTIC CITY

As this paper is going to press the announcement is made that Atlantic City has been chosen for the 1916 convention of the American Electric Railway Association, which will be held Oct. 9 to 13 inclusive. Important information regarding the convention will be found in the Association News pages.

CUTTING THE GORDIAN KNOT

A novel solution of the Toledo low-fare question is contained in the decision by Judge Killits rendered April 10 in the Federal Court for the Northern District of Ohio, Western Division. It is based on the theory that after a franchise expires the obligations of the company to the city as regards rates of fare disappear just as do the rights of the company to use the streets. Thus released, it can raise its fares, if it wishes to do so, from 3 cents to 5 cents, as it now has been authorized to do in Toledo, and the only remedy which the city has is to order the cars off the streets. This, of course, if it desires, it has a perfect right to do. The decision has been reported only in the daily papers, but as we understand it, it is briefly as follows: Where a contract between two parties has terminated, the question is again thrown open to mutual agreement, but until agreement is reached the rights of each party are simply the primitive ones, in this case the voluntary establishment of rates on the one hand and eviction on the other. Of course the present arrangement is purely temporary, and it is possible it will be attacked by the city. It emphasizes, however, the anomalous situation in Toledo in which a company with a large fixed investment is dependent upon the whim of an outside party for his possession of this property. Broadly speaking, neither side can allow this condition to continue, least of all the city, and it is disgraceful that the city has allowed the question to drag so long.

ONE COMPANY SECTION PER MONTH

For the fourth time in four months the Electric Railway Journal had, last week, the pleasant duty of chronicling the formation of an American Association company section. If this rate could be maintained, it would be merely a matter of arithmetic to estimate the growth of the movement. Section No. 10 was formed almost exactly four years from the inauguration of No. 1. The year 1912 saw three sections founded, 1913 none, 1914 two, 1915 two and 1916, to date, three. All of the sections are doing good work and, as far as we can judge, there has been no lapse of interest. In commenting upon the formation of company section No. 9, attention was directed to the fact that the membership was more than one per mile of track. The section formed in Hampton, Va., a few days ago started even better, for by the same method of rating there are 1.3 members per mile of track. This may not be an entirely fair basis of comparison, for it is proportionately easier to rally the employees of a small company than those of a large one. However, a mile of track is a natural electric railway unit, and it is a very tangible one. The average number of employees per mile of track throughout the country is seven, and the total trackage is about 47,000 miles. These facts indicate that there is a big field for individual membership, and that if the Hampton rate was applied all over the country there would be 61,000 members, a figure almost staggering in its magnitude. It is less staggering, however, if one judges the future by the present rate of growth.

THE BROOKLYN ARTICULATED CAR

Two seemingly opposite tendencies are to be observed to-day in rolling stock practice. At one end we have the movement toward the small one-man car, and on the other hand there is a tendency toward train operation. In each case, however, the object is the same, namely, to give more service at a lower platform expense. The Brooklyn articulated car described in last week's issue is an example of the latter tendency, for an articulated car is really a train although made up as a permanent operating unit. While the article points out clearly enough that the number of uneconomical single-truck cars in Brooklyn is very small for so large a system, the experiment will be worth all it costs for what the company will gain from it in studies of passenger handling and fare collection. In any event the electric railway industry at large will have reason to be grateful to Brooklyn, for these studies will offer a fine starting point for others. It would be unfair to the articulated car to assume that it must be accompanied by so thoroughgoing a reconstruction and modernization as has been carried out with the Brooklyn unit. The example of Boston shows clearly enough that single-truck cars can be paired in this fashion at a cost far below that of a new car of fairly equal capacity. The management of the Brooklyn system, however, for reasons of general study equipped them exactly as if they were entirely new cars. Therefore, those who wish to look into the articulated car on its merits should judge it only on what it does as an operating unit and then decide whether they need place on their cars the additional devices applied in Brooklyn.

SHOP EQUIPMENT FOR SMALL ROADS

In an inquiry addressed to this journal information has been requested regarding the best layout and shop equipment for an electric railway having twelve passenger cars. There is thus brought up the problem of the size of shop wherein machine tools can be economically installed, because it is more or less obvious that a road having twelve cars can hardly afford to install very much in the way of machinery. It is conceivable that the situation might be such that machine work could be done only by sending it to an outside shop in a distant city under conditions that would involve extraordinarily high charges, but in general the overhead expense involved in the installation of almost any machine tool under the circumstances in question would involve a burden all out of proportion to the cost of work that it would do in the course of a year. This would make its purchase undesirable on economic grounds.

As an example, there might be considered the individual case of a wheel press, provided the cars were equipped with cast-iron wheels. Even assuming that each wheel had a life of, say, two years, thus involving the pressing on and off of four wheels per car per year, the wheel press would be used only forty-eight times during the course of a twelvemonth, or in round numbers for, say, fifty operations.

The wheel press might be purchased for about $1,000, and regardless of the number of operations that were accomplished with it during any period of time, this investment would involve interest at the rate of 6 per cent, and depreciation, obsolescence and repairs at a rate of, say, 8 per cent more, giving a total annual overhead charge of 14 per cent on $1,000, or $140 per year. The labor charge for each operation might be assumed, for the sake of illustration, to cost only 20 cents, and this would involve $10 per year in addition to the overhead charges. This makes a total of $150 for the fifty operations, amounting to $3 per wheel.

It is hardly conceivable that the charge for removal and application of wheels in an outside shop equipped with a press that might be adapted to wheel work could be more than $2, including handling costs. The purchase of a wheel press, therefore, would involve the payment of a premium of $1 per wheel merely for the sake of having the press in the shop. Of course this latter factor has a certain indeterminable value. When work is sent out to be done, there is always involved a delay which may perhaps be costly, and there is always an uncertainty as to just when the completed work will be returned. It is hardly likely, however, that any small road would wish to saddle itself with an annual charge amounting at least to $50, but probably a great deal more, merely to protect itself against the possibility of trouble or expense from this cause as it would in the case under consideration.

The same course of reasoning applies in the case of the engine lathe, shaper and drill press that go to make up what might be called an elementary equipment of tools for machine work, the possibility for the use of each machine being dependent simply on the relation between its first cost and the number of operations performed upon it during the course of a year. In the case of the drill press, perhaps, the low first cost and the great variety of small jobs that can be done upon it make the tool susceptible of use under almost any conditions. A plain upright machine costing $200, for example, might easily be used on an average once each day during the year, and this would involve a burden on each operation of only 8 cents. Without the drill press many of these operations would doubtless have to be done by hand or patched up hurriedly in some way owing to lack of time to send the work out to some near-by machine shop, and this might well involve costs that would make the small burden negligible.

However, the drill press represents an extreme in the list of tools that can be used for a great many small jobs. At the same time, when it is of the plain, upright type, the expense involved in its installation is very small, so that the fixed charges thus involved are not worth a great deal of discussion on economic grounds. But where the larger tools are concerned, and especially where these tools have a restricted use, the small railways might well hesitate before making an installation even though the charges imposed for outside work might appear at first glance to be high.

EARNINGS ARE PICKING UP

An article in our financial column this week shows that sixty-two representative electric railways with $281,000,000 of receipts in 1915 suffered a loss of 1.02 per cent in gross and 0.62 per cent in net as compared with the 1914 results. These figures are better than was estimated would be the case toward the end of last year, but it should be remembered that while the aggregate gross for the companies reporting is about one-half that for all the companies in the country, a number of important districts are missing, because of the large number of companies that do not publish both annual and monthly reports. In fact, the returns are the least plentiful where the reported reductions in the receipts are the greatest, *i.e.*, in the Far West. Could all operating railways have been considered, the decreases would probably have been greater, for the small companies must have suffered more severely than the large ones. In spite of these facts our figures are of value as indicating that at least sixty-two of the most representative companies, owing to improving business in the later months, suffered a less decline in earnings for the year than was anticipated. Furthermore, they indicate that the poor results were not spread over the whole country, for in general the Eastern and Central groups showed gains and only the Southern and Western groups losses.

Some encouragement, therefore, may be found from the year's figures, but even greater encouragement will come from the figures for January, 1916, as compared with January, 1915. These indicate an increase of 8.08 per cent in gross and 14.17 in net, improvements being noticeable for all sections and for almost all companies.

The year 1916 will not in all probability keep up to these figures, for January, 1915, constitutes an abnormally low basis of comparison in determining the percentage increases. Moreover, as regards net earnings, we do not imagine that electric railways are yet fully experiencing the cumulative effect of the present rising cost of materials and labor on account of stored-up materials and wage agreements. If these restrictions are kept in mind, however, we believe it can safely be said that electric railways are beginning to share in the general prosperity resulting from increasing industrial activity and are in a position to show a substantial improvement over 1915.

WAGE INCREASES AND RATES

Two labor questions of nation-wide importance are now awaiting settlement, one relating to the wages of coal miners, the other in regard to the increase of wages asked by a considerable number of steam railroad trainmen. In many respects the two problems are the same. In both, an advance in wages is sought, although the last change in each case was an advance. In both, each side seems well organized. In both, the industry involved is one supplying a necessity, and while it is possible to store coal but not transportation, a serious interruption in either supply would be a national calamity. In both, practically all sections of the country are threatened. With these several points of similarity there is one essential difference. The general assumption in the coal case seems to be that if the employees win their demands for higher wages the employers will pass on the increase in the cost of producing the coal to the public. Indirectly, the public will have to pay the higher wages if they are granted. But with the railroads no such automatic transfer of the burden can be made.

The trouble with the steam railroads is similar to that which the electric railways have to face. The rate-making authority does not necessarily have to take into consideration any increase in the cost of production of the service which the railways have to sell—namely, transportation. The cost of production may continue to go up, as indeed it has done, on both steam and electric lines, higher taxes may be assessed, the cost of capital may go up, but there is no assurance that permission for an increase in rates will follow. Indeed, with the electric lines all of these things have taken place, but as yet there has been no general increase in fares.

We have said before, and we repeat, that regulation should include some system by which rates will be raised promptly with increases in the cost of producing service, just as it should act promptly to reduce rates when profits are excessive. The action need not be automatic. It is better that changes in rates should be made only after a careful study of all the attendant circumstances, and commercially it is desirable that rates should have a certain degree of stability, whereas expenses are bound to vary from year to year and from month to month. But a certain degree of stability does not mean permanency of either a very low or a very high rate when expenses have shown a constant tendency in the opposite direction for a period of years. Under such a condition regulation which does not act might be better termed strangulation.

WHAT KIND OF EDUCATION DO OUR BOYS NEED?

Every reader of this paper who has a son to educate, or who employs young men, or who has a fatherly interest in the young fellows of his acquaintance, will get some food for thought from the article by Prof. A. M. Wilson which appears in this issue. Dean Herman Schneider of the University of Cincinnati has for many years been the champion of the justly so-called "co-operative" plan of education. The fundamental principle of this is that students should work at the same time that they study, alternating the periods of work and study at more or less frequent intervals, say of one or two weeks or more. This blends the atmosphere of shop and classroom and permits the student to earn money systematically.

Many individual students have been carrying out the co-operative principle for themselves from force of necessity. It remained, however, for the University of Cincinnati to work out a feasible scheme for bringing the shops and the school together in the educational scheme. Fortunately the university in this case is located in an industrial center where there is plenty of work to be had in normal times. The task of the teachers was so to plan their curriculum that it would permit the young men to work in the industries continuously enough to make their work worth while. The result was a program which permitted two men alternately to work on the same job so that the work went on like Tennyson's brook, although men came and went.

Naturally, as producing transportation is one of the leading industries in Cincinnati, the Cincinnati Traction Company was asked to lend its aid in furnishing employment to the co-operative students, which it did. In view of this fact, the editors invited Professor Wilson, who is in charge of the electrical engineering department at the university, to tell what he has been trying to do and how he has been trying to do it. This he has done frankly and clearly. It is true that few communities are situated exactly as is Cincinnati, and it is doubtful if exactly the same plan can be followed elsewhere, except in a few places. The general principle holds, however, and if the railway people and the instructors in many communities will get together much can be accomplished.

The electric railways need properly-trained young men to become the foremen, superintendents and managers of the future. It is not too much to expect them to assist in training these young men either while they are in school or thereafter, or both. The professional teachers and the students must take the initiative in the matter, but some encouragement from the railway managements would be of great help and inspiration to them.

Co-operative Education in Electric Railway Work

The Cincinnati Traction Company Has Been Co-operating with the University of Cincinnati for Several Years in the Educational Plan Developed by the Latter—The Instructor in Charge of this Work Explains the Plan and Summarizes the Results

By A. M. WILSON
Professor of Electrical Engineering University of Cincinnati

FOR the benefit of those who may have the patience to read what follows, but who have not had time or opportunity to follow educational developments closely, it should be stated that there are many careful students of the problems involved who have expressed dissatisfaction with the results obtained from our efforts and expenditures in education. This criticism has been applied with peculiar force to technical and professional education, probably because results can be more directly observed and estimated. A perusal of the proceedings of the Society for the Promotion of Engineering Education and of the reports of some of the investigations of the Carnegie Foundation, and similar organizations will at least indicate, beyond doubt, not only that we have not reached perfection in our educational practice but that some of our educational principles could be modified to good advantage.

The gist of the criticism of the product of our technical schools from the point of view of railway executives is, first, that technical graduates cannot apply their training in such a manner as to get economical results; second, that their training does not seem to be of such a character as to develop or increase ability to handle men, and third, that because they have already enjoyed the advantage of a technical training they seem to feel that they are entitled to still further advantages without being required to give the degree of service demanded of those who have not had a technical education. As might be expected, the expressions of many technical graduates engaged in railway work, indicate that the situation is not satisfactory from their point of view. The foregoing is a rough outline of the situation. A complete discussion would take more time than most men have available for such a subject.

There seems to be only one way of meeting this situation, that is, by requiring technical men who wish to follow railway work to become familiar with railway conditions while they are receiving their theoretical training. Such a method of training would eliminate any possibility of the technical graduate having erroneous notions regarding his value, and would give him the ability and qualities required for success, if it is possible for him to acquire them. This is the function of what is called the "co-operative" principle, as applied to this particular phase of education. A statement of what has been accomplished up to the present time will probably be the most effective method of indicating the possibilities of this relatively new departure in education.

Co-operative Work with the Cincinnati Traction Company

The college of engineering of the University of Cincinnati has been co-operating with the Cincinnati Traction Company for three years. There are two students for each job. They alternate between the university and the job. One man goes to the university for two weeks while the other works for the Cincinnati Traction Company. At the end of each two-week period the first man takes up practical work and the other attends the University.

There are four essential factors which affect the successful operation of a co-operative course in electric railway engineering. These are (1) the general business situation; (2) the personal qualities of the students; (3) the personal qualities of the workmen, foremen and superior officers with whom the students come in contact, and (4) the manner in which the university keeps in touch with the students and their foremen or superintendents.

It must be borne in mind that the industrial situation has been far from ideal during the larger part of the past three years, and that electric railways have had to bear their share of the burden. Under normal business conditions many electric railway executives would be glad to entertain propositions which they would not feel justified in considering during the past three years. But in spite of these conditions, during the past year there have been about thirty-five of our students in work more or less directly connected with electric railway operation.

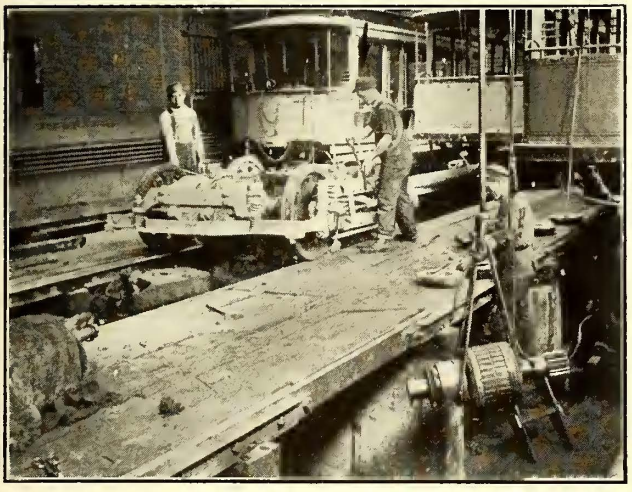
The effect of the personal qualities of the student is felt almost immediately in co-operative work. We have found several cases in which students, who would have been very successful in the ordinary technical courses, have shown a sort of genius for creating situations which were rather difficult to handle. It is remarkable how bad an impression can be created by a youngster whose intentions are really good but whose experience and tact are negligible quantities. He will linger in the memory of a workman long after the good qualities of a dozen subsequent satisfactory students have been forgotten. Fortunately, the work of the co-operative students as a body is judged by men of wide experience and mature judgment, in nearly every case. Besides, good men produce their good effects, just as the poor men their bad effects. The results so far attained have been quite satisfactory.

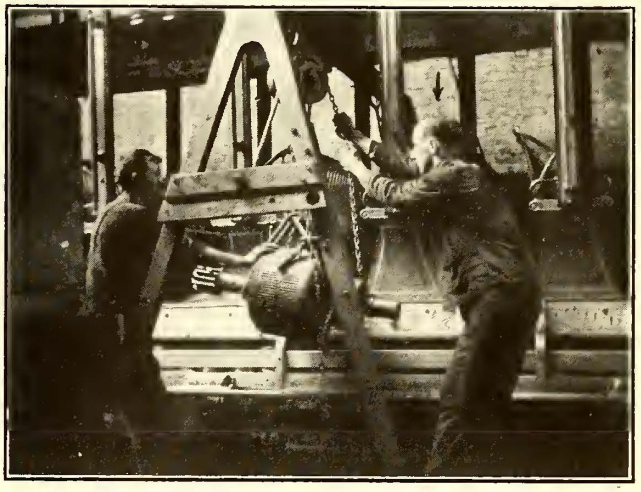
Students in the Carhouse

Regarding the workmen, foremen and higher officials, our experience so far has been that they have, as a rule, been very reasonable and fair. Many of the workmen and foremen realize that this application of the co-operative principle puts within reach of their children opportunities which they themselves were denied. The superintendent of carhouses, Mr. Frazier, has entered into the spirit of our problem, and has contributed many valuable suggestions to help us meet the practical difficulties which have arisen from time to time. It cannot be said that the co-operative students engaged in carhouse work have made any marked contribution to the general efficiency of such work, to justify the interest shown by Mr. Frazier and some of his foremen.

The co-operative principle has seemed so logical to them that they have been interested in watching the results of its application. In the repair shops of the Traction Company Howard Elliott, the master mechanic, and his foremen, have given many valuable suggestions regarding the characteristics of the students. The students in the repair shops have probably exerted an appreciable influence upon the general shop atmosphere, but it would not be safe to make any extensive claims on the basis of the results achieved up to the present time.

Only students of sufficient physical strength to do the work satisfactorily are assigned to carhouse work. They are assigned to night work during the first year, and the grade of work they do is determined entirely by the ability they demonstrate. Usually they are assigned to controller inspection and repairs at first, and later to brake and truck inspection and to car distribution, as they become more familiar with the details of the carhouse in which they are employed. In order to relieve the foreman of as much annoyance as possible, whenever any change is made, the incoming man is required to work with the outgoing man for a couple of nights, or as long as may be necessary to familiarize the new man with the local conditions.





CO-OPERATIVE EDUCATION IN ELECTRIC RAILWAY WORK—STUDENTS OF THE UNIVERSITY OF CINCINNATI AT WORK IN LOCAL CARHOUSES

At the end of the first year, or as soon thereafter as is feasible, the men who have been on the night shift are changed to the day shift. The change is in the nature of a promotion, as the work is different and somewhat pleasanter. Sometimes these changes are not made as promptly as would be the case if it were possible to ignore the practical details for which the foremen are responsible. But students with the proper spirit to make successful men always find that the time devoted to night work is by no means long enough to enable them to master all its details.

The problem of the best way to handle the men who have finished two years of carhouse work has not been solved. A year ago, when the first set of men had finished two years of work, the writer took up the question of establishing a systematic scheme of training, to cover the five years of the course. Several suggestions were made, but the subject was not of sufficient interest to the company to permit of any of these suggestions being given a trial. Some of the discussions of these suggestions would, no doubt, have been of interest to many educators who have not been brought into immediate personal contact with the problems which confront men responsible for practical results day after day. The old difficulties, which have made the field of railway engineering so unattractive to technical graduates in the past, were immediately confronted. But in this case, the men involved had not completed four years of a technical course, and then spent so much time in railway work that they had a feeling of failure in the thought of leaving it. Some of the men took up power plant work. Some took up design work, in which their carhouse experience has been of direct value. One found carhouse work so attractive that he decided to try to reach success by continuing along that line. Not one of them felt that his two years of carhouse work was in any degree a loss of time or effort. Some of those who are now completing the second year of carhouse work have not definitely decided to make any change, because of the valuable experience they feel they are getting.

Students in the Shops

Many students do their co-operative work at the repair shops of the Cincinnati Traction Company. Here there is the usual opportunity for experience of the repair shop character. During the first year the students are expected to adjust themselves to general shop conditions. Those who have natural ability soon have opportunity to exercise it. Those who have no marked ability in shop work are put at work they can do. All have the same opportunity to observe the general conditions under which work of this character is done.

At the end of the second year the question of what to do next is not so important as in the case of those who have done carhouse work. Those who desire to continue the work may remain in the repair shops, in jobs suited to their capacities. Those who feel that railway work is not attractive are given other opportunities. There is always room for men of ability; and in two years it is easily possible to determine the limitations of an individual, especially when his mental capacity is under observation, as well as his usefulness in practical work.

During the first year each student is visited a number of times while at work. If a student becomes restive under the monotony of shop conditions, or develops an attitude which is not entirely satisfactory, it is frequently possible to get him to change his viewpoint by discussing the situation with him. Our experience seems to indicate that it is not a matter of great importance what a student does during the first year. If he has the right spirit, with fair ability, he is almost

invariably advanced. If he is not advanced, sooner or later he will have opportunities along other lines. If a student has not the necessary qualities for success in engineering work, it would be impossible for us to locate him in a position satisfactory to him, to us and to the company. But in this case he is in a position to determine whether it is wise to continue in engineering work.

Comparing Notes on Practical Experience

During the second year the co-operative students in electrical engineering meet twice a week in what is called a class in co-ordination. Each student is called upon to tell the others about something which he has seen or has done. No reference to what he has read is permitted, except as it may have direct bearing on what he has done or seen. Students engaged in carhouse work have given talks on the methods or arranging the cars in the carhouses, and getting them out, with the least possible confusion, to suit the operating schedule. Some of the standard trucks used by the Cincinnati Traction Company have been discussed and compared. Brakes and brake rigging have been discussed several times. In all these discussions the men are required to have their sketches ready in advance. Sketches, catalog illustrations, cuts from magazine articles, any illustrations which may serve to make the discussion clear, are urgently requested. Special emphasis is placed upon the use of these aids in presenting ideas to others. In this way each student has several opportunities during the year to know something of what the others are doing; and the exercise of telling about his work is usually of great value to the teller at least. Of the hour assigned to the subject, about thirty minutes are devoted to presentation, and the remainder to discussion.

WORK RECORD CARD

NAME W.H. Green — CLASS OF 1917 — SCHOOL YEAR ENDING AUGUST 1915 — Summer SEMESTER

FIRM Cincinnati Traction Co.

WEEK ENDING	HOURS WORKED	HOURS LOST	DEPT	NATURE OF WORK DONE
July 3	55	0	Repair	Building Coal Chutes.
" 10	50	5	"	" " "
" 31	55	0	"	Repairing gear pans.
Aug 7	55	0	"	Building " "
Sept 4	55	0	"	Building coal Chutes.
" 11	55	0	"	" " "
" 18	50	5	"	Truck repair.
" 25	55	0	"	Building and repairing trucks.
Oct. 2	55	0	"	" " "
TOTAL	485	10	DEGREE E.E.	ENTERED SEPT 1913 WAGES 191 RATE 17½ RAISED 191 RATE

CO-OPERATIVE EDUCATION IN ELECTRIC RAILWAY WORK—CARD RECORD OF STUDENT'S WORK

At first it was our intention to try to arrange the curriculum so that it would fit in closely with the practical experience of the students. But we find that this is not possible, nor is it desirable, except in co-ordination classes. While specialization is a good thing, the student probably gets enough of that in his practical experience. In the curriculum, work of a broad, fundamental character is given, and the student can make any sort of special application.

It should be constantly kept in mind that no amount of detailed instruction can change an inherently mediocre man into one of high caliber. In many cases, too much detailed instruction would be irritating and irksome. After the fundamental principles are thoroughly grasped by the student, it is probably best for him to leave the development of the majority of the practical details to his own initiative and observation. We have had several very successful graduates who, on account of peculiar circumstances, could not be given very close observation during their shop periods; though as a rule, students who desire special assistance or instruction regarding any particular phase of their work can readily obtain it.

What Has Been Accomplished

The results of three years of experience in co-operative training in electric railway engineering have been encouraging, all things considered. Most of the difficulties have been those introduced by students who could not appreciate how serious is the problem of making a living. But the principle underlying the co-operative course, as applied at the University of Cincinnati, cannot be controverted by anyone who considers the problems of education carefully.

Several of the co-operative students working for the Cincinnati Traction Company are sons of relatively poor workmen. Their parents are ambitious for them, and they have justified the effort expended to put them through high school. Since they have entered the co-operative course they have earned enough, by working for the Traction company, to pay all their university fees, buy all their books and clothes, bear all the incidental expenses, such as athletic tickets, entertainments, etc., and contribute somewhat towards their own support. Of course, living at home as they do, this burden is not heavy, and will become lighter as they progress towards graduation, instead of heavier. Students whose parents do not live in Cincinnati cannot enjoy this financial advantage to the same degree; but the educational advantage is still beyond question even if we could eliminate financial considerations entirely. We cannot do this, however. For instance, it would be ideal, from the average student's standpoint, if, when he had mastered one practical shop operation, he could be shifted to another. But since it is necessary for him to be a business proposition to his employer, he must remain at any given job long enough to be profitable. It would be ideal from the educational viewpoint, if, when a student has gone as far as desirable in one line of work, he could be changed to another regardless of the rate of wages paid. But frequently the student's financial condition will not allow him to make such a change. It is better that these conditions should be realized by the student, while he is going through the training process. They are continually being met after graduation. Every one has to contend with them more or less. Many of the disappointments of technical graduates have been due to the fact that they were removed from these difficulties and embarrassments too completely for four years.

A Possible Five-Year Electric Railway Course

When it was suggested to arrange a five-year course in electric railway work, the attitude taken by a number of officials was this: "Most of us have established our positions without even the aid of a technical education such as your students get. We had to fight our way up without the assistance of any special courses arranged for our benefit. It seems to us that these young fellows have advantages now that we did not have, in being able to work while under careful supervision, and in connection with a technical engineering course. We are quite willing to co-operate with you to a reasonable extent. We will promote those of your students who seem to us to justify promotion, but if a young man who is not receiving a technical education looks better to us, we will certainly give him the preference. Your scheme looks good enough to justify trying it, but our business is to get economical results. We have to have

men, anyway, so we might as well hire your students. It is reasonable to suppose that the extra trouble, of taking care of two men for one job, will be offset by the fact that a larger percentage of your students will be satisfactory than of the boys we would pick from the usual applicants for jobs."

Needless to say, such an attitude is absolutely fair and offers a basis for co-operative education from which only good results can be obtained in the long run. No young man coming in contact with electric railway work under such conditions can fail to get some good out of it, even if he does not pursue the course to the end.

In our suggestion that a systematic course be adopted, running through the five years of the school period, we were in absolute accord with the principles outlined by the railway officials. Our thought was that, at the end of two years, it would be easily possible to pick out those who had shown capacity for greater development. It would be a good business proposition for the company to have a number of these men coming through their organization in different capacities. When they came to graduation, if there was a vacancy, the company would have men available to choose from, who would be familiar with their methods. If there was no vacancy, they would have had a good training and would be in a position to do useful work somewhere; and there would always be other students coming along behind them, receiving the same training, and ready to step into their places. In this way the element of healthy competition would always be present and would tend to promote efficiency.

Broader Aspects of Co-operative Education

No mention has been made, so far, of the enriching and strengthening effect of education upon even a mediocre man. But this influence is one of the good reasons why it is not necessary to strain so very hard to tie the theory and practice more closely together than has been indicated. Very often the graduate from the ordinary four-year technical course starts out with high ambition to make a place in the world; but loses much of the finer influences of his college career, through failure to appreciate some of the things that are first brought to the attention of the co-operative student. In the application of the co-operative principle presented here, these ambitions would always be tempered by cold, hard facts.

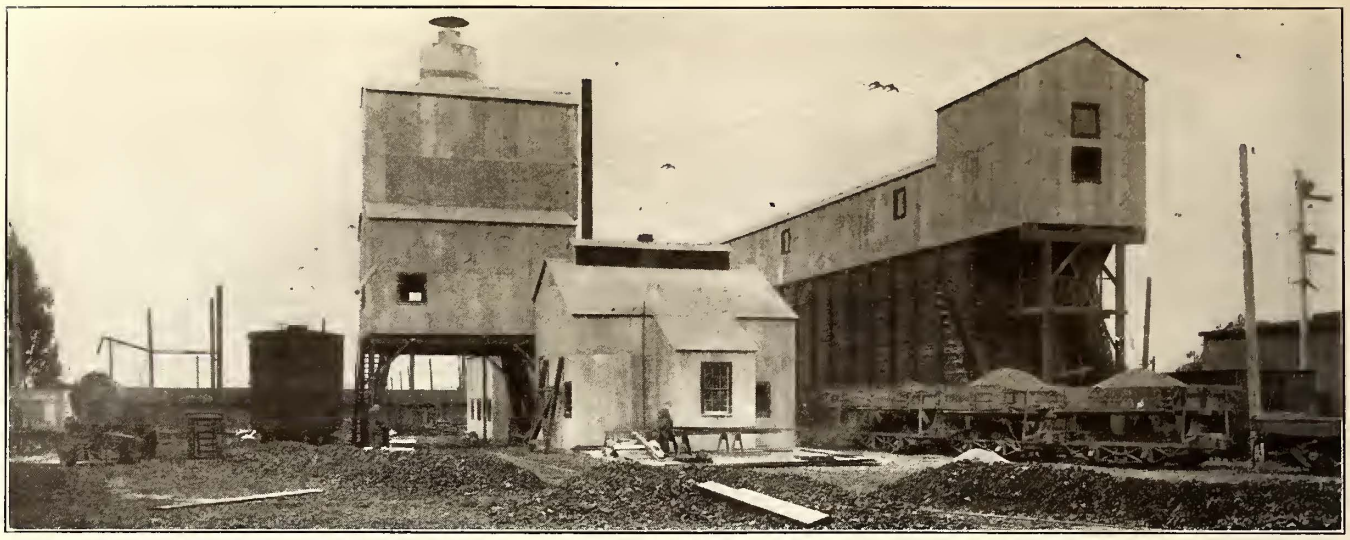
There does not seem to be any particular point of distinction between co-operative education in electric railway engineering and co-operative education in other phases of engineering. There is certainly no difference in principle. The problem of arranging for an entirely satisfactory progressive development for the student is affected by the conditions peculiar to railway work. These conditions soon become apparent to a student who has any power of observation; and he can determine, with prosaic facts before him, whether to continue or not. Of course, in considering these conditions the student has the viewpoints and counsel of his instructors. His fellow students in other lines of work give him information regarding the general characteristics of their jobs. His visits to the various shops and factories, which are part of the prescribed coordination courses, serve to broaden his outlook upon the entire field of engineering activity, and enable him to appreciate the relative advantages and disadvantages of the work in which he is engaged. It seems difficult to imagine a young man considering the field of electric railway engineering from a saner or more effective viewpoint.

There is one feature of co-operative education which has been of more than passing interest. There seems to be a certain type of educator who retains, consciously or unconsciously, the idea that there is some sort of method in education by means of which the process of acquiring a trained mind can be deprived of nearly all effort on the part of the student. One gets this impression from listening to and reading some of the speeches and articles encountered at conventions where educators congregate. Certainly a great many high school graduates seem to have been put through some such process, judging by the results. Many of the young men who enter the co-operative courses have in mind more what a co-operative course should give to them than what they will have to give to it. It cannot be too strongly emphasized, that it is impossible to get more out of a co-operative course than is put into it. This is true of any other course. Those who are in the work feel sure that the co-operative principle tends toward higher efficiency. But efficiency in education is a very difficult thing to determine; that is, the relative efficiency of a co-operative course in engineering, as compared with common practice in engineering education, although cost data, so far, indicate that the co-operative principle has some advantages. But so far as the student is concerned, even after making all possible allowances for difference in efficiency, it cannot be too strongly emphasized that the increased opportunity to come into direct contact with practical affairs calls for increased effort on his part, to make the most of the opportunity.

Ventilation for New York Subways

The Public Service Commission for the First District of New York has received a report from the board of consulting engineers appointed last summer to investigate the method of ventilating the new subways and to determine whether any improvement over the sidewalk grating method could be made. The report approves the system of natural ventilation used by the engineers of the commission, namely, providing for the ingress of fresh air from stations and other openings, the piston action of the trains in forcing out vitiated air and the escape of such vitiated air through ventilating gratings either in the sidewalks above the subway or through openings in the walls of the structure. An improvement could be made, the report points out, by introducing an expensive system of refrigeration, but it is estimated that the cost of such a system would be prohibitive. The report is signed by William Barclay Parsons, S. L. F. Deyo, L. B. Stillwell and J. Vipond Davies, the four consulting engineers appointed by the commission. Mr. Parsons was the chief engineer of the Rapid Transit Commission, and planned the construction of the first subway. He and Mr. Deyo are consulting engineers for the Interborough Rapid Transit Company, while Mr. Stillwell and Mr. Davies are consulting engineers for the Brooklyn Rapid Transit Company.

The electrification of a new tunnel, known as the Otira Tunnel, about midway in the length of the Southern Alps in South Island, New Zealand, is being considered. Suitable energy could be supplied by the construction of hydroelectric plants in the near-by vicinity. A large and comprehensive scheme is also under consideration for the supply of electrical energy in the North Island of New Zealand, with a view toward utilizing part of this energy for railway electrification and for promoting a system of light railways throughout the country districts now suffering from lack of communication.



S. F.-O. T. RYS. PAVING PLANT—LEFT TO RIGHT, MIXER TOWER (BOILER HOUSE IN REAR), DUST HOUSE, STORAGE BINS AND TOWER

Concrete and Asphalt Mixing Plant Saves Its Cost in One Year

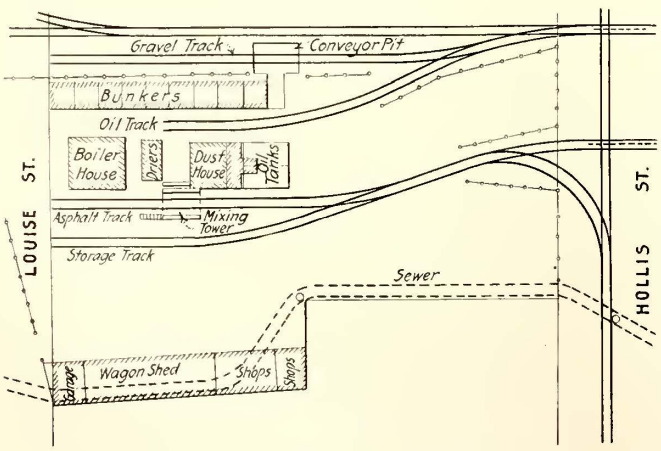
By the Installation of a Complete Equipment for Laying and Repairing Macadam and Asphalt Paving and for Mixing and Placing Concrete, the San Francisco-Oakland Terminal Railways Have Achieved Remarkable Economies

By GEORGE H. BINKLEY

Formerly Chief Engineer Maintenance of Way and Structures Department, San Francisco-Oakland Terminal Railways

THE San Francisco-Oakland Terminal Railways operate a system of tracks in nine municipalities and two counties on the east side of San Francisco Bay. The total length of single and double track amounts to 258 miles, single-track measurement, some of which is on private right-of-way. Practically all of the paving is of two kinds. The main thoroughfares are paved with standard asphalt, consisting of a 6-in., 1:3:6 concrete base, covered with a 2-in. binder course and topped with a 1½-in. asphalt wearing surface. Oil macadam is used on streets of lighter traffic. Five miles of single track and 28 miles of double track are paved with asphalt, and 35 miles of single track and 53 miles of double track are paved with macadam, a total of 202 miles, single-track measurement.

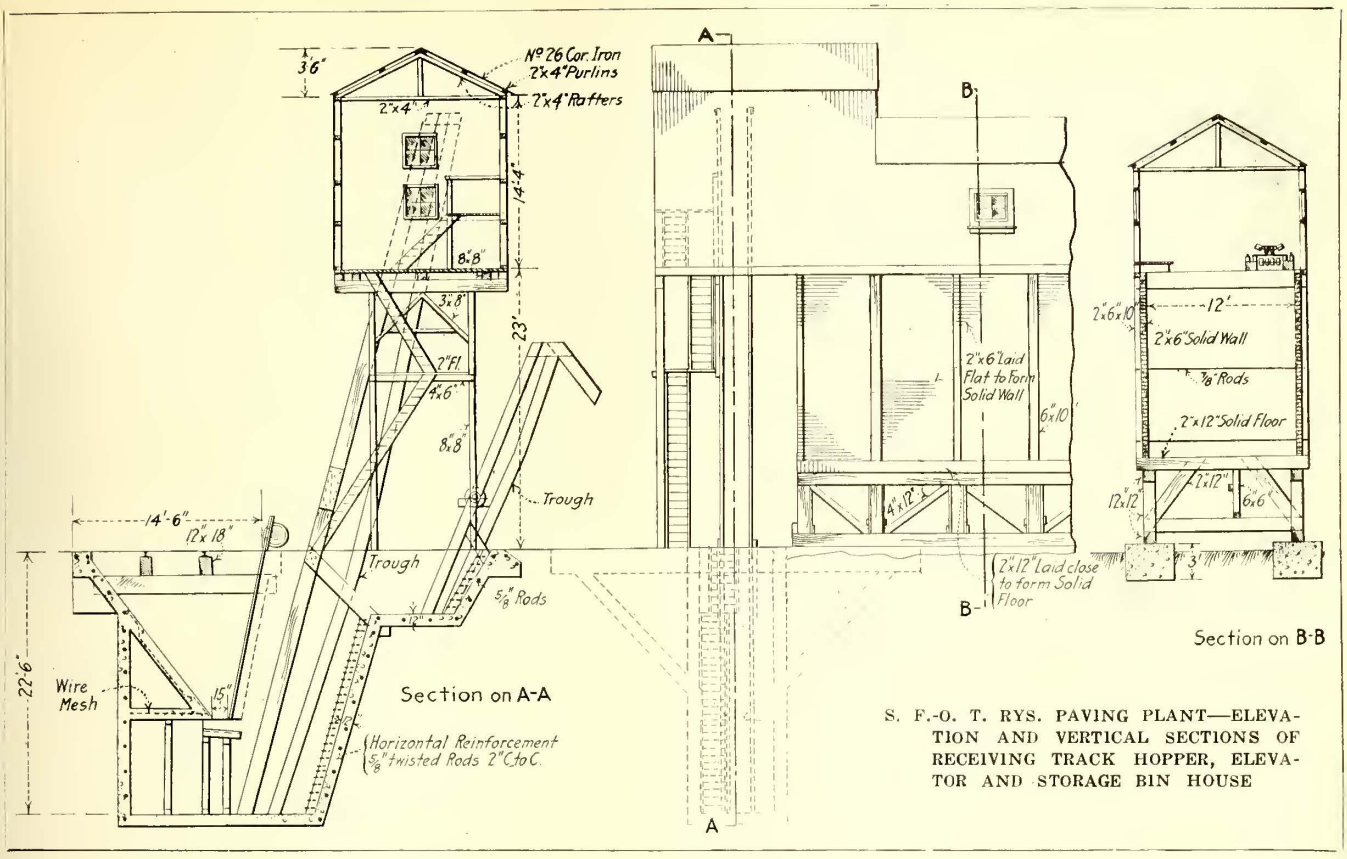
In 1913 the company purchased a 4000-gal. steel oil tank car electrically operated, and equipped with motor and a 4-in. Gould rotary pump for atomizing, and two three-wheeled 12-ton Austin gasoline rollers for oil macadam work. The result was so satisfactory that in 1914 an asphalt plant was erected and the paving department was increased and supplied with tools necessary to carry on all paving operations. For oil macadam, an additional 12-ton Austin gasoline roller was purchased, together with a Ward asphalt road oil atomizer and two Studebaker oil wagons with steel tanks of 600-gal. capacity each.



S. F.-O. T. RYS. PAVING PLANT—GENERAL LAYOUT OF PLANT

For concrete work two two-sack mixers of the Austin cube type were provided. These are steam, oil-burning, reversible, and mounted on wide tread wheels to operate on street paving, and they are self-propelling. One mixer would probably turn out enough concrete, but the machines are heavy, and in order to avoid numerous long moves which would be necessary on account of the large area to be covered, it was thought desirable to have two. Concrete material is delivered on the street by cars, and wheelbarrows are used for charging the machines, which deliver concrete by means of spouts. It has been found entirely practicable to use a 20-ft. spout when necessary to pour across one track on double-track paving. Water is obtained from street hydrants adjacent to the work.

The tools for laying asphalt consist of all necessary street tools, including two fire wagons, made by the Geiger Manufacturing Company, and a 39-in. Erie steam, oil-burning, tandem roller. This is a 5-ton roller with weight added to make a total of 6½ tons, producing a compression of 250 lb. per lineal inch. The narrow roller was selected to permit operation between rails of track. Hot asphalt is brought to the street in six 5-yd., all-steel dump cars, having a capacity of 3000 lb. per cubic yard. These cars were made by the Western



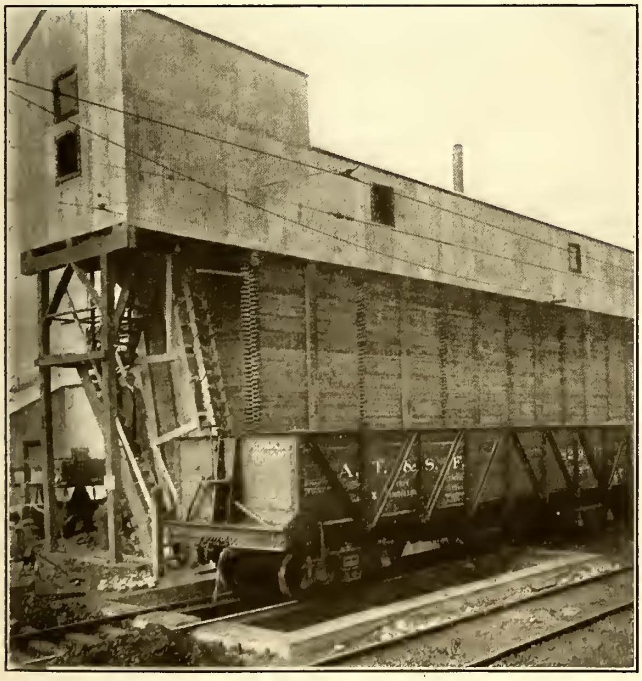
S. F.-O. T. RYS. PAVING PLANT—ELEVATION AND VERTICAL SECTIONS OF RECEIVING TRACK HOPPER, ELEVATOR AND STORAGE BIN HOUSE

Wheeled Scraper Company, and comply fully with all the requirements of the safety appliance act.

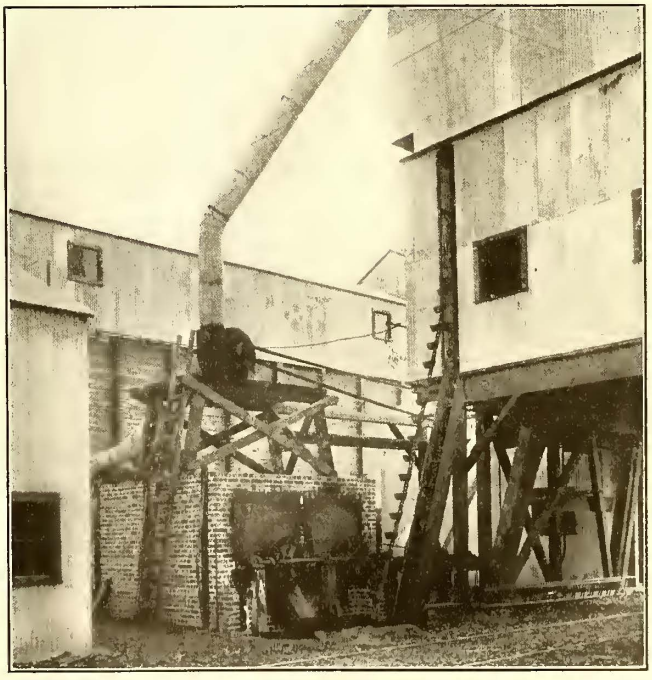
Asphalt Plant

The asphalt plant is located in the Yerba Buena yards, between the material yard and the shops of the company. It consists of storage bins for sand and rock, a dust house, underground tanks for asphalt, fuel and road oil, a sand drier, an asphalt mixer and a shed for wagons, rollers, etc., the general layout being as shown in an accompanying plan.

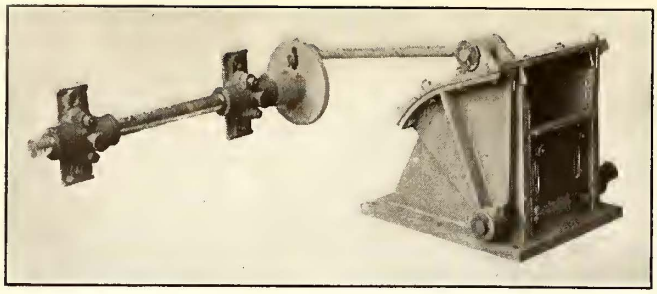
The machinery for the storage bins was designed to take sand and crushed rock at the rate of 100 tons per hour from the discharge of a track hopper, deposit them in bunkers and carry off material at the rate of from 20 to 30 tons per hour from any one compartment. Sand and stone are delivered to the plant in standard cars, which are dumped into a reinforced concrete track hopper. This is covered with a wood grating to prevent accident. At the bottom of the hopper is a 16-in. x 36-in. reciprocating feeder, with automatic regulating gate. Material deposited in the hopper is carried up



S. F.-O. T. RYS. PAVING PLANT—TRACK HOPPER, ELEVATOR AND STORAGE BINS AND TOWER



S. F.-O. T. RYS. PAVING PLANT—DRIERS AND ELEVATOR TO MIXER TOWER



S. F.-O. T. RYS. PAVING PLANT—REGULATING FEEDER GATE IN TRACK HOPPER

into the bunker tower by a bucket conveyor operated by a 10-hp. motor. The lift is 57 ft. and the buckets are 17½ in. x 8½ in. x 11¾ in. All conveying machinery was furnished by the Meese & Gottfried Company.

The entire plant is electrically operated and the several motors are Westinghouse two-bearing, open, horizontal, compound-wound, 550-volt, 1150 r.p.m., with the exception of the 50-hp. motor on the mixer, which makes 565 r.p.m. Current is obtained from the power house of the company located nearby.

The material bins, having a total capacity of 750 cu. yd., are nine in number, each being 12 ft. x 12 ft., in plan and 16 ft. deep, with 6-in. walls made of 2-in. x 6-in. lumber and floors of 2-in. x 12-in. planks laid on edge. They are supported by 7-ft. bents, with 12-in. x 12-in. caps and sills resting on concrete foundations. The tower is 14 ft. x 18 ft., the height of the eaves being 37 ft. 4 in. above the top of the rail. The bucket elevator discharges onto a 20-in. belt conveyor, 117 ft. between centers, operated by a 10-hp. motor. This belt carries the sand and rock to the different bins.

Below the bins are two 16-in. belt conveyors, 48 ft. and 58 ft. centers respectively, which take the material from the bunkers to a bucket conveyor, delivering it to the driers or to a bucket elevator, 12 in. x 5½ in. x 7½ in., 22 ft. centers, used for loading stone and sand into dump cars for use on the street railway tracks. These belts are operated by another 10-hp. motor.

The drying ovens consist of two revolving 30-in. pipes 18 ft. long, with brick firebox for burning oil; cast-iron housings, furnace doors and frames, all inclosed in a brick structure 21 ft. 3 in. x 11 ft. x 7 ft. high. The capacity is 150 cu. yd. A 17-in. Yaeger rotary fan is located on a platform above the driers, connected with a dust collector, 72 in. in diameter, over the mixer tower.

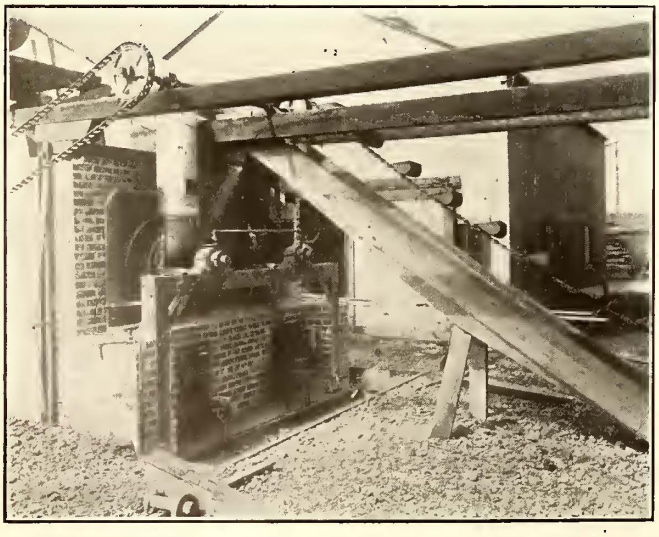
A bucket conveyor delivers hot material from the drier to a double-lined mixer having a capacity of 9 cu. ft. The mixer tower is of 10 in. x 10 in. Oregon pine, with 2-in. x 12-in. flooring. For use with the mixer are Dormant 2500-lb. capacity scales, a measuring box, a steel hot-rock and sand bin 7 ft. square, a dust bucket with 300-lb. dial spring scales, a dust bin 3 ft. 6 in. x 11 ft., a revolving sand screen 24 in. in diameter and 7 ft. 7 in. long covered with ⅛-in. mesh wire, and an asphalt measuring bucket with 500-lb. dial spring scales. The mixer and driers are operated by a 50-hp. motor. Both were furnished by the Geiger Manufacturing Company. The manufactured asphalt paving material is dropped from the mixer into the steel dump cars, referred to before, for delivery to the street. A steam cylinder operates the opening from the mixer.

The dust house is 24 ft. x 24 ft., and a Salem bucket conveyor takes the dust from the house to the dust bin at the mixer. Adjoining the dust house is an annex 8 ft. x 8 ft., in which is located a 7½-hp. motor to operate three small Trahern rotary pumps for asphalt, road oil and fuel oil respectively, and a Worthington duplex piston pump to care for condensation from the steam heating coils in the several tanks.

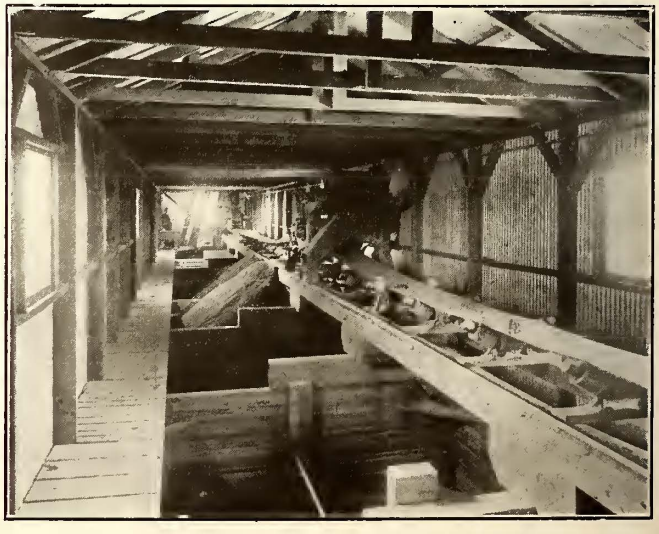
There are three underground reinforced-concrete tanks. The fuel-oil tank is 12 ft. x 22 ft. x 9 ft. deep, and the road oil and asphalt tanks are each 10 ft. 6 in. x 24 ft. x 9 ft. deep. All are equipped with steam coils and are kept heated continuously. Oil and asphalt are brought to the plant in standard tank cars and unloaded by gravity into the underground storage tanks. Asphalt is pumped from the tank to the mixer, fuel oil to the boiler and drier, and road oil to a standpipe with a swinging arm, which is arranged so that it may be used for filling the tank car operating on the tracks of the company, or the horse-drawn tank wagons. Concrete platforms with sumps have been installed, so that the delivery tanks can be blown out and the oil returned to the storage tank.

The boiler house is 28 ft. x 30 ft., including an office and lavatory. The oil-burning boiler, 48 in. in diameter, 15 ft. long, 100 lb. working pressure, made by Joshua Hendy Company, is of 50-hp. capacity, and has an extra feed pump connected with a concrete underground water tank for use in case of interruption to regular water service. The wagon shed is 18 ft. x 130 ft., open in front.

All buildings are of wood and corrugated iron, and the entire plant is inclosed with an 8-ft., tight-board fence with gates. The yard is paved with oil macadam



S. F.-O. T. RYS. PAVING PLANT—DRIERS AND ELEVATOR FROM STORAGE BINS



S. F.-O. T. RYS. PAVING PLANT—BELT CONVEYOR WITH TRIPPER OVER STORAGE BINS

and underlaid with drain tile to allow surface water to run off.

The shops of the company are protected by a domestic fire system, with tank and pump, but owing to the danger of water getting into the oil tanks, this system has not been extended to the paving plant. Hand grenades have been distributed throughout and a chemical engine on wheels has been provided. Dust and sand are always available in case of fire in the tanks. A first-aid medical cabinet has been installed for personal injuries, and the company, working in conjunction with the State accident commission, has safeguarded the plant in almost every possible way.

General Considerations

The paving plant is compact, of low first cost, adapted to its purpose and can be operated at a minimum for fuel, power and labor. The construction of the unloading hopper and storage bins with conveying machinery does away with the large amount of labor which is required when material is brought in and unloaded on the ground, to be rehandled to drier and mixer. The plant is kept ready for operation continuously, and paving repair work is under way daily, weather permitting. The operating force consists of a day engineer, a mixerman, one helper and a night engineer, who acts also as a watchman. The storage of sand in covered bunkers instead of upon the ground without shelter materially increases the capacity of the driers, as the sand does not become wet unless during transportation to the plant on cars.

With its own plant, the company can do work when and where it is necessary or desirable, and there is no delay in waiting for the convenience of contractors, not to mention the difference in cost. The ability to make paving repairs at any time is of great advantage to a street railway.

During the first year the plant was operated, owing to financial conditions, only half as much concrete and asphalt work was done as had been contemplated, and still the difference between the cost of the work done and the prevailing contract prices equalled the cost of the plant, exclusive of interest on the investment and depreciation.

It was estimated that under existing conditions 8000 sq. ft. of standard asphalt paving could be laid each day, although the capacity of the asphalt plant is in excess of that amount. By having its own rollers, which are kept on the street throughout the year, buying road oil in tank cars and delivering by its own tanks, thus reducing cost of tankage and hauling, the company secures a marked saving in oil macadam paving. By owning excellent concrete mixers, with men accustomed to operating them, and delivering material by car, the company can put in good concrete at a cost much below contract price.

The municipal authorities, realizing that the company is equipped to do good work, and has no incentive to slight any part of it, have not burdened the railway with any inspection fees. The asphalt work is done to conform to city specifications, and samples are submitted for laboratory tests.

The work accomplished during the first fiscal year consisted of 509,000 sq. ft. of standard asphalt paving, equal to 10 miles of single track, of which 320,000 sq. ft. was new pavement and 189,000 sq. ft. was patching; 11,000 cu. yd. of concrete, and 1,537,000 sq. ft. of oil macadam, the equivalent of 30 miles of single track, of which new paving and repairs were about equal.

The plant was designed and erected by the maintenance of way department of the railway, of which the writer was chief engineer at the time.

Jacksonville Valuation Brief

Valuation Deduced From Actual Investment Deemed of Primary Import, Although Cost-of-Reproduction Theory Is Thought to Give Fairly Consistent Result

THE Jacksonville Railway & Light Company, Jacksonville, Ill., which is controlled by the Illinois Traction System, has presented to the Illinois Public Utilities Commission an exhaustive brief against complaints filed by two citizens of Jacksonville alleging that the rates charged are excessive and unreasonable. The case is important on account of the question as to what particular rates may be found to be just and reasonable, but it is of even greater importance on account of the fact that the decision will probably establish clearly the policy of the State of Illinois in regard to utility regulation and utility development.

In its brief the railway has attacked the valuation problem from two distinct points of view, namely: the amount of capital actually invested in the business by the present owners of the property, and the cost of reproduction, following the method of the commission's engineers, which involves elements of depreciation, overhead, and intangible values. The company first presents the valuation which it insists should be adopted as the basis for a fair return, as deduced from its actual investment in the plant and property under consideration. It then presents its views in regard to the value of the property as deduced from a determination of the value of the "bare bones" of the plant with adequate assignments of overhead expenses, intangible values and working capital, and in so doing it asks the commission to bear in mind at all times that the two theories of valuation are entirely distinct and independent and should not be confused. At the same time, it emphasizes the fact that if reasonable judgment is exercised and care taken in the appraisal, and the results of experience be applied to the particular theory of valuation under consideration, the results will be fairly consistent.

Following the reasoning of the Massachusetts Public Service Commission in the Blue Hill and Norfolk & Bristol cases, the company holds that the Illinois Commission must find the company to have honestly and prudently invested in the Jacksonville properties approximately $900,000, after making due allowance for depreciation of the property as accruing from an assumed excess dividend of 1 per cent over 8 per cent paid during the years of ownership by the present company. It would seem, it is said, that the investment originally made, together with the capital subsequently invested in rehabilitation, improvements and developments, should remain intact as the basis of return upon which investors' rights should be predicated. The company, however, is familiar with the theory that depreciation should be charged annually and that the investment value of the property would gradually decrease as long as there was a deficit in net earnings below the rate of return plus depreciation. Yet upon the theory that the investor must first take from net earnings, representing the money contributed by the public, a certain amount each year and apply this against the depreciation to plant, whether or not a fair rate of return is earned over and above depreciation, the results in the Jacksonville situation will produce an actual remaining value in the property of $852,340. This figure is obtained by subtracting from the investment each year the insufficiency of net earnings to meet both depreciation and return and thus limiting consideration to the "actual" capital invested in the property, and also

at the end of the period by adding to the remaining investment the accrued total deficit by which the investment failed to yield an annual fair return plus depreciation.

On the subject of reproduction cost the brief points out that consistent results are obtained by all the authorities testifying in the case with the exception of the commission's engineers. The total of the present value of the gas, electric light and railway departments of the company, as determined by the commission's engineers and including only the assigned values to the "bare bones" of the property, is $483,899 as compared to L. E. Fischer's similar exhibit of $701,553. The cost-new value as determined by the commission's engineers, taking into consideration certain rehabilitation plans in order to place all figures on a comparable basis, amounts to $732,670 without any element of intangible value, which is said to be entirely reconcilable with the valuation determined for the company by Byllesby & Company, deducing a value of $834,542, including the intangible values. In the face of the repeated admissions and contentions of the commission's engineers that the actual investment in the property is always of more weight in determining the fair value for computing the rate of return, the ultimate valuation of $834,542 determined by Byllesby & Company and the conclusions of Mr. Fischer showing a present value of $898,862 with intangible, both of these valuations being predicated upon the reproduction plan of determining values, are said to be entirely comparable with the investment of $852,340.

In the opinion of the company the much cited Des Moines Gas Company case is authority that "good will" is not a proper element to be considered in a rate-making case, but that it is not improper to include in the valuation put upon various individual units of property the element of "going value." This is believed to be, indeed, by far the better and more logical plan in determining a valuation upon the reproduction-cost basis. The confusion in evaluating "going value" is said to arise from the misnomer of the intangible value thus existing. The terms "going value" or "going-concern value" savor always of the idea of "good will." In so far as it includes the expenditure of money in developing and attaching business and consumers to be served, it represents an investment and is an element of value. If the term "developed potential value" is used to designate this element of intangible value, the confusion is said to be removed.

In regard to the rate of return, the brief states that capital cannot be retained or secured to finance lighting and street railway companies without a fair assurance that a rate of return of 10 per cent upon the money actually invested will not be disputed. It is not the absolute earning of a 10 per cent rate of return that the investor demands and must receive, but it is the knowledge that opportunity is afforded to reach such a rate in view of the fact that there is no guaranty that any given rate of return will be in fact earned. The finding of the commission that the investor should not earn to exceed 8 per cent would limit the opportunity which furnishes the only inducement for the risk assumed by capital invested in public service. The general conclusion of the brief is that the fair value upon which a rate of return should be allowed is something in excess of $800,000, and the fair rate of return would be at least 8 per cent upon this value. Moreover, the company must earn a sufficient amount to accumulate a depreciation reserve of approximately 3 per cent annually on the value of the property used and useful in the gas department, approximately 5 per cent for the electric and railway departments, and approximately 1 per cent on the total fair value to amortize the discount upon bonded indebtedness.

In closing its brief, the company asks the commission in its decision to announce the reasons for its conclusions. It is said to be vitally important that the citizens and the owners of utilities know the theories of the Illinois commission upon the fundamental and controlling factors of the elements governing the fixing of rates in Illinois. Moreover, sources of invested capital are profoundly interested in learning the attitude of the State toward utility development.

Discussion on Energy Saving at Illinois Association Meeting

At the Illinois Electric Railways Association Meeting Held on March 31, Energy Saving Was the Theme to Receive Consideration

At the annual meeting of the Illinois Electric Railways Association held at the Hotel La Salle, Chicago, Ill., on March 31, several papers were presented on the general subject of efficient car operation. Most of these were abstracted in last week's issue. The paper by E. S. Gillette, abstracted below, was not available in time for that issue. In the account of the discussion printed last week through an oversight the fact that E. S. Cooper, engineer Westinghouse Electric & Manufacturing Company, participated was not mentioned. In connection with his remarks Mr. Cooper used the diagrams presented by N. W. Storer in his 1915 paper before the Western Society of Engineers and the Chicago section of the A. I. E. E. These were reproduced in the issue of the Electric Railway Journal for Feb. 6, 1915, page 286.

Power Saving in Car Operation

BY E. S. GILLETTE
Electrical Engineer Aurora, Elgin & Chicago Railroad, Wheaton, Ill.

The Aurora, Elgin & Chicago Railroad has realized for a number of years that the possibilities in the direction of power saving were great, and it has endeavored in the past to impress this fact upon the motormen by bulletin notice. However, not until last year did we make an active campaign to educate our trainmen in the savings which might be made by coasting.

In formulating our plans for the coasting campaign we gave consideration to the merits of the several devices on the market designed to check the operations of the motormen in handling their cars. There appeared to us to be certain disadvantages involved in the use of any of these devices, aside from the investment required, and we finally determined upon the plan of thoroughly instructing our trainmen in the proper method of operating their cars and with respect to the amount of coasting which could be done without interfering with their schedule, relying upon their pride and interest in producing results equal, or nearly equal, to those obtained through the use of one of the devices referred to. The results which we are at present obtaining, I believe, bear out our judgment in this respect.

Preliminary to the launching of the actual campaign of instruction a letter was sent out by our vice-president and general manager to each trainman, in which was discussed in a general way the widespread industrial depression which had not been without its effect upon our company. It was pointed out in this letter that whatever resulted in gain or loss to the company must correspondingly result in gain or loss to the individual employee. On these personal grounds, as well as on the ground of their interest in the company's

welfare, their co-operation was solicited to produce the saving made possible by using the maximum amount of coasting. Following this a few remarks were made on the possible savings, instancing actual results secured by the companies which had preceded us in taking up this matter.

The conductors were not overlooked in this appeal, for the reason that conductors are important factors in securing the possible amount of coasting. They can avoid or reduce many delays and, by being alert, can reduce the time necessary for loading and unloading passengers, thereby increasing the time available for the run. The trainmen were also informed in this letter that the company had engaged a coasting expert to instruct and advise them as to the proper method of accelerating, braking and coasting. Inclosed with this letter were sheets indicating points on our line where coasting could be done to advantage.

For the instruction of our men we secured the services of E. C. Clarke, supervisor of instruction Brooklyn Rapid Transit Company. Mr. Clarke held meetings with the men, rode with them on the cars and, by individual instruction, demonstrated to them what was possible to be done in saving energy. Mr. Clarke spent about a month on the property in the manner above outlined. Upon leaving to resume his duties in Brooklyn he addressed a letter to the motormen, complimenting them upon their aptness in grasping what he had endeavored to teach them, calling their attention to the saving already being made, and urging them to continue their efforts. With this letter was sent a booklet, printed on substantial stock and containing coasting suggestions peculiar to the property.

In connection with the campaign herein outlined our engineering department went thoroughly into the matter of coasting. Following are the main points of their findings.

The objects of the tests made by the engineering department were: (1) To show the great amount of saving which could be made in power if our trainmen would do as much coasting as possible. (2) To determine the energy consumption per car-mile which we might reasonably expect. (3) To show that it is altogether feasible to do a great amount of coasting and still maintain the schedule.

Several trains were fitted up with Sangamo watt-hour meters. The cars weighed approximately 93,000 lb. without passenger load and were equipped with four GE-66, 125-hp. motors, with a gear ratio of 32:20, and an average wheel diameter of 34 in.

No attempt was made to run these tests under special conditions. The cars were placed on regular runs and the operating schedule was followed as closely as possible throughout the trip, except that the different trips were made under as nearly the same weather conditions as possible.

On the first nineteen trips the motormen operated the cars just as they did before receiving instruction in coasting. The energy consumption per car-mile was slightly above 4.26 kw.-hr. On the next seventeen trips they operated with as much coasting as possible, and averaged about 3.58 kw.-hr. per car-mile. The saving effected by coasting was thus more than 0.5 kw.-hr. per car-mile.

In these tests we did not differentiate between braking time and actual coasting time. Naturally the braking time enters into this problem to a very great extent, but what the company was especially interested in at this time was to determine the amount of power which could be saved by coasting.

The amount of coasting which can be done on any given trip depends largely on the number and duration of stops, on the average line voltage, on whether or not the train is running on time, and on the personal equation of the motormen. The number and length of stops for any particular run are probably the most difficult variables to control. Due to the existence of these variables, we can expect neither the same amount of coasting nor the same energy consumption per car-mile for any two runs. However, we can expect that the average figure obtained from all test runs will be an average of what the motormen can be expected to do.

The tests showed very clearly that it is possible to do a considerable amount of coasting and maintain our schedule, and to do a great deal of coasting and even make up time. Attention is called to this fact especially, because we have an extremely difficult schedule to maintain. The cars are geared to make between 60 and 70 m.p.h., while the schedule speed averages about 28 m.p.h., with stops averaging about one to every three-fourths of a mile. Several railroads have to be crossed frequently, delaying the trains. We have to operate through a suburban district of considerable extent at a greatly reduced speed.

By way of illustration of the above assertion several test runs may be cited. On one from Wheaton to Chicago, of average severity, the train left Wheaton three minutes late, made seventeen stops on the trip, came into Elmhurst (9.1 miles from Wheaton) on time, arrived at Fifth Avenue, Chicago, four minutes ahead of schedule, and coasted 55.4 per cent of the time. Another two-car train left Wheaton two minutes late, made nineteen stops during the trip, arrived at Forest Park (15.7 miles from Wheaton) on time, was held up two minutes at the Great Western crossing, and came into Fifth Avenue, Chicago, two minutes late, having coasted 53.8 per cent of the time. Had it not been for the two minutes lost at the crossing the train would have arrived at Fifth Avenue, Chicago, on time.

The following is what we consider a banner run. It was made by a two-car train from Fifth Avenue to Wheaton, with seventeen stops and 68 per cent coasting. This may seem like an exaggerated statement to some who have not investigated the subject of coasting, but I dare say that any roads could obtain as good if not better results.

During the month of January we ran more than 234,000 car-miles on our Chicago division. If only 0.5 kw.-hr. per car-mile had been saved (and I do not wish to convey the impression that I think only this amount can be saved by efficient operation), it would have amounted to approximately 117,000 kw.-hr. at the car.

The average coasting on the non-coasting trips was 22.2 per cent, while that on the coasting trips was 49.3 per cent. These tests were certainly convincing as to possible economies in the use of power by motormen.

After Mr. Clarke returned to Brooklyn we arranged that the service inspectors on each division should ride with the motormen and instruct them in the matter of coasting. If they do not understand the principle after some little instruction the inspector takes the controller handle and shows them what can be done. Each time he rides with a motorman he grades him as to his ability in coasting, and the grades are sent into the general office. If we find that a man who is graded low is not improving he is called into the office and the subject of coasting is discussed with him. We have found as a result that in every case the men have improved to a marked extent in the handling of the equipment.

The Dundee (England) Tramways have installed at a special location on their system an automatic trolley reverser. Should the device work successfully it will be adopted at other places on the system.

COMMUNICATION

Why Trolley Wire Wears Out

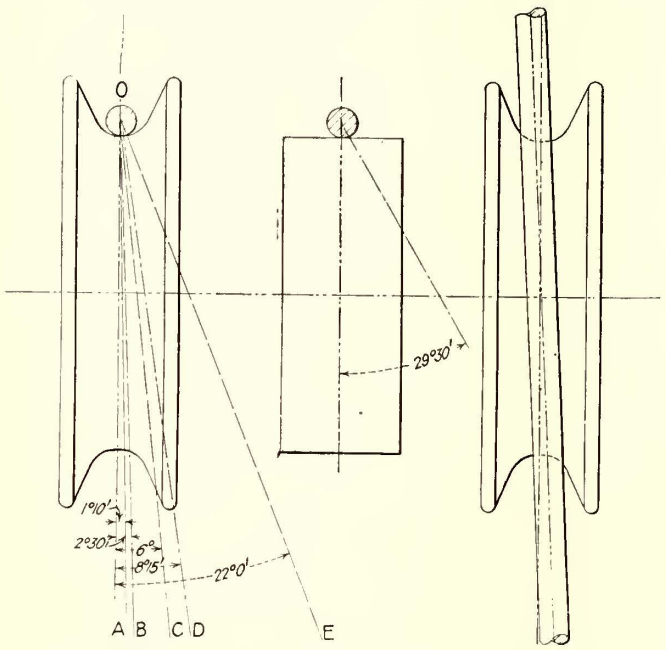
11 BROADWAY, NEW YORK, April 13, 1916.

To the Editors:

I believe that most engineers familiar with trolley operation will differ from the premises, argument and conclusions expressed by S. L. Foster on page 613 of the March 25 issue of the ELECTRIC RAILWAY JOURNAL.

It is not necessary to go back to pre-retriever days to get facts for a comparison of the wear on trolley wheels and wire with and without retrievers or catchers. There are still many systems, especially in the cities, where neither retrievers nor catchers are used.

Since reading Mr. Foster's article I have examined a number of trolley wheels, some of which were on cars equipped with catchers located 14 in. out of center and others having neither catchers nor retrievers. As many wheels showing one-sided wear are to be found on cars not equipped as on those equipped. And, what is more significant, on examining a number of wheels on



Key: Line *OA*—resultant straight track retriever pull, 5 lb.
Line *OB*—resultant straight track retriever pull, 9 lb.
Line *OC*—Rope on straight track, retriever 16 in. off center.
Line *OD*—Resultant retriever pull, 9 lb., 16 in. off center, wire is 57 in. off center on opposite side.
Line *OE*—Line of rope with retriever 16 in. off center and wire 57 in. off center on opposite side.

EFFECTS OF ANGULAR PULL OF TROLLEY CATCHER OR RETRIEVER ROPE

the roofs of the long double-pole cars operated by the Third Avenue Railway, New York, N. Y., where the trolley rope leaves the catcher 14 in. from the center of the car, fully 60 per cent showed wear on one side or the other, and of this 60 per cent fully half showed the wear on the side opposite to that where it would be expected if Mr. Foster's conclusions were correct.

The trolley conditions under which these cars operate are particularly unfavorable because the roof of the vestibule extends beyond the wheel when the trolley pole is flat on the roof, and the catcher is located under the projecting vestibule so that the rope makes rather sharp bends when it leaves the catcher and another bend at the roof. The cars pass around the sharp curves under elevated railways and the rope frequently catches on the hood, causing it to take a much sharper angle at times than when the rope passes directly from the catcher to the pole.

Now with the aid of the diagrams let us analyze the mechanics of the case and see why an inclined rope does not pull the trolley wheel against the flange.

First, take the case where the rope emerges from a retriever 16 in. off from the center of the car, the extreme case mentioned by Mr. Foster. With the wire 18 ft. high, the angle of the rope would be about 6 deg. from the vertical. Suppose we have 30-lb. trolley pressure and 5-lb. pull on the trolley rope. This is a high trolley-rope tension and a well-constructed catcher or retriever should not give over 3 lb. or 4 lb. at the most. Under these conditions, the resultant force acting between the wheel and the wire is 25 lb. and it acts at an angle of only 1 deg. 10 min. from the vertical. If we have, say, a new trolley wheel in which the groove at the bottom has a radius of 5/16 in. and the trolley wire stands in the groove 0.006 in. from the center on the side toward which the inclined trolley rope tends to pull it, the line of action of the resultant will pass through the point of contact between the wire and the wheel and there will be absolutely no tendency for the wire to move out of this position due to the pull of the trolley rope. Even with the excessive pull of 9 lb. mentioned by Mr. Foster, the angle of the resultant would be only 2½ deg., and the wire, moved 0.013 in. from the center of the groove, would be in a position where there would be no tendency for it to move in either direction.

Take the extreme case given by Mr. Foster where a long car going around a 45-ft. radius curve results in the trolley being 57 in. off the center on one side, with the retriever 16 in. off center on the opposite side, with a pull on the trolley rope of 9 lb., and a net trolley wheel pressure of, say, 24 lb. The line of the rope in this case would be 22 deg. from the vertical and the line of the resultant force acting between the wire and the wheel would be 8¼ deg. The horizontal component of the pull on the rope would be 3½ lb., and the amount which the trolley wire would have to be displaced from the center of the groove to bring the point of contact between the wire and the wheel in direct line with the resultant would be 0.045 in.

The real cause of the wire creeping to the side of the wheel is lack of accurate alignment of the axis of the wheel at right angles to the axis of the wire. The slightest variation of this angle will cause the wire to creep over to one side and climb up the curved side of the wheel until the inclination at the point of contact equals the angle of friction. So long as the horizontal component or direct side pull of the trolley rope does not exceed the force that would be required to make the trolley wheel slip on the wire it can have no effect whatever on causing wheels to wear eccentrically. Suppose for instance a trolley wire rested on a plain cylindrical wheel, that the trolley base springs were adjusted to give a pressure of 30 lb. between the wheel and wire when there was no pull on the trolley rope, and that it took 9 lb. to pull the rope out of the retriever. Under these conditions, assuming a co-efficient of friction between the trolley wheel and wire of 20 per cent, the trolley rope could lead off at an angle of 29½ deg., before it would cause the wheel to slip sidewise on the wire, and at any less angle than this, if the alignment of the axis of the wheel was such as to tend to cause it to creep away from the side on which the retriever was located, it would so creep in spite of the side pull of the trolley rope.

There is no question but that the tension spring which takes in the slack trolley rope in retrievers and catchers should be as efficient as it is possible to make

it and it never ought to require anything like 9 lb. to pull out the rope even for the highest wire. It must be strong enough to take in a wet rope, and the friction of the coils of the spring against each other and of the rope drum on its shaft should be kept as low as possible so as not to increase more than necessary the pull required to draw the rope out when the trolley wheel is rising. But the fact that trolley wheels are found to wear on one side where no retrievers are used and that where retrievers or catchers are used the wheels are as apt to wear on one flange as the other, and the wire on curves sometimes wears on the outside and sometimes on the inside of the curve, these facts, I believe, show clearly that trolley retrievers and catchers, even under unfavorable conditions, cannot be the cause of unsymmetrical wear, either on trolley wheels or trolley wire. It is, so far as I have been able to ascertain, the universal experience that the maintenance cost of overhead wires is greatly reduced by the use of catchers or retrievers. C. J. Earll.

1916 CONVENTION ATLANTIC CITY OCTOBER 9 TO 13

ASSOCIATION NEWS

1916 CONVENTION ATLANTIC CITY OCTOBER 9 TO 13

Atlantic City Selected for the 1916 Convention of the Association—President Henry Announces Personnel of Convention Committees—New Haven and Milwaukee Company Sections Hold Instructive Meetings

Committees for Atlantic City Convention

At a meeting of the convention committee in New York this week it was announced that the fall convention of the association would be held on Young's Million-Dollar Pier, Atlantic City, N. J., Oct. 9-13. Work on convention affairs has been started in earnest. Members of the convention committees appointed by President Henry met with him at the offices of the association on April 11. The duties of executing the plans for the exhibit and entertainment features were distributed among the three American Association convention committees recently appointed. The membership of these committees is as follows:

Exhibit committee: Daniel W. Smith, chairman, Peter Smith Heater Company, Detroit; John J. Stanley, Cleveland Railway; J. J. Dempsey, New York Consolidated Railway; L. J. Drake, Jr., Galena Signal Oil Company; J. G. Berry, General Electric Company; Miles B. Lambert, Westinghouse Electric & Manufacturing Company, and William H. Heulings, Jr., The J. G. Brill Company.

Committee on entertainment: E. S. Wickwire, chairman, Ohio Brass Company, Mansfield, Ohio. Other members not yet appointed.

Finance committee: L. E. Gould, Electric Railway Journal, chairman; Britton I. Budd, Chicago Elevated Railways; M. C. Brush, Boston Elevated Railway; J. D. Mortimer, North American Company; William H. Simpson, Railway Materials Company, and Robert H. Belknap, Pennsylvania Steel Company.

The general convention committee, which will have authority over the convention exhibits and entertainment, has been appointed as follows: Thomas Finigan, American Brakeshoe & Foundry Company, chairman; H. C. Donecker, Public Service Railway, vice-chairman; A. H. Ford, Cumberland County Power & Light Company, Portland, Me.; Robert I. Todd, Terre Haute, Indianapolis & Eastern Traction Company, and Daniel W. Smith, E. S. Wickwire and L. E. Gould. President Henry will shortly address a letter to the members of the American Electric Railway Association and to the electric railway manufacturers setting forth the important features with regard to the fall convention. Also, Mr. Smith, chairman of the exhibit committee, will shortly announce the plans and detail arrangements for the exhibit.

Recognition of the participation of the manufacturers in the work of the American Association under the by-laws as revised at Chicago was provided, and the plans for accelerating the membership work were furthered by the appointment of the following manufacturers to serve on the membership committee of the American Electric Railway Association, of which George W. Knox, Oklahoma Railway Company, is chairman; S. D. Hutchins, Westinghouse Traction Brake Company, co-chairman; E. B. Meissner, St. Louis Car Company; John H. Benham, International Register Company; James H. Drew, Drew Electric & Manufacturing Company; Charles C. Peirce, General Electric Company; W. K. Archbold, Archbold-Brady Company, and John M. High, Pantasote Company.

The manufacturers' exhibits will be made by member companies, who will rent space through the exhibit committee. All other privileges of the convention will be open to representatives of all railway and manufacturing member companies without payment of any fees except those of company membership. The executive committee of the American Association has directed that the dues of manufacturing companies joining the association since the recent Chicago meeting will be only one-half of the full annual dues. The fiscal year ends Oct. 31, 1916.

President Henry announced that the membership committee would meet on April 18 at the association headquarters, and that the exhibit committee would meet at the Hollenden Hotel, Cleveland, on April 20.

Activities of the Company Sections

MILWAUKEE SECTION

The meeting of company section No. 1 was held on March 30. It was devoted to a quiz and to reports from the committees on profit sharing and cost of service. The "Review of the Technical Press," a mimeographed index of important articles appearing during the preceding four weeks, was distributed to the members.

W. C. Bolt, shop accountant, presented the report of the committee on profit sharing, a supplemental report of that committee. He discussed the effects of the inauguration of the profit-sharing plans in the several departments of the company, some of the practical advantages which he outlined being as follows: (1) Profit sharing urges economies in both labor and materials; (2) provides a basis of added compensation to individual employees in accordance with merit; (3) develops an *esprit de corps* in the employees and places upon them the burden of maintaining a high degree of efficiency in their respective departments; (4) develops

a spirit of friendly co-operation among the employees, resulting in the desire to help one another and thereby increase their store of knowledge, their earning power and their value to their employers; (5) furnishes incentives to greater care and diligence in the daily work of employees; (6) lessens the need of supervision as personal efficiency increases; (7) tends, when properly administered, to retain employees in the service of the company; (8) establishes the identity between the interests of the employees and the interests of the company, and (9) creates an incentive for personal efficiency and increased production, and stirs on to greater and greater efforts.

G. W. Kalweit, general auditor, read the report of the committee on cost of service. This report was in the form of a progress report covering only a preliminary treatise of the subject. He outlined the nature of the costs incurred incident to the development of street railways, taking up organization, financing and construction. He stated further that the costs of service were of three types: (*a*) Interest, taxes and that part of depreciation which would occur if the property existed but was not operated; (*b*) those expenditures necessitated by the operation of cars and which would occur in substantially the same amount if no passengers were carried, and (*c*) those expenses occasioned by the passengers and varying with the number of passengers.

Mr. Kalweit explained the accounting classification of cost of service, and the elements of cost, emphasizing the primary importance of reducing expenditures to unit costs, these units to be operating units. The committee proposes to examine into each element of cost to determine the particular unit of operation to which it is most closely related, and thus to arrive at a set of unit costs from which it will be possible to determine cost of service with some accuracy.

CONNECTICUT COMPANY SECTION

The fifth regular meeting of Company Section No. 7 was held on April 4, being preceded by the usual dinner, during which the section was entertained with musical selections.

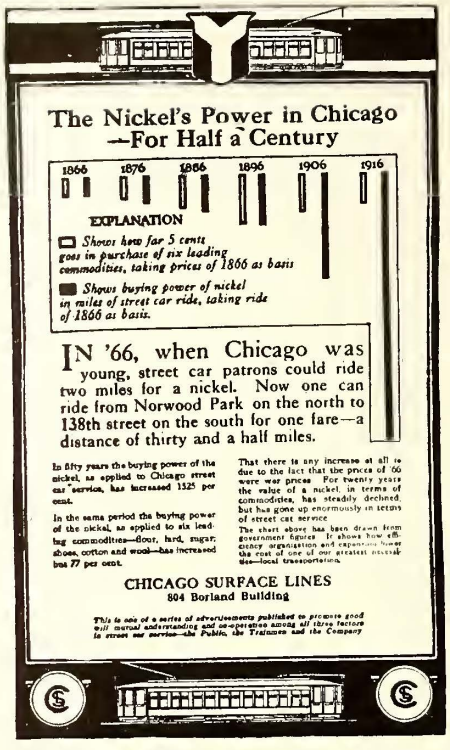
The speakers at the meeting were Alfred Green, mechanical expert Galena Signal Oil Company; W. G. Gove, superintendent of equipment Brooklyn Rapid Transit Company, and H. N. Balfour, head bookkeeper accounting department, S. H. Steele, claims investigator, and C. T. Matson, claim agent, all of the Connecticut Company. Mr. Green gave a comprehensive illustrated talk on "Lubrication," and supplemented this by answers to questions on the lubrication of various motors. Mr. Gove gave interesting facts in regard to the system of his company. Mr. Balfour read a paper on "Construction Accounting in Its Relation to Other Departments." Since the meeting the last-named paper has been duplicated and distributed to the several departments of the company. Messrs. Steele and Matson gave short talks on safety-first problems, discussing part of the paper by H. A. Bullock read at the February meeting.

President Flickinger announced the appointment of a committee to investigate various types of snow-fighting equipment with a view to making recommendations to the company. The committee comprises F. W. Miller, superintendent Hartford; F. P. McKaig, roadmaster Hartford; W. E. Crilly, master mechanic Hartford; F. A. Hewitt, superintendent Middletown; H. L. Wales, superintendent Waterbury; P. Ney Wilson, roadmaster New Haven; W. F. McCoy, master mechanic Bridgeport; M. E. Stark, roadmaster Bridgeport, and H. W. Beebe, supervisor of equipment New Haven. Progress reports will be expected from this committee from time to time, pending the completion of its final report.

Chicago Newspaper Advertisement

Emphasizes That Ride Has Increased 1525 Per Cent in Length in Fifty Years

ONE of the series of advertisements which the Chicago Surface Lines has now been running about a year called attention to the fact that the power of the nickel for street railway rides in Chicago had increased about 1525 per cent in fifty years. The relative increases for ten-year periods were illustrated on a chart, a reproduction of which is shown in the accompanying illustration. The title of the advertisement is the same as the title of the chart, namely, "The Nickel's Power in Chicago—For Half a Century." Other text matter reads, "In 1866, when Chicago was young, street car patrons could ride 2 miles for a nickel. Now one can ride from Norwood Park on the north to 138th Street on the south for one fare—the distance between these two points being 30½ miles.



CHICAGO ADVERTISEMENT

"In fifty years the buying power of the nickel, as applied to Chicago street car service, has increased 1525 per cent. In the same period the buying power of the nickel, as applied to six leading commodities—flour, lard, sugar, shoes, cotton and wool—has increased but 77 per cent. That there was any increase at all is due to the fact that the prices of 1866 were war prices. For twenty years the value of a nickel, in terms of commodities, has steadily declined, but it has gone up enormously in terms of street car service. The chart illustrating this fact has been drawn from government figures. It shows how efficiency, organization and expansion lower the cost of one of our greatest necessities—local transportation." Accompanying each advertisement in this series is the following paragraph: "This is one of a series of advertisements published to promote good-will, mutual understanding and co-operation among all three factors in street car service—the public, the trainmen and the company." For the past few months new advertisements have appeared in all of the local newspapers once each week.

This advertisement occupied space approximately 6½ in. x 10½ in. in size, and the text matter was inclosed in a standard black margin with cuts of a car at the top and bottom of the advertisement.

An ordinance has been passed in Portland, Ore., forbidding passengers on street cars to talk to the motormen on duty. Signs to that effect have been placed in the cars.

EQUIPMENT AND ITS MAINTENANCE

Short Descriptions of Labor, Mechanical and Electrical Practices in Every Department of Electric Railroading

Contributions from the Men in the Field Are Solicited and Will Be Paid for at Special Rates.

The Variable-Load Brake

Of all of the novel features of the equipment on the New York Municipal Railways car that have been described in various issues of the ELECTRIC RAILWAY JOURNAL, doubtless the one that has been subject to most discussion is the variable-load brake. This is not so much because the installation constitutes the first application of the idea in rapid transit operations, but rather because it marks the culmination of the efforts of many inventors who are justly entitled to credit as pioneers but who have vainly striven for several decades to evolve a device for which the need was obvious. The successful variable-load brake has involved overcoming extraordinary inherent difficulties. Almost every railroad man has considered the problem, and almost every one has arrived at a solution, for there is, on paper, nothing easier. On the other hand most of these conceptions never passed even the experimental stage, and this has made the variable-load brake seem like the proverbial pot of gold at the rainbow's end.

Practically from the time when the air brake first came into use, this demand for adjustable maximum braking power has existed. It has been especially marked in the case of steam railroad freight cars, whose total weight when light might be only some 30 per cent of the total weight when loaded, because a braking power designed to utilize the adhesion of the loaded car would obviously produce sliding wheels in case the car was empty. On the other hand, a braking power suitable for the light car would be quite inadequate for a heavy loading, and this is the condition that exists largely at the present time, freight trains with a maximum total brakeshoe pressure of only 15 per cent of the gross train weight being common.

With passenger equipment, the demand for adjustable braking power has been, until recently, less insistent. The high-speed car, found on the steam railroads, has been of such great weight that the addition of some fifty or sixty passengers has really been negligible, adding only about 5 per cent to the load on the wheels. With the recent development of light-weight steel equipment, however, the percentage of increase due to the passenger load has been enlarged, and in the New York Municipal car it has actually become 45 per cent, the light car weighing only 85,000 lb., while the passenger load reaches a possible maximum of 38,000 lb. additional.

In this case, the relatively frequent stops for which the car was designed prohibited the company from taking chances with sliding wheels, and the light-weight braking power had to be rigidly limited to a figure suitable to the weight of the empty car. As opposed to this was the fact that a 45 per cent increase in total train weight meant a practically proportional increase in braking distance, this in turn causing a serious waste of time by increasing the distance between trains at limiting points.

The alternative was the provision of adjustable braking power, and this has been accomplished by a scheme which, in brief, consists in varying the capacity of the air-brake auxiliary reservoir and thus making more, or less, compressed air available for use in the brake cylinder. Actually, the change in reservoir capacity is brought about by the introduction of a second reservoir that is divided into a series of compartments of various sizes, these being connected to or separated from the original reservoir by ports controlled by a slide valve. The movement of the latter is effected by the push from a pin against which the slide valve is held by air pressure, the pin being connected by a rack-and-pinion system to the vertical piston of a small air cylinder which is mounted between the spring plank and the truck bolster. Since the vertical rack moves relatively up and down as the bolster is depressed or raised in accordance with the variations in the weight on the truck springs due to the changes in passenger load, the whole constitutes a weighing device which automatically adjusts the position of the slide valve, and thus the auxiliary reservoir capacity, to the load on the car. The process of adjustment, however, takes place only when the car doors are open. When they are closed prior to starting the train, the pin that moves the slide valve is retracted by the release, electrically, of the air in the small cylinder on the spring plank, and at the same time the slide valve is locked, by a simple latch, in the position that it had assumed at the instant when the doors were closed. Obviously the retraction of the pin removes the physical connection between the slide valve and the load-measuring device so that the movements of the springs when the car is in motion have no effect, thus preventing any change in the adjustment of the braking force by the up-and-down motion of the car caused by inequalities of the track.

From the foregoing it is evident that a really accurate adjustment of braking power has been attained with reasonably little complexity and small liability for break-down, because the load-measuring device is operative only when the doors are open and the car is, in consequence, stationary. Of course, the apparatus in this installation has neither the extreme simplicity nor the cheapness to make it altogether suitable for an ordinary freight car, for which another type of empty-and-load brake is beginning to come into use, but on rapid transit cars additional expenditures for brake equipment are truly negligible when they afford opportunity for increasing the service on a line that may cost several hundred thousand dollars per mile. Then, too, with the frequent and thorough inspections that are possible and are the rule on electric railways, the introduction of additional apparatus constitutes by no means the serious problem that would be the case with steam railroad equipment.

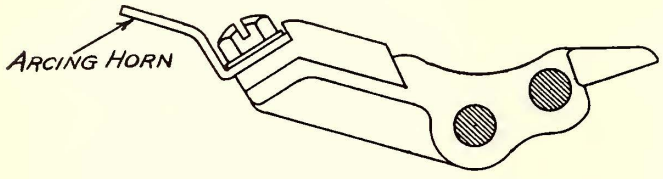
These, in fact, are major conditions which practically assure the commercial success of the innovation, and as its mechanical practicability has been demonstrated by nearly a year of active service, there seems to be good reason for classing it among the important achievements of the railway industry. Certainly when a device permits the application of sufficient braking power to make an emergency stop from 30 m.p.h. in a distance of 194 ft., as in the case under discussion, it constitutes a really definite step toward getting the maximum of capacity out of the road.

Defects in Multiple-Unit Control Equipment

BY C. W. SQUIER, E.E.

Multiple-unit control, as the name implies, was devised as a means for operating several cars, each equipped with its own motors, in trains from a single operating point. For such operation each car of a train is considered a unit and is controlled and operated as a unit independent of the other cars in the train.

Although originally devised for train operation, multiple-unit control, or what now may be more properly termed "unit switch group control," is coming into general use for single car equipment, as it removes the heavy power circuits and the circuit-breaking apparatus from the car platform and permits the installation of these parts in a location where they cease to be a danger and annoyance to passengers. Fundamentally, this system is composed of a set of switches or contactors with heavy contacts for handling the motor current and giving the various circuit combinations necessary for the control of the motors. Small operating controllers at each end of the car control the operation of the switches or contactors. These master controllers are similar in design and operation to the usual drum-type controllers, but are much smaller in size, and handle



ARCING HORN WHICH ELIMINATES BURNING AT CONTACTS

only the small control current which is admitted to the operating coils of the unit switch group through the train line wires instead of handling the main motor current. The control current is taken either from low-voltage taps of a control resistor connected to the line or from a storage battery.

Two methods are used for operating the switches or contactors of the unit switch group. One, used by the General Electric Company, employs the control current through solenoid coils to close the electrically operated contactors. The other, practised by the Westinghouse Electric & Manufacturing Company, uses the control current to energize magnet valves, which admit air to cylinders for closing the contactors. The results obtained are the same for both types, the difference being in the method which is employed to operate the contactors.

In the construction of the various parts comprising a multiple-unit control equipment, similar types have been used to those employed for hand controllers, and the troubles and remedies already discussed in previous articles on circuit breakers, controllers, etc., will apply to these parts equally well, so in this discussion I shall take up only those not already mentioned in the articles referred to.

The contacts in all the later types of unit switches are provided with blow-outs, which direct the magnetic flux across the contacts and blow the arc toward the front and away from the operating mechanism of the switches. This is the most efficient and successful type of blow-out and reduces the burning at the contacts to a minimum. If one watches the arc as it is being blown out, he will find it floating to the side of the contacts and thus keeping close to the side of the arc chute. In order to draw this arc away from the restricted part of the arc chute and keep it away from the sides, two important methods have been worked out by the manufacturers. These are not found in the earlier types of unit switch group control, but can easily be added in most cases, and will prove a decided advantage in reducing excessive burning at the contacts. The first consists of the addition of burning or arcing horns to the front of the contacts, so shaped as to stretch the arc and draw it away from the sides of the arc chute. When the circuit is opened at the contacts, the magnetic field set up causes the arc to move from the contacts to the arcing horns, thus lessening the burning at the contacts. An accompanying illustration shows a form of arcing horn that has been added to some of the switches of the Type A B unit-switch group with good results. These arcing horns are held in position by the same screw that fastens the contact tips.

The second method referred to for drawing the arc away from the sides of the arc chute involves the use of pointed contact tips so shaped that the circuit is broken on these pointed ends, and there is still the full width of the tip in contact when the switch is entirely closed. The wiping action of the contacts while closing makes this possible, as they slide over each other from the end to the position where the contacts have full width.

The gases generated by opening the circuit at the contacts cause a yellow metallic layer to be deposited on the sides of the arc chute. This deposit is a very good conductor and causes short circuits if not kept properly cleaned off. The linings of these arc chutes should be examined on each inspection and any deposit scraped off. Care must be taken to see that the gases from arcs are not confined but are allowed to escape by liberal ventilation to the surrounding air. Pockets in the car framing are also a source of trouble where the arc is blown into these. I recall one installation where the line switches were surrounded by car members in such a manner that a few operations of the line switches would fill this space with gas, and short circuits were continually occurring by the arc floating to ground, even though this was a distance of some 12 in. away.

On cars having the Westinghouse electro-pneumatic type of control all magnet valves should be thoroughly cleaned and blown out on regular overhauling, and careful adjustments of the armatures made with metal gages and valve stems lengthened where necessary in order to maintain proper operation at specified voltage. Controllers should then be notched up, and all magnet valves and cylinders inspected for air leakage. If the cylinders leak, the leathers should be removed and replaced with freshly lubricated ones. If a cylinder drops off slowly, inspect for a broken spring.

The following method of treating cylinder leathers has been found to be the most satisfactory: The leathers are worked in Marvin's brake cylinder compound and some of this is rubbed thoroughly into the pores of the leather with the fingers. Any excess of the compound is wiped off with cheese-cloth. Before installing the leathers in the cylinder, the walls of the cylinder are also wiped with a small quantity of the compound. Switch-arm insulators are carefully examined, and any dirt or oil cleaned off, and all switch arms and the controller frame are tested with a lamp circuit for ground. If found clear, the controller frame is grounded and the arms again tested. If grounds show on either test, they are cleared before cars are allowed to return to service.

Multiple-unit control equipments should be given a thorough overhauling at least once a year, when all parts should be removed as far as possible, and switch

arms, fingers, pins and all moving parts examined for excessive wear. Broken or burned arc shields, broken shunts, badly worn interlock contacts, or burned tips and arcing horns should be renewed. Broken or oil-soaked switch-arm insulators should be replaced, and all insulation parts should be thoroughly cleaned, then painted or shellacked. All leads to the magnet coils and in the wiring boxes should be tightened and examined for worn insulation or broken strands. Line relays, limit switches and auxiliary relays should be opened up, thoroughly cleaned and tested and adjusted to work properly on low voltages such as might be obtained in service.

Automatic Track Switch in Rochester

BY C. L. CADLE
Electrical Engineer New York State Railways, Rochester Lines

In November, 1915, the Rochester lines of the New York State Railways installed at one of the busiest points on its city lines a new type of track switch which is saving its first cost at the rate of about once in every three months, and which has given very satisfactory results from an operating standpoint ever since it was placed in service.

The switch, which is of the Collins non-splitting, non-splashing type, is installed at the corner of Main and State Streets in the city of Rochester. From a study of the traffic conditions at this point it has been found that the number of cars passing the corner and operating the switch, either for main line or for branch line runs, reaches a rate of approximately 150 cars per hour during the maximum fifteen-minute period of the day. During its four months of service no important difficulties have been experienced with its operation. A few minor defects with the mechanism were found, but none of these is serious, and the company thinks so well of the proposition that it expects shortly to install eleven track switches of this type to replace eleven old automatic switches now in operation on the company's city lines.

At the point where the switch is located a switchman was always employed prior to the introduction of automatic operation because of the extraordinarily heavy traffic, which is, in fact, the maximum experienced anywhere on the whole system during the rush hours. The installation of the device has eliminated the switchman at this location, reducing the operating costs approximately $3.30 per day, while the service that is given is just as satisfactory as under conditions of manual operation.

The principal features of the switch that differ from those of the old type generally in operation throughout the country are, first, that it is driven by a motor, thus permitting the introduction of a train of gears to retard the motion of the switch point when it moves from one side of the bed to the other. This causes the switch to operate without splashing. In addition to this the switch point is firmly held in the position to which it is thrown by means of a spring that is connected with a train of gears, and in consequence, the switch point cannot fly back between the trucks of a car and thus make it split the switch. The third important feature is a control that is effected by both a cut-in contact and a cut-out contact so arranged that a following car which is extremely close to the car operating the switch is prevented from throwing the switch point between the trucks of the first car as it passes over the switch point. In the accompanying illustration the cut-in contact is shown just ahead of the trolley pole of the car in the foreground. The cut-out contact does not appear in the picture, being attached to the trolley wire near the frog, approximately over the switch.

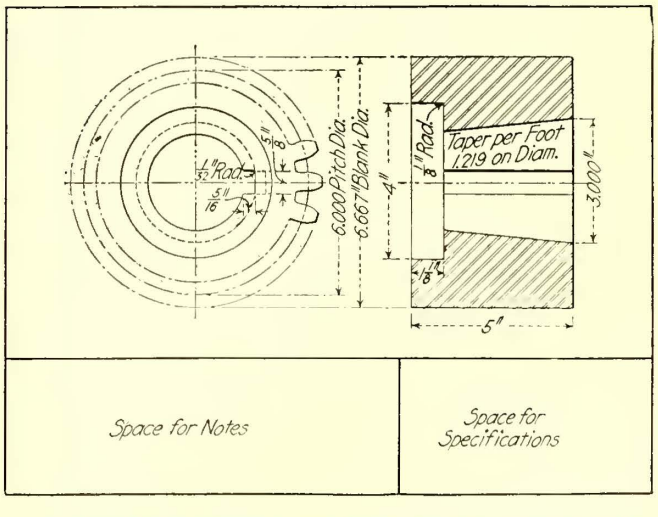
ELECTRIC TRACK SWITCH AT CONGESTED CORNER IN ROCHESTER

Cataloging Equipment Insures Accuracy

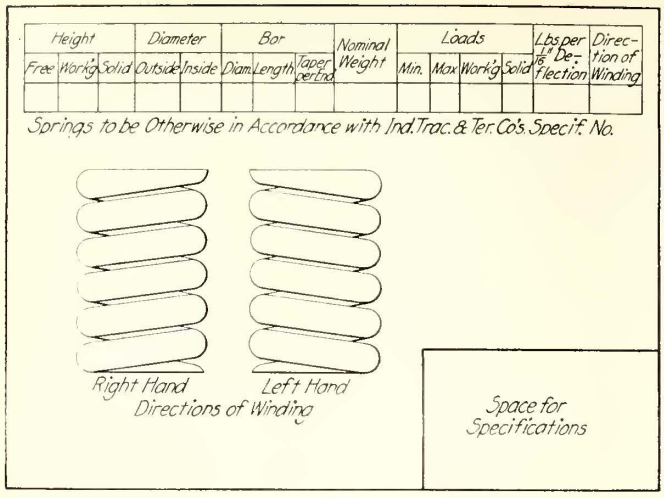
BY L. M. CLARK
Master Mechanic Indianapolis Traction & Terminal Company, Indianapolis, Ind.

All equipment parts such as springs, gears, pinions, etc., have been carefully cataloged by the mechanical department of the Indianapolis Traction & Terminal Company, Indianapolis, Ind. All the principal dimensions, weights, maximum, minimum, working and solid loads and deflections are itemized for helical and elliptic springs. Reproductions of typical pages taken from the catalog of equipment parts for helical and elliptic springs are shown in the illustration below and those on the next page.

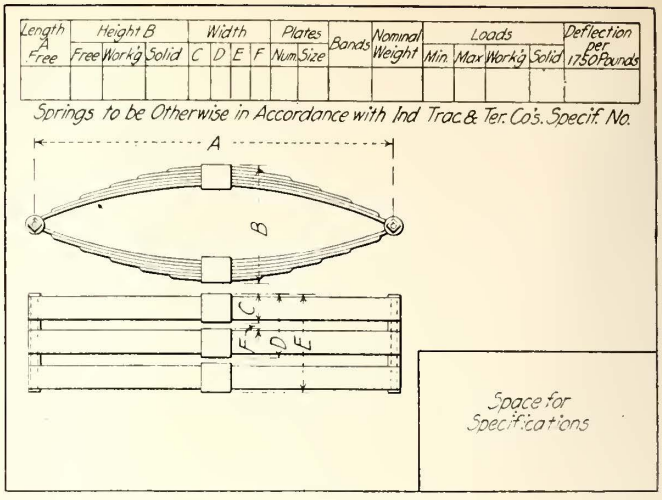
Catalog pages for gears and pinions show all dimensions both in plan and section for the various types. The name of the manufacturer, the number of the motor and the gear ratio are also indicated. All the different types of springs, gears or pinions, as the case may be, are then classified and indexed to show what types are used with certain classes of trucks and motors. A reproduction of one of these classification sheets is also



INDIANAPOLIS EQUIPMENT CATALOG—REVISED PINION DATA SHEET



INDIANAPOLIS EQUIPMENT CATALOG—HELICAL SPRING DATA SHEET



INDIANAPOLIS EQUIPMENT CATALOG—DOUBLE ELLIPTIC SPRING DATA SHEET

shown in the accompanying table. All drawings are on standard correspondence size sheets so that they may be bound under one cover. An issue letter is added to the drawing number shown in the title to indicate revisions in the standard drawings for any particular equipment part. The original drawing contains only a number, and revised drawings are lettered beginning with the first letter of the alphabet. This method of cataloging equipment parts not only facilitates the work of making requisitions for repair parts but insures the greatest possible accuracy when it is used for reference purposes.

INDIANAPOLIS TRACTION & TERMINAL COMPANY TERRE HAUTE, INDIANAPOLIS & EASTERN TRAC. CO.

CLASSIFICATION OF SPRINGS

Issue of May 1, 1913

TRUCK SPRINGS

Truck	Elliptic		Helical											Truck	Elliptic		Helical										
	Side Frame	Bolster	Side Frame	Bolster			Equalizer			Journal Box			Motor Susp.		Side Frame	Bolster	Side Frame	Bolster			Equalizer			Journal Box			Motor Susp.
			Single	Single	Outside	Inside	Single	Outside	Inside	Single	Outside	Inside					Single	Single	Outside	Inside	Single	Outside	Inside	Single	Outside	Inside	
Peck Single	1411		1438							1439			1437	Dorner No. 18		1426					1443	1453				1437
Dupont Single	1410 1428		1435							1436			1437	Peck 14-a-xx		1413			1444	1445				1446	1450	
Peck 14-B-3		1412					1441			1442			1437	Peck 36-8 (61-79)		1429					1459	1447				
Brill 27-G		1415		1448						1449			1437	Peck 36-8 (20-58, 1-2)		1414					1459	1447				
Brill 27-F		1416		1451						1452			1437	Bald, 78-35 (P's. F't)		1424 1425					1460	1461				
Brill 27-F-1		1416		1451						1452			1437	Std. C-80 (65-90)		1421				1459						
Std. 0-50		1417					1454						1455 1456	Std. C-80 (20-58, 11)		1422 1423					1459	1462				
Std. C-50-P		1420						1457	1458					Std. C-80 (600)		1421				1463						

MISCELLANEOUS SPRINGS

Damper Coil, Std. 0-50 Truck	1470	Brake Release spring, Peck 14-0-xx Truck	1481
Dead Lever Guide, " "	1471	Trolley Base, U. S. No. 1-6-10 and 11.	1484
" " " Std. C-50-P Truck	1471	Single Jour. Box, McGuire Sweepers Nos. 37-38	1485
⅞ Flat Hanger Coil	1472	Track Switch Box	1486
1" " " "	1473	Siding Spring Switch	1487
1⅛" " " "	1474	Draft Spring, City Car Coupler	1488
⅞" Parabolic Hanger Coil	1475	Sand Rigging Coil	1489
1" " " "	1476	Draft Spring, Tomlinson, M.C.B. Coupler, Outside	1479
Dead Lever Guide. Std. C-80 Truck	1477	" " " " " Inside	1483
Damper Coil, " " "	1478	Clutch (10") spring, Concrete mixer	1470
Brake Release Spring, Std. Light	1480	Bolster spring, Barney & Smith Truck	1427
" " Std. Heavy	1482		

Contact Signals for Jamestown (N. Y.) Lines

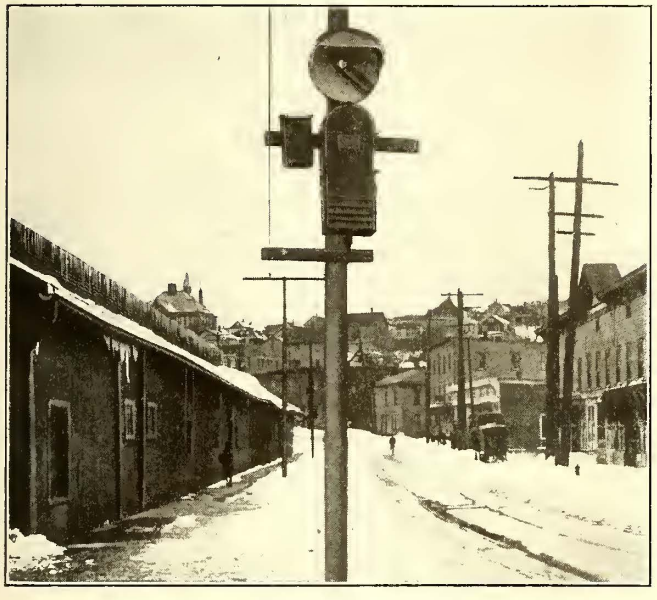
An unusually complete installation of Chapman trolley-contact signals has recently been made on the city and interurban lines centering in Jamestown, N. Y. On the city lines, which are operated by the Jamestown Street Railway Company and the affiliated Chautauqua Traction Company, nine blocks have been installed. Five of these are on a 4-mile single-track section of a suburban line which extends from Jamestown to a suburb several miles from the city. Over this line city cars are run at twenty-minute intervals in winter and at ten-minute intervals in summer, and the installation possesses no unusual features, being a typical example of the use of signals to accelerate movements on a low-speed line.

However, four other blocks that have been installed in connection with a single-track loop line in the city provide a combination of car-spacing and traffic-accelerating signals that is uncommon. The loop is about 2½ miles long and it surrounds the most closely-built section on the south side of the city, a ten-minute service being maintained on it in both directions throughout the day. The ten-minute headway on the loop line is filled out in one direction by cars that turn into the loop from a single-track line which branches off one side of the loop, and serves an outlying part of the city. These cars are operated on a twenty-minute headway and they alternate on the loop with the loop-line cars in one direction to maintain the ten-minute headway over that section of the line. The spacing of the cars on the loop line is maintained by three signal blocks, and an additional block about 1 mile long has been installed on the branch to establish the same spacing between the loop-line cars and the branch-line cars when they turn onto the loop.

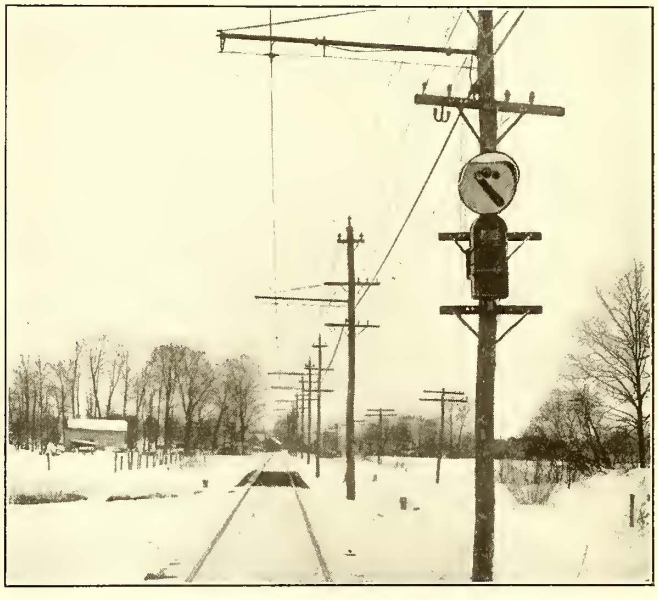
Cars on the branch line that approach the junction with the loop are controlled by the signal at the junction, which prevents their entering the next block on the loop until the preceding loop-line car has reached a point about ten minutes in advance. At the same time the opposing signal holds the block on the branch line against the car which has passed around the loop and is ready for the out-bound service on the branch line, thus preventing interference with the in-bound car that is approaching the loop to take its place in the ten-minute service on the loop line.

The importance of this elimination of interference arises from the fact that the 2½-mile loop is covered in just about twenty minutes—the headway between branch-line cars—and also because of the fact that the branch line joins the loop at the top of a steep hill which obscures the view in both directions. In consequence, the car that is just preparing to leave the loop for the branch line is liable to be on the time of the car which is approaching on the branch line and preparing to enter the loop. If either one or the other happened to be slightly late there might easily be a question, without the use of the signals, as to just where each car was.

The fifteen blocks that have been installed upon the interurban line, which is the converted steam railroad known as the Jamestown, Westfield & Northern Railway, and described in the Electric Railway Journal for June 12, 1915, are used to protect a service of high-speed cars now operating over the line. Limited cars make the run of 32 miles between Jamestown and Westfield in fifty-nine minutes, and the locals make the run in one hour and fourteen minutes, passenger trains being run at one-hour intervals. In addition there are six baggage-car runs, together with work-car and freight transfer service that is handled by an electric locomotive, the line having been built originally as a connecting link for freight interchange between the trunk-line steam railroads that cross it.



CAR SPACING SIGNAL AT JUNCTION OF BRANCH LINE AND CITY LOOP IN JAMESTOWN



TYPICAL HIGH-SPEED INTERURBAN SIGNAL ON JAMESTOWN, WESTFIELD & NORTHERN RAILROAD

These signals were installed only as a safeguard to high-speed traffic, as the train-order system of operation with "31" orders, as well as "19" orders, has been retained in force since the signals were installed. The signals are designed for high-speed operation in every respect, special provision having been made to eliminate evil results from grounds or crosses on the line wires. Some difficulty was at first experienced through the tendency of motormen to run too fast through the contactors, since it was found that speeds in excess of 40 m.p.h. were liable to cause mechanical damage. However, this difficulty has been entirely obviated since the motormen have become familiar with the signals and their locations, and the cost of maintenance has dropped to negligible figures.

Dynamic Balance

At the recent New Orleans meeting of the American Society of Mechanical Engineers, N. W. Akimoff, engineer Dynamic Balancing Machine Company, Philadelphia, discussed the subject of dynamic balance as opposed to the more commonly understood condition of static balance. For the latter to exist it is necessary only for the center of mass of the body to lie somewhere upon the axis of rotation so that the body is in neutral equilibrium in regard to this axis. For dynamic balance, however, there must first be static balance, and in addition the body must be free from any so-called centrifugal couple in any axial plane. Centrifugal

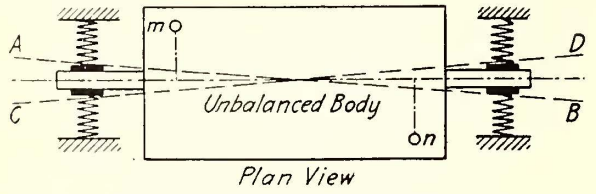


FIG. 1—EFFECT OF DYNAMIC UNBALANCE IN A STATICALLY BALANCED BODY

couples are due to two masses on opposite sides of the shaft, and located at a certain distance axially from each other. Such masses may be, for instance, the centers of gravity for corresponding congested regions.

A condition of dynamic unbalance is illustrated in Fig. 1, which shows a case where vibration may take place even though the rotating body is in static balance. To offset the effect of such a couple as appears here, there must be introduced another couple equal and opposite in effect, and to determine the exact location of the axial plane of the disturbing couple which must be counteracted as well as the numerical value of the disturbing couple and its sign, a new form of balancing machine has been developed. This consists of a rigid horizontal beam, such as a lathe bed, which is hinged at one end and supported by a spring at the other. The body to be tested for dynamic balance, which must

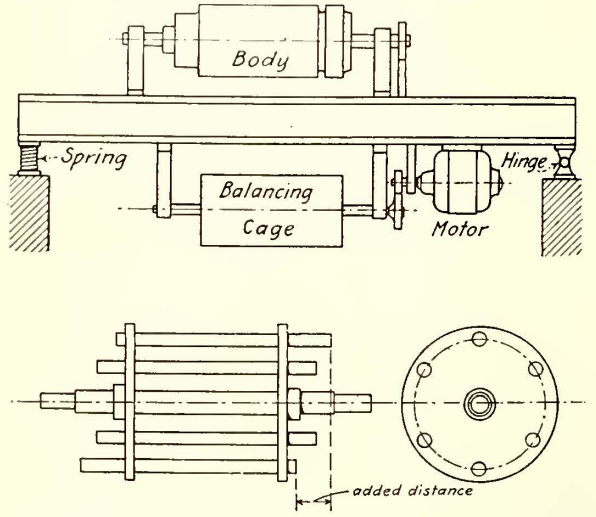


FIG. 2—DYNAMIC BALANCING MACHINE AND CONSTRUCTION OF TESTING CAGE

be previously placed in perfect static balance, is supported on the beam. If this body is dynamically unbalanced, the body will, when rotated, cause the beam to vibrate in a vertical plane with a period of oscillation equal to the period of rotation of the body.

Below the bed of the machine is supported a so-called squirrel cage that is rotated in unison with the article to be tested. The cage consists of two circular disks carrying an even number of rods, usually six or eight, arranged to slide through the disks. The rods are accurately made and their common weight is known, so that any displacement of one of them with respect to the one exactly opposite will not affect the static balance, originally perfect, but will introduce a certain centrifugal couple according to the displacement. This displacement has been called the "added distance." Thus the cage has means for indicating the exact amount of unbalance which must be put into it in order to counteract, or to reproduce with the opposite sign, the exact unbalance that exists in the article to be tested.

Speed of rotation of the body to be tested is important only as regard the characteristics of the springs that support one end of the bed, and in practice the speed of the cage is never higher than 400 r.p.m. Theoretically, one pair of rods in the cage would suffice to establish the extent of the counteracting couple, since the relative position of the rods to the body that is being tested can be altered readily through the transmission, which is a sprocket chain between the squirrel cage and the piece that is being tested. For convenience, however, it is best to have three or four pairs of rods, and even then it is sometimes necessary also to change the angular position of the cage so that the balancing can be done finally by one pair of rods and not two, as often happens at the beginning of a test. When the rods in the cage have been so adjusted as to eliminate vibration in the bed of the machine, the added distance may be directly determined by measuring the change in position in the two rods, and the body to be tested may be placed in perfect dynamic balance by adding or deducting weight at opposite sides of the axis and at opposite ends of the body to set up a couple equal to that indicated by the adjustment of the rods in the cage, this couple counteracting the disturbing couple existing originally in the tested body.

Savings and Loan Fund for Commission Employees

Through the efforts of the executive committee of the Public Service Commission Association a savings and loan fund for the benefit of the employees of the commission is about to be established. Deposits will be received from officers and employees of the commission. No one will be allowed to deposit more than $10 per calendar month, except by special action of the finance committee. Loans will be made from such funds to officers and employees of the commission applying for the same, in the manner designated by the savings and loan committee. No person, however, is to be allowed to borrow more than the amount of his accrued salary, and in any case not more than 50 per cent of his monthly salary, except by special action, payable on the next monthly pay-day of the office in which the borrower is employed. The accumulations or net profits will be divided semi-annually on May 31 and Nov. 30 among the depositors, according to the amounts and time of their deposits.

According to the *Elektrotechnische Rundschau* electro-magnetic couplers are being introduced on the German railways for switching purposes. The buffers of the switching locomotives are replaced by iron cylinders wound as electro-magnets and the front buffers of the trucks fit into a semicircular recess in these cylinders. To release the truck it is only necessary to switch off the circuit. A considerable saving in labor for switching operation is anticipated.

Electric Railway Legal Decisions

Charters, Ordinances, Franchises

ALABAMA.—*Transfers Assumed to Be Valid Until Proved Otherwise.*

In an action against a street railway for wrongful ejection of the plaintiff, whose transfer was refused, it is to be presumed that the transfer was valid until the contrary appears. (Birmingham Railway, Light & Power Co. v. Smith, 69 Southern Rep., 910.)

ARKANSAS.—*Injury to Property by Change of Grade.*

That a street railway company persuaded a City Council to pass an ordinance creating an improvement district, by the acts of which district plaintiff's property was damaged by changing the street grade, does not create a liability on the part of the railroad for such damages. (Red v. Little Rock Railway & Electric Co., et al., 180 Southwestern Rep., 220.)

CALIFORNIA.—*Ordinance to Sprinkle Streets Presumed to Be Legal.*

Where a municipality by ordinance required that a street railroad operated therein should sprinkle its tracks to lay the dust, all presumptions were in favor of the validity of such ordinance, so that the burden was on the railroad questioning it to show its invalidity. In the absence of showing to the contrary, the court was required to assume that it was a necessary police measure and that the injury it was intended to obviate was caused entirely by the railroad. (Pacific Gas & Electric Co. v. Police Court of City of Sacramento, et al., 152 Pacific Rep., 928.)

ILLINOIS.—*Construction of Text of Ordinance.*

A city ordinance embodying a contract between the municipality and street railways could be construed only in the light of its text, and not in the light of letters, statements and opinions as to its meaning of members of the local transportation committee of the city council which it did not appear were brought to the attention of the council itself at large when the ordinance was submitted to it for passage, since it is the intention of the City Council which the courts must endeavor to determine, not the intention of committee members, in construing an ordinance. (People ex rel. Dwight v. Chicago Railways et al., 110 Northeastern Rep., 386.)

ILLINOIS.—*Municipality Can Contract for Rights in Streets Only Within Its Own Boundaries.*

An ordinance of a village, granting a street railway the right to use its streets, which was accepted by the railway, provided that a 5-cent fare only should be required to a point within the city of Chicago. Thereafter Chicago annexed a part of the village territory and provided by ordinance, which was accepted by the railway, that it must collect a fare from each passenger and could not accept transfers issued at points without the city limits. In a suit to compel the restoration of the 5-cent rate from the village to the point within Chicago, it was contended that the condition prohibiting the exchange of transfers imposed by the city on the railway was invalid, the claim being based on the assumption that the railway was under obligation to maintain a 5-cent fare between the village and the point within Chicago under the village ordinance, that the duty was public, and that any contract not to perform it was void as against public policy. Held, that the contention was invalid, as the power of a municipality to regulate the conditions on which a street railway may occupy its streets is dependent on the jurisdiction of the municipality over the streets and subject to transfer to another municipality. (People ex rel. Dwight v. Chicago Railways et al., 110 Northeastern Rep., 394.)

INDIANA.—*Consolidation—Equitable Relief—Right of Directors to Vote as Stockholders.*

To warrant the interposition of a court of equity in an action by a stockholder in one of two street railway companies to annul a consolidation agreement between them and to restore to one of them the property owned by it prior to consolidation, the facts well pleaded must constitute a fraud or breach of trust, and that the act may be unwise is no ground for relief in equity.

Directors in a street railroad company who are also directors in another company are not disqualified from voting at the stockholders' meeting for the consolidation of the two companies, where the statute authorizing consolidation does not disqualify them, as stockholders are not regarded as trustees for one another. (Norton et al. v. Union Traction Co. of Indiana et al., 110 Northeastern Rep., 113.)

INDIANA.—*Consolidation of Railroads—Compensation.*

Burns' Ann. St. 1914, Secs. 5685-5691, authorizing the consolidation of street railway companies, does not violate Const. Art. 1, Sec. 21, providing that no man's property shall be taken by law without just compensation or, except in case of the State, without such compensation first assessed and tendered, in that it permits the conversion of stock of dissenting minority stockholders without provision for appraisal and payment of its value. (Thomson et al. v. Indiana Union Traction Co. et al., 110 Northeastern Rep., 122.)

KANSAS.—*Verified Statements to Municipality Sufficient and Submission of Books and Records Unnecessary.*

Where a public utility corporation has complied with the provision of an ordinance extending its franchise and providing for the filing with the city clerk of verified, annual statements, showing its receipts and disbursements, mandamus will not lie to compel the corporation to submit its books and records to the city for inspection, for the purpose of verifying the correctness of such statements. (City of Wichita v. Wichita Railroad & Light Co. et al., 152 Pacific Rep., 768.)

MISSISSIPPI.—*Compensation for Damages from Second Track.*

The laying of an additional track in a street does not constitute a "public nuisance," by which abutting landowners sustain such special damages as to entitle them to abatement thereof, but they are entitled to compensation for actual damages suffered thereby, and such compensation must be made before the track is laid. (Williams et al. v. Meridian Light & Railway Co. et al., 69 Southern Rep., 596.)

NEW YORK.—*Time Limit on Transfer Expired While Passenger Waited for Car.*

The conductor of a street railway, receiving a passenger from another line with which it had a transfer agreement, is charged with knowledge of its own schedules and is bound to give due consideration to the passenger's statement that a transfer presented by him shortly after an hour at which it was marked to expire was given to him but shortly before the time limited, and that the time had expired while he was waiting at the transfer point, hence the company was liable for ejecting him for refusal to pay fare. (Kenney v. New York Railways, 154 New York Sup., 151.)

NEW YORK.—*Reasonableness of Extra Charge for Cash Payment to Be Determined by Commission.*

Public service commissions law (Consol. Laws, chap. 48, sec. 28), provides for the filing by the carrier of a schedule of tariffs, together with regulations determining the aggregate of such tariff in each particular case. Sec. 49 confers upon the commission a supervisory control over such tariffs and provides that whenever it deems the tariffs or regulations unjust or unreasonable it may determine the just and reasonable rates and fares, to be thereafter observed. An interurban electric railway company filed a schedule providing for an extra charge to the passenger of 10 cents where he had not purchased a ticket. Plaintiff was ejected from defendant's car for refusal to pay the extra charge and brought action on the ground that, the regulation being unreasonable, he was justified in refusing to pay. Held, that he had no standing to bring the action, the attack being on the rule itself, and not on the manner of its enforcement, and the reasonableness thereof being for the initial determination of the Public Service Commission, and not for the court. (Metzger v. New York State Railways, 154 New York Sup., 789.)

WEST VIRGINIA.—*Ejection of Passenger for Disorderly Conduct After that Conduct Had Ceased.*

Where the evidence tends to show the passenger's per-

sistence in disorderly conduct and the use of vulgar and profane language warranting ejection, an instruction is erroneous which forbids the exercise of that right, if, at the time therof, the passenger "had ceased to curse and swear and had ceased his disorderly conduct." (Frank v. Monongahela Traction Co., 83 Southwestern Rep., 1009.)

United States.—*Conditions Under Which Injunction Against Order of Corporation Commission Will Be Granted.*

A clear case of unreasonable, arbitrary or confiscatory action on the part of a State corporation commission in directing a street railway company to double-track one of its lines for a specified distance must be made before a federal court may restrain the enforcement of the commission's order by an interlocutory injunction. (Phoenix Railway of Arizona v. W. Paul Geary, Frank A. Jones and Amos W. Cole, members of the Corporation Commission of the State of Arizona, 36 Supreme Court Rep., 45.)

Law of Negligence

Alabama.—*Law Imputing Negligence of Automobile Driver to All Occupants of Private Car Invalid.*

Automobile act (Acts 1911, page 649, Sec. 34), providing that the contributory negligence of the person operating any motor vehicle shall be imputed to every occupant thereof but not to passengers paying fare and riding in motor vehicles regularly used for public hire, is repugnant to the State and federal constitutions, because discriminating against persons riding in motor vehicles and denying equal protection of the law to persons similarly situated. (Birmingham-Tuscaloosa Railway & Utilities Co. v. Carpenter, 69 Southern Rep., 626.)

Alabama.—*Injuries to Stock—Burden of Proof.*

Where plaintiff sought to recover for the killing of a calf by a street railroad, the burden of proof was upon him to show negligence of the railroad, for the statutes affecting the burden of proof in cases where stock was killed by railroads do not apply to street railways. A street railway is liable for killing stock on its right-of-way only where its neglect is the proximate cause thereof. (Montgomery Light & Traction Co. v. Woods, 70 Southern Rep., 119.)

California.—*Last Clear Chance Doctrine.*

In an action for injuries due to a collision between an automobile and defendant's street car, an instruction attempting to charge upon the doctrine of last clear chance was erroneous in telling the jury that defendant would be liable if the motorman was in position to know of the danger to plaintiffs and failed to exercise ordinary care to protect them, as eliminating the doctrine of contributory negligence. (Quackenbush et al. v. Los Angeles Railway Corp., 151 Pacific Rep., 756.)

Indiana.—*Duty to Look and Listen a Continuing One.*

The duty to use one's eyes and ears in interests of safety when crossing tracks is a continuing one, not excused by obstruction of the view if the approach of the street car might be ascertained from any point, and the failure of a driver to perform such duty was contributory negligence, barring a recovery for injuries in a collision. (Evansville & Southern Indiana Traction Co. v. Williams, 109 Northeastern Rep., 963.)

Iowa.—*Automobile Stopped on Tracks—Doctrine of Last Clear Chance.*

Where an automobile owner was negligent in driving upon a street railway's tracks, and then stopped, involuntarily killing his engine, so that he could not extricate himself, and the motorman of an approaching car negligently failed to stop, when he might have done so, and injured the automobile, the street railway was chargeable with the damage under the doctrine of last clear chance. (Joyner v. Interurban Railway, 154 Northwestern Rep., 936.)

Kentucky.—*Attorney Has Lien on Amount of Judgment Not of Actual Payment.*

Under Ky. St. Sec. 107, giving an attorney's lien for fees, where a client, after a judgment in his favor, settled with the adverse party for an amount less than that awarded him by the judgment, the attorney, having a contingent contract for one-half of the recovery, was entitled to one-half of the amount of the judgment, instead of one-half the amount of the compromise. (Chreste v. Louisville Railway, 180 Southwestern Rep., 49.)

Kentucky.—*Joint Tort-Feasors in the Case of a Broken Trolley Wire.*

A street railway company established a crossing over the tracks of a railroad company, and the contract required the trolley wire to be maintained 22 ft. above the track. The contract authorized the removal of the trolley in case it sagged below that level. The trolley wire, which sagged, was struck by a wrecking train, and on the return trip was broken by the train. The railroad company had knowledge of the condition of the wire. A person struck by the live wire recovered against both the street railway company and the railroad company. Held, that the railroad company was not entitled to contribution from the street railway to the amount of the recovery against it. (Owensboro City Railroad v. Louisville, Henderson & St. Louis Railway, 178 Southwestern Rep., 1043.)

Massachusetts.—*Animals Running at Large.*

A bull at large on a highway without a keeper, while subject to being distrained under Rev. Laws, Chap. 33, Secs. 22, 23, is not a trespasser as to a street railway, and a street railway owes it the ordinary duties of care in such cases. (Carrington v. Worcester Consolidated Street Railway, 109 Northeastern Rep., 828.)

Nebraska.—*Passenger on Steps.*

It is not negligence *per se* for a street car passenger to take a position with one foot on the steps of the car, with one hand holding onto the handrail, and one foot swinging in the air, preparatory to alighting at his place of destination. But if he should be injured by slipping from the steps while the car is in motion he must prove that his slipping from the steps was occasioned by the negligent operation of the car. (Jelinek v. Omaha & Council Bluffs Street Railway, 154 Northwestern Rep., 545.)

New York.—*Under Workmen's Compensation Act a Motorman Is Not Engaged in His Employment When Going to Have His Watch Tested.*

The workmen's compensation law provides that compensation shall be payable for injuries sustained by employees "engaged in the following hazardous employments," group 1 of which includes the operation of street railways, etc.; "injury" is defined as "accidental injuries arising out of and in the course of employment"; and an "employee" is defined as a person engaged in a hazardous employment for an employer, carrying it on upon the premises or at the plant, or in the course of his employment away from the plant. Decedent, a motorman, finished his work for the day, signed his name to the register as evidence thereof, and started to take one of the company's cars to go to have his watch tested, a fortnightly requirement of the company, which designated and paid the person making the test, when he was killed by an automobile running near the curb. Held, that decedent was not engaged in the operation of a street railway, included as a hazardous employment, and that the testing of his watch was merely a condition of the employment, so that the employer was not liable. (De Voe v. New York State Railways, 155 New York Sup., 12.)

Oregon.—*Effect of Contributory Negligence Under Workmen's Compensation Act.*

Under employers' liability law, declaring that the contributory negligence of a person injured shall not be a defense but may be taken into account by the jury in fixing the damage, slight carelessness of an employee will not bar recovery for an injury caused by the employee's carelessness and the gross negligence of the employer. But in all cases where there has been any negligence on the part of the employer, the issue of contributory negligence must be submitted to the jury for comparison. (Hartman v. Oregon Electric Railway, 151 Pacific Rep., 472.)

Virginia.—*Injuries from Fellow Passenger.*

Where one passenger is attacked and injured by a fellow passenger, and the assault was unexpected by the train crew and they were in a position where they could not offer protection, there can be no recovery from the company. (Virginia Railway & Power Co. v. McDemmick, 86 Southeastern Rep., 744.)

NEWS OF ELECTRIC RAILWAYS

U. S. SUPREME COURT RULES AGAINST COMPANY

So-Called St. Louis Mill Tax Case Decided Against United Railways—Ordinance Imposing Tax Passed in 1903

The Supreme Court of the United States on April 10 dismissed for want of jurisdiction the appeal of the United Railways, St. Louis, challenging the validity of the St. Louis mill tax ordinance, assessing a tax of 1 mill on the railways for every passenger carried. The decision was in suits instituted by the city to recover from the company amounts aggregating $2,500,000.

Richard McCulloch, president of the United Railways, refused to comment on the decision. He referred the St. Louis newspapers to Henry S. Priest, counsel for the company, who conducted the case for the company before the Supreme Court. Mr. Priest is reported to have said that nothing was left for the company to do but to contest the cases which have not yet been tried involving the tax. The total of judgments already obtained is $2,500,000. The total amount said to be due to the city is $3,500,000. A special reserve fund was set up by the company to meet a possible decision unfavorable to it, the fund consisting of United States bonds and other securities in the treasury.

Argument in the case was heard by the United States Supreme Court on April 5. Mr. Priest, in opening his argument before the court, declared that in the former decision of the court the validity of the mill tax ordinance was not passed upon and that therefore the decision of the Supreme Court of Missouri, which assumed that the Supreme Court of the United States had upheld the validity of the mill tax ordinance, was incorrect. He declared that the tax ordinance was invalid, because it was confiscatory and was in effect double taxation. Charles P. Daues, City Counsellor, and Truman P. Young, assistant City Counsellor, of St. Louis, arguing for the city authorities, contended that the ordinance was a valid exercise of the taxing power, and that the validity of the ordinance was upheld in the first decision of the United States Supreme Court and that the decision of the Missouri Supreme Court should be affirmed.

In 1903 the Municipal Assembly passed an ordinance requiring the United Railways to pay the city of St. Louis, in addition to all of its other taxes, a tax of 1 mill per 5-cent passenger, which amounts to a tax of 2 per cent upon the gross receipts of the company. The matter was tried in the United States Courts on the claim of the United Railways that the imposition of the tax was a violation of the franchise contracts between the city and the United Railways. Two United States judges decided this claim in favor of the company, but when the question reached the United States Supreme Court, that court decided that the imposition of the mill tax could not be considered a violation of a contract agreement.

The question in regard to the justice or the validity of the tax, however, still remained unsettled. The city then brought suit in the local Circuit Court to enforce the payment of the tax. The Circuit Court decided in favor of the city. Upon appeal to the Missouri Supreme Court the question was decided in favor of the city by a divided court, four of the judges voting to enforce the tax and three of them voting that the tax was illegal. The matter was then appealed by the United Railways to the United States Supreme Court. The question at issue before this court was whether or not this was a just tax, and whether or not it was in the nature of double taxation, inasmuch as the United Railway Company already paid city, State, school, franchise and government taxes.

Based upon the present earnings of the United Railways the mill tax amounts to about $235,000 a year. Some time ago the company said in the *United Railways Bulletin* that if it should be required to pay this additional tax of $235,000 a year it would be paying considerably more than 10 per cent of the entire annual gross receipts of its lines for the purposes of taxation.

TOLEDO STRIKE DECLARED OFF

Victory for Open Shop—Court Allows Increase in Fare to Provide Funds for Cars and Other Added Expenses

The Toledo Railways & Light Company, Toledo, Ohio, and its motormen and conductors reached an agreement on the evening of April 9 and the road resumed operation the following morning at 7.30 o'clock, after having been idle since the afternoon of March 28. The company had presented a proposition earlier in the day and the men accepted it by unanimous vote at 5.15 o'clock in the afternoon.

No union buttons will be worn by the men while on duty. This contention, considered the most important by it, was won by the company. The road will, therefore, be operated on the open-shop plan. The company, however, yielded a number of other points considered less vital than the contention of the union for a closed shop. The wage scale agreed upon, in cents per hour, is as follows:

	1916	1917	1918
First year of service	26	27	28
Second year of service	27	28	29
Third year of service	28	29	30
Fourth year of service	29	30	31
Four years and over of service	30	31	32

All tripper and plug runs are to be eliminated as far as possible and no runs are to return less than seven hours' pay in one day. The day for the regular men is to be on the two-turn system and no run is to exceed ten hours' straight time, the time to be divided as equally as possible. Runs are to be assigned in accordance with seniority and the list is to be opened for reselection at least every three months. The extra list of men is to be operated at the respective carhouses on the revolving plan. Regular motormen and conductors, when required to work overtime in emergency, are to be paid time and one-half. While instructing new men the regular men are to be paid 25 cents a day in addition to their regular time. Platform time is to be paid sand-car, wreck-car and work-train employees and flagmen at railway crossings.

Carhouse employees will work nine hours a day and receive 20 cents an hour this year, with an increase of 1 cent an hour next year and an additional cent in 1918. Shopmen are to work eight hours a day, with half an hour for meals. The present rate of pay for the hours worked is advanced 15 per cent, and in emergencies the men are to receive time and one-half after ten hours. Six days are to be considered a week. The men are to have free transportation. All employees are to be paid from the time they are called for duty until they are relieved.

The right of discipline is vested in the company, but employees discharged by the superintendent or others are to have the right to a hearing before company officials. No discrimination is to be shown and the men have the privilege of joining the union or not, as they desire. No sympathetic or other strike is to be declared, except for violation of the terms of the agreement. It is specified that no badge or other emblem objectionable to the company shall be worn and the company has the right to determine the kind of uniform that shall be worn, although employees may buy uniforms in the open market.

The motormen and conductors receive an increase in wages of 3 cents an hour this year and 1 cent each for the two years following. The hours of the shop men and others are reduced from ten to eight with no reduction in wages.

As a result of the strike settlement the Federal Court did not appoint a receiver for the company. In order to provide funds for paying the increased wages and purchase additional cars, Judge Killits authorized the company to charge a straight 5-cent fare at all hours in the day, with six tickets for 25 cents. Heretofore the rate has been 3 cents during the rush hours morning and evening. The court said the company had made the low rate voluntarily, but because of the fact that it has no franchise it has a right to make the

rate anything that is fair. The only thing the city can do is to fix a rate and then notify the company to accept it or cease operating on the streets.

On April 10 the court named Capt. John Craig as custodian of the portion of the fund derived from the increase in fares. The money so derived is to be set aside for the purchase of cars.

At the request of Henry L. Doherty a conference with the Council committee on street railways was held on April 10. Mr. Doherty asked that the city select an expert to reroute the cars in such a way as to get the greatest mileage from them, the expense to be borne by the company. He explained that if the city did the rerouteing it would eliminate any doubt regarding the sincerity of the company. Several phases of the proposed betterment of the service were discussed at this meeting. Mr. Doherty told the committee that it would require months to secure new cars, but he agreed that an order should be placed at this time, payment to be made by the Doherty Company, since the Toledo Railways & Light Company cannot secure funds for that purpose now, except through the accumulation from the receipts, as already mentioned.

The electrical workers share in the reduction of the work day from ten to eight hours and the increase in wages.

Mr. Doherty issued a statement in which he said:

"The record of this strike is without parallel in the history of the country and will put Toledo in a class by itself in the eyes of the people throughout the country. There has been not a single arrest, directly or indirectly caused by the strike. Not a blow has been struck, no property damaged. Any city can be proud of such a record, and it is convincing evidence that Toledo is a city of law and order.

"We had told our men that if they would be patient we would endeavor to work out a settlement of the street railway franchise problem and as soon as that settlement was reached we would advance their pay. The men decided to leave the matter in my hands. Later, when they were urged to organize and strike the temptation was irresistible.

"There was a serious difference of opinion between our men. Some wanted to organize and enforce their demands and others emphatically opposed it. The company cannot give good service with two warring factions of employees. We therefore were compelled to take the position that there should be no discrimination or distinction between union and non-union men.

"I hope that every car rider will refrain from doing anything that will cause lack of harmony between our men. A word of counsel from the conservative element of our car riders to all who show a disposition to excite quarrels and arguments will be greatly appreciated by the company."

MR. HENRY EXPLAINS PROPOSED IMPROVEMENTS

Charles L. Henry, president of the Indianapolis & Cincinnati Traction Company, made an address before the Westwood Civic Association, Cincinnati, on the evening of April 6, in which he explained the plans of his company for extending its line from Rushville, Ind., to Cincinnati, in case the proposed rapid transit loop is built to give the road an entrance to the heart of the city. Mr. Henry placed special stress on the importance of approving the $6,000,000 bond issue for the construction of the loop on April 25. He asserted that the trade population of Indianapolis has been increased 50 per cent by the interurban railways which enter the city, and that Cincinnati may receive the same benefit if it will make their entrance possible.

Mr. Henry said his company was prepared to spend $500,000 in making connections with the proposed rapid transit loop. The extension of the line, however, depended entirely upon the construction of this loop. It would do no good to build the road to the outskirts and bury it there. The plan of the company was to build a line from Rushville, Ind., through Brookville to Harrison and thence to Westwood. From the latter place the cars would run over the Cincinnati & Westwood line to Queen City Avenue, from which a connection with the rapid transit loop would be built.

Mr. Henry said that the run between Indianapolis and Cincinnati could be made in three hours, and that a sleeper service would be operated after midnight on a schedule of about five hours.

TOLEDO SETTLEMENT PLAN SUMMARIZED

Organization of New Company Suggested With Guaranteed Return of 6 per cent on Valuation Figure

The features of the plan for community ownership of the property of the Toledo Railways & Light Company, Toledo, Ohio, as contained in the report of N. D. Cochran, N. C. Wright, Edward P. Usher and Johnson Thurston, the sub-committee of the committee appointed by Mayor Milroy in November, 1915, were referred to briefly in the Electric Railway Journal of April 8, page 708. The sub-committee was charged with the task of devising some plan of settlement. In its report the sub-committee said that it submitted only the general outlines of its plan of settlement. The main features of this plan follow:

A separate company is proposed to take over from the Toledo Railways & Light Company at a price to be agreed upon all the company's railway property except the power house. The new company would issue stock of a par value of $10 a share, all common, to the amount determined upon as the fair value of the property. This stock would be owned in the first instance by the Toledo Railways & Light Company, but would be deposited with five trustees under a trust agreement and be voted by these trustees.

The right would be reserved to citizens of Toledo to purchase the stock on installments at par during a period of five years, the stock taken by citizens to be released from escrow when paid for and to be voted by the holder of record. The city would have the right to purchase at par all of the stock not taken by citizens and have the right to take that held by the latter at any time at a 105 or 110 per cent of par. At the end of the five-year trust period all stock then remaining in the hands of the trustees would be released from escrow and become the absolute property of the Toledo Railways & Light Company, subject, however, to the city's right to purchase such stock at any time.

The rate of fare would be fixed periodically so as to return 6 per cent to the stockholders. The trustees would be selected by agreement between the officers of the company and the present franchise committee or its successor. Steps would be taken to secure a Supreme Court decision as to the right of the city to issue bonds to purchase the stock. In this connection the committee says that "if bonds can be sold at 4 per cent to purchase a guaranteed 6 per cent stock, there will be a profit of $20,000 a year on each $1,000,000 of bonds in excess of the interest the city will have to pay."

The committee says that the plan makes its possible quickly to eliminate foreign ownership of the Toledo system. If necessary the plan contemplated would require that the Toledo Railways & Light Company purchase $3,000,000 par value of the stock of the new company to provide funds for extensions and improvements. In concluding its statement the sub-committee said:

"In furtherance of this plan and to bring about the earliest possible settlement of the railway problem, the sub-committee recommends that the general committee appoint a board of five trustees to have charge of the carrying out of the following program:

"1. To secure a valuation of the property.

"2. To secure funds either by private subscription or through the city for expenses the board of trustees will have to incur.

"3. To secure the services of a competent attorney and a competent engineer.

"4. To secure the incorporation of a company under the laws of Ohio, under such name as may be agreed upon, which company will issue common stock, the par value of the shares to be $10 each; and to do such other things as may be necessary to complete the deal for the purchase of the street railway property and carry out this plan.

"5. To cause an ordinance to be prepared which they will initiate by petition and bring to a vote of the people at a special election as quickly as possible.

"6. To offer for sale at the proper time after the passage of the ordinance the stock on deposit to the citizens of Toledo, either reserving the right to allot as they see fit or providing terms in advance as to how the stock shall be sold and apportioned.

"7. To do such other things as may be necessary properly to perform the duties of their trust."

PORTLAND COMPANY DEMURS TO NEW CONSTRUCTION

The Portland Railway, Light & Power Company, Portland, Ore., in a hearing before the Columbia River Inter-State Bridge Commission, stated that it desired to build a line across the Columbia River Inter-State Bridge at a cost of approximately $100,000, and give continuous service between Vancouver, Wash., and Portland, Ore., but that it was not financially able to do so at this time. The meeting was called by the commission to discuss the subject of tolls and kindred topics with representatives of companies desiring franchises over the bridge. According to the estimates of the commission the total annual cost of maintenance will be $62,500. This figure includes interest on the bonds, pay for the toll tenders and bridge tenders, repairs and general upkeep, etc.

F. I. Fuller, representing the company, stated that there were two objectionable points in the franchise. First, the company would be compelled to pave the track across the bridge while other vehicles carrying twenty-five or more passengers but not traveling on rails would be relieved from paying any part of the cost of the pavement; and, second, the street railway would be compelled to maintain an eighteen-hour service, while the large automobile buses would be relieved from such requirement.

The commission finally agreed to change the schedule so that passengers on street cars would be taxed 3 cents and when riding in any vehicle not operated on rails 3½ cents. The commission went on record as favoring the inclusion of all common carriers, even the jitneys, in this classification.

Officials of the Portland Railway, Light & Power Company intimated that the company might operate a one-man car at frequent intervals on the bridge, and stated that in their opinion this feature of giving better service should be encouraged by the commission by granting a somewhat smaller toll. The commission appointed a committee to confer with the various interests in regard to the franchises and to report later.

PLANS DEVELOPING FOR NEW ARKANSAS ROAD

The Little Rock, Pine Bluff & Eastern Traction Company expects to build its proposed interurban line in the near future. It is first intended to reconstruct the Main Street bridge at Little Rock, building an entirely new superstructure sufficient to carry a 50-ton car in addition to highway traffic. The bridge is 1750 ft. in length. The present bridge is without stringers and has a roadway 22 ft. wide with two 6-ft. sidewalks. The new bridge will have a roadway 32 ft. wide with two 5-ft. sidewalks. Two plans are under consideration for this rebuilding. One contemplates a temporary bridge, to cost $20,000, located three blocks above the present bridge, to carry traffic during rebuilding. The other contemplates maintaining traffic on the present bridge during reconstruction. The total cost is not to exceed $300,000 and the contractor is asked to take the old steel.

The Little Rock, Pine Bluff & Eastern Traction Company interests, the representatives of the County of Pulaski and adjacent property holders and the officers of the Intercity Terminal Company expect to confer within sixty days and apportion the expenses of construction of the bridge. Plans for the bridge must be approved by Boller, Hodge & Baird, New York City.

After the reconstruction of the bridge the new interurban company expects to construct 45 miles of track from Augusta and Little Rock to Pine Bluff, using 90 lb. A.S.C.E. rail. The interurban will use the tracks of the present railway companies in the three cities mentioned. The interurban line will operate at 1200 volts, direct current, and the city lines at 600 volts, direct current. The maximum grade will be one-half of 1 per cent. It is proposed to purchase eight double-truck 40-ton cars, each with a seating capacity of fifty-six persons. Two baggage and express cars, four trail cars and twenty flat and box cars will also be purchased. C. C. Kavanaugh, 221 Southern Trust Building, Little Rock, Ark., president of the Argenta-Intercity Terminal Company and a director of the Little Rock Railway & Electric Company, is one of the promoters of the Little Rock, Pine Bluff & Eastern Traction Company.

WAR BONUS FOR SOUTHWEST MISSOURI EMPLOYEES

As a result of the war in Europe the district in which the Southwest Missouri Railroad, Webb City, Mo., operates is enjoying a high degree of financial prosperity in which the company is sharing. In order that its employees may participate in the war profits, especially in view of the fact that the larger volume of business now being transacted by the company entails greater burdens, greater responsibilities and more particular service on the part of every one of its employees, the company has announced that it proposes to pay to each of the regular employees, except the president, attorneys and men employed in temporary or special work, a "war bonus" of 10 per cent each month, based upon the amount earned in the regular way during the month previous. Thus if a man earns $100 during the month of April, 1916, he will receive early in the month of May, 1916, as his bonus $10. The payment of this bonus will be continued so long as conditions warrant. The plan went into effect on April 1.

A. H. Rogers, president and treasurer of the Southwest Missouri Railroad, concluded as follows a statement which he issued about the plan:

"The expenses of the company of every character have been increasing significantly for many years and particularly so during the more recent boom period. Therefore you may know that only a fraction of the present increase in the revenues of the Southwest Missouri can be reserved for net income. The rates of fare on the Southwest Missouri Railroad are as low as the lowest in the United States.

"When the expenses of merchandising, manufacturing and other lines of business increase, the effect thereof is neutralized by an increase of the price of the commodity output. A railroad, however, is helpless in such a situation and cannot raise its rates so as to shift its financial burdens onto the shoulders of the public as is true of commercial concerns. The differential legal status of trade and of transportation must not be ignored.

"However that may be, men, it gives me some comfort to know your 'war bonus' will be paid to you out of the pocket of your own company rather than from the composite pocket of its passengers. Finally, let us all hope that regardless of the effect upon the finances of the Southwest Missouri Railroad and upon thine and mine, the big war may soon see its finish under guarantees that will insure the future peace of Europe without humiliation to the defeated, if there be such, and without dismemberment of any of the little nations or a diminution of their individuality and independence."

NEW YORK CENTRAL FILES WEST SIDE PLANS

Details and maps of the plan finally agreed upon by the experts of the city of New York and the New York Central Railroad for the readjustment, removal from grade and the electrification of the railroad's freight tracks on the West Side of Manhattan were on April 7 filed with the Board of Estimate by the board's sub-committee on port and terminal facilities. The plans were worked out jointly by Ernest P. Goodrich, consulting engineer of the borough of Manhattan; Charles W. Staniford, chief engineer of the Department of Docks and Ferries, and John F. Sullivan, engineer of the Bureau of Contract Supervision of the Board of Estimate acting for the city, and by George A. Harwood, chief engineer of electric zone improvements, and H. D. Jouett, designing engineer of West Side improvements, representing the railroad.

The cardinal principle of the plan is that throughout their length, from Inwood Hill, at the northern tip of Manhattan Island, to Canal Street, where the southern terminus is located, the tracks will be underground or carried on an elevated structure above the street level. Approximately $50,000,000 will be expended by the New York Central in making the proposed improvements, and Ira A. Place, vice-president of the railroad, estimated that of this total about $15,000,000 will be spent for work that will benefit the municipality. It is considered that the effect generally will be of a most beneficial nature because of the increased safety and comfort derived from removal of the tracks from grade and substitution of electric haulage for steam locomotives.

The recommendations of the committee were adopted that

sets of the plans be put on view at the Grand Central Terminal and at City Hall, that the Corporation Counsel be instructed to prepare for submission to the board a form of contract to carry into legal effect the recommendations of the committee, and that the Board of Estimate fix April 25, at 10.30 o'clock, as the time of public hearing upon the plans.

HEARING ON NEW YORK COMMISSION BILLS

It was reported from Albany on April 12 that the Senate Public Service Committee was expected to report favorably the bills which have followed the Thompson committee's investigation. The proposed legislation follows:

The removal from the courts of the power to review the commission orders in rate cases through certiorari.

The reparation act, which would force corporations to return to consumers money charged over the rate finally fixed by the commission during the time in which decision had been pending.

The act to give the Board of Estimate the right to supervise all transit construction.

The addition of the Mayor and Comptroller to the Board of Directors of the Brooklyn Rapid Transit Company and the Interborough Rapid Transit Company.

The act placing private water companies, outside city limits, under the Public Service Commissions.

At the hearing before the Senate committee on April 12 Public Service Commissioners Whitney and Hervey appeared in favor of the first two bills. They said, however, that they would prefer that the law remain as it is with regard to construction supervision.

Samuel F. Moran, representing the Brooklyn Edison Company, declared that the removal of the right of certiorari would injure the companies and private individuals. He pointed out that taxpayers who made complaints now possess the right of a court review when the decision of the commission goes against them. He said that the law would deprive the companies of their right to a fair return upon their investment. He also said that the reparation act would not hasten in the slightest the decision in rate cases.

On April 13 the Republican caucus decided to pass the Thompson bill permitting the Board of Estimate to take over control of subway construction through a rapid transit commission. In its original form the Thompson bill made mandatory the establishment of a rapid transit commission to take over subway construction work. In the amended bill now before the Legislature such a commission is to be established only if the Board of Estimate and Apportionment votes in favor of the change.

AGREEMENT ON DALLAS FRANCHISES LIKELY

It was reported from Dallas, Tex., on April 10 that the prospects were good for the city and representatives of Stone & Webster, who operate all the local electric railways in Dallas and the Dallas Electric Light & Power Company, which lights the city, reaching an agreement on the new franchises that are soon to be granted.

On April 4 the voters amended the charter of Dallas so as to authorize the City Commission to negotiate franchises with public service corporations on other bases than the 4 per cent gross receipts tax, as was provided under the old charter, and also to negotiate indeterminate franchises; that is, the City Commission received power to negotiate and grant franchises to traction and electric lighting companies requiring service at cost, after allowing a reasonable return on an agreed investment, and the commission also received power to purchase the property of public service corporations or require their sale to some other company at any time after ten years, if the service rendered should fall below the standard demanded by the commission, or if the corporations should otherwise decline to comply with the provisions of the franchises granted.

Voters of Dallas also approved the amendment empowering the City Commission to authorize the consolidation of the various traction companies now operated separately by Stone & Webster.

The voters also approved the amendment empowering the City Commission to negotiate a similar franchise with the Dallas Electric Light & Power Company, fixing its valuation and requiring service at cost after allowing a return of 7 per cent on an agreed valuation of the property. Further, the voters approved a bond issue of $500,000 to be used for the construction of the first unit of a municipal lighting plant that will ultimately furnish current for the city's use and also for the public, the same to be operated by the city for consumers at cost.

Most important of the propositions voted on, aside from the general proposition of empowering the City Commission to negotiate indeterminate franchises with the street railway and electric lighting companies, was the approval of the proposed franchises which the commission will require of the traction and lighting companies. These franchises were based on the report recently submitted by Edward W. Bemis after investigation of the situation in Dallas, and fix valuations for all the properties in question, state the rate of return that will be permitted the companies on this fixed valuation, outline definitely the betterments that will be required from time to time, and specify the rates that will be charged, these being fixed on a sliding scale, being automatically reduced as the earnings of the companies exceed a specified amount for any year.

The valuations fixed by Mr. Bemis are considerably lower than those claimed by the companies and it is on this point that a contest will occur if any is to be made. Prior to the election representatives of Stone & Webster announced that the companies could not accept these proposed franchises, even though the voters approved them. Charles F. Wallace, representing Stone & Webster, intimated that the company would resist such franchises to the full extent of the law, even to the point of resisting the commission's authority to condemn under the right of public domain or any other right, the properties of the companies in Dallas. Mr. Wallace has declined to make any definite statements since the election, merely saying in response to questions that the Stone & Webster officials outlined their position prior to the election.

INQUIRY INTO RELATIONS OF NEW YORK AND QUEENS COUNTY LINES.

A session of the Thompson legislative investigating committee was held on April 8. The committee inquired into the intercorporate relations of the Interborough Rapid Transit Company and the New York & Queens County Railway, which operates in Long Island City and in other places in Queens County. The principal witness was Dr. A. F. Weber, statistician of the commission. He reported to the commission on May 27, 1914, in regard to the company. This report showed that the percentage of operating expenses to gross receipts of the company had increased from 60 per cent in 1906 to 85 per cent in 1914. The principal cause of this increase was deferred maintenance. Fifty steel cars had been purchased in 1908. The committee went over much the same ground that was covered in questioning Commissioner R. C. Cram at the inquiry early in 1915 and reported in the Electric Railway Journal of Feb. 20, 1915, page 389.

COUNCILS APPROVE PHILADELPHIA LOAN BILLS

City Councils of Philadelphia, Pa., on April 11 passed the two loan bills providing for transit and port improvements and the financing of general purposes and unfunded debt. The bills total $114,525,000. This places the issue of transit improvement squarely before the voters. The Philadelphia *Public Ledger* says that the proposition, embracing the Taylor comprehensive transit plan, designed to serve all sections of the city on a straight 5-cent fare basis, represents the greatest improvement in the history of Philadelphia. It contemplates the expenditure of $57,100,000 for subway and elevated lines. The remaining $10,000,000 in the bill is for port improvement.

The second bill, providing for a loan of $47,425,000 for general purposes and unfunded debt, received a negative vote in Common Council. Mayor Smith said he would sign the bills. They will go before the people at the polls at the primary election on May 16.

Service Resumed in Clarksville.—Street railway service in Clarksville, Tenn., has been resumed by the Citizens Street Railway, the successor to the Clarksville & Dunbar Cave Railway, which suspended operation last fall.

New Terminal in Newark to Open on April 30.—The Public Service Railway, Newark, N. J., has announced that its new terminal in Park Place will be opened on April 30. The company has submitted to the Board of Works a schedule of car line rerouteing. New lines are to be created and existing lines are to be discontinued. Some of these changes are to go into effect on April 25.

Proposals for the Purchase of Transformers.—Sealed proposals will be received at the office of the Assistant Purchasing Agent, The Panama Canal, 24 State Street, New York City, until 2 p. m., on April 22, at which time they will be opened in public, for purchasing transformers offered for sale by the canal. Blanks and general information relating to the sale may be obtained from R. E. Rutherford, assistant purchasing agent.

Brooklyn Company Wins Bridge Toll Case.—Supreme Court Justice Erlanger has handed down a decision holding that the contract entered into by the city with the New York Municipal Railway Corporation and the New York Consolidated Railroad, subsidiaries of the Brooklyn (N. Y.) Rapid Transit Company, relieved the Brooklyn Rapid Transit Company from the obligation of paying tolls for the operation of cars over the Williamsburg Bridge. The contract was made on March 19, 1913.

Two-Year Wage Agreement Arranged.—It was announced at Hamilton, Ont., on March 21 that an agreement to run for two years had been entered into between the Hamilton Street Railway and its employees. The request of the men was for 25 cents an hour for the first-year men, 28 cents an hour for the second-year men, and 30 cents an hour for the third-year men, and an eight-hour day. Under the new agreement the first-year men will receive 22 cents an hour, the second-year men 24 cents an hour, and the third-year men 28 cents an hour, and they will continue with the ten-hour day schedule.

"Toronto Charity Railway."—The Toronto *Daily Star* said recently: "The Toronto Civic Railway is already becoming known as the Toronto Charity Railway. The fare fixed upon by the City Council, when the civic car line commenced operation, was 2 cents cash, or six tickets for 10 cents. A glance at the average fare collected in 1913, 1914 and 1915 shows that very few passengers pay for their ride in cash. If everyone used the little green ticket, the average fare would work out at 1.66 cents. In 1913 the average fare was 1.71 cents; in 1914 it was 1.69 cents, while last year it was 1.70 cents. The annual deficit has more than doubled in three years of operation. At the end of 1913 it totalled $154,317."

Arlington Street Station Bill Reported.—The committee on metropolitan affairs has reported a bill requiring the Boston Transit Commission to construct a station in the Boylston Street subway at Arlington Street, Boston, Mass. The Boston Elevated Railway has opposed the building of a station at this point for the last two years. A provision of the bill requires the Public Service Commission to hold hearings on the measure if the company and the Transit Commission do not agree upon the use of the station, and if the company does not accept the station by Dec. 1, 1916, the bill provides that no additional franchise shall be granted nor any existing franchise be extended until the company signs an agreement to rent and use the station.

Damages Awarded Railway for Change of Grade.—The city of Seattle, Wash., by the decision of Judge Edward E. Cushman of the United States District Court, in the case of the city against the Seattle, Renton & Southern Railway, will be required to pay the company $41,700 for changing the grades of Rainier Avenue. The company demanded $3,000,000. A Superior Court judgment awarded the company less than $2,000. The receivers of the company after this $2,000 judgment was set aside by the Supreme Court, began an action in the Federal Court to prevent the city from changing the grades of the street, so far as the railroad tracks were concerned. Judge Cushman decided in favor of the city in this case, but referred the question of damages to Judge Claypool.

Amicable Settlement of Ferry Loop Question.—Following a conference with the State Board of Harbor Commissioners on April 3, representatives of the Municipal Railway of San Francisco and the United Railroads reached an agreement whereby the city will have the use of the outer loop of the United Railroads at the ferry, provided it pays for its share of electricity used and a proportion of the cost of construction and maintenance based on the use of the tracks by the "C" and "D" lines. The "A" and "B" lines are to use the loop free, as originally agreed upon. On April 5, however, President Lilienthal announced that his company would oppose the plan of the Municipal Railway to make a physical connection between its Church Street line and the Market Street tracks of the United Railroads.

Reduction in Massachusetts Commission Recommended.—The special legislative committee which has been investigating Massachusetts commissions as a result of Governor McCall's message has reported a bill reducing the membership of the Public Service Commission from five to three, cutting down the salary of the chairman from $8,500 to $7,500, and reducing the salary of a commissioner from $8,000 to $7,000. The term of service on the board would also be reduced from five years to three. Under the provisions of the new bill, the salaries of the commissioners will be paid by the State, but the other expenses of the board will be met by the public utilities regulated by it. The attempt to transfer regulation of telephone and telegraph companies to the Gas & Electric Light Commission has failed. The new bill provides for a reduction of $19,000 a year in salaries.

Cleveland Men Ask Increase.—The motormen and conductors on the Cleveland (Ohio) Railway on April 11 asked for an increase in wages to 40 cents an hour. The present scale is 29 cents an hour for first-year men and 32 cents for all others. In addition the men want seats for conductors on all cars and trailers. They claim for discharged employees the right to be heard before a representative of the union, an official of the company and the person making the complaint that resulted in the discharge. This would mean that a patron of the road who made a complaint would have to appear at the hearing. If the complainant does not appear, then the discharged employee is to be reinstated with full pay. J. J. Stanley, president of the company, said that the fare would have to be advanced to the highest figure in the Tayler franchise if this demand were granted. It is said that he will demand an open shop. Fielder Sanders, street railway commissioner, said he would oppose any demand that would necessitate an increase in the present fare.

PROGRAMS OF ASSOCIATION MEETINGS

Iowa Street & Interurban Railway Association

The annual meeting of the Iowa Street & Interurban Railway Association will be held at Dubuque, Iowa, on May 10, 11 and 12.

Arkansas Association of Public Utility Operators

The date of the meeting of the Arkansas Association of Public Utility Operators fixed originally to be held at Little Rock on May 9, 10 and 11, has been changed to June 6, 7 and 8 in the same city.

Electric Power Club

The Electric Power Club, which is made up of manufacturers of electric motors, generators, transformers and controlling apparatus, will hold its annual convention at the Homestead Hotel, Hot Springs, Va., on May 8, 9, 10 and 11.

National Electric Light Association

The annual convention of the National Electric Light Association will be held this year at the Congress and Auditorium Hotels, Chicago, May 22-26. An exhibit will be held in the Auditorium Theater in connection with the convention. Special trains will be run from New York and St. Louis to the convention.

Financial and Corporate

EARNINGS MAKE BETTER SHOWING

Decrease in 1915 Electric Railway Earnings Over 1914 Not So Great as Feared—Returns for January, 1916, Indicate Marked Improvement

An examination of the gross and the net earnings of many representative electric railways in this country for the calendar year 1915, as compared to 1914, shows that the earnings in the last calendar year suffered slight decreases. On the other hand, a similar examination of the returns for January, 1916, as compared to January, 1915, indicates a substantial improvement in the first month of the present year. These totals are based on the experience of sixty-two companies having an aggregate gross revenue of approximately $281,000,000 in 1915 and being well divided geographically and also well differentiated as regards city, city and suburban, and interurban service.

INCREASES IN 1915 ELECTRIC RAILWAY EARNINGS OVER 1914

	City	City and Suburban	Interurban	Total
Eastern:				
Number of companies	8	5	8	21
Gross	0.80%	d0.67%	7.25%	1.14%
Net	3.06%	2.43%	18.51%	4.08%
Central:				
Number of companies	6	5	8	19
Gross	d2.48%	5.24%	d1.34%	0.12%
Net	d4.43%	7.46%	d4.12%	d0.79%
Southern:				
Number of companies	9	6	4	19
Gross	d8.12%	d0.07%	d12.81%	d4.49%
Net	d9.57%	3.56%	d21.17%	d4.36%
Western:				
Number of companies	..	3	..	3
Gross	....	d14.55%	....	d14.55%
Net	....	d29.62%	....	d29.62%
Total:				
Number of companies	23	19	20	62
Gross	d0.26%	d2.88%	d0.54%	d1.02%
Net	1.35%	d5.58%	d0.33%	d0.62%

NOTE.—"Eastern" includes New England and Middle Atlantic States to Southern Pennsylvania boundary. "Central" includes states west of Pennsylvania and north of the Ohio River, as well as the Missouri River States. "Southern" includes states south of Pennsylvania and the Ohio River, and Arkansas, Oklahoma and Texas. "Western" includes states west of Texas, Kansas, Nebraska and the Dakotas. The letter d denotes decrease.

The concrete percentages of increases and decreases shown in the accompanying tables do not, of course, prove anything conclusive in regard to the entire industry in view of the comparatively small number of reports. In the Eastern section returns from Boston and in the Central section returns from Chicago were lacking, while the available figures for Western railways were so scarce that only the three, Portland, Puget Sound and Vancouver, companies in the Northwest were included. Moreover, the division of the companies as to their character of service was bound in some cases to be somewhat arbitrary, especially when combined service was rendered and no segregated figures were available. In a few cases of both railway and lighting service the total earnings were included because of the impossibility of ascertaining the railway figures. In spite of these difficulties, however, the representative character of the reporting companies tends to indicate the reliability of certain general deductions.

Of the sixty-two companies examined for the calendar years 1914 and 1915, thirty showed increases in gross and thirty-two reported increases in net. About half of these increases came from the Eastern lines, the other half of the increases being about equally divided between the Central and Southern sections. The increases were very evenly divided among the different classes of companies. The aggregate result for 1915 was a decrease of 1.02 per cent in gross but a smaller decrease of 0.62 per cent in net. This decrease in gross was brought about by decreases of 4.49 per cent in the Southern section and 14.55 per cent in the Western section, which more than overcame the increases of 1.14 per cent in the Eastern group and 0.12 per cent in the Central group. The decline of 0.62 per cent in the total net was reached through decreases of 0.79 per cent in the Central section, 4.36 per cent in the Southern section and 29.62 per cent in the Western section in spite of an increase of 4.08 per cent in the East. As to the different classes of service, all lines showed decreases in gross, while the city lines alone secured an increase in net.

The gain of 1.14 per cent in gross for the Eastern group resulted mostly from increases for the city lines and the interurban lines. These with city and suburban lines as well shared in the increase of 4.08 per cent in net. Out of twenty-one companies operating in city service in the East, fifteen had increased gross and thirteen increased net. In the Central section the gain in gross for the city and suburban lines slightly more than offset the losses for the city companies and the interurban companies so as to give an aggregate gain of 0.12 per cent in gross, but owing to the larger decreases in net for the last two classes the gain for the city and suburban lines was insufficient to keep the aggregate net from showing a decrease of 0.79 per cent. The results in this section would have been worse if it had not been for the very favorable earnings made in the Twin Cities, Detroit and Akron, and on a large interurban system in Illinois. As for the Southern group, with the exception of the net for city and suburban lines, all clases met losses in both gross and net. The quarter of greatest loss seemed to be Texas. As before stated, the showing for the Western section is predicated on the reports of three Northwestern city and suburban lines, but general information regarding California and other Western lines would seem to indicate that more reports would give little if any improvement for the section.

The results of operation of the same sixty-two railways during January, 1916, as compared to January, 1915, were more favorable as regards percentage increases than those during the preceding calendar years, for the gross earnings increased 8.08 per cent and the net earnings 14.17 per cent. The important point in regard to these figures is that all geographical divisions except the West, and all classes of service displayed improvements during last January. Every company in the Eastern group reported gains in gross, and all but one reported gains in net. In the Central group all companies except one had increased gross and net, while in the Southern group fourteen out of nineteen showed higher gross and thirteen out of nineteen higher net. In the Northwest, however, the three reporting lines continued to show decreases in both gross and net. The general improvement, however, augurs well for 1916, although it should be remembered that the basis of comparison used for 1915 was abnormally low and also that electric railways are not yet feeling the full effect of current rising costs of operation. All in all, the foregoing tables together demonstrate that the influences making for decreased earnings in 1915 did not have such a harmful effect as anticipated, and electric railways are now in a position to show substantial improvement over 1915 if the present industrial prosperity is maintained.

INCREASES IN ELECTRIC RAILWAY EARNINGS IN JANUARY, 1916, OVER JANUARY, 1915

	City	City and Suburban	Interurban	Total
Eastern:				
Number of companies	8	5	8	21
Gross	7.80%	11.63%	16.20%	8.78%
Net	15.06%	26.86%	21.63%	16.17%
Central:				
Number of companies	6	5	8	19
Gross	6.73%	22.08%	6.59%	11.22%
Net	13.49%	40.85%	6.31%	19.41%
Southern:				
Number of companies	9	6	4	19
Gross	5.33%	7.17%	3.72%	6.14%
Net	8.46%	14.39%	d0.63%	10.73%
Western:				
Number of companies	..	3	..	3
Gross	...	d4.68%	....	d4.68%
Net	...	d11.47%	....	d11.47%
Total:				
Number of companies	23	19	20	62
Gross	7.48%	8.91%	9.13%	8.08%
Net	14.48%	15.67%	10.25%	14.17%

NOTE.—"Eastern" includes New England and Middle Atlantic States to Southern Pennsylvania boundary. "Central" includes states west of Pennsylvania and north of the Ohio River, as well as the Missouri River States. "Southern" includes states south of Pennsylvania and the Ohio River, and Arkansas, Oklahoma and Texas. "Western" includes states west of Texas, Kansas, Nebraska and the Dakotas. The letter d denotes decrease.

ANNUAL REPORTS

Chicago Railways

The comparative statement of income, profit and loss of the Chicago (Ill.) Railways for the twelve months ended Jan. 31, 1915 and 1916, follows:

	1915	1914
Gross earnings Chicago surface lines	$31,690,761	$31,966,048
Operating expenses	21,041,356	19,889,275
Residue receipts	$10,649,405	$12,076,773
South Side Lines proportion of residue receipts (41 per cent)	4,366,256	4,951,477
Chicago Railways proportion of residue receipts (59 per cent)	$6,283,149	$7,125,296
Deduct: Joint account expenses and adjustments applicable to previous years	20,327	(cr.)55,106
	$6,262,822	$7,180,402
Deduct: Interest at 5 per cent on valuation	4,230,975	4,116,762
Net divisible income	$2,031,847	$3,063,640
City of Chicago (55 per cent)	1,117,516	1,685,002
Chicago Railways (45 per cent)	$914,331	$1,378,638
Interest at 5 per cent on valuation of property	4,230,975	4,116,762
Interest on bank balances	64,807	118,231
Interest on treasury securities	103,440	92,534
Gross income	$5,313,553	$5,706,165
Deductions:		
Interest accrued on		
First mortgage bonds	$2,650,242	$2,617,750
Consolidated mortgage bonds	1,809,394	1,818,452
Purchase money bonds	166,314	162,920
Sinking fund reserve, accrued	250,000	250,000
Federal income tax	17,828	16,436
Corporate expenses and adjustments	89,203	123,446
Total deductions	$4,982,981	$4,989,004
Net income	$330,572	$717,161

It will be recalled that the detailed report of the Chicago Surface Lines, comprising the Chicago Railways and the South Side Lines (Chicago City Railway, Southern Street Railway and Calumet & South Chicago Railway), was published in the ELECTRIC RAILWAY JOURNAL of March 25, together with figures for the South Side Lines. For the year ended Jan. 31, 1916, all the surface lines showed a falling off in gross earnings of $275,287 or 0.86 per cent as compared to the preceding year, while the total expenses of operation increased $1,152,081 or 5.79 per cent. As a result the divisible residue receipts suffered a loss of $1,427,368 or 11.81 per cent, so that the 41 per cent going to the South Side Lines fell from $4,951,477 to $4,366,256 and the 59 per cent going to the Chicago Railways decreased from $7,125,296 to $6,283,149.

Thus the Chicago Railways' portion of the residue receipts decreased $842.147. After making certain adjustments, as shown in the preceding statement, the net income divisible between the company and the city of Chicago dropped from $3,063,640 to $2,031,847, a decrease of $1,031,793 or 33.67 per cent, this being shared in amount proportionately by the company and the city. The Chicago Railways' own gross income after the deduction of the city's share from the divisible amount totaled $5,313,553 in 1915 as compared to $5,706,165 in 1914, a decrease of $392,612 or 6.88 per cent. The income deductions showed a slight decrease, so that the company's net income amounted to $330,572 in 1915 as compared to $717,161 in 1914, a decrease of $386.588 or 53.9 per cent. After deducting the interest paid on the income bonds for the year ended Jan. 31, 1915, amounting to $100,000, and two dividends of $4 each on the participation certificates, Series I, in full for the year ended Aug. 1, 1915, and expenses, all totaling $264,016, there was left a deficit from the year's operations of $33,444 for the participation certificates Series 2. Surplus, however, was called upon for the payment of a $2 dividend on the second certificates, amounting to $248,600, so that the surplus as of Jan. 31, 1916, totaled $286,952 as compared to $568,996 a year before.

In spite of the difficulties encountered in the year, the company complied with all the reserve requirements of its ordinances and also made the usual annual payment of $250,000 for the retirement of Series C consolidated mortgage bonds. In order to provide funds with which to take care of the company's expenditures for rehabilitation work during the year, $1,500,000 of first mortgage bonds were sold in January, 1916, of which $500,000 were treasury bonds. As soon as the Board of Supervising Engineers shall have made certain adjustments, however, the company will be in a position to issue additional bonds to replace the above mentioned treasury bonds. During the year the company constructed approximately 15 miles (single track) of new extensions, under ordinance requirements, and reconstructed 10 miles of track. The amount added to capital account during the year was $1,868,717, bringing the total up to $85,626,674 on Feb. 1, 1916.

Public Service Railway

The comparative statement of income, profit and loss of the Public Service Railway and the Public Service Railroad, Newark, N. J., for the calendar years 1914 and 1915, follows:

	1915	1914
Revenue from transportation	$15,842,346	$15,625,268
Revenue from operations other than transportation	180,586	171,228
Total operating revenue	$16,022,932	$15,796,496
Operating expenses:		
Maintenance of way and structures	$1,534,735	$1,490,226
Maintenance of equipment	1,176,045	1,173,990
Traffic	2,287	4,060
Conducting transportation	5,029,181	5,154,900
General and miscellaneous	1,201,882	1,289,889
Total	$8,944,130	$9,113,065
Taxes	1,224,833	1,177,442
Total operating revenue deductions	$10,168,963	$10,290,507
Operating income—railway	$5,853,969	$5,505,989
Operating income—other operations	13,592	15,666
Total operating income	$5,867,561	$5,521,655
Non-operating income	68,024	67,910
Gross income	$5,935,585	$5,589,565
Income deductions	5,397,909	5,274,453
Net income	$537,676	$315,112
Appropriations (excluding dividends)	.....	(Cr.) 2,272
Net increase in surplus	$537,676	$317,384

The foregoing statement has been secured to supplement the data taken from the published report of the holding company, the Public Service Corporation of New Jersey, and printed in the ELECTRIC RAILWAY JOURNAL of April 8. The revenue from transportation in the railway department increased $217,078 or 1.3 per cent during 1915, while the revenue from operations other than transportation increased $9,358 or 5.4 per cent, making the total increase in operating revenues $226,436 or 1.4 per cent. The operating expenses dropped $168,935 or 1.8 per cent during the year, this decrease being mostly occasioned by decreases of $125,719 or 2.4 per cent in conducting transportation and $88.708 or 6.8 per cent in general and miscellaneous, and an increase of $44,509 or 2.9 per cent in maintenance of way and structures. Moreover, taxes increased $47,391 or 3.8 per cent during 1915, with the result that the net increase in railway operating income amounted to $347,980 or 6.3 per cent. Income deductions, however, increased $123,456 or 2.3 per cent, so that the net income gained $222,564 or 70.6 per cent.

As stated in the issue before mentioned, the revenue passengers in 1915 totaled 313,923,363, as compared to 310,308,660 in 1914, an increase of 3,614,703 or 1.1. per cent. This compares with an increase of 1,323,420 revenue passengers or 0.4 per cent in 1914 over 1913. In 1915 the transfer and free passengers increased 3,529,423 or 3.5 per cent as compared to 1,543,389 or 1.6 per cent in 1914, so that the increase in total passengers was 7,144,126 or 1.7 per cent in 1915 and 2,866,809 or 0.7 per cent in 1914. Thus the percentage of passengers using transfers increased from 21.2 per cent to 21.5 per cent, while the average fare per passenger fell from 3.83 cents to 3.82 cents. The revenue from transportation decreased from 30.763 cents per car-mile to 30.540 cents per car-mile. The car mileage rose from 50,792,889 car-miles to 51,873,660 car-miles, and the passenger receipts per car-mile decreased from 30.72 cents to 30.49 cents. The car-hour total in 1915 was 5,573,670 as compared to 5,665,119 in 1915, and the passenger receipts per car-hour rose from $2.75 to $2.84.

PETITION TO FORECLOSE EMPIRE UNITED

Permission to bring a foreclosure action against the Empire United Railways, Inc., Syracuse, N. Y., will be asked of Justice William Andrews on April 15 by Murray, Prentice & Howland, New York, as counsel for the Equitable Trust Company. They will also ask for the appointment of C. Loomis Allen and Hendrick S. Holden, temporary receivers of the company, as receivers under the mortgage. The Equitable Trust Company is trustee under the mortgage dated July 1, 1913, under which the Public Service Commission granted permission to issue a total of $20,000,000 in first and refunding 5 per cent gold bonds. The petition states that $605,000 of these first and refunding Empire United bonds were issued on Nov. 10, 1913, and that the interest of these was defaulted on Jan. 1, 1916. The trustee now asks that the default be made as to principal and interest and that it be permitted to proceed with the foreclosure of all the Empire United properties.

TENTATIVE REORGANIZATION PLAN APPROVED

The plan for the reorganization of the Seattle, Renton & Southern Railway, Seattle, Wash., proposed by Attorney John C. Higgins, of the law firm of Higgins & Hughes, representing a committee of the bondholders, has been approved and signed by Judge Frater, in the King County Superior Court. The new company will be capitalized at approximately $1,700,000, or the amount of claims and the liabilities of the present receivers. The company has liabilities of about $1,650,000, including $175,000 of indebtedness incurred by the present receivers. Mortgage claims amount to approximately $1,060,000. Approximately 25 per cent on the face of all claims, or $373,000, will be paid into the new company in cash by claimants who have entered the reorganization. This new cash will be used in clearing the liabilities of the present receivers. The liabilities include a bill for $105,000 for power furnished by the Puget Sound Traction, Light & Power Company, Seattle. Under the plan, for cash paid into the new company the bondholders will receive first mortgage bonds and for their claims second mortgage bonds. The common claimants will receive first mortgage bonds for cash paid into the new company, and stock for their claims in the old company.

The road will be sold at auction on May 1, and the preferred and common claim holders will unite in bidding it in. The city utilities committee of the City Council of Seattle has recommended to the Council that the matter of purchase be referred to a special committee composed of members of the city judiciary, the utilities and the finance committees, to discuss with representatives of bondholders a plan whereby the city may become a bidder.

Boston (Mass.) Elevated Railway.—The Massachusetts Public Service Commission has granted approval of two bond issues of $1,581,000 and $815,000 by the West End Street Railway, both issues payable in not exceeding thirty years with interest not exceeding 5½ per cent annually. It is understood the former is to be used to refund the one-year issue of serial 5 per cent debenture bonds of 1915, maturing $1,581,000 on Aug. 1, while the latter will refund the 4 per cent twenty-year gold bonds due on May 1.

Choctaw Railway & Lighting Company, McAlester, Okla.—The property of the Choctaw Railway & Lighting Company was sold on April 8 at public sale by Special Master Allen Wright to C. B. Mason, chairman of the bondholders' protective committee, for $450,000. The new owners announced that they would purchase new equipment, put the property in first-class condition throughout and continue operation. It is expected that the property will be leased to an operating company.

Los Angeles & San Diego Beach Railway, San Diego, Cal.—The Los Angeles & San Diego Beach Railway has applied to the California Railroad Commission for authority to issue notes for $37,500 to the Southern Trust & Savings Bank, San Diego; the Merchants National Bank, San Diego, and the Citizens' National Bank, Los Angeles. The company has also applied to the commission for authority to issue four notes for $4,750 each to the Citizens' National Bank, Los Angeles, with interest at 7 per cent. The notes are in renewal of former notes.

Monongahela Valley Traction Company, Fairmont, W. Va.—Knauth, Nachod & Kuhne, New York, N. Y., and Hambleton & Company, Baltimore, Md., and New York, N. Y., having sold more than $750,000 of an issue of $1,000,000 of first and refunding mortgage 5 per cent gold bonds of the Monongahela Valley Traction Company, are offering the balance at 94 and interest to yield 5.45 per cent. The bonds are callable at 105 and interest on June 1, 1922, or any interest date thereafter.

Otsego & Herkimer Railroad, Cooperstown, N. Y.—The New York Public Service Commission, Second District, has authorized the Otsego & Herkimer Railroad to issue $250,000 of its 5 per cent fifty-year first mortgage bonds, to be sold at not less than 80, netting $200,000. The proceeds of this issue will be applied in discharging and refunding the capital obligations of the company, including $84,000 in notes held by the Equitable Trust Company, New York, and $163,000 of accounts payable and other unfunded debt. The case is held open on the records of the commission pending the completion of an examination of the company's books and affairs.

Petaluma & Santa Rosa Railway, Petaluma, Cal.—The California Railroad Commission has denied the application of the Petaluma & Santa Rosa Railway to issue to George P. McNear 165 shares of its capital stock at $25 a share, under an agreement previously made with him. The road has leased its yards at Petaluma from McNear on a ten-year lease and agreed to buy the property for $9,500 on condition that McNear in turn buy 165 shares of the company at $25 a share. The commission in this decision adhered to its policy of not permitting corporations to issue stock at less than 80 per cent or 85 per cent of its par value.

Philadelphia Company, Pittsburgh, Pa.—The Philadelphia Company has declared a quarterly dividend of 1¾ per cent on the $40,443,000 of common stock, payable on May 1 to holders of record of April 15. This compares with 1½ per cent paid in February, 1916.

Republic Railway & Light Company, Youngstown, Ohio.—The Youngstown & Niles Railway has applied to the Ohio Public Utilities Commission for authority to issue $100,500 of common stock to reimburse the Mahoning & Shenango Railway & Light Company, a subsidiary of the Republic Railway & Light Company, for financing the electric railway the former company is building between Warren and Youngstown. The Mahoning & Shenango Railway & Light Company has advanced $60,000 and is willing to advance $40,000 additional to purchase right-of-way between Youngstown and Niles.

Scioto Valley Traction Company, Columbus, Ohio.—The Columbus Depot Company has applied to the Ohio Public Utilities Commission for permission to sell $200,000 of its common stock to the Scioto Valley Traction Company. The depot company was organized to build an interurban station at the corner of Rich and Front Streets, Columbus.

Southern Traction Company, Inc., Bowling Green, Ky.—Suit has been filed at Bowling Green, Ky., against the Southern Traction Company, Inc., asking that a receiver be appointed for the company.

Syracuse & South Bay Electric Railroad, Syracuse, N. Y.—The properties of the Syracuse & South Bay Electric Railroad and the Syracuse, Watertown & St. Lawrence River Railroad are to be offered at foreclosure sale on May 19. The sale of the properties was originally set for Jan. 21.

Toledo Railways & Light Company, Toledo, Ohio.—The Federal Court at Toledo did not act upon the request made by the city solicitor for the appointment of a receiver for the Toledo Railways & Light Company in connection with the strike of the employees of the company. As a result of the strike settlement, noted elsewhere in this issue, the court authorized the company to charge a straight 5-cent fare with six tickets for 25 cents and named a custodian for the funds derived from the increase in fares, which are to be applied to the purchase of cars.

Western New York & Pennsylvania Railway, Olean, N. Y.—The New York Public Service Commission, Second District, has approved the surrender of all of its capital stock by the Olean, Bradford & Warren Railroad to the Western New York & Pennsylvania Railway for a consideration of

$1. Upon the surrender of the stock a certificate to that effect must be filed in the office of the Secretary of State and of the Public Service Commission, and the stock certificates themselves must be indorsed with a notation of these facts.

DIVIDENDS DECLARED

Brooklyn (N. Y.) City Railroad, quarterly, 2 per cent.

Kentucky Securities Corporation, Lexington, Ky., quarterly, 1½ per cent, preferred.

Milwaukee Electric Railway & Light Company, Milwaukee, Wis., quarterly, 1½ per cent, preferred.

Monongahela Valley Traction Company, Fairmont, W. Va., 1 per cent, common.

Pacific Gas & Electric Company, San Francisco, Col., quarterly, 1¼ per cent, common.

Philadelphia Company, Pittsburgh, Pa., quarterly, 87½ cents, common.

Public Service Investment Company, Boston, Mass., quarterly, $1.50, preferred.

ELECTRIC RAILWAY MONTHLY EARNINGS

BERKSHIRE STREET RAILWAY, PITTSFIELD, MASS.

Period			Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m.,	Feb.,	'16	$410,857	*$317,425	$93,432	$118,373	‡†$23,742
1 "	"	'15	358,756	*290,973	67,783	117,299	‡†48,527
8 "	"	'16	3,595,335	*2,733,646	861,689	924,053	‡†993
8 "	"	'15	3,541,838	*2,666,256	875,582	944,638	‡†2,851

CLEVELAND, PAINESVILLE & EASTERN RAILROAD, WILLOUGHBY, OHIO

1m.,	Feb.,	'16	$27,808	*$17,058	$10,750	$11,050	†$300
1 "	"	'15	23,460	*15,593	7,867	10,938	†3,071
2 "	"	'16	56,673	*34,303	22,370	22,112	258
2 "	"	'15	49,274	*31,621	17,653	21,900	†4,247

CONNECTICUT COMPANY, NEW HAVEN, CONN.

1m.,	Feb.,	'16	$681,372	*$477,232	$204,140	$97,450	‡$129,352
1 "	"	'15	556,153	*380,181	175,972	98,257	‡99,136
8 "	"	'16	5,835,300	*3,932,572	1,902,728	788,791	‡1,298,580
8 "	"	'15	5,353,002	*3,927,701	1,425,301	786,234	‡812,277

GRAND RAPIDS (MICH.) RAILWAY

1m.,	Feb.,	'16	$103,429	*$64,435	$38,994	$14,486	$24,508
1 "	"	'15	94,889	*63,629	31,260	13,679	17,581
12 "	"	'16	1,186,079	*831,255	354,824	166,787	188,037
12 "	"	'15	1,286,852	*832,498	454,354	161,921	292,433

LAKE SHORE ELECTRIC RAILWAY, CLEVELAND, OHIO

1m.,	Feb.,	'16	$106,507	*$76,660	$29,847	$36,325	†$6,478
1 "	"	'15	89,200	*68,734	20,466	35,990	†15,524
2 "	"	'16	219,876	*153,479	66,397	72,434	†6,037
2 "	"	'15	187,537	*140,546	46,991	71,916	†24,925

NEW YORK (N. Y.) RAILWAYS

1m.,	Feb.,	'16	$1,040,676	*$763,345	$277,331	$284,815	‡$39,719
1 "	"	'15	982,480	*734,200	248,280	294,381	‡9,201
8 "	"	'16	9,107,997	*6,211,049	2,896,948	2,287,491	‡982,278
8 "	"	'15	8,887,645	*6,390,642	2,497,003	2,289,730	‡547,007

NEW YORK & STAMFORD RAILWAY, PORT CHESTER, N. Y.

1m.,	Feb.,	'16	$22,358	*$21,698	$660	$7,985	‡†$7,283
1 "	"	'15	21,129	*22,228	†1,099	7,979	‡†9,052
8 "	"	'16	256,775	*205,008	51,767	63,979	‡†11,779
8 "	"	'15	259,008	*208,788	50,220	63,109	‡†12,567

NEW YORK, WESTCHESTER & BOSTON RAILWAY, NEW YORK, N. Y.

1m.,	Feb.,	'16	$36,414	*$80,220	†$43,806	§$9,624	‡†$52,098
1 "	"	'15	32,206	*41,767	†9,561	§6,237	‡†14,175
8 "	"	'16	335,319	*378,970	†43,651	§52,174	‡†82,816
8 "	"	'15	292,817	*347,351	†54,534	§51,358	‡†92,660

NORTHERN OHIO TRACTION & LIGHT COMPANY, AKRON, OHIO

1m.,	Feb.,	'16	$359,403	*$213,006	$146,397	$53,411	$92,986
1 "	"	'15	260,451	*164,986	95,465	50,862	44,603
2 "	"	'16	726,545	*424,612	301,933	106,991	194,942
2 "	"	'15	541,289	*346,964	194,325	101,114	93,211

REPUBLIC RAILWAY & LIGHT COMPANY, YOUNGSTOWN, OHIO

1m.,	Feb.,	'16	$310,459	*$180,245	$139,214	$64,867	‡$65,738
1 "	"	'15	233,237	*145,471	87,766	55,254	‡32,617
2 "	"	'16	628,774	*362,810	265,964	132,155	‡134,455
2 "	"	'15	482,600	*301,049	181,551	110,644	‡71,169

RHODE ISLAND COMPANY, PROVIDENCE, R. I.

1m.,	Feb.,	'16	$410,857	*$317,425	$93,432	$118,373	‡†$23,742
1 "	"	'15	358,756	*290,972	67,783	117,299	‡†48,527
8 "	"	'16	3,595,335	*2,733,645	861,689	924,053	‡993
8 "	"	'15	3,541,838	*2,666,256	875,582	944,638	‡†2,851

WESTCHESTER STREET RAILROAD, WHITE PLAINS, N. Y.

1m.,	Feb.,	'16	$16,533	*$20,302	†$3,769	$1,725	‡†$5,467
1 "	"	'15	16,079	*20,444	†4,365	1,384	‡†5,742
8 "	"	'16	168,363	*172,292	†3,929	13,288	‡†16,983
8 "	"	'15	175,279	*181,031	†5,752	10,270	‡†15,933

*Includes taxes. †Deficit. ‡Includes non-operating income.
§Excludes interest on bonds, charged against 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

BUS RIGHTS GRANTED OVER RAILWAY PROTEST

New York Public Service Commission Holds Albany Bus Line to Be a Real Necessity

The Public Service Commission for the Second District of New York has granted a certificate of public convenience and necessity to the Woodlawn Improvement Association Transportation Corporation for the operation of its autobus line from the Union Station to the city line, Albany, via Broadway, Orange Street and State Street, North Pearl Street, South Pearl Street, Hudson Avenue, Lark Street, Madison Avenue and New Scotland Avenue. The granting of the certificate was opposed by the United Traction Company, which urged that the bus line's authority from the Common Council was not valid, and that it would be a source of unjust competition with the electric railway. The traction company attorneys urged that the authority from the Common Council was not valid because it purported to be a franchise and was not sold at public auction as the law requires in connection with franchises. Of this the order of the commission said:

"In the opinion of the commission the consent of a city to the operation of a bus line or stage route required by Sec. 26 of the transportation corporations law is not the granting of a franchise within the meaning of Sec. 37 of the second class cities law. It is more in the nature of a license, such as those issued to hackmen and others."

The commission likewise dismissed the assertion of the railway that the new bus line will unjustly compete with the railway. In speaking of New Scotland Avenue the commission says:

"It passes through a new and rapidly developing residential section of the city. The nearest line of street railroad is along Madison Avenue, which, throughout this residential section, lies from 2500 to 4000 ft. from New Scotland Avenue. The cross streets now open are few in number and for the most part not well improved. While the building of a street railway on New Scotland Avenue has for a long time been urged by the property owners, it does not appear that the company proposes to construct such a line in the near future. It is therefore quite evident that at present some convenient and cheap means of transportation would not only be of help to the residents of the New Scotland Avenue section, but that some such means is a real necessity."

The commission refers to the competition with the railway lines east and south of New Scotland Avenue as only "potential competition," and says that the only evidence concerning it is that it will be so slight as not to affect at all the revenues of the railway company.

The commission says that the traction company cannot claim protection from competition in the New Scotland Avenue district itself where the company's lines are so far away as not to afford adequate service.

SAFETY-FIRST TALKS IN JACKSON

The Jackson Light & Traction Company, Jackson, Miss., has recently been publishing a series of safety talks in the local papers. While they were written primarily to reduce accidents in which the cars are concerned, they cover a number of situations with which public utilities have nothing to do. In other words, an effort was made to hold the interest of the readers by going outside of railway accidents and including accidents in the homes. These talks were read each day in all of the public schools of the city, and as an indication of their effectiveness the company has received a request from a near-by city to send copies of them for this purpose. The talks were written by Raymond H. Smith, general manager of the company, formerly superintendent of the Connecticut Railway & Lighting Company at Bridgeport, Conn.

Excerpts from Safety Talk No. 2, which discusses the

meaning of the word, and Safety Talk No. 11, which was addressed particularly to automobile owners, follow:

"Safety First. What is its significance? When you see or hear this expression, does it mean anything to you, or is it one of the many expressions and movements which you designate as 'a good thing,' and dismiss from your mind as something in which you have no personal interest? 'Safety First' is synonymous with 'The Prevention of Accidents.' Now, let's go a little further. Accidents happen unexpectedly, like the proverbial bolt from the clear sky. To-day your neighbor may be the victim. To-morrow you may be the unfortunate one. 'Safety First' now has a new meaning to you; it is a measure for the Prevention of Accidents—a movement in behalf of your own personal safety—the safety of your family."

"Street intersections are places which call for considerable care. Don't depend too much upon hearing the car gong, and don't place too much dependence upon the motorman hearing your horn. Both the auto and the street car are making considerable noise. Depend largely upon your eyes to keep you out of danger. Slow down in coming out of side streets. Hold back. It takes but a few seconds' time. If there is any turning out to be done, you must do it—the motorman can't. In turning into a street with car tracks, try as far as possible to avoid the car tracks. Get the habit, even if there is no car coming.

"Again we repeat, we are not asking you to be careful in order that we may be careless, without taking the consequences. There are two parties concerned in street railway accidents, the public and the company. The exercise of care by one of these parties will greatly reduce accidents; but think what an additional safeguard it would be if the second party would acquire the habit of caution! It would lessen the possibility of accidents 100 per cent—a pretty good dividend on life and limb. Let's both be careful."

Mr. Smith also sent recently over his signature a note asking all automobile and other vehicle owners to co-operate with the company in trying to avoid accidents. He said that if each owner would caution his driver, and then repeat his words of caution, it would be a distinct benefit to the owner, to the company and to humanity.

JOINT TROLLEY-AUTO FREIGHT ARRANGEMENTS

Articles of incorporation have been filed by the Mount Eden Motor Truck Company, which will operate the truck end of the joint freight service with the Louisville & Interurban Company, referred to in the Electric Railway Journal of April 8, page 715. The authorized capital is $5,000, and the incorporators are in no way connected with the railway company. The agreement concerns only a joint through rate which will enable the Louisville & Interurban Company to accept shipments at Louisville or at any point on any of its lines, for delivery at certain points beyond the terminal of the Louisville and Shelbyville line, and vice versa.

Service will start with one truck on April 15, but three other trucks of large capacity are available for service at any time they are needed.

At the outset the run which is to be made will be 12½ miles, through Southville, to Mount Eden, or 25 miles for the round trip. It is planned to make two round trips daily, starting from Mount Eden in the morning and making connection with the morning freight train at Shelbyville, then returning and dropping freight at the way stations. After noon the proceeding will be repeated, meaning that the truck will supply the same character of freight service to points on its route as does the railway. There will, therefore, be two, or four, or six, etc., round trips daily, according to the number of trucks put in service.

Rates have been perfected and tariffs issued to the shippers who are expected to patronize the service. The tariffs will be filed with the State Railroad Commission before service is begun. An idea of the tariffs charged will be gained from the fact that on first-class freight the rate from Louisville to Shelbyville (railroad) is 23 cents per 100 lb.; from Louisville to Southville (railroad and truck), 34 cents per 100 lb.; from Louisville to Mount Eden (railroad and truck), 40 cents. On sixth-class freight, the rates for the same distance run: Louisville to Shelbyville, 13 cents; Louisville to Southville, 21 cents; Louisville to Mount Eden, 26 cents.

THROUGH SERVICE OVER 250-MILE ROUTE

A new through limited service between Indianapolis, Ind., and Zanesville, Ohio, was inaugurated on Sunday, April 9, by the Terre Haute, Indianapolis & Eastern Traction Company and the Ohio Electric Railway Company. This is probably the longest interurban journey in the country without change of cars. The distance from terminal to terminal is 250 miles, and the running time is eight hours and fifty minutes. One train will be operated each way every day, leaving Indianapolis at 9 a. m. and leaving Zanesville at 7.10 a. m. The through cars pass through Richmond, Ind., and Dayton, Springfield, Columbus and Newark, Ohio, and make stops at the larger interurban towns along the line. The standard type of three-compartment interurban cars of the Terre Haute, Indianapolis & Eastern Traction Company and the Ohio Electric Railway Company, of an over-all length of 61 ft. 6 in., will be used in the new service, except that these trains, will be known as "The Columbian," will be fitted with special floor coverings, etc., in order to make as attractive as possible the equipment used in this limited service.

This is the first step toward the establishment of more extended through interline interurban service which was advocated at the meeting of the Central Electric Railway Association held at Indianapolis last winter. The schedules of the new Indianapolis-Zanesville service have been arranged so that a three-minute connection may be made with through limited service from Springfield, Ohio, to Lima and Toledo, Ohio, and to Fort Wayne, Ind., via the Ohio Electric Railway. It is now possible to travel from Indianapolis to Toledo with only one change of cars, at Springfield, Ohio, and from Indianapolis to Cleveland with only two changes of cars.

NEW ROCHELLE MOTOR-BUS LINE SUSPENDS

On April 12 the New Rochelle Auto-Bus Corporation announced that operation of the four motor buses owned by the company would be permanently discontinued on the following day, and with the carrying out of this apparently sudden decision the first 5-cent bus line to be organized under the Thompson regulative law of New York State went out of existence after only two months of operation. Reasons for the abandonment of the project were reported by the president of the company to be failure of the local residents to patronize the buses, but from approximate figures given out at the same time it appears that about one and one-half passengers per bus-mile were being handled by the fifteen-passenger units. It was also stated that the "overhead charges" were very heavy and that residents who had promised to purchase stock in the company after buses had been placed on the streets did not make good their agreements, thus leaving the corporation with insufficient capital to expand its service beyond that given by the four buses originally placed in operation. Just how these purchases of stock would have benefited the situation is not clear, because according to the president's statement the daily earnings of each bus approximated $10, while the daily expenses of operation were $20 per bus. The total loss to the backers of the venture is reported to be about $10,000.

The territory served by the two routes that were operated was closely built up with detached suburban residences, and the round trips approximated 3 miles in length. Service was given at ten-minute intervals in opposite directions, each of the two buses on one route making three round trips per hour during an eighteen-hour day, and thus covering about 160 miles. The reported expenses of $20 per bus per day, or 12½ cents per bus-mile, did not, apparently, cover anything more than direct operating expenses, because during the two months that the buses were running they had depreciated but little and had evidently required no expenditures for heavy repairs.

Boston Fare-Limiting Bill Killed.— The legislative committee on street railways has voted down the bill prohibiting street railways from charging more than 5 cents for a continuous trip within Suffolk County.

Rhode Island Transfer Investigation Proposed. — An act has been introduced into the Rhode Island Legislature to require the Public Utilities Commission to investigate the use of free transfers on the street railways of the State, and to order such changes as it may deem desirable. The commis-

sion is to report on the matter to the General Assembly in January, 1917.

Use Found for the Janitor.—The Board of Education of Louisville, Ky., is considering a proposal advanced by a member of the Louisville City Council, which would make the janitors of the schools traffic policemen during the hour before the schools "take up" and just after they are closed at the end of sessions. He proposes that the janitors take stands at crossings and see to it that the traffic laws are observed by motorists, drivers and street cars.

Chicago Traffic Board Urges Safety Zones.—Safety zones for the heavy traffic street intersections in all parts of Chicago have been recommended by the Citizens' Traffic & Safety Commission. These are intended particularly for the safety of persons boarding and alighting from street cars, and it is recommended that these zones be marked off with movable posts and chains inclosing an area approximately 100 ft. long and 5 ft. wide, measured from the track rail.

New Kansas City Publication Christened.—The monthly publication of the Kansas City (Mo.) Railways has been christened *The Railwayan*. The second issue, for April, has a cover printed in colors showing attractive spots in Kansas City that can be reached for 5 cents. It is a twenty-four-page magazine, three columns to a page. A considerable demand for the magazine has developed among the general public, although it is intended for distribution only to the street railway employees.

Safety Signs in Buffalo Cars.—Signs with a red background and white letters, "Watch Your Step," have been placed just outside the entrance of the near-side cars on the Buffalo city lines of the International Railway, and the iron railings and grab irons have been painted white so as to be more easily seen by passengers boarding and leaving the cars. Heretofore these railings were painted black. Other signs bearing the words "Safety First. It never pays to take a chance" have also been prominently hung from the car ceiling.

Request for Change in Fares Refused.—The Town Board of Fredonia, N. Y., has refused to modify the franchise of the Buffalo & Lake Erie Traction Company so as to permit the company to increase its passenger fares in certain zones. The officials of the company are said to have considered the advisability of abandoning the road between Erie and Fredonia because of inability to meet the operating expenses under the present tariff. The appeal of the company for relief in this connection was noted in the ELECTRIC RAILWAY JOURNAL of March 18, page 583.

Dubuque Ordinance Bars One-Man Cars.—Plans made by the Union Electric Company to put one-man cars in operation in Dubuque, Iowa, were stopped by the passing of an ordinance compelling the use of cars with entrance and exit at both ends and designed to be operated by two men. The company has endeavored in a friendly way to obtain a repeal of the ordinance but without success. The City Council has since been asked to suspend the operation of the ordinance for six months in order to try out the one-man cars in regular service. This request has not been acted upon yet.

Final Argument in Rochester Jitney Case.—Final argument was held at Albany on April 12 before all the members of the Public Service Commission of the Second District of New York on the application of sixty Rochester jitney operators for certificates of necessity and convenience. Commissioner William T. Emmett, who conducted the hearing, announced at the close that the decision of the commission would not be announced until after Charles R. Barnes, the commission's electric railway expert, had reported to the commission in connection with the matter. The hearings held in Rochester before the commission on the jitney applications were reviewed briefly in the ELECTRIC RAILWAY JOURNAL of March 4, page 476, and March 25, page 628.

Michigan Railway Freight Increasing. — Although the Michigan Railway, Jackson, Mich., has not entered the carload freight business on an extended scale, the growth of its business along this line is said to indicate clearly the stability of this class of traffic as a source of revenue. During the last five-year period the annual gross receipts from freight traffic have gradually increased, and even during the general business depression, which began in 1913 and continued through 1914, the freight revenue did not fall off as did the earnings from passenger traffic. On the other hand, the increase in freight receipts during 1915 was practically the same as that in receipts from passenger traffic. The year 1915 was a very prosperous one for most of the industries in Michigan, a condition which is reflected in the gross earnings of the company.

St. Louis Service Case Carried to Court.—A writ of mandamus was applied for in Jefferson City, on April 4, by the United Railways, St. Louis, in the suit to prevent the Public Service Commission of Missouri from passing on the question of whether the company shall install additional service in North St. Louis. A petition filed by the Citizens' & Taxpayers' League and set for hearing April 13, asks that a direct line be installed from the western city limits along St. Louis Avenue to the river. The league contends that the service in North St. Louis is inadequate and does not provide for handling patrons from the western to the eastern city limits expeditiously. In the application for mandamus, the company takes the position that under the public service law the commission has no right to pass on such question.

Jamestown Employees Insured Under Group Plan.—The twenty-fifth anniversary of the electrification of the Jamestown (N. Y.) Street Railway was celebrated on April 4. A. N. Broadhead, president of the Jamestown Street Railway, Chautauqua Traction Company, Jamestown, Westfield & Northwestern Railroad and Western New York Electric Company, announced that a group life insurance policy had been taken covering every employee of the companies under sixty years of age. It provides a $500 policy to every man who has been employed six months, the certificates increasing with length of service to five years, when the benefit amounts to $1,000. Increases in the wages of the railway employees have also been announced. The increase amounts to 2 cents an hour, from 19 cents to 21 cents, for new men, and a similar increase up the scale until the five-year men and over receive an increase of 2½ cents, or from 25 cents to 27½ cents an hour.

Endless Chain Ticket Scheme Revived.—The Duluth (Minn.) Street Railway has been embarrassed lately through the revival in that city of the endless chain street railway ticket scheme which had its origin more than ten years ago and has reappeared several times since then in different parts of the country. Herbert Warren, vice-president and general manager of the Duluth Street Railway, called attention to the fact that the company had no connection with the sale of the tickets under the endless chain scheme, and that it was not responsible for any one offering to make a special rate or to reduce prices. The scheme was operated by the Cut Rate Car Fare & Advertising Company, with W. R. Bilderback, Chicago, as manager. He began to operate on April 4, but on April 6 was arrested and charged with advertising illegally. The $200 bail which he posted was forfeited when he hurriedly quit Duluth. The police estimate that his earnings for the three days he operated were between $1,500 and $2,500.

Postal Employees Checked in Chicago.—In 1906 the post-office authorities agreed to pay the Chicago surface railways $23,852 annually for transporting 347 carriers. Since then the amount has been increased to $24,837. On July 1, 1915, the number of carriers employed in the territory covered by the Chicago Surface Lines was 2407. This represented an increase of more than 27 per cent while the increase in return to the company amounted to only 3 per cent. A check made by the company showed that each day there were 11,893 rides with pouches and 8914 without. After taking into account the ordinary transfer percentage, the railway concluded that the post-office department was receiving 12,000 cash fare rides daily, equivalent to approximately $190,000 a year. The situation was called to the attention of the postmaster. He admits that the compensation to the company is inadequate now, and has asked the men to use the cars as little as possible. The question of a readjustment of the method by which the government pays for the rides of its employees is being considered.

Personal Mention

Mr. G. J. Meyer, heretofore chief engineer of the Montreal & Southern Counties Railway, Montreal, Que., has been appointed chief engineer and general superintendent of the company.

Mr. Curtis Duke has resigned as chief engineer of the power station of the Fort Wayne & Springfield Railway, with headquarters at Decatur, Ind., to accept a position at Hoopeston, Ill.

Mr. S. G. McMeen, president of the Columbus Railway, Power & Light Company, Columbus, Ohio, has been appointed a member of the navy consulting board by Secretary Daniels. The announcement of his appointment was made on April 7.

Mr. G. A. Henson, heretofore chief accountant of the Winnipeg (Man.) Electric Railway, has been appointed assistant treasurer of the company, and is in charge of the accounting department of the general office under Mr. F. Morton Morse, the secretary-treasurer.

Mr. F. S. Woodcock, heretofore traffic manager of the Saskatoon (Sask.) Municipal Railway, having left for active military service, the position has been abolished, and Mr. J. P. McKenzie, formerly master mechanic, has been appointed assistant superintendent, a new position.

Mr. Franklin T. Griffith, president of the Portland Railway, Light & Power Company, Portland, Ore., has also been named chairman of the board of directors of the Willamette Valley Southern Railway, which is controlled by the Portland Railway, Light & Power Company.

Mr. Marion G. Charles, whose appointment as master mechanic of the Oregon Electric Railway and the United Railways, Portland, Ore., was noted in the ELECTRIC RAILWAY JOURNAL of April 1, page 672, was with the Oregon Electric Railways in the capacity of shop foreman from July 15, 1910, to Sept. 8, 1915, at which time he was transferred to Spokane, Wash., as general foreman of the Spokane & Inland Empire Railway. He remained in the latter capacity until March 17, when he was appointed to his present position.

Mr. James E. Gibson, whose appointment as general manager of the Kansas City (Mo.) Railways was noted briefly in the ELECTRIC RAILWAY JOURNAL for April 1, was born in Kansas City on Aug. 20, 1881. He is the son of Mr. James F. Gibson, formerly judge of the Circuit Court. He was educated in the public schools of Kansas City and at the University of Missouri, from which institution he was graduated with the class of 1902. In the same year he was appointed secretary to Congressman W. H. Cowherd. After serving under Mr. Cowherd from 1902 to 1904 he resigned to enter the service of the Metropolitan Street Railway, Kansas City as a clerk in the accounting department under Mr. J. A. Harder, then auditor of the company. In December, 1905, he was advanced from the auditing office to the position of assistant to President Corrigan of the company. He entered the transportation department of the company in 1909 as superintendent of the Forty-eighth and Harrison division, where he remained until June, 1910, when he was appointed to the office of general superintendent of the company. He served in the capacity of general superintendent through the receivership of the Metropolitan Street Railway and the reorganization of the company as the Kansas City Railways.

J. E. GIBSON

Mr. William C. Harrington, whose appointment as superintendent of transportation of the Kansas City (Mo.) Railways, was noted briefly in the ELECTRIC RAILWAY JOURNAL for April 1, was born on Aug. 31, 1872, in County Tipperary, Ireland. He came to the United States in 1882, and went to work for the Corrigan Consolidated Railway, Kansas City, in 1888, as stable boy, at Fourth and Wyandotte Streets. He was later promoted to driver, gripman, cable splicer, motorman and division superintendent. In August, 1909, he became connected with the general office as assistant general superintendent under President Corrigan of the Metropolitan Street Railway. Mr. Harrington knows Kansas City, is thoroughly familiar with its traditions, is well acquainted with the need of the business and the pleasure-traveling public, and has the respect of the employees such as comes through years of familiar association in working with them toward a given end.

W. C. HARRINGTON

Mr. Richard T. Sullivan, for the last eight years general superintendent of the city and interurban railways of Houston (Texas) Electric Company, has been appointed manager of railways of the Mahoning & Shenango Railway & Light Company, Youngstown, Ohio. The appointment was announced by President R. P. Stevens, of the Mahoning & Shenango system on April 10 and Mr. Sullivan will assume his new position within a few days. Mr. Sullivan was born in Newton, Mass., and was educated in the public schools there, the Massachusetts Institute of Technology and Harvard University, taking the degree of electrical engineer at Harvard in 1906. He has since been identified with the Stone & Webster Engineering Corporation, participating in a number of important investigations and reorganizations in various parts of the country. In his new position Mr. Sullivan will be manager of approximately 200 miles of city and interurban railways in Youngstown, Warren and Niles, Ohio, and New Castle and Sharon, Pa., and connecting those cities and smaller communities.

OBITUARY

William Chisholm, chief engineer of the Windsor, Essex & Lake Shore Rapid Railway, Kingsville, Ont., was electrocuted on March 23 while coupling electric cars at a gravel pit in Essex.

George O. Jenkins, first president of the Brockton & Whitman Street Railway, died at Whitman, Mass., on March 31. Mr. Jenkins was born in Boston in 1846. He was prominent in manufacturing circles.

Frank P. DeLong, dispatcher of the Stark Electric Railroad, Alliance, Ohio, died at his post on March 22, from the effects of a stroke of apoplexy. For many years he was a dispatcher on the Lake Shore Railroad.

Fred A. Berg, general foreman of carhouses of the Puget Sound Traction, Light & Power Company, Seattle, Wash., died at the Seattle General Hospital on April 4, after an illness of several weeks. Mr. Berg was born in Russia. He settled in Portland, Ore., in 1888. He had been a resident of Seattle since 1905. He was fifty-seven years old.

William A. Read, head of the banking and investment firm of William A. Read & Company, New York City, died at his home in New York on April 7. Mr. Read was born in Brooklyn fifty-eight years ago, and was graduated from the Polytechnic Institute of Brooklyn. In 1877 he entered the employ of Vermilye & Company, New York, bankers, and was admitted to the firm in 1896. In 1904 he retired from Vermilye & Company and formed the firm of William A. Read & Company. He had long been a director of the Twin City Rapid Transit Company, Minneapolis, Minn., and the Interborough Rapid Transit Company, New York, N. Y.

Construction News

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

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

RECENT INCORPORATIONS

***Clear Lake Suspended Monorail Company**, Sacramento, Cal.—Incorporated to construct a line from Sacramento to Lakeport, 24 miles. The road will be of the suspended monorail type. Freight and passenger service will be provided. Capital stock, $50,000. Directors: L. H. Briggs, Kelseyville; Andrew Smith, Fenley; S. E. Brookes, Hopland; F. D. Flint, San Francisco, and M. S. Sayre, Lockport.

FRANCHISES

Atlanta, Ga.—The Georgia Railway & Power Company has asked the Council for a franchise to construct a 2½-mile extension, beginning at Moreland and Ponce de Leon Avenues to Emory University.

Newport, Ky.—An agreement has been reached between the South Covington & Cincinnati Street Railway and the city commissioners of Newport on a franchise that will be offered for sale and which this company will secure. It is to pay $6,000 as a rental for the use of the streets, furnish larger cars than those now in use and build a new line in the east end of the city.

Shreveport, La.—The Shreveport Railway will ask the Council for a franchise on certain streets in Shreveport with a view to changing the Fairfield and Jordan Street line.

Fairhaven, Mass.—The Union Street Railway has asked the Council for a franchise to construct an extension of its line on Fort Street from the present terminus to the Acushnet River.

Brooklyn, N. Y.—Acting Mayor Frank L. Dowling has signed the franchises requested by the Brooklyn Rapid Transit Company for new trolley lines on Metropolitan Avenue, from Dry Harbor Road to Jamaica Plank Road, on Eighth Avenue from Thirty-ninth Street to Bay Ridge Avenue, and on Fresh Pond Road between the Lutheran Cemetery line and Myrtle Avenue, which were voted by the Board of Estimate on Aug. 26, 1915.

Buffalo, N. Y.—The Public Service Commission for the Second District of New York has approved the franchises of the International Railway for the tracks in Ohio Street, between Main Street and Illinois Street, which will form part of a new loop for the Main Street cars, serving the new Lackawanna terminal and the various boat lines at the foot of Main Street with a direct connection to the business and residential parts of the city.

Lorain, Ohio.—A tentative franchise has been prepared for the Lorain Street Railway which calls for a fare of 5 cents and seven tickets for 25 cents. The company some time ago refused a franchise which provided for a 3-cent fare.

***Chester, Pa.**—The Chester & Eddystone Street Railway has asked the Council for a franchise to construct a line in Chester.

Ephrata, Pa.—The Reading & Ephrata Street Railway has received a franchise from the Council to construct a line in Ephrata. The tracks will reach the borough limits at Pine Street and Church Avenue and will extend along Pine Street to Duke Street, on Duke Street to Marshall Street and on Marshall Street to Washington Avenue, where connection will be made with the tracks of the Ephrata & Adamstown Street Railway. [April 1, '16.]

Salt Lake City, Utah.—The Board of County Commissioners has agreed upon the terms of a franchise to the Salt Lake & Utah Railroad, granting them the right to construct an extension through Granger and Pleasant Green, subject to the approval of the details of the franchise by the county attorney.

TRACK AND ROADWAY

Birmingham Interurban Development Company, Birmingham, Ala.—In connection with its proposed electric railway from Birmingham to the Warrior River and Jasper, this company will erect bridges across Locust Fork and Mulberry Fork of Warrior River. W. W. Shortridge, Birmingham, secretary. [April 8, '16.]

Calgary (Alta.) Municipal Railway.—The Mayor of Calgary has requested Commissioner Graves to prepare a report as to the cost of extending the Calgary Municipal Railway to the Sarcee military camp.

Oatman, Ariz.—D. L. Mayhew, secretary Mohave-Oatman Water Company, Oatman, and associates will soon be ready to receive bids for the construction of 24 miles of electric railway, with mileage to be increased ultimately to 75 miles, including power plants and a gas plant with 28 miles of main pipe, the total cost amounting to more than $2,000,000. [March 11, '16.]

Little Rock, Pine Bluff & Eastern Traction Company, Little Rock, Ark.—This company plans to begin construction in the near future on its proposed line from Argenta and Little Rock to Pine Bluff, 45 miles. It is proposed first to reconstruct the Main Street bridge at Little Rock, building an entirely new superstructure, the cost to be proportioned between the Little Rock, Pine Bluff & Eastern Traction Company, the County of Pulaski and adjacent property owners and the Intercity Terminal Company. The company will use the tracks of the present railways in Argenta, Little Rock and Pine Bluff. The main line will operate at 1200 volts direct current and the city lines at 600 volts direct current. The maximum grade will be one-half of 1 per cent. The county judge of Pulaski County, Little Rock, will have charge of letting contracts for the bridge construction. C. C. Kavanaugh, 221 Southern Trust Building, Little Rock, president. [Dec. 19, '14.]

Pine Bluff (Ark.) Company.—This company has just completed the construction of about 1 mile of new track, using 70-lb. A.S.C.E. rail, concrete foundation and creosoted ties.

Pacific Electric Railway, Los Angeles, Cal.—This company will construct an extension from Claremont to Uplands. This extension will be made as part of a general scheme of the Pacific Electric Railway to extend its freight business in the Pomona Valley, accepting fruit shipments to be turned over to the railroads for shipment East. It is stated that as soon as the line, for which rights-of-way have already been obtained, is completed, the company will construct a large packing house at the Uplands end of the line.

***Tampa, Fla.**—Plans are being made to construct a line from Tampa to Lakeland via Plant City and Gary. Franchises have been secured to operate the proposed line through Plant City and Gary. E. J. Binford, Tampa, is interested.

Freeport Railway & Light Company, Freeport, Ill.—This company will reconstruct the track on its North Galena Avenue line.

Aurora, Elgin & Chicago Railroad, Wheaton, Ill.—It is reported that this company plans to construct a line from Maywood Speedway to Franklin Park through the west end of Maywood, east end of Bellewood and Melrose Park.

St. Joseph Valley Railway, Elkhart, Ind.—It is reported that this company will begin construction this spring on a 9-mile extension either from Montpelier or from Pioneer.

Indianapolis Traction & Terminal Company, Indianapolis, Ind.—This company will lay new tracks in Indiana Avenue from West Street to Fall Creek.

Fort Dodge, Des Moines & Southern Railway, Boone, Iowa.—This company, which recently purchased the Crooked Creek Railroad, will electrify the line and make connections with the interurban railway at Fort Dodge.

Tri-City Railway Company, Davenport, Iowa.—This company will spend nearly $75,000 this year in Davenport on track work. Several extensions have been asked by residents, and plans are being made to construct at least one of the extensions this year. More than 60,000 ties, costing approximately $55,000, have been purchased by the company for use in Davenport.

*Carrollton, Ky.—Business men of Carrollton are projecting a plan to construct an electric railway to connect Carrollton and Prestonville, which is across the Kentucky River. The project is industrial and the railroad would be used largely for freight hauling.

*Mount Olivet, Ky.—W. C. Myers, Mount Olivet, has taken up with the Cincinnati Chamber of Commerce the matter of construction of an electric railway line from Mount Olivet to Cincinnati. He suggests a route via Bridgeville, Germantown, Brooksville, Powersville, Berlin, Lenoxburg, Caddo, Mount Auburn, Peach Grove, Bradyville, Grants Lick, Claryville and Alexandria.

*Shelbyville, Ky.—J. W. Cudgell, Shelbyville, is preparing plans for the construction of an electric railway from Frankfort to Shelbyville, 20 miles. W. W. Lindsey, Detroit, Mich., is interested. The Kentucky Traction & Terminal Company will co-operate in the construction of the line.

Winnipeg (Man.) Electric Railway.—Plans are being considered by this company to extend its Marion Street line to the stockyards. The company will also construct a line over the Arlington Street bridge.

Boston & Eastern Electric Railway, Boston, Mass.—This company has asked for an extension of time of three years in which to file its bond preliminary to constructing an electric railway between Boston and Lynn, Danvers and Beverly. [April 17, '15.]

Worcester (Mass.) Consolidated Street Railway.—This company has under consideration the construction of an extension from Rice Square to Sunderland Road and the extension of the Greenwood Street line to reach the Worcester-Millbury municipal boundary line.

Emma, Mo.—A communication from the Emma Creamery Company states that the company is not interested in the construction of an electric railway from Sweet Springs to Emma, as reported in the issue of March 25. It is proposed to construct a transmission line from Sweet Springs to Emma for the purpose of lighting and power.

*Red Lodge, Mont.—Surveys are being made for a proposed electric railway between Red Lodge and Columbus via Bear Creek, 40 miles. D. E. Thompson, Lincoln, Neb., is interested.

Public Service Railway, Newark, N. J.—Work has been begun by this company on the construction of an extension of its Central Avenue line through Orange.

Trenton & Mercer County Traction Corporation, Trenton, N. J.—The Supreme Court has ordered the Mercer County Traction Company to construct a line from Yardville to North Crosswicks, in accordance with the terms of a franchise granted the company.

Brooklyn (N. Y.) Rapid Transit Company.—Ground was broken on April 8, at the corner of North Seventh Street and Bedford Avenue, in the borough of Brooklyn, for the new eastern district subway to connect Williamsburg with Fourteenth Street, Manhattan. The contract provides for the completion of the subway within twenty-seven months from the signing of the contracts on Feb. 29, 1916. The cost of construction is estimated at $15,000,000.

International Railway, Buffalo, N. Y.—Construction work has been begun by the International Railway on the new tracks in North Main Street. Despite the heavy traffic over this line, service is being continued without delay or interruption while the construction work is in progress. While the tracks on the south-bound line are being laid cars are being operated over the north-bound track by means of temporary switches.

Interborough Rapid Transit Company, New York, N. Y.—This company has notified the Public Service Commission for the First District of New York that it is ready to proceed with the work of raising the Second Avenue elevated railroad structure between Fifty-eighth and Sixty-second Streets in order to provide for the proposed extension of that line over the Queensboro Bridge to connect with the new rapid transit lines in Queens.

Ottawa (Ont.) Electric Railway.—The United States Steel Products Company, Montreal, has received a contract from the Ottawa Electric Railway to construct an extension of its Rideau Street line.

Niagara, Welland & Lake Erie Railway, Welland, Ont.—Work has been begun by this company on the construction of an extension south to Dain City and Port Colborne. The line will pass under the Michigan Central Railroad tracks at the subway between Main Street and the Welland Canal.

Willamette Valley Southern Railway, Oregon City, Ore.—This company proposes extensive improvements and repairs to its system during the present year.

Oregon Electric Railway, Portland, Ore.—Plans are being considered by the Oregon Electric Railway to construct an extension of its lines from Eugene to Springfield, about 4 miles.

Lewistown & Reedsville Electric Railway, Lewistown, Pa.—Preliminary surveys are being made by this company for a proposed extension from the Reedsville terminal across the Seven Mountains via Milroy, Potter's Mills and Bellefonte to State College.

Lykens Valley Railway, Williamstown, Pa.—A report from this company states that extensive improvements are being planned on its line.

Citizens' Street Railway, Clarksville, Tenn.—Street car service was resumed in Clarksville by this company on April 5.

Salt Lake & Utah Railroad, Salt Lake City, Utah.—This company has completed the construction of an extension to Salem and operation has been begun on the line. This is part of the proposed extension to Payson.

SHOPS AND BUILDINGS

Tri-City Railway, Rock Island, Ill.—Work on this company's new car shops at Rock Island is progressing and the buildings will be completed about July 1. The new inn being constructed in Rock Island will be completed by June 1.

Kansas City, Mo.—Negotiations are in progress, with prospect of early completion, for establishing a union freight terminal for the interurban railways in Kansas City. An option has been obtained on a large building west of Main Street and north of Fifth Street, acceptable to a majority of the interurbans, that can easily be transformed into a terminal, and would provide about 10,000 ft. of dock room.

Public Service Railway, Newark, N. J.—Nine storage houses for trolley cars will be erected by this company for the new cars to be placed in operation during the coming summer. Four of them will be built near the Passaic Wharf and the others near the Plank Road car shops. Each building will be 50 ft. wide with a depth of 150 ft., and will be of timber construction with a covering of metal protected by asbestos. Contracts for the buildings were awarded to the Stillman, Delehanty & Ferris Company

Charleston (W. Va.) Interurban Railroad.—This company will build a combined freight and passenger station in Charleston. New stations will also be erected at St. Albans and at Cabin Creek Junction.

POWER HOUSES AND SUBSTATIONS

Bloomington & Normal Railway & Light Company, Bloomington, Ill.—This company will install a substation in Lexington and rebuild its distribution system there to operate at 2300 volts, three-phase, stepped down to 110 and 220 volts.

Iowa Railway & Light Company, Cedar Rapids, Iowa.—Plans have been completed by this company for the construction of a new power house in Perry to cost about $100,000.

Charlottesville & Albemarle Railway, Charlottesville, Va.—This company is in the market for one 50-kw. or 75-kw. motor-generating set consisting of a 2300-volt, three-phase, 60-cycle motor, direct connected to a 250-volt d.c. generator. John L. Livers, general manager.

Puget Sound Traction, Light & Power Company, Seattle, Wash.—This company is constructing a system of negative feeders to the various substations at an estimated cost of $50,000. The system will cover practically every electric line in Seattle.

Milwaukee Electric Railway & Light Company, Milwaukee, Wis.—This company contemplates the erection of a boiler house three stories high on Lake Avenue, Racine, and will install three boilers.

Manufactures and Supplies

FERROMANGANESE SITUATION UNIQUE

Ferromanganese, an alloy which plays a very important part in the manufacture of all steels, as well as in the manufacture of manganese steel castings, is in such demand that the price of the limited supply has advanced from a normal average of $50 per ton at the seaboard to a cash price of $450 per ton. In smaller lots, where the purchaser is in desperate need, as much as $550 and $600 per ton has been paid for this alloy. The difficulty is said to be because deliveries are being made only on contract, and high prices prevail in emergency sales. Contracts for delivery during the first half of 1917 are being made at $175 per ton. These facts are mentioned because they are reflected in the high prices of structural steel and special work. No doubt greater increases will follow if the war continues and the present restrictions on delivery from England obtain.

This manganese alloy is made from manganese ore which is mined principally along the Black Sea on the coast of Asia Minor, a source of supply which has been cut off by the present European war. Most of the ferromanganese used in this country in the past has come from England, and it is said that practically 75 per cent of the English output of the alloy has come to the United States. The English are securing their present supply of ore from India and Brazil, and except for the control by the United States Steel Corporation of a few mines in Brazil, England and France have had almost a monopoly of output of ferromanganese. Naturally, the demand for the material in connection with the manufacture of munitions abroad and the restricted supply of the ore have reduced the shipments to this country. They have also stimulated domestic production, and recent dispatches report the establishment of some electric furnaces at Herolt, Shasta County, California, for the manufacture of ferromanganese. In the past, of course, the use of ferromanganese in the manufacture of war materials has been very small compared with its use in the manufacture of structural material and rail steel.

T-RAIL PRICES ADVANCE

Announcement was made by the United States Steel Corporation April 13 of increases of $5 a ton for Bessemer and open-hearth T-rails. After May 1, contracts placed for rails to be delivered after May 1, 1917, will be $35 a ton for open hearth and $33 a ton for Bessemer. The old price of $28 a ton for Bessemer rails has been in force for thirteen years without change. It is reported from Pittsburgh that the independent companies would also add $5 a ton to their rail prices.

Inquiry on April 14 at the New York office of one of the manufacturers of girder rails disclosed that as yet that office had not been told of any increase in the price of girder rails, but that such notice might be received any day. The grooved girder rails used by electric railway companies, owing to the fact that these rails are more expensive to manufacture than T-rails, have usually sold at about $6 a ton more than T-rail. As a rule, however, the prices for the rails are quoted for delivered rails rather than for the rails at the mill.

ROLLING STOCK

Keokuk (Iowa) Electric Company has ordered one car body from the American Car Company.

Northern Texas Traction Company, Fort Worth, Tex., has ordered ten car bodies from the American Car Company.

Springfield & Washington Railway, South Charleston, Ohio, has ordered one closed car from the Cincinnati Car Company.

Reading Transit & Light Company, Reading, Pa., has ordered fifteen double-truck cars from The J. G. Brill Company.

Sand Springs Railway, Tulsa, Okla., has acquired two new all-steel passenger cars, which will be placed in immediate operation.

Conestoga Traction Company, Lancaster, Pa., has ordered three city and one interurban car from The J. G. Brill Company.

Little Rock, Pine Bluff & Eastern Traction Company, Little Rock, Ark., proposes to purchase new car equipment, as described in the news department of this issue.

New York State Railways, Rochester, N. Y., have ordered fifty large center-entrance cars from the Cincinnati Car Company, through the W. R. Kerschner Company, New York.

Aurora, Elgin & Chicago Railroad, Aurora, Ill., has ordered four double-end, semi-steel, 42-ft., prepayment-type cars for its Fox River division from the St. Louis Car Company.

Boston (Mass.) Elevated Railway has ordered thirty surface trailer car-bodies and fifty sets of trucks from The J. G. Brill Company and twenty car-bodies from the Laconia Car Company.

Kankakee (Ill.) Electric Railway has ordered two one-man cars from the St. Louis Car Company. These cars are of the manufacturer's standard lightweight type similar to those furnished Albuquerque, N. M.

Southwest Missouri Railroad, Webb City, Mo., mentioned in the ELECTRIC RAILWAY JOURNAL of April 1 as expecting to purchase additional cars, has ordered five cars from the American Car Company, for delivery within four months.

Mahoning & Shenango Railway & Light Company, Youngstown, Ohio, will place orders immediately for ten new all-steel cars of the center-entrance type. The company also has been reconstructing four trail cars in its shops.

New York State Railways, Syracuse, N. Y., have ordered thirty-five city cars from the G. C. Kuhlman Car Company, and will also order six interurban cars. The Westinghouse Traction Brake Company, New York, N. Y., has received the order for air-brake equipment for all these cars.

Detroit (Mich.) United Railway has ordered from the G. C. Kuhlman Car Company eight 55-ft. 4-in. passenger cars, seating capacity fifty-eight; and one trail car, 56 ft. 6 in. over bumpers, seating sixty-four. These cars are of Pontiac city type, with trail car entrance and exits from the front of the car. The company also has ordered from the Cincinnati Car Company eight 50-ft., 25-ton capacity freight trail box cars with monitor deck roofs.

Steubenville & East Liverpool Railway & Light Company, Steubenville, Ohio, noted in the ELECTRIC RAILWAY JOURNAL of March 25 as having ordered five suburban double-end cars from the Cincinnati Car Company, has specified the following details for this equipment:

Date of delivery	End of May
Seating capacity	52
Weight of car body	18,000 lb.
Bolster centers, length	24 ft.
Length of body	36 in.
Length over vestibule	47 ft.
Width over all	8 ft. 6 in.
Height, rail to sills	38½ in.
Rail to trolley board,	11 ft. 11½ in.
Body	Steel
Interior trim	Cherry, stained
Headlining	Sheet steel, carlines in view, white enameled
Roofs	Arched
Underframes	Steel
Airbrakes	West. S. M. E.
Axles	Baldwin 5-in.
Control	West. H. L.
Curtain material	Pantasote
Wheelguards	Cincinnati
Destination signs,	Elec. Ser. Sup. Co.
Door operating mechanisms,	Cincinnati
Gongs	Cincinnati
Handbrakes	Peacock
Heaters	Cooper
Headlights	Dayton Incandescent
Journal boxes	Symington
Motors	West. 532-B-4, 50-hp., inside hung
Registers	Ohmer
Sanders	Lintern
Seats	Cincinnati, rattan
Step treads	Mason
Trolley catchers	Knutson
Trolley base	U. S.
Trucks	Baldwin 73-18-K
Ventilators	Cincinnati
Wheels	Baldwin 1 wear steel, 33-in., 3-in. tread, ¾-in. flange

TRADE NOTES

Parrott & Company, Portland, Ore., are now representing the Track Specialties Company in that territory.

Goldschmidt & Lyman, Inc., New York, N. Y., have organized to conduct a brokerage business in raw metals and manufactured metal products. The company is located at 90 West Street.

Electric Railway Improvement Company, Cleveland, Ohio, has recently furnished bonding cars to the Reading Transit & Light Company, Rhode Island Company, Massachusetts Northeastern Street Railway and Atlantic Store Electric Railway.

Railway & Signal Equipment Company has been established in Peoria, Ill., a location having been secured in the E. A. Havens Building on the Rock Island tracks. The company makes railway supplies, such as anchors, drawbars, replacers, etc.

Electric Service Supplies Company, Chicago, Ill., has moved its offices into more commodious quarters on the sixth floor of the Monadnock Building, Chicago. At the same time this company's Chicago warehouse was moved to larger quarters at 352 Ohio Street.

Curtain Supply Company, Chicago, Ill., has received orders to equip with Ring No. 88 fixtures and Rex all-metal rollers the following cars, which have been recently ordered: Rockland, Thomaston & Camden Street Railway, one car; Cumberland & Westernport Electric Railway, five cars; Waterbury & Milldale Tramway, two cars.

Heywood Brothers & Wakefield Company, Wakefield, Mass., reports the recent receipt of orders for seats for the ten cars ordered by the Holyoke (Mass.) Street Railway and twelve cars ordered by the Northeastern Massachusetts Street Railway, Haverhill, Mass.; specifications for sixty cars for the Boston (Mass.) Elevated Railway. The company is also building the seats for the forty new cars ordered by the Des Moines (Iowa) Street Railway.

Acme Supply Company, Chicago, Ill., has appointed Franklin M. Nicholl as sales representative. Mr. Nicholl will be located at the general sales office, Steger Building, Chicago. He has been for the last seven years Eastern and Canadian sales representative for the Dayton Manufacturing Company. Previous to that position he was for five years sales representative with the O. M. Edwards Company, and before that was sales representative for the Curtis truck.

John C. Dolph Company, Newark, N. J., has moved into larger quarters on Emmet Street, in Newark, with convenient shipping facilities, being next to the South Street station of the Pennsylvania Railroad. The new factory occupies plotted ground, 75 ft. x 100 ft., on which has been erected a modern brick building, which is equipped with every facility for the manufacture of insulating varnishes and compounds, in which line this company has specialized for several years.

Holden & White, Chicago, Ill., have received an order for Hartmann self-centering center-bearing plates and Perry anti-friction side bearings from the McGuire-Cummings Manufacturing Company, for the forty cars recently purchased by the Des Moines (Iowa) City Railway. Orders have also been received from the Southern Car Company for ten Wasson air-retrieving trolley bases for the cars being built for the Cumberland & Westernport Electric Railway, Cumberland, Md. An order has also been received from the Chicago & West Towns Railway for 100 Bierce anchors.

General Electric Company, Schenectady, N. Y., reports that the sales in its railway department for the first eight weeks of the current year as compared with those of last year have been proportionately greater than the sales in any other department of the company. Two recent large orders have been received, one for GE-248 motor equipment for the 200 additional subway cars ordered by the New York Municipal Railway, this order having been approved by the Public Service Commission; the other for fifty-four four-motor equipments for the cars just ordered by the New York State Railways, Rochester Lines.

Perry, Coffin & Burr, Boston, Mass., dealers in investment bonds, have dissolved by mutual consent. The following members of this firm: W. Coffin, A. Burr, W. L. Garrison, Jr., P. S. Dalton, together with P. Jewell and F. E. Frothingham, have incorporated under the name of Coffin & Burr, Inc., to conduct a business in investment bonds at 60 State Street, Boston, and 61 Broadway, New York. Associated with the foregoing will be R. Spellman, J. A. Paine, W. P. Barker, J. T. Beach and H. B. Pennell, Jr., Arthur Perry, formerly senior partner of Perry, Coffin & Burr, Arthur Perry, Jr., and Henry H. Perry have formed a partnership to deal with investment bonds with offices in the Equitable Building, corner of Devonshire and Milk Streets, Boston; associated with them are G. F. Wells, F. W. Mitchell, J. A. Fowler, C. N. Breed, and F. N. Peirce. This firm has opened a branch office at 17 Exchange Street, Providence, R. I., which will be in charge of Mr. Fowler.

ADVERTISING LITERATURE

General Electric Company, Schenectady, N. Y., has issued a folder describing its magnetic blow-out lightning arresters for electric railway service.

Roller-Smith Company, New York, N. Y., has issued a catalog describing its electrical instruments for signal system testing. These instruments include d.c. and a.c. portable volt-ammeters and direct reading portable ohmmeters.

Standard Underground Cable Company, Pittsburgh, Pa., has issued Bulletin No. 202-1, describing the properties of its standard C. C. C. wire for telephone or telegraph systems, transmission systems, railway signal systems and bond, messenger, guy and tie wires.

Cleveland Railbond Company, Cleveland, Ohio, has issued a bulletin entitled "Rail Bonding: The Problem and Its Solution," which describes and illustrates the "Champion" method of rail bonding. Photographs show this process in operation without interruption to traffic.

Westinghouse, Church, Kerr & Company, New York, N. Y., have issued "a story in pictures" of the new Taylor-Wharton plant located near Easton, Pa. The plant comprises five buildings of which the main or finishing shop is 460 ft. x 420 ft. All buildings have complete skeleton steel frames with base walls of reinforced concrete to the window sills. The power plant contains six 350-hp. Stirling boilers with Detroit stokers, two 500-kw. geared turbines, and one 1000-ft. two-stage air compresser.

Ohio Brass Company, Mansfield, Ohio, has issued Catalog No. 16, in 654-page book form, covering its complete line of appliances used in the construction, maintenance and operation of electric railways, mine haulage systems and transmission lines. This catalog supersedes and cancels all other catalogs of this company, with the exception of Valve Catalog No. 50. Notwithstanding its size, the book is very easy of reference, the materials described being divided clearly into the following general classifications: catenary line materials, direct suspension line material, high-tension porcelain insulators, rail bonds and tools, third-rail insulators, and car equipment materials. The description of catenary line materials is prepared in a particularly interesting manner, owing to the numerous photographs reproduced of representative types of construction. Included under car equipment are the following apparatus: emergency hose bridges, trolley wire pick-ups, trailer connectors, electric car signal systems, trolley catchers and retrievers, trolley bases, whistles, air-sander equipment, and couplers. The last section of the book contains tables and data showing quantity of overhead materials required per mile for different types of construction, tensile strength of copper wire, and properties, weights and sizes of different types of cables, wires and tubings.

NEW BRAKESHOE COMPANY

A new company to manufacture brakeshoes was incorporated last week under the laws of Delaware with a capital of $1,000,000. The name of the company is the Vulcan Brake Shoe & Equipment Company, and the enterprise will be conducted largely by a number of the younger men formerly connected with the American Brake Shoe & Foundry Company. The plant of the new company will be located at Baltimore and the main office at 120 Broadway, New York.

Permanent organization will be perfected in the near future, when a complete staff of officers and directors will be elected. It is understood that W. H. McDonough, who is well known in the financial district, will be chosen president. F. W. Grant, formerly assistant to the vice-president of the American Brake Shoe Company, will be treasurer. Raymond M. Brower and Edward Barrett Smith, formerly in charge of the sales department of the American Brake Shoe Company, will be vice-presidents. R. N. Hill will be engineer of tests. H. K. Shoenherter, who was with the American Brake Shoe & Foundry Company since its inception in 1902, will be foundry superintendent for the company just incorporated.