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IMPORTANCE OF FIRST-AID TRAINING

An excellent feature of the nation-wide "safety first" movement, and in fact in many instances preceding it, has been the establishment of first-aid-to-the-injured stations. Resuscitation from electric shock is an example of their excellent work, and the equipping of all shops and carhouses with first-aid outfits represents a move along the same line. At this time it is particularly to the generally established practice among public utilities of installing the first-aid outfits that we want to direct attention. When a road has provided a first-aid outfit its work is just begun, since only the tools have been supplied without necessary training of employees for their proper use. It is often possible to find among employees someone who is acquainted with the proper method to pursue in first-aid work, yet there is always a chance that that particular person is not available when he is most needed. To make certain that first-aid treatment will be available for all accidents appears to be a fine opportunity for constructive work on the part of the company surgeon. In fact, the surgeon of the Chicago Elevated Railways has carefully trained a first-aid squad, which in turn trains employees at shops and carhouses in the use of the first-aid equipment, as well as how to perform various other kinds of first-aid work. Manifestly, such a schooling is productive of excellent results.

DISCIPLINARY VALUE OF EM- PLOYEES' REPORTS

While an excess of red tape, so to speak, in the way of reports is to be avoided, one must not lose sight of their worth for maintaining good discipline as well as for record purposes. A difficulty well known to department heads is the ever-present problem of eliminating interdepartmental friction and petty jealousies among ambitious employees. To a certain extent, there is bound to be some internal stress in any organization or department where each man is striving to make a good showing, but a certain number of report forms help to confine this feeling to a healthy form of rivalry. As an example of this, work-train service furnished to the way department is often unnecessarily delayed, while, on the other hand, through the carelessness of their crews, work trains often hold up the regular traffic. To meet this condition certain managers have required that the causes and lengths of all delays to trains be reported by both the dispatcher and the representative of the way department or other department in charge of the work train. The result of this checking of one report against another, particularly where serious complaint has been made, has been greatly to reduce the number of reports

and materially improve relations between employees. Similar good effects have followed the application of the same plan to disputes between the overhead and transportation departments, particularly where power or telephone line interruptions have occurred. Where it is found that there is a discrepancy between the report of one department and another on the same subject it is, by means of an investigation, an easy matter to discover who is in the wrong. The chief effect of this form of disciplining, however, has been that discrepancies seldom occur because one party to a difficulty knows that the other is preparing a report covering the same subject, consequently each endeavors to be honest in the information which he furnishes.

A BRITISH VIEW OF THE CAB SIGNAL

In view of the interest in cab signals that has been suddenly aroused through the radical action of the New York Municipal Railways in adopting them for the new subways in Brooklyn, it is rather a surprising coincidence that a recent discussion of this device by the British Institution of Mechanical Engineers should have indicated, at least by implication, a sudden change of attitude with regard to its merits and possibilities. Conservative practice in Great Britain for some years past has been very generally opposed to the cab signal, which is, inherently, an initial step toward automatic train control, because the energy which illuminates the red lamp in the cab may be utilized, just as easily, to shut off power or to apply brakes. The objections to the use of the cab signal, apparently, have been directed mainly toward the complications involved, automatic stops in connection with fixed signals having received very much more attention than the cab signal as a practical means to provide greater safety of operation. Yet at the December meeting of the British Institution of Civil Engineers, according to *The Engineer*, evidence was brought out to the effect that the automatic stop was "impracticable," by which is probably meant that it was very limited in application. The same charge was not made against the cab signal because this is in presumably successful use on sections of two British railroads to-day. However, our contemporary points out that the cab signal, as an indication only, seems unlikely to effect any improvement over present methods, although it may facilitate train operation in foggy weather, and this statement can hardly be denied. At the same time, if, as is here implied, it is the case that the cab signal may be considered to have reached a parity with the present system in regard to reliability, maintenance cost and

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expense of installation, it seems difficult to avoid the conclusion that it is an improvement, because it necessarily contains the possibilities of automatic protection against collisions. This is a feature that the roadside-signal systems have failed thus far to achieve in generally practical form, notwithstanding the many years that they have been in extended use. Indeed, it seems probable that the popularity of the cab signal in the near future will depend only upon its ability to equal the operating record of the older systems, and, apparently, this is a task to which it will soon be set in this country on a large scale.

THE MID-WINTER MEETING

The seventh mid-winter meeting of the American Electric Railway Association will be held in Washington on Jan. 29. The proceedings will be confined to a single day. The meeting will be unique in that the President of the United States and other distinguished representatives of the federal government will be in attendance. President Wilson will speak at the conference and, while his subject has not yet been announced, knowing as he does the purpose of the conference and the opportunity which it affords for reaching the heart of the industry, he cannot but touch upon those subjects which vitally concern its leaders. The presence of the President and his colleagues shows that they recognize the important part which electric railway transportation occupies in the prosperity of the country and the daily life of its citizens.

It is high time that the public should come to an equal realization of this and also of the magnitude of the interests involved in the industry. It occupies a different position from that of the steam railroads, partly because of its youth, partly because it is a gradual accretion of large numbers of small detached units without great inherent adhesive force. But now, through the progress made by interurban roads in particular, the electric railway is assuming national proportions, as is evident from the increasing control exercised by the Interstate Commerce Commission and the growing interest of the federal government in its affairs.

The mid-winter meeting is destined to play a more and more important part in the work of the association. This, with its affiliated associations, has two functions—technical and administrative. The annual convention in October largely ministers to the former. Here the committees present their reports, the result of the year's efforts, and the manufacturers show what progress they have made in their respective fields. Papers and discussions largely relate to keeping the cars moving efficiently and with satisfaction to the public. The winter conference is for a different purpose—the deliberate consideration of the broad principles underlying success in transportation, the application of which make operation possible. Those principles are not simple; in fact, compared with the technique of operation, they might be called vague. They are involved with finance, labor, the public temper, the

idiosyncrasies of legislation and regulative bodies, and so on. There are, therefore, two compelling reasons why all of the executives concerned with these phases of railway operation should attend the mid-winter conference this year. First, they have an unusual opportunity to demonstrate to the federal legislators the importance of their work, and there are pressing problems of administration which they need to consider.

CHICAGO TRACTION SITUATION

Although Chicago, through contractual relations, is a co-partner in the operation of its surface railway lines, nearly every aldermanic or mayoral election is heralded with scathing criticism of some phase of the railway's operation. To one thoroughly familiar with the 1907 ordinances, known as "the settlement ordinances," since they were supposed to clear up an unsatisfactory situation, it appears ridiculous that the city should raise the "railway issue" whenever its politicians are up for re-election. To the City Council the ordinance gives the power to specify a standard of service and grant extensions. This service standard governs the annual additions made to rolling stock. Yet with this power in its own hands, the city administration is now engaged in a systematic campaign of criticism, seemingly because, out of it, some of the administration's henchmen hope to offer a panacea which will return them to office.

About a year ago a department of public service was added to the city governmental organization, and, judging from the results of its work, for the sole purpose of offering destructive criticism in whatever direction the administration might care to turn its attention. Literally, thousands of petty offences, beyond the control of any street railway organization, have been charged against the surface railways by this department. These add fuel to the campaign of criticism, but it is quite certain that no substantial improvement will result from this flagellation of the railways. It may be that criticism is deserved in some few instances, but the City Council, through its local transportation committee, has power to correct these.

While the various phases of this campaign have received publicity through the newspapers, a few of the editors have grasped the crux of the situation, namely, that the control of Chicago's transportation facilities has no place in local politics. The settlement ordinances created the Board of Supervising Engineers, whose powers do not include supervision over the operation of the surface railways. The record of this organization and the caliber of its members certainly warrant the bestowal of this additional responsibility. The fact that the city has representation equal to the railways on the board should insure unbiased rulings. It is to be hoped that the strategy of the administration will reveal itself to the public to the extent that it in turn will cease to support anything but sound business judgment. On the other hand, the failure of the administration to execute past promises to improve transportation already has caused some important com-

mercial organizations to seek relief by appealing to the Illinois Public Utilities Commission, which has heretofore not taken part in the controversial questions arising between the city of Chicago and its public utilities. It is generally agreed by those who have carefully studied Chicago's transportation problem, that the only solution is to be found in additional downtown terminal capacity. More surface tracks are out of the question, additional elevated lines are not desired, hence there must be resort to subways. For the past six years subways have been discussed, and in fact during the past two years they have received sufficient consideration to warrant definite action. The present city administration promised to begin the subway system if it was elected, yet has always found a plausible excuse for not abiding by its promise when the opportunity was offered.

REACTANCE IN TRANSMISSION SYSTEMS

The necessity in large power systems for greater protection of electrical generating and distributing apparatus than is afforded by automatic circuit breakers, was clearly demonstrated in the discussion at the January meeting of the American Institute of Electrical Engineers in New York. Under short-circuit conditions currents may rise practically instantaneously to many times the normal values, producing overheating and excessive mechanical stresses and jeopardizing equipment other than that directly affected. Switches which will automatically and certainly open circuits carrying enormous currents are available, but in extremely large plants the combined generating capacity may be such as to produce short-circuit currents in excess of the ability of switches to interrupt. In such cases it is essential to limit the magnitude of the currents by introducing reactance into the circuit. For this purpose the inherent reactance in generators and transformers can be augmented and reactance coils can be inserted in feeders, between generators and busbars and between busbar sections. While it is true that the difficulties with short-circuits are most serious in very large plants, the principle of reactance protection is of wide application, which explains the very general interest in the methods proposed for minimizing these difficulties.

Unless electrical mass is deliberately added to it by introducing magnetic leakage in generator armatures or in transformers or by connecting reactors in circuit, as already mentioned, the electric circuit is practically inertialess. Until within a few years this was considered a virtue for several reasons. For example, from the standpoint of switching, small electrical energy storage capacity is desirable, for when a switch opens the stored energy must be dissipated in heat in the switch arc and in the resistance of the line as the stored electric charge surges back and forth. Still more important is the fact that the smaller the reactance the better is the voltage regulation. When reactance is introduced for protection, therefore, it involves the dissipation of more energy in switching and more reactive voltage drop. The former can be taken care of in the design of the circuit breakers. The latter is not now considered

as important as it once was, particularly as constant voltage can now be obtained, when necessary, by auxiliary regulating devices. At any rate, in large plants the necessity for protection is so urgent that something must be sacrificed to secure it, and the result is a compromise among conflicting requirements.

In his paper on this subject, abstracted elsewhere in this issue, I. W. Gross gives the results of a mathematical analysis of short-circuit phenomena. We regard the analysis as valuable in the following particulars: First, it gives an idea of the magnitude and the laws of variation of the mechanical forces and the heating effects which may result from short-circuits, although the author has assumed conditions which make the results conservatively large; that is, he has assumed that there are "dead" short-circuits, that the heat is entirely confined to the conductor, etc. Hence the values derived may be considered the limiting ones. Second, it illustrates the scientific method of attacking a problem to secure data which may be relied upon as a guide to practical design. While the mathematics employed may seem more refined than the accuracy of the fundamental assumptions would warrant, the argument is logical, and the accuracy of the results can be discounted sufficiently to allow for possible variations in the premises without invalidating the argument. Third, as the study was made in connection with the design of the extension of a large power plant the results have a practical quality which gives them a higher standing than if they were a merely academic production. Among the very interesting facts brought out by Mr. Gross the most astounding is that forces of a ton or more per running foot may be developed in a cable. The conductor wrapping, which is fortunately amply strong, then performs the important extra function of preventing bursting at short-circuit time, due to the tendency of the conductors to fly apart. Another startling fact is the rapidity of temperature rise, so that one-fifth of a second is none too short a period for the opening of the circuit breaker. One trembles for the fate of a cable if the breaker fails to open promptly.

Mr. Gross also took up the question of the best location for the protective reactance coils in a power plant. These coils are bulky and they cost money. After it has been decided how much protection is desired the problem is to get that with the least cost for the coils and the space to accommodate them. In the discussion it was brought out that reactors in individual feeders radiating from a very large power plant may be so bulky as to be out of the question. It was to determine the most economical arrangement for a given case that Mr. Gross undertook the study which resulted in the preparation of his paper.

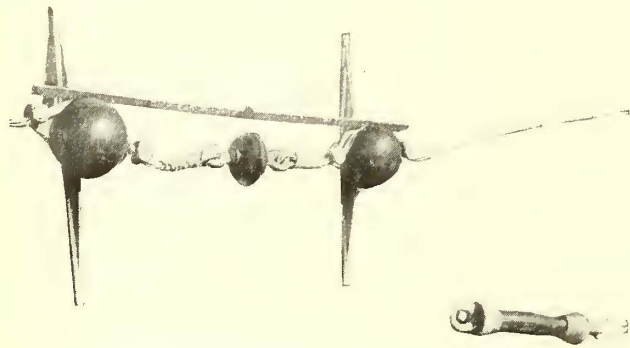
This whole subject of reactance is tied up with the modern tendencies in power generation and transmission. Centralized generation is the order of the day, largely on account of considerations of economy. But centralized generation is risky unless precautions which are not necessary in smaller and detached plants are taken to insure reliability. If "all the eggs are put in one basket" they must be heavily insured.

The Double Trolley System in Seattle

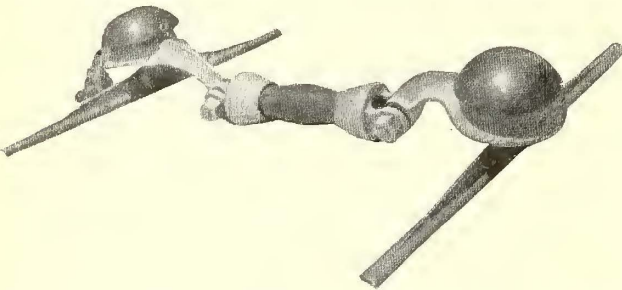
One of the Very Few Installed in This Country—It Contains Many Interesting Features, Some of Which Are Explained in Detail

BY H. J. KENNEDY, ELECTRICAL AND MECHANICAL ENGINEER.

Particular technical interest attaches to Division "A" of the electric railway recently put into operation by the city of Seattle, Wash., due especially to the use of a double-trolley system, which may, perhaps, be called the "heroic remedy" or preventive against electrolysis. With the traffic relations and financial and political conditions surrounding the construction of this railway the present article is not concerned beyond stating that physically it is a continuation of the Seattle, Renton & Southern Railway, from the northerly terminus of the latter, past the westerly shore of Lake Union nearly into Ballard.



SEATTLE MUNICIPAL RAILWAY—COMPONENTS OF DOUBLE-TROLLEY STRAIGHT LINE CONSTRUCTION



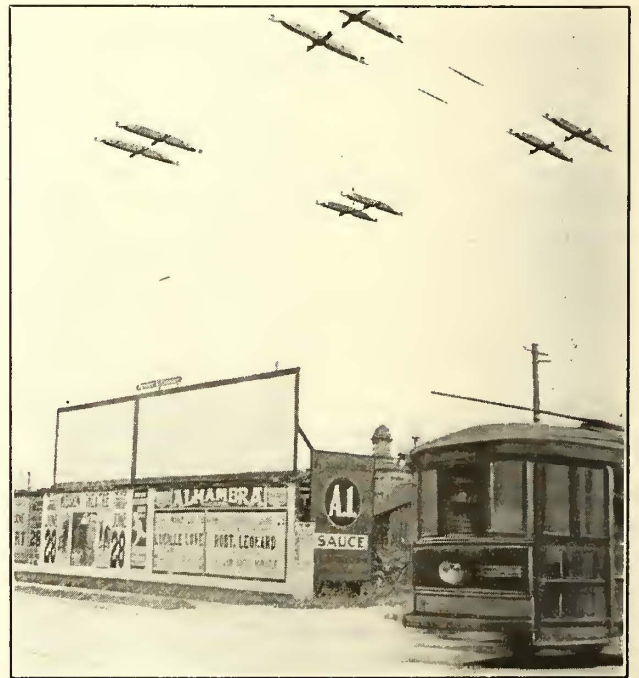
SEATTLE MUNICIPAL RAILWAY—COMPONENTS OF DOUBLE-TROLLEY CURVE CONSTRUCTION

It is proper to state first that the wires are spaced 18 in. center to center, symmetrically with respect to the track center line. An illustration of the principal components of the typical straight-line construction is shown, the hangers being 9 in. on each side of the center, as indicated by the 2-ft. rule. Another illustration shows curve construction. On a double-track line, starting at the wooden pole on one side, the sequence of material is as follows: $\frac{5}{8}$ -in. eyebolt; $\frac{3}{8}$ -in. galvanized steel strand; standard, round, wood strain-insulator 10 in. long; $\frac{3}{8}$ -in. steel strand; standard straight-line hanger of cap-and-cone type with lock washer; standard Giant strain-insulator of $2\frac{5}{8}$ -in. diameter, with two eyes into which the ends of the steel strand are close-tied; standard straight-line hanger; $\frac{3}{8}$ -in. steel strand across to other track, where the order is reversed, back to the other wooden pole.

With the exception of the portion of the railway within the underground conduit district (using iron poles), the poles are of Washington cedar, from 30 ft. to 75 ft. in length. The spacing was complicated by

street and alley intersections (often diagonal), entrances, existing poles, cross lines, etc., and varied from 50 ft. to 125 ft. Two cross-arms on one side of street are assigned to carry the railway feeders. Many of the poles have as many as eight cross-arms, due to the necessity of carrying wires for the fire alarm and police telegraph service, the city lighting wires, and the different power, telephone and telegraph company's wires.

The cross-overs most used are being equipped with trolley frogs, insulated crossings and section breaks, so that the trolley wheels run without interruption from the main line to the cross-over, and vice versa, the cur-



SEATTLE MUNICIPAL RAILWAY—RIGHT-ANGLE CROSSING OF DOUBLE TROLLEY AND SINGLE TROLLEY

rent supply being subjected to a brief interruption as the wheels pass over an insulated break, or to reversal, due to the opposite location of positive and negative wires—which reversal, of course, has no effect on the direction of motion of the motors, since armature and field are affected alike.

On cross-overs which are not used continually, the expense and complication of trolley frogs, etc., are saved by stopping the cross-over trolley wires 18 in. away from the main track wires, trolley poles being shifted by hand from one pair of wires to the other.

Where the double-trolley railway crosses the single-trolley railway, insulated crossings were installed at the expense of the double-trolley railway, an agreement being drawn up between the two covering the matters of first cost, cost of maintenance and liability for repairs and accidents. In each case the single-trolley wires were allowed the under-run, principally because they were there first, but also because the double-trolley circuit is broken at two places in series in passing the crossing, whereas the single-trolley circuit would have

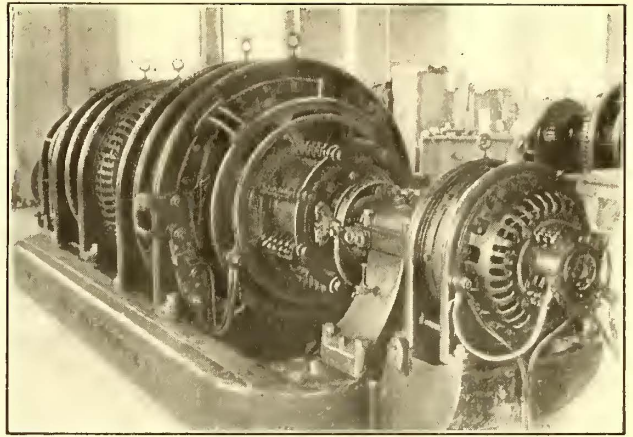
been broken at the single-trolley wheel only, with greater chance of drawing an arc.

These insulated crossings were specially made with extra long wood breaks, for the reason that the negative of the single-trolley system is grounded; whereas if it should at any time become desirable for the neutral of the three-wire generator which was employed on the double-trolley system to be grounded (with equal insulation on both sides, it is virtually at ground potential), the negative of the double-trolley system would then be at 300 volts lower potential than the ground or than the negative of the single-trolley system, and 900 volts lower than the potential of the positive of the single-trolley system.

