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QUALIFICATIONS OF COMMISSIONERS

The editorial discussion of the proper qualifications of a public service commissioner, following the appointment of Colonel Hayward to the Public Service Commission, First District, New York, is a healthy sign. While no exception is taken to the new appointee personally, the sentiment is generally expressed that he has not had the experience or training necessary to fit him for the extremely responsible position to which he has been appointed. While both of these qualities may be acquired, it is hardly the purpose of the commission to serve as a training school in transportation matters for its members. When public service commission regulation began, we said that the success of the idea would depend entirely upon the character of the men who would be induced to accept positions of this kind. The opportunities for constructive work are so large that we believed, and still believe, that the position would appeal to a certain number of men of broad caliber and public spirit who reside in every community. But these men will not be seekers for the position. They can be induced to accept it only by an appeal to their sense of civic duty, and their services can be retained only when a well-informed public opinion insists that appointments to the commission shall not be the means of payment of political debts. We are glad to see evidences of a better general realization of the importance of the office of public service commissioner, even if the facts are not fully understood in all of the state capitols.

UTILIZING INERTIA OF MOVING TRAINS

At the last meeting of the New York Railroad Club, W. S. Murray again called attention to the flywheel effect of moving trains, mentioned editorially in this paper on page 265 of the issue for Feb. 6. According to Mr. Murray, the heavy load peaks expected at the Cos Cob power station from the starting of the 3500-ton freight trains did not materialize. The moving trains obligingly give up some of their stored kinetic energy by slowing down a little, being encouraged to do so by the slight voltage drop due to the extra draft of current by the freight train. In this issue we print a communication giving the results of some calculations of this phenomenon. The author assumes that a heavy train is operating on the d.c. section of the New Haven line (on the New York Central track in New York City), and that a 10 per cent voltage drop occurs. By a simple graphical method he calculates the current drop and the varying rate at which current and speed attain steady values again. The interesting results of the calculations are that the reduction in load is ample and its duration sufficient appreciably to relieve the power house. The assumed voltage drop caused a load reduction two-and-a-half times as great as itself. As Mr. Murray pointed out in his New York discussion this inertia effect is another illustration of the principle of regeneration. There is this difference, however, that stored kinetic energy is drawn upon in this case, whereas potential energy is drawn upon in the three-phase system.

COMPANY SECTION INITIATIVE

Although there are as yet but a handful of company sections of the American Electric Railway Association all of these are developing new ideas or applying old ones in new ways. Among the chief advantages which a national association section has over one purely local in nature is the interaction of the spirit of emulation with the resultant stimulation which is naturally fostered. Each section wants to "go the others one better," and increasingly lively competition brings out the talent for invention which often lies dormant. We see this effect already and expect to see it still more as all of the sections become familiar with what each is doing. As examples of originality and adaptiveness we note the following: The Public Service Railway section has inaugurated a course in public service economics to continue through two seasons. The new Manila section has resolved to capture the medal for the best section paper, being stimulated in this resolve by C. N. Duffy's offer to add a $100 prize if this is done. The Washington section recently conducted a competition for the best paper from trainmen and others on the trainman's duties. The Milwaukee section not only produced but wrote a play which made a decided hit, besides capturing the section medal last year. The Denver section utilizes to the full the publicity facilities afforded by the *Tramway Bulletin*, which is its official organ. These are but a few of the straws which show the way the wind blows. What's the next "stunt"?

SHOW THE SHOPMAN

Not so long ago the only repository of maintenance costs was the greasy notebook of the master mechanic. To his aides this tattered volume was as a royal arcanum, a book of seven seals. As secrecy does not beget teamwork, it is no wonder that foremen and inspectors, under chiefs of this type, showed little ambition to improve their practices. In these days this condition is rapidly giving way to a course of publicity that often transforms indifference to enthusiasm. A pioneer in this work is the Mechanical Improvement Club of the Memphis

Street Railway, which has practiced shop publicity for the past eight years, largely through the medium of quarterly meetings. The high standard of this co-operation is reflected in the account of the latest meeting of the club, chronicled elsewhere in this issue. The two papers abstracted in this account are not notable so much for new ideas as for the broad points of view manifested by men who are serving in such positions as night foreman and truck foreman. The Memphis Street Railway is not a large property, yet its Mechanical Improvement Club numbers nearly a score of men who at one time or another summarize past and present performances in open meetings. In addition to the discussions provoked at these quarterly meetings, changes from month to month as compared with preceding years are posted on a shop chart which is accessible to all. The comparative records reproduced in the article in this issue certainly are a splendid justification of a publicity that arouses the will to do better in every branch of the maintenance department.

SCIENTIFIC CAR SCHEDULES

Nothing so irritates the conscientious engineer as waste of energy, and his constant effort is to reduce it. Sometimes, to be sure, he is so absorbed in the work of saving energy that he overlooks the cost of doing so and spends as much or more on one side of the ledger as he saves on the other. But this is the exception. There is no doubt greater interest being felt in the economics of operation than ever before. The higher costs of operating cars and the diminishing income per car-mile have forced upon the railway men the consideration of energy saving as an element of operating cost reduction. This fact explains why the fundamental and familiar principles of energy consumption in train operation are receiving so much attention at present.

It is interesting to note here that these fundamentals were enunciated as far back as 1898 in an article written in that year in the Street Railway Journal by A. H. Armstrong. He showed, for instance, that the energy consumption per car-mile, for a given schedule speed, considered as a function of the rate of acceleration, varies inversely with the latter, but a point is reached beyond which increase in rate of acceleration does not produce commensurate saving in energy. The inverse relation mentioned exists because the more quickly the car reaches maximum speed and the longer the coasting period, the lower will be the speed when the brakes are applied. As the kinetic energy absorbed while the car is being stopped is proportional to the square of the speed at the time of brake application, any reasonable reduction in this speed is worth while. A modern instance of this truth is cited in the paper by H. P. Fligg, on coasting, presented at the last meeting of the Denver Tramway section of the railway association and abstracted elsewhere in this issue. Of course, high accelerating rate means large commutating capacity and large heat-absorbing ability of motors, i.e., large motors, so that an economic balance must be struck between first and maintenance costs of motors, controllers, etc., on the one hand and energy cost on the other.

Closely associated with these articles in thought is that which appeared in the issue of April 3 by G. W. Remington in which another interesting comparison was made. This was between energy consumption in two runs in which the same accelerating rate was used but in one of which straight-line acceleration was continued much longer than in the other. This run required much larger motors than the other because inefficient acceleration on resistance was continued longer, requiring a higher gear ratio or its equivalent and correspondingly larger starting current. The inefficiency of the high-maximum-speed run is indicated by the high speed at the point of brake application. Here a 3 per cent schedule-speed increase was secured at 75 per cent increased energy cost and a greatly increased motor cost, obviously a most extravagant procedure. While the example presents an exaggerated comparison it shows how sensitive is energy consumption to the influence of acceleration and coasting.

MODERN EVIDENCE PRESENTATION

An editorial, published last week and entitled "Records as Evidence," directed attention to the extensive use by the Western steam railroads of the actual transportation records as evidence in an arbitration hearing on wage increases. The same thing is going on at present in Boston where the Bay State Street Railway is confronting a similar demand. Examples of the kind of evidence which the railway is presenting are printed elsewhere in this issue. The data which its experts are putting before the board are of the same nature as would interest the company's directors. The figures and diagrams are all capable of verification and form an impressive exhibit. The employees justly contend that living expenses have been increasing rapidly of late years. Everyone admits this. But at what rate have they been increasing? Generalizations and impressions are qualitative, not quantitative, and when it comes to calculating to within a fraction of a cent what wages a railway can pay, a quantitative measure is requisite. The Bay State Street Railway is wise, therefore, in first determining what the facts are and then presenting them forcibly. The result will be of great educational value, entirely aside from the outcome of the present controversy. Once a reasonable basis of agreement regarding a fair relation of profits, wages and cost of living is established, it is a mere matter of accounting to maintain this.

This tabulation of costs of living of electric railway operatives is by far the most comprehensive of any which have been made, so far as we know. The best general indications of the cost of living which are available are the "index numbers" prepared by several authorities, which are made up week by week from the costs of staples. A graph of one of these, the index number of the New York *Annalist*, is shown in one of the diagrams which accompany our report of the Bay State testimony and was selected from among several

used by the company in the hearing. This number is based on the average wholesale prices of twenty-five staple foodstuffs weighted in the proportion of their use by an average family. As far as the country as a whole is concerned it should be an accurate gage of food costs, but, as the chart shows, it is not a measure of costs in the Bay State district. In spite of the much higher rate of increase of food costs in this district the wage-rate increase has more than kept pace with it.

The company's testimony showed conclusively that, while in five years the number of passengers carried per car-hour had increased slightly the number per conductor is less and the average schedule speed is less also. Evidently car crews do not have to work any harder. During this time the wages have increased more rapidly than the cost of living by 2.6 per cent of the cost, or nearly 25 per cent of the increase. At present each Bay State crew is making an annual car mileage less by 29 per cent than a Middlesex & Boston crew and less by 7 per cent than a crew on the Boston Elevated surface lines. That working conditions are satisfactory to the men is indicated by the fact that more than one-half have been with the company longer than five years and more than 40 per cent are drawing the maximum wage. Furthermore, according to Professor Richey, 21.9 per cent of the gross income is paid out in wages, compared with 21.7 per cent, the average for Massachusetts, and 20 per cent, the average in New England. In this connection, it is interesting to note that during the fiscal year ended June 30, 1914, the net income of the company was 13.7 per cent of the gross income, as compared with 15.3 per cent during the previous year, showing a loss of 10.4 per cent, although the company did a larger business. Thus, while the demands of the wage earners and the public have increased, the income to the stockholders has decreased by a large percentage.

DIVIDENDS AND RATE MAKING

It has often happened that the declaration of large dividends on the capital stock of public service corporations has been immediately followed by insistence on the part of its patrons that the rates of the company are too high. This question recently came up before the Board of Public Utility Commissioners of New Jersey in the Acquackanonk Water Company case, and the resulting decision discusses for probably the first time an official commission view of such a point.

In answer to the contention that during recent years the company had declared exceptionally high dividends and that this proved the return of the company on its existing rates to be exorbitant, the commission stated that such a contention must have as its foundation the proposition that the par value of the aggregate of the securities of a public utility is the basis upon which the company should be allowed to earn a return. The commission held, however, that the par value and the market value of outstanding securities are not controlling factors, and that the reasonableness of any rate must be determined under normal conditions by reference to the return upon the fair value of the property reasonably employed in public service when operated with reasonable economy and efficiency. The par and the market value of outstanding securities are sometimes less and more often greater than this fair value, and if it cannot be successfully contended that the par or the market value should be accepted by the public as a basis for rate making when such value exceeds the fair value, it likewise cannot be successfully contended that such value of securities when less than the fair value should be accepted by the utility as the measure of its right to earn.

Speaking more specifically of the dividend rate, the commission asserts that the size of the dividend paid by a public utility cannot control a rate-making body in determining the reasonableness of the utility's rate. Whether, after a company has provided for its operating expenses, depreciation charges and fixed charges, there is anything left for division among the stockholders, depends upon the economy and efficiency of its operation, the amount of its fixed charges and the amount of its rate. Fixed charges might be reasonable, the volume of business what might be reasonably expected in the territory supplied, the rate reasonable as judged by recognized rules, but the utility might have nothing left with which to pay dividends. Another utility operating under identical conditions might, on account of superior efficiency and economy of management, have a surplus available for dividend distribution, but the amount of its capital stock might be so great that the dividend percentage would be very small. Still another utility, working under the same conditions, might have a smaller capital stock on which to declare a dividend from a surplus equal to that accumulated in the second instance, and the dividend percentage would be very large. If the theory—that the amount of dividends declared should receive primary consideration in rate-making—should be carried to its logical conclusion, the first utility referred to above should have its rates increased because it paid no dividend; the second utility should be allowed a smaller rate increase because its dividend was very small, while the third utility should have its rates decreased because it paid a high dividend. This, as the commission states, would lead to the most palpable absurdities.

The rate-making rule of the Board of Public Utility Commissioners of New Jersey precludes the giving to the capitalization and dividend record of the company any controlling and determining force. This, however, does not mean that they do not receive consideration as elements in rate making. As for the dividends in particular, the record of such payments is naturally considered in making any allowances to the company for going value or for the development of business in the first stages of operation. To take such figures, however, as the sole evidence of what reasonable rates should be, would constitute a tax on utility management. This same idea is brought out in Wisconsin decisions, where the rates are fixed to yield utilities a minimum return, the companies being free to earn any additional amount if possible through the use of more efficient and more economical principles and devices.

Printing 1,000,000 Transfers a Day

The Third Avenue Railway System Prints Its Own Transfers at a Net Cost of 9 Cents Per 1000 This Article Is a Description of the Plant, Equipment and the Printing Practice

On Jan. 15 of the current year the Third Avenue Railway System placed a printing plant in operation in a new building at East 133d Street and Third Avenue. The printing office occupies the first floor, and the efficiency department, which was described in the Electric Railway Journal for March 20, the second floor of this building. At present the printing plant is devoted exclusively to the printing of transfers, which are of the double coupon type illustrated.

The equipment comprises the following machinery: Two series V, model 2, Meisel transfer presses, each driven by a 3-hp Crocker-Wheeler motor; three No. 4 Boston wire stitchers; one 35-in. Seybold "Dayton" cutter, driven by a 2-hp Diehl motor; one steel "Economy" baler; one 500-lb. capacity tiering machine from the Economy Engineering Company, Chicago, Ill.; packing tables, transfer cases, employees' metal lockers of Penn-Dar type; one 2-ton auto truck. Including the delivery service, the department staff numbers the chief, five men, two boys and four girls.

Method of Printing and Handling Transfers

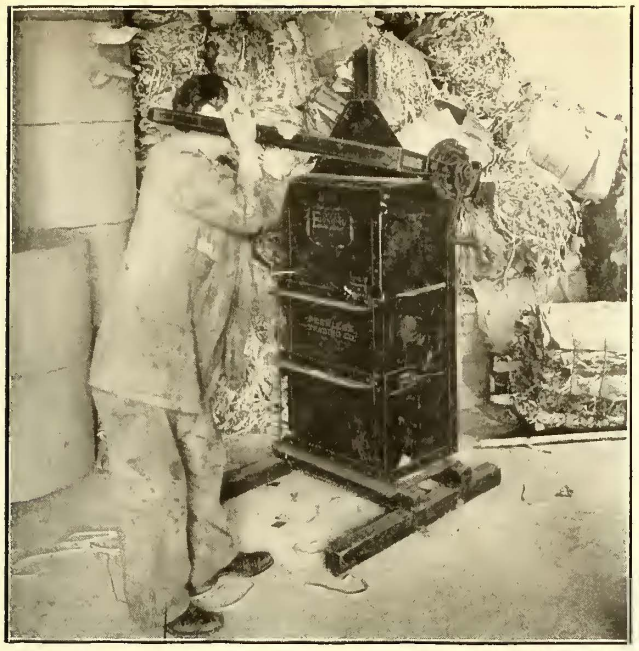
The capacity of each transfer press, if used on a straight run, would be 252,000 transfers an hour. However, owing to the necessity for make-ready, changing plates and rolls, etc., involved in printing 110 different styles of transfers, this maximum is not obtained in practice. The press prints a sheet 14.92 in. x 18¼ in., which gives twenty-one transfers 2 1/16-in. x 6 1/16 in. Five printings per transfer are required as follows: The back, covering "Notice to Passengers"; main text of front of transfer; serial number in red; a.m. or p.m., these letters appearing on separate transfers in order to prevent manipulation; date in red, both on the main body of the transfer and on the coupons. Then the press perforates the sheets and trims two edges to give a straight edge for the cutting which follows.

Next the sheets are taken to the cutter where they are cut into strips of seven each, after which they are removed for machine stitching and returned to the cutter to be divided into single transfers. Following this, the transfers are tied by hand into packages of 1000 each. They are then packed into wooden cases according to serial numbers and date, each case being properly identified. The cases are taken to the carhouses in the auto truck previously mentioned.

The output of the plant is 1,000,000 transfers per working day from the roll to the delivery truck. The transfers are printed thirty days ahead of date of use to make proper allowance for emergency conditions. They are delivered to the proper car stations as fast as printed.

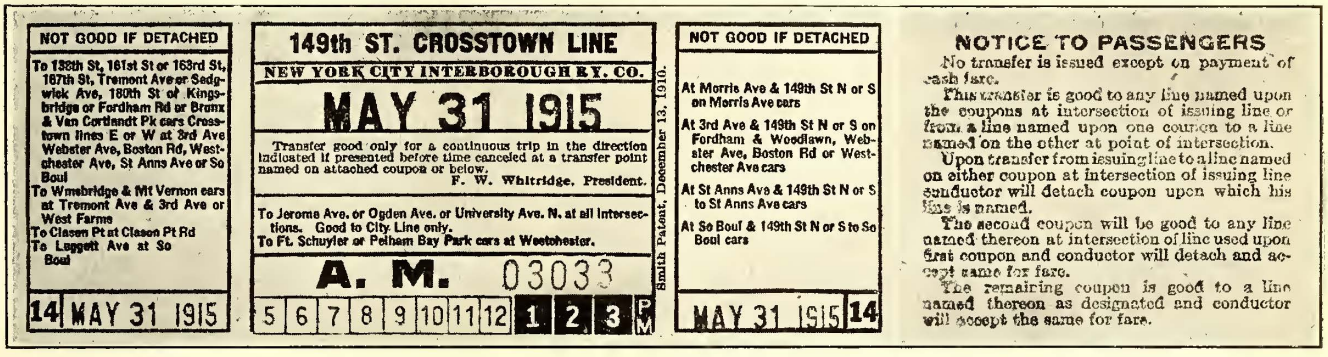
The transfer paper stock is delivered in rolls averaging 270 lb. weight, each equivalent to about 180,000 transfers. A three months' supply of these rolls is stored in quarters adjoining the pressroom. The rolls are stacked by means of the tiering machine, which is also available for loading the auto truck, as will be noted from an accompanying illustration. All trimmings are gathered and packed by machine into bales weighing

THIRD AVENUE TRANSFER PRINTING—GENERAL VIEW OF THE PRESSROOM AND BINDERY, WITH TRANSFER TRIMMING MACHINES AND SORTING TABLES IN THE FOREGROUND

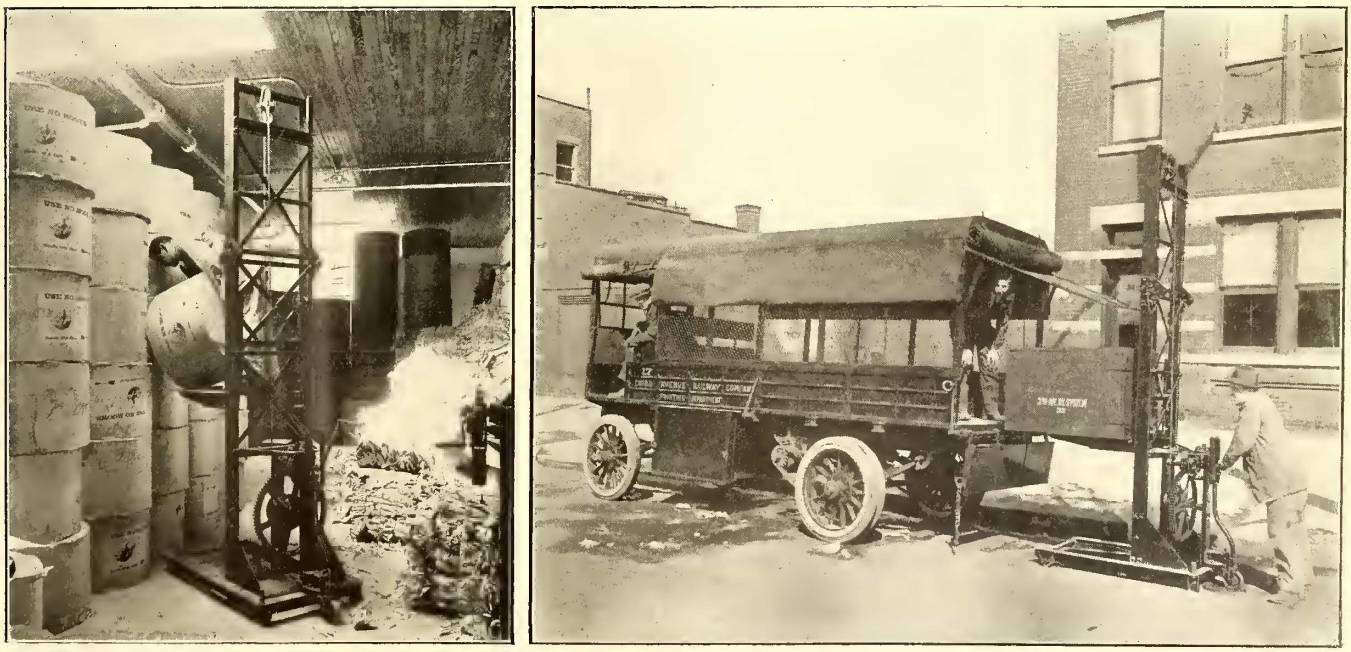


THIRD AVENUE TRANSFER PRINTING—USE OF BALING MACHINE TO TAKE CARE OF TRANSFER TRIMMINGS

THIRD AVENUE TRANSFER PRINTING—CUTTING UP THE TRANSFERS INTO SINGLE LENGTHS



THIRD AVENUE TRANSFER PRINTING—FRONT AND BACK OF DOUBLE-COUPON TRANSFERS, REPRODUCED TO INDICATE THE NUMBER OF PRINTINGS REQUIRED

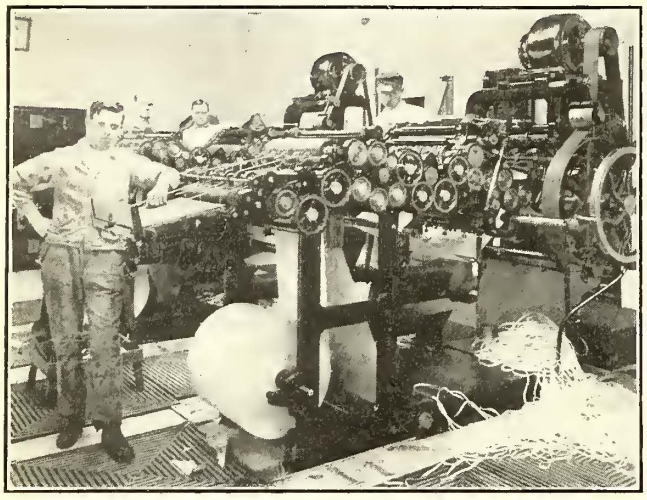


THIRD AVENUE TRANSFER PRINTING—THE DELIVERY AND STOCKING OF TRANSFER PAPER BY MEANS OF A TIERING MACHINE; SHIPMENT OF BOXES OF COMPLETED TRANSFERS IN AN AUTO TRUCK WITH THE AID OF THE SAME MACHINE

about 100 lb. each. The bales are sold to a paper dealer about once a month.

Costs

The building, which is 100 ft. deep and 22 ft. wide with a single-floor 22-ft. x 60-ft. storage "L," cost about $12,000, exclusive of land, and the printing equipment about $16,000. Since the department has been inaugurated so recently, the exact cost of its operations cannot yet be given. However, it is estimated at this



THIRD AVENUE TRANSFER PRINTING—ONE OF THE TWO TRANSFER PRINTING PRESSES ON WHICH 110 STYLES ARE PRINTED

time that the net cost of printing 1000 transfers is 9 cents, compared with 17 cents to 22 cents when purchased. Furthermore, the plant has proved a big convenience in printing a few hundred extra or special transfers for emergencies. The stated cost of home printing includes not only all equipment and operating expenses, but fixed charges, taxes, lighting and power, etc. In fact, in making up these figures the printing department was charged with the use of the entire building, although the second floor is occupied by the efficiency department.

Following Up Platform Recruits at Syracuse

This System Reduces Cost of Training to the Company and Encourages Recruits to Greater Efforts

On Feb. 1, 1914, the New York State Railways—Syracuse Lines—inaugurated a follow-up system for new platform men. Previous to that time new men had been placed on the cars after completing the regular instruction period subject to the same superintendence and discipline as the experienced men. The follow-up system was devised for the twofold purpose of watching the new men to see that they did not lapse from the lessons of the schoolroom and of placing their discipline during the first six months of service in charge of the head of the instruction department for all but dischargeable offenses.

The results of the new plan are reflected in the accompanying table, which shows the number of platform candidates received in the instruction department during the year 1914 and the number who resigned at the different stages mentioned in the table. In checking these figures with previous years, the company finds that it was obliged to hire only 208 men in 1914, as compared with 250 to 300 men in earlier years. The total

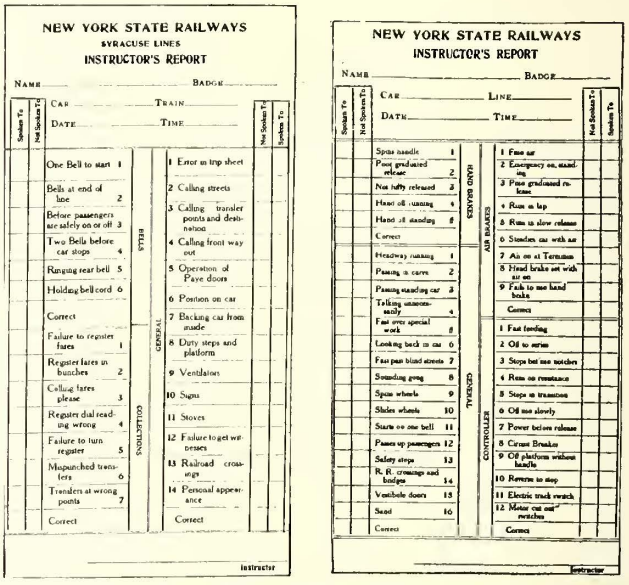
NEW YORK STATE RAILWAYS—SYRACUSE LINES
INSTRUCTION DEPARTMENT

Data on Platform Candidates for Twelve Months Ending Dec. 31, 1914.

	Conductors	Per Cent	Motormen	Per Cent
Number of men received in instruction department	116	....	92	....
Average per month	9.6	....	7.6	....
Number resigned during instruction	22	18.95	21	22.45
Number discharged during instruction	22	18.95	5	5.44
Number of men turned in	72	62.1	66	71.75
Number resigned after being turned in	10	8.62	19	20.65
Number discharged after being turned in	13	11.2	11	11.96
Number of men who completed written examination after thirty days	52	44.8	45	49

number of men employed on the Syracuse lines varies from 550 to 575 men.

The value of this reduction of about 20 per cent in number of men handled is indicated by the fact that the training of each new man, exclusive of accidents, costs the company about $40. John E. Duffy, general superintendent of the Syracuse lines, is greatly pleased with the new system, but thinks that part of the reduction in men handled may be credited to the fact that the maximum wage rate for beginners was increased



REPORT FORMS USED BY TRAVELING CONDUCTOR OR MOTORMAN INSTRUCTOR

during the year 1914 from 22½ cents to 24 cents an hour. The other rates are 26 cents an hour after six months' service, 28 cents after one year's service, and 30 cents for experienced men transferred to interurban lines.

The accompanying forms are reproduced to show the character of report as made by the traveling conductor or motorman instructor. These two instructors follow up the recruits on the cars with decreasing frequency as the experience of the men increases. If their reports show that a man has a special weakness the recruit is ordered back to school for further instruction in that detail. The system of separate discipline is also encouraging to the new men as evidence of the company's desire to give them a fair chance to make good.

The repeal of the "full-crew" law which imposes a needless annual expense of $1,100,000 upon the railroads of New York State, is being urged by The Merchants' Association. In a letter to Assemblyman Frank L. Seaker, chairman of the Assembly railroad committee, the association advocates the passage of two bills indorsed by Assemblyman Conkling repealing the law.

Coasting

Coasting Department Chief Denver Tramway Gave Experience with Coasting Clocks, Showing Resulting Energy Economy

At the March meeting of the Denver Tramway Company section of the American Electric Railway Association, H. P. Fligg, chief of the coasting department of the Denver Tramway, presented a paper on the results achieved by the company in economizing in energy consumption of cars. After showing how improved design has brought down the waste in equipment operation, he quoted from the ELECTRIC RAILWAY JOURNAL of 1909 as follows: "Electric railway companies are spending great sums of money in building large power plants and equipping them with efficient machinery, but after the power goes out to the line no record of it is made and motormen use it wastefully or economically, depending upon their intelligence and care." This quotation showed that there was appreciation of the need for economy in the use of energy many years ago. Mr. Fligg then proceeded to give data showing conditions in Denver which are summarized below.

REDUCTION IN ENERGY AND FUEL CONSUMPTION

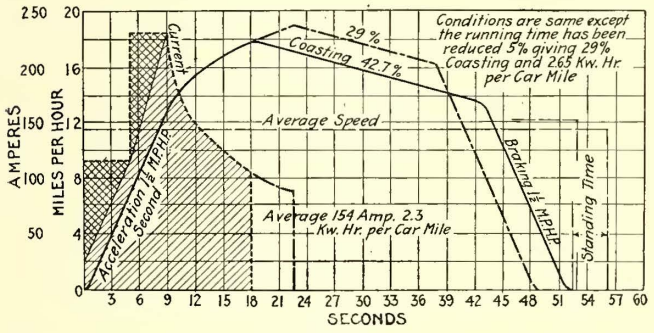
The increase in energy consumption per car-mile is illustrated from the fact that in 1904 it was 2.205 and eight years later it was 3.055, an increase of 38.5 per cent. This was the power-house output divided by the total number of car-miles operated. Between 1912 and 1914 the consumption was reduced to 2.88 kw-hr. per car-mile, and from present indications 1915 will show a still greater reduction. Extensive tests made with the coasting recorders now used show that four-motor cars averaging 10.5 m.p.h. and five stops per mile, and coasting 26 per cent, consume 2.3 kw-hr. per car-mile for traction, this consumption being at the car. The average rate of coal consumption in Denver is about 4.9 lb. per kw-hr., so that, allowing 10 per cent loss in transmission, the coal consumption per car-mile is 12.4 lb. Under the same general conditions a two-motor car would have consumed about 8 lb. of coal. Theoretically, had the four-motor car been doing the same work in the same time and coasting 36 per cent, the coal burned at the carhouse would have been 11.16 lb. per car-mile. Based on energy requirements as found during the test and under present average conditions, an average motorman working a four-motor car for twelve hours per day will control the consumption of about 1400 lb. of coal for traction only, an average of 116 lb. per hour.

As it is the power used for traction that is lowered by coasting, the coasting record is an indirect tally on the coal consumption demanded. Some check on energy consumption of the car is recognized as imperative to economical operation. The greatest economy results when the time rate of acceleration predetermined in the selection of the equipment is strictly adhered to, and advantage is taken of the stored-up energy. Rates of acceleration varying from 0.75 to 2.25 m.p.h.p.s. are common practice and raise no objection from passengers.

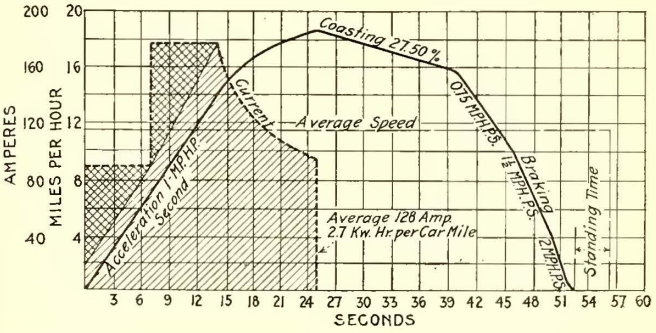
RIGHT AND WRONG CONTROLLER AND BRAKE HANDLING

There is a great difference between a high, uniform rate of acceleration and an irregular one, for during the former the current demand is nearly uniform. Some companies have installed ammeters to assist the motormen in producing a uniform acceleration. From a practical standpoint more time should be given on the first two or three controller points than on the others, as the man who has studied his coasting record has found out. After accomplishing a smooth and fairly rapid acceleration a man's efficiency as an operator is only half developed. Braking is one of the greatest variables in car operation, due to the fact that with every different speed a different amount of energy is stored in the car. Efficient braking results in a minimum dissipation of energy through brakeshoes. Under ordinary conditions this means stopping the car with one application.

Braking presents two features which must be watched very closely, the manner of taking the required amount of air and the manner of getting rid of it. From three to five seconds should be consumed in taking the air so as to get the shoe in snug contact with the wheel before the pressure is too great. Once it is in good contact air can be taken more rapidly without bad results.



DENVER COASTING—FIG. 1—SPEED-TIME GRAPHS, FOUR-MOTOR CAR, 11.5 M.P.H., SIX STOPS PER MILE

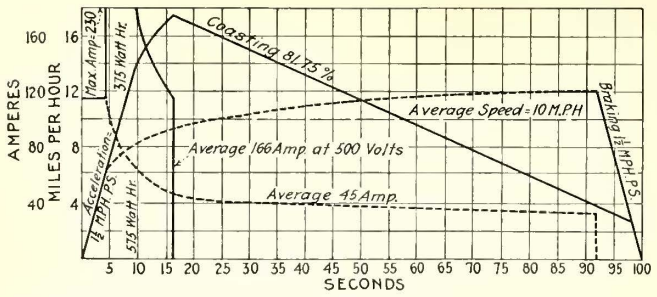


DENVER COASTING—FIG. 2—SAME AS FIG. 1, EXCEPTING VARIATION IN ACCELERATION, COASTING AND BRAKING

STUDIES IN SPEED-TIME GRAPHS

The accompanying diagrams show how energy saving is accomplished.

Fig. 1 was constructed for some of the operating conditions existing in Denver. The average speed is 11.5 m.p.h., with six stops per mile and stops averaging four seconds. Acceleration and braking are at the rate of 1.5 m.p.h.p.s. The graph shows that the run can be accomplished with 42.7 per cent coasting and an energy consumption of 2.3 kw-hr. per car-mile. It has sometimes been argued that if cars were speeded up to allow three or four minutes' additional time at the end of the line for the motors to cool, etc., the results would be the same as though secured by an increase in coasting. To test this the same conditions were assumed for the round trip with the characteristic speed-time graph shown solid in Fig. 1, except that the trip was made in fifty-seven instead of sixty minutes, giving an additional three minutes at the end of the line. The result is shown in the dot-and-dash line of the figure. In this



DENVER COASTING—FIG. 3—SPEED-TIME GRAPHS SHOWING MINIMUM AND MAXIMUM COASTING

case there is only 29 per cent of coasting, and the energy consumption is 2.65 kw-hr. per car-mile, an increase of 15 per cent.

With a given schedule to maintain, and the same number of stops per trip, the coasting can be varied by a change in the acceleration rate, a change in the braking rate, or a change in the length of stop. The length of stop, to some extent, depends upon the manner of acceleration and the manner of braking, these being less with smooth operation than with rough, choppy operation.

Fig. 2 has been constructed to show the effect of changing the rate of acceleration and braking. The former has been chosen at 1 m.p.h.p.s., and the latter graduated from 0.75 to 2 m.p.h.p.s., the other characteristics remaining as before. This shows a possible coasting of 27 per cent instead of 42.7 per cent, practically 15 per cent less, while the energy consumption is 2.7 kw-hr. per car-mile, an increase of practically 15 per cent.

A small amount of series running does not seriously affect the energy consumption, but carried to an excess it affects both energy and coasting. This is shown in Fig. 3, giving data for a four-motor car, accelerated to full series and run so as to cover the greatest possible distance in 100 seconds, accelerating and braking at the rate of 1.5 m.p.h.p.s. In this operation 575 watt-hours are consumed. If, with the same rate of acceleration and braking, the car is brought to full parallel, coasting as much as possible, to a speed of about 17 m.p.h., to cover the same distance in the same time, but 375 watt-hours are consumed, a saving of 35.5 per cent for the parallel operation.

CONCLUSIONS

The best results in operating cars are obtained through efficient acceleration and braking, and by anticipating all stops or slow-downs, whether they be for passengers, special track work, passing cars going in an opposite direction, or for other traffic conditions. The basis of all these is "mechanical feeling" and "judgment of distance and speed."

COASTING AVERAGES

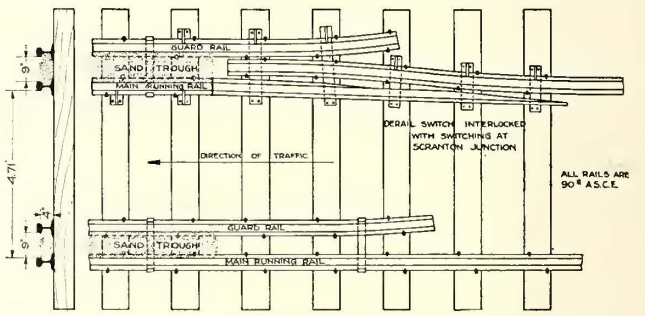
Road	Average Per Cent Coasting
Hudson & Manhattan Railroad	45.20
Long Island Railroad	37.40
Denver Tramway	35.80
San Francisco-Oakland Terminal Railways	35.10
Elmira, Corning & Waverly Railroad	34.70
Virginia Railway & Power Company (Richmond division)	34.10
Northern Texas Electric Company (Ft. Worth)	34.00
San Antonio (Tex.) Traction Company	32.80
Third Avenue Railway (New York)	32.70
Washington Railway & Electric Company (Rockington division)	29.70
British Columbia Electric Railway (Vancouver, B. C.)	28.80
Interborough Rapid Transit Company (New York) (subway division)	27.70
Boston Elevated Railway	27.30
Northern Texas Traction Company (Ft. Worth)	26.70
Empire United Railways (Syracuse, N. Y.)	24.60
Interborough Rapid Transit Company (New York) (elevated division)	23.60
Bay State Street Railway (Boston, Mass.)	23.30
Washington Railway & Electric Company (Tennalytown division)	23.20

In closing Mr. Fligg quoted a table furnished by the Railway Improvement Company showing the January coasting records of a number of roads using coasting clocks. It was explained that on this table the records of the first two roads are not comparable with the rest as they are multiple-unit systems operating over private rights-of-way.

An Effective Stop for Runaway Cars

Cars Diverted Into Gravel Trough—Elaborate Tests Show Constant Retarding Force of 12,500 Lb.

A runaway-car stop, which will be of interest to the engineering profession generally and particularly to those connected with the operation of electric railways in more or less hilly country, has recently been installed and tested on the line of the Lackawanna & Wyoming Valley Railroad in Scranton, Pa. It has been placed at the foot of the long grade approaching Scranton Junction to protect the Scranton yard and terminal from a possible runaway descending this grade. The installation is a modification of the "sand tracks" which have been in operation for some time in Europe, particularly in Germany, where they are used principally to protect against overrunning on stub-end tracks, as at steam railroad passenger terminals and freight classification yards. The only other examples of this type of protection in this country, apparently, are the sand tracks which were constructed by Ford, Bacon & Davis on the sharp grades descending the Palisades to Edgewater, on the line of the New Jersey & Hudson River

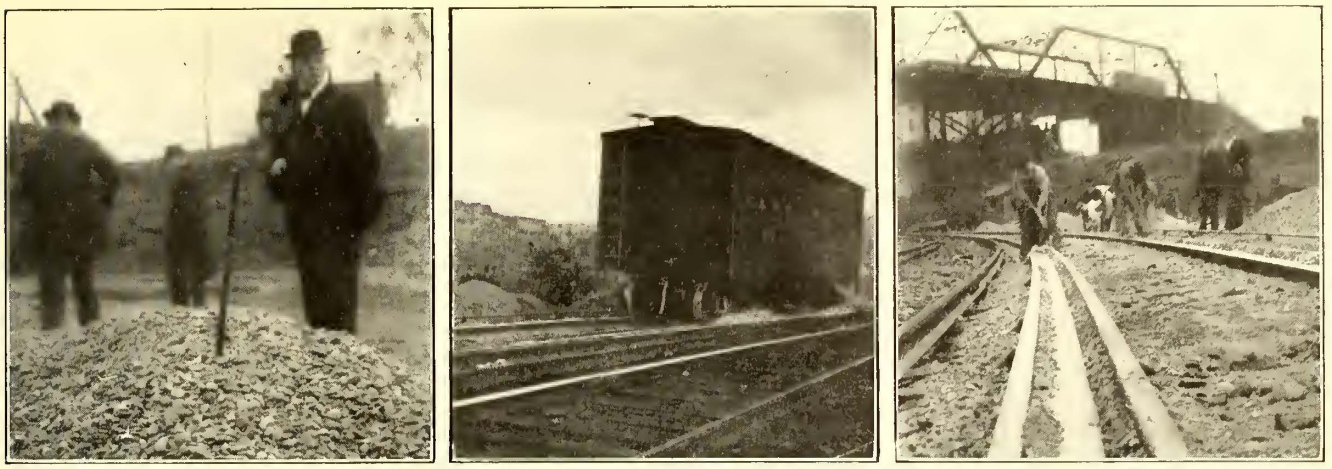


RUNAWAY CAR STOP—DETAILS OF CONSTRUCTION AT ENTRANCE TO SAND TROUGH

Railway & Ferry Company, now operated by the Public Service Railway Company. At the time these tracks were planned a careful search failed to reveal any published tests of troughs of this kind to indicate their retarding qualities for cars of different weights and speeds. The engineers, therefore, made certain tests, the results being published in this paper (see issue for Sept. 8, 1906, page 384). Since that time other tests were made in Germany as described in the ELECTRIC RAILWAY JOURNAL for Sept. 2, 1911, page 397.

The runaway stop at Scranton consists, as will be seen by reference to an accompanying illustration, of two double troughs about 350 ft. long formed between the running rails and additional guard rails adjacent, the troughs being filled with gravel to a depth of approximately 4 in. At the entrance end an ordinary split-switch point is set in the running rail, the switch being normally open to divert any traffic into the troughs. Upon the approach of a regular train under control the switch is set for the main line by the operator in a near-by interlocking tower.

The stop has been elaborately tested by running cars into it at speeds ranging from 15 m.p.h. to 30 m.p.h. In all, fifteen such tests have been carried out. The first five were made with a gondola freight car which,



RUNAWAY CAR STOP—VIEWS SHOWING BEST SIZE OF GRAVEL, CAR ENTERING STOP AT 25 M.P.H., AND CRUSHED GRAVEL BETWEEN RAILS AFTER PASSAGE OF CAR

with its load, weighed 58,000 lb., and the last ten with a loaded box car weighing 76,400 lb. The test cars were drawn to various points on the grade, then cut loose and allowed to run free into the trough, observations being made as to the speed, distance and time required to make the stop, etc. The damage done during the tests was negligible and consisted principally of broken spikes and anti-creepers. Practically no damage was done to the cars or trucks, which entered and were stopped in the trough in a very satisfactory manner. It was found that the first car bumped considerably as it passed over the ties under the trough, but that the gravel was thus tamped enough so that subsequent cars ran smoothly.

Various materials were placed in the trough for the different tests, such as ¾-in. crushed stone, screened sand, small gravel and large gravel, and although hardly enough tests were made to define accurately the laws governing the behavior of cars at various speeds with the various materials, it appears that the resisting force is approximately constant for any one material, regardless of the car weight, within the range of the weights and speeds tested. The retarding force exerted by the various materials was found to be as follows: Crushed stone, 10,000 lb.; screened sand, 10,700 lb.; small gravel, 11,000 lb.; large gravel, 12,500 lb.

From this may be deduced the data shown in the following tables:

DISTANCES REQUIRED TO STOP A 50,000-LB. CAR

	Crushed Stone	Screened Sand	Small Gravel	Large Gravel
30 m.p.h.	151	141	138	121
60 m.p.h.	604	575	548	483

DISTANCES REQUIRED TO STOP AN 80,000-LB. CAR

	Crushed Stone	Screened Sand	Small Gravel	Large Gravel
30 m.p.h.	242	226	220	194
60 m.p.h.	969	922	878	775

RATE OF RETARDATION IN MILES PER HOUR PER SECOND

	Crushed Stone	Screened Sand	Small Gravel	Large Gravel
50,000-lb. car	4.4	4.7	4.8	5.5
80,000-lb. car	2.7	2.9	3.0	3.4

The behavior of the test cars while entering and traversing the trough was in every way satisfactory, there being no apparent tendency to sway, jump or leave the trough, and the retardation was apparently quite smooth and uniform.

In the light of the results of the tests described above, it appears that this device should find more or less extended application in those cases where it is desired not only to protect against possible runaway cars on grades but also to protect such possible runaways against damage to themselves and their contents. Although the rate of retardation is undoubtedly higher than that possible or advisable with ordinary car brakes, especially for the lighter cars, such a rate is not sufficiently high to be dangerous and is certainly much to be preferred to other possible developments in the case of a runaway. It is also interesting to note that the most suitable material, or large gravel, is undoubtedly the least likely of the materials tested to become ineffective during the winter because of freezing, as its self-drainage would be better than that of any of the other materials tested.

It is the opinion of the designers that, whatever the material used, tamping between the ties is necessary to insure smooth running through the stop. This may best be done by running one car of normal weight through the stop before the latter is placed in service. The passage of a car crushes and packs the gravel in the center of the trough to a considerable extent, as shown in one of the illustrations, and this packed material should be removed with a pick after each time that the stop comes into use. Logically, this packing of material indicates a greater retardation at the first axle of the car than at subsequent axles, and it also indicates that the retardation obtained with one car would not be increased in direct proportion with trains of more than one car. The retardation, however, appeared to increase somewhat with increased depth of gravel, and this might be made to take care of increased train length. The stop in question was intended only for single cars.

The information concerning this device was furnished by L. L. Odell, of the staff of Ford, Bacon & Davis, engineers, who, collaborating with W. E. Higgins, vice-president and general manager of the Lackawanna & Wyoming Valley Railroad, was principally responsible for the details of design and tests.

Public Service Commission Exhibit at Panama-Pacific Exposition

In the New York City building at the Panama-Pacific Exposition, the Public Service Commission for the First District is exhibiting, by means of pictures, two phases of its work—rapid transit and regulation. The commission booth is 14 ft. wide by 24 ft. long, with wooden partitions 9 ft. 6 in. high. The color scheme of the exhibit is dark brown and old ivory. The pictures are arranged in sequence, showing rapid transit construction on the dual system step by step, from start to finish. The exhibit on regulation is most comprehensive, covering all features of the commission's work in connection with the public utilities in its jurisdiction. An additional feature of the exhibit on construction work is a moving picture with a little romance to provide human interest.

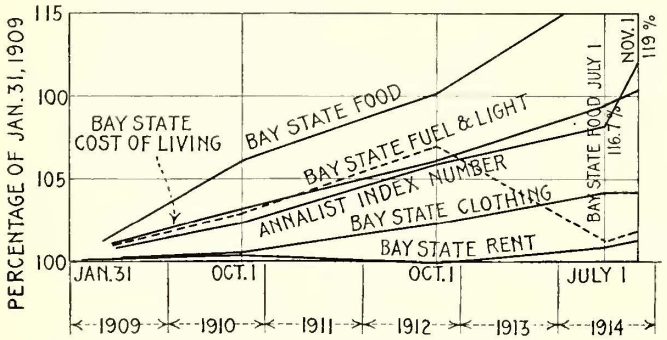
The Bay State Street Railway Arbitration

At Last Week's Hearing Hon. J. M. Swift, C. F. Bancroft, C. R. Rockwell and Prof. A. S. Richey Gave Important Testimony, That of the Last-Named Being Replete with Statistical Data

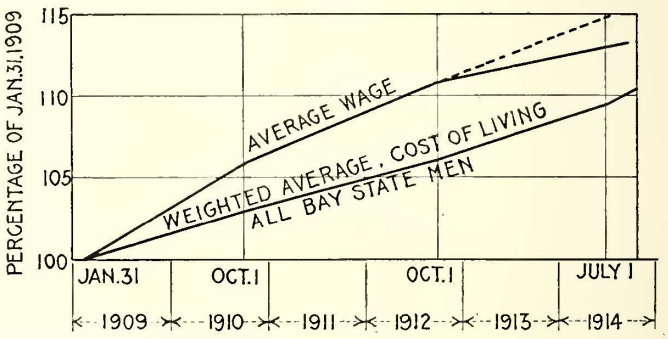
Progress on the wage arbitration case between the Bay State Street Railway of Boston, Mass., and its employees, which has been under way for several months, has been reported in the news columns of the ELECTRIC RAILWAY JOURNAL from week to week.*

On March 29, the forty-sixth day of the proceedings, the railway began its presentation of evidence, Hon. James M. Swift, attorney for the company, urging that the board should not consider evidence prior to the 1909 arbitration. The contentions of the company were that platform and other work was no more difficult and required no more skill than in 1909; that there had been no material change in the equipment nor increase in the difficulties of fare collection, and that the increase in pay had more than offset the increased cost of living.

The company paid the "going rate" and claimed that in view of the business depression the demand of the employees for an increase from the present 28-cent maximum to a 30-cent minimum rate was appalling, as



BAY STATE ARBITRATION—INCREASE IN ELEMENTS OF COST OF LIVING DURING PAST FIVE YEARS



BAY STATE ARBITRATION—RELATION OF INCREASE IN WAGE RATE AND COST OF LIVING

was the contention that the condition of the company treasury should have no bearing upon the wage rate. "There is no more firmly-fixed principle in law," said Mr. Swift, "than that a man is entitled to a reasonable return upon his investment in the public service corporation." The company has had to practice great economies since 1910 and has not been able to furnish as good service as the public called for. Car painting and improvements have had to be postponed for lack of funds. Officials also have been moderately paid for the responsibilities they hold, while dividends have been so low as to make the investment unattractive to new capital.

Referring to the previous offer of the company of an increase of ½ cent per hour, Mr. Swift said that subsequent events have shown that the company could not stand even this increase, now withdrew the compromise offer, and claimed that wages should be reduced. The arbitration board was asked to restore the rate of wages in force before the 1912 agreement. To meet the situation the company will offer a co-operative plan, of which particulars will be given later.

PROF. A. S. RICHEY'S TESTIMONY

Prof. A. S. Richey of the Worcester Polytechnic Institute, superintendent of time-tables Bay State Street Railway, testified that while the cost of living on the Bay State system increased 10.41 per cent from 1909 to November 1, 1914, wages had increased 13 per cent. The increased cost of living was made up of the following increases: Food, 19.1 per cent; rent, 1.37 per cent; fuel and light, 1.91 per cent; other items, 4.15 per cent. The average wage on Jan. 31, 1909, was 23.25 cents per hour, compared with 26.33 cents on Oct. 1, 1914.

The accompanying diagrams were exhibited, among others, to show these data in graphical form. The "Annalist index number" referred to shows the fluctuations in the average wholesale prices of twenty-five food commodities selected and arranged to represent a theoretical family's food budget.

Professor Richey presented Table I of operating statistics and stated that the average schedule speed of all cars on Massachusetts street railways, excluding elevated and tunnel lines, was 9.56 m.p.h. for 1914. Of 8000 notices issued by the company to the men in the last ten years 45.4 per cent called attention to existing rules or orders, cautioned regarding accidents, or were for information only and did not in the least affect the duties of car service employees. He stated further that the cost of living on the Bay State system since 1909 had been 4.75 per cent less than in Boston, the density of population on the Boston Elevated system being 11,229 per square mile, while that on the Bay State system, even in the Chelsea division, is but 6507 and in Lynn but 4000 per square mile.

TABLE I—OPERATING DATA, BAY STATE STREET RAILWAY

	Fiscal year 1909	Fiscal year 1914
Revenue passengers per car-hour	47.2	50.8
Total passengers per car-hour	53.4	57.4
Speed, miles per hour	8.46	8.35
Revenue passengers per conductor	111,926	111,381
Total passengers per conductor	126,707	125,792

TABLE II—DATA FROM THREE ELECTRIC RAILWAYS IN MASSACHUSETTS

	Bay State St. Ry.	Boston Elevated Ry.	Middlesex & B. St. Ry.
Cars per mile of track in rush hours	1.03	6.43	1.19
Population per mile of track	1,739	4,570	1,554
Receipts per mile of track	$11,920	$60,520	$8,996
Car-miles per mile of track per year	40,158	201,322	35,308
Average number of passengers per car-hour	59.6	97.3	50.2
Population per square mile	848	11,229 (surface)	587
Annual car-miles per crew	17,662	19,024	24,904
Annual receipts per conductor	$5,242	$5,720	$6,346

*See Vol. XLIV, pages 1074 and 1402; Vol. XLV, pages 76, 150, 200, 268, 303, 346, 433 and 477.

In the fiscal year 1914 the Bay State company had a total passenger revenue of $8,969,856 and carried 215,000,000 passengers, compared with $13,820,162 and 445,000,000 passengers on the Boston Elevated system. The total population served, 1,309,120, is spread over 1544 square miles, compared with a population of 1,043,000 and a territory of 93 square miles at Boston. The Bay State system has 4.6 conductors and motormen per mile of track, compared with 21.2 on the Boston Elevated system and two on the Middlesex & Boston Street Railway. Other unit data are given in Table II.

The Bay State company has 1031 cars equipped with air brakes, or 48.8 per cent of the total, compared with 558 cars thus equipped, or 16.3 per cent of the surface cars on the Boston Elevated. Of the gross receipts, the Bay State company paid 21.9 per cent in wages, compared with 21.7 per cent on all Massachusetts electric roads, 19.98 per cent in New England, and 18.35 in the United States. The data of the Massachusetts Bureau of Statistics show that the number of industrial workers employed in factories has varied from 34 per cent to 37 per cent above the minimum in the years 1907 to 1913 inclusive. The average number of days factories or any departments of these were in operation in a year varied from 293.5 in 1907 to 289.2 in 1913. Great superiority in respect to continuity of employment was shown by Professor Richey for Massachusetts street railways compared with representative industries. (See Table III.)

TABLE III—AVERAGE UNEMPLOYMENT, IN PERCENTAGE OF TOTAL WORKERS

	Street Railways	Textile Mills	Boots and Shoes
1909	2.5	7.8	7.8
1910	2.4	10.7	7.5
1911	2.1	12.6	5.8
1912	2.5	12.4	9.0
1913	2.4	11.6	7.6
1914	2.7	11.1	17.8

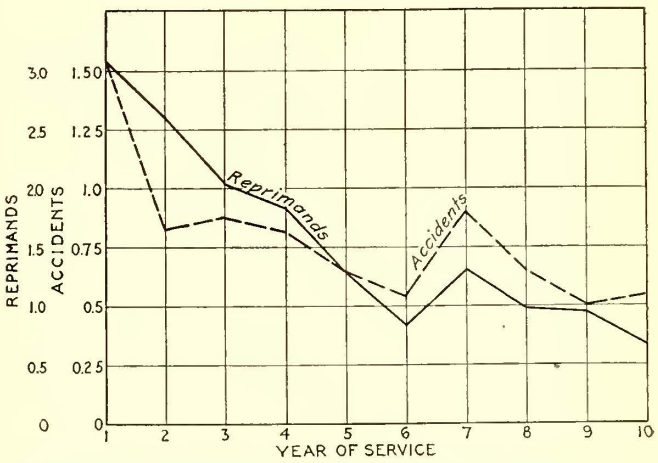
Boot and shoe workers and textile workers were selected for comparison because there are probably more employees in these two industries in the Bay State territory than in any other industry. The data were drawn from reports of the labor union secretaries to the State board.

Only 16.3 per cent of the motormen and conductors, excluding call men, are in the first year of service. Men who have worked more than two years comprise 83.7 per cent of the total; more than three years, 68.3 per cent, and in the fifth year and over, 55.2 per cent. Forty-one per cent of the total number of men, or 1313 out of 3205, are getting the maximum pay of 28 cents per hour, having reached or passed the eighth year of service. The number receiving 27 cents is 249, or 7.8 per cent; 626 men, or 19.5 per cent, receive 26 cents; 495 men, or 15.4 per cent, receive 25 cents; 522 men, or 16.3 per cent of the total, receive 24 cents. The average length of service of all conductors and motormen on Oct. 3, 1914, was 7.53 years, that for conductors being 6.46 years and that for motormen, 8.62 years. Excluding first and second-year men, the average length of service of motormen was 11.36 years; of conductors, 9.66 years, and of both classes, 10.58 years. Wages have been automatically increased 0.55 cent per hour since 1909 by the operation of the graduated scale, besides the increases granted by agreements.

A letter was introduced from the Secretary of the Navy, Hon. Josephus S. Daniels, stating that after a thorough investigation he had come to the conclusion that the labor conditions affecting wages throughout the country have not experienced any essential change during the last year, and that he had, therefore, decided to continue the same schedule in 1915 as in 1914, this applying to the Boston Navy Yard, from which men are sometimes drawn for street railway service.

An analysis of the payrolls for the year ending Oct. 3, 1914, showed that during the year an average of 2132 regular men drew $15.26 per week; 856 spare men drew $12.13 each, and 107 call men drew $3.99 each, the average of all employed being $14.01, and of all excluding call men, $14.37. The number of spare men was about 700 in winter and more than 1000 in summer. A study of the former occupations of 3504 men showed that 13.4 per cent were clerks, salesmen and agents; 12.3 per cent teamsters and drivers; 11.4 per cent shoe and leather workers; 10.4 per cent textile workers; 8 per cent from the building trades; 6.5 per cent farm workers; 5.6 per cent metal workers and foundry men; 2.4 per cent servants and attendants; 2.6 per cent tradesmen; 2.2 per cent former conductors or motormen; 1.6 per cent in steam railroad service; 1.2 per cent fishermen and seamen; 1.6 per cent from electrical trades; 1.2 per cent government and municipal employees; 0.9 per cent from printing trades; 7.7 per cent from miscellaneous indoor occupations; 0.6 per cent from miscellaneous outdoor occupations, and 2.3 per cent had unknown occupations. Of the conductors and motormen 63.5 per cent were married, and averaged 1.5 children each. For the year 1913, 65 per cent of the male employees in Massachusetts manufacturing plants earned less than $15 per week, covering nearly 500,000 employees. The average yearly wages of 28,085 male employees in Massachusetts industrial plants in 1913 was $773.89.

In the last three years 14.3 per cent of all employees resigning from the Bay State company have returned



BAY STATE ARBITRATION—DIAGRAM SHOWING RELATION OF REPRIMANDS AND ACCIDENTS TO LENGTH OF SERVICE

to its service. Of those who left in their first year the greater part did so during the first three or four months.

The number of accidents to employees per 100 employees on the Bay State lines is about 2.5, compared with 6.6 per cent in cotton mills, 4.9 per cent in the shoe industry, and 18.2 per cent in foundries and metal working plants. In the last five years on the Bay State lines there were thirty-six head-on collisions and 772 rear-end collisions. Of the rear-end collisions, 449 were on double track, 247 were on single track and seventy-six were on turnouts. As the company has about 80 per cent of single track, there were fifty times as many rear-end collisions on double track as head-end collisions on single track, refuting the evidence of the union as to the greater danger of single-track operation. The witness then introduced the graph shown herewith, illustrating the relation between years of service, reprimands to conductors and motormen and accidents.

Although there were twenty-seven fare reductions or increase in free transfer facilities in the past five

years, in no case has the company raised its fares. The size of the system made these changes relatively unimportant, so far as imposing additional duties upon conductors went.

As an index of the financial condition of motormen and conductors, Professor Richey showed that 425 of these employees, either in their own or their wives' names, own real estate with a total assessed valuation of $1,095,576. Evidence was also introduced from the thirteenth census to the effect that the average number of wage earners in manufacturing industries is 6,615,046, with an average yearly wage of $518.

The estimated annual cost of increases granted by the company in the agreement of Nov. 4, 1914, is $13,457; the increased yearly cost of paying motormen and conductors 30 cents per hour the first year and 35 cents per hour thereafter, as demanded by the union, would be $661,438; the extra cost of a seven-hour minimum guarantee with a minimum of two and one-half hours for morning trippers would be $245,558 per year, and other extras due to service beyond the twelfth hour, to increases in track and line departments and in power and substations bring the grand total to $1,189,113 per year as the entire extra cost of granting the union demands. The wages of motormen and conductors would be increased about 45 per cent by this policy.

A large number of extracts from the employees' magazine, the *Motorman and Conductor*, were read by counsel for the company in refutation of the testimony of numerous employees that life was a continual grind, with little pleasure and but a dreary outlook. The items quoted described the participation of members of the union in balls, field and aquatic sports, amateur theatricals, automobiling, travel, and matrimonial affairs and indicated that a large share of recreation and enjoyment falls to the lot of members of the union in the various divisions of the Bay State system.

In conclusion Professor Richey commented at length upon the testimony of Prof. Irving Fisher of Yale University relative to the cost of living, and contended that the latter's figures were of too general a character to represent local conditions. Professor Richey said that Professor Fisher's view of the index number, how it is constructed and how it represents the change in prices from year to year, and the method used by him in weighting the index, are in accord with the company's views. Contrary to Professor Fisher's assumption that price movements do not vary materially between communities, the company's investigation shows that there have been decided differences between the increases in living cost on different parts of the system. The company's index numbers are based on results of investigations in the North Atlantic section by the United States Department of Labor, correcting the index numbers used by Professor Fisher. The department will shortly issue a new bulletin with previous errors corrected. The Bay State studies show that the local increase in prices of clothing, heat and light has been very much less than the increase in food and rent, contrary to Professor Fisher's evidence.

MR. BANCROFT'S TESTIMONY

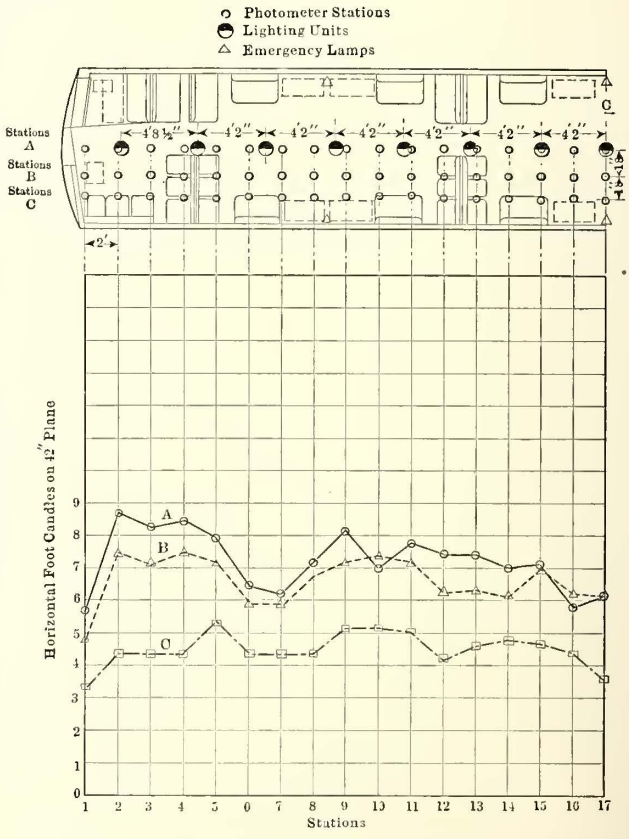
C. F. Bancroft, superintendent of motive power and machinery, testified that he had not known of a single case of heat prostration in the last fifteen years in a Bay State boiler room. He had only been able to maintain the company's equipment with regard to safety during the last two or three years, because of decreased appropriations. In the last year or two it has been necessary to discontinue car painting. On account of the damage done to equipment by motormen who attempt repairs with inadequate knowledge or tools the company prefers that all except the most minor repairs be made by the regular maintenance force.

MR. ROCKWELL'S TESTIMONY

Charles R. Rockwell, vice-president and treasurer, was the next witness. He stated that in 1911 the company's gross earnings were $8,761,847; operating expenses were $5,484,480; net income, $3,277,367; net divisible income, $1,454,307; dividends, $1,148,965, and balance, $7,617. In 1914, these items were, gross earnings, $9,695,249; operating expenses, $6,363,969; net income, $3,331,280; net divisible income, $1,324,296; dividends, $1,242,069; balance, $682. In 1911 the wages of motormen and conductors were 20.87 per cent of the revenue and in 1914 they were 21.94 per cent. The addition of 1 cent per hour to the wages of motormen and conductors in 1914 would have increased the wages by $85,430, which is more than two-thirds of the salaries of $2,500 and above in the company. The common stock pays 5¼ per cent dividends at present. The average dividend for ten years and nine months ending June 30, 1914, was 4.25 per cent.

Lighting Distribution Curves of New York Municipal Car

As noted in the ELECTRIC RAILWAY JOURNAL for March 27, the lighting of the New York Municipal Railway Corporation's car was described by Messrs. Gove and Porter before the Illuminating Engineering Asso-



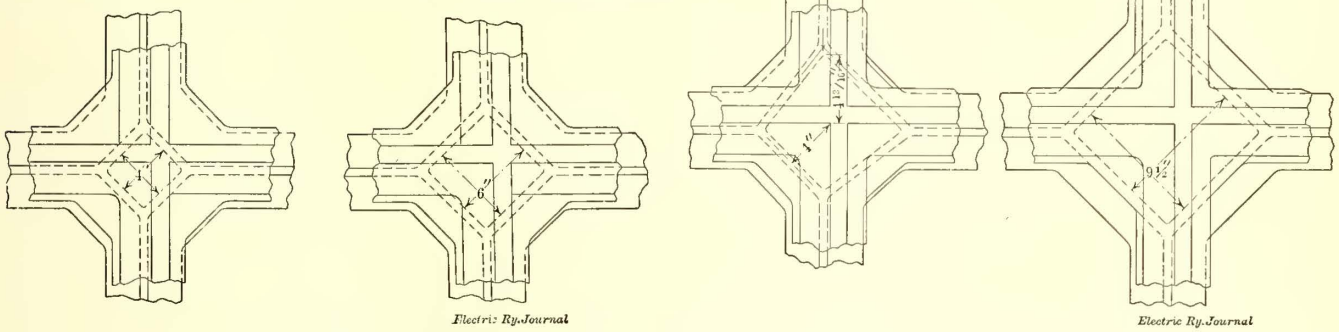
DISTRIBUTION CURVES OF EQUIPMENT FINALLY ADOPTED

ciation on March 11, 1915. All of the lighting distribution curves presented in the original paper were also reproduced in the ELECTRIC RAILWAY JOURNAL. Since this first publication the distribution curves of the equipment adopted have been made available. These curves, as reproduced, are for a single line of fifteen 56-watt bowl-frosted tungsten lamps placed symmetrically down the center line of the ceiling, equipped with reflectors.

Recent Solid Manganese Steel Crossings

A Study of Twenty-two Crossings Installed in Chicago During the Last Three and a Half Years Indicates that the Makers Have Succeeded in Shifting the Area of Imperfection from the Impact Points to Say 8 in. From the Gage Line

One of the chief difficulties experienced in the manufacture of solid manganese steel castings for track special work has been the elimination of segregated or unsound metal at the intersecting flangeways or at the mass points in crossing frogs. Operating experience has revealed the weak spots and has thus suggested further changes in the manufacturing process to remove these imperfections. In the past five years much testing has been carried on by different manufacturers to eliminate entirely unsound metal from track special work, or at least to remove it from the points receiving the heavy impact blows. In the article of May 2, 1914, describing Chicago's experience with solid and insert manganese steel special track work, it was stated that the principal difficulty in obtuse-angle and right-angle crossings of solid manganese steel was that after the second year they would chip at the intersecting flangeways. Manufacturers have agreed generally that this chipping or breaking of the running rail corners at intersections has been due principally to segregated or unsound metal. This belief was borne out by the fact that this type of failure did not occur in all solid manganese steel crossings. In fact, a large per cent were found in perfect condition and indicated that they would give very long life.



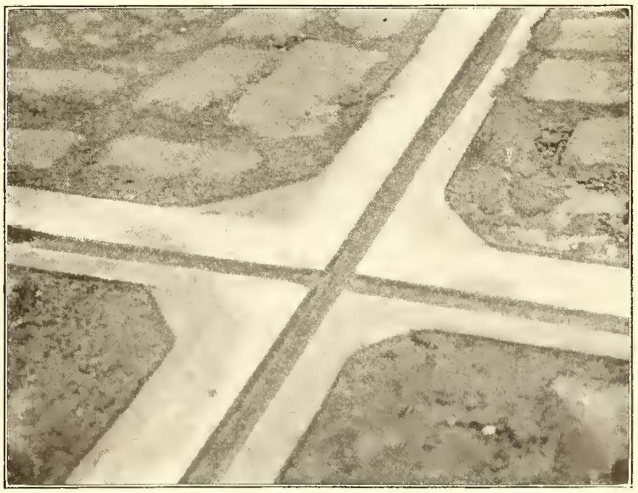
MANGANESE STEEL CROSSINGS—FIGS. 1, 2, 3 AND 4—DEVELOPMENT OF TYPES

Changes in Manufacture

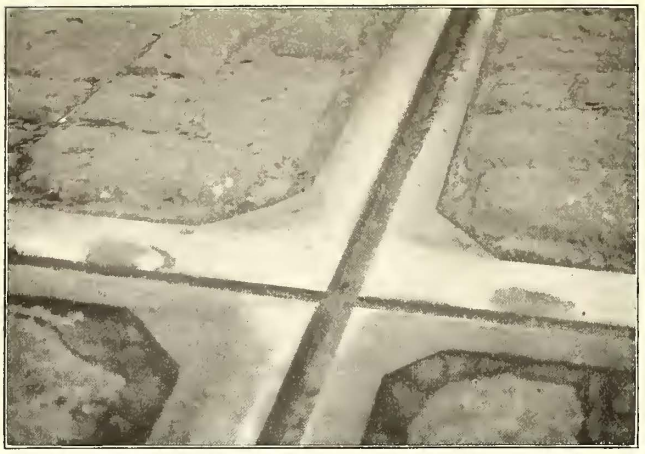
Since the unfortunate experience with solid manganese steel special work in Chicago, a number of the defective layouts have been replaced with castings which the manufacturers believed would eliminate unsound metal from the crucial points. Developments along this line included the adoption of a limiting thickness for the supporting webs, as well as the more general use of the channel instead of the T-rail sections, particularly at the points supporting the intersecting flangeways. While these changes have had a tendency to reduce segregation, internal strains and cold spots in the casting, they did not entirely remedy these defects at the mass points in solid crossings. Still other remedies included enlarging and changing the location of the gates and risers so as to feed the molds more liberally, and partial chilling in the molds. All of these have had a beneficial effect on the finished castings.

In their endeavor to remove unsound metal from the crucial points of right-angle and obtuse-angle crossings, some manufacturers rearranged the supporting webs. The successive stages through which the web distribution has passed in right-angle crossings are shown in Figs. 1, 2, 3 and 4. In the original designs of solid manganese steel crossings it was intended that the webs should intersect at right angles, which would have brought the junction exactly beneath the intersection of the running rails. This arrangement was considered impracticable, however, because of the foundry difficulties entailed, and was supplanted by the type with an intervening box 4 in. square. Service tests with this type indicated that the box was too small to introduce the necessary precautions against segregation, because the webs were too close to the crucial points. As shown in the illustrations, these box-like supporting webs have gradually been spread apart until the inside dimensions were 9½ in. square, as shown in Fig. 4. As these several stages of enlargement were made it was believed that the points of unsound metal would be further removed from the points of severest impact. Experience had shown that where the webs intersect, it was very difficult to eliminate segregation from the ball of the rail.

Early in 1911 several of these solid manganese steel crossings with the supporting webs in the form of a 9-in. box were installed at heavy traffic points in Chicago. After three and one-half years of service these crossings have demonstrated that chipped intersections



MANGANESE STEEL CROSSINGS—FIG. 5—BEGINNING OF DEPRESSION, WENTWORTH AVENUE AND FIFTY-NINTH STREET, CHICAGO



MANGANESE STEEL CROSSINGS—FIG. 6—CRACK BEGINNING IN DEPRESSION, HALSTED AND FIFTY-FIRST STREET, CHICAGO

can be eliminated, or at least up to the time of examination they gave no proof to the contrary. Other imperfections such as cupping at the joints or at the intersections, as well as cold rolling in the arms, were imperceptible, and this was considered evidence of improvement over the original installations.

Examination of Crossings Three and One-half Years Old

In some of these more recent designs of solid manganese steel crossings, however, a peculiar phenomenon has begun to reveal itself after three and one-half years of service. A recent inspection of several of these newer layouts showed that slight depressions have begun to appear on the heavy traffic rail, about 8 in. from the intersection of the gage lines. As illustrated in the three accompanying halftones, Figs. 5 to 7, inclusive, these depressions at first appear merely as dark spots on the running rail beside the gage line. The peculiar thing about them, however, is that the depressions do not receive the passing wheel loads, but the metal seems to have shrunk away from the normal surface of the ball of the rail. In some of these depressions it was observed that a fine hair-line crack had begun to form along the edge, and in still others this crack had opened quite perceptibly, in fact that portion of the rail in the depression had begun to spall. It was also found that these depressions formed exactly over the intersection of the two webs forming sides of the square supporting box and the web in the running rail arm. Manufacturers believe that this is simply evidence that the unsound metal has been removed from the crucial points but has not been entirely eliminated. In other words, the mere shifting of the supporting webs had not removed this form of frailty. Partial chilling in the mold in conjunction with the other marked improvements in manganese steel foundry practice should exclude even this imperfection from the manganese steel crossings made to-day.

MANGANESE STEEL CROSSINGS—FIG. 7—PIECE SPALLED OUT OF DEPRESSION, WENTWORTH AVENUE AND FIFTY-NINTH STREET, CHICAGO

At first it was thought that the dark spot or depression noted was at the point where the wheels entered the narrow throatway or changed from a tread to a flange bearing. While in these installations the failure to provide gradual approaches either to the narrow throatway or to the riser in the flangeway caused a small, bright spot to appear, the locations on this bright spot and of the depression were not coincident, hence it was apparent that there was no relation between the two. Since this phenomenon could be accounted for as a mechanical difficulty, the manufacturers were satisfied that they were working along the right line. On the other hand, as the unsound metal area was so small and removed from the points of heavy impact, it was believed to be inconsequential and indicated that the presence of unsound metal in the wearing surface of solid manganese steel crossings had been practically eliminated. While only ten different layouts including twenty-two crossings of the newer design were inspected, each had been under three and one-half years' service with traffic totalling 150 wheels or 560 tons per hour. The uniform wear as well as the absence of other imperfections in all of these layouts indicated that the wearing qualities of solid manganese steel crossings had been improved and that a more uniform product had been produced.

Agricultural Extension via the Electric Way

The dairy husbandry department of agricultural extension of Purdue University, Lafayette, Ind., has arranged with the Fort Wayne & Northern Indiana Traction Company, Fort Wayne, Ind., for a freight motor car with passenger trailer to be used in transporting an exhibit employed in connection with agricultural educational work. The freight car will contain exhibits of feeds and articles necessary to the scientific feeding of dairy cattle. In the passenger car lectures by experts on this subject will be delivered.

FORT WAYNE & NORTHERN INDIANA TRACTION—EXHIBIT AND LECTURE TRAIN

According to the present plan this two-car train will be operated over the lines of the Fort Wayne & Northern Indiana Traction Company, the Marion & Bluffton Traction Company, the Union Traction Company of Indiana, the Terre Haute, Indianapolis & Eastern Traction Company, and Indiana Railways & Light Company. The entire trip will require approximately a week, stops being made at many points en route. Posters have been distributed along the route to be taken by the train.

ANNUAL CONVENTION SAN FRANCISCO OCTOBER 4 TO 8, 1915

American Association News

ANNUAL CONVENTION SAN FRANCISCO OCTOBER 4 TO 8, 1915

Signal Rules, Materials for Overhead Construction, State Laws Regarding Employment, Etc., Considered at Committee Meetings—Manufacturers' Association Officers Return from Pacific Coast

JOINT COMMITTEE ON BLOCK SIGNAL RULES

A joint sub-committee on signal rules appointed at the joint meeting of the rules and block signal committee, as reported in the issue of the ELECTRIC RAILWAY JOURNAL for March 20, page 589, met in New York on April 7. Those in attendance were L. H. Palmer, New York, N. Y.; J. M. Waldron, New York, N. Y.; C. E. Morgan, Jackson, Mich., and J. W. Brown, Newark, N. J. This committee was appointed at the close of the discussion on block signal rules for the purpose of studying signal rules for use in connection with interlocking, block and contactor signals. After all-day and evening sessions the committee adopted a tentative report embodying a number of recommendations which will be mailed to the full committees.

COMMITTEE ON POWER DISTRIBUTION

A meeting of the sub-committee on overhead material was held in New York April 1 to 3 inclusive. Those present were Charles R. Harte, New Haven, Conn., chairman; G. W. Palmer, Jr., Boston, Mass., and C. L. Cadle, Rochester, N. Y. The general specifications were considered in detail and put into final shape, the subject of wrought iron and mild steel was completed with the exception of a few points of adjustment between the manufacturers and the standards, and the subject of wooden cross-arms was practically completed. It was decided that the subject of wrought iron and mild steel should be handled as a whole, leaving the treatment of other matters to be adjusted as they come up in turn.

MANUFACTURERS' ASSOCIATION

President E. H. Baker and Secretary H. G. McConnaughy of the Manufacturers' Association, who have been in San Francisco arranging for the accommodation of the convention, were last heard from at Los Angeles on their way home after a highly-successful trip. They are expected back in New York about the middle of next week. Mr. McConnaughy's office reports that the response to the sending out of bills about a week ago has been very satisfactory. This is appreciated by the executive committee because, if they can be relieved of the work of following up the collection of dues, they can devote their undivided attention to the details of transportation arrangements.

COMMITTEE ON TRAINING OF TRANSPORTATION EMPLOYEES

A meeting of the committee, C. S. Ching, Boston, chairman, was held in Boston on March 25 and 26. In addition to the members of the committee there were in attendance the following Boston men: Edward Dana, H. H. Hanson and R. B. Currie, Boston Elevated Railway. and H. I. Irwin, Bay State Street Railway. After a discussion of the best manner of compiling state laws relative to the employment of men on electric railways, it was decided to concentrate on the laws relating to certain subjects, as follow: hours of labor, workmen's compensation, safety appliances and comfort of employees in transportation service, intoxication among employees, and examination of employees. The committee finds that there are but eight roads which have a standard for watch inspection. The committee believes that while such a standard is desirable for city roads it is inexpedient to recommend a high standard at present, but will recommend that roads work toward such. The adoption of a standard clock for all stations is suggested as a step in the right direction. The committee considered the results of a data sheet canvass and will ask for certain additional data before completing its report.

WASHINGTON SECTION COMPETITION

At the April meeting of Company Section No. 4 three prizes will be awarded to motormen for the best papers submitted before April 15 on the subject "How to Operate a Car so as to Prevent Accidents, Insure Comfort of Passengers, and Save Power." A large poster advertising the competition is illustrated herewith.

WASHINGTON SECTION—LARGE POSTER ADVERTISING MOTORMEN'S LITERARY CONTEST

This is a continuation of the competition reported in the issue of the ELECTRIC RAILWAY JOURNAL for Feb. 27, 1915, where the awarding of prizes for papers on "The Duties of a Trainman to the Traveling Public" was reported. In the earlier conductors' competition thirty-six papers were submitted.

Secretary Burritt has announced the following scale of prices of the engineering manual and requests that members assist him in circulating it among interested persons: To members of the association the price of the manual alone is $1 and the binder $1. To non-members the manual is $4 and the binder $1. Sections are sold separately at prices from 10 cents to 25 cents each.

COMMUNICATIONS

Inertia Effect of Moving Electric Trains

PHILADELPHIA, PA., March 15, 1915.

To the Editors:

In an editorial printed in the issue of the ELECTRIC RAILWAY JOURNAL for Feb. 6 you called attention to a certain "flywheel" effect noticed in starting heavy trains by means of electric locomotives on the New Haven Railroad. While this subject is not of as pressing and immediate importance as the jitney bus or the virtues of public service commissions, yet the principles involved will be acting when the jitney bus is forgotten and public service commissioners are as perfect as the characteristics of human nature will permit. It may therefore be of interest to analyze the phenomenon roughly to ascertain how important this inertia effect might be.

From physical considerations one can see at once that some such inertia effect must come into action when the voltage is lowered, because the steady speed of a series motor is practically proportional to the voltage at the same current value. The current would be practically constant at any steady speed as the train resistance is nearly constant over the range of speed involved in this case. In slowing down to the lower speed corresponding to the lower voltage the train would draw upon its stored energy and in that manner relieve the power house.

The writer was interested to obtain a quantitative idea of this phenomenon and used the following simple graphical method in doing so. The problem is this: (1) What will be the reduction in current and tractive effort due to a sudden reduction in voltage? and (2) at what rate will the current return to its original value or to one corresponding to the reduced speed, if it is desired to allow for the slight change in train resistance? The solution may be divided into the following two parts, namely: (1) Determination of instantaneous reduced current, and (2) determination of increase of current and rate of speed reduction.

Considering first the question of reduced current, when a train driven by series motors settles down to a steady speed, the current drawn is just sufficient to produce the tractive effort required to overcome train resistance. Curve *A*, Fig. 1, is the current-speed curve for the motors used on the original New Haven locomotives, when operating on direct current at 300 volts, while *B* is the corresponding current-tractive-effort curve. If we assume for illustration a train resistance of 2200 lb. per motor the current will be 800 amp and the speed 50 m.p.h. Under these conditions the 300 line volts (motors are connected in series) are balanced thus:

$$300 = E_c + IR = 287.2 + (800 \times 0.016)$$

where E_c = counter-emf, I is the current and R the motor resistance, assumed to be 0.016 ohm.

Now assume the voltage to suddenly drop 10 per cent, or to 270. The current must drop to a point at which the sum of the counter-emf and the resistance drop is 270. The counter-emf is proportional to speed and field flux. The latter, as A. M. Buck explained in his article on page 330 of your issue of Feb. 13, is proportional to the tractive effect per ampere; hence we may write:

$E_c = K \times \Phi \times$ m.p.h., where, for convenience, tractive effort per ampere is represented by Φ (to suggest flux) and where K is a constant depending upon the number of armature conductors, etc. The value of K can be obtained at once from the data given above, where $E_c = 287.2$ volts.

$$287.2 = K \times \frac{2200}{800} \times 50 = K \times 2.75 \times 50, \text{ or } K = 2.09.$$

Then if we knew what the new value of E_c was we could calculate Φ by direct proportion, and from a curve, as *C*, plotted between Φ and I we could read off the new current value.

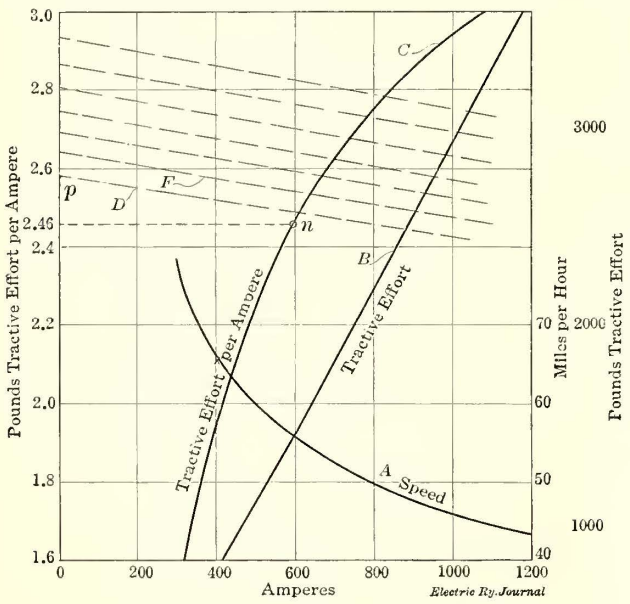
An approximation to the correct value can be obtained by assuming the resistance drop the same as before; when

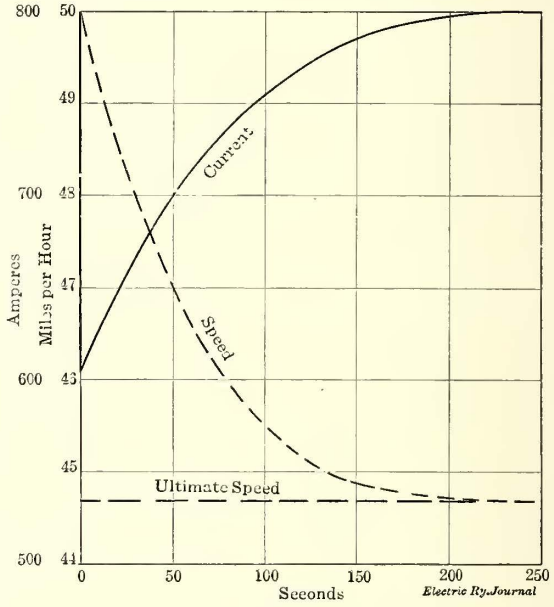
$$\frac{\Phi_1}{\Phi_2} = \frac{270 - 12.8}{300 - 12.8}$$

the speed remaining constant for the time being, or

$$\Phi_2 = 2.75 \times \frac{257.2}{287.2} = 2.46.$$

The corresponding current (see point *n*) is 590 amp, which is a considerable reduction (more than 25 per cent) due to a voltage drop of 10 per cent.





INERTIA EFFECT OF MOVING TRAINS—FIG. 1, GRAPHICAL SOLUTION OF PROBLEM; FIG. 2, CURVES SHOWING RESULTS OF CALCULATIONS

It is easy to allow for the variation of resistance drop by the following plan. From a point p on the line of 0 amp corresponding to 270 volts, i.e., where

$$\Phi = \frac{270}{K \times \text{m.p.h.}} = \frac{270}{2.09 \times 50} = 2.58,$$

draw a straight line, D, such that at any point Φ (proportional to the counter-emf) is

$$\Phi = \frac{270 - IR}{270} \times 2.58.$$

At 1000 amp, for example,

$$\Phi = \frac{300 - 1000 \times 0.016}{300} \times 2.58 = 2.43.$$

The intersection of this line with curve C gives the exact value of current, about 606 amp, practically the same as before.

Let us now determine the rate of increase of current and rate of speed reduction. With the reduced current there is a deficiency in tractive effort, as indicated by the tractive-effort curve, of 2200 — 1460 = 740 lb. The rate of retardation is then, as acceleration is the quotient of force and mass, if the train weight is 100 tons per motor,

$$a = 740 \div \left(\frac{100 \times 2000}{32.2} \times \frac{5280}{3600}\right) = 740 \div 9100 = 0.0814 \text{ m.p.h.p.s.}$$

It is necessary to use a step-by-step method of calculating the variation of speed, current and time. The plan often followed in plotting acceleration curves can be used for this purpose; that is, a decrement of speed, say 1 m.p.h., can be assumed, and the corresponding current, tractive effort and acceleration calculated. On the assumption that the speed falls off uniformly while undergoing this decrement the average rate of retardation will be one-half the sum of the values before and after. The duration of the decrement is then the quotient of the decrement and the negative acceleration. This can be repeated until the steady-running speed corresponding to the reduced voltage is attained.

Assume then that the speed has fallen from 50 to 49 m.p.h. As the line voltage is assumed to remain at 270,

$$270 = E_c^1 + IR.$$

As the speed is reduced the flux must increase proportionately if the resistance drop is assumed to remain the same, the correction being provided as before.

On the Φ curve, $\Phi = 2.56$ corresponded to 50 m.p.h. and no resistance drop. Then for the reduced speed, the corresponding point is,

$$2.56 \times \frac{50}{49} = 2.635.$$

Drawing the line F by the method outlined before we note the intersection with the curve C, corresponding to 635 amp and 1570 lb. tractive effort.

The retardation is,

$$(2200 - 1570) \div 9100 = 0.0692 \text{ m.p.h.p.s.}$$

Assuming that, while the speed has been falling, the average negative acceleration was

$$\frac{0.0814 + 0.0692}{2} = 0.0754 \text{ m.p.h.p.s.},$$

the time required was

$$\frac{50 - 49}{0.0754} = 13.25 \text{ seconds.}$$

This process may be repeated for, say, 48, 47, 46, 45 and 44 m.p.h., the last value being lower than the ultimate speed, as shown in Fig. 2.

The results of the calculations have been plotted in Fig. 2, from which it is seen that a reduction of voltage like that taken for granted under the assumed condition produces an appreciable relief in power-house load enduring for an appreciable length of time.

I trust that the above may contain some points of interest to your readers.

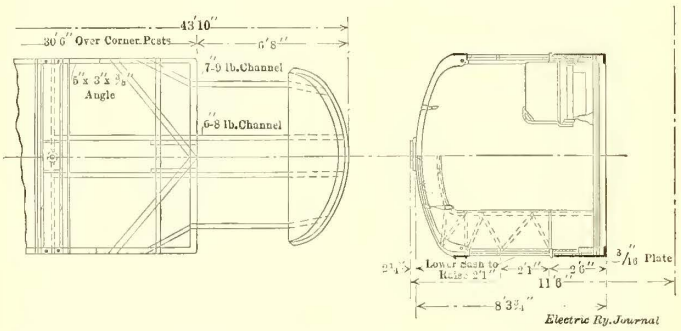
J. McANNIX.

Semi-Steel Cars in Collision

THE AMERICAN RAILWAYS COMPANY
PHILADELPHIA, PA., March 27, 1915.

To the Editors:

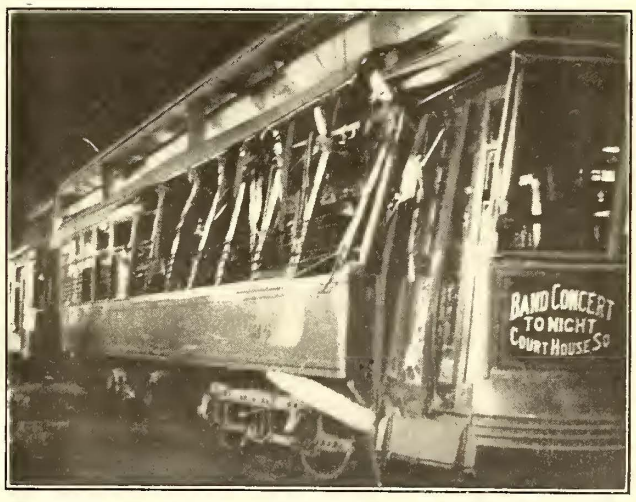
We have been much interested in your article on steel car maintenance on the Long Island Railroad, as described in the issue of the ELECTRIC RAILWAY JOURNAL for March 20. On the same subject but with reference to lighter cars you may be interested in the accompanying photograph showing the condition of one of our semi-steel cars after an accident. This car received the full impact of a runaway car making a high speed on a 6 per cent grade, an impact which would practically have demolished a wooden car. The construction of the car is shown from the line drawing sent herewith. Its principal features are a steel under-



SCRANTON RAILWAY COLLISION—FRAMING OF PART OF CAR

frame and continuous T-iron post. This car is similar to the one mentioned in the issue of the ELECTRIC RAILWAY JOURNAL for March 20, page 556, except that it is a few feet shorter.

The underframe is constructed as follows: The side sills are of 5-in. x 3-in. x ⅜-in. angles in one piece, bent around the corner posts and spliced in the center, forming the end sill. Crossbars are of 4-in. channels, weighing 5¼ lb. per foot., with the exception of the first



SCRANTON RAILWAY COLLISION—APPEARANCE OF DAMAGED CAR

crossbar back of the end sill, which is a 6-in. channel, weighing 8 lb. per foot, which takes the strain of the platform knees. The steel girder plate, 29-in. wide and 3/16 in. thick, extends from corner post to corner post, and the end plates, 33-in. wide and 3/16 in. thick, extending from the bulkhead posts and around the corner posts, connect to the side plates with 2½-in. batten plates. The top chord of the girder plate is a con-

tinuous strip 2½ in. x ½ in. Diagonal braces are 2½-in. x ⅜-in. bars.

The platform knees are of 7-in. channel, 9¼ lb. per foot. The center knees extend to the bolster, while the outside knees anchor to the bottoms of the side sills. All knees are bent accurately to shape to meet the conditions of platform level and step openings, and are securely anchored to the end sill by stirrups and bolts.

The flooring is of 13/16-in. x 3¼-in. tongued and grooved yellow pine, nailed to 1¾-in x 5-in. white oak cross-sills, which are securely bolted to the channel-iron crossbar.

The car body is framed with 2-in. x 2-in. x ¼-in. T's, running in one continuous piece from side sill to side sill, forming post and roof carline and accurately anchored to the angle side sill and to the girder plate. The bulkhead openings are of latticed construction, having 2-in. x 2-in. x ¼-in. T's bent to shape, forming the opening.

As indicated in the photograph the damage to the car consisted in the kinking of the posts near the name plate and the breaking of the glass and door on one side of the car. The other side of the car was uninjured, and there was but slight injury to passengers.

The posts were bent back into shape by the use of a blow torch and the whole car was repaired at a labor cost of $518, and a cost for materials of $67. The runaway car was of similar construction and had its vestibule and underframe damaged. It was repaired at a labor cost of $242, and a material cost of $31. If these cars had been of the old-type, wooden construction it is almost certain that one of the cars would have been totally destroyed. As it was the side sill and plate girder were not injured at all, the letterboard and the attached side of the roof being the only parts of the side injured, in addition to the windows and posts mentioned above.

C. G. Keen,
Engineer Way and Structures.

Registration of Fares

Railway Audit & Inspection Company, Inc.
Philadelphia, Pa., March 30, 1915.

To the Editors:

One of the vital questions confronting electric railways to-day and one that has in the past been condoned or treated as a joke is the theft of money by employees. The time has come, however, for a full and open discussion of this subject, and this letter is intended as an opening wedge.

No other business is so much handicapped in regard to the collection of its revenue as the street railways. Although the conductors are really the custodians for the entire revenues of the company and work under a proportionately greater trust than that imposed upon bank cashiers, they are in many cases strangers to the management and in general are placed upon a basis of optional honesty through the use of machines that tally only when the employees so choose. Hence, even with sufficient inspection constantly carried on to keep the road properly covered, some conductors are found "short." They are warned by the management, but this procedure is ineffective. In time the offense is simply repeated, and the effect upon fellow employees and young men outside the company is extremely harmful.

One reason for the present prevalence of this practice is the fact that convictions for such wrongdoing are difficult to obtain. On account of a Supreme Court ruling, it must be proved that the fares first were not registered on account of an intent to steal or embezzle, and that on the completion of the day's work the unregistered fares were held out by the conductor. The question of jurisdiction has also arisen—as, for example, in the Bucks County (Pa.) case, where four conductors were released on the ground that the fares had been held out in Pennsylvania and returns made in New Jersey. Lastly, there is the difficulty of securing a verdict for the company from the jury, either on account of badly prepared evidence or on account of the failure of the jurors to understand the conditions and to look at the matter in a properly serious light.

Electric railways, however, should now begin to take concerted action to place the stealing of nickels in the same class with other thefts. They should frame and push at any cost state laws prescribing a policy of collection and proper registration of fares collected. It should be provided that failure so to register would constitute *prima facie* evidence of theft and the offense would be a misdemeanor punishable by imprisonment. Furthermore, the courts in the county, district or city where the failure to register occurred, should have jurisdiction over such offenses. The next move on the part of the railways would be to notify labor unions that no question of theft or discipline would be considered as debatable in committees but would be treated as violations of the law.

Any method of optional registration is a continual source of temptation, and if this temptation cannot be overcome by principle it should be destroyed by the fear inculcated by proper legal punishment. It is my opinion that legislators would have much to answer for if they failed to pass such a law as suggested, if properly prepared.

V. L. Edmunds,
General Representative.

The Reading of a Technical Journal

The Southwestern Electrical & Gas Association
Dallas, Tex., April 1, 1915.

To the Editors:

I have just noted with much interest the notice on your Publisher's Page in the issue of March 27 in regard to the circulation of the Journal among the employees of railways. While Mr. Yungbluth's plan is an excellent one and much preferable to dumping into the waste basket or letting the papers lie in dusty heaps in corners, it seems to me that it would be better still to give to each one of such departments as these to whom copies are sent an individual subscription to the Journal and, in cases where such departments contained a large number of men, several copies of the Journal.

In the first place, the cost of the Journal and—in fact, not to make this exclusively an individual matter with the Journal—the cost of any first-class operating technical journal, is so small, compared with the valuable matter that it furnishes within the year, that I do not believe it is wise to consider the subscription costs at all, and it is especially unwise to consider them as a factor in their full distribution to the employees. Taking the Electric Railway Journal as an instance: it covers, within the year, valuable items of information or suggestions or advice pertaining to the details of every single department of street and interurban railways. In other words, its issues will contain more or less of good, useful information or suggestion to every single employee of a street railway, from the track greaser up, and therefore it does not seem to me that it is wise to miss the opportunity of placing the paper in the hands of every single employee or, at any rate, of giving to each one the fullest facility for reading it.

At the very reasonable price of the Journal, the question of additional subscriptions sufficient for the convenient reading by all the employees would not make a large item with even the smallest street and interurban

railways, and with the larger and more complex organizations of the larger companies, the information contained in the JOURNAL is even a greater necessity and their very size and complexity makes the cost of extra subscriptions to the JOURNAL a more negligible factor.

As a matter of fact, a file of the best technical journal pertaining to the particular class of public utility operated is an absolute necessity on or very close to the desk of the head of any department of that utility and should remain there, with its semi-annual index, for at least a year's issues. This means that none of these issues goes elsewhere, either as a portion of a circulation library or otherwise. To the minor subdivisions of departments there should be at least separate copies for each to circulate from the head of such minor division downward to the men in that division, and if such a division contained a large number of men there should be several copies for such general circulation.

One of the disadvantages of the circulating library method of "a few copies all down the line" is shown in the dating on Mr. Yungbluth's label. This copy reached the storekeeper on March 16, reached Manchester on March 19, with two more places, possibly, to which to send it. Outside of the extra handling which was required for this purpose, and which would not tend to improve the appearance of the magazine, there is the fact that the parties at the tail-end of the line may receive their copy four or five days or a week after its issue or after its receipt at headquarters. Such a delay in reaching the individual is not conducive to interest in the magazine, and it might very easily be possible that some suggestion contained in it would reach him after the opportunity of using such suggestion had passed. It is my idea that the quicker each current number of the technical magazine taken reaches every individual employee, the better will be the results.

There is also the further fact that a more personal interest would undoubtedly be developed in the magazine where it was the personal property of the individual or of the department or subdivision of department. To own—either as personal property or as departmental—a neat file of these magazines, instead of having them sent in as a sort of temporary "hand-me-out," would undoubtedly make the employees take a more personal interest in the magazine and would also give them a more ample opportunity thoroughly to read and digest it.

Without in any way meaning to discredit Mr. Yungbluth's idea, which is an excellent one where the supply of these magazines is limited, I would strongly suggest that the best method is to spend a little more money for sufficient separate subscriptions for the benefit of the various heads of departments, subdivisions and groups of employees. The reasons for such suggestions are fully given above. A hundred subscriptions to any one of the larger street railways is a very small item of expenditure—in fact, it should not be considered an "expenditure" but rather as a very wise investment that will return a high rate of interest. The personal experience of the writer in this matter is—not only with reference to the ELECTRIC RAILWAY JOURNAL but with reference to the lighting and other technical magazines for every class and kind of public utility—that a careful reading of the whole magazine, especially including the advertisements, notices, etc., has never failed to save him within the year many times the cost of the subscription, and he has also found that reading by the employees of the same magazines has resulted in suggestions, economies and other favorable factors that gave more return on the $3 or $4 invested than on almost any other expenditure made by the company.

H. S. COOPER, Secretary.

Making the Safety Movement Permanent

FITCHBURG & LEOMINSTER STREET RAILWAY
FITCHBURG, MASS., April 7, 1915.

To the Editors:

In your issue of April 3 I note a timely editorial on "The Brass Band in the Safety Movement." I say timely, because it has appeared to more than one who has this idea under way that sooner or later the newness would wear off, and then what?

In my opinion the only safe way to treat this important feature of our railway work is through co-operation, not of a few, but of the many, so that the movement may be so general that it cannot fail because of the diversified interests which it serves.

By co-operation I mean that in the city where a campaign of this kind is being waged all organizations should be represented in the safety association, including heads of the automobile, motorcycle, team drivers, fire, police and school departments, and the railways. With an organization of such as these working in harmony for a common cause, drawing from the varied walks of life for its membership, there cannot fail to be awakened the moral attitude, at least, of the people throughout the country.

A movement for the masses and not for the classes is one which will appeal to everybody. A movement to preserve human life and limb and conserve happiness thereby cannot fail, simply because it is a humane movement. No matter how loud the band has played, or how far or near the movement has been heralded through the press, there remains that one essential feature, and the saving grace of every movement that succeeds, thought, and this once aroused means that everybody is a safety-first practitioner, for "self-preservation is the first law of nature."

These various organizations pulling together as a unit will always be an endless chain, and when a body of men can sit down together and rationally agree that each one is for the betterment of the other's interests, then you have an organization that will accomplish something and does not need the brass band, or the press for that matter, to accomplish results. I know of one such.

The membership of such an association must be drawn from every club, religious or otherwise, and from lodges, unions, etc. They should be asked to send a delegate to represent them and act for them. With everybody joining hands in a common cause there can be no slip. It only requires continual hammering by some live wire in the organization to create fresh interest, and the rest is easy.

Then forget the band and its momentary illusion for the few, and remember only this movement which is so radically different from any other. For it is not a one-man movement, not a street railway, automobile or motorcycle proposition, but one in which everybody plays a part according to the intellect that has been given to him, and thus before we know it we have an organization free from the assailment of the press or public, because they are one with us and will not seek to destroy themselves.

You fellows who think you have exhausted your ability in this direction, just reach out and get hold of that "other fellow" who may have better ideas than either you or I of what to do, and not shut yourself up in your office and bemoan the fact that there is nothing new. For everybody you run up against has something new, and all you need do is to cull out what is practical and then apply it. Hoist that banner "First Aid to the Uninjured" a little higher and get together with everybody.

H. K. BENNETT.

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.)

Methods and Costs of Concreting for Modern Pavement

BY S. GAUSMANN, BROOKLYN, N. Y.

Too much cannot be said of the necessity for care in the concreting of modern track construction. In this article the writer will present a comparison of the different methods of mixing and state some of the causes of failures in paving where wear and settlement appear from apparently no just cause and are invariably laid to improper paving.

Character and Placing of Mixture

While steam cinders make a good, cheap concrete with a 1:3:6 mix it is too often necessary to use more sand and cement, reducing the proportions to 1:2:4, on account of the quality of the cinders. Unless these cinders are obtained free, the cost of the concrete will be nearly as much as if gravel or stone is used and yet it will be nowhere near the quality of mixtures containing the latter elements.

A 1:3:6 mixture containing either stone or washed gravel, preferably the latter, is most desirable in modern track construction.

One of the causes of failures in paving is that when the concrete is placed in the track it is often too wet, thereby undermining the bed of the ties and causing the track to "pump." If this trouble does not develop before the track is paved it will do so soon after, and then the paving as well as the track will show the ill effects. While concrete with an excess of water might do in some construction it will not serve in track work. It should be avoided, especially where operation is resumed over track immediately after the concreting is finished and before it has had time to set.

Another condition to be avoided is the failure to compact the concrete thoroughly under the rail. While with an exceedingly wet concrete this space will be filled at first, the concrete will soon shrink away from the rail, leaving a void which is not large in extent, but large enough to do damage. On the other hand, when the concrete is of the proper consistency a large pocket will be left unless extreme care is used. To avoid this trouble the concrete should be thoroughly placed by shovel tamping, followed, after it has set slightly, by tamping with tamping bars from both sides of rail. Unless this is done sand from below the paving will work into the pockets and cause the pavement to settle, especially along the rail.

When the concrete is placed in the track it should be well rammed and the surface kept to a uniform height. While a templet can be used for this purpose, it is unnecessary except in the case of brick or wood block paving, as men accustomed to the work can keep the concrete to the desired height.

When track is concreted from the bottom of the ties to 3 in. or more above the ties it is advisable to do so in two sections, bringing the first section to the top of the ties and placing on this a very thin layer of sand, followed by the rest of the concrete. While this separation may seem to be added work it can be done at no greater expense than if the concrete was placed all at once; it will not injure the quality of the foundation, and although the "other fellow" possibly is not considered, the two-section practice means much good to the road when reconstruction is undertaken.

In mixing concrete the hand process should be avoided as it is very unsatisfactory, both from a cost as well as a quality standpoint, for no matter how well it may be followed the ordinary workman will get careless. Even if the proper proportions are in the batch they will not be mixed properly, and especially so if the men are expected to do a certain amount as a day's work.

A batch mixer is, of course, preferable. While the cost of production and placing varies little from that of a continuous mixer much more can be done in a given time. Still, for many roads the initial cost of this machine is practically prohibitive and for such construction the continuous mixer is the ideal machine.

Cost of Concreting

The following costs are based on doing work with no car interference. These costs will be somewhat increased under car operation, with machines outside the tracks, or decreased with machines of larger capacity.

The freight rates for hauling machines to and from work are in accordance with rates approved by the Public Service Commission of the State of New York, First District, and include the total cost of maintenance of the car equipment, cost of trackage and overhead line rights and office expenses of the freight department. These rates vary according to the length of haul, the figures given being for an average haul. This haulage cost would be considerably reduced where the track department does its own handling of material, etc., and where only the wages of crews are charged against it instead of having the freight department make a general charge per car-mile.

The batch mixer, for which the following costs for operation are given, is of 0.5 cu. yd. capacity. It can be bought for $1,300, mounted on a car, and is electrically operated as to mixing only, so that it must be hauled to and from the work daily.

The number of men employed and their rates per hour in operating a machine of this character are: One assistant foreman, 25 cents; one operator, 25 cents; four laborers, 20 cents; six laborers, 18 cents; fourteen laborers, 16 cents; one checker of time and material, 15 cents, or a total cost of $47.70 for one day of ten hours. This cost is distributed to the various operations as follows:

Operation of the machine	$2.50
Watching mix and dumping	4.25
Handling material to the machine	13.50
Removing and placing the track	22.10
Ramming and tamping under the rail	3.85
Checking	1.50
	$47.70
Add other charges:	
Overtime for cleaning	$0.90
Interest on investment	.58
Freight to and from work	6.25
Lubricants, repairs and incidentals	2.33
	$10.06
Total	$57.76

A gang of this size will average in a ten-hour day approximately 675 ft. of single track with concrete 7 in.

deep. The volume, with 6-in. x 8-in. x 8-ft. ties spaced 2 ft. center to center, is equal to 94.22 cu. yd., making the unit cost $0.613 per cubic yard, exclusive of material.

A good continuous mixer of a standard make can be purchased for $560. Although such mixers are supplied on wheels for use at the side of the track, a good car with old pony wheels and a wooden frame can be made for approximately $30, thus bringing the total cost to less than $590. This cost is for a gasoline-operated machine, but an electrically operated one is preferable. Provided an old motor is obtainable, the first cost will vary but little from gasoline, whereas the cost of operation will be less.

As a machine of this kind is easily derailed it need not be removed from the street daily, and can be left on the work continuously ready for use at any time, with no outlay for freight charges until it is required at other points.

The number of men employed, and their rates per hour, in operating one of these machines are: One assistant foreman, 25 cents; one operator, 25 cents; two laborers, 20 cents; three laborers, 18 cents; eight laborers, 16 cents; one checker of time and material, 15 cents, or a total cost of $28.70 for a ten-hour day. This cost is distributed to the various operations as follows:

Operation of machine	$2.50
Handling material to machine	10.20
Distributing in track	12.10
Ramming and tamping under rail	2.40
Checking	1.50
	$28.70
Add other charges:	
Overtime for cleaning	$0.50
Interest on investment	.26
Freight to and from work	1.25
Gasoline, oil and repairs	2.25
	$4.26
Total	$32.96

This gang will average 430 ft. of single track per ten-hour day, with concrete 7 in. deep. This length, with 6-in. x 8-in. x 8-ft. ties spaced 2 ft. center to center, is equivalent to 60.054 cu. yd., making the unit cost $0.5488 per cubic yard, exclusive of material.

Of course, in mixing by hand the number of men employed may vary, but for an illustration we may assume that as many are employed as on the continuous mixer, exclusive of the operator. The cost then would be distributed to the various operations as follows:

Distributing material and mixing	$10.50
Distributing in the track	11.80
Ramming and tamping under the rail	2.40
Checking	1.50
	$26.20

This number of men in a ten-hour day will average 225 ft. of single track with concrete 7 in. deep which, with 6-in. x 8-in. x 8-ft. ties spaced 2 ft. center to center, amounts to 32.77 cu. yd., equivalent to a unit cost of 80 cents per cubic yard.

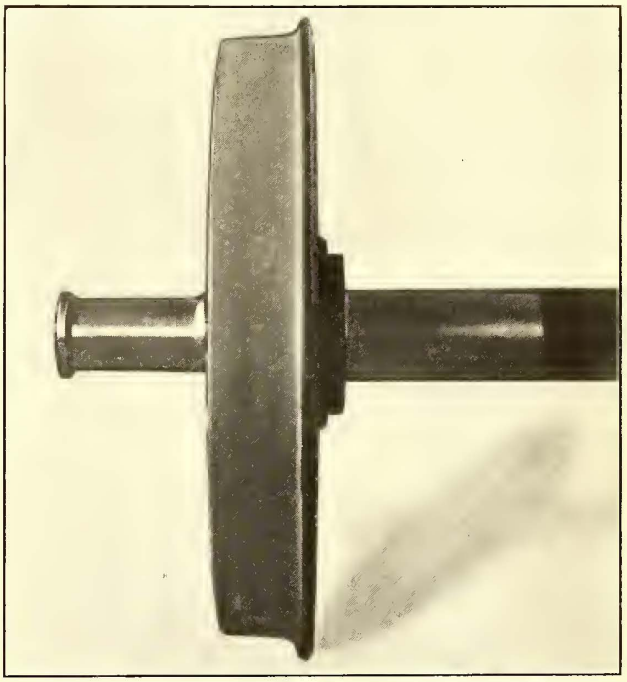
The foregoing figures were obtained from many years' experience in this line and from carefully collected data. While they may not apply to all locations, the costs can be easily adjusted to meet any conditions from the information given.

During the recent cold weather in Louisville, Ky., when the Louisville & Portland Canal was frozen over, small fish swarmed into the intake waterways of the Louisville Railway Company's High Street power plant and were drawn through the screens and circulating pumps. They entered the intake waterways in search of air, but made much work for the men in charge of the condensers, as the fish had to be removed. The record catch for one day was 112 lb.

Restoring Steel Wheel Flanges with a Welder

BY F. A. MURPHY, ELECTRICAL ENGINEER AND MASTER MECHANIC CHICAGO, OTTAWA & PEORIA RAILWAY, OTTAWA, ILL.

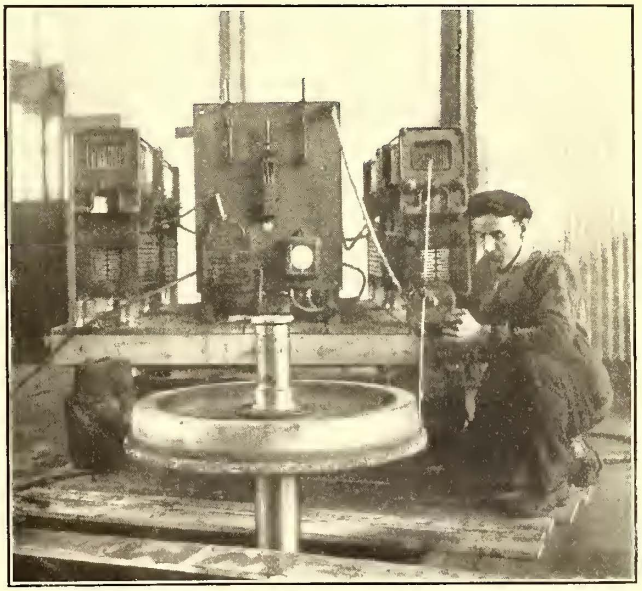
With the advent of the electric welder came the serious consideration of adapting this outfit to deposit metal to replace that worn away on various parts of car equipment. It is one application along this line, namely,



WELDING ON WHEEL FLANGES—FIG. 1—WHEEL WITH SHARP FLANGE

the restoration of flanges on steel car wheels that is described in the present article. The danger that sharp-flanged wheels will split switches, shear rails, etc., is recognized, and need not be dwelt upon here.

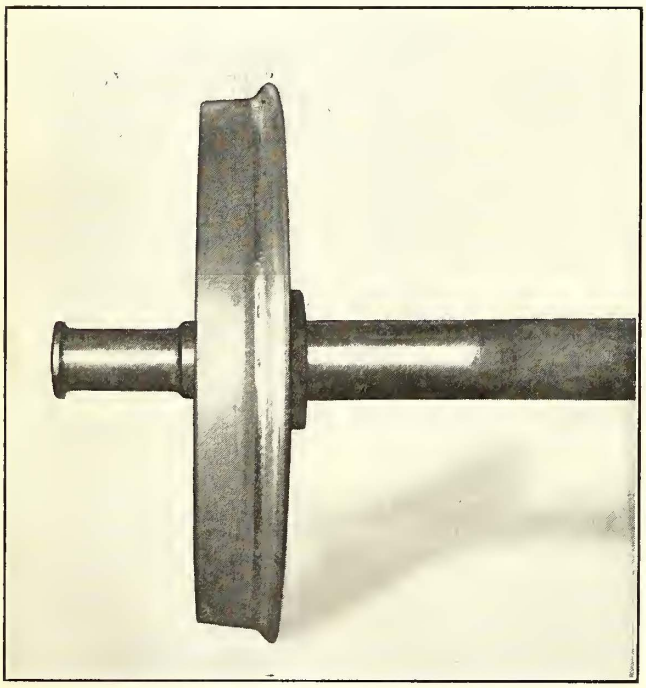
Fig. 1 shows one wheel of a pair removed from a 50-ton car on account of a sharp flange. To give this



WELDING ON WHEEL FLANGES—FIG. 2—WELDING OPERATION AND EQUIPMENT

wheel the proper flange contour it was necessary either to take enough material off of the wheel face by turning, or to deposit enough steel on the worn portion of the wheel flange to bring about the same result. If the first method, namely, that of turning, had been used, at least 5/8 in. of metal would have been removed from the tread of each wheel, thereby causing about 33 1/3 per cent reduction in the wear life of the wheel. But, by restoring the flange with an electric welder, the 5/8 in. of metal usually wasted in turning is saved and the life of the wheel is thus prolonged accordingly.

Fig. 2 shows an operator building up a flange on the wheel illustrated in Fig. 1. The metal electrode is 1/4-in. cold-rolled steel. Fig. 3 shows the finished wheel, which, after the flange had been over-built with the welder, was placed in the wheel lathe and finished. The total cost of removing, welding, finishing and replacing this particular wheel was $3.37. This amount approximates the cost of handling wheels for each turning. In addition the metal usually wasted in turning is saved. The latter is estimated to be worth about $9.50 per pair of wheels.



WELDING ON WHEEL FLANGES—FIG. 3—THE WELDED FLANGE RESTORED TO NORMAL CONTOUR

From data collected, wheels with welded flanges are found to have made an average of 40,000 miles. This mileage might be greatly increased by developing some means of hardening the metal which is used in building up these flanges. The addition of carbon by using a carbon electrode and chilling the metal are being investigated. While this method of restoring worn steel wheel flanges is considered experimental, the results obtained indicate its possibilities. The writer intends to continue his experiments and would appreciate the experience of others working along the same line. In addition to the work outlined, successful results have also been obtained from electrically-welded flat spots. These, like the wheel flanges, were over-built and then ground to a true contour.

The influence of the New York, Westchester & Boston Railway, the new high-speed third-rail line out of New York, is lending to the growth and development of Westchester County was shown in an article printed in the New York *Evening Post* of April 3.

Sleeving Shrunk on Worn Armature Shafts —Rethreading Pinion-End Threads

BY "VULCAN," A.M.I.C.E., A.M.I.E.E., ENGLAND

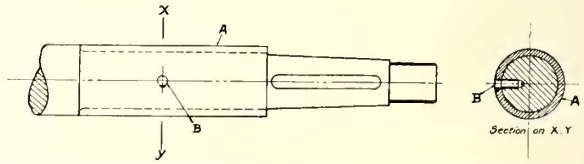
The following is a description of the methods adopted by the writer in dealing with worn or damaged armature shafts on a large British street railway:

The armature bearings were of the ordinary anti-friction metal-lined type, both split and solid. The operating conditions were normal, but as the system was one of the earliest to commence running it is only to be expected that a large number of the older armature shafts had worn to a small size. The diameters, of course, varied in dimensions, but each was made true and parallel every time the armature passed through the winding shop.

Apart from the occasions when they were under repair the shafts were put into the turning lathe at least once annually when the car came in for its general overhaul.

To keep the number of bearings for issue to the depots within reasonable limits, the shafts were finished to the nearest 1/32 in. A fixed minimum diameter was decided upon and when a shaft reached this size, instead of removing it and pressing in a new one, as is very commonly done, the shaft was brought back to the maximum diameter in the following manner:

A steel sleeve, *A* (see sketch), was bored out to a size which gave a tight shrink fit to the shaft, the latter being skimmed and filed in the lathe but not polished. The sleeve was then heated to a dull red, passed over the shaft and allowed to cool slowly.



KEYED SLEEVING SHRUNK ON A WORN ARMATURE SHAFT

As an extra safeguard to prevent any movement, a 3/8-in. peg, *B*, was screwed through the sleeve into the shaft; and to prevent the possible working loose of this peg a small notch was cut in the side of the peg hole with a chisel, so that a small projection was formed on the peg when it was expanded by hammering after being tightly screwed up. The armature was then put back into the lathe and the sleeve turned to the top standard diameter. This method proved to be much cheaper than installing new shafts and was quite satisfactory in every way.

Recently a shaft or two has been built up to the original diameter with added metal by the oxy-acetylene process. The cost of this is greater than one would at first think, chiefly because of the quantity of oxygen used. A good final surface can be obtained by machining, but it is not certain that it can be made uniformly hard all over. In the absence of a sufficiently long experience of the wear under running conditions, a true comparison cannot yet be made with the method previously described.

Rethreading Pinion-End Threads

It is a very common thing to find the pinion-end threads either stripped or otherwise badly damaged. The writer's common practice in dealing with these cases has been to cut off the threaded portion and bore an axial hole in the end of the shafts; this is then tapped to suit a plug threaded like the original extension. After tightly screwing the plug into position a cross pin is fitted through the shaft and plugged to prevent the latter from screwing back. Many shafts have been

repaired in this way and have invariably proved satisfactory.

A newer process which has now been adopted with perfect success is to build up the old threaded portion with the oxygen blow pipe and afterwards re-turn and thread it. Where the necessary apparatus for carrying out the latter process is in use, this method of reinstating damaged threads will be found both economical and entirely suitable.

Memphis Maintenance Co-operation

A feature in the organization of the Memphis (Tenn.) Street Railway for the past eight years has been the Mechanical Improvement Club, which is composed of the foremen, inspectors and others in the car maintenance department, with A. D. McWhorter, master mechanic, as chairman. This organization meets quarterly to discuss equipment maintenance, and once a year an additional touch of good-fellowship is given to the gatherings by a banquet. These meetings have done a great deal toward improving operating conditions.

On the occasion of the latest banquet, held on Jan. 28, several instructive papers were presented by members of the staff. Abstracts of two, "How to Reduce Car Changes," by C. B. Tutwiler, night foreman, and "Motor and Truck Maintenance," by E. L. Berger, foreman motor and truck department, are presented herewith.

How to Reduce Car Changes

Mr. Tutwiler said that reports on defective cars cannot always be depended on because they are sometimes incomplete and sometimes they are misleading. Again, a defective car report may be prepared with attention to each defect, but its value may be greatly lessened if a careless workman fails to realize the importance of faithful performance of duty.

Efficient inspection should begin with the car placer, who is in a position to see several of the defects that may be overlooked by the crew or by the inspector.

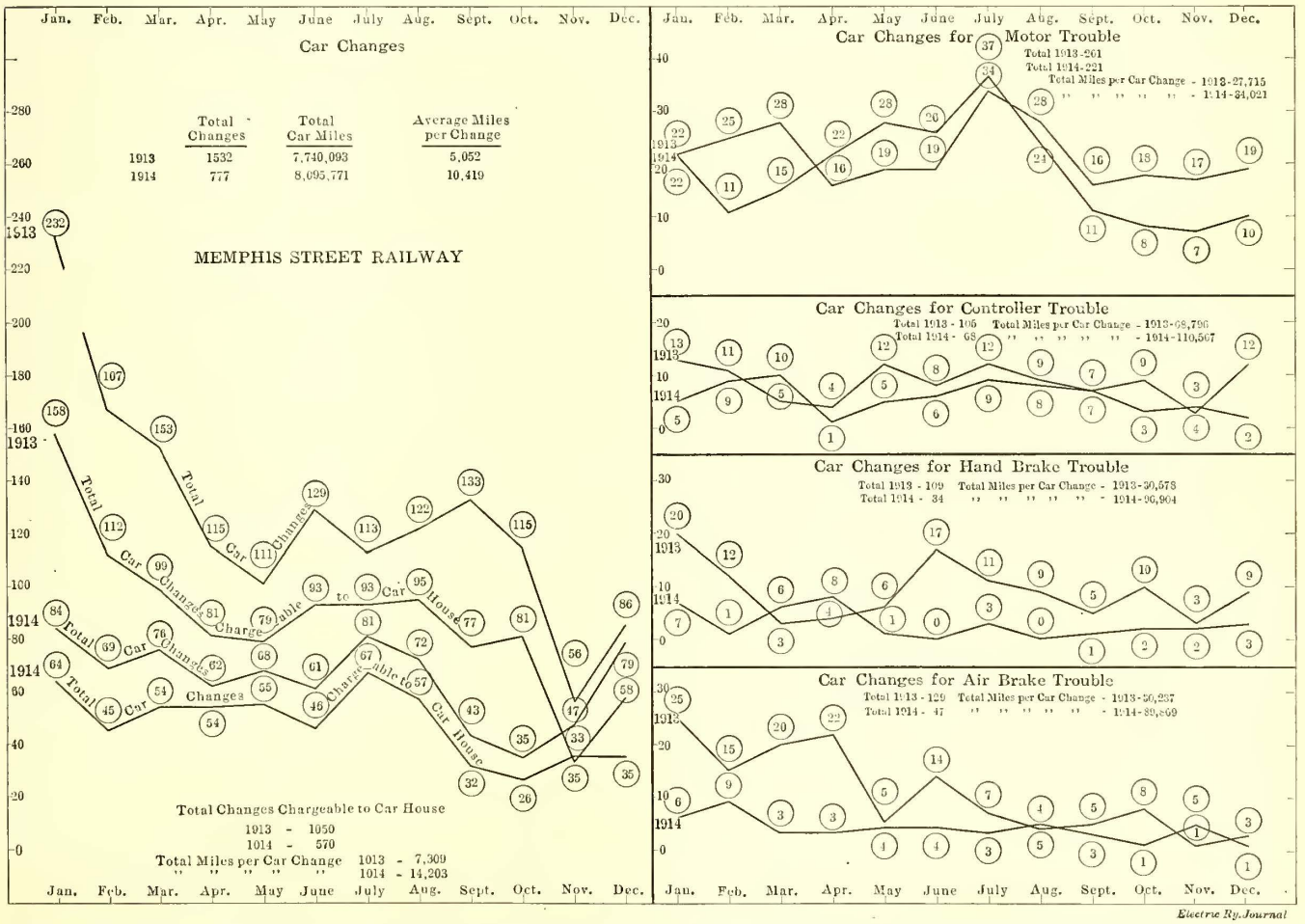
Before returning a repaired car to service, it should be thoroughly inspected from the trolley to the rail. When it comes in from its first day's run, the shopmen should notice how each part stood the first day's service. Any part that shows a weakness or defect should be watched closely until that weakness or defect is overcome.

Not only should every job be treated as conscientiously as the biggest, but each man ought to do a little more than the work assigned to him. If a man notices a defect that has been overlooked by a fellow workman, he should in the spirit of co-operation call the other man's attention to the defect. Of course he should be just as willing to receive suggestions relating to his own work. Vigilance should never be relaxed, but the same careful inspection should be maintained as if the car had been giving trouble every day. The motorman with a defective car is like a mechanic with a defective tool or a barber with a dull razor.

In concluding, the speaker said that car changes could be reduced by thorough inspection, co-operation, recognition of responsibility, vigilance and enthusiasm.

Motor and Truck Maintenance

Mr. Berger said that motor failures in 1913 were 261; in 1914, 221. The record for 1914, while showing fewer troubles, was not a satisfactory one and was not in any way an index to the true condition of the motors.



Electric Ry. Journal

EQUIPMENT MAINTENANCE GRAPHS OF THE MEMPHIS (TENN.) STREET RAILWAY COVERING THE YEARS 1913 AND 1914

During the first half of the year the interurban equipment set a new high mark for breakdowns, and later the continued excessive heat baked out and destroyed a number of No. 800 fields entirely out of proportion to the mileage made with them. After these conditions had passed only thirty-six failures were recorded in four months, against 185 in the previous eight months.

Other avoidable troubles had, no doubt, added to this list, but in every case steps had been taken to prevent a recurrence, if possible. The 1913 record in reduction of motor failures, namely, from 679 to 261, was one that would probably stand.

But the reduction of trouble, while of vital importance, is only an incident. There were other problems of equal importance. Time-saving methods had been and were being devised and applied as rapidly as practicable. Three years ago the renewal of eighteen pairs of wheels was conceded a good week's output for three men. In one week of the preceding month four men had renewed thirty-six pairs, and the week before the same crew had renewed forty-one pairs, in addition to taking care of the regular motor maintenance.

At the last annual meeting the working force had been reduced from nine men to five. This number has since been reduced to three.

Many and varied practices had been evolved and tried for the prevention of cruelty to the purchasing department. The discovery that a tin cap was superior to the oil disk was one. The disk, owing to its unmechanical construction, was destructive to bearing liners and impossible to retain permanently. The tin cap, purchased at a cost of $1.09 per hundred against the cost of the disk at $5 per hundred, saved the more costly liners. The purchasing department promptly extended the idea to sign top caps, buying for 63 cents per hundred an article that had previously cost $5 per hundred. In some cases, notably No. 57 and No. 800 bronze axle bearings, journal bearings and babbitt metal, formerly a continuous nightmare to the storeroom purchases, had been decreased almost to the discontinuance of purchasing. As for truck maintenance, with the exception of the wheels the trucks were operating steadily without attracting attention, and that is invariably a safe guide to the condition of the trucks.

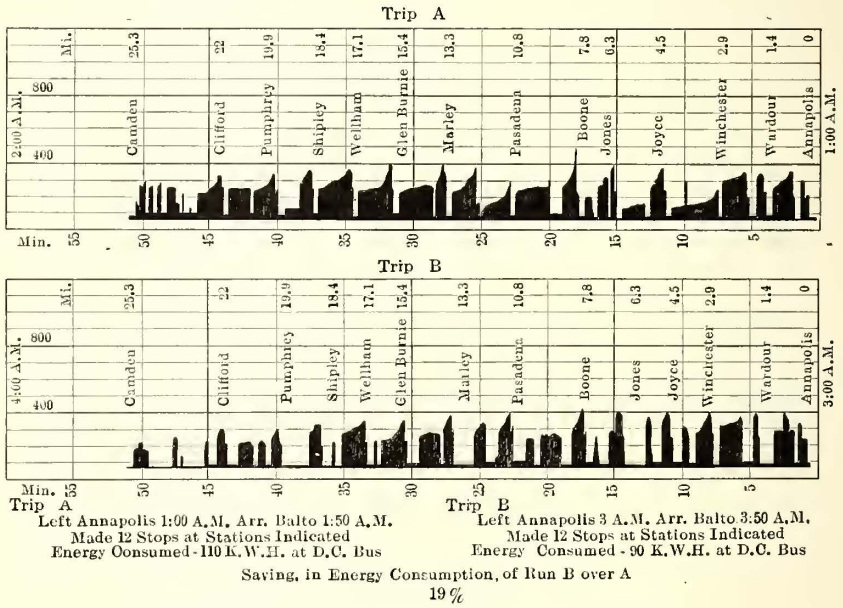
Concluding with some statistics, the speaker said that in 1911 the armature bearings made a mileage of 14,200. In the last six months of 1914 the mileage was 39,042, an increase of 24,842, or 275 per cent. Axle bearings in 1911 made 24,800 miles; in the last half of 1913 they made 84,195, and in the last six months of 1914 they made 190,919, or 227 per cent over the same period of 1913 and 770 per cent over 1911.

Comparative Records of Car Changes

In connection with this data, Mr. McWhorter furnished the graphic record shown on page 721 of car changes in the years 1913 and 1914. The original of this chart is posted in a prominent part of the shop where it is accessible to all employees. At the beginning of 1914 the records for the preceding year were posted in black lines. Then red lines were extended on the same chart as the figures for each month of 1914 became available. On the new chart, prepared to compare the years 1914 and 1915, a dotted line shows the figures for 1914 while a solid line is being extended from month to month of 1915. So far the new year also shows a decrease over its predecessor.

Ampere-Hour Meters on the Annapolis Short Line

The management of the Annapolis Short Line, following a careful study of energy consumption data, was convinced that a great improvement was possible if the motormen were taught how to take better advantage of coasting. To secure a basis for comparison, a coasting test run was made on April 23, 1914, between Annapolis and Baltimore under exactly the same stop and line conditions but with practically no coasting on the first trip and maximum possible coasting on the second trip within the same schedule conditions. The difference in energy used was found to be practically 19 per cent. Energy consumption graphs from this test were then plotted, one below the other on the same sheet, as reproduced, as an object lesson to the men. The lower graph shows the time that coasting was possible between the stations named.



ANNAPOLIS SHORT LINE—COASTING TEST RUN

At first the men were simply instructed to be more careful in the use of energy, no meters being employed. It was found, however, that while some improvement followed at first backsliding was almost immediate because there was no procedure to sustain the interest of the men. Therefore, on Jan. 1, 1915, the company equipped the thirteen motor cars with Sangamo ampere-hour meters, this type being chosen in preference to watt-hour meters because of more reliable operation, lower cost and ease of installation. In fact, to install an ampere-hour meter it is necessary only to open up the ground lead and connect it in circuit without incurring any danger of insulation breakdown. The meters also are read very easily, for in addition to the usual integrating dial they have a larger dial which indicates amperes up to 300, that limit representing somewhat more than the amperes that would be used on a round trip between Baltimore and Annapolis. This large dial is easily read by the motorman, thus removing any distrust which the more mysterious integrating dial might inspire.

During the entire month of January the meters were run blind, and in the meantime one of the most capable

men was trained as an instructor in the art of coasting. This man then spent about two days in turn with each motorman.

The "runs" record for meter records, as reproduced, has space for the train and car numbers, the motorman's name, the reading of the integrating dial at the beginning and end of a round trip, the energy consumption per trip, the stops per trip (as obtained from the conductor's report), and the "overs" per trip. The expression "overs" refers to the number of amperes a motorman shows in excess of the minimum for a trip with the same number of stops. The "average overs" of a motorman, as summarized by days or months, is obtained by adding the "overs" for either period and dividing the sum by the number of trips made by him.

MOTORMAN'S RECORD OF POWER CONSUMPTION, STOPS, ETC.

RUNS..... DATE.....

Train No.	Leaving Time..	Car No.	Motorman.	Meter Reading		Power Consumed in A. H.	Stops.	Overs.	Remarks.
				Start.	Finish.				

ANNAPOLIS SHORT LINE—RECORD DEVISED TO MAKE AMPERE-HOUR COMPARISONS OF MOTORMEN

An "x" opposite a man's run indicates absence, and an "o" that he has made a perfect record.

In addition to making allowance for the number of stops, the men are also classified according to morning and evening runs. The reason is that the evening men are on an hourly instead of half-hourly schedule after 6 p. m., so that they have less meets to make and are also less likely to suffer from low voltage. The records of the men are posted on the bulletin board, and keen competition exists between them.

The record for the month of February shows an average energy consumption of 3.6 kw-hr. per car-mile. This in comparison with January's average kilowatt-hours per car-mile (4.2) shows a saving of 15 per cent; or compared with the figure for February, 1914, 4.7 kw-hr. per car-mile, a reduction of 23 per cent.

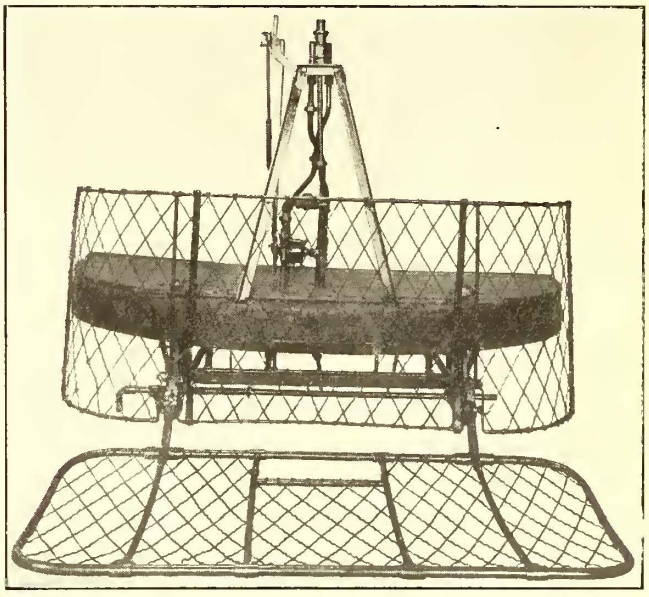
In the month of March the energy consumption was 3.4 kw-hr. per car-mile. This is a saving of 19 per cent over January, 1915, and 24 per cent over March, 1914. The energy consumption for March, 1914, was 4.5 kw-hr. per car-mile. The brakeshoe saving in February and March, 1915, will be from 25 per cent to 30 per cent.

A Novelty in Fenders

The recent indorsement of the redesigned fender made by the American Automatic Fender Company, Seattle, Wash., by a committee appointed for its examination by the Public Service Commission of New York, First District, has called attention to the remarkable results that can be readily attained by pneumatic operation. This fender is operated either automatically by striking a light blow upon the outboard edge of the apron or else manually by moving a small valve handle in the vestibule. The motion is not only downward but backward as well and it is so rapid that the eye cannot follow it.

The movement diagonally downward to the rails is calculated to take one-eightieth part of a second, the actual speed at which the fender travels being twice that of a street car moving at full speed. In consequence, the apron, when it is dropped automatically, must actually withdraw from contact with the opposing object while the downward movement is being made, thus prohibiting the possibility of any projecting member being caught and forced under the fender.

The new device is a development from the original Nelson fender, and this fact is recognized in the report of the New York Public Service Commission's committee, which stated that the fender as examined on March 8, 1915, bore no resemblance to the fender submitted in the tests of 1908, except in name and in the fact that it is operated by air. Unlike the original fender, it can be compactly folded up to permit the coupling of cars, besides which it is notable for lightness, shortness of projection, automatic operation upon contact with any object, a backward movement as the fender drops, and provision so that operation of the fender, whether automatic or by the motorman, simultaneously drops the fender and sets the brakes. The fender also permits the installation and operation of a wheelguard, and is adjustable to any height above the rails. Continuing the committee reported that no opportunity had been presented for testing the fender in actual service, but that the objectionable features, which had caused it to say in its report of Dec. 29, 1908, that this fender was not applicable to New York City service conditions, had been eliminated in the present construction.

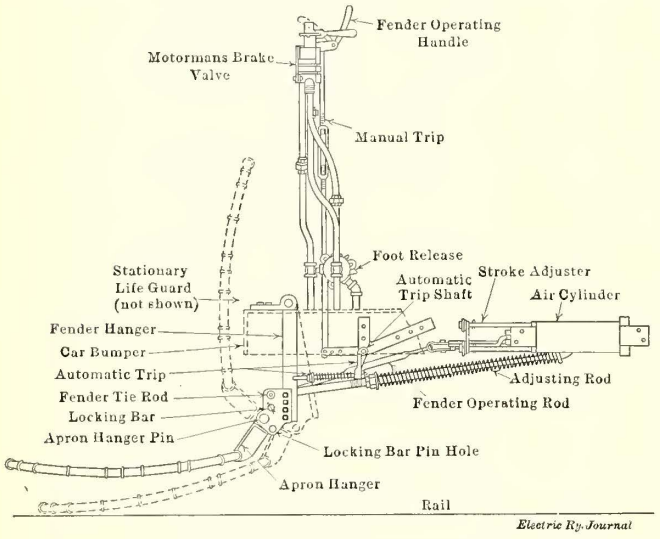


AIR-OPERATED FENDER—FRONT VIEW, SHOWING OPERATING VALVE CONNECTED TO AIR-BRAKE PIPING

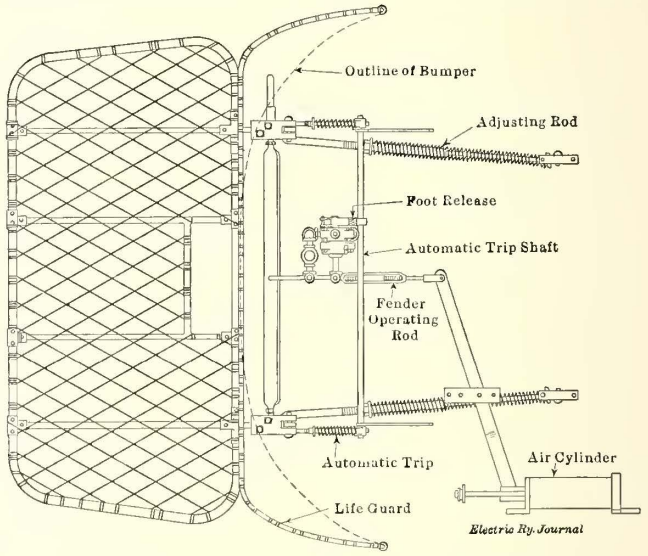
The new design differs from the original mainly because the apron swings downward and backward instead of being pressed straight down by direct-acting air cylinders. The principle of pneumatic control, however, is the same as in the early type of Nelson fender which has been attracting much attention on the Pacific

Coast during the past three years. This fender first became prominent four years ago, when exhaustive fender and wheelguard tests in Portland, Ore., were conducted jointly by the city and the street railway officials. The tests lasted more than a year, and over forty different devices were tried out. As a result the air fender has replaced wheelguards on all the air-equipped cars in Portland, where the narrow streets and congested traffic make severe conditions for a projecting apron. The officials of the Portland Railway, Light & Power Company, however, have recently gone on record in a letter to the New York Public Service Commission, with the statement that they regard the air fender as entirely successful. Thirty-six persons were picked up by it on the streets of Portland during 1914.

During the year 1913, fender and wheelguard tests similar to those in Portland were conducted by the street railway officials and the Canadian government authorities in Vancouver, B. C. These were described in the ELECTRIC RAILWAY JOURNAL for Nov. 1, 1913. The air fender again showed the best record and it is



AIR-OPERATED FENDER—DIAGRAM OF ELEVATION, SHOWING THE OPERATING MECHANISM



AIR-OPERATED FENDER—PLAN VIEW, SHOWING LOCATIONS OF LIFE GUARD AND OUTLINE OF APRON

now being installed on the cars of the British Columbia Electric Railway Company in Vancouver and Victoria. It is also in use in Boise, Idaho, and on the municipal cars in Seattle, being highly indorsed by the users in both cities.

In the previously-mentioned fender and wheelguard tests conducted by the New York Public Service Commission in 1908 the air fender in its original form received a rating of 80.3 per cent efficiency, only two devices being higher out of a total of sixty-seven tested. In the Vancouver tests, however, which followed the rules laid down by the New York Commission, the improved air fender received a rating of 91.8 per cent efficiency.

The latest model is so constructed that it is hung from behind the bumper instead of in front, reducing maintenance to a minimum because all the castings and the trip mechanism are placed where they are not exposed to breakage. The projection is also reduced by this construction, the fender extending only 30 in. outboard. From the diagrams shown above it will be seen that the apron is attached rigidly to apron-hanger castings, which are hung from jaw castings by the so-called apron-hanger pins. These pins serve as pivots when the apron is folded up. The apron is locked in either folded or operating position by castings which are attached to the locking bar and which have projections fitting into the locking pinholes and preventing movement of the apron-hanging castings. The jaw castings in turn are bolted to the fender hangers which swing from the bumper beam.

The operation of dropping the fender is effected by pulling the whole arrangement back against the long springs on the adjusting rods, the change in angularity of the fender hanger causing the outboard edge of the apron to strike the rails. The power for this operation is obtained from an air cylinder which is controlled by a semi-automatic, wide-opening three-way valve that is cut in on the air-brake exhaust piping on the car. It is supplied with air direct from the main reservoir, and when the valve is opened air goes to the fender-operating cylinder and also to the brake cylinder, a check valve permitting operation of the brakes without affecting the fender but involving a brake application whenever the fender is dropped.

The three-way valve is operated automatically by an arm extending from the automatic-trip shaft. The shaft is caused to rotate by a slight movement of the fender hanger, the latter being connected by adjustable springs to arms at each end of the shaft. By tightening these springs the movement of the fender hanger necessary to operate the valve is reduced and the action is thereby made more delicate to any desired degree, but normally the adjustment is made so that a 15-lb. pressure at the edge of the apron causes the valve to open. The valve also may be operated directly by moving a valve handle located beside the regular brake valve and by a reset pedal near the floor, which provides for release of the air and the return of the fender to normal position.

An important feature is that the air-brake exhaust is carried through the three-way valve so that if the valve ports are stopped up the air brakes cannot be released. In addition, the ready return of the fender to operating position makes daily testing an easy matter. For running during heavy snow which might exert enough pressure against the apron to operate the fender automatically a latch (not shown on the illustration) is provided to prevent the rotation of the automatic trip shaft. This does not, however, prevent operation by means of the fender-operating handle, as this opens the three-way valve direct.

News of Electric Railways

DETROIT PURCHASE NEGOTIATIONS

Review of Steps in Connection with Negotiations for Sale of Urban Lines to the City

Negotiations for the municipalization of the lines of the Detroit (Mich.) United Railway within the one-fare zone have reached the stage where the City Street Railway Commission has made an offer to the company, and the stockholders, after holding a special meeting to consider the proposition, have replied to the offer. The commission's offer, made on Feb. 23, 1915, in brief was as follows: For all the property, real, personal, and mixed, including franchises and franchise rights, except cash, accounts receivable and securities, within the one-fare zone, so called, of Detroit, the city, to the extent of its power, will assume the payment of the mortgage debt of the Detroit United Railway not exceeding $24,900,000; a clear title subject to the mortgage to be furnished to the city, and immediate possession by the commissioners following upon the ratification of the proposal by three-fifths of the electors to be assured. To this proposal the stockholders replied with an authorization to the board of directors to sell the property as described to the city at a price of $24,900,000 plus any amount expended for additions, extensions and betterments after April 1, 1915, on terms of payment satisfactory to the directors and determined by counsel to be valid.

The existing laws of Michigan governing the power of cities to acquire public utilities have been held by counsel for the city to be not broad enough to cover the proposition submitted by the Street Railway Commission and consequently at the instance of the commission bills have been introduced in both branches of the Legislature to confer this power. The bills have not as yet been reported out of committee, but the city expects they will be passed at the present session.

The Street Railway Commission, which was created by a charter amendment for the express purpose of bringing about municipal ownership of the Detroit city lines, engaged Prof. E. W. Bemis several months ago to make an appraisal of the property within the one-fare zone. This appraisal stated the value of the property, excluding items of material on hand and some other features, to be approximately $21,000,000. The company asserted that $35,000,000 had been invested in the property and that its value, after an allowance for depreciation, would be in excess of $30,000,000. After consideration the commission made an offer, subject to the will of the voters, to assume the bonded indebtedness of the company not to exceed $24,900,000, but did not make any statement as to what it would pay for the lines on the basis of a cash price. Announcements in the newspapers by members of the commission set forth that it had been estimated that the receipts of the street railway would be sufficient to meet operating expenses, interest on bonds and amortize the funded debt, and these announcements were taken to mean that the commission had decided the assumption of the bonded debt of the company was more likely to bring early municipalization than any other plan.

The one-fare zone includes all the territory within the city of Detroit and connecting villages in which the company operates at a flat seven-for-a-quarter rate of fare. Inasmuch as these lines, involving 220 miles of single track, are always regarded as the Detroit city unit, all negotiations have been on the basis of the city acquiring the entire system on which one rate of fare exists.

The commission engaged an expert accountant to go over the bonded debt of the company and make a report, but the statement of the accountant, if completed, has not yet been made public. The funded debt of the company includes some $4,100,000 of bonds outstanding against properties of the Detroit United Railway which are not a part of the city system but a part of the Flint, Pontiac and Orchard Lake interurban divisions.

A question has been raised as to the construction to be placed upon the commission's offer of assuming the bonded debt, it being contended in news articles and editorials in some newspapers that the commission did not intend to pledge the credit of the city in taking over the funded debt. Another question raised is whether the commission proposes to assume the bonds of $4,100,000 outstanding against interurban properties of the Detroit United Railway. On neither of these points has the commission made a public statement as to its meaning. J. C. Hutchins, president of the Detroit United Railway, at the meeting of the board of directors on March 1, announced that these matters were the subject of negotiation. No announcement has been made as to any negotiations covering the entrance of interurban cars into the city, this being regarded as a matter of detail.

At the present time an additional appraisal of all the properties included in the Detroit United Railway and its subsidiary interurban companies is being made by Dean M. E. Cooley of the University of Michigan for the State Railroad Commission. This appraisal is likely to be made public some time in May.

It is unlikely that the Street Railway Commission's final and entire proposal for the consideration of the electors will be made public until after the necessary State legislation has been enacted. Just what the final proposition will be remains to be developed out of the negotiations proceeding between the commission and the company, and the course that these negotiations will take will of course depend upon how closely the views of the company and the commissioners coincide on the different questions involved.

KANSAS CITY INTERURBAN STATION

A joint Council committee named to consider proposed locations for an interurban railway station in Kansas City, Mo., is hearing the arguments of the supporters of various sites. In the cases of three sites franchises are being asked of the Council by men who agree to erect a suitable station. Detail plans for a building and for track arrangement have been filed with the committee. The three sites which are the subjects of franchise requests are at Fourteenth and Main Streets, Tenth and Wyandotte Streets, and Eleventh and McGee Streets. Wholesale and jobbing interests who wish to promote the convenience of traveling men and the development of Kansas City as a jobbing center unite with a considerable proportion of retail merchants in favor of Tenth and Wyandotte Streets. Other retail merchants and property owners strongly favor Eleventh and McGee Streets, while the Fourteenth and Main Street location has its backing of business interests. It is at present not considered likely that a decision will be immediately reached by the Council committee; nor that even if an ordinance is prepared for establishing an interurban station the necessary steps can be taken for a year or so.

MISSOURI PUBLIC SERVICE COMMISSION

According to the second annual report of the Missouri Public Service Commission for the year ended Dec. 31, 1914, 345 formal complaints and applications were filed during the year, of which 243 were concluded. During the same period 651 informal complaints were filed, of which 563 were adjusted either by correspondence or by informal conferences with the complaining parties and the utilities affected. The report gives detailed accounts of the activities of the legal, rate, engineering, accounting and other departments of the commission during the year. The commission states that the money stringency and the falling off in the market for securities of all classes of corporations since the beginning of the European war was very noticeable to the commission in the small number of applications for authority to issue stocks and bonds. During the year the commission completed a valuation of the Kansas City, Clay County & St. Joseph Railway and the Cassville & Western Railroad. The commission notes that few complaints were made during the year, as to any unfair treatment of the public by utility agents and employees, and complimented the agents and the employees for their courteous demeanor.

STRIKE IN WILKES-BARRE

Inability to Choose Third Arbitrator Precipitates Strike—Statement by Company

A strike was declared on the lines of the Wilkes-Barre (Pa.) Railway on April 1 through the overbearing attitude of the representatives of the trainmen with respect to wages. The case is an unusual one in that the company had agreed with the men to working conditions for the next three years, the question of wages being the only one that remained open. This subject the company agreed to arbitrate.

The committee representing the men proposed that one arbitrator be chosen by the company, one by the men and the third arbitrator by the two previously chosen within ten days. As this method did not provide a definite way of arbitration in case of a disagreement between the two arbitrators as to the third arbitrator, the company proposed that the third arbitrator be chosen by the presiding judge of the Court of Common Pleas of Luzerne County, and in case of his failure to act within five days the presiding judge of the Circuit Court of Appeals for the Eastern District of Pennsylvania make the appointment. This plan was rejected by the committee of the men, and the company agreed to accept the committee's method. T. D. Shea was appointed to represent the men and S. D. Warriner the company. E. C. Jones, who was proposed by Mr. Shea, representing the men, was accepted by Mr. Warriner, representing the company. Although both Mr. Warriner and Mr. Shea requested Mr. Jones to serve he declined.

Conferences were then held by the two arbitrators, but they failed to agree, and following the expiration of the time allotted to them, set for Feb. 12, a meeting was held at the office of the company, at which the two arbitrators, committee, management and counsel of both parties were present. The management again suggested that the appointment of the third arbitrator be left to the five judges of the Court of Common Pleas of Luzerne County. This was declined. After this failure to agree it was suggested that the two arbitrators discuss the amount of wages to be paid trainmen, with the hope that perhaps they could agree without the need of an umpire. On March 30 Mr. Shea and Mr. Warriner reported that they could not agree on the wage terms. T. A. Wright, manager of the company, issued a statement at once reviewing the entire proceedings. This statement he concluded as follows:

"To sum up the situation: We have mutually agreed upon working conditions for the next three years, wherein we made certain concessions; we have agreed to arbitrate wages; this we are still willing to do by any reasonable method and that the umpire be a disinterested person, who, through social, business, political or religious life, could not be influenced by either party. And, finally, we have offered an increase of 8⅓ per cent to be accepted in five days, or the offer to be withdrawn."

On April 8 federal and State mediators succeeded in inducing the men and Mr. Wright to accept John Price Jackson, State Commissioner of Labor, as umpire.

STRIKE ON SYRACUSE SUBURBAN LINES

Late on April 7 a general strike order affecting the Empire United Railways was issued at Syracuse, N. Y., by international officers of the Amalgamated Association. The total number of employees of the company is 426 and the number of trainmen 319. Ernest Gonzenbach, general manager of the Empire United Railways and associated lines, issued the statement published below in regard to the position of the company in the controversy. The Brotherhood of Electric Trainmen announced its intention to stand by its agreement with the Empire United Railways and to back up the brotherhood men employed on the system, and that it did not intend to have the Amalgamated interfere with it. The statement of the brotherhood said that a principle was at stake which the brotherhood would see through to the end. A member of the executive committee of the Amalgamated Association said that that association was fighting for "recognition of the union, whose members are recognized as the men best fitted to operate electric cars."

Mr. Gonzenbach's statement follows:

"No one regrets more than I the crisis growing out of the controversy between the two labor organizations. I am very sorry to be put in a position in which I do not desire to be placed—between the upper and nether stones, being made a victim of something over which the company I represent had no control and was not responsible.

"We had an agreement with the Amalgamated Association on the Auburn & Syracuse line, which worked out finely, being satisfactory to the employees and satisfactory to the company.

"If we had not been bound by another contract—that with the brotherhood—we would have been glad to have entered into an agreement with the Amalgamated Association covering the Empire United Railways.

"Under existing conditions we could not in honor do this. If we had broken faith with the brotherhood, which has carried out its part of the agreement to the letter, we would have sacrificed our business honor and thrown suspicion on future contracts in which we might enter.

"There is no prejudice on my part or any of the other officials of the company against the Amalgamated Association and no reason why we should not have done business with its representatives along the lines they desire except the existence of another contract which could not be broken.

"We have men enough to keep cars running regularly on all the lines provided we have proper protection."

The strike at Syracuse went into effect on the morning of April 8. The trouble seems to be centered around the Auburn & Syracuse line, and it was said that not a car was moved in Auburn on April 8. The situation is complicated by the fact that the local railway lines in Syracuse and Rochester, into both of which cities the Empire United Railways operates, are organized under the Amalgamated Association and threats were made to call strikes in these cities if the cars of the Empire United Railways were permitted to operate into them over the city lines proper. To forestall any attempt to keep its cars out of Rochester, the Empire United Railways on April 8 obtained a temporary injunction restraining the New York State Railways from preventing cars of the Empire United being run over New York State Railway tracks in Rochester. This order of the court was made returnable on April 10. The Lake Shore and the Oswego division cars of the Empire United Railways run into Syracuse over the company's own tracks, but the cars of the South Bay line enter the city over the New York State Railway's tracks.

WHAT LABOR EARNS

Statistics taken by the chairman of the executive committee of the Associated Railroads of Pennsylvania and New Jersey from the report of the secretary of internal affairs of Pennsylvania for 1911 make the following comparative exhibit as to the number of wage earners, the character of industries employing them, and their average yearly income:

Character of Industries	Number Wage Earners	Average Annual Income
Anthracite coal	169,629	$573
Bituminous coal	173,116	584
Iron and steel	111,563	696
Pig iron	13,038	632
Cars and car wheels	11,418	676
Engines and boilers	5,162	612
Electrical supplies	9,981	597
Furniture	8,463	534
Hats	8,585	541
Iron and steel forgings	2,086	608
Machinery	15,751	574
Paints, white lead, etc	1,826	550
Railroad supplies	4,935	719
School teachers (male)	8,044	547

INTIMIDATING SEATTLE EMPLOYEES

An unsuccessful attempt was made on March 31 to stampede the conductors and motormen of the Seattle lines of the Puget Sound Traction, Light & Power Company and intimidate them into joining the union fostered by the Amalgamated Association. Late in the evening several hundred men interrupted the service of the company by smashing windows, confiscating controller handles and fare boxes and cutting trolley ropes. The company, in order to avoid trouble points, changed the routing of some of the cars. A. L. Kempster, manager of the company in Seattle, in speaking of the affair, said:

"I do not believe there is a more loyal force of employees in the country. The men do not want to strike and have

no grievance against the company which they have made known. The mob was assembled for the purpose of stampeding the men into joining a union. During the last few weeks our men have been pestered to join the union. They have been swamped with circulars and have been importuned at their homes and on the cars."

Sam Atkinson and W. B. Fitzgerald, national officers of the union, state the matter will be dropped until the employees of the company desire to join the union.

IMPORTANT CINCINNATI MATTERS

At a special meeting of the Rapid Transit Commission at Cincinnati, Ohio, on March 29, Archibald S. White and John E. Bleekman, with their engineers, presented a complete plan for bringing the various interurban railways into the business section of the city. They appeared at the invitation of the commission to explain a proposition that was made in February. This included the construction of a rapid transit entrance and the rehabilitation of a number of interurban lines.

Mr. White's suggestion is a modification of plan No. 4, which was described in the ELECTRIC RAILWAY JOURNAL of Jan. 9, page 108. Suggested by both J. G. Schmidlapp and Bion J. Arnold, it was finally worked out by Assistant City Engineer Edwards. It contemplates a terminal station near the post-office and an elevated road through Third Street and a private right-of-way touching Mt. Adams near the Marine Hospital. Another branch would pass through Norwood, Bond Hill and Ivorydale to Winton Place. An extension from Torrence road to Carrel Street would afford service to the east end and connect with three interurban lines.

Mr. White suggested that he would undertake to build the road and then turn it over to the city at cost, taking bonds in payment. He further said he would organize a company to operate it, paying as rental the interest on the bonds and a certain amount to a sinking fund, together with operating expenses, taxes and incidentals. Any remaining profit would be divided between the company and the city. He has obtained options on three of the interurban lines and is negotiating with two others. If his proposal is accepted the roads will be purchased, rehabilitated and extended to Hamilton, Dayton, Springfield, Xenia and Columbus.

The law to empower the city of Cincinnati to finance and build a rapid transit loop was approved by the board of park commissioners and the Rapid Transit Commission on April 3. It provides in the first place for the appointment by the Mayor of a board of rapid transit commissioners consisting of five members after the City Council takes action to that end. The commission members are to serve without compensation.

Sections 2 and 3 provide for the election of officers of the board and the appointment of a superintendent and engineers. Section 4 places the management of construction with the board and gives it the right to build under, on or over canal lands, streets, alleys and public highways, whether within or without the limits of the corporate boundaries. Control of operation of the road is also vested in the board. Under Section 5 the board has power to expend money appropriated or received from the sale of bonds for transit purposes but no liability is to be incurred unless the funds are in the city treasury to the credit of the board. Section 6 provides for the assessment of 50 per cent of the cost of boulevards or parkways built in connection with the road upon the owners of abutting property. Section 7 deals with the manner of issuing bonds and levying taxes. The board must submit its wants to Council, and if it fails to act within sixty days then the matter may be taken directly to the electors. Section 8 limits the amount of bonds or the total indebtedness contracted for this purpose to 2 per cent on the total value of all property listed and assessed for taxation. Under section 9 the board is authorized to build the road proper, together with all tracks, switches, depots, terminals and everything else in connection with it. Section 10 provides for the purchase or appropriation of lands needed for the road, within or without the corporation boundaries. Section 11 describes the manner in which all rentals and moneys received from the lease of the road or any of the property shall be kept and handled. A sinking fund is to be provided for the payment of accruing interest and the principal of the bonds. Section 12 authorizes the board to lease the road for operation.

LEGISLATION IN OHIO

The Ott bill limiting the hours of labor of street and interurban railway motormen and conductors was passed by the House of Representatives by a bare majority on March 30. As amended, the measure provides that the men shall not work more than ten in any consecutive thirteen hours and shall have eleven hours of rest in each twenty-four, and that by agreement between the men and their employer they may work longer when occasion requires. The provision requiring that new men shall work fifteen days under a trained man before being allowed to operate a car was dropped. The bill will now go to the Senate.

The Smith bill, requiring that motormen be protected from dust the year around by screens, has passed the Senate. On March 30 the Meyers bill, permitting steam and electric roads to unite in building union depots, was passed by the Senate.

VALUATION OF SPOKANE PROPERTIES

The valuation of the property of the Washington Water Power Company, Spokane, Wash., was begun recently by officials of the Public Service Commissions of Washington and Idaho. After the figures are secured it is expected that the commissions will establish a valuation on which rates for all services will be based. Though joining in the work Idaho will pay only about one-fifth of the cost, because the street railroads, the larger power plants and the more extensive power distribution systems are in Washington. When the final figuring is completed on the valuation rates will be made to cover the company's business not only in Spokane, but in the small towns in Washington and Idaho and in the mining districts which the company serves.

SPRINGFIELD ARBITRATION HEARING

The hearing in connection with the differences between the management of the Springfield (Mass.) Street Railway and the representatives of its employees was convened at two o'clock on April 7 and adjourned at 4.30 o'clock by agreement of both sides to meet again at 9 a. m. on April 8. The company's case will be outlined as soon as the men have brought their side to the attention of the State Board of Arbitration. The conference on April 7 was an executive one, but it was stated before the meeting opened that the only matter at issue involved the reinstating of three conductors discharged for alleged irregularities in fare accounting. It is stated that the principal contention of the representatives of the men will be that it is impossible under the present system of registration and accounting of fares to secure convicting evidence against a conductor who might be suspected of irregular accounting, and that the company should have provided transfer registers so as to allow the men to make a proper accounting by registration of all fares that are collected, whether in cash, complimentary tickets or transfers.

Maine Labor Bill Postponed.—The bill to limit the hours of work of the street railway employees to nine a day has been indefinitely postponed by the Senate of Maine.

Tennessee Compensation Measure.—The workmen's compensation act before the Tennessee General Assembly has been recommended for rejection by the Senate judiciary committee.

Chicago Election Without Traction Issue.—William Hale Thompson was elected Mayor of Chicago on April 6. The utility issue, which has carried mayors into office in the past, did not attain any importance in the contest.

Workmen's Compensation.—On April 1 Governor Whitman of New York signed the bill amending the workmen's compensation law by providing for direct settlement of claims between employers and employees and for advance payments to injured employees.

New Jersey "Seven Sisters" Law Amended.—Governor Fielder of New Jersey has signed an amendment to the "seven sisters" act of 1913 permitting corporations to purchase stock of other corporations.

solely for the purpose of investment, not using the same for voting purposes of bringing about the substantial lessening of competition.

Storm in the East.—New York and practically the entire Atlantic seaboard were in the grip of a severe storm on April 3. Snow, driven by a northeast gale, which at times obtained a velocity of 60 m.p.h., held up trans-Atlantic sailings, damaged telephone and telegraph wires, delayed interurban cars and suburban trains, and crippled transportation on the surface and elevated lines.

Newport Franchise.—A committee of the Business Men's Club of Newport, Ky., met Mayor Hembold and the City Commissioners on April 1 and the franchise which is soon to be offered for sale was discussed. It is said that officials of the Cincinnati, Newport & Covington Street Railway, which is expected to be the only bidder, are very much opposed to certain conditions of the franchise.

Another Seattle Purchase Proposal.—A new proposal for the purchase of the Seattle, Renton & Southern Railway by the city of Seattle, Wash., was presented to the City Council recently by a committee representing property owners in the Rainier Valley who according to report are willing to bear part of the expense of the purchase in order that the controversy between the city and the receivers of the line may be settled.

Writ of Error In Contempt Case.—Federal Judge Killits, sitting at Toledo, Ohio, has granted Negley D. Cochran and the Toledo Newspaper Company a writ of error and they have appealed the cases against them to the United States Circuit Court of Appeals at Cincinnati. They were convicted of contempt of court in connection with certain news items and editorials alleged to have reflected on the acts of the court in the Toledo Railways & Light Company cases.

Wyoming Commission Organized.—The Public Utility Commission, created by the last Legislature of Wyoming, was formally organized on April 1. The commission consists of Governor John B. Kendrick, Robert B. Forsyth, state auditor, and Herman B. Gates, state treasurer. Governor Kendrick appointed H. Allen Floyd, Sheridan, Wyo., secretary of the commission. The board will have power over all public utilities in the State not in conflict with the Interstate Commerce Commission.

Brooklyn Fender Hearing.—The Brooklyn (N. Y.) Rapid Transit Company fender order was brought up again before the Public Service Commission on April 1 at a rehearing before Commissioner Cram. The railroad objects to that part of the order compelling it to place projecting fenders and wheel guards on all its cars outside of the heart of the city. It contends that there is no fender which in its present form is suitable to the local conditions obtaining in Brooklyn. The question is still open before the commission.

The Toledo Franchise.—Mayor Keller, of Toledo, Ohio, has received a letter from H. L. Doherty, of H. L. Doherty & Company, operating the property of the Toledo Railways & Light Company, saying that he is anxious to reach an agreement with the city on the franchise matter at an early date, but that no company can operate under the franchise prepared by the special committee of the City Council some time ago. Mr. Doherty said he would return to Toledo soon ready to take up the franchise question at the convenience of the city officials.

Special Public Utilities Number.—The New York *Evening Post* published a special sixteen-page supplement to its regular edition for March 31 dealing with public utilities. The principal articles were "Utility Earnings" and "Law and Regulation." The other articles dealt largely with utility prospects in various sections of the country and the utilities of South and Central America. A page was devoted to portraits and biographical sketches of Theodore N. Vail, Thomas A. Edison, Wilbur C. Fisk, H. L. Doherty and Alexander C. Humphreys, "men who have helped to make public utilities servants of the public."

Renton Suit Abandoned.—The City Council of Seattle, Wash., has passed the bill for the abandonment of the suit brought to condemn the private right-of-way of the Seattle, Renton & Southern Railway in Rainier Valley. The suit was brought about three years ago. The case went to the State Supreme Court and was remanded to the Superior Court for retrial. The case was set for retrial, but Corporation Counsel Bradford advised the Council to abandon the litigation, declaring that since the courts have ruled the company has a legal franchise, the company may be compelled to raise its tracks to street grade without resorting to condemnation proceedings.

Commission to Examine Books of Chicago Trust. — The Illinois Public Utilities Commission has ruled that its accountants shall examine the books of the Chicago Elevated Railways collateral trust. Commissioner Thompson holds that a declaration of the power of trustees was insufficient and that evidence of their acts was necessary to prove that the trust was not a public utility. G. E. Porter, counsel for the trustees, admitted that they exercised power over the roads but stated that they did not go beyond the rights of stockholders. Hearings have been postponed until the commission's accountants report.

New York Franchise Tax Reduction.—Comptroller Prendergast of New York City said recently: "The franchise taxes charged against the Metropolitan Street Railway for 1910 and 1911 amounted to $1,865,165. The company contested the valuations placed upon its properties by the State Board of Tax Commissioners. It has carried its protest to the Court of Appeals, and that court has just rendered a decision reducing the tax from the figure just given to $878,121. The city will not be able to collect this full amount because the company is entitled to deduct what it has paid for the privilege of doing business under Section 48 of the franchise tax law."

Chicago Questions Commission's Authority.—The corporation counsel for Chicago holds that the Illinois Public Utilities Commission is authorized to subpœna the officers and employees of the city as individuals, but not as representatives of the city. He has further expressed the opinion that while the city employees were serving on the witness stand as individuals their testimony was not binding on the city nor an admission by the city that it recognized the authority of the commission. Acting upon this advice the local transportation committee decided that in the future any attempt on the part of the commission to interfere with traction matters in Chicago would not be tolerated.

The New York Commission Inquiry.—On April 5 Governor Whitman of New York notified the Public Service Commissioners for the First District of New York, who appeared before him two weeks ago in answer to charges growing out of the legislative investigation of the commission, that they need not appear before him on April 6. When the Governor adjourned the hearing it was for two weeks, in order that he might ask the commissioners under charges to reappear if there were any points in the record upon which he wanted more light. Many contradictory statements have been made in regard to the probable course of action by the Governor with respect to removals from office.

New Subway Ventilating Systems.—The Public Service Commission for the First District of New York has adopted a resolution in favor of employing J. G. White & Company as consulting engineers, to work with the engineering department of the commission in perfecting some new system of ventilation for the subways now under construction in New York City. The present system consists of gratings in the sidewalks. The commission and the consulting engineers will investigate the merits of a proposed system, consisting of chimneys of ornamental design placed either in private property or in public squares. The chief engineer of the commission has been directed to confer with J. G. White & Company.

New Viaduct Line in Kansas City.—The first street cars were operated over the Twelfth Street viaduct on March 18, the Twelfth Street cars of the Metropolitan Street Railway being routed to the stock yards over the structure. For more than a year the Twelfth Street cars have been looping back at the top of the bluffs overlooking the West Bottoms, and the traffic from the stock yards and wholesale district has been cared for by the circuitous "stock yards" line, winding southward, and the elevated and surface lines along the north edge of the district. Until October, 1913, the stock yards district was served chiefly by a cable rail-

road, the last survivor of its era in Kansas City. The Twelfth Street line traverses a hotel district.

Bill of Particulars Asked.—George W. Wickersham, in behalf of his clients, Lewis Cass Ledyard and other officers and directors of the New York, New Haven & Hartford Railroad, asked Judge William H. Hunt in the Federal District Court at New York on April 5 to require the government to furnish the defendants with bills of particulars, to enable them to prepare a defence to the indictment charging them with conspiracy to violate the Sherman law. Mr. Wickersham also complained of the vague and general description of the commerce, which the indictment charges the New Haven men monopolized. Frank M. Swacker, assistant United States attorney-general, and Robert Stephenson, assistant United States district attorney, for the government, asserted that the indictment was specific enough.

Against Pierce Bill.—The New Jersey Utilities League, the formation of which was noted in the ELECTRIC RAILWAY JOURNAL of Feb. 20, page 390, has protested through its president, John A. Riggins, against statements made in an editorial published in the Newark *News* commenting on the Pierce indeterminate franchise bill, the passage of which by the Senate of New Jersey was noted in this paper on April 3, page 686. In concluding his letter to the *News* Mr. Riggins said: "We have mentioned only two provisions of the bill: compulsory sale at cost, and amortization of capital account. The former mulcts the company, the latter mulcts both the company and the public. No such confiscatory provisions are on the statute books of any other state. There are numerous other radical provisions to which reference might be made. These will suffice to show how harmful is the bill. Wisconsin, whose radical policies have lately been repudiated at the polls, becomes a most conservative state when viewed in the glare of the Pierce bill."

Precautionary Subway Measures.—As a result of the investigation into the Times Square subway accident of Jan. 6 the Public Service Commission for the First District of New York has adopted a resolution, proposed by Commissioner Milo R. Maltbie, that counsel to the commission be directed to prepare an order with reference to various improvements, embracing the following requirements: install a complete and separate telephone system, with telephone stations at frequent intervals along the roadway between stations; install an improved lighting system throughout the subway, so arranged that in case of failure of one source of supply another automatically will take its place; install an additional independent source of power supply for operating the ventilating fans; rearrange power, signal and light cables in manholes so as to guard against a breakdown in one class of cables being communicated to another class; install ventilating outlets for existing subway manholes where required; and install additional ladders and stairways from the subway to the street through existing ventilating chambers, to be used as emergency exits.

PROGRAM OF ASSOCIATION MEETING

Iowa Street & Interurban Railway Association

The convention of the Iowa Street & Interurban Railway Association, as previously announced in the ELECTRIC RAILWAY JOURNAL, will be held at Keokuk, Ia., on April 22 and 23. A program, including the following papers, has been announced:

"Measures for the Welfare of Employees," by Morris A. Welsh, chief special agent of the Waterloo, Cedar Falls & Northern Railway, Waterloo, Ia.

"The Jitney Bus," by C. I. Palm, of the Omaha & Council Bluffs Street Railway, Omaha, Neb.

"The Investigation and Care of Railway Circuits," by F. V. Skelley, assistant general superintendent of the Tri-City Railway, Davenport, Ia.

"Safety First," by F. K. George, director of safety of the United Light & Railways Company, Grand Rapids, Mich.

"Arrangement of Schedules with a View to Providing Service During the Evening Peak," by L. L. Sloss, superintendent of transportation of the Des Moines (Ia.) City Railway.

Financial and Corporate

BUSINESS IN WASHINGTON

A. W. Leonard of Stone & Webster Reviews Conditions in the State of Washington

A. W. Leonard, president Puget Sound Traction, Light & Power Company, Seattle, Wash., has written to the New York *Evening Post* in part as follows:

"The recent Legislature showed a tendency to enact legislation that from a general business standpoint is safe and sane. The result should be increased confidence in the country at large, and should be additional proof that this State has eliminated to a great extent much of the freak legislation so prevalent in other states.

"Among the measures enacted, which, from our standpoint, are important, were the bill to compel cities to use money voted for bond purposes for that particular purpose, and not allow diversion to other projects; the bill to require municipalities to submit budgets, and under penalty to comply with the estimates contained therein; the bill regulating jitney buses, and requiring them to furnish a surety bond of $2,500; and the public utility bill requiring a certificate of necessity and convenience, which will prevent duplicate investment in the public utility field. The jitney bill will perhaps have the most important effect on our business. Since the advent of the jitney the receipts of this company have been reduced thousands of dollars per month.

"One very important bill which failed of passage was the one to allow public utilities to operate under an indeterminate franchise. This measure would have placed the companies on a firmer basis. It will undoubtedly come up again.

"Another bill which is badly needed is one that will place the municipal light and power plants in this State under the same regulation as the privately-owned plants. At present the municipal plants have an undue advantage in that they can quote lower rates or offer special inducements in the way of fixtures, free lamps, etc., to secure customers."

BERLIN WAR RIDING

War Cuts Traffic 15.1 Per Cent on Surface Lines and 27.2 Per Cent on Rapid Transit Lines

Statistics just available covering all electric railway surface traffic in Berlin for the years 1913 and 1914 show that the traffic in 1914 was 578,611,030 as compared with 623,212,835 in 1913, a reduction for the year of 7.2 per cent. The losses caused by the war, however, were actually 15.1 per cent, as the loss resulting from industrial depression alone in the first six months amounted to only 1.3 per cent. The Grosse Berliner Strassenbahn alone (exclusive of its suburban lines) carried 425,419,478 pasengers during the year, a loss of 8.6 per cent. The loss for the first half of 1914 was 3.5 per cent, but for the second half it was 15.6 per cent.

These losses in surface railway traffic are all the more striking because a large number of horse and motor buses were withdrawn for military purposes. Thus the bus business for the first six months of 1914 consisted of 101,547,372 passengers, an increase of 6.3 per cent compared with 1913. During the second six months of 1914, however, only 48,951,946 passengers were carried, a decrease of 32.8 per cent compared with the second six months of 1913.

On the elevated-subway system (Berlin Hoch- und Untergrundbahn) 52,736,030 passengers or 45.1 per cent more were carried in the first half of 1914 than for the same part of 1913, this extraordinary increase being largely caused by the opening of the Wilmersdorf line. Yet the war made such inroads on this system that the second six months of 1914 showed a decrease of 27.2 per cent compared with 1913, despite the new mileage. The fact that the rapid transit system suffered so severely would indicate that most of the bus travel went to the surface lines. The latter have a uniform fare of 2½ cents, except in a few suburbs, where the fare is 3¾ cents, whereas a rather costly zone system is in vogue on the subway-elevated routes.

The total number of passengers for the last six months of 1913 and 1914 respectively was 372,303,257 and 298,731,155—a loss in 1914 of more than 24 per cent.

ANNUAL REPORTS

Hudson & Manhattan Railroad

The comparative statement of income, profit and loss of the Hudson & Manhattan Railroad, New York, N. Y., for the years ended Dec. 31, 1913 and 1914, follows:

		1914	1913
Gross revenue—passenger fares		$3,490,880	$3,478,084
Miscellaneous revenue from railroad operations:			
Advertising		$150,689	$162,732
Other car and station privileges		66,804	65,334
Sale of power		3,619	7,632
Miscellaneous transportation revenue		10,950	2,197
Other miscellaneous revenue		28,008	27,734
Total miscellaneous railroad revenue		$260,070	$265,629
Total railroad revenue		$3,750,950	$3,743,713
Operating expenses of railroad:			
Maintenance of way-structures.	Actual	$216,849	$224,751
	Reserve	61,745	56,599
Maintenance of equipment	Actual	159,797	149,088
	Reserve	63,272	57,999
Traffic expenses		1,625	1,973
Transportation expenses		786,358	797,139
General expenses		157,693	167,477
Total operating expenses of railroad		$1,447,339	$1,455,026
Net operating revenue from railroad		$2,303,611	$2,288,687
Taxes on railroad operating properties		251,205	261,306
Net income from railroad operation		$2,052,406	$2,027,381
Net income from Hudson Terminal Buildings		$957,079	$920,755
Net income from other real estate properties		40,191	16,235
Total net income from outside operations		$997,270	$936,990
Total net income from all operating sources		$3,049,676	$2,964,371
Non-operating income		28,628	32,754
Gross income		$3,078,304	$2,997,125
Income deductions other than bond interest:			
Interest on car purchase agreements		$54,267	$63,467
Interest on real estate mortgages		52,199	38,399
Interest on loans payable		.....	55,729
Rental tracks, yards and terminals		73,187	55,083
Amortization of debt discount and expense		37,531	36,895
Miscellaneous deductions		19,606	11,862
Deductions prior to bond interest		$236,790	$261,435
Net income applicable to bond interest		$2,841,514	$2,735,690
Deduct bond interest on N. Y. & J. 5's, first mortgage 4½'s and first lien refunding 5's		2,121,007	*2,020,264
Balance of net income, for the period, available for interest on adjustment income bonds		$720,507	$715,426

*For the purpose of comparison, the interest deductions for the month of January, 1913, are included as if the first lien and refunding mortgage and the adjustment income mortgage (both dated Feb. 1, 1913), had been effective during that month.

During 1914 the total railroad revenue of the company increased $7,237 or 0.19 per cent, the passenger revenue increasing $12,796 or 0.37 per cent and the miscellaneous revenue decreasing $5,559 or 2.09 per cent. The items of miscellaneous revenue showed the following percentages: Advertising, decrease of 7.4 per cent; other car and station privileges, increase of 2.2 per cent; sale of power, decrease of 52.6 per cent; miscellaneous revenue other than transportation, increase of 1 per cent, and miscellaneous transportation revenue, increase of 398.6 per cent. The report states that during the first seven months of 1914 the company's passenger traffic showed a consistent and satisfactory normal increase of 2.6 per cent over the same period for 1913. Owing to the depressed business conditions incident to the war, however, the last five months showed a decrease of 1.8 per cent. The principal loss in traffic was in that which under normal conditions flows to and from Hoboken, where since Aug. 1 there was a condition of almost complete stagnation because of the internment of the North German Lloyd and the Hamburg-American steamships.

By the exercise of great care in expenditures, the net income of the company was not adversely affected by the loss in traffic in the latter part of the year. The operating expenses decreased $7,687 or 0.53 per cent, so that the net railroad operating revenue increased 0.65 per cent. The decrease in operating expenses was secured by cuts of 1 per cent in maintenance of way, 17.6 per cent in traffic expenses, 1.3 per cent in transportation expenses and 5.8 per cent in general expenses, these being more than sufficient to overcome an increase of 7.7 per cent in maintenance of equipment. The ratio of operating expenses to total operating revenues was 38.58 per cent, as compared to 38.86 per cent in 1913. Taxes decreased $10,101 or 3.8 per cent, and income deductions other than bond interest decreased $24,645 or 9.4 per cent. As a result the net income applicable to bond interest increased $105,824 or 3.8 per cent.

During 1914 the company carried 59,900,257 passengers as compared to 59,434,152 in 1913, an increase of 0.8 per cent. The number of passengers per revenue car mile was 7.54 in 1914 and 7.44 in 1913. Following are other comparative traffic statistics: Passenger revenue per revenue car mile, 1914, $0.4393, 1913, $0.4352; gross railway operating revenue per revenue car mile, 1914, $0.4720, 1913, $0.4684; operating expenses (excluding taxes) per revenue car mile, 1914, $0.1821, 1913, $0.1820; net railway operating revenue per revenue car mile, 1914, $0.2899, 1913, $0.2864; passenger revenue per passenger, 1914, $0.0583, 1913, $0.0585. The company now has 18.757 miles of track and 226 steel passenger motor cars.

Capital Traction Company

The statement of income, profit and loss of the Capital Traction Company, Washington, D. C., for the year ended Dec. 31, 1914, follows:

Revenue from transportation:		
Passenger revenue		$2,242,205
Mail revenue		297
Total revenue from transportation		$2,242,502
Revenue from operation, other than transportation		13,490
Total operating revenue		$2,255,992
Operating expenses		1,150,192
Net operating revenue		$1,105,800
Miscellaneous income		17,146
Gross income, less operating expenses		$1,122,946
Deductions from income:		
Taxes	$120,581	
Tax, special police	21,527	
Interest	283,711	
Total deductions	$425,819	
Net income	$697,127	
Dividends	660,000	
Surplus for year	$37,126	
Surplus at beginning of year	82,023	
	$119,150	
Credit:		
Unredeemed tickets of old issues charged off	$29,244	
Net material and supplies adjustments	3,096	
Total	$32,340	
Surplus at close of year	$151,490	

The passenger receipts during 1914 decreased $53,751, as compared to 1913, on account of the general business depression. By a decrease in operating expenses this amount was reduced to a net loss of $25,877. The operating ratio for 1914 was 50.98 per cent. During the year $56,723 was added to the depreciation reserve, $21,699 was paid in bonuses to motormen and conductors under the merit system and $37,127 was added to surplus after the payment of a 5½-per cent dividend.

During 1914 the company made capital expenditures of $11,404. Air-brake equipments were installed on fourteen double-truck open cars. It is stated that the saving in operation expected from the adoption of the prepayment type of car and the installation of air brakes is now being realized in the material reduction in the number of accidents and in the amount paid out in settlement of claims. During the year such an amount showed a total reduction of $7,555 over 1913.

The company now owns and operates 44.943 miles of single track and operates 2.112 miles under trackage agreements, conduit construction, and also owns 10.924 miles of surface construction, a total of 57.979 miles for operating tracks. It has 705 cars, all passenger cars for actual service, except fifty service cars and twelve obsolete cars. A valuation of the company is being made by The J. G. White Engineering Corporation.

London Street Railway

The gross earnings of the London (Ont.) Street Railway for the year ended Dec. 31, 1914, were $375,895, an increase of $43,928 over 1913. Of this increase $43,839 came from passenger traffic. This unusual increase was mostly caused by the first year's operation of Sunday service, although the gross earnings made a satisfactory gain even without Sunday earnings. The outbreak of the European war caused some inconvenience in the way of financing but did not otherwise seriously affect the company's business. This is ascribed to the fact that the manufacturing industries of London are more of a domestic nature than those in many other cities.

The total operating expenses for 1914 amounted to $267,901, an increase of $32,984. Cost of power for transporation showed a decrease of $3,701 for the year, but the remaining expense items showed increases, as follows: way and structures, $5,193; equipment, $4,363; car service, $23,979, and general $3,150. The net earnings increased by $10,944 to $107,994, while interest deductions increased $2,835, giving net income of $76,045, an increase of $8,109.

During 1914 the company expended $47,912 in construction and equipment. The total revenue passengers carried in 1914 were 10,286,448, as compared to 9,078,489 in 1913, and the transfers in the two years were 1,697,963 and 1,462,562. The net earnings per car mile decreased from 6.13 cents in 1913 to 5.66 cents in 1914.

Atlantic Gas & Electric Company, New York, N. Y.—The securities deposited by the Atlantic Gas & Electric Company and its subsidiary, the Pennsylvania Utilities Company, to secure the first collateral mortgage bonds, dated 1912, were sold at auction on March 27 for $283,388 to the bondholders' protective committee. It is understood that these will soon be taken over by the General Gas & Electric Company under the plan noted in the ELECTRIC RAILWAY JOURNAL of Jan. 23. This latter company controls the Northwestern Ohio Railway & Power Company and the Rutland Railway, Light & Power Company.

Connecticut Valley Street Railway, Greenfield, Mass.—An application has been made to the Massachusetts Legislature for authority to consolidate the Connecticut Valley Street Railway and the Northern Massachusetts Street Railway. At present the eastern terminus of the Connecticut Valley Street Railway is at Miller's Falls and the western terminus of the Northern Massachusetts Street Railway is at Orange, twelve miles distant. It is reported that a physical connection will be made by the construction of a line to cost $400,000.

Hanover & McSherrystown Street Railway, Hanover, Pa.—The Hanover & McSherrystown Street Railway was sold on April 1 by J. W. Stacy, president York Trust Company, and associates to interests connected with Brooks & Company, Scranton, Pa. Negotiations had been in progress for the last year but were delayed by the adverse effect of the European war. On the new board of directors Mr. Stacy was succeeded by James A. Linen, Jr., Scranton, and the other new directors follow: C. R. Bedford, Scranton; Edward L. Allen, Hanover; J. E. Weisenfluh and F. B. Atherton, Scranton. Ellis S. Lewis, York, and Benjamin W. Frazier, Philadelphia, members of the old board, remain on the new one. The new board organized by electing the following officers: President, James A. Linen, Jr., Scranton; vice-president, J. E. Weisenfluh, Scranton, and secretary and treasurer, F. B. Atherton, Scranton. The sale of the street railway company carries with it the Hanover Light, Heat & Power Company. The capitalization of the companies is $135,000 of stock and $400,000 of bonds.

Interstate Railways, Camden, N. J.—It is announced by John A. Rigg, president Interstate Railways, that the response of holders of the preferred stock of the company to the proposition offered by the directors for an exchange of that stock for other preferred shares, without the retirement clause and thus a permanent investment, as noted in the ELECTRIC RAILWAY JOURNAL of Jan. 23, has been very favorable. The directors have selected the Real Estate Title Insurance & Trust Company, Philadelphia, as the depositary for the present preferred issue, temporary certificates being issued in exchange for the existing shares until the permanent certificates are ready for delivery. A stockholders' meeting has been called for April 23 to amend the company's certificate of incorporation to conform with the provisions of the new preferred stock.

Joliet & Eastern Traction Company, Joliet, Ill.—It is announced that the certificates of stock in the new Joliet & Eastern Traction Company, the corporation formed of bondholders of the old Joliet & Southern Traction Company, will be ready for distribution to the bondholders within thirty days. The amount of stock of the new company will be $350,000, the value fixed by the Illinois Public Utilities Commission, and this stock will take the place of the $800,000 of bonds. Very few of the bondholders accepted the proposition made to them some time ago to accept 10 per cent of their bonds in cash in lieu of stock in the new company.

Joliet, Plainfield & Aurora Railroad, Joliet, Ill.—The bondholders of the old Joliet, Plainfield & Aurora Electric Railroad have been notified that a second dividend has been declared by the receiver in bankruptcy proceedings. This new dividend makes a total of 36.80 per cent on the outstanding bond issue of $400,000, or $147,280 that have been distributed to the creditors out of the amount paid at the sale of the road. The company which succeeded this old corporation is the present Aurora, Plainfield & Joliet Railway.

Kansas City Railway & Light Company, Kansas City, Mo.—The protective committee for the first lien 5 per cent bonds of the Kansas City Railway & Light Company has issued a circular to holders urging that the bonds be deposited with the committee by May 15. The committee reviews the steps toward the reorganization of the Kansas City properties and states that to reach an acceptable agreement it may be necessary to foreclose the various mortgages.

Long Island Railroad, New York, N. Y.—A formal complaint in a suit in equity has been filed by Dick Brothers & Company, New York, against the Pennsylvania Railroad, the Long Island Railroad, the Pennsylvania Tunnel & Terminal Railroad, and the present thirteen directors of the Long Island Railroad. The complaint contains five counts and alleges a misuse of the property and the money of the Long Island Railroad for the specific advantage of the Pennsylvania Railroad and the tunnel company which it controls. The plaintiffs ask for a receiver for the Long Island Railroad and also demand two separate injunctions, one to restrain the present directors from continuing practices complained against and the other to restrain them from advancing money for further expenditures of the Long Island Railroad for the benefit or purposes of the Pennsylvania Railroad, or from paying any principal or interest on account of advances made by the Pennsylvania Railroad.

Los Angeles (Cal.) Railway Corporation.—The Los Angeles Railway Corporation has filed an application with the California Railroad Commission requesting authority to sell $250,000 of its first and refunding mortgage gold bonds for the purpose of refunding $250,000 of first mortgage 6 per cent bonds of the Los Angeles Traction Company, falling due on May 1.

Nashville Railway & Light Company, Nashville, Tenn.—A dividend of 1 per cent has been declared on the $4,000,000 of common stock of the Nashville Railway & Light Company, payable on April 1. This compares with dividend payments of 3 per cent in 1910, 3½ per cent in 1911, 5½ per cent in 1912, 7¼ per cent in 1913 and none in 1914.

Omaha & Lincoln Railway & Light Company, Ralston, Neb.—The Nebraska State Railway Commission has authorized the Omaha & Lincoln Railway & Light Company to issue securities amounting to $130,000, divided as follows: $97,500 of 5 per cent bonds, $22,000 of 6 per cent preferred stock and $10,500 of common stock. This makes the total capitalization of the company $330,000, upon which amount the commission requires an allowance of 7 per cent to be set up for maintenance and depreciation. The new issue covers property recently constructed, largely transmission lines, a very small portion of this amount having been expended on the railway properties. The order of the commission requires that separate accounts be kept of the railway and the lighting properties.

Pacific Gas & Electric Company, San Francisco, Cal.—It is officially announced that the Pacific Gas & Electric Company has completed arrangements for the redemption on April 22, 1915, at 100¼ plus accrued interest, of an additional $1,500,000 of its one-year 5 per cent notes, maturing on Dec. 15, 1915. The redemption of these notes eight months before they are payable will result in a large saving of interest to the company. The company is reported to have cash balances of approximately $3,000,000, which accounts for its ability to get these notes out of the way. After this redemption there will be only $1,500,000 of these notes left, as compared with $7,000,000 outstanding a year ago. It is anticipated that this balance will also be called in very shortly.

Porto Rico Railways, Ltd., Toronto, Ont.—The gross earnings of the Porto Rico Railways, Ltd., which controls the Porto Rico Railway, Light & Power Company, San Juan, Porto Rico, for the year ended Dec. 31, 1914, amounted to $772,905, a decrease of $77,216 over 1913. The operating expenses decreased $45,782 to $404,071, and other revenue decreased $38,960 to $8,146, giving a net income of $376,000, a decrease of $70,395. This falling off is attributed chiefly to the general financial depression aggravated by the low price of sugar when last year's crop was marketed. An amount of $361,529 was charged to capital accounts during the year. The freight traffic decreased from 165,958 tons to 101,524 tons and the number of passengers carried from 7,283,479 to 6,632,460. Passenger earnings per car-mile dropped from $0.3013 to $0.268.

Tri-State Railway & Electric Company, East Liverpool, Ohio.—The sale of the property of the Tri-State Railway & Electric Company at the county courthouse in Cleveland on March 30, as announced in the ELECTRIC RAILWAY JOURNAL of March 27, was postponed until April 7 on account of the presence of only one bidder.

Washington & Maryland Railway, Washington, D. C.—The Public Utilities Commission of the District of Columbia has found the following values, as of Aug. 15, 1914, for the Washington & Maryland Railway: amount of money expended in the construction and equipment of the utility as shown by the utility's and the contractors' records, $119,558; reproduction cost of physical property, $60,403, and reproduction cost of physical property less depreciation, $55,298. In determining the total reproduction cost, however, the commission decided that the following percentages should be added: 5 per cent for engineering and superintendence, 3 per cent for interest during construction and 3 per cent for legal and organization expense, insurance, omissions and contingencies. This total of 11 per cent added to the foregoing figures gave a reproduction cost of $67,047 and a reproduction cost less depreciation of $61,381. The commission determined the proper rates of depreciation to be 3.34 per cent for way and structures and 4.25 per cent for power plant equipment.

West End Street Railway, Boston, Mass.—The 8700 new shares of common stock of the West End Street Railway, which, as noted in the ELECTRIC RAILWAY JOURNAL of March 27, were authorized by the Massachusetts Public Service Commission to provide for additions, were sold at auction on April 1 at prices ranging from 63¾ to 64½. The shares were disposed of in twenty-eight different lots and among fifteen purchasers, the largest purchasers being R. L. Day & Company with 3790 shares, Moors & Cabot with 1035 shares, and Kidder, Peabody & Company with 1000 shares. The sales price compares with 66⅛ to 68 in April, 1914, and 71⅛ to 78¼ in February, 1913.

West India Electric Company, Ltd.—According to the annual report of the West India Electric Company, Ltd., Kingston, Jamaica, the gross receipts for 1914 increased 1.43 per cent over 1913 to $288,924, while the operating expenses increased 5.06 per cent to $155,228. The net earnings, therefore, decreased 2.48 per cent to $133,696. The total of passengers carried decreased 3.39 per cent to 5,030,391, and the railway department receipts decreased $5,287. The receipts of the lighting department increased $7,698 for the year. The payment to the government of the 4 per cent tax on the railway receipts amounted to $8,326, a decrease of $190. The company announces its intention to add to its contingent fund until it reaches $100,000.

DIVIDENDS DECLARED

American Light & Traction Company, New York, N. Y., quarterly, 1½ per cent, preferred; quarterly, 2½ per cent, common, also 2½ per cent in stock.

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

Cincinnati, Newport & Covington Light & Traction Company, Covington, Ky., quarterly, 1⅛ per cent, preferred; quarterly, 1½ per cent, common.

City Railway, Dayton, Ohio, quarterly, 1½ per cent, preferred; quarterly, 1½ per cent, common.

Dallas (Tex.) Electric Company, 3 per cent, first preferred; 2½ per cent, second preferred.

Dayton & Troy Electric Railway, Dayton, Ohio, quarterly, 1¼ per cent, preferred.

Jacksonville (Fla.) Traction Company, quarterly, 1½ per cent, preferred.

Lake Shore Electric Railway, Cleveland, Ohio, quarterly, 1½ per cent, first preferred.

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

Nashville Railway & Light Company, Nashville, Tenn., quarterly, 1¼ per cent, preferred; one-half of 1 per cent, common.

Philadelphia Company, Pittsburgh, Pa., quarterly, 1½ per cent, common.

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

Virginia Railway & Power Company, Richmond, Va., 1½ per cent, common.

ELECTRIC RAILWAY MONTHLY EARNINGS

AMERICAN RAILWAYS, PHILADELPHIA, PA.

Period			Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1m.,	Feb.,	'15	$391,191	.....	.....	.....	.....
1 "	"	'14	383,248	.....	.....	.....	.....
2 "	"	'15	834,477	.....	.....	.....	.....
2 "	"	'14	824,885	.....	.....	.....	.....

AURORA, ELGIN & CHICAGO RAILROAD, WHEATON, ILL.

1m.,	Feb.,	'15	$130,652	*$127,705	$2,947	$2,989	†$42
1 "	"	'14	133,794	*132,572	1,222	346	876
8 "	"	'15	1,372,173	*1,188,451	183,722	27,659	156,063
8 "	"	'14	1,423,742	*1,190,610	233,131	2,775	230,356

BERKSHIRE STREET RAILWAY, PITTSFIELD, MASS.

1m.,	Feb.,	'15	$62,068	$56,004	$6,064	$17,285	††$11,097
1 "	"	'14	67,870	63,623	4,247	15,976	††11,681
8 "	"	'15	656,455	591,099	65,356	137,931	††71,395
8 "	"	'14	684,776	598,367	86,409	122,331	††34,845

CITIES SERVICE COMPANY, NEW YORK, N. Y.

1m.,	Feb.,	'15	$388,164	$13,047	$375,118	$40,833	$334,285
1 "	"	'14	391,259	9,031	382,228	29,167	353,061
12 "	"	'15	3,942,499	130,266	3,812,234	443,333	3,368,900
12 "	"	'14	2,657,931	86,690	2,571,241	181,396	2,389,845

CLEVELAND, SOUTHWESTERN & COLUMBUS RAILWAY, CLEVELAND, OHIO

1m.,	Feb.,	'15	$83,791	$54,978	$28,813	$32,153	†$3,340
1 "	"	'14	82,929	55,425	27,504	31,588	†4,084
2 "	"	'15	177,105	114,136	62,970	64,207	†1,237
2 "	"	'14	176,981	115,567	61,415	63,483	†2,068

CONNECTICUT COMPANY, NEW HAVEN, CONN.

1m.,	Feb.,	'15	$556,153	$380,180	$175,973	$98,258	‡$99,135
1 "	"	'14	535,364	458,789	76,575	88,366	‡9,379
8 "	"	'15	5,353,002	3,927,701	1,425,301	786,235	‡812,277
8 "	"	'14	5,409,522	4,032,557	1,376,965	713,893	‡837,595

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

1m.,	Feb.,	'15	$21,129	$22,229	†$1,099	$7,979	††‡9,052
1 "	"	'14	19,731	22,235	†2,504	7,800	††‡10,275
8 "	"	'15	259,009	208,788	50,221	63,109	††‡12,567
8 "	"	'14	252,451	201,958	50,494	61,694	††‡10,858

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

1m.,	Feb.,	'15	$32,206	$41,767	†$9,561	$6,237	††‡$15,638
1 "	"	'14	25,708	45,180	†19,471	7,124	††‡26,160
8 "	"	'15	292,817	347,352	†54,534	51,358	††‡104,371
8 "	"	'14	260,199	391,052	†130,852	43,901	††‡170,751

RHODE ISLAND COMPANY, PROVIDENCE, R. I.

1m.,	Feb.,	'15	$358,756	$290,972	$67,783	$117,299	††‡$48,527
1 "	"	'14	358,331	321,679	36,651	110,314	††72,854
8 "	"	'15	3,541,838	2,666,266	875,582	944,638	††2,851
8 "	"	'14	3,596,063	2,693,767	902,295	858,171	‡130,646

TWIN CITY RAPID TRANSIT COMPANY, MINNEAPOLIS, MINN.

1m.,	Feb.,	'15	$714,878	$493,881	$220,997	$47,575	$173,422
1 "	"	'14	678,838	465,476	213,362	44,909	168,453
2 "	"	'15	1,484,170	1,025,421	458,749	100,575	358,174
2 "	"	'14	1,424,844	959,085	465,760	94,525	371,235

*Includes taxes. †Deficit. ‡Includes other income.

Traffic and Transportation

THE JITNEY BUS

Houston and Salt Lake City Regulatory Ordinances Passed —San Francisco Ordinance Introduced—Additional City Reports

The ordinance intended to regulate the jitney in Houston, Tex., has been adopted by the City Council, and automobile owners who desire to comply with the terms of the ordinance have thirty days in which to make their arrangements. The ordinance provides that jitney operators shall furnish liability insurance in the sum of $10,000 or give a personal bond for that amount for the protection of the public. It also carries the usual wheel tax of $12 a year for each car, and in addition a provision fixing the tax for ordinary touring cars for jitney service at $1 a month and the tax for the buses carrying ten or more passengers at $50 a year. Under the ordinance the Public Service Commissioner of the city is vested with authority to grant licenses and permits, regulate schedules and designate terminals of each line, subject to appeal to the City Council. Each application for a permit must show the names of each and all who are to drive the car, the type of car, horsepower of the machine, factory number, county license number, seating capacity, terminals of the line, streets to be used and the schedule of departure and arrivals. Before receiving the permit to operate the drivers are to be examined by a board composed of the superintendent of police, the city attorney and the person in charge of the city automobile repair shop. No passengers will be allowed to ride on the running boards, fender or door and only one passenger will be allowed to ride in front with the driver. One conviction of a driver suspends his license for ten days and the third conviction will revoke the license permanently. Any person who violates any provision of the ordinance is subject to a fine of not less than $5 or not more than $25. Representatives of the Houston Jitney Association have served notice on the city officials that they will ask for a referendum election to determine whether the voters of the city approve the ordinance. The members of the association claim that it will be impossible for jitney owners and operators to comply with the provisions of the ordinance. Under the city charter if 10 per cent of the voters ask for a referendum the City Council is obliged to order an election to be held.

On March 31 the City Commission of Salt Lake City, Utah, passed an ordinance regulating the operation of motor buses for hire over the streets of Salt Lake, effective on April 1. The measure does not relate to street cars, interurban cars or motor vehicles used exclusively as hotel buses, or sightseeing cars, or to autos rented from a stand in the streets, or from any public or private garage, where the destination or route of such cars is under the direction of the passenger. It is aimed solely at the regulation and control of the jitneys operating in competition with the street railways. It provides for the licensing of such cars at the discretion of the City Commission, such license to be limited to certain routes and terminals designated in the application for license. Regular schedules must be maintained by all such cars from six o'clock in the morning until midnight every day, including Sundays and holidays. The application for license must contain information as to the name, age and residence of the owner and operator, type of car, power and seating capacity, license number, factory number, route, terminals and schedule to be maintained. Cars with a seating capacity of four pasengers or less are to pay the city $75 a year license, cars with more than four or less than ten passenger capacity are to pay $100, and cars of more than ten passenger capacity are to pay $125. After dark every car is to be artificially illuminated on the inside and also on the outside to show the route and terminals. The ordinance makes it unlawful to run on any streets other than those designated in the route. It is unlawful to run past or within 25 ft. of any other motor bus or any street car for the purpose of reaching a prospective passenger first. Policemen, firemen and employees of the city health department when wearing uniforms must be carried free. Drivers are forbidden to charge or receive any amount in addition to the regular passenger fare for the transportation of hand baggage. It is unlawful to cross any railway track without first bringing the car to a full stop. A bond of $5,000 is required for the protection of passengers against damage from injury to themselves or property. The license of any owner or operator may be revoked by the city at any time if it appears that the owner or operator is a careless or reckless driver. Any violation of the ordinance is deemed a misdemeanor and is punishable by a fine not exceeding $50 or thirty days in jail, or both. On second conviction the license may be cancelled.

The public utilities committee of the San Francisco Board of Supervisors tentatively adopted a proposed jitney bus ordinance on March 31. The outstanding features of the proposed ordinance provide for insurance of the jitney patrons against accident and the payment of an annual license by the jitney owners, graduated according to seating capacity. The insurance feature is designed to provide a policy which shall yield a maximum of $5,000 in case of accident causing injury or death, and $10,000 if two are hurt or killed. In addition to this the policy must provide for payment of $1,000 in case of property damage. It is provided that jitney owners shall pay the premiums on these policies, but in event of recovery in court for damages it is to be provided that the injured party or his heirs, in case of death, may receive their insurance from the insurance company itself. The license feature of the proposed ordinance provides that owners of jitneys shall pay a license fee to the city of from $40 to $100 per annum, according to the seating capacity of their vehicles. Other provisions prescribe the duties of the police relative to routing the traffic.

In addition to the general rules governing the operation of the jitney promulgated under the police power, Director Talbert of the department of streets and sewers of St. Louis has had introduced in the Municipal Assembly an ordinance to require the jitneys to be inspected by the city as to their safe running condition, but no regulation as to charges or service is provided. Richard McCulloch, president of the United Railways, is quoted in part as follows:

"So far the city has not seen fit to order any regulation of the jitney as to the service and any irresponsible person is permitted to operate a jitney. I believe that the powers of the State Public Service Commission are such as would allow it to set aside any city ordinance. That matter, however, has never been tested, but the United Railways will urge that it be treated fairly in any regulation as to transportation service in St. Louis."

John M. Atkinson, chairman of the Public Service Commission of Missouri, is reported to have said that the regulation of the jitneys would lie with the city of St. Louis and that the jitneys were not under the jurisdiction of the commission.

The bill which has been introduced into the Legislature of Iowa authorizing cities and towns of that State to regulate the jitney follows in full:

"Cities and towns, including cities acting under the commission form of government, and cities acting under special charter, shall have power to regulate, tax and license so-called jitney buses, and all motor vehicles operating upon the streets and avenues of such cities and towns and engaged in carrying passengers for hire, on a plan similar to that followed by street railway companies; to fix and determine the streets and avenues upon which they shall be permitted to operate; to require such vehicles to be operated over reasonable routes, and upon reasonable schedules; to require the owners or operators thereof to file with such city or town a proper indemnity bond for the protection of the city or public against damages resulting from negligence in the operation of such vehicles; and to impose penalties within the limits of section 680 of the code, for the violation of any ordinance enacted hereunder."

The special joint committee of the City Council of Little Rock, Ark., has agreed upon the terms of the ordinance to be passed by that city to regulate the jitney. The surety bond is fixed in the sum of $5,000 for each automobile let for hire. Other provisions include the definition of streets on which public automobiles may be operated, limitation of the number of passengers the cars may carry and require-

ments for licenses. The seating capacity specified by the manufacturers of the cars is to be the maximum number of passengers which may be carried. Licenses are fixed at $3 a month for drivers of five-passenger cars, $4 a month for seven-passenger cars, $6 a month for eight to twelve-passenger cars and $8 a month for larger cars. These licenses are to be payable quarterly and are in addition to the regular vehicle licenses. The inspection of public automobiles is provided for through the creation of an automobile inspector, who will pass upon the fitness of automobiles for public service and the qualifications of chauffeurs. The penalty for violation of any provision of the ordinance is fixed at not less than $5 or more than $25.

The bill to regulate the jitneys and to require owners to file bonds to cover possible damages and to pay 10 per cent of their gross earnings as a tax has been negatively reported by the committee on roads of the House of Pennsylvania.

Operators of jitneys in Memphis are required by a ruling of R. A. Utley, fire and police commissioner, to turn in their State license numbers to the department, where they are supplied with special license plates, red letters on a green plate, the words "Public Service" appearing perpendicularly at either side. The old numbers will be carried on the records of the department and the plates must still be kept by the owners of the car. Owners of buses may not change the plates at will but when they enter "public service" must remain in it until they go on record at the department as having relinquished the jitney plates which indicate the character of their machines. These plates, it is stated, will give the public and the police definite information as to the character of any automobile they may see on the street. The new plates are supplied without cost to the jitney owners.

In the Electric Railway Journal for March 27 the jitney situation in various cities was outlined by publishing data on the number of buses in operation, the character of service, the possibility of regulation and the like. The following list which appears in the Erie *Daily Times* supplements this, the data having been obtained by the Buffalo police from the police chiefs of the cities named:

Seattle—800 cars. Ninety-two people injured on streets. Ten extra officers detailed to traffic duty. Stolen autos found in jitney service. Traffic congested. $2,500 bond required.

Fresno, Cal.—Fifteen cars. Can use only routes not covered by street cars. $10,000 bond required.

Los Angeles—700 cars. Twenty-five per cent increase in accidents. Schedule over definite route.

Birmingham—100 cars. Traffic congested and several accidents occasioned. Regulatory ordinance now being considered.

Spokane—Ninety cars. Traffic slightly congested. No accidents. $2,500 bond required.

San Antonio—120 cars. Traffic heavily congested. Great increase in number of accidents. Two killed. Ordinance requiring bond and other regulations now being printed.

Oakland—300 cars. Forty accidents in January. One hundred and twenty-eight jitneys gone out of business. Traffic is congested. One hundred and twenty-five arrests for violations of ordinance. $10,000 bond required.

Tacoma—Seventy-five cars. No special ordinance as yet. Hindrance to traffic.

Baltimore—Twenty-five cars. New venture here. Regulation not as yet prepared. Several accidents since operation.

Salt Lake—Fifty cars. Ordinance just passed. Had few accidents, but nothing serious.

New Orleans—250 cars. Regulations being drawn. Have added much to street congestion. Had several accidents, one fatality.

Vancouver—350 cars. Regulations now being prepared. Traffic much congested in principal streets. Number of minor accidents.

Nashville—Twelve cars. Lengthy ordinance now in press. No traffic trouble.

After a trial of several months all of the jitney bus operators in San Angelo, Tex., have suspended service.

A peculiar turn has been given to the question of liability in connection with jitney bus accidents in a suit filed at Seattle on March 29. Victor Clements, a laborer, has asked for damages in the sum of $20,500 against the city. He contends that the city, in permitting its streets to be put to an unlawful use by the operation of automobiles as common carriers without regulation and without franchise, was responsible for injuries which he sustained when he was struck by a jitney.

The federal trustees of the Rhode Island Company and officials of the Rhode Island Jitney Bus Association appeared before the committee on ordinances of the City Council of Providence on April 6 and discussed regulations for jitney bus service. The meeting lasted four hours. The jitney men proposed a license fee of $10 per bus per year in place of the present $3 charge. About 650 jitneys, mainly Ford cars, are now being run. The bus representatives also favored requiring each jitney owner to take out a bond of $1,000 for each car operated, to serve as a guarantee of damages in case of injury to persons through the fault of jitney operators. Stringent rules to insure competent operators, a 5-cent fare and regular routes throughout the city were also recommended. A minimum age limit of twenty years was suggested for jitney operators. The railway company's representatives advocated a $100 license fee per bus, urged a higher bond value, and recommended the enforcement of existing ordinances relative to hacks and carriages in connection with jitneys, particularly in relation to the avoidance of congestion and the restriction of standing places.

On April 2 the ordinance committee of the City Council of Portland, Maine, held a hearing on jitney buses. A. H. Ford, general manager of the Cumberland County Power & Light Company, said that the local street railway service is in danger of curtailment, with resulting discharge of employees. Other speakers urged the importance of regulation.

COPPER ZONE SYSTEM EXTENDED

The Public Service Commission of Indiana on March 29 granted the petition of the Terre Haute, Indianapolis & Eastern Traction Company for a new local and interdivision passenger tariff, based on the copper zone instead of the nickel zone system. As shown in the order of the commission, the fares to be charged and collected by the company on and after May 1, 1915, are to be computed on the following basis: at the rate of 2 cents a mile for the distance actually traveled, as nearly as practicable, one-half mile at 1 cent each to be taken as the unit, 5 cents, however, to be the minimum fare. In the case of fractional miles, from 0.75 (regarded as 0.8) of any mile to 0.24 (regarded as 0.2) of the next mile, both inclusive, fractions are to be disregarded, and the intervening whole mile regarded as the distance. In the case of fractional miles, from 0.25 (regarded as 0.3) of any mile to 0.74 (regarded as 0.7) of the same mile, both inclusive, the fractional distance is to be regarded as one-half mile and the total distance taken as the number of whole miles and one-half. For instance, any distance from 5.3 miles to 5.7 miles, both inclusive, is to be regarded as 5.5 miles, and any distance from 5.8 miles to 6.2 miles, both inclusive, is to be regarded as 6 miles.

The minimum fare is to be 5 cents, and due consideration is to be given to competitive mileage of other steam or electric railroads. The fares for children between five and twelve years of age are to be at the rate of 1 cent a mile, computed in the method outlined above.

Each passenger riding to or from points outside the corporate limits of any municipality to or from points within the corporate limits of such municipality upon a car making a continuous trip between such points, is to be regarded as a continuous passenger between such points, and is to be charged and pay a continuous passage fare computed upon the mileage basis, from the point outside the municipality to the station maintained or designated by the company in the municipality.

Petitions for establishing the copper zone system of fares have also been filed with the Public Service Commission by the Indianapolis & Cincinnati Traction Company and the Fort Wayne & Northern Indiana Traction Company, but no hearings have yet been held by the commission on these petitions.

EXPERIENCE MEETINGS IN SCRANTON

Paul Adrian, writing in the Elmira (N. Y.) *Telegram* of April 4, said in part:

"W. E. Boileau, general manager of the Scranton (Pa.) Railway, has started an educational school that is bringing results. Every Monday afternoon, Mr. Boileau calls together two or three hundred of his employees. All the bosses are represented. Stenographers are there. All complaints are heard and placed on record. The employees talk freely. Their suggestions are taken seriously. They report where there is a weak spot. The bosses come forward with their suggestions. Mr. Boileau then gives a talk—a practical one. He tells the men what the company wants for the wages paid. He tells the conductors they are the servants of the passengers, while on the car, and that they are paid for civility and not talking back. He shows them it is their business to make car riding as popular as possible, for the more fares collected the more conductors and motormen will be employed. He has a heart to heart talk with his men. He interests them in air, electricity, machinery, clean cars, well ventilated cars and the comfortable temperature of cars. The result of the talks—the getting together—is made manifest in many ways. The employees and the bosses are learning to understand each other, and all work for the interests of the company, and help add to its business. With Mr. Boileau safety is first, and he talks interestingly on the subject and tells his audience it is the careful and not the venturesome man who is profitable to the company. In all industries, in all trades, in all business there should be more heart to heart talks between employers and employees."

POLITENESS

An exceedingly practical discussion of the value of politeness is being placed before the employees of the Louisville (Ky.) Railway under the signature of J. T. Funk, superintendent of the company. It is brief and to the point. It reads:

"Politeness is a gift that all persons do not possess, but it is something that can be acquired by practice. The operative of a car who is polite and courteous to his passengers is in possession of an asset of great value to the individual; such an employee is soon discovered by the riding public and is appreciated by every passenger with whom he comes in contact. In many cases when such a one has an accident and is desirous of having witnesses, he can secure them without difficulty. In many instances passengers will volunteer their statements in his behalf. On the other hand, when it is known that an employee is not polite and is cross, it becomes difficult to secure information exonerating him, even though he may not be at fault for the accident. Certain it is that the general public appreciates a polite man on either end of the car. Conductors and motormen can add greatly to their own comfort as well as to that of passengers by being polite under all circumstances."

BENEFIT ASSOCIATION AT ROCKFORD

The Rockford (Ill.) City Traction Company has organized a mutual benefit association among its employees, having previously built a fine clubroom for them. The clubroom provides a library, a poolroom, card tables, private steel lockers, shower baths and a floor that is being used monthly for dances. A male chorus and an orchestra have been organized and rehearsals are being held. There are social gatherings every month. Besides the entertainment and clubroom privileges the employees are united in a mutual benefit association that provides for the employee during accident or sickness disability and insures against the death of an employee, his wife or any child under fifteen years of age. Of the 200 employees 180 are members of the association. An employee by paying $1 a month into the association receives $1 a day in accident benefits from the first day, and $1 a day for sickness after the fifth day. If the employee is sick longer than ten days he is paid at the same rate from the first day of sickness. If a member dies his beneficiary receives $100, while if the wife or a child under fifteen years of age dies the employee is paid $50 in death benefits.

Two death benefit claims have been allowed for the wives of two employees. One employee has died since July 1, 1914, the date of organization. About $600 has been paid in one form or another as benefits since the association was organized, and there is more than $600 in the treasury. At the last entertainment an oyster supper was served from 4 p. m. to 8 p. m., after which a musical program was rendered and dancing enjoyed. The company arranges for a picnic for the employees each year, and this also brings the employees and their families in closer and more congenial relations. With an orchestra organized and rehearsing and the male chorus perfected it is hoped to give a minstrel show or some entertainment of like nature next winter. A new schedule of runs has been worked out by which a day of ten to ten and one-half hours has been put into effect. Under this plan the "swing" run has been practically eliminated so that there are more men than formerly off duty during the evening.

SAFETY ZONES IN LOUISVILLE

Extension of the safety-first zone plan of the Board of Public Safety of Louisville to the wide streets of the city is projected along the lines of an experiment the traffic department is making at the intersection of Fourth Street and Broadway. The zones have been marked for some time at the intersections of the narrow streets, posts with flags at the tops having been in use for several months to indicate where traffic must stop as street cars do at the intersections. On the wide streets, such as Broadway, Jefferson and Market Streets, the board did not believe it necessary to mark off a space where pedestrians could feel safe, for the reason that there is plenty of room at the sides of the railway tracks. Confusion has resulted, however, and now the Board of Public Safety is putting into use a series of posts connected with chains, to mark off the safety zones at such intersections. The two end posts are topped with flags and are connected with the two remaining posts by chains, the four posts and the chains serving to enclose a space adjacent to the car tracks and with the open side toward the tracks. It is probable that, after a somewhat longer trial, the system will be extended to other broad thoroughfares in the central part of the city.

Limiting Car Capacity.—Health Commissioner Goldwater of New York put into effect on April 5 his order limiting the carrying capacity of the Eighth and Sixth Avenue car lines of the New York Railways. Both the health board and the company had men on hand to check the service.

Increase in Wages.—Platform men of the Mahoning & Shenango Railway & Light Company, Youngstown, Ohio, received an advance of 1 cent an hour in wages on April 1. The advance was made in accordance with the terms of a contract signed with the motormen and conductors on April 1, 1914, and affects several hundred men.

Safety Campaign in Toledo.—The Columbus Railway, Power & Light Company, Columbus, Ohio, is preparing to resume vigorously the safety-first campaign begun some time ago. Poster advertising will be used extensively in the campaign. F. M. Babbitt is in charge of the safety department. H. W. Clapp, superintendent, said that the accidents during February showed a decrease of 35 per cent over those of the same month a year ago. He attributes this largely to the safety-first campaign.

San Francisco "Transit Tidings."—The United Railroads, San Francisco, Cal., has revived *Transit Tidings*. The company says: "*Transit Tidings* again steps into the field of San Francisco publicity. Its mission is educational, to acquaint the people of this city and visitors, in a concise way and by means of maps, with the interesting points of our city and with the best and cheapest means of reaching them. It will serve as a guide of ready reference for exposition travel. Put it in your pocket; you will find use for it many times each day."

Side Destination Signs in Kansas City.—The Metropolitan Street Railway, Kansas City, Mo., is installing side destination signs on such cars as were not already so equipped. All cars bought or reconstructed in the past five years have had the side signs. Some of the older cars had

signs only on the front and rear ends. A type of sign that can be installed with small change in the cars is being used for the present purposes. They are being put next to the rear entrances as being most convenient for observation of the passengers waiting for or boarding cars.

Accidents in New York.—Twenty-one persons were killed by automobiles on the streets of New York City during March, according to the report of the National Highways Protective Society. Trolleys caused the death of four, and wagons caused the death of five. During the corresponding month of 1914 the total number of persons killed was twenty-seven. The number of persons killed on the streets and highways of New York State outside of New York City during the past month was thirteen. Of this number, nine were deaths from automobiles, two by trolleys, and two by wagons.

Colonel Hayward's First Case.—Colonel William Hayward of the Public Service Commission of the First District of New York, the successor on the commisison to Milo R. Maltbie, held his first public hearing on April 5. It was on the application for a rehearing on the order of the commission of Nov. 20 that the New York & Queens County Railway improve its service. Commissioner Cram's conduct of the same matter had been such that Colonel Hayward, as counsel for the legislative investigating committee, had founded one of his charges against that commissioner upon it. The company contested the order on the ground that it involved the purchase of equipment, which it claimed it could not afford. In concluding the hearing Colonel Hayward said that he saw no reason for changing the original order of the commission.

Safety-First Campaign in Fitchburg.—The first meeting in Massachusetts of men representing all kinds of traffic for the purpose of formulating plans for a safety-first campaign and the prevention of accidents was held on March 26 in Fitchburg, Mass. On the suggestion of A. Q. Thayer, chief of the police department, it was voted to petition the city government to place signs of the "silent policeman" style at dangerous places. Stereopticon views were thrown on a screen by Harrah K. Bennett, claim agent of the Fitchburg & Leominster Street Railway, who called the meeting. He said that he did not wish it to appear that it was a railway idea entirely. The co-operation of the railway companies, motorists, motorcyclists and all who used the streets was needed. Commenting editorially on the meeting the Fitchburg *Daily News* said in part: "As was rather neatly set forth in a letter by Mr. Bennett, first aid to the uninjured is the object in view. Through the hearty co-operation which the campaign will receive from the Fitchburg Automobile Club the local motorcycle club and civic organizations, the safety-first slogan is bound to grow in importance in this city until we shall see the elimination of preventable accidents. This work should have the hearty indorsement of every citizen."

Hauling Gravel and Sand.—The Chicago, Lake Shore & South Bend Railway, Michigan City, Ind., announces that it has just closed a contract to furnish and haul all of the gravel and sand to be used in paving a 15-mile section of the Lincoln Highway which parallels its line. This section of the Lincoln Highway, which is being constructed from coast to coast, is to be paved with an 8-in. concrete slab, 18 ft. wide, and with a 3-ft. gravel border on each side, the same depth or thickness as the concrete pavement. This will require approximately 1600 carloads of gravel and sand and about 250 carloads of cement. The gravel and sand will be furnished by the railway company from a gravel pit on its line near South Bend, Ind., and the cement will be delivered to it at Michigan City for distribution to points most convenient for highway construction forces. In connection with this contract the railway also announces that it has approximately 500,000 yd. of very fine gravel and torpedo sand in its pit and in the gravel land adjoining. The company has just undertaken the erection of a modern gravel washing and screening plant, at an estimated cost of $15,000, with which it proposes to supply the territory served by its line with washed gravel and sand. The screening plant will have a capacity of approximately 600 yd. per day, and with it the company hopes to develop a freight business of 3000 carloads a year.

Personal Mention

Mr. S. C. Dows has been appointed purchasing agent of the Iowa Railway & Light Company, Cedar Rapids, Ia.

Mr. J. E. Weisenfluh has been elected vice-president of the Hanover & McSherrystown Street Railway to succeed Mr. William D. Hinds.

Mr. T. H. Rabe has resigned as treasurer of the Birmingham Railway, Light & Power Company, Birmingham, Ala., to go into business for himself.

Mr. F. B. Atherton has been elected secretary and treasurer of the Hanover & McSherrystown Street Railway, Hanover, Pa., to succeed Mr. Ellis S. Lewis.

Mr. R. S. Cook, purchasing agent of the Iowa Railway & Light Company, Cedar Rapids, Ia., has been appointed assistant general manager of the company.

Mr. N. H. Hawkins, formerly credit manager of the Birmingham Railway, Light & Power Company, Birmingham, Ala., has been elected assistant secretary and assistant treasurer of the company.

Mr. John W. Stacy has resigned as president of the Hanover & McSherrystown Street Railway, Hanover, Pa., following the sale of this company by himself and associates to Brooks & Company, Scranton, Pa., as noted elsewhere in this issue.

Mr. James A. Linen, Jr., Scranton, Pa., has been elected president of the Hanover & McSherrystown Street Railway, Hanover, Pa., to succeed Mr. John W. Stacy, following the sale of the company by Mr. Stacy and his associates to Brooks & Company, Scranton, Pa.

Mr. J. P. Ross, formerly secretary of the Birmingham Railway, Light & Power Company, Birmingham, Ala., has been elected secretary and treasurer of the company, succeeding in the latter capacity Mr. T. H. Rabe, whose resignation is noted elsewhere in this column.

Mr. William O'Connell, county treasurer of Cook County, Ill., has been appointed a member of the Illinois Public Utilities Commission to succeed Mr. James E. Quan, resigned. Mr. Quan was appointed chairman of the commission to serve temporarily, his resignation coming voluntarily after a little more than a year's service.

Mr. Allan Purvis, recently manager of the interurban lines of the British Columbia Electric Railway, Vancouver, B. C., has been appointed superintendent of the Canadian Pacific Railway lines west of Toronto to Windsor. Mr. Purvis was in the employ of the Canadian Pacific Railway previous to his association with the British Columbia Electric Railway.

Mr. H. H. Sanborn, rate expert, and Arthur B. Roehl, assistant rate expert of the California Railroad Commission, have tendered their resignations to take effect the latter part of April. Mr. Sanborn and Mr. Roehl have been with the Railroad Commission for more than four years, during which time they have assisted in all important railroad rate hearings and investigations. Mr. Sanborn and Mr. Roehl propose to form a partnership for the practice of law in San Francisco.

Mr. J. G. Herrin, assistant superintendent of the Kansas City-Western Railway, Kansas City, Kan., has been appointed general superintendent of the company, and Mr. John M. Sheehan, claim agent of the road seven years ago, returns as assistant superintendent and general claim agent. Mr. Herrin succeeds J. W. Richardson, who died two months ago. All three men were in train service on the cable lines of Kansas City more than twenty years ago when the present management of the Leavenworth line had charge of that property. Mr. Richardson and Mr. Herrin were gripmen on cable trains, and had risen together in the service of the interurban.

OBITUARY

J. A. Gaboury, who is said to have been largely responsible for the successful promotion of the first electric railway in Columbus, Ga., is dead.

John Englis, Brooklyn, N. Y., is dead. Mr. Englis was well known throughout the East in coastwise and inland

shipping circles and as one of the promoters of the Brooklyn Union Elevated Railroad and other subsidiaries of the Brooklyn Rapid Transit Company.

Walter Spooner Allen, formerly statistician of the American Telephone & Telegraph Company, died at San Diego, Cal., on March 31. Mr. Allen was born in New Bedford, Mass., and was graduated from the Massachusetts Institute of Technology. He studied at the university of Leipzig and taught for three years at the Massachusetts Institute. He was the first secretary of the Massachusetts Board of Gas & Electric Light Commissioners and acted as secretary of the special committee appointed by the Massachusetts Legislature on the relations of street railways and municipalities. He was also secretary and executive officer of the board of Paris exposition managers of Massachusetts, and represented Massachusetts at the Paris exposition of 1900. He was also one of the United States delegates to the tramway congress at Paris.

John D. Murphy, roadmaster of the New York & Long Island Traction Company, Hempstead, N. Y., and the Long Island Electric Railway, died suddenly of heart failure at his home in Hempstead on April 2. Mr. Murphy entered the employ of the New York & Long Island Traction Company about nine years ago in charge of construction of overhead on the Jerico turnpike division. Four years ago he was placed in charge of the track and line of the company with the title of roadmaster. Before becoming connected with the New York & Long Island Traction Company Mr. Murphy was in the employ of the New York & Queens County Railway and before that he was with the Union Traction Company, Philadelphia, now included in the system of the Philadelphia Rapid Transit Company. He was forty-nine years old and is survived by a widow and four sisters.

Lee Massengale, who was interested in the promotion of the jitney in St. Louis, committed suicide at his home in East St. Louis on April 1 in a fit of melancholia, said to have been induced by failures which he sustained in the jitney business. Mr. Massengale was formerly vice-president, secretary and general manager of the Iola (Kan.) Railroad. He was born at Denton, Tex., on July 5, 1865. In 1885 Mr. Massengale entered the employ of the Lindell Railroad, St. Louis, Mo. From 1887 to 1889 he was connected with steam railroads. In the latter year, however, he returned to the Lindell Railroad in connection with the installation of the Sprague system and subsequently became master mechanic of the company. In 1900 Mr. Massengale was appointed master mechanic of the United Railways, St. Louis. In 1894 he accepted the position of master mechanic of the East St. Louis & Suburban Railway, but resigned from the company in 1906, to become general manager of the Iola Railroad. He was also at one time connected with the Lake View Traction Company, Memphis, Tenn.

BUSES IN KANSAS CITY

The jitney service in Kansas City has grown to the use of nearly forty buses of a capacity of ten to eighteen passengers each, but the number of small passenger cars is declining. It has been estimated by the jitney association that nearly 50,000 persons have been carried by the jitneys, at 5 cents and 10 cents a trip, on a single pleasant spring day. This is about 10 per cent of the number normally carried on the street cars in a day. A special service for Swope Park, the 1300-acre playground through which there is no street railway service, is now being planned by the jitney opertors.

Director of Public Safety Porter of Philadelphia, who has just returned from a visit to the West, considers the jitney a nuisance. He is quoted by the Philadelphia *Record* of April 3 as having said:

"In some cities the jitney has developed into an ideal aid to pickpockets and women flirts. Pickpockets work with the driver. They get a victim in the seat between them and then as the car bounces along and the victom's mind is concentrated on keeping his hat from blowing off, they go through his pockets and trim him well. No such complaints have been received in this city, thus far, but with the rapid growth of the jitney in popularity the complaints will undoubtedly come."

Construction News

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

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

RECENT INCORPORATIONS

***Willimantic & Manchester Street Railway, Willimantic, Conn.**—Application for a charter has been made by this company in Connecticut to build an electric railway from Willimantic south of the tracks of the Central Vermont Railroad where connection may be made with the tracks of the Connecticut Company, thence through Pleasant Street and connecting streets to Columbia, thence extending through to the towns of Andover, Coventry, Bolton, and Manchester to a point in Manchester near Manchester Green where connection can be made with the tracks of the Connecticut Company. Among those interested are: T. J. Spellacy and Joseph I. Kopelman of Hartford, and Edward M. Yeomans of Andover.

***Fort Myers, Marco Bay & Miami Railway, Miami, Fla.**—Application for a charter has been made by this company to build an interurban railway from Fort Myers to Miami, via Naples and Marco Bay, a distance of 150 miles. W. B. Clay, Arcadia, engineer in charge of the survey.

FRANCHISES

Redwood City, Cal.—The Council has approved the ordinance granting a sale and transfer by Edward F. Fitzpatrick to the Redwood City Harbor Company all the right-of-way, title and interest heretofore granted by the town of Redwood City to E. F. Fitzpatrick, and authorizing the construction of an electric railway on Chestnut Street in Redwood City. [March 13, '15.]

Washington, D. C.—The Washington & Maryland Railway has asked the Public Utilities Commission of the District of Columbia for permission to build lines on Kansas Avenue and other thoroughfares in Washington, D. C.

Alton, Ill.—The Alton & Eastern Electric Railway has asked the Council for a one-year extension of time on its franchise in which to build an extension of the Alton Street line from Alton to the new hospital east of Alton. T. W. Gregory, East St. Louis, secretary. [Dec. 19, '14.]

Aurora, Ill.—The Aurora & Mendota Electric Railway has asked the Council for a fifty-year franchise in Aurora. This proposed line will extend along the Burlington route through Bristol, Plano, Sandwich, Somonauk, Leland, Earlville, Mendota to Princeton, where it will connect with the Illinois Traction System of interurban lines. [Nov. 21, '14.]

Brandon, Man.—The City Council has decided to connect up the two main dead-ends of the Brandon Municipal Railway system, with Twenty-second Street as the basis of the west end, at a cost of approximately $16,500.

***Kalispell, Mont.**—The Flathead Development Company has asked the Council for a franchise to build an electric line in Kalispell.

Camden, N. J.—The Public Service Railway has obtained from the State Board of Public Utility Commissioners the approval of an ordinance passed by the city of Camden for the construction of its new electric line from Camden to Haddonfield. The ordinance provides for a new line in Starr Avenue, crossing Border Street, and the necessary connections; also a new line in Border Street. In addition the ordinance provides for a double track line on the White Horse pike from Ferry Avenue to Haddon Avenue. The Utility Commission having approved the ordinance, it is now in full effect, and the Public Service Railway may begin the work at any time.

Buffalo, N. Y.—The International Railway has received a franchise from the Council for a double-track line on West Ferry Street between Hampshire Street and Niagara Street in Buffalo.

Cleveland, Ohio.—The Cleveland Railway has received a franchise from the Council for the Payne Avenue line extension to East 105th Street in Cleveland.

Lorain, Ohio.—The Lorain Street Railway has asked the Council for a franchise in Lorain.

Hull, Que.—The City Council has asked the Hull Electric Railway to extend the Chelsea Road tracks to the Mountain Road in Hull.

TRACK AND ROADWAY

***Hot Springs, Ark.**—The Mountain Valley Water Company, which is owned and controlled by St. Louis interests, contemplates the construction of an electric line from Hot Springs to the company's headquarters in Mountain Valley.

Pacific Electric Railway, Los Angeles, Cal.—An extension south of Los Angeles to Ingledale, Lawndale and Hawthorne Acres is being contemplated by this company.

San Francisco (Cal.) Municipal Railway.—The California Street municipal railway line has been completed and will be operated to the terminus at Thirty-third Avenue in San Francisco. Heretofore it has stopped at Thirteenth Avenue.

San Francisco-Oakland Terminal Railways, San Francisco, Cal.—This company is asked to extend its line along Broadway to Rockridge.

Connecticut Company, New Britain, Conn.—An extension through the northwest section of New Britain will be built by this company within the next few months.

Southern Illinois & St. Louis Railway, Harrisburg, Ill.—This company reports that work has been begun on its 60-mile line to connect Harrisburg, Marion, Pittsburg, Johnston City, West Frankfort and Herrin. The company has purchased rails, ties, cement, bridge steel and rolling stock for the line and will purchase power from the Southern Illinois Railway & Power Company. The repair shops will be located at Johnston City. Capital stock, authorized and issued, $3,500,000; bonds, authorized and issued, $2,500,000. Officers: W. H. Schott, 111 West Monroe Street, Chicago, president and general manager; Charles Schott, secretary, and Frank Payne, Johnston City, superintendent and chief engineer. [March 6, '15.]

Peoria (Ill.) Railway.—This company has begun work double-tracking Main Street in Peoria.

Public Utilities Company, Evansville, Ind.—Work on the extension of the Bell Street line will begin at once in Evansville. All materials for the construction of the line have been purchased.

Gary (Ind.) & Interurban Railway.—An extension from Chesterton to Porter is being planned by this company.

Louisville & Southern Indiana Traction Company, New Albany, Ind.—By an agreement reached between this company and the city of New Albany, the city will make extensive repairs in the streets, restoring those portions for which the railway company is responsible and dividing the charges accordingly. The asphalt streets will be repaired with crushed rock and saro, the brick streets with brick. If the saro and rock does not prove satisfactory, granitoid will be used for the asphalt repair work hereafter.

Columbus, Kan.—A party of surveyors and engineers is working on the second survey of the proposed electric line from Columbus to Miami. When this work is completed, it is said that a survey will also be made to Galena.

Hutchinson (Kan.) Interurban Railway.—An extension on Avenue F east in Hutchinson is being planned by this company.

Joplin & Pittsburg Railway, Kansas City, Kan.—This company has awarded a contract for grading the 33-mile line between Bonner Springs and Lawrence to S. S. Dolman & Son, Topeka.

Arkansas Valley Interurban Railroad, Wichita, Kan.—The extension from Halstead to Hutchinson will be built in the near future.

Bay State Street Railway, Boston, Mass.—An extension of the Highland Circuit line over what is known as the Highland loop will soon be built by this company.

Duluth (Minn.) Street Railway. — An extension from Tenth Street to Sixteenth Street in Duluth is being contemplated by this company.

Missouri & Kansas Interurban Railway, Kansas City, Mo.—This company has completed the installation of 20 miles of aluminum cable, additional to its copper equipment, being the first aluminum lines in this section.

United Railways, St. Louis, Mo.—Arrangements are being made by this company to extend the north end of the Taylor line from its present terminus at Florisant Avenue to Broadway via Bircher Street in St. Louis.

Brooklyn, N. Y. — The Degnon Contracting Company, which has the contract for the extension of the Fourth Avenue, Brooklyn, subway from Forty-third Street to Eighty-sixth Street, during the week informed the Public Service Commission, First District, that its work is sufficiently advanced to allow track-laying work to begin. Tracks will be laid immediately as far south as Sixty-fifth Street, to a connection with the Sea Beach railroad, which is to be operated in conjunction with the Fourth Avenue line. It is expected that operation of the line will be possible by June 1 of this year.

Republic Railway & Light Company, New York, N. Y.—It is stated that plans are being worked out by the corporate interests of this company for a bond issue of possibly $25,000,000. If the matter is satisfactorily arranged it means that important improvements will be made on the traction lines and power plants in Youngstown, Sharon, New Castle and Warren, Ohio.

New York, N. Y.—Bids are desired until April 15 by F. J. G. Kracke, commissioner of bridges, Municipal Building, New York, for the equipment of the westerly tracks of the upper deck of Manhattan Bridge. Security, $40,000.

Niagara River & Eastern Railroad, Niagara Falls, N. Y.—This company has asked the Public Service Commission for permission to build a line to connect with the Buffalo, Lockport & Rochester Railway, between Lockport and Niagara Falls. [Dec. 12, '14.]

Yonkers (N. Y.) Railroad.—The Thomas Crimmins Contracting Company, with offices at 444 East Sixty-ninth Street, New York City, is expected to resume work on the double-tracking of the Park Avenue line in Yonkers at once. The double tracks, which now end at Ashburton Avenue, will be extended to the terminal of the line at Roberts Avenue. That portion of the line up to Ashburton Avenue is now double-tracked, the work having been done last year by the same company. Negotiations are pending with a contractor for the double-tracking of Yonkers Avenue, on which the city is now laying a permanent pavement.

Ohio Valley Traction Company, Portsmouth, Ohio.—O. S. Hord, Maysville, Ky., and A. Keithly, Huntington, W. Va., were awarded the contract for building the extension of this company's line between Sciotoville and Ironton, on March 27, on their joint bid. The figures were not made public. The work is to begin within twenty days from the date of the award and be completed by Dec. 1, 1915.

Hamilton (Ont.) Street Railway.—A sub-committee of the Hamilton City Council and this company are considering plans for an extension to the southwestern section of Hamilton, and the renewal of the tracks on York Street in Hamilton.

Forest Hill Electric Railway, Toronto, Ont. — The railway committee of the Ontario Legislature has refused to grant any further extension of time on the franchise in which to begin work on this proposed line on the northern boundary of Toronto, and the charter will accordingly become useless and the project to build an electric railway along the Forest Hill road will be abandoned. [March 20, '15.]

Lehigh Valley Transit Company, Allentown, Pa.—This company contemplates the reconstruction of its tracks with new rails and ties on the following streets in Allentown, Pa.: Hamilton Street, Second to Sixth Street (including new brick work); North Fourth Street from Greenleaf to Sumner Avenue; St. John Street from Sixth to Fifth Street (including new brick work).

Schuylkill Traction Company, Norristown, Pa.—Work has been begun by this company at Frackville for the proposed extension to Pottsville.

Phoenixville, Valley Forge & Stafford Electric Railway, Phoenixville, Pa.—This company has placed in operation its line into the center of Phoenixville over its own tracks.

Shippensburg, Newburg & Western Railway, Shippensburg, Pa.—Engineers have gone over the route of this railway as far west as Roxbury by way of Lurgan and Orrstown. Some of the ties on the route to Newburg were laid some time ago. This was a projected 13-mile line to connect Ship-

pensburg, Middlespring, Newburg, McKenney and Roxbury. [Jan. 10, '13.]

Dallas (Tex.) Southwestern Traction Company.—This company, recently organized with the object of constructing an electric interurban line from Dallas southwestward through Cleburne, Irving, Glen Rose, Comanche, Ballinger, Brownwood, thence to San Angelo, has been given indorsement by a committee appointed by the Merchants and Manufacturers' Association of Dallas. The committee is composed of George W. Riddle and William G. Breg.

***Houston, Tex.**—A movement for organization of a company to construct an interurban line from Houston (Tex.) to Richmond, a distance of about 30 miles, was launched at a meeting in Houston this week. Committees were appointed to organize the business interests of Houston, Richmond and Sugarland in behalf of the proposed line. It is planned to raise $50,000 in cash, and $38,000 was pledged at the Houston meeting, Houston business men pledging $28,000 and Richmond $10,000. Houston interests also promised to procure right-of-way. A committee on organization was appointed as follows: T. B. Wessendorff, Mayor of Richmond; R. F. Ransome, Richmond; J. R. Farmer, Richmond; E. P. Eastburn and E. Kennedy, Houston.

Guadalupe Valley Traction Company, Seguin, Tex.—This company reports that it has obtained a charter for the proposed electric railway to connect Austin, Lockhart, Seguin and San Antonio and that some of the right-of-way and a franchise from the city of Austin and the County of Travis has been obtained, with the right to cross the bridge across the Colorado River. The incorporators of this electric railway are the owners of the Guadalupe Water Power Company and have spent several hundred thousand dollars acquiring water rights and riparian rights in and to the waters of the Guadalupe River from Seguin, in Guadalupe County, north through Guadalupe County and Comal, Kerr and Kendall Counties. This project is progressing and it is expected when work begins on the power plants arrangements will also be made to begin the construction of the electric line. W. B. Dunlap. [Ang. 2, '13.]

Ogden, Logan & Idaho Railway, Ogden, Utah.—Work has been begun by this company on the extension to Huntsville. The Utah Construction Company has the contract. [Oct. 5, '14.]

Roanoke Railway & Electric Company, Roanoke, Va.—Construction of a cut-off from Jamison Avenue southward on Eighth Street to Highland Avenue to Seventh Street to Murray Avenue in Roanoke will soon be built by this company.

Virginia Railway & Power Company, Richmond, Va.—An extension of its Grove Avenue line from its present terminus at the intersection of Canal Street up to High Street, in Petersburg, provided that the city will pave Canal Street in Petersburg is being planned by this company.

***Big Bend Transit Electric Railway, Spokane, Wash.**—This company, which plans to build an electric railway from Spokane along the Spokane River to its junction with the Columbia River, has filed with C. O. Upchurch, agent for former Spokane Indian reservation, maps and plans for a line from Spokane to Miles and has asked for further grants and concessions from the Interior Department on the reservation and the Fort Spokane military reserve.

SHOPS AND BUILDINGS

Fort Smith Light & Traction Company, Fort Smith, Ark.—Arrangements have been concluded by this company for removing its headquarters from North Sixth Street to the Ben Wolf Building at the corner of North Third Street and Garrison Street in Fort Smith.

POWER HOUSES AND SUBSTATIONS

Missouri & Kansas Interurban Railway, Kansas City, Mo.—This company has increased its battery equipment near Olathe, and has installed a 300-kw generator at Overland, replacing a 200-kw generator, which is held temporarily in reserve; this and other excess capacity may ultimately be installed elsewhere for the company.

Ottawa (Ont.) Electric Railway.—This company has installed a 2150-hp generator set in its new steam auxiliary power plant on Middle Street in Ottawa.

Manufactures and Supplies

ROLLING STOCK

Manhattan & Queens Traction Corporation, New York, N. Y., is considering the purchase of ten new cars.

Androscoggin Electric Company, Lewiston, Maine, has ordered two interurban closed car bodies from the Laconia Car Company.

Miami (Fla.) Traction Company, B. B. Tatum, president, is reported as having ordered four storage-battery cars from The J. G. Brill Company.

Valencia (Venezuela) Tramways has ordered four cross-bench open cars from The J. G. Brill Company. The order was placed through the J. G. White Engineering Corporation.

Quito (Ecuador) Tramways has ordered two closed double-truck cars from The J. G. Brill Company. The order was placed through the J. G. White Engineering Corporation. The construction of these cars has been completed.

New York, Westchester & Boston Railway, New York, N. Y., noted in the ELECTRIC RAILWAY JOURNAL of Feb. 27, 1915, as having issued requests for bids on fifteen new steel cars, has ordered this equipment from the Pressed Steel Car Company.

New York Municipal Railway, Brooklyn, N. Y., has issued requests for bids on 100 new cars for the dual subway system. This equipment will make a total of 300 cars ordered for the system, with 300 more cars contemplated at later dates. Bids for the new equipment are to be submitted by April 15.

Southern Illinois & St. Louis Traction Company, Harrisburg, Ill., will operate twenty passenger cars and twenty freight cars on its new line. Eighteen passenger cars already have been ordered, as noted in the ELECTRIC RAILWAY JOURNAL of April 3, 1915.

Minneapolis, St. Paul, Rochester & Dubuque Electric Traction Company, Minneapolis, Minn., which was reported as having ordered rolling stock in the issue of the ELECTRIC RAILWAY JOURNAL for April 3, 1915, will purchase twelve instead of nine passenger trail cars. Three of these trail cars are designed for handling mail and express and the third for handling baggage.

TRADE NOTES

Standard Paint Company, New York, N. Y., has removed its offices from its former location at 100 William Street to the Woolworth Building.

J. P. Rapp, steel wheel specialist, has resigned from the Forged Steel Wheel Company and allied companies, and has been appointed vice-president of the Gulick-Henderson Company, inspecting, consulting and chemical engineers.

Chicago Pneumatic Tool Company, Chicago, Ill., has removed its branch offices to new quarters, as follows: New York office, from 50 Church Street to 52 Vanderbilt Avenue; Boston office, from 191 High Street to 185 Pleasant Street.

Walter N. Albertson, Milwaukee, Wis., public utility engineer, has moved his office from the Railway Exchange Building to larger quarters at 527 First National Bank Building. Mr. Albertson is president of W. N. Albertson & Company of Milwaukee.

Walpole Tire & Rubber Company, Walpole, Mass., has appointed Joel Mann Martin, for the past five or six years connected with the Atlanta office of the General Electric Company, to a position with the rubber company. Mr. Martin will handle Walpole tapes and insulating varnishes in the South.

Lindsley Brothers Company, Minneapolis, Minn., has changed its general sales offices from the First National Soo Line Building to the McKnight Building, Minneapolis. Its general offices are in Spokane, Wash. The company is establishing in Minneapolis a large yard which will contain a complete stock of sizes of Western red cedar poles.

Street Railway Signal Company, Philadelphia, Pa., writes that in order to devote more time to the engineering and manufacturing branches of its rapidly growing business, it

has assigned the exclusive selling agency for its signal apparatus to the Electric Service Supplies Company, Philadelphia, New York and Chicago.

Vacuum Impregnating Works, Chicago, Ill., has taken over the plant and business of the Federal Electrical Manufacturing Company. The combined companies are serving more than seventy electric railways in the capacity of winding, rejuvenating and impregnating all kinds of coils. This company has a large impregnating plant located in Chicago.

W. B. Huey and **A. H. Huey** announce the formation of a new company, under the name of the Huey Company, with offices and plant at 59 East Adams Street, Chicago, for the production of high-grade blueprints, direct blue line prints, negative prints, black line prints, litho reproductions, hectograph copies and photostat reproductions. A complete line of sensitized papers and drawing materials of all kinds will be carried in stock.

Aleck M. MacCutcheon, previously with the Crocker-Wheeler Company, Ampere, N. J., has recently removed to Cleveland to take charge of the design work of the Reliance Electric & Engineering Company of that city. At the time of leaving the Crocker-Wheeler Company Mr. MacCutcheon was engaged in the design of special motor generator sets for use in connection with wireless installations.

Society for Electrical Development, New York, N. Y., announces the appointment of George W. Hill to its staff. Mr. Hill will devote his time to the work of the field cooperative section under George B. Muldaur. Mr. Hill was connected for six years in the storage-battery sales and engineering work, including two and a half years in charge of the Canadian territory of the Canadian General Electric Company, and five years with the Westinghouse interests, part of which time he was in charge of the retail supply department at Boston and the remainder with the Westinghouse Lamp Company.

Esterline Company, Indianapolis, Ind., manufacturer of "Golden Glow" headlights, has received an order for its interurban type headlights from the North Holland Electric Tramway, Haarlem, Holland. These headlights are being equipped with standard 94-watt bulbs. This company reports shipment of headlight equipment during March to the following electric railways: Topeka (Kan.) Railway; Fort Smith (Ark.) Traction Company; Ogden (Utah) Rapid Transit Company; Mahoning Valley Railway, Youngstown, Ohio; The J. G. Brill Company for new cars of the Bridgeton & Millville Traction Company; Portland Railway, Light & Power Company, Portland, Ore.; Mobile Light & Railroad Company, Mobile, Ala.; Des Moines (Ia.) City Railway; Ogden, Logan & Idaho Railway, Ogden, Utah; United States Lighthouse Service, Detroit, Mich.; St. Joseph Railway, Light & Power Company, St. Joseph, Mo.; Shreveport (La.) Railways; St. Louis Car Company for new cars of the Empire United Railways; Wason Manufacturing Company for new cars of the Shore Line Electric Railway; Niles Car & Manufacturing Company for Self-Propelled Car Company's new oil-electric cars; Boston & Maine Railroad, Boston, Mass.; Los Angeles (Cal.) Railway; Idaho Traction Company, Boise, Idaho; Toronto (Ont.) Suburban Railway; Manila Electric Railroad & Light Company, Manila, P. I.; Virginia Railway & Power Company, Norfolk, Va.; Terre Haute, Indianapolis & Eastern Traction Company, Indianapolis, Ind.; Eastern Electric Company, Ltd., St. John, N. B.; Long Island (N. Y.) Railroad; Everett Railway, Light & Water Company, Everett, Wash.; Iowa Railway & Light Company, Cedar Rapids, Ia.; Rounds Line, Owensboro, Ky.; Carbon Transit Company, Mauch Chunk, Pa.; San Antonio (Tex.) Traction Company; West India Electric Company, Kingston, Jamaica; Cedar Rapids & Marion City Railway, Cedar Rapids, Ia.

ADVERTISING LITERATURE

Union Electric Company, Pittsburgh, Pa., has issued a catalog describing its lightning arresters for the protection of pole transformers and railway circuits.

Kellogg Switchboard & Supply Company, Chicago, Ill., has issued Bulletin No. 67, which contains a thorough discussion of its system of railway telephone operation.

National Carbon Company, Cleveland, Ohio, has issued a circular which outlines in an interesting way the reason of the company for choosing three pyramids as a trademark for the sale of its carbon brushes.

Drew Electric & Manufacturing Company, Indianapolis, Ind., has issued a blotter advertising its electric railway, light and power materials and a separate folder describing and illustrating its motorman's safety mirrors for open and closed cars.

Bridgeport Brass Company, Bridgeport, Conn., has issued a bulletin which contains a report, accompanied by tables, on the qualities of its conductor wire "Phono-Electric." The tests were conducted by Leonard Paget, civil engineer, and comparisons were made with hard drawn copper wire of previously standardized quality. One table shows the high breaking strength of this wire for various sizes. The bulletin also explains that this wire, unlike hard drawn wire, is of homogeneous tenacity throughout and shows by another set of tables its greater tensile strength compared with hard drawn wire when the outer "skin" of both kinds of wires of similar sizes has been removed. Other tests show the greater elastic and torsional strength of the "Phono-Electric" wire.

Ohmer Fare Register Company, Dayton, Ohio, has issued in pamphlet form a guide to the electric railway systems in the West. The pamphlet is entitled, "Sunset Land by Trolley," and the preface says that the pamphlet has been compiled for the use and convenience of electric railway officials or their friends who are planning to visit the expositions this year at San Francisco and San Diego. The book contains fifty-two pages and is an electric railway Baedeker to the sights of electric railway interest, not only in the Pacific Coast states but also in Colorado. Each electric railway system is mentioned by name and there is a short description of it with an account of the principal points of interest which the visitor would like to see in each city. The pamphlet includes an index of the electric railway companies mentioned in the text, some forty-five in number, and a statement is made that all of these companies are users of Ohmer fare registers.

Robert W. Hunt & Company, Chicago, Ill., engineers, have issued a bulletin of standard specifications for steel rails in connection with their bureau of inspection which includes tests, consultation, and inspecton of all rails and structural materials. As stated in the bulletin, 3,374,475 tons of rails have been examined under their special inspection. "Special inspection" orders require experienced and competent inspectors to be located in each department of the mill at all times, while the orders are being filled. Thus there are inspectors night and day in the steel mill, in the blooming mill, in the rail mill and at the drop testing machine, in addition to the regular final rail inspectors. These inspectors record all important data pertaining to each heat, and by transmitting pertinent conditions to each other prevent the effect of careless workmanship by subjecting the work to special scrutiny prior to the acceptance of the rails. The circular contains specifications for carbon steel rails as adopted by the American Railway Association and the American Society for Testing Materials, manufacturers' standard specifications for open hearth and Bessemer steel rails and specifications of the Colorado Fuel & Iron Company for open-hearth steel rails.

NEW PUBLICATION

Catalog of Books on Railway Economics. By Bureau of Railway Economics. University of Chicago Press. 446 pages. Cloth.

This book is a record of the works relating to the economics of railway transportation which are cataloged in thirteen of the principal libraries of the country and in the collection of the bureau. The book is not a complete bibliography, for literature in periodicals, miscellaneous papers and ordinary state and federal documents is omitted. The main divisions of the index are according to general works on special topics, administration, construction and operation, traffic, railways of the various countries, and railway periodicals and proceedings. The topics of most interest to electric railway officials are those of such general application as taxes, valuation, government ownership, capitalization, regulation and the like. A few references are given to books on electrification.