The feeder system at present installed is considerably less than that designed for ultimate installation when the line is extended and the traffic becomes very much heavier than at the present time. Five feeder-circuit breakers were installed in the substation, with space for some additional ones. Only three have been utilized at the start, one feeding a pair of 1,192,500 circ. mil aluminum cables (each equivalent to 750,000 circ. mil copper), extending northerly and westerly to near the outer end of the line; another tapped on by 638,000 circ. mil aluminum cables (equivalent to 400,000 circ. mil copper) to trolley wire opposite substation, and another pair of 1,192,500 circ. mil aluminum cables extending south. Feeder taps are located from 1000 ft. to 2270 ft. apart, with section breaks between them. With this arrangement of feeders, with ten cars in operation on the division and 600 volts emf at Aloha Street, it is estimated that the maximum drop would be experienced at the outer end of the line, being about 61.5 volts or 10.3 per cent at the furthest feeder tap. Near the southerly end the drop is less. On the initial installation, a saving in first cost of more than \$3,000 was made by using aluminum instead of copper, the price per pound of aluminum cable being 22.3 cents delivered at Seattle, while copper cable was 15.6 cents per pound, the total weight of aluminum required being of course very much less for equal conductance.



SEATTLE MUNICIPAL RAILWAY—EXTERIOR VIEW OF SUBSTATION



SEATTLE MUNICIPAL RAILWAY—EXCITER END OF MOTOR-GENERATOR SET

Power for the line is supplied from a single substation, which was designed, in addition to its railway function, also to form part of the municipal electrical distribution system, centering in the Yesler Way substation at the city end of the 60,000-volt transmission lines from the plant at Cedar Falls in the mountains. The distribution from Yesler Way to the various outlying substations is accomplished by a 15,000-volt, two-phase, five-wire system with grounded neutral. The substations are transformer stations, that are used principally for lighting, but also for carrying a certain amount of a.c. motor load. The lighting department is already supplying 250-volt direct current, principally for elevator motors, from its Yesler Way substation, and the addition of similar facilities in the railway substation puts the department in a much stronger position to make contracts. In consequence two 500-kw synchronous motor-generator sets were installed, the generators being of the three-wire type to supply direct current at 300 volts, as well as the 600-volt current required by the railway.

In the accompanying illustration of the machine two slip rings may be seen mounted on the shaft; they are connected to electrically opposite points of the armature winding. From the carbon brushes making contact with these rings, connections are made to a Thompson-Ryan balancing coil, which prevents difficulty from sparking and armature reaction when the 300-volt loads are unbalanced. The balancing coil is intended to be capable of carrying continuously in the neutral 25 per cent of the full load current without exceeding the full-load temperature of generator. The neutral is connected to the middle point of the coil and is led through the generator breaker to the neutral bus. The coil has been located in the basement close beside the machine foundation, to minimize the length of lead to the machine and to improve the regulation. It was specified that under the extreme unbalanced condition, above specified, the variation of emf on either side of the neutral should not be greater than 2 per cent of the mean. The generator is over-compounded 50 volts between no load and full load. The series fields are split, one-half being connected to the positive brush and the other half to the negative brush. A 75-hp induction motor and a 10-kw 125-volt d.c. generator are mounted on the main shaft of the machine, the former being used for bringing the main motor up to synchronous speed in starting the machine and the latter being used for an exciter.

The Pennsylvania Railroad System reports that of the 188,411,876 passengers carried in 1914 not one was killed. The report shows that trains on this system traveled 67,389,381 miles.

Census Report on Electric Railways

Rolling Stock, Traffic, Capitalization, Financial Operations and Employees Are Considered in This Final Abstract of the Forthcoming Census Report on Street and Electric Railways

In the last issue of this paper an abstract was published of the first part of the forthcoming Census Report on Electric Railways. The subjects considered were the development of the industry, power equipment and track. In this issue an abstract is published of the remainder of the statistical portion of the census report.

ROLLING STOCK AND TRAFFIC

Table I shows a classification of the different types of cars in use. Prepayment cars are reported for the first time in this census report. They are in general use in all parts of the country, except in New England and the mountain states. The states leading in express, freight, mail and baggage cars are Illinois with 1917 cars and California with 1507 cars. Of the 73,758 cars with electric motors 45,996 have two motors and 25,806 have "four or more" motors. The other cars have one motor or three motors each. Of the total number of 94,016 cars 43 per cent are equipped with hand brakes exclusively and 57 per cent with power brakes. This shows an increase in cars with power brakes during the past five years, because in 1907 the percentages were, hand brakes 58.8 and power brakes 41.2.

There were 277 electric locomotives in use by the street and electric railways in 1912 as compared with 117 in 1907 and three in 1902. These locomotives are exclusive of the number employed on the electrified divisions of steam railroads, of which, in 1912, there were 341. Of the total number of cars 71.4 per cent were owned by companies having gross incomes of \$1,000,000 or more per year, 15.4 per cent by companies with gross incomes between \$250,000 and \$1,000,000, and 13.2 per cent by companies with gross income of less than \$250,000.

TABLE I—CARS—NUMBER AND KIND

	Number			Per Cent of Total			Per Cent of Increase ¹		
	1912	1907	1902	1912	1907	1902	1902-1912	1907-1912	1902-1907
Total	94,016	83,641	66,784	100.0	100.0	100.0	40.8	12.4	25.2
Revenue cars	83,956	75,685	61,404	89.3	90.5	92.0	36.7	10.9	23.3
Passenger	76,162	70,016	60,290	81.0	83.7	90.3	26.3	8.8	16.1
Closed	48,123	40,470	32,658	51.2	48.4	48.9	47.3	19.0	23.9
Open	18,993	22,537	24,259	20.2	26.9	36.3	-21.7	-15.7	-7.1
Combination—									
Closed and open	7,985	6,442	3,134	8.5	7.7	4.7	154.8	24.0	105.6
Passenger, with baggage, express, freight, or mail	1,061	567	239	1.1	0.7	0.4	344.0	87.1	137.2
Express, freight, mail and baggage	7,794	5,569	1,114	8.3	6.8	1.7	599.6	40.0	399.9
Service cars—work cars, snow plows, sweepers, etc.	10,060	7,956	5,380	10.7	9.5	8.0	87.0	26.4	47.9
Prepayment cars	16,012			17.0					
Parlor, sleeping, dining, and private cars	149	118	(?)	0.1	0.1			26.3	
Cars equipped with motors	73,779	63,517	50,699	78.5	75.9	45.5	16.1	25.3	
Electric locomotives	277	117	3				136.8		

¹A minus sign (-) denotes decrease.
²Figures not available.

TABLE II—PASSENGER TRAFFIC—STREET AND ELECTRIC RAILWAYS AND STEAM RAILROADS¹

	1912	1907	1902	Per Cent of Increase		
				1902-1912	1907-1912	1902-1907
Number of revenue passengers:						
Street and electric railways	9,545,554,667	7,441,114,508	4,774,211,904	100.0	28.3	55.9
Steam railroads	1,004,081,346	873,905,133	649,878,505	54.5	14.9	34.5
Receipts from passengers:						
Street and electric railways	\$502,651,637	\$382,132,494	\$233,821,548	115.0	31.5	63.4
Steam railroads	660,373,176	564,606,343	372,963,248	77.1	17.0	51.4

¹Steam railroad statistics from reports of the Interstate Commerce Commission.

The total number of passengers carried in 1912 was 12,135,341,716, or an increase of 27.3 per cent over the number carried in 1907, and 107.9 per cent over the number carried in 1902. The number of transfer and free passengers in 1912 was equal to 27.1 per cent of the number of revenue passengers, as compared with 28.1 per cent in 1907. During the past five years the average number of revenue passengers per mile of track increased 7.4 per cent. The average number of revenue passengers per car-mile was 5.06, as compared with 4.70 in 1907 and 4.26 in 1902. The average number per car-hour was 48.38, as compared with 43.06 in 1907 and 33.28 in 1902 for those companies reporting car-hours. In 1912 92.1 per cent of the companies reported car-hours; in 1907, 77.6 per cent and in 1902, 47.7 per cent.

Table II gives an interesting comparison between the steam and electric railways. It shows that the passenger traffic on the electric railways was nine and one-half times that on the steam railroads, while the receipts from passengers were about 24 per cent less.

CAPITALIZATION

Table III shows the gross and net capitalization of the street and electric railways exclusively. In 1907 common stock formed the largest proportion of the outstanding capitalization, being for the operating and

TABLE III—CAPITALIZATION, INCLUDING FLOATING DEBT AND REAL-ESTATE MORTGAGES

	1912	1907	Per Cent of Increase ¹
Capital stock	\$2,379,346,313	\$2,097,708,856	13.4
Common	1,970,385,003	1,776,920,076	10.8
Preferred	408,961,310	320,788,780	27.5
Funded debt	2,329,221,828	1,677,063,240	38.8
Floating debt and real-estate mortgages	302,259,042	282,986,902	6.7
Total	5,010,827,183	4,057,758,998	23.5
Stocks and bonds of other electric railway companies and treasury securities	360,105,164	237,896,093	51.4
Net capitalization	4,650,722,019	3,819,862,905	21.8
Investments in other securities and nonrailway properties	105,145,250	136,768,104	-23.1
Net capitalization based on street and electric railways:			
Inclusive of floating debt and real-estate mortgages	4,545,576,769	3,683,094,801	23.4
Per mile of track	112,405	107,942	4.1
Exclusive of floating debt and real-estate mortgages	4,243,317,727	3,400,107,899	24.8
Per mile of track	104,930	100,495	4.4

¹A minus sign (-) denotes decrease.

TABLE IV—GROSS INCOME OF OPERATING COMPANIES, BY SOURCE

Account	1912	1907	1902	Per Cent of Increase		
				1902-1912	1907-1912	1902-1907
Gross income	\$585,980,517	\$429,744,254	\$250,504,627	133.9	36.3	71.69
Operating revenues	\$567,511,704	\$418,187,859	\$247,553,999	129.2	35.7	68.9
Passenger	502,651,637	382,132,494	233,821,548	115.0	31.5	63.4
Parlor, chair, and special car	1,036,520	705,261	303,608,241.4	47.0	132.3	
Freight	10,165,616	5,231,215	1,038,097,879.3	94.3	403.9	
Mail	723,840	646,575	432,080,67.5	11.9	49.6	
Baggage, express and milk	3,687,947	1,560,802	401,672,818.1	136.3	288.6	
Other transportation revenue	1,919,413					
Sale of electric current	36,500,030	20,093,302	7,703,574,373.8	81.7	160.8	
Other nontransportation revenue	10,826,901	7,818,209	3,853,420,181.0	38.5	102.	
Income from other sources	18,418,813	11,556,396	2,950,628,524.2	59.4	291.	
Per Cent of Gross Income						
Operating revenues	96.9	97.3	98.8			
Passenger	85.8	88.9	93.3			
Parlor, chair, and special car	0.2	0.2	0.1			
Freight, mail, baggage, and express	2.5	1.7	0.8			
Sale of electric current	6.2	4.7	3.1			
Other operating revenue	2.2	1.8	1.5			
Income from other sources	3.1	2.7	1.2			

lessor companies 47.1 per cent of the total, while in 1912 it is only 41.8 per cent of the total. On the other hand the five years between 1907 and 1912 have shown a larger proportionate increase of the funded debt, which now constitutes 49.4 per cent of the total, while the common stock is 41.8 per cent and preferred stock 8.8 per cent of the total.

HOLDING COMPANIES

There were sixty-one holding companies or organizations in 1912 identified largely with the industry. The

TABLE V—PER CENT DISTRIBUTION, BY ACCOUNTS, OF GROSS INCOME OF OPERATING COMPANIES

Account	Total—All Companies			Companies Reporting Net Income			Companies Reporting Net Deficit ¹		
	1912	1907	1902	1912	1907	1902	1912	1907	1902
Gross income	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Operating revenues	96.9	97.3	98.8	97.0	97.1	99.4	95.8	98.1	95.2
Miscellaneous income	3.1	2.7	1.2	3.0	2.9	0.6	4.2	1.9	4.8
Operating expenses	56.8	58.5	56.8	55.4	57.0	55.7	68.3	63.5	64.3
Deductions from income	32.6	32.1	31.0	31.0	27.6	28.5	45.4	47.9	47.2
Taxes	6.0	4.6	5.2	6.1	4.8	5.2	4.8	4.0	5.3
Interest	16.7	14.8	15.2	15.2	14.7	14.2	28.7	15.3	21.9
Rent of leased lines and terminals	7.6	11.2	10.2	7.5	6.4	8.8	9.1	28.0	19.4
Miscellaneous deductions	2.3	1.5	0.4	2.2	1.8	0.3	2.8	0.6	0.6
Net income or net deficit ¹	10.6	9.4	12.2	13.6	15.3	15.8	13.7	11.4	11.5
Dividends	8.8	6.2	6.3	9.9	7.9	7.2	0.1	(2)	0.3
Surplus or deficit ¹	1.8	3.2	5.9	3.7	7.4	8.5	13.8	11.4	11.8

¹Indicates deficit.
²Less than one-tenth of 1 per cent.

TABLE VI—PER CENT DISTRIBUTION OF OPERATING EXPENSES, BY ACCOUNTS

Account	Operating Expenses			General Accounts		
	1912	1907	1902	1912	1907	1902
Operating expenses	100.0	100.0	100.0			
Way and structures	13.9	11.4	9.6	100.0	100.0	100.0
Superintendence of way and structures	0.8			5.6		
Maintenance of way	9.1	8.7	6.8	65.0	76.5	70.9
Maintenance of electric lines	1.7	1.9	2.1	11.9	16.8	21.8
Buildings and structures	0.8	0.8	0.7	5.8	6.7	7.3
Depreciation of way and structures	1.1			8.0		
Other operations	0.5			3.7		
Equipment	12.0	12.5	11.7	100.0	100.0	100.0
Superintendence of equipment	0.5			4.2		
Maintenance of power equipment	1.1	1.5	1.5	9.4	12.2	13.1
Maintenance of cars and locomotives	5.1	5.5	5.4	42.3	43.9	45.9
Maintenance of electric equipment of cars and locomotives	3.0	4.3	3.7	24.7	34.1	31.9
Miscellaneous equipment expenses	0.9	1.2	1.1	7.6	9.8	9.1
Depreciation of equipment	1.1			9.2		
Other operations	0.3			2.7		
Traffic expenses	0.8	0.7	0.8			
Conducting transportation	57.0	56.1	59.1	100.0	100.0	100.0
Superintendence of transportation	2.1	1.4	1.8	3.8	2.5	3.1
Power	18.2	17.5	16.2	41.9	31.2	27.4
Power-plant employees	1.9	3.1	3.2	3.3	5.6	5.5
Substation employees	0.6			1.0		
Fuel for power	6.1	8.4	9.0	10.6	14.9	15.3
Other power supplies and expenses	0.6	1.1	1.2	1.1	1.9	2.1
Power purchased	7.4	4.9	2.7	13.0	8.7	4.6
Other operations	1.6			2.9		
Operation of cars	36.7	37.2	41.0	64.4	66.3	69.5
Conductors, motormen, and trainmen	29.5	29.8	34.2	51.8	53.0	58.0
Miscellaneous transportation expenses	7.2	7.5	6.8	12.6	13.3	11.5
General and miscellaneous	16.3	16.8	17.3	100.0	100.0	100.0
General expenses	5.7	6.0	6.7	35.3	35.9	38.8
Injuries and damages	6.2	7.2	6.6	38.2	43.0	38.4
Insurance	0.9	1.2	1.5	5.8	7.4	8.1
Stationery and printing	0.3	0.3	0.3	2.0	2.0	2.0
Store and stable expenses	0.6	0.7	1.2	3.8	3.9	6.7
Rent of tracks and terminals	1.1	1.1	1.0	6.8	6.5	6.0
Rent of equipment	0.4	0.2		2.2	1.4	
Other operations	1.0			5.8		
Wages, supplies, and expenses incident to electric service, not elsewhere included		2.4	1.5			

TABLE XI—OPERATING RATIOS FOR 1912 AND 1907

Total Number of Companies	Number of Companies Reporting Operating Ratio—													
	Under 50 Per Cent		50 Per Cent but Under 60 Per Cent		60 Per Cent but Under 70 Per Cent		70 Per Cent but Under 80 Per Cent		80 Per Cent but Under 90 Per Cent		90 Per Cent and Over			
	1912	1907	1912	1907	1912	1907	1912	1907	1912	1907	1912	1907		
Total number	1973	938	69	77	224	195	233	263	177	160	109	109	161	134
Revenue passengers per mile of track:														
Under 25,000	184	169	4	11	31	27	50	45	25	26	26	21	48	30
25,000 but under 50,000	143	134	6	9	24	21	27	22	30	22	16	26	40	34
50,000 but under 100,000	242	232	13	19	40	39	61	73	46	37	37	25	45	39
100,000 but under 200,000	220	263	19	17	60	61	55	83	47	52	22	30	17	20
200,000 but under 300,000	95	67	11	7	33	20	23	23	16	12	6	3	6	2
300,000 but under 400,000	41	32	9	8	14	11	10	8	5	5	1		2	
400,000 and over	48	41	7	6	22	16	7	9	8	6	1	4	3	
Revenue passengers per car-mile:														
Under 2	157	144	4	6	28	26	34	35	27	23	17	19	47	35
2 but under 3	168	164	7	11	27	34	36	27	32	30	27	27	39	35
3 but under 4	194	217	10	15	38	30	40	68	43	36	25	36	38	32
4 but under 5	200	202	15	15	52	56	64	67	37	37	17	11	15	16
5 but under 6	137	122	16	17	43	26	37	41	18	23	15	7	8	8
6 but under 7	57	37	9	4	20	10	14	10	5	6	3	4	6	3
7 and over	60	52	8	9	16	13	8	15	15	5	5	5	8	5

¹Not including two companies doing freight business only. ²Exclusive of six companies which failed to furnish this information, and one freight road.

total amount of their reported assets was \$1,239,057,329, of which 61.7 per cent was invested in stocks and bonds of electric railway companies. Only seven of these

TABLE VII—PER CENT DISTRIBUTION OF OPERATING EXPENSES BY ACCOUNTS—COMPANIES CLASSIFIED ACCORDING TO INCOME FROM RAILWAY OPERATIONS: 1912

Account	Per Cent of Total			Per Cent of Operating Expenses			
	Class A	Class B	Class C	Total	Class A	Class B	Class C
Number of companies	93	15.9	74	8			
Operating expenses	72.0	16.0	12.0	100.0	100.0	100.0	100.0
Way and structures	72.5	16.0	11.5	13.9	14.0	13.9	13.4
Equipment	74.7	14.5	10.8	12.0	12.5	10.9	10.8
Traffic	51.6	29.0	19.5	0.8	0.6	1.4	1.3
Conducting transportation	72.7	15.7	11.7	57.0	57.5	55.8	55.4
Superintendence of transportation	77.2	13.8	9.0	2.1	2.3	1.8	1.6
Power	64.4	18.8	16.8	18.2	16.3	21.4	25.5
Operation of cars	76.5	14.3	9.2	36.7	39.0	32.7	28.3
General and miscellaneous	68.3	17.6	14.1	16.3	15.4	17.9	19.2

TABLE VIII—OPERATING COMPANIES—DEDUCTIONS FROM INCOME, BY ACCOUNTS

Account	1912		1907		Per Cent Distribution	
	1912	1907	1912	1907	1912	1907
Number of companies		975		930		
Deductions from income	\$191,123,408	\$138,094,716				
Taxes	35,027,965	19,755,602	18.3	14.3		
On real and personal property	15,658,239	9,464,616	8.2	6.9		
On capital stock	3,899,146	2,348,439	2.0	1.7		
On earnings	9,486,792	5,437,028	5.0	3.9		
Federal corporation tax	1,016,901		0.6			
Miscellaneous	4,966,887	2,505,519	2.6	1.8		
Interest on funded and floating debt and mortgages	98,025,338	63,740,744	51.3	46.2		
Rent of leased lines and terminals	44,784,521	48,022,596	23.4	34.8		
Charges for sinking fund	6,229,136		(1)	3.3		
Miscellaneous deductions	7,056,448	6,575,774	3.7	4.8		

¹Included under "Miscellaneous deductions."

TABLE IX—RATIO OF TAXES TO GROSS INCOME LESS OPERATING EXPENSES (PER CENT)

Division	1912			1907		
	1912	1907	1902	1912	1907	1902
United States	13.8	11.1	12.2			
New England	21.1	17.2	19.4			
Middle Atlantic	12.6	9.4	11.9			
East North Central	15.2	11.2	10.7			
West North Central	14.0	11.4	10.6			
South Atlantic	11.9	11.6	11.6			
East South Central	14.4	15.0	11.7			
West South Central	10.4	9.3	13.1			
Mountain	10.7	6.6	8.5			
Pacific	12.2	11.5	10.0			

TABLE X—GENERAL RESULTS OF OPERATIONS OF ALL COMPANIES AND OF COMPANIES CLASSIFIED ACCORDING TO INCOME FROM RAILWAY OPERATIONS, 1912

Unit	All Companies			
	975	Class A 91	Class B 155	Class C 729
Number of companies	975	91	155	729
Ratio of operating expenses to operating revenues (per cent)	58.7	56.7	61.7	68.3
Per mile of track:				
Operating revenues	\$13,820	\$19,844	\$8,937	\$5,784
Operating revenues exclusive of income from sale of current	12,931	19,011	7,929	4,890
Operating expenses	8,107	11,252	5,517	3,949
Net operating revenue	5,713	8,592	3,420	1,835
Per car-mile:				
Operating revenues	29.53	29.49	30.63	28.32
Operating revenues exclusive of income from sale of current	27.63	28.25	27.18	23.94
Operating expenses	17.32	16.72	18.91	19.33
Conducting transportation	9.87	9.62	10.56	10.71
All other	7.45	7.10	8.35	8.62
Net operating revenue	12.21	12.77	11.72	8.99
Per revenue passenger:				
Operating revenues	5.95	5.54	7.51	7.68
Passenger revenue	5.27	5.08	6.10	5.87
All other	0.68	0.46	1.41	1.80
Operating expenses	3.49	3.14	4.64	5.24
Net operating revenue	2.46	2.40	2.87	2.44

holding companies were in New York, but they controlled 35.9 per cent of the total investment.

FINANCIAL OPERATIONS

The first eight states, in the order of the magnitude of their gross receipts, were the same in 1912 as in 1907, viz: New York, Pennsylvania, Illinois, Ohio, Massachusetts, California, Missouri and New Jersey. The ninth state in 1912 was Michigan, which in 1907 was twelfth in the list.

The gross income of all companies in 1912 was \$621,535,884, of which \$35,144,521 was reported by the lessor companies as income from rental paid by the operating companies. The gross income of the operating companies is shown in Table IV. Table V shows the per cent distribution by accounts of gross income of operating companies, showing net income and also net deficit. The bulk of the deficit comes from companies in the New England and Middle Atlantic divisions. In 1912 these divisions furnished 61.5 per cent of the total deficit, as compared with 58.3 per cent in 1907 and 52.6 per cent in 1902.

Table VI shows the per cent distribution of operating

by occupations into a number of classes, but except for conductors and motormen the grouping was unsatisfactory, as among the small and medium-sized companies one employee acts in several capacities. Hence the schedule was altered for the 1912 census. The bureau believes that the change in the form of the inquiry may have had some effect on the numbers reported for the different classes in the various censuses, and it may be that in some cases foremen, inspectors, starters and engineers, that were specified as wage earners in the prior censuses, were considered salaried employees in 1912 and reported as such.

Transmission Line Short-Circuit Conditions Discussed at A. I. E. E. Meeting

Electrical Engineers Consider Mechanical and Heating Effects of Short-Circuits and the Application of Reactance to Limit Them

A paper on this subject was presented at the New York meeting of the American Institute of Electrical Engineers on January 8 by I. W. Gross of the motive power department Interborough Rapid Transit Company. The paper and the following discussion brought out, first, the magnitudes of the effects of short-circuits in large power plants and in transmission lines, particularly cable lines; second, the necessity for furnishing protection to equipment, and, third, the function of reactance in furnishing such protection and the methods used in applying it.

Mr. Gross pointed out that, in a high-tension system, protection must be furnished for the following: (1) Oil switches against absolute failure; (2) generators, transformers, busbars and underground cables against mechanical forces; (3) all apparatus against overheating, and (4) the system as a whole against complete shut-down. No system is completely protected without attention to these elements. The paper was the result of a study made in connection with the plans for the enlargement of the Seventy-fourth street power plant of the company.

Following the outline given in the above paragraph the author proceeded to discuss the theoretical and some of the practical phases of the subject. He cleared the ground by stating that oil switches can be obtained with a guarantee that they will interrupt short-circuit currents up to 36,800 amp. He demonstrated mathematically that, with short-circuit current values likely to occur in large plants, rupturing forces of the magnitude of a ton per foot of cable may result. The cables, however, are amply strong to resist these. Curves showing these forces for different current values and different center-to-center distances of conductors were given. A similar analysis of mechanical reaction between busbars was described.

In showing how temperature rise is related to short-circuit conditions, Mr. Gross gave the results of calculations based on the assumption that for the short period involved, less than a second at the outside, the heat generated can be assumed to be confined to the conductor. Then, from the calculated volume of the conductor, the assumed specific heat of the material and the heating effect of the calculated train of current waves, the temperature rises for a large number of conditions were calculated and results plotted. Owing to the oscillating character of the current, which falls quickly from a maximum transient value to a steady alternating value, the mathematical demonstration is involved, but the underlying physical principles are not so, and the results are easily adapted to other conditions. The curves show that the temperature may

TABLE VII—EMPLOYEES, BY CLASSES OF OCCUPATION

Class	1912	1907	Per Cent of Increase
Number of companies	975	1939	3.8
Persons employed:			
Number	282,461	221,429	27.6
Salaries and wages	\$200,890,939	\$150,991,099	33.0
Salaried employees—			
Number	23,271	11,700	98.9
Salaries	\$26,128,786	\$12,909,466	102.4
Salaried officers of corporation—			
Number	1,927	1,518	26.9
Salaries	\$3,708,553	\$3,852,252	48.2
Managers and superintendents—			
Number	2,882	2,094	37.6
Salaries	\$5,376,526	\$3,580,367	50.2
Clerks, stenographers, and other salaried employees—			
Number	18,462	8,088	128.3
Salaries	\$15,043,707	\$5,476,847	174.7
Wage earners—			
Average number	229,190	209,729	23.6
Wages	\$174,762,153	\$138,081,633	26.6
Conductors and motormen—			
Average number	131,321	115,518	13.7
Wages	\$95,451,625	\$75,705,054	26.1
Conductors—			
Average number	65,726	60,032	9.5
Wages	\$47,101,768	\$38,234,158	23.2
Motormen—			
Average number	65,595	55,486	18.2
Wages	\$48,349,857	\$37,470,896	29.0
All other employees—			
Average number	127,869	94,211	35.7
Wages	\$79,310,528	\$62,376,579	27.1

¹Exclusive of six companies which failed to furnish this information.

²Number employed Sept. 16, 1912.

expenses of the 975 operating companies. Table VII shows the corresponding figures for 1912 but divided into three classes of companies, viz: Class A, or those having gross income from railway operations of \$1,000,000 or more; Class B, with income of \$250,000 or more but less than \$1,000,000; and Class C, with income less than \$250,000. Table VIII gives the deductions from income for the operating companies, and Table IX shows the ratio of taxes to gross income less operating expenses in per cent for the different groups of states. The report says that in all the divisions, with the exception of the South Central, taxes consumed a larger proportion of the income left after paying operating expenses in 1912 than in either 1907 or 1902.

Table X shows the general results of operations of all companies and of companies classified according to income from railway operations. Table XI shows the operating ratios reported for 1907 and 1912, the companies being grouped according to the revenue passengers per mile of track and per car-mile.

EMPLOYEES

Table XII gives the number of employees and salaries or wages paid for all of the companies. In connection with this table, the report points out that in the 1907 and 1902 reports wage earners were grouped

rise to prohibitive values within the 0.18 second stated by Mr. Gross to be the minimum period during which the circuit can be opened, unless precautions are taken to limit it.

The remainder of the paper is taken up with the application of the theory to various arrangements of current-limiting reactors, particularly to the one adopted for the Seventy-fourth street plant and described in the issue of the *ELECTRIC RAILWAY JOURNAL*, Vol. 43, page 872. Short-circuits at various points were assumed and the results were calculated and plotted. This method, which was selected by H. G. Stott as the best adapted to conditions at Seventy-fourth street, has the merits of limiting the current to safe values without excessive reactance; of protecting the generators against mechanical injury due to poor synchronizing, and of transmitting power between busbar sections with reasonable voltage drop.

Inspecting Equipment in Greater New York

Pull-Ins, Equipment Complaints, Ventilation, Accidents, Etc., Discussed by Commission's Senior Electrical Engineer

William C. Whiston, senior assistant electrical engineer of the Public Service Commission for the First District of New York, contributed to the *Public Service Record*, for November, 1914, published in the interest of that commission, a very interesting article dealing with the equipment inspection bureau of the commission. Mr. Whiston said that in 1907, when the commission first began its work, more than 30 per cent of the cars on some lines in Manhattan and the Bronx had to be run into the carhouses during the day because of defective equipment. After the engineers of the equipment inspection bureau had made a minute inspection of this equipment it was thoroughly overhauled under orders of the commission and put in good condition. The city is now divided into districts, to each of which is assigned an engineer to visit each surface carhouse in his district at irregular intervals, according to the conditions found. One engineer is assigned to the subway and elevated car equipment, which is similarly inspected.

In addition to the inspections of car equipment, general inspections of the tracks of the various street railways are made at least once each year to determine what track should be rebuilt or repaired during the following season. The matter is then taken up with the company and an agreement is reached by which as much as possible of poor track is scheduled for rebuilding or overhauling during the next season.

Complaints by the public regarding equipment are investigated promptly, and if they are found to be justified the company involved is communicated with. In almost every instance repairs are made without formal action by the commission.

Another branch of the work is the investigation and study of accidents. The accident reports received from the engineers are classified and studied to prevent repetitions of those of most frequent occurrence. A study of the commission's records brought out the fact that the near-side stop reduced the number of collisions with vehicles, and the number of persons struck by cars, but that the number of boarding accidents increased seemingly, because people not familiar with the new ordinance still wait on the far side of the street and then try to jump on a moving car.

Mr. Whiston referred to the subject of brakes on surface cars and to the rehabilitation of the power plant of the Richmond Light & Railroad Company at Living-

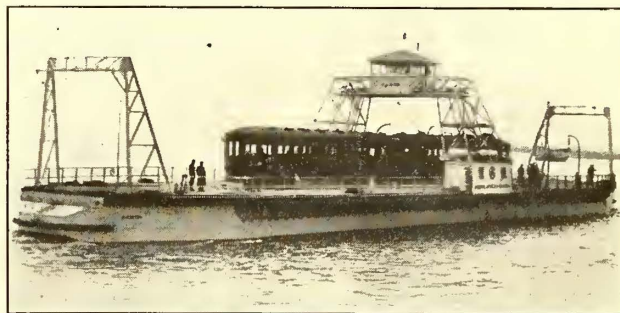
ston, Staten Island, the rebuilding of which has been referred to previously in this paper.

In regard to the tests which are being carried on to determine the efficiency of different systems of ventilation in use on cars, Mr. Whiston said that samples of the air in cars of different types are taken to determine the number of parts of carbon dioxide in 10,000 parts of air, but he expressed doubt as to whether this will convince the traveling public, who generally cannot be convinced that a car is well ventilated unless they can see some direct opening to the outer air. To substantiate his point about the idiosyncrasies of the public, Mr. Whiston says that many complaints have been received in regard to the center-entrance cars, which are the most scientifically ventilated in the city.

In connection with the matter of the screeching caused by the application of the brakes Mr. Whiston says that most of the companies affected have already submitted for approval a brakeshoe containing an asphaltum insert which it is found gives just enough lubrication on the flanges of the wheels to prevent screeching and not interfere with braking efficiency.

Steel Ferryboat in Service on the Oakland, Antioch & Eastern

The steel ferryboat *Ramon* was put in service on the line of the Oakland, Antioch & Eastern Railway between Mallard and Chipps Island in Suisun Bay on Jan. 3. The new boat, which was built at San Francisco, is 235 ft. long, has a beam of 58 ft. and is equipped with a 600-hp oil-engine. The two slips into which the ferry operates are 2600 ft. apart and the trip takes from eight minutes to nine minutes, the normal speed of the boat being $7\frac{1}{2}$ m.p.h. The boat has a capacity of eleven



STEEL FERRYBOAT OF THE OAKLAND, ANTIOCH & EASTERN RAILWAY

freight cars and one locomotive and ordinarily handles eighteen trains a day. A special feature of its design is that, instead of the usual means of mooring in the slip, there is provided a mechanical locking device that can be released instantly when the last truck is on board. The engine is always started a few minutes before the train arrives, and thus there is a minimum delay in getting away from the slip. The ferry is equipped with pneumatic steering gear and operates in either direction. For the convenience of passengers a grill room is provided on the lower deck.

The Stevens Institute of Technology, of which Dr. A. C. Humphreys is president, is conducting a whirlwind ten-day campaign to raise \$860,000 for an endowment fund, to clear off present debts and to add somewhat to the building equipment. If this amount is raised Andrew Carnegie and John D. Rockefeller will each add \$250,000. The campaign is under the direction of the "Stevens Tech. Fund Committee," with executive offices at 50 Church Street, New York.

Travel on New York Transit Lines and Steam Railroads

Statistics of Passengers Carried—Statement Showing the Extent of Travel and Accidents in Five Years and Six Months

In the editorial last week in this paper on the number of passengers carried and accidents to passengers on the steam railroads and on the subway and elevated roads in New York, an error was made in the comparison of the passengers carried. The number of passengers carried on the steam roads reporting to the Interstate Commerce Commission for the year ended June 30, 1912, was 1,004,081,346, while the number on the combined subway and elevated railway system in New York for the same year was 607,244,697, or a little more than 60 per cent of the number on the steam roads for the same period. The statistics for accidents on the steam railroads quoted were from the Interstate Commerce Commission reports for the years ended June 30, 1913, and 1914, and for the Interborough for the year ended June 30, 1914. These figures were correctly stated. Although the difference in accidents per passenger carried is not so great as stated last week the comparison is sufficiently striking.

On Jan. 14 the Interborough Rapid Transit Company published a statement in all of the New York daily papers, showing the safety of subway and elevated travel. The statistics of the accidents on the subway and elevated lines were brought up to include the recent accidents, and figures were given for five-year periods. The statement follows:

"To the Public:

"In view of recent published statements calculated to unsettle confidence in the safety of travel upon the rapid transit lines in this city and to create a false impression that the management, intent on profit, is unmindful of public welfare, the board of directors invites attention to the following facts:

"Passengers carried during the five years, six months, and twelve days ended Jan. 12, 1915,

Elevated Division	Subway Division	Total
1,678,115,936	1,692,362,193	3,370,478,129

"Fatal accidents due to train operation, excluding suicides and trespassers,

Elevated Division	Subway Division	Total
3	1*	4

*Including recent fatality not due to train operation.

"Some measure of the comparative safety of travel upon the rapid transit lines in this city, notwithstanding the onerous conditions of congestion, and frequent and rapid service under which they are operated, may be derived from the following comparisons:

"Passengers carried for the five years ended June 30, 1913, upon the steam railroads of the United States, over 4,800,000,000.

"Fatal accidents to passengers from steam railroad operation, excluding trespassers, 1862.

"Fatal accident rate upon the steam railroads, to passengers carried, one passenger in 2,610,000.

"Fatal accident rate upon the London underground lines to passengers carried, one passenger in 25,000,000.

"Fatal accident rate upon the elevated and subway lines of the Interborough Rapid Transit Company, to passengers carried, one passenger in 842,620,000.

"This company employs the best operating talent.

"This company buys the best materials.

"This company leads the world in the development of electrical transportation.

"This company encourages and carefully considers every thoughtful suggestion relating to the safety and comfort of its passengers.

"This company has never refused a request of its operating department for any device or improvement tending to promote efficiency and safety in operation. For this purpose this company has expended during the last five years (apart from its ordinary operating and maintenance charges), more than *Thirteen Millions of Dollars*.

"This company operates the safest passenger railroad in the world."

The statement is signed by T. P. Shonts, president Interborough Rapid Transit Company.

Discussion on Paving

Merits of Wood and Stone Blocks Considered at Philadelphia A. A. S. Meeting

At a meeting of the engineering section of the American Association for the Advancement of Science held in Philadelphia on Dec. 30 and 31, several interesting papers on paving were presented. The program was in charge of Fred W. Taylor, consulting engineer, Philadelphia, and A. H. Blanchard, professor of highway engineering Columbia University, New York.

WOOD BLOCK PAVING

T. S. Oxholm, engineer in charge, bureau of engineering borough of Richmond, New York, explained his practice in laying wood blocks on dry mortar in preference to sand. He considers paving thus constructed more durable and, as the mortar sets gradually, there is ample time to roll the blocks into place. At the same time new pavement can be used as soon as completed.

George W. Tillson, consulting engineer to the president of the borough of Brooklyn, New York, outlined the practice in New York City in regard to wood paving block specifications and tests. A test for the absorption of creosote oil to the extent of 20 lb. per cubic foot by blocks of yellow pine weighing 42 lb. per cubic foot was that they should sink in water. After blocks were kiln-dried at 100 deg. Fahr. for twenty-four hours they were immersed for an additional twenty-four hours and were rejected if they gained more than 3 per cent in weight. Pavements constructed of such blocks without expansion joints have been in use ten or eleven years with practically no attention on account of instability of the blocks. The specifications have been changed to admit the use of oil of 1.10 to 1.12 specific gravity without resin, and to permit 3½ per cent absorption. No trouble from bulging has resulted even when expansion joints were not used. The borough of Manhattan, in its 1914 specifications, has decreased the treatment from 20 lb. to 18 lb. per cubic foot and has increased the permissible absorption to 5 per cent. These blocks are used with bituminous joint filler but without expansion joints. No maintenance data are, of course, available as yet.

STONE BLOCK PAVING

This subject was discussed by H. H. Schmidt, chief engineer of the bureau of highways, borough of Brooklyn, New York. He stated that modern granite block paving dates back but five years and many of the objectionable features have been removed. An extensive study of this type of paving has been conducted in Brooklyn, and it has been found that the value of granite for paving purposes depends very largely upon

its composition. Standard specifications were prepared and have been embodied in the specification adopted by the American Society of Municipal Improvements in October, 1914. There are in Brooklyn 160 miles of stone pavement, of which 25 miles are of the improved type. There were no expenditures for maintenance of these 25 miles in 1914.

The bureau employs certain traffic standards in studying paving and street congestion as follows:

Traffic density units per minute per foot of roadway = (number of vehicles passing a given point × traffic value) ÷ (8 × 60 × width of roadway in feet).

Traffic value is given by the following table:

Character of Vehicle	Weight in Tons	Traffic Value
Rubber-tired vehicles:		
Large auto trucks, loaded	9	5
Large auto trucks, empty	4	4
Small auto trucks, loaded	3	3
Small auto trucks, empty	1½	2
Pleasure automobiles	1¾	1
Carriages	2	2
Steel-tired vehicles:		
Loaded trucks	7½	10
Empty trucks	3½	7
Loaded wagons	2½	7
Empty wagons	1½	4
Carriages	1	2
Trolley cars	—	10

The density of traffic may be divided roughly thus: Maximum, 1.16 to 1.74; medium, 0.58 to 1.15, and minimum, 0.00 to 0.57.

Reduced to tonnage per foot width of roadway, per eight-hour day, the following show what is meant by heavy, medium and light traffic in Brooklyn: Maximum, 200 to 235 or more; medium, 100 to 199, and minimum 0 to 99.

Buffalo's Railway Facilities

Sketch of Past and Present Conditions in That City and Vicinity Is Given by E. J. Dickson

At the first "Electrical Railway Night" of the Central Railway Club, Buffalo, N. Y., held at the Hotel Statler on Friday, Jan. 8, E. J. Dickson, vice-president International Railway, presented a historical survey of street and electric railway development in and about Buffalo. The following abstracts from Mr. Dickson's paper are of more than local interest because of their comparisons of old and new service equipment and costs.

TRACK

In the track construction used during the sixties and seventies a side-bearing stringer rail weighing 42 lb. per yard was used. This was spiked to 5-in. x 7-in. pine stringers. The joint plates were of cast iron, 18 in. long and countersunk into the stringers. The tie rods to hold the stringers in place were spaced 5 ft. centers, and no crossties were used. Where paving was employed it consisted of stone block bedded in sand only. The following is a bill of material covering 1 mile of track built between 1860 and 1880:

65 tons rails at \$28 per ton	\$1,820.00
31,800 ft. lumber at \$22 per thousand	677.60
1956 tie rods and 4224 washers averaging 16 cents per rod	171.06
5280 spikes at 8 cents per pound	79.20
211 joint plates at 8 cents per pound	16.88
200 yd. sand at \$1.25 per yard	250.00
Labor at 35 cents per running foot, including laying track, paving and clearing rubbish	1,848.00
Total	\$4,862.74

During the following decades the standards of track construction constantly advanced because of heavier cars and shorter headways, until in 1910 the company found it necessary to install a 124-lb. 9-in. girder rail with shoulder tie plates, tie rods at 6-ft. centers, ties at 2-ft. centers and eight-bolt continuous joints with bonds. The substructure used with this construction was of

crushed stone ballast which had been rolled with a 10-ton roller. While this substructure gave general satisfaction where the sub-grade was of dependable character, it called for constant repairs in those locations where lack of drainage converted it to a soggy, unstable mass. This portion of the track standards adopted in 1910 had been replaced, therefore, by an 8-in. concrete base under the whole structure, the rail being afterward tamped up with 2 in. of crushed stone. The following is a bill of material covering 1 mile of single track as laid on the system to-day:

195 tons of rail at \$38.50 per ton	\$7,501.00
2640 white oak and long-leaf yellow pine ties at 93 cents each	2,455.00
880 tie rods at 32 cents each	281.00
4928 tie plates at 13.6 cents each	670.00
176 Continuous joints at \$4.75 each	836.00
10,560 drive screws for plates at 0.136 cent each	40.00
10,560 screw spikes at 2.5 cents each	264.00
528 No. 0000 bonds at 39.8 cents each	209.00
1228 yd. concrete sub-base at \$2.43 per yard	2,984.00
695 yd. concrete paving base at \$2.43 per yard	1,684.00
444 yd. tamping stone at 75 cents per yard	333.00
Drainage material, tile, lumber, drains, etc.	138.00
Labor excavating, concreting, laying, bonding, etc., at \$1.61 per track foot	8,516.00
Paving at \$3.14 per track foot	16,580.00
Total	\$42,491.00

ROLLING STOCK

About 90 per cent of the cars used between 1860 and 1890, the beginning of the electrification period, were of two-horse type, 26 ft. over all, with 20-ft. body, single-truck type with cast-iron wheels, seated thirty passengers in longitudinal seats, weighed more than 1800 lb. and cost from \$800 to \$1,000 each. Most of the earlier electric double-truck cars weighed from 14 tons to 20 tons each. In 1906 came 200 pay-as-you-enter cars for the heavier traffic lines. These prepayment cars weighed 26½ tons each. One hundred and fifty were equipped with four 40-hp motors and fifty with four 50-hp motors each. Each had seats for forty-four people, and the unit cost per car was approximately \$7,000. In 1910-1911 the company bought sixty-two double-truck near-side cars, now increased in number to 362, which carry only two 60-hp motors each, seat fifty-four people, weigh but 19 tons and cost, complete with all additions to date, \$6,000 per car.

WORKING HOURS

All horse cars except the 10 per cent of bobtail type were manned by a driver and conductor. In 1870 these men were paid a flat rate of \$1.65 a day. They began their morning run at, say, 6 o'clock and, except for fifteen minute reliefs for dinner and supper, worked through the day until they pulled into the carhouse at night between 8 o'clock and midnight. In this way cars averaged 84 miles a day, while the crews averaged 80 miles a day with fourteen to seventeen hours. To-day the older men in the service average only nine and one-half hours a day, and if they were to work sixteen hours a day as in 1870 they would, according to the present wage schedule, earn \$5.45 a day, or three times the wage of 1870.

PRESENT SYSTEM FREIGHT AND MARKET SERVICE, DISPATCHING, ETC.

The International Railway of to-day is a unification of thirty-two separate street railway, bridge and construction companies formed in Buffalo, Niagara Falls, the Tonawandas, Lockport and on the Canadian side of the frontier. It may be conveniently divided as follows: The city lines in Buffalo, Niagara Falls and Lockport; the interurban or suburban lines to Lancaster-Depew, Kenmore-Tonawanda, Lockport-Olcott and to Niagara Falls; also the Park and River (Canadian side) line.

The Buffalo-Lockport-Olcott division extends from

Buffalo over the leased Erie Railroad right-of-way to and through the Tonawandas to the former Erie station in Lockport. From Lockport to Olcott the track is on the International Railway's right-of-way through the thickly-populated fruit and produce district between the Lock City and Lake Ontario. Between the Tonawandas and Olcott standard steam railroad equipment is handled for freight service by electric locomotives, three of the latter being owned by the company. In addition to the carload freight and l.c.l. shipments, the company operates during each fruit season a "fruit express" by which fruit and produce is transported from stations north of Lockport direct to the Elk Street market in Buffalo. Ten special motor cars are used for this service during the height of the season.

The interurban portion of this division consists of 32.5 miles of road 12 1/3 miles of which, between Tonawanda and Lockport, has recently been double-tracked. Operation had always been on standard rules, namely, time-tables and train orders with dispatchers on duty while cars are in operation. In 1913 it was determined that, owing to the increase in number of trains and the continued growth of traffic, the system of train dispatching by use of the telegraph with operators at the principal stations along the line, was becoming obsolete and would not long fulfil requirements for safe operation. In December, 1913, the telephone system with all-metallic circuit was installed for messages of this character. At the same time the services of operators were discontinued, the dispatchers delivering orders direct to the train crews. At this time there were but 2 1/3 miles of double track on the division, and notwithstanding the fact that the six months period immediately following the change was one of construction with large numbers of work extras on the line daily, the results from the standpoints of safety and continuity of operation, especially, have been most gratifying.

Mr. Dickson also described the operations of the Niagara Falls and Scenic Belt Line which are, perhaps, the most widely-known scenic electric railways in the world. On heavy days both of these lines are operated on a three-minute headway.

Speaking of city fares Mr. Dickson said that up to the year 1892 no universal transfer privileges had been allowed to Buffalo local riders. A few transfers were granted, but as a rule it was necessary to pay an extra fare, usually an exchange ticket costing 3 cents. On the first horse railway, a 3-mile ride cost 12 cents; to-day a 12 1/2-mile ride could be obtained for 5 cents under the broad transfer system in vogue.

GENERAL STATISTICS

The cost of the first power station in Buffalo in 1892 was \$285,000, compared with an appraised value of \$2,180,712 for the power stations and substations of 1913, despite which increase the company secures most of its electrical energy from Niagara Falls. In fact, during 1913 the average energy purchased a day was 260,625 kw-hr., while that taken from the steam stand-by plant was only 15,530 kw-hr. a day. In addition, the company's own hydroelectric plant generated 10,075 kw-hr. a day in 1913.

The total mileage of the system, single-track, is 396. For this trackage the company provides on a regular week-day schedule 10,628 single trips each twenty-four hours. A steam railroad, Mr. Dickson said, would be proud to have 98 per cent of its trains on time although all operation was over right-of-way. Yet if the International Railway, which must operate very largely over public streets open to other traffic, made an equivalent showing by being late 200 out of 10,628 trips the citizens would soon be carrying complaints to the Public Service Commission. During 1913 his company car-

ried 231,509,275 passengers, of whom 52,080,550 were transfer passengers. The number of passenger car-miles was 21,222,760.

In conclusion, speaking as a former steam railroad man, Mr. Dickson said that when he entered electric railway service its intricacies were as surprising to him as some of the data submitted might be to his audience; but it was a great and interesting business with tremendous possibilities, notwithstanding the many unpleasant features connected with it.

The paper was followed by an informal discussion and the election of officers for the new year. Secretary Vought urged the members to enlist the electric railway men of the Buffalo district, following the example of the New York Railroad Club.

Experiences with 2400-Volt Locomotives *

Maintenance Costs and Methods on Butte, Anaconda & Pacific Electrification—Roller Pantographs—Arcing at Contactors

In the discussion on J. B. Cox's paper on the Butte, Anaconda & Pacific Railroad electrification, which was published in the *ELECTRIC RAILWAY JOURNAL* for Nov. 7, 1914, the author stated that the steel rollers on the pantographs of the electric locomotives collected 600 amp at speeds ranging from 16 m.p.h. to 20 m.p.h. quite satisfactorily, a mileage of from 10,000 to 12,000 being obtained. The sliding type is simpler than the roller collector and is preferable to it, even with half the life in mileage and with equal wear on the trolley. Currents up to 3000 amp have been collected without sparking by a single pantograph with a double sliding collector.

The cost of maintenance of the distributing system, as given in the paper, covered all items chargeable to this account, which were principally for material, labor and work-train service and were at the rate of approximately \$125 per mile per year. The cost given for electric locomotive maintenance, including depreciation, should be less in the future. This is because the published figure, 7.47 cents, included 2.46 cents for depreciation, leaving 5.01 cents per mile for actual repairs, and this latter figure included the cost of considerable experimenting with pantograph rollers and minor improvements. Again, it is natural to expect the workmen will become more familiar with the new equipments. Mr. Cox added that it was easier to break in old steam organizations to operate and take care of electric locomotives than to train electrical men who had not had previous steam railroad experience.

To familiarize the workmen with the electric locomotives a general shop inspection and overhaul was made after the first year's service. The locomotives were each in the shop one week, whereas four weeks were required on an average for the steam locomotives for a similar overhaul, and the costs in each case were about proportional to the time in the shops. The tires on the drivers of the electric locomotives averaged somewhat more than double the mileage between turnings obtained from those under the steam locomotive, although the numerous sharp curves on the system result in rapid wear of the flanges. The author believed that on the first installation of a new type locomotive on any road, whether electric or steam, the adaptation and development charges during the first year were likely to make up for the smaller amount of general repair work required during the first year.

Referring to the matter of the burning out of contactors on the locomotives due to dust or to irregularity in following the proper sequence of operations, Mr. Cox

*Abstracted from Proceedings of American Institute of Electrical Engineers for January, 1915.

said that there had been no instances of serious trouble. There had been instances of flashing-over of insulators at the back of the contactors which was thought to have been due to the accumulation of dust from the ore, as this contains some copper. But these arc-overs were discovered only at inspections and apparently had occurred when the contactors were opening the circuit, thus breaking the current before the arc did anything more than burn off the dust. They gave no trouble. No difficulty with contactors has been experienced when the motors were changed from the series to the parallel position, nor had any contact tips been changed. On the whole the contactors on the locomotives show less signs of arcing or burning than on an ordinary 600-volt locomotive in a similar service. The commutators of the main motors also are in splendid condition and look as if they had recently been turned.

Meeting of Massachusetts Association

At the monthly meeting of the Massachusetts Street Railway Association at Young's Hotel, Boston, on Jan. 13, Arthur A. Ballantine, counsel for the Middlesex & Boston Street Railway, discussed the recent decision of the Massachusetts Public Service Commission authorizing the increasing of fares on the system. This case was abstracted in the *ELECTRIC RAILWAY JOURNAL* of Nov. 7, 1914, page 1055. Mr. Ballantine brought out that under the public service act a company cannot put a change in fares into effect until the commission has had at least thirty days' notification. The Middlesex & Boston proceedings extended from July 1, 1914, to Oct. 28, 1914, and the company had lost the benefit of an increased revenue during its heavy summer riding period. He thought the time element required to conduct such cases should be taken into account by other companies contemplating proceedings of this character.

Mr. Ballantine paid a high tribute to the manner in which the board set forth the fundamental principles at stake in the case and outlined the bearing of the findings upon the future of electric railways in Massachusetts. The full petition of the company was not granted, but pending the working out of the fares adopted the company is endeavoring to give a fair trial to the rates, hoping that in due course the additional revenue needed will be authorized, when it is seen that the realization of all that the commission expressed itself in favor of on principle cannot be obtained under the present schedules. The company desired to increase its gross receipts by about \$110,000 per year. The decision of the board yields about \$80,000 additional income per annum, corresponding to a rate of return of about 3.5 per cent on the stock. The recognition by the commission of the fundamental needs of capital, however, gives the company every reason to believe that its legitimate requirements will be taken care of in due course. The decision marks a turning point for electric railways in Massachusetts toward a more equitable return upon their efforts to serve the public.

Exhibit at A. R. M. M. and M. C. B. Convention

The Railway Supply Manufacturers' Association has issued its annual circular in regard to the exhibit at the American Railway Master Mechanics' Association and the Master Car Builders' Association at Atlantic City this June. The Master Mechanics' meeting will be held from June 9 to 11 inclusive and the Master Car Builders' from June 14 to 16 inclusive. The exhibit, as usual, will be held on Young's Million Dollar Pier. The charge for space, in addition to the membership dues of \$15, is 40 cents per square foot. Space will be as-

signed on Feb. 19, and those who desire to exhibit are requested to send in their applications before that date to the secretary, J. D. Conway, Oliver Building, Pittsburgh, Pa.

COMMUNICATION

Interest Rates on Public Utility Bonds

WELSH BROTHERS: INVESTMENT BONDS

PHILADELPHIA, PA., Jan. 12, 1915.

To the Editors:

I note with interest the discussion in your columns upon the rates of interest which will obtain throughout the remainder of the war and the reconstruction period which must follow the re-establishment of peace. An estimate may be offered as to the general trend, certain guesses (more or less intelligent) as to the details. My personal opinion is as follows:

Rates for liquid capital, which is largely used to complete commercial transactions, will remain low for some months to come. Production and trade should increase materially in 1915 and cause the rates for liquid capital to harden. The rise in these rates should be regulated and checked by at least three main factors in the general situation: (1) While certain lines of manufacture and trade will doubtless be abnormally stimulated by war conditions, the average for all industries the country over should not cross (if it reaches) the line of normal; (2) speculation in securities should continue much restricted by steady, though governed, liquidation for European account, if not by arbitrary regulations imposed by the exchanges; (3) the possibility of gold imports due to large commercial export balances and favored by low rates in London.

Rates for capital to be permanently invested in plant account should remain high throughout the war, partly on account of uncertainty, largely because the great financial countries of the world are destroying capital and to that end will be seeking to borrow here instead of lending as in the past. The reconstruction to follow the war will be difficult. Many concerns carried along by others till then will be thrown on their own resources, to stand or fall as the case may be. Hundreds of millions of fiat money will have to be retired or repudiated before the issuing countries will attain financial soundness. Though at that time prostration of business may result in the maintenance of low rates for the liquid capital needed to complete a comparatively small volume of commercial transactions, the accumulated destruction of fixed capital and the doubt as to the solvency of individuals, corporations and nations abroad should make capital for permanent investment dear both abroad and here. Most economists, I think, believe that the destruction of capital in the Russo-Japanese and Balkan wars and in such catastrophes as the San Francisco fire had a perceptible effect on interest rates. The destruction resulting from this war will, of course, be many times that occasioned by all of the above disasters combined. The effects of the present unparalleled destruction will be mitigated, but not, I hold, nullified by business depression, enforced economies and the return into circulation of hoarded gold.

Assuming high rates for fixed capital, what will the effects be upon the corporations of this country, more particularly those engaged in so-called "public service"?

The results thus far have been peculiarly confusing. In this local market accumulated funds for investment have been to a considerable extent released and (excepting equipments and other short term securities) have gone chiefly into old, well-known railroad bonds and bonds of municipalities. The prices of such long term

issues have advanced till they now sell nearly as high as they did before the war and return only about 4 per cent. Simultaneously, one of the greatest and strongest railroad companies paid a full 5 per cent for a long-time loan, based on the same security behind bonds which sold on a 3½ per cent basis just ten years ago. Fresh issues of this nature will doubtless affect the whole long-term investment market. It is my opinion that they will affect more fully bonds now selling to return only 4 per cent, than sound issues of public utilities now selling to return 5½ to 6 per cent.

As was to be expected, earnings of public service companies are standing up remarkably well in the face of the business depression. It is beginning to dawn on the minds of investors that a good rate of interest and high security are to be found in the bond of a public service company, which, in return for good service at reasonable rates, is protected from competition by commission authority. The American public is fast becoming convinced that though trade is dull finances here are sound beyond doubt. It will not be long before public service companies, which have justified or can justify their capitalization and charges and on those charges are reporting fair margin of earnings, will be able to borrow all the money they really need by paying rates of interest, which, though perhaps high, will not be prohibitive. The weaker companies may suffer. Nor will this condition be altogether deplorable. For a number of years there has been need of just such a curb to the pyramiding operations of more than one large public utility operator. HERBERT S. WELSH.

The data are compiled from the daily "Peak Load and Delay Card," which each conductor is required to keep. The peak load is taken as the number of passengers on the car at the point on each route where experience shows the car to be regularly crowded the most, and beyond which the load commences to decrease. When passing this point the conductor records on each trip the number of passengers in the car and the amount of delay, if any has occurred.

PORTLAND RAILWAY, LIGHT & POWER CO. Peak Load and Delay Card							
Line <u>SELLWOOD</u>				Car <u>1017</u> Train <u>4</u> Run <u>4</u>			
Cond. <u>H. E. STEVENS #1152</u>				Date <u>SEP 16 1914</u>			
<small>Sufficient cars are operated on every line to carry all normal traffic without overloads. If all seats are taken and there are thirty passengers standing, your car will be considered overloaded. Look at your watch and note exact time you arrive at peak load point. If space is too small to explain cause of delay or overload, make note "—" and write explanation on back of this sheet.</small>							
Inbound at <u>11⁴⁰ Hawthorne</u>				Outbound at <u>12⁴⁰ Hawthorne</u>			
TIME	PASS.	MIN. LATE	CAUSE	TIME	PASS.	MIN. LATE	CAUSE
6.39 ^a AM	35	-	-	6.40 ^a AM	8	-	-
7.37	46	-	-	7.53	31	-	-
8.38	39	-	-	8.59	3	-	-
9.47	26	-	-	10.03	17	-	-
10.46	24	-	-	11.01	22	-	-
1.58 ^p PM	51	-	-	2.19 ^p PM	33	-	-
3.07	47	-	-	3.23	41	-	-
4.08	15	-	-	4.31	34	-	-
5.14	13	-	-	5.43	72	-	9 Bouyon 2" St
6.13	11	-	-	6.40	15	-	-

PORTLAND TRAFFIC—CONDUCTOR'S REPORT

Plotting Peak Traffic as an Aid to Schedule Adjustment

This System Gives the Company Valuable Data to Adjust Schedules and Disprove Claims of Poor Service

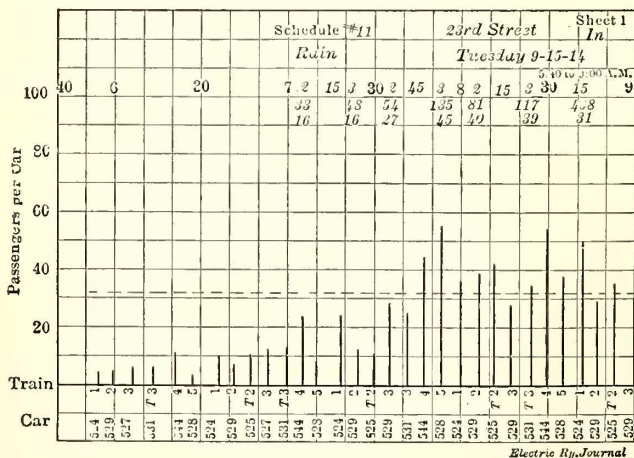
Records of the rush-hour traffic on lines of the Portland Railway, Light & Power Company have long been used in deciding where and when to increase the service, and the method of plotting the data shown in the accompanying illustrations has been developed recently after a great deal of experiment. The primary object was to facilitate schedule adjustment, but, in addition

For the rush-hour periods these data are recorded on charts, as shown in the illustrations. The length of the lines in the chart indicates the number of passengers, and the position of each line marks the time at which the car passed the corner established as the point on its route where the peak load may be expected. Vertical dotted lines are used to show extra cars or "trippers" that run only during rush hours, the full vertical lines representing cars on regular runs.

In addition to the number of each car, its train or route number is given. Whenever the loading exceeds the seating capacity three additional figures are entered for each fifteen-minute period, of which the upper one represents the number of cars passing during the period, the second the total number of passengers, and the lower one the average number of passengers on each car. The dotted horizontal line marks the seating capacity, so that a glance shows on what trips cars carried standing passengers. This plan was introduced by F. W. Hild, general manager of the Portland Railway, Light & Power Company, and Fred Cooper, superintendent of transportation.

Use of Signals on Steam Railroads

According to the last report of the Interstate Commerce Commission 53 per cent of the country's steam railroad mileage on which passenger traffic is carried is protected by block signals, 20.8 per cent having automatic signals and 32.2 per cent having manually operated signals of some form. Of the automatic signals 91.6 per cent were of the semaphore type and 8.1 per cent used discs either exposed or enclosed, only 0.3 per cent being unclassified. Of the non-automatic signals 0.2 per cent made use of the electric train staff, while the controlled manual system comprised 1.3 per cent. It was stated also that 36 per cent of the steam railroads were still using a yellow or white light for a clear indication.



PORTLAND TRAFFIC—TYPICAL CHART

to showing just where extra rush-hour service is needed, it has been found that this system enables the company to disprove unjust claims as to poor service. At the same time it convinces the public, wherever it becomes known, that the company is making an honest effort to meet the traffic requirements.

American Association News

Additional Committee Appointments Are Announced—President Wilson and Other Men of Note Will Address the Washington Meeting—Activities of Various Committees—Coming Committee Meetings

ADDITIONAL COMMITTEE APPOINTMENTS

In addition to the appointments announced in the issue of the *ELECTRIC RAILWAY JOURNAL* for Jan. 2, page 59, the following committee lists have just been given out by Secretary Burritt:

Joint committee on life of physical property: (Accountants) R. N. Wallis, Fitchburg, Mass., co-chairman; A. R. Patterson, Boston, Mass.; W. H. Forse, Jr., Anderson, Ind.; (engineers) Martin Schreiber, Newark, N. J., co-chairman; R. B. Rifemberick, Detroit, Mich.; J. H. Hanna, Washington, D. C.

Accountants' Association committee on accounting definitions: Frederic Nicholas, New York, N. Y., chairman; R. N. Wallis, Fitchburg, Mass.; George A. Harries, Gloversville, N. Y.; S. C. Stivers, New York, N. Y.; F. H. Sillick, New York, N. Y.

PROGRESS ON THE WASHINGTON PROGRAM

Supplementing reports previously printed it may be stated that President Woodrow Wilson will address a second session of the conference which will convene specially at 3 o'clock for the purpose, immediately following the 2 o'clock reception at the White House.

The morning conference will be held at 10:30 o'clock at the New Willard Hotel. The speakers for the morning conference so far secured are as follows: Hon. Andrew J. Montague, member of the House of Representatives; D. W. Morrow, of J. P. Morgan & Company; N. C. Kingsbury, vice-president American Telephone & Telegraph Company; Timothy S. Williams, president Brooklyn Rapid Transit Company; Charles L. Henry, president Cincinnati & Indianapolis Traction Company; Arthur Williams, president American Museum of Safety; C. C. Peirce, vice-president American Electric Railway Manufacturers' Association. C. Loomis Allen, president American Electric Railway Association, will preside.

CHICAGO MEETING OF BLOCK SIGNAL SUB-COMMITTEES

Several sub-committees of the joint committee on block signals of the Engineering and Transportation & Traffic Associations met in Chicago on Jan. 11. The committee members in attendance were J. W. Brown, Newark, N. J.; C. D. Emmons, South Bend, Ind.; John Leisenring, Peoria, Ill., and H. A. Nicholl, Anderson, Ind. L. E. Gould, M. H. Hovey and W. W. Talbert were present also.

The sub-committee assigned to this duty discussed the use of the terms "registering" and "non-registering signals" and "car counting" and "non-car counting signals." This discussion indicated that the members favored the use of the former expression.

On the subject of highway crossing protection, Mr. Leisenring reported that he had sent out data sheets and that at the March meeting of the committee he will present a synopsis of the replies. He will also consider this subject in a memorandum to be presented after the report on highway crossing protection has been read at the next meeting of the Illinois Electric Railway Association.

The sub-committee appointed to suggest revision of the block signal rules for contactor signals decided to

consider the matter after a transcript of the Atlantic City discussion is obtained.

In connection with the topic "Operating by Signal Indication Only" Mr. Nicholl read letters from twenty-four steam and electric railroads and one consulting engineer, giving opinions on the suggested plan. It was decided that he should secure more data and outline a recommendation upon which the committee can take action at the March meeting.

COMMITTEE ON SECTIONAL ASSOCIATIONS

The American Association Committee to consider relations with sectional associations met in New York on Jan. 11. Those present were R. P. Stevens, Youngstown, Ohio, chairman; H. C. Donecker, Newark, N. J.; James F. Hamilton, Schenectady, N. Y., and C. L. S. Tingley, Philadelphia, Pa. After discussing the work of previous committees, T. C. Martin, secretary of the National Electric Light Association, who had been requested to attend for the purpose of explaining the membership plan of that organization, outlined the relation of the section movement to the success of the N. E. L. A. Mr. Donecker agreed to compile, for reference by the committee, certain statistics of existing associations, relating particularly to plan and scope of activities, membership and dues. This compilation will be presented at the next meeting, which will probably take place in March.

COMMITTEE ON PASSENGER TRAFFIC

A meeting of this committee of the Transportation & Traffic Association was held at the Congress Hotel, Chicago, on Jan. 11, with morning and afternoon sessions. Those present were P. P. Crafts, Mobile, Ala., chairman; J. A. Greenland, Fort Wayne, Ind.; E. E. Soules, Peoria, Ill., and E. M. Walker, Dubuque, Iowa.

The committee prepared a form letter and data sheets to be sent to all member companies preliminary to taking up the following: (1) study of the results of one-man car operation, (2) study of the effect of the use of the automobile on passenger traffic, with particular reference to interurban and suburban conditions; (3) continuation of the study of the motor bus and trackless trolley, supplementing the report of the 1914 committee. The meeting adjourned to a date to be set by the chairman.

MILWAUKEE COMPANY SECTION

In place of the usual December meeting of Company Section No. 1, the section accepted the hospitality of the local N. E. L. A. company section at a joint Christmas celebration.

COMING COMMITTEE MEETINGS

Jan. 26, 27, New York, 10 a. m., meetings of the sub-committees of the block signal committee, postponed from Jan. 4 and 5, as outlined on page 1393 of the issue of this paper for Dec. 26, 1914, will be held at association headquarters.

Jan. 27, New York, 10 a. m., Engineering Association committee on equipment, W. G. Gove, Brooklyn Rapid Transit Company, chairman. (See outline of work, *ELECTRIC RAILWAY JOURNAL*, issue of Dec. 26, 1914, page 1393.)

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.)

Equipment Defects—Hand-Operated Controllers—Contacts, Fingers, Springs and Bases—II

BY C. W. SQUIER, E.E.

Renewable Contact Tips.—The ball of the contact finger receives all the wear and burning due to making and breaking the circuit and is the only part of the finger that makes renewal necessary. In order to avoid scrapping the entire finger and contact spring when the contact portion of the finger becomes too worn, several types of renewable contact tips have been designed. The principal argument against the use of such tips is their high first cost and the troubles that some of them have given due to the loosening of the tip.

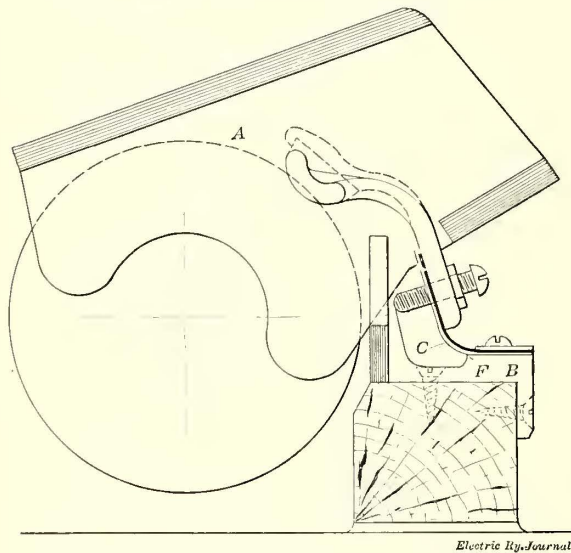
One of the best and simplest renewable contact tips is illustrated in the right-hand drawing. This consists of a standard section of half-round copper so tapped out that it can be screwed to the shank of the

finger with a renewable contact tip is also shown dotted in this figure. This finger can be used in the standard controllers without changing any of the other contact details. In the right-hand drawing the same type of renewable contact tip is shown, but the other contact details have been changed to overcome troubles experienced with the standard adjusting screws, finger springs and contact bases.

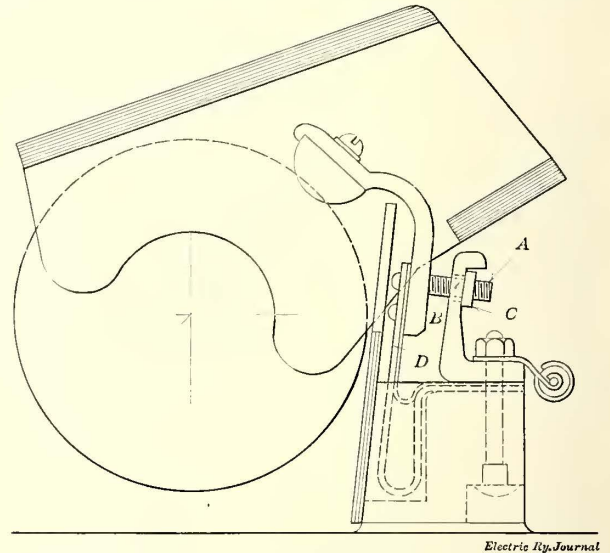
ADJUSTING SCREWS

The style of adjusting screw used with the standard fingers of the K-10 and K-11 controllers is shown in the section of the contact details (left-hand cut). This is screwed through the finger and causes the finger to be raised or lowered by pressing against the upright portion of the finger base. When the proper adjustment has been made unscrewing is prevented by the tightening of a check nut.

The chief criticism of this form is the trouble required to make an adjustment, as it is necessary to use



STANDARD CONTACT DETAILS FOR K-10 AND K-11 CONTROLLERS



SPECIAL CONTACT DETAILS FOR K-10 AND K-11 CONTROLLERS

finger. The tip is kept in place and is prevented from turning by a small lip on the end of the finger shank. A positive lock washer is also used under the head of the screw to prevent it from loosening. The advantage of using a standard section of half-round copper is that it can be obtained readily from most supply houses, thus making it unnecessary to send to the controller manufacturers for the supply parts. This half-round copper is obtained in a long bar and can be cut off to correspond to the different widths of the fingers. It requires no machining of the contact tip other than the drilling and tapping for the screw. This kind of tip also provides a large section of metal to take the arcing, and the tips can be replaced in less time than is required to replace an entire contact finger.

RENEWABLE CONTACT TIPS ON STANDARD CONTROLLERS

The left-hand drawing shows a section of the standard K-10 and K-11 controller contact details. A

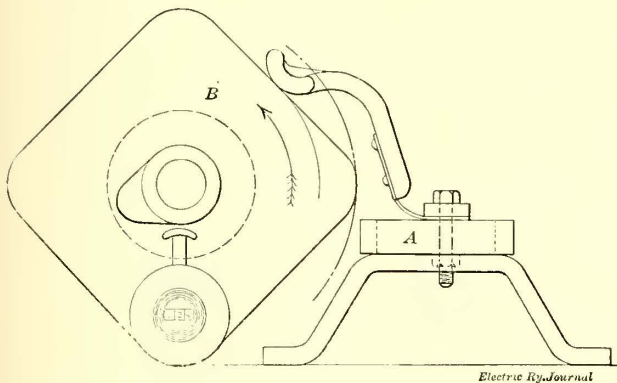
both a screwdriver and a wrench. If the check nuts are not screwed down firmly the adjusting screws loosen and the fingers are pressed in too far toward the center of the drum. Care should be taken to use only screws that are the proper length and that are threaded to the head. When screws are too long they sometimes strike the arc shield as the latter is closed and thus prevent free movement of the fingers. Again, if not threaded to the head, the screw may be screwed the full length of the thread without obtaining the proper degree of adjustment.

The right-hand drawing named shows a finger adjustment which was designed to overcome the objections and troubles just mentioned. It includes a threaded rod *A* riveted into the shank of the contact finger. The end of this rod passes through a hole in the finger base *B* and the adjustment is obtained by screwing or unscrewing a square nut *C* on the threaded rod. The adjustment can ordinarily be made with the hand and

without the use of tools by pulling the finger back so that the adjusting nut clears the lip on the finger base, and then by screwing or unscrewing this nut. After the adjustment has been made the nut is kept from turning by the lip on the finger base, and it cannot change its position due to vibration because the nut is locked positively by the lip. This adjustment also preserves the exact alignment of the fingers with respect to the contact segments on the drum. Where this type is used care must be taken to make certain that the holes in the contact bases through which the adjusting screws pass are so large that they do not bind or rub on the screws as the fingers raise and lower. The square nuts on the adjusting screws must also fit close enough to the lugs on the finger bases so that they cannot turn when in position; but the nuts must not be so close that they will interfere with the slight movement which the fingers have as they make and break contact with the contact segments.

FINGER SPRINGS

While investigating controller troubles, I inspected several thousand worn-out controller fingers at various maintenance shops, and found that an average of one finger in every ten was removed for a broken or cracked finger spring. Most of these breakages occurred just at the edge of the finger where the spring and shunt rest against it. This point is shown in the standard contact drawing at C.



DEVICE FOR TESTING CONTROLLER FINGER SPRINGS

The fingers inspected were of several different types and a further classification of the spring breakages showed that 90 per cent of the broken springs were on fingers which had no shunts. I first thought that the current carried by the spring might have something to do with their breakage, but later tests showed that this was not the case. The reason that the breakages were not as frequent on finger springs with shunts was due to the fact that the soft copper shunt formed a cushion for the spring at the edge of the finger so that the bending strain was distributed over a greater area of the spring. By rounding the contact edge of the finger, the breakages were decreased somewhat, but the insertion of a few thin strips of soft copper to act as a cushion proved the best remedy. It is thus seen that shunts are an advantage in another way than that of helping to carry the current from the finger to the contact base. Another cause for the breakage was in the material used and the manner in which the springs were manufactured. A vibration and bending test on springs showed that a phosphor bronze spring punched out of sheet metal had a much shorter life than springs which were drawn to the exact width required. In comparing results of tests on punched springs, I also found that those which were

bent across the grain of the spring had a longer life than those in which the bending occurred with the grain.

TESTING FINGER SPRINGS

In the third drawing I have illustrated a simple method for testing finger springs. A number of fingers with springs are clamped side by side to the base A. The contact portion of the fingers rests on the drum B, which has alternate high and low spots so located that the contact portion of the fingers is moved through a distance of 1/2 in. in passing from the low to the high position. The drum may be mounted in an old controller frame and the clamping base located in a similar relative position to the regular contact block. The pressure with which the fingers bear against the drum should be measured with a spring balance before the test is started and afterward at regular intervals. This pressure can be increased or decreased as desired by moving the clamping bar together with the fingers toward or away from the drum. Rotation of the drum may be obtained by belting it to any conveniently located shaft, and the number of revolutions may be recorded by a counter.

“SWAN NECK” FINGER SPRINGS

When fingers become burned or blistered from excessive arcing there is a tendency for them to stub as the ends of the contact segments are rotated against the finger, that is to say, when the drum is being rotated from the ball of the finger toward the spring. With the fingers located as in the first two drawings this stubbing would occur with clockwise rotation of drum.

The closer the fulcrum about which the fingers move is to the drum, the less tendency there is to stub, as any pressure against the end of a finger will then tend to lift it away from the drum instead of pressing it in toward the center. In the first drawing the line A B is drawn tangent to the drum at the point of contact with the finger. The fulcrum about which the finger moves is at F and this is slightly inside the line of tangency A B.

In order to bring this fulcrum point still farther inside the line of tangency, a type of finger spring known as the “swan neck” has been developed. This was brought out by the General Electric Company several years ago and has come into very extended use on several of the later types of controllers. This spring is shown in the second drawing. In addition to bringing the fulcrum close to the drum, this spring also provides a long finger spring, thus increasing durability. The drawing shows how this type of spring may be applied to K-10 and K-11 controllers. Its use with these controllers would necessitate a new design of contact base and block.

In using the “swan-neck” spring it is necessary to place a carefully designed insulating shield between the spring and the drum because when an arc is broken on the heel of the finger, that is to say, on the side next to the finger spring, the arc has a tendency to hang on and follow down the finger spring to a point D where the arc is broken. Hence instead of breaking the arc on the contact tip of the finger it is broken on the spring, and but a few operations will be required to destroy the spring. For this reason the clearance between the insulating shield for the spring and the arc deflectors must be very small because the arc will follow through a very small crack. The magnetic blow-out should also be arranged so that the arc will be blown away from the spring.

With all types of finger springs care must be taken to see that they are properly riveted to the fingers and a good contact obtained. An inspection of a large

quantity of fingers just manufactured showed that many had lacquer and varnish between the springs and fingers.

FINGER BASES

The principal troubles experienced with finger bases consist of breaking of adjusting lugs and loosening of the bases from the finger boards where these are of wood and fastened with wood screws. The breakage of the adjusting lugs is generally due to the fact that the fingers are stubbed or become caught in the drum. In the second drawing a type of finger base which uses a through bolt to hold it in place is shown. This bolt has proved much more satisfactory than wood screws.

Location of Trolley Wire on Curves—III

BY S. L. FOSTER, CHIEF ELECTRICIAN UNITED RAILROADS OF SAN FRANCISCO

Effect of Change in Trolley Pole Length or Trolley Base Location—The wheelbase of each truck, the distance between the centers of trucks and the height of the car roof are not conveniently susceptible of change.

The height of the trolley wire and the track conditions are assumed to be uniform for all cars, leaving as the only two convenient variables in the formula the length of the trolley pole and the distance of the trolley base from the center of the car roof. The effect of changes in these variables on the car just considered is shown in the following tables, assuming all other dimensions left unchanged:

Length of Trolley Pole	Location of Trolley Wire Inside Track Center—No Elevation of Outer Rail	Increase or Decrease for Change of One Foot in Pole Length
13.6 ft.	9 3/4 in.	
14.6 ft.	10 3/4 in.	1 1/2 in. increase
12.6 ft.	8 3/4 in.	1 in. decrease
Distance of Trolley Base from Roof Center		
5.6 ft.	9 3/4 in.	
6.6 ft.	9 1/4 in.	1/2 in. decrease
4.6 ft.	10 1/4 in.	1/2 in. increase

The above figures also indicate the bad results of not maintaining a uniform length of trolley pole and the effect of indifference to the uniform location of the trolley base.

ADAPTATION OF CARS TO STRANGE CURVES

Variation of the length of pole or location of base, preferably the latter because requiring no further thought, can be used to compensate for differences in car dimensions not susceptible of alteration. By this variation the trolley wheel of a new type of car can be made to run with least friction on a curved trolley wire already located for an old type of car.

Example: Two cars have the following dimensions:

Car	b	B	C	L	h	i	K
I.	4.5	20.8	10.6	14.4	19	11.5	155
II.	4.4	21.6	8.6	14.4	19	12.3	212

Move Trolley Base—It is desired to run car I on trolley curves already installed for car II and to do all the adapting of car I by altering the location of the trolley base.

From formula (11) it is seen that the location of the trolley base—C—was used squared and as a minus quantity. By adding the C² of car I—112—to the K of car I—155—we get, then, a quantity—267—from which a new C² must be subtracted to get the same K—212—as that of car II.

This new C² is 55, and the square root of this 55 or 7 ft. 5 in. is the new distance to which the trolley base on car I should be moved from the center of the car roof to secure least friction between the trolley wheel of car I and the curved trolley wire which was installed for car II.

Vary Length of Trolley Pole—If it had been desired to leave the trolley base where it was originally and to secure the adaptation of the trolley wheel of car I to the curve already installed to suit car II, it would have been only necessary to substitute l²—266—in the K of car I in place of the original l²—209—to secure the same K as the K of car II. By extracting the square root of this 266 we get 16 ft. 4 in. as the new pole length.

This is unlikely to be the course followed as it is desirable to have a uniform length of trolley pole throughout a railway system. It is also unlikely because this longer pole would probably project abnormally beyond the end of the car and cause trouble in car storage work.

Effect of Change in Height of Trolley Wire—The effect of variation in the height of the trolley is shown in the accompanying table using the same data as before:

Height of Trolley Wire	Location of Trolley Wire Inside Track Curve—No Elevation Outer Rail	Increase or Decrease for Change of 1 Ft.
16 ft.	11 in.	3/8 in. increase
17 ft.	10 5/8 in.	3/8 in. increase
18 ft.	10 1/4 in.	1/2 in. increase
19 ft.	9 3/4 in.	
20 ft.	9 1/4 in.	1/2 in. decrease
21 ft.	8 1/2 in.	3/4 in. decrease
22 ft.	7 7/8 in.	7/8 in. decrease
23 ft.	6 7/8 in.	3/4 in. decrease

These figures show that slightly raising or lowering the trolley wire at curves has a very slight effect on the relation between the trolley wheel and trolley wire.

Transition Curves—In the case of transition, spiral or easement curves, the results of the foregoing formula are applied in the central part of the curve, where the radius is uniform, the ends, where the transitions or larger radii are, will take care of themselves as the trolley wire will be gradually brought back to the center of the straight track by the lineman's eye.

Proportionality as Table Basis—In the case of suburban lines where the curvature is expressed in degrees, it is necessary only to calculate the versed sine for a 1-deg. curve, or one having a radius of 5730 ft. The versed sines of other curves are proportional to the degree of curvature. For example, if the versed sine on a 1-deg. curve is 3/8 in. exclusive of the versed sine due to elevation of the outer rail, then a 2-deg. curve, the versed sine, exclusive of elevation of outer rail, will be 3/4 in.

Likewise it is necessary only to calculate the versed sine for one radius of curvature, as the versed sine varies proportionally with the radius though inversely, whereas it varies directly with the degrees of curvature. For example, if the versed sine for a 50-ft. radius curve and a long suburban car is 3 ft. 9 1/4 in., for a 100-ft. radius curve and the same car, it will be one-half or 1 ft. 10 5/8 in., for a 200-ft. curve it will be one-quarter, etc.

Radius from Versed Sine—It is often desirable to determine the radius of curvature roughly on the ground from the versed sine. This is readily done by the formula

$$R = \frac{4V^2 + C^2}{8V} \tag{14}$$

Where R = Radius of curvature

V = Versed sine at center of the chord length used

C = Chord length used

all dimensions are in feet.

Using 30 ft. as length of chord, this formula becomes

$$R = \frac{V^2 + 225}{2V} \text{ or transposing } V = R - \sqrt{R^2 - 225} \tag{15}$$

The accompanying table of versed sines has been calculated for the various radii given, using 30 ft. as chord length. Beyond 1000-ft. radius 30-ft. rails will prob-

ably not be bent accurately and this chord method will not be safe unless a longer length than 30 ft. is used.

TABLE OF RADII AND CORRESPONDING VERSED SINES OR MIDDLE ORDINATES FOR 30 FT. CHORD LENGTH

Radius	Versed Sine	Radius	Versed Sine
35 ft.	40 1/2 in.	160 ft.	8 1/2 in.
40 ft.	35 in.	180 ft.	7 1/2 in.
45 ft.	31 in.	200 ft.	6 3/4 in.
50 ft.	27 1/2 in.	250 ft.	5 1/2 in.
55 ft.	25 in.	300 ft.	4 1/2 in.
60 ft.	23 in.	350 ft.	4 in.
70 ft.	19 1/2 in.	400 ft.	3 3/4 in.
80 ft.	17 in.	500 ft.	2 3/4 in.
90 ft.	15 in.	600 ft.	2 1/4 in.
100 ft.	13 1/2 in.	700 ft.	2 in.
120 ft.	11 in.	800 ft.	1 3/4 in.
140 ft.	9 1/2 in.	900 ft.	1 1/2 in.
150 ft.	9 in.	1000 ft.	1 3/8 in.

Railway Sand Experience

BY W. F. CARR, ENGINEER MAINTENANCE OF WAY CHICAGO, OTTAWA & PEORIA RAILWAY, OTTAWA, ILL.

Whether it is more economical to purchase a high-grade, thoroughly clean sand which does not require the use of a sand drier, or to purchase a cheaper grade of sand and attempt to clean and dry it, is a question which has received careful consideration. The Chicago, Ottawa & Peoria Railway, Ottawa, Ill., operates along a portion of the Illinois River valley, in the region of large silica sand deposits. In fact, Ottawa sand is well known all over the country for its excellent quality and high proportion of silica, and is used by the government in its neat cement tests. At first this sand appeared to be too expensive for use on our interurban cars, hence we opened a sand pit of our own where a reasonably clean, uniform grade of sand was available. I believe this sand from our pit will compare favorably in quality with most of the sand used by railway companies.

More or less trouble has been experienced in using our own sand, however, and after investigation it was concluded that the sand contained a natural cement in some form. Shortly after it had been placed in the sand drier and thoroughly heated, a slight crust formed over the top. It was also found that apparently clean sand had a great affinity for moisture. This made it difficult to keep the sand dry and non-clogging during periods of extremely damp weather. To avoid this trouble, it would have been necessary to wash the sand thoroughly and then dry it, which would have been very costly. In seeking another remedy for this difficulty, it was decided to purchase the silica sand, which had been mined, thoroughly washed and dried.

Experience with this high-grade sand has shown that it is free from vegetable matter and, being thoroughly clean, is practically moistureproof. This sand costs about \$1.35 per ton, and by storing it in a practically airtight house a sand drier is unnecessary. A microscopic examination of the sand shows that, while the grains are round, when it is deposited on the rail from the sand pipes and crushed under the wheels it acts like a high-grade powdered glass. A slight spinning of the wheel is sure to burn a blue spot in the rail, indicating its extreme hardness and high abrasive value, a thing desired in all sand used in either braking or to stop slipping wheels. In other words, by the purchase of sand at \$1.35 a ton it has been found that the sand drier is not only an unnecessary piece of equipment, if the sand house is made comparatively weatherproof, but that less sand is necessary. In addition, probably the most important advantage in using high-grade sand is that the pipes are never clogged, a condition which is just as likely to occur in an emergency as at any other time.

The *Review of Reviews* for January contains a page article entitled "Electric Railway Progress" and based on the articles in the convention number of this paper.

Dead-Ending Feeders to Metal Poles

BY G. H. M'KELWAY, LINE ENGINEER BROOKLYN RAPID TRANSIT SYSTEM

There are two ways to dead-end feeders to metal poles, either directly on to the pole through insulators, or on an arm attached to the pole. The former method can be considered as standard when only one feeder is to be dead-ended, but when there are several, the best practice calls for a wooden dead-end arm. As wood has good insulating qualities, it practically adds a third insulator to the two which sound practice always requires between a live wire and the ground. It is on account of the omission of this dead-end arm that Fig. 1 is representative of poor practice, or rather does not

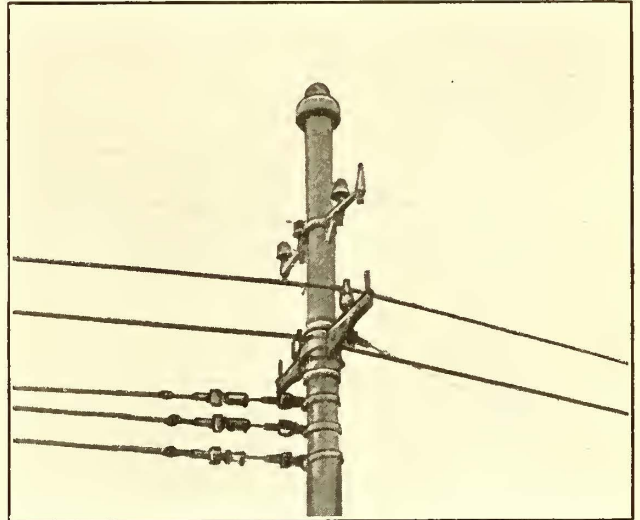


FIG. 1—THREE FEEDERS DEAD-ENDED ON POLE

represent the best practice. Fig. 2 is a photograph of the same point as Fig. 1 but was taken a month or two later after an arm had been installed. The only excuse for not putting in an arm sooner at this location was that the feeders had been run at different times, so that the best practice was overlooked when the second and third wires were run.

When there is only one feeder to stop there is no objection to dead-ending on the pole, as the first cost is less and the appearance better than if an arm were installed. When two or more wires are to be dead-ended an arm should be placed on the pole, as the

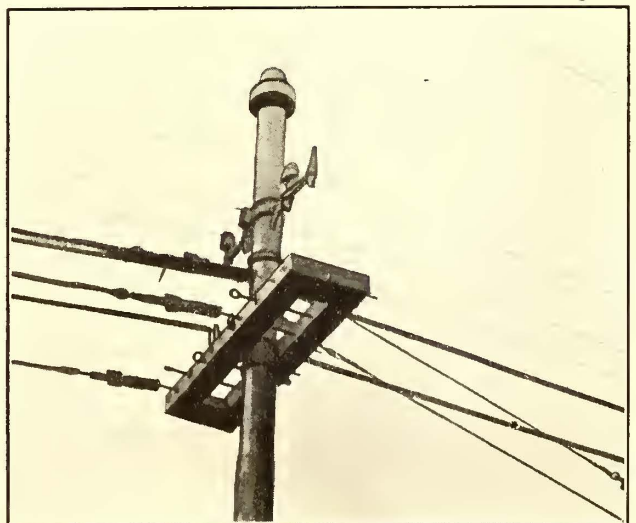


FIG. 2—FEEDERS OF FIG. 1 DEAD-ENDED LATER ON ARM

appearance of the installation will be better while the difference in cost decreases with each wire installed.

The dead-end insulator generally used with feeder wires is the heavier type of Brooklyn strain as shown in Figs. 1 and 2, but sometimes the heavy wood strain, shown in Fig. 3, is used. This insulator can be made very strong, equalling the Brooklyn in its resistance to tensile stress, and has the advantage that it gives positive evidence when it fails, while the composition insulator may burn out or break down mechanically without its weakness being noted until the insulator in series with it, which may have had to bear all of the potential stress for an extended period, also breaks down.

The disadvantages of the heavy wooden strain are, first, its appearance, for it is big and clumsy; and second, the fact that unlike the Brooklyn, it has no take-up feature. A take-up could undoubtedly be incorporated into the wood insulator of the size attached to feeders in the same way that it has been added to the smaller type of wood strains used as span insulators. However, that form of construction would be uneconomical.

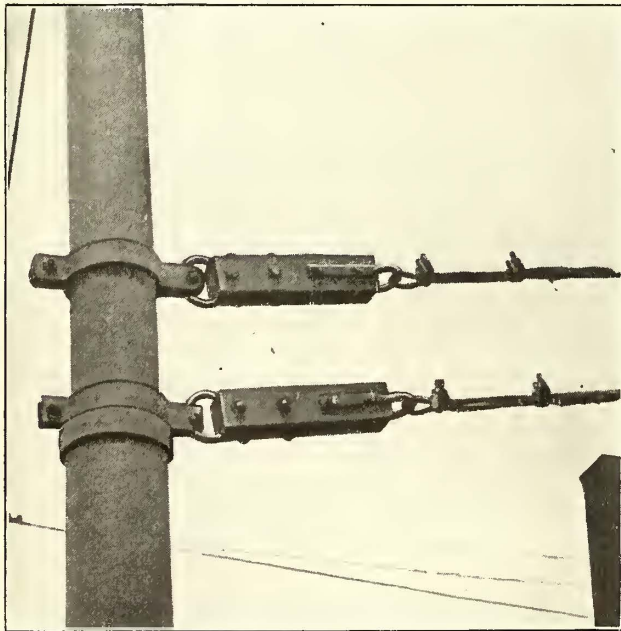


FIG. 3—USE OF HEAVY WOODEN STRAIN TO DEAD-END FEEDERS

The fact that a broken wood strain insulator will drop the feeder to the ground might be held as a point against its use, but if a Brooklyn insulator breaks down enough to put a hard ground on the feeder it will burn down. Hence the ultimate result will be the same and there will be no chance that the pole will be made alive while the insulator still appears to be in good condition.

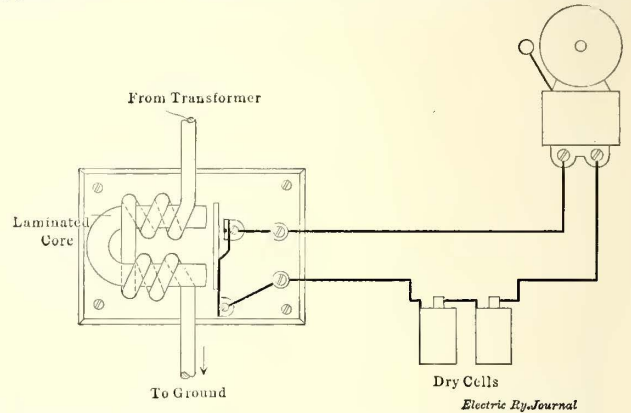
In most cases the use of the Brooklyn strain would seem to be preferable with the wooden arm installed whenever more than one feeder is dead-ended, despite the fact that the wooden insulator is a very serviceable although unattractive piece of equipment.

A cat was chased up a high line pole of the Fox & Illinois Union Railway by a dog recently and became crossed with an a.c. wire carrying 33,000 volts. The automatics tripped and when the power was again put on the line they tripped again and the cat fell to the ground. On inspection the cat showed a singed streak for its full length. The cat was sent to the office of the Public Service Company at Joliet, by which the high-tension line is operated.

A Ground Wire Alarm

BY J. G. KOPPEL, ELECTRICAL SUPERINTENDENT OF BRIDGES, SAULT STE. MARIE, MICH.

The accompanying drawing shows a home-made ground alarm which was devised and constructed by the writer some time ago and which has been in successful operation since. The device is connected in series with any ground wire used to protect electrical apparatus in a power house or substation. The core

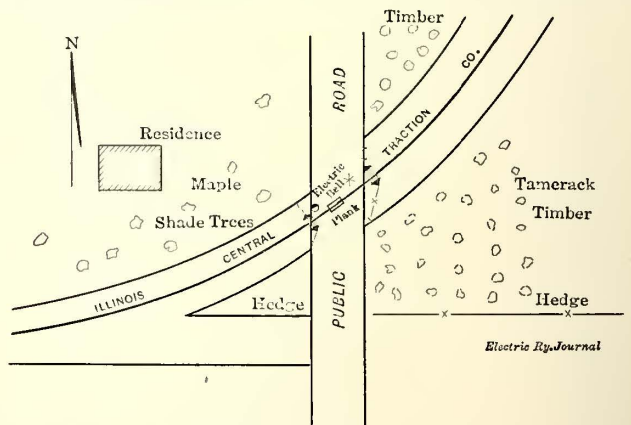


WIRE-WOUND LAMINATED CORE AND DRY BATTERY BELL OUTFIT USED AS GROUND WIRE ALARM

is laminated, insulated and wound with No. 6 B. & S. bare copper wire, the combination being so sensitive that very little current is needed to attract the iron armature by which the circuit of the alarm bell is closed to warn that there is a ground on the system.

Sketch of Illinois Standard Highway Crossing

In response to a request from the Governor and the Illinois Public Utilities Commission, all steam and electric railways are required to furnish detailed information regarding the condition of all road and street crossings along their lines. This information is prepared on a two-page form which is accompanied by a standard road-crossing sketch. A line drawing typical



SKETCH OF ILLINOIS STANDARD HIGHWAY CROSSING

of one of these sketches is reproduced. It will be noted that all the information regarding the condition of the crossing, its arrangement and physical characteristics are shown. The call for this information was made in pursuance of an investigation to determine the most effective street and road crossing protection, now under way by the Illinois Public Utilities Commission. In the form used, the condition of any crossing is available in ready reference form in case an accident occurs or a complaint arises.

New Computing Fare Recorder

In the new computing fare recorders for suburban and interurban railway systems recently put on the market by the Dayton Fare Recorder Company, of Dayton, Ohio, several marked improvements have been introduced. The recorders are made in eight standard sizes, and intermediate sizes are also made to provide for classified registration of any number of fares from two to twenty-four. All are constructed with standard interchangeable parts, special attention having been given in the design and construction of the mechanisms to insure durability and dependability in service.

The operating mechanism for the recorders is very simple and durable in construction, two rods, 5/16 in. and 7/16 in. in diameter, with straight, positive connections and operating handles conveniently located, being used in the standard equipment. On some cars, where it is not practicable to use rods for both the setting and registering operations, only one rod and a cord are used. An improved form of fare indicator is located in various parts of the car, thus providing for the most effective public and private inspection of the classification and registration of the fares.

A very important feature of the Dayton system is the computed form of the printed record of the fare collections produced on the recorders. The records are a complete computation of the fare receipts, showing in detail the number of each kind and denomination of fare

To produce the record shown in Fig. 1 the conductor sets the counters at zero at the end of each trip, the record showing the number of fares of each denomination collected on the trip, and the total number of fares for all the trips.

To produce the record shown in Fig. 2 the conductor does not set the counters at zero until the end of his last trip. The last reading from the register which he takes shows the total number of all fares registered. The relief conductor who takes charge of the car then

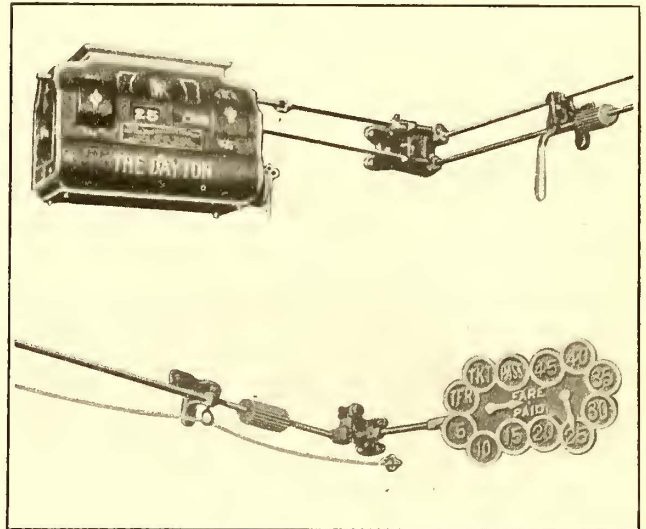
RECORDER NO. 2918													
INTERURBAN TRACTION COMPANY													
RUN NO. TOTAL RECORD													
LINE NO. DATE													
PASS	TICKET	10c	5c	10c	15c	20c	25c	30c	35c	40c	45c	TOTAL PASSENGERS	REGISTER TOTAL
12	12	36	46	65	50	39	40	20	24	15	22	465	1848
TIME TRIP RECORD													
3:30 PM	02	15	05	06	17	07	6					1	1228
2:15 PM	01	03	09	03	03	05	5	6	4	2	2	2	1228
1:00 PM	02	11	06	05	11	10	4	5	3	1	2	1	62
11:15 AM	01	03	05	10	05	04	2					5	1228
10:30 AM	00	14	04	03	03	03	6	7	4	2	3	7	1228
9:15 AM	01	11	03	05	06	03	6	0	3	4	7	5	62
8:00 AM	03	14	04	08	12	05	5	6	3	4	2	2	68
6:45 AM	02	10	05	06	05	04	5	3	1	2	1	7	48
5:30 AM	00	00	00	00	00	00	00	00	00	00	00	00	00

COMPUTING FARE RECORDER—FIG. 1—RECORD OBTAINED BY SINGLE CONDUCTOR

RECORDER NO. 2918													
INTERURBAN TRACTION COMPANY													
RUN NO. TOTAL RECORD													
LINE NO. DATE													
PASS	TICKET	10c	5c	10c	15c	20c	25c	30c	35c	40c	45c	TOTAL PASSENGERS	REGISTER TOTAL
3	11	7	62	15	9	5	4	7	5	13	4	29	2030
TIME TRIP RECORD													
11:50 PM	12	71	28	38	44	21	21	25	14	12	11	14	312
9:45 PM	04	52	24	33	34	18	17	22	12	11	10	12	269
8:30 PM	09	48	21	26	34	15	15	17	10	9	7	11	222
7:15 PM	00	35	16	19	28	12	11	15	6	6	5	7	173
6:00 PM	05	22	11	15	17	08	9	9	4	4	2	4	117
4:45 PM	02	19	04	03	07	05	3	4	3	1	2	3	51
3:30 PM	00	00	00	00	00	00	00	00	00	00	00	00	00
3:30 PM	19	86	34	47	51	28	26	28	20	17	14	16	196
2:15 PM	17	76	31	41	45	21	22	26	15	12	15	14	148
1:00 PM	14	67	24	33	42	20	14	24	13	15	11	13	148
11:15 AM	12	50	19	25	32	20	11	20	13	14	9	11	124
10:30 AM	07	48	15	21	28	16	19	15	8	11	6	10	136
9:15 AM	08	36	14	16	23	13	11	14	7	4	9	15	122
8:00 AM	07	25	07	14	19	07	10	10	4	5	3	5	106
6:45 AM	05	10	04	07	05	08	1	4	2	1	2	2	45
5:30 AM	00	00	00	00	00	00	00	00	00	00	00	00	00

COMPUTING FARE RECORDER—FIG. 2—SAMPLE RECORD OBTAINED WHEN CONDUCTORS CHANGE

collected on each trip, as well as the number of passengers carried, and the starting and leaving time; also the total registrations of each kind of fare during the entire run regardless of the number of trips made. The records are in the form of a balance sheet. The items of registration can be verified by both cross and column addition. In the accompanying illustrations two forms of records are shown, each covering the work of the conductors for the same number of trips and hours of operation.



COMPUTING FARE RECORDER—FIG. 3—OPERATING MECHANISM AND FARE INDICATOR

takes a zero reading to show the condition of the register at the beginning of his run as indicated at 3:30 p. m. on the sample record. This conductor then operates the recorder the same as the preceding conductor, the last register reading showing the total result of registrations for his period of work.

When operation of the car is discontinued for the day, as shown at 11 p. m. on the sample record, an inspector or other authorized employee takes a final reading from the recorder, obtaining a record of the total fare registrations made by both conductors. The work of any number of conductors operating on the same car, can, of course, be covered in this way.

With either of the above forms of record, it is optional with the company whether the conductors are permitted to remove the records from the recorders and use them in making settlement, or else will have the records removed by an inspector or register clerk and later check them against the returns made by the conductor. In all cases the printed records produced on the recorders are an indisputable statement of the fare collections and are accepted without question as to their correctness by both the conductors and the receiving office, thus creating a condition of mutual confidence. All employees engaged in the work of collecting and handling and accounting for the fares are equally protected, and this helps greatly in building up the personal efficiency of the men and counts for immediate and lasting improvement of the service.

According to advices sent to the railroads of the country, the Panama-Pacific Exposition in San Francisco will open on time. The exposition is now 97 per cent completed, which assures a fully-completed exposition on the opening date, Feb. 20. Forty-two foreign nations will exhibit, among whom will be nearly all the European nations now at war. The exposition will continue from Feb. 20 to Dec. 4, 1915.

Messages of the Governors

Significant Statements Are Reproduced from the Messages of the Governors of Ten States to the Incoming Legislatures, Now in Session

Legislative sessions are held in nearly all states this year. In many of them the preliminary work of organization has been completed and the consideration of regulatory measures has been begun. The subjects of interest to the electric railroads discussed by the governors include taxation, workmen's compensation, public service corporation regulation, etc. Governor Whitman of New York is expected to deal with matters in special separate messages. Extracts from the messages of the governors of Massachusetts, Nebraska, Kansas, Indiana, New Jersey, Rhode Island, Missouri and Illinois follow:

GOVERNOR DAVID I. WALSH OF MASSACHUSETTS

"I must repeat my last year's protest against the law which relieved the transportation and telephone and telegraph companies from defraying the cost of the Public Service Commission, thereby adding nearly \$200,000 annually to the State tax. The sole question is whether these companies, rather than other public service corporations, are entitled to this exemption from taxation at the expense of all the other taxpayers of the commonwealth; and this question I am sure should be answered in the negative.

"We all fervently hope that the five trustees who really represent the public will be able to work out the salvation of the Boston & Maine Railroad. As the situation develops I shall make further recommendations to you in a special message.

"With a network of trolley service connecting all our cities, I can see an immense advantage by creating simple and inexpensive receiving stations at points a few miles apart along these lines, where farmers might leave their farm products at stated intervals during the day to shipped into a central station in the city, the latter station to be owned and controlled by private co-operative associations, as is now the case among the orange growers in California. With a zone system of receiving and distribution inaugurated throughout the commonwealth, this method of transportation should be more economical than by steam railway, automobile or wagon.

"I must protest against obliging the commonwealth to begin the experiment of public ownership of transportation facilities by building and operating lines which private capital will not undertake because of the certainty that they cannot pay. Let us begin with a paying proposition if we are to venture at all in this untried field."

GOVERNOR JOHN H. MOREHEAD OF NEBRASKA

"The increase in population of the State and the rapid development of our towns and cities make the subject of public service corporations important. The method of dealing with this class of property should receive your earnest and careful consideration. Other States have passed legislation that is said to completely and satisfactorily deal with the subject, and I recommend that you consider the legislation of these States, as it is unwise to pass experimental legislation or to adopt new and untried methods when we may profit by the experience of others. I urge a careful study of the laws of these States, and that these corporations be placed under the jurisdiction of our State Railway Commission, and that we adopt a system which will deal with this far-reaching question adequately and successfully."

GOVERNOR ARTHUR CAPPER OF KANSAS

"I recommend the enactment of laws to strengthen the workmen's compensation act for the better protection of the workers. I recommend the adopting of an amendment to the utility commission law prohibiting the use of free

railroad passes by members and employees of the commission, and the strengthening of the 'blue-sky' law."

GOVERNOR SAMUEL M. RALSTON OF INDIANA

"I hesitated long before I espoused legislation creating a Public Service Commission. Certainly there can be no complaint with the present commission because of the amount and character of work it has done since May 1, 1913. It inherited all the unfinished work of the Railroad Commission, and, by the terms of the statute of its creation, it had imposed upon it all the current duties of that body. Some idea of the work of the commission can be had from the fact that, during the first year, 693 formal cases were filed and 425 of these have been disposed of. During the same period there were 335 cases, denominated as informal, filed and by far the greater portion of these have been adjusted. And the docket of the commissions now shows that from May 30, 1914, to Dec. 30, 1914, the number of formal cases filed approximates in number all the cases filed the first year. These facts show the stupendous amount of work that must be done by the commission in the discharge of its duties.

"The commission was given the appropriation of \$40,000 set aside for the Railroad Commission and an appropriation of \$75,000 made directly to it, a total of \$115,000. The commission turned over to the State in fees collected \$22,785, showing the cost for the first year to be \$92,215, which is much less than the amount appropriated by some of the other states for like work. I have expected great things of this commission and I have not been disappointed, no matter what the disappointments of others may have been. If there be anyone in this body who is hostile to the public service law, I want to remind those representing the majority of this Legislature that their party in its platform of 1914 went on record in favor of the public service law and commission. The commission will be glad to lay before your honorable body any information at its command you may desire bearing upon its work.

"The Indianapolis street railway strike of 1913, as well as various others of less magnitude, has shown the waste and cost in time and property and life itself, chargeable to the irrational, crude and cruel strike and lockout, as means of settlement of differences between capital and labor. The day when the individual citizen played any great part on the side of either capital or labor has departed. It is my earnest desire that the Sixty-Ninth General Assembly enact a law creating a board of conciliation and arbitration, and thus place Indiana in the line of progress alongside of her sister states."

GOVERNOR R. LIVINGSTON BEECKMAN OF RHODE ISLAND

"A careful study of the result of the workmen's compensation law since it has been in full operation has convinced me that some amendments ought to be made. It is important that all accidents should be immediately reported by the employers to the Commissioner of Industrial Statistics. From a complete report of all accidents, much could be learned which would be of value in preventing a recurrence of many avoidable accidents. Approximately 11,000 accidents, slight or severe, occur yearly in the State of Rhode Island, where more than 165,000 wage earners are employed. I am of the opinion that if a careful investigation were made concerning the causes of these accidents many of them would be found to have been avoidable and that it would result in the adoption of rules and regulations which would be of practical benefit and a material factor in the elimination of many unnecessary accidents. I therefore recommend an amendment to this law which will require all employers of labor, except those coming under the head of agricultural, domestic and personal service, to report all accidents upon uniform cards,

to be furnished by the State, to the Commissioner of Industrial Statistics, within five days of their occurrence."

GOVERNOR WOODBRIDGE N. FERRIS OF MICHIGAN

"Provide for the assessment of interurban railroads, light and power companies and all corporations whose property extends through more than one assessing district, and the equitable apportionment of the same among the several assessing districts in which located. Repeal the law exempting from taxation credits that can be offset by debits.

"At the meeting of attorneys-general held in Washington in October a committee was appointed to prepare and submit to the legislatures of the various states of the nation a new 'blue-sky' bill, to meet the objections to the validity of the present act. This bill will be submitted to you, and I earnestly recommend its enactment into law.

"Under the present corporation laws only 10 per cent of the authorized capital of the corporation is required to be paid in. Parties turning in property to a corporation fix their own values in their articles of association. I recommend that no corporation be permitted to organize unless at least 50 per cent of its authorized capital be paid in, and that when property makes up any part of such payment that an appraisal of such property be had by some officer of the State.

"The powers of the Railroad Commission should be extended to cover all public utility corporations of the State. Furthermore, as there can be no intelligent fixing of charges without a knowledge of the real value of the properties, I would recommend that the commission be authorized to make physical valuation of all such properties that they may deem advisable, that the rates fixed may return reasonable dividends on actual cash investment.

"I respectfully suggest that the incoming Legislature create a court of inquiry composed of the Circuit Judge of the circuit where the industrial dispute arises, the Governor and Attorney-General of the State, and one or more members appointed on the nomination of the parties involved; or a board composed in some other manner, which shall investigate the matter in dispute and make a public finding thereof, with such recommendations as they believe are warranted to secure justice for both parties. It is generally admitted that compulsory arbitration is impractical. In the light of legislative experience little more can be accomplished than to focus public opinion upon industrial disputes.

"A provision should be added to the workmen's compensation law covering under proper restrictions portions of work which are let or sublet on contract by manufacturers and builders, so as to reasonably insure the protection of the compensation law to all of the men engaged in such work, whether they are working directly for the principal or doing his work through some contract or sub-contract. Our Supreme Court has recently decided that the Michigan compensation law is limited strictly to injuries received by accident. There can be no reasonable ground for denying the same measure of compensation to the workman or his dependents in case of the loss of life or limb suffered through an occupational disease, as is given in case where such loss is sustained by accident. The provision of the compensation law requiring the employer to furnish the injured employee with medical and hospital service and medicine for a period of three weeks following the injury is wholly inadequate. The amount of medical attention and care furnished should in all cases be proportionate to the injury, the same as the money compensation provided for. The provision fixing the rate of compensation in seasonable occupations should be so amended that the earnings of the injured workman in other like employments may be taken into consideration in computing the rate of compensation."

GOVERNOR JAMES F. FIELDER OF NEW JERSEY

"The annual report of the State Board of Equalization of Taxes, recently filed with me, shows an increase of more than \$75,000,000 in the total valuation of property for taxation, exclusive of the stocks of banks and trust companies and railroad property, and that, notwithstanding this increase in valuation, the average tax rate of our municipalities is twenty-seven points higher than last year. I renew my recommendations that assessors be no longer elected,

but be appointed under civil service rules for assessment districts; that they be paid proper salaries; that their assessments be made under uniform rules to be prepared by some higher tax authority; that their tax lists be open to inspection before confirmation, and that some appellate board be given power to hear appeals from the valuation proposed, after which the tax lists may be finally made up and filed. I commend this highly important matter to your most careful thought, with the earnest hope that a satisfactory solution of the problem will be reached before you adjourn."

GOVERNOR ELLIOTT W. MAJOR OF MISSOURI

"By establishing an industrial commission, which should be fashioned after and along the same lines of the public service act, you can place in operation a commission which will meet the industrial needs and demands of the day, and render an enlarged service to the people, one far in excess of that heretofore rendered, although each department has been effective and efficient in its labors. A committee was appointed by the last General Assembly to investigate this subject and make its report to the present Legislature. The men upon this committee were drawn from both political parties. The committee's work has been thorough and complete, and it has prepared a measure creating an industrial commission, to which I call your earnest and careful consideration.

"I recommend to the Legislature the passage of a workmen's compensation act. I have not had time carefully to examine the law prepared by the committee appointed by the last Legislature, to study the subject and prepare a measure, but have examined it in a general way, and find it has much merit and perhaps is as good a measure upon the subject as can be found in the other states.

"The public service commission act abolished the Railroad & Warehouse Commission, and the Public Service Commission has been no more expense to the State than it cost to maintain the Railroad & Warehouse Commission. The commission has now been at work for twenty months, and in that time has handled approximately 600 formal complaints and applications and approximately 1000 informal complaints. The fees collected by the commission and turned into the general revenue fund of the State have reached the sum of \$100,000. In addition to these fees, the commission, through its counsel, Judge Bean, ascertained the cost paid by the State in the Missouri rate cases upon motion in the federal court, same was collected and turned into the treasury, approximately \$30,000. The service of the commission to both the public and the public utilities coming under its jurisdiction has been entirely satisfactory."

GOVERNOR EDWARD F. DUNNE OF ILLINOIS

"The State Public Utilities Commission closed the first eleven months of its administration on Nov. 30, 1914. During that time the commission was organized, its work systematized, and the administrative, engineering, accounting, rate and service departments were built up to such a state of efficiency as the limited time and the means at the disposal of the commission would allow. The present working force of the commission, attorneys, engineers, accountants, statisticians, experts, inspectors, clerks, stenographers, etc., numbers seventy-three persons. The Illinois public utilities law is probably the most comprehensive measure of its kind ever enacted. While the operations of the commission have been satisfactory throughout the entire State, including Chicago, and while there seems to be no sentiment, at the present time, in favor of local commissions to regulate intraurban utilities down the State outside of Chicago, there is considerable sentiment in that city in favor of a local ancillary commission, to take charge of and control the intraurban municipal utilities of that city, and I therefore favor the creation of such an ancillary commission for Chicago to take charge of and control the intraurban utilities of that city.

"In the interest of the protection of human life and limb rather than protection to railroad interests, I believe that a law should be enacted making trespassing on railroad property a misdemeanor. It is now merely an infraction of civil rights. Such a law would tend to discourage trespassing and result in the saving of life and limb."

News of Electric Railways

NEW JERSEY COMMISSION REPORT

Recommendations Regarding Legislation—Enterprise Should Not Be Penalized—Going Concern Value—The Year's Work.

In its annual report the Board of Public Utility Commissioners of New Jersey makes the following recommendation in regard to legislation which it deems desirable:

"In accordance with the provisions of the public utility act which directs the board in reporting to the Governor to make 'such recommendations as it may deem proper,' the board, in view of the foregoing, respectively recommends that consideration be given to the advisability of amending the public utility act so that it shall clearly appear, as the legislative intent and as an authoritative declaration of State policy, that the board, in fixing just and reasonable rates to be charged by a public utility, shall not value the franchise of such utility in excess of the amount the board finds to have been legitimately spent in procuring it. Such is the policy of the State as specifically declared in the public utility act with respect to the capitalization of franchises.

"The board can exercise such powers only as the Legislature delegates to it. The law designating these powers must be in the first instance construed by the board. The Legislature has provided for appeals to be taken from orders of the board to the court. If an order of the board is issued, based on what the court regards as an erroneous construction of the law, the board's order will be set aside.

"In the Passaic gas rate case, the Legislature not having specifically referred to the value to be placed on the franchise in fixing a rate, the board did not apply the rule apparently laid down by the Court of Errors and Appeals.

"The valuations specifically referred to have been undertaken with a view of determining the reasonableness of the rates charged and of fixing new rates to be charged if the existing rates should be found unjust and unreasonable. Such determination and fixation by a board exercising powers of the nature conferred on this board, necessarily involves valuations of the utilities' properties. The value fairly determined must be the base on which the utility shall be allowed a reasonable return, and this governs the rate to the public. It is the opinion of the board that this base should be not merely the value of the company's physical property used in supplying service to the public. To hold this would require elimination from consideration of expenditures legitimately incurred in developing the business of the utility to a state of efficiency commensurate with the requirements of the community in which it operates.

"The management of a utility which develops the utility's business in a thorough and efficient way, which seeks to obtain and is successful in getting and holding as its customers those who, except for the effort of the utility to make its service attractive, would not take it, should not be penalized. Expenses reasonably incurred in this way, sometimes called 'going concern value,' sometimes 'development cost,' in the opinion of the board, should be considered in determining the base on which a return should be allowed. This is a rule uniformly applied by other commissions and the courts in rate proceedings. The utility furthermore should be allowed a return on expenses legitimately incurred in obtaining the franchise under which it operates. On the theory outlined above, the board determined the base on which, in its opinion, the Public Service Gas Company was reasonably entitled to a return in its Passaic district. Allowing on the base so determined a return of 8 per cent, the board found the rate charged by the company to be excessive and ordered it reduced to 90 cents per thousand cubic feet."

Outlining the work of the past year, the report shows that the board has investigated 606 complaints. Many of these were treated informally and settled without hearing, this being particularly the case with reference to complaints of inequalities in freight rates. In these cases a number of rates were lowered by railroads without objection. Proceedings to the number of 456 were subjects of hearings by the board. These included complaints formally treated, applications for approval of issues of securities, leases and

mergers, privileges granted by municipalities to utilities and sales of properties.

The board approved fifty-nine applications for the issuing of securities, the par value of the securities involved being \$88,106,750. There have been forty-nine sales of properties of public utilities approved. Eighty-two petitions for approval of ordinances and resolutions of municipalities granting privileges to utilities have been sanctioned.

SUBWAY FIRE INQUIRY AND ORDERS

New York Commission Orders Retirement of Wooden Cars—Chief Engineer Asked to Report on Making Subway Safer

On Jan. 8 the Public Service Commission of the First District of New York notified the Interborough Rapid Transit Company that wooden cars must be eliminated from the subway. May 1 was mentioned in the commission's letter to the company as the date on which it has been decided tentatively that the elimination of the cars should begin. On the same day the commission adopted a resolution calling on Alfred Craven, its chief engineer, to report at once on the practicability of a number of suggestions that have been made for rendering the subway safer. The suggestions referred to the chief engineer include several of those made by Fire Commissioner Adamson in his report to Mayor Mitchel on Jan. 7. Mr. Adamson's principal recommendations were as follows: Complete isolation of all splicing chambers from the subway proper; fire escapes between stations; emergency fire-fighting equipment, including standpipes; fire alarm system connecting with fire headquarters; abolition of wooden cars. The suggestions on which Mr. Craven has been asked to report follow:

1. Whether splicing chambers in the subway operated by the Interborough Rapid Transit Company could be so reconstructed as to cut off all connection with the subway.
2. Recommendations for enlargement, rearrangement or increase of emergency exits.
3. Separation of high-tension and low-tension cables, particularly in splicing chambers.
4. The complete separation of lighting and signal circuits from power cables, with auxiliary independent connections for emergency purposes.
5. Independent supply of power for ventilating fans and for the lighting of signs at emergency exits.
6. Auxiliary independent connections to power substations.
7. Recommendations as to increase in the lighting system throughout the subway.

The letter from Chairman McCall of the commission to President Shonts of the Interborough Rapid Transit Company regarding the elimination of the wooden cars in the subway follows:

"Following conferences between the engineers of the commission and of your company, and the testimony of Frank Hedley, vice-president and general manager of the company, before the commission on Jan. 7, 1915, the commission is of the opinion that the Interborough Rapid Transit Company should replace composite cars now operating in the subway, at the earliest possible moment, and, accordingly request the forwarding immediately to the commission the earliest practicable dates, and not later than May 1, 1915, upon which you can secure delivery of car bodies for the purpose of effecting such substitution."

On the same day that the foregoing letter was addressed to Mr. Shonts, Commissioner Maltbie proposed and the commission adopted a resolution instructing Clifton W. Wilder, the electrical expert of the commission, to inquire and report the earliest possible date when the manufacturers would be ready to supply 478 steel car bodies necessary to convert all of the composite cars into steel ones.

Upon receipt of the letter from Chairman McCall the answer from Mr. Shonts was made public. He said in substance:

"The company is prepared to carry out the plan for such substitution substantially as explained by Mr. Hedley in his testimony on Jan. 5 last, to which you refer. We have this

day asked the manufacturers to advise us as to the earliest dates of delivery. We shall transmit that information as soon as received by us. I will leave the discussion of the details of the exchange between the subway and elevated systems to be taken up with the commission at the adjourned hearing."

The substitution plan to which Mr. Shonts referred was that wooden bodies of composite cars be removed from the trucks and placed on lighter trucks, which would make it possible for them to be used on the elevated lines, especially on sections reinforced for the third-tracking.

As if to make its position clear beyond doubt the commission on Jan. 12 unanimously adopted a formal order directing the company to eliminate the 478 wooden cars it now has in use in the subway not later than Dec. 1, 1915. This action was taken after the commission's engineers had advised it that the new steel cars to replace the old wooden cars could be built and delivered within ten months. James L. Quackenbush, counsel for the company, wanted to stipulate that the company should have the privilege of transferring the wooden cars ordered out of the subway to the elevated line, but the commission announced that the question of whether or not the wooden cars may be used on the elevated line will be taken up at the hearings now being conducted into the elevated service and equipment. The formal order of the commission to the company was in part as follows:

"It is ordered that the Interborough Rapid Transit Company be and the same hereby is required and directed to retire from operation on its subway lines hereinafter described the cars of wooden construction known as copper sheathed composite cars, now operated by it in trains on the subway lines known as the Manhattan-Bronx Rapid Transit Railroad and the Brooklyn-Manhattan Rapid Transit Railroad, and to replace the said cars with cars of all-steel construction of a type similar to the cars of all-steel construction now operated by it on its said subway lines. . . . and shall not operate any cars on the said subway lines for the transportation of passengers except cars of steel construction of the type above mentioned; and that the Interborough Rapid Transit Company shall not after the retirement and replacement of any of said wooden cars again put any of said wooden cars into service on its said subway lines."

The jury which has been investigating the two deaths in the Ninth Avenue Elevated Railway accident of Dec. 9 on Jan. 12 rendered a verdict charging T. P. Shonts, president; Frank Hedley, vice-president and general manager, and all of the other directors of the company with culpable negligence. No mention was made by the jury of the motorman or conductor of the wrecked train. James L. Quackenbush, counsel for the company, accused the coroner of giving the jury a wrong statement of law and with misstating the evidence. The coroner said he would fix the bail at \$5,000 each and declared the hearing closed. Subsequently he reduced the amount of the bond to \$1,000 each. All signed bonds except a director who lives in Philadelphia.

LABOR LEGISLATION IN OHIO

Twenty-five representatives of the electric railway employees in Ohio met in Columbus during the week ended Jan. 16 to map out plans for securing legislation in their interest at the present session of the Legislature. Delegates were present from: Cleveland, Cincinnati, Mansfield, Steubenville, East Liverpool, Akron, Youngstown and Elyria. Thomas Moore, Youngstown, was made chairman of the meeting. George R. Davies, president of the local organization at Cleveland, acted as secretary. The delegates returned to their homes on Jan. 14, but did not care to discuss the steps taken until information could be given in complete form. It is practically certain, however, that a bill will be prepared for the purpose of enabling the men to secure a revision of their contract at Cleveland. This, it seems, they cannot do under existing arrangements. The subjects about which the men are concerned—the number of hours of work, the number that men must be on duty to secure a full day's work, speed of cars, time for layovers and other things—it is claimed cannot be arranged satisfactorily under the schedules prepared by the city and executed as nearly as possible by the company.

TOLEDO MUNICIPAL OWNERSHIP ORDINANCE

The ordinance which City Solicitor Thurstin of Toledo, Ohio, asked the City Council to pass at its meeting on Jan. 4 not only provides for a bond issue of \$4,000,000 for the purchase of the local street railway, but fixes the rate of fare and makes provision for turning the property over to a private company if it is found that the city cannot operate the lines to advantage.

The bonds are to be dated March 1, 1915, and run twenty years and are made a lien on the street railway built or purchased with the proceeds from their sale. The bonds are to be considered in default ninety days after the failure to pay interest when due. If the property is sold under foreclosure the purchasing company will receive a franchise provided for in the ordinance to run not more than twenty years from the date of purchase or until the city pays off the bonds or the amount due. Any company into whose possession the road may come as a result of foreclosure and sale is to collect fares as follows:

Children under four years of age accompanied by adults, nothing. Children between the ages of four and eight years, 1 cent. Persons more than eight years of age, between the hours of 5 and 8 a. m. and between 4 and 7 p. m., 3 cents, with five tickets for 15 cents; at all other hours, 5 cents or six tickets for 25 cents, good at any hour, with free transfers.

The city is to have the right to take over the property from the purchaser at any time up to Jan. 1, 1935, by the payment of the amount due on unpaid bonds with 7 per cent interest since the date of the foreclosure. The city is to have the right to take over the property without restriction in 1935. Any controversy that may arise in regard to these matters is to be submitted to arbitration. The ordinance provides for street paving by the operating company and for the joint use of the operating company's tracks by interurban railways.

LIMITING PROFITS

Comments of a Virginia Newspaper on the Subject of Profits

The Roanoke (Va.) *Times* printed in its issue of Jan. 6 an editorial "Limiting Profits," as follows:

"Can we limit profits of public utilities without restraining enterprise? Mr. Trafford, of Richmond, head of the municipal electric plant there, thinks the street railway and electric system should be limited to 'a reasonable profit,' which he fixes at 6 per cent to 7 per cent. That is a fair profit. Most people with money to invest would be satisfied with it. But is it right to limit a profit while we cannot guarantee it? And can people with money be induced to invest it in any undertaking involving risk, or waiting, with 6 per cent or 7 per cent as the very top notch to be hoped for?"

"Suppose a man is asked to put \$10,000 in a street railway to develop a new section. He knows he must expect to wait four or five years before he possibly can touch a cent of dividend. He will lose interest on his money through that time. What is the business reasoning that will carry him into such an investment, with the possibility of never realizing anything and the certainty that at best he never can get more than 7 per cent? In this country millions and millions of dollars are invested in enterprises which have developed new territory, created vast new wealth, established communities and given employment to thousands of people, which have been years in operation and never have paid the original investors a cent. How are we to compute what will be fair and reasonable profit when these enterprises do begin to earn? Are we to allow nothing for the interest lost while the money was earning nothing for its owners but doing much for the public? And who is to provide for the lean years? If 6 per cent or 7 per cent is fair profit in good years, will the public, or the government, take care that the same rate shall be maintained in lean years when by dull times, strikes, fire or other calamity the profits disappear?"

"Mr. Trafford is a deeply philosophical citizen with the habit of splashing around in water several feet over his head."

BAY STATE ARBITRATION

Hearings in the wages arbitration case of the Bay State Street Railway were resumed at Boston, Mass., on Jan. 7. Philip Mansfield was entered as counsel for the Amalgamated Association, succeeding Joseph B. Eastman, resigned. Robert S. Goff, vice-president of the company, estimated the average wage of all the men on the system at about \$14 per week. About 25 per cent of the system is double track. The witness said that if the cars were all run well loaded the requirements of travel would not reasonably be met, on account of the need of maintaining a minimum service. Taking the system as a whole, the running time has not been materially reduced within recent years. A record obtained from the time-table department showed that in the fiscal year 1914 the average number of motormen and conductors employed was 3422, and the total platform wages paid was \$2,054,148, an average of \$609 per man. Free transportation outside an employee's division is usually granted upon request. The company's business increases about 65 per cent in a summer month as compared with a winter month, the range in total employees being from 5000 to 6600, including a track force of from 1200 to 1500 in spring and summer. George H. Gray, general superintendent, Division 1, North, and Thomas Lees, general superintendent, Division 2, Lowell, Mass., testified at length relative to the duties of transportation employees.

At the continued hearing this week John T. Conway, general superintendent of Division 1, Lines South, with headquarters at Brockton, described in detail his multifarious duties.

TRACKLESS TROLLEY REQUEST REFUSED

The Public Service Commission of Pennsylvania has refused to approve the application of the Perkiomen Electric Transit Company for a certificate of public convenience which would have authorized the company to establish a trackless trolley system in Pennsylvania. The applicant is a Delaware corporation and is registered to transact business in Pennsylvania. The commission says that the application involves the question not merely whether the transportation of the kind offered by such a trackless trolley system is necessary or proper for the accommodation or convenience of the public, but whether such service rendered in the course of business proposed to be carried on by the particular applicant would, in view of the entire absence of legislative regulation of the rights and powers of such a corporation, be proper for the service, accommodation, convenience or safety of the public.

The commission points out that the State has adopted a broad policy in relation to the improvement of the public roads and highways in country districts and that large sums are constantly being expended on their construction and maintenance. While the commonwealth has been vigilant in regulating by law the right of street railways to use streets and roads, the Legislature has not clearly indicated the policy of the State in regard to the use of such highways by companies using a means of transportation such as the trackless trolley system. The commission declares that the exercise in Pennsylvania by a corporation of another State, of rights in which the public is so vitally interested, should be undertaken only when these rights have been considered and defined by the law-making body of the commonwealth.

INTERSTATE COMMERCE DEFINED

Remarks of Justice Day of Supreme Court in South Covington & Cincinnati Street Railway Case

The Supreme Court of the United States on Jan. 5 rendered a decision in the suit of the South Covington & Cincinnati Street Railway against the city of Covington, Ky., to enjoin the enforcement of an ordinance providing for the regulation of the operation of the road. The court distinguished between the legal and illegal phases of the ordinance and remanded it to the State court for further consideration not inconsistent with the opinion just rendered. The court found the provisions of the ordinance prohibiting the use of unguarded platforms by passengers, separating the motorman from the passengers and requiring

cleanliness, ventilation and fumigation of cars to be within the State jurisdiction. The court considered to be invalid, however, the provisions affecting frequency with which cars shall be run, the number of passengers to be carried on each car and the requirement that a temperature of 50 deg. Fahr. shall be maintained in the cars. In rendering the decision, Justice Day said in part:

"This court repeatedly has held that whether given commerce is of an interstate character or not is to be determined by what is actually done, and if the transportation is really and in fact between states, the mere arrangements of billing or plurality of carriers does not enter into the conclusion.

"Here is an uninterrupted transportation of passengers between states, on the same cars and under practically the same management, and for a single fare. We have no doubt that this course of business constitutes interstate commerce.

"Reaching the conclusion that the traffic here regulated is of an interstate character we think the necessary effect of these regulations is not only to determine the manner of carrying passengers in Covington and the number of cars that are to be run in connection with the business there, but necessarily directs the number of cars to be run in Cincinnati and the manner of loading them when there, where the traffic is much impeded and other lines of street railway and many hindrances have to be taken into consideration in regulating the traffic.

"If Covington can regulate these matters certainly Cincinnati can, and interstate commerce might be impeded by conflicting and varying regulations in this respect, with which it might be impossible to comply. On one side of the river one set of regulations might be enforced, and on the other side quite a different set, and both seeking to control a practically continuous movement of cars.

"There are other parts of the ordinance which we are of opinion are within the authority of State, and proper subject matter for its regulation at least until the federal authority is exerted. As to the regulation affecting the temperature of the cars and providing that it shall never be permanently below 50 deg. Fahr., the undisputed testimony shows that it is impossible, owing to the opening and closing of doors and other interferences that make it impracticable. We therefore think, upon this showing, this feature of the ordinance is unreasonable and cannot be sustained. Our conclusion is that the Court of Appeals of Kentucky erred in refusing to grant the injunction as against the provision of the ordinance regulating the number of passengers to be carried in a car and the number of cars to be provided and the regulation as to heating, in view of the testimony as heretofore stated.

"In these respects its decisions should be reversed. We think the other provisions of the ordinance are separate, and concerning them the plaintiff in error was not entitled to an injunction in the State court. Judgment is reversed in part and the case remanded to the State court for further proceedings not inconsistent with this opinion."

PUBLIC RELATIONS IN SAN FRANCISCO

Good-Will of Public the Company's Best Asset, Says President Lilienthal

In a signed editorial in the November issue of the *United Railroads Magazine*, Jesse W. Lilienthal, president of the company, says in part:

"I believe that I have made it plain to you all that the good-will of the people is the best asset that the company could have. So that if we are influenced only by the most selfish motives, it would still be good policy to do everything in our power to earn that good-will. Now, how is the good-will of the public to be obtained? One purpose of this magazine is to have you tell us from time to time how you think this should be done. We must, of course, in the first instance use every dollar that we can spare to put our roadbed and equipment in the best possible condition and keep them so. Cars must be kept clean and properly ventilated. We must use every possible effort to stop killing and maiming people. That does not simply mean that we must avoid all carelessness on our own part—it also means that we must guard against the carelessness or helplessness or incompetence of passengers and

pedestrians and drivers of other vehicles. It is our legal duty, just as it is our moral duty, to prevent injury to third persons where possible, even though they foolishly expose themselves to it. And we must, by all means in our power, educate the public to the dangers that attend transportation in a crowded thoroughfare. We have already begun to advertise 'safety first' principles, and we are considering having lectures delivered and motion pictures shown in the public schools to teach the children what they must do to protect themselves against accidents.

"We must, where injury has been done, give patient attention to claims for damages, examine all the circumstances impartially, and when we are at fault we must make reasonable reparation.

"Finally, we must be courteous to the public. I have said this often before, but I cannot say it too often. A pleasant word changes the whole picture. We are made happier when we come in contact with an obliging person, and the best of it all is that our own task is made easier when we perform it cheerfully and with kindness toward those with whom it brings us in contact. Nothing pleases me more than to receive a letter from some passenger calling attention to the courtesy of any of our platform men. That is the surest way to get the good-will of the public, and I am glad to say that of late such letters of commendation are beginning to come in quite frequently."

OHIO COMMISSION REPORT

According to the report of the Public Utilities Commission of Ohio filed with Governor Cox on Dec. 31, the mileage of the electric railways in that State is 2745.03. The capital stock of the companies is \$123,429,920, a decrease of \$2,265,080 over 1913. The net income was \$2,381,174, a decrease of \$88,823. Dividends amounted to \$1,901,695, an increase of \$210,894. The bonded debt of the companies increased by \$3,500,000 over 1913 and the cost of equipment showed an increase of \$5,428,000. The operating revenues increased \$948,000 over the previous year and the operating expenses \$1,086,000. The roads employed 11,601 persons, an increase of 579. The salaries paid aggregated \$7,858,959, an increase of \$881,271 for the year. The number of persons killed or injured on the electric railways was 1744, or 166 more than in 1913. Of 178,637,260 fare passengers carried on the electric railways thirteen were killed, or one to every 13,741,327. Injured passengers numbered 869, or one to every 205,566.

The commission suggests that the law should be so amended that rates may be suspended pending an investigation. The commission now has no authority to suspend a rate or schedule until it becomes effective. The report suggests that railroads be required to give notice of thirty days of a change in rates, unless otherwise ordered by the commission. It is also recommended that railway and railroad companies be required to secure the approval of the commission for the abandonment of stops, stations and agencies. This, however, would not apply to city lines, where such regulation should be exercised by the local authority. Block signal systems should be installed on all roads where gross earnings justify the expenditure. Other suggestions are: That the commission be notified immediately of any change in the personnel of the responsible officers of railroad and utility corporations; that the commission be authorized to order the refunding of unreasonable charges by railroads and utilities; that members of the commission be exempted from testifying in civil actions when the matter out of which the action grew has been officially investigated, and that the commission be authorized to investigate upon its own motion matters affecting the rules, regulations and practices of common carriers.

PROPOSED NEW TRAMWAYS IN LONDON

Among the Parliamentary notices for the proposed construction of new tramways are those of the London County Council to extend its present tramways to new terminals within the city of London at Tower Hill in lieu of Aldgate, and Smithfield in lieu of Farringdon Street. Various short extensions in the Hackney district are also proposed. Many of these schemes are revivals of proposals to which Parliamentary sanction has been refused in former sessions. It is also sought by the Council to obtain authority to

run trail cars on lines north of the Thames similar to those in use on the southern portion of the system. It has been decided by the Council that the proposal regarding the suggested tramways from Waterloo Road to Blackfriars Road, through the New Cut and Great Charlotte Street, will not be proceeded with in the next session of Parliament. The scheme has met with strong local opposition on behalf of the traders of the New Cut market and their customers. The Council has also decided not to proceed with the contemplated legislation with regard to the proposed tramway from Victoria Station to Westminster Bridge, via Victoria Street.

PERSONNEL OF NEW CALIFORNIA RAILROAD COMMISSION

The personnel of the new Railroad Commission of California, which took office on Jan. 4 under appointments from Governor Johnson, is the same as heretofore with the exception that Frank R. Devlin was named to fill the vacancy caused by the election of John M. Eshleman, former president of the commission, as Lieutenant-Governor. As now organized the members of the commission and their terms of office are as follows: Max Thelen, president, six years; Edwin O. Edgerton, six years; H. A. Loveland, four years; Frank R. Devlin, four years, and Alex Gordon, two years. Douglas Brookman has been named as attorney for the new commission, which announces that all present employees will be retained. Mr. Devlin was a member of the State senate in 1903-1905 and was elected judge of the Superior Court of Solano County in 1906, which position he later resigned to resume private practice as an attorney at law.

Rayburn Interstate Commerce Bill Reintroduced.—Senator Pomerene of Ohio has reintroduced in the Senate the Rayburn railroad securities bill with an amendment increasing the number of Interstate Commerce Commissioners from seven to nine. The Rayburn bill was abandoned by Democratic leaders at the last session of Congress.

Three New Haven Officials Denied Immunity.—The Federal District Court at New York has overruled the pleas of immunity interposed by John L. Billard, James S. Elton and William Skinner to indictments charging them with criminal violations of the Sherman law in connection with their acts as directors of the New York, New Haven & Hartford Railroad.

St. Louis Mill-Tax Case.—The United Railways, St. Louis, Mo., has carried the mill-tax case direct to the Supreme Court at Jefferson City. On Jan. 2 the court instructed its chief clerk not to file the motion of the company for a rehearing. The plea made to the court on Jan. 7 asks that body to reverse its decision in the mill-tax cases handed down on Dec. 19, to reverse its construction on its rule not to permit readjudication of decisions, and to take another view of its decision that holidays and Sundays shall be included in the ten days allowed after a decision, in which to file motions for rehearings.

Suggestion Advanced for a National Electric Week.—Acting on a suggestion advanced by the Society for Electrical Development, representatives of leading electrical manufacturers, central stations, jobbers, contractors, dealers and trade journals, at a special meeting held on Jan. 8 in the society's office, voted in favor of planning a national electric week to be held in the United States and Canada some time this fall. It was the opinion of those present that such a week would call the attention of the public in the most forcible manner possible to the many uses of electricity, stimulate the men in the industry itself and impart a boom to general business throughout the entire country.

Strike Averted.—Mediation appears to have been finally successful in averting the strike called by the conductors and motormen of the Wilkes-Barre (Pa.) Railway to enforce demands for increased wages and for relief from other alleged grievances. Congressman Casey, Wilkes-Barre, representing Secretary of Labor Wilson, effected a meeting between Thomas A. Wright, general manager of the company; ex-Judge F. W. Wheaton, counsel of the company; Roland B. Mahany and John A. Moffitt, national mediators,

and John A. Steese, State mediator. As a result, an offer of 1 cent an hour increase has been made. The question of the right of the company to discharge employees without giving reasons remains to be adjusted.

Cincinnati Rapid Transit Belt.—C. L. Henry, president of the Indianapolis & Cincinnati Traction Company, was in Cincinnati on Jan. 5. In regard to the rapid transit belt line projected by the city, he advised that adequate freight facilities as well as passenger terminals be provided in the plans. Indianapolis made the mistake of looking upon the interurban railways primarily as passenger lines, with the result that freight facilities there are inadequate. Freight is an important factor in modern interurban business, and special care should be taken to build large and well-equipped freight terminals. Mr. Henry said that the company of which he is president will build into Cincinnati as soon as plans for the interurban entrance are settled.

Repaving in Columbus.—At a conference with representatives of the Columbus Chamber of Commerce and a special committee of the City Council recently, S. G. McMeen, president of the Columbus Railway, Power & Light Company, stated that if the city insists upon repaving West Broad, East Main and East Long Streets this year \$400,000 will be added to the company's improvement expenses. The company's program for improvements called for the expenditure of \$380,000, which is \$180,000 in excess of the normal improvement bill. The city desires to do this work in order to give employment to as many people as possible and because to delay it another year will place a greater amount of work in the next year's period than can be done.

Philadelphia Transit Loan Ordinance.—Two ordinances providing for a vote of the people of Philadelphia on an increase in the indebtedness of the city by \$30,000,000 for new transit facilities have been introduced in the Councils by John T. Connelly, chairman of the finance committee. A special election is provided for in one of the ordinances. The other signifies the desire of the city authorities to increase the debt of the municipality "for the purpose of establishing, purchasing, leasing, locating, constructing, equipping and improving transit facilities, wholly or in part, or for any one or more of them, and the use and operation of the same within the corporate limits of Philadelphia and within the limits of adjacent cities, boroughs or townships."

LEGISLATION AFFECTING ELECTRIC RAILWAYS NEW YORK

Governor Whitman of New York announced recently that it was proposed to conduct an investigation of both the Public Service Commission of the First District and the Commission for the Second District. The Legislature reconvened on the evening of Jan. 13. Senator William H. Bennett of Manhattan had presented a resolution providing \$25,000 for expenses and a committee of three Senators and five Assemblymen to investigate not only the recent accidents in New York, but the commission as well, but the Senate has not acted on the matter. The preamble of the resolution called attention to the presence of wooden cars in the subway and referred to the present disorganized condition of and chaotic control exercised by the commission for the first district. The Governor is reported to have said that the only plan for doing away with the commissions which has received serious consideration is the one to consolidate the two commissions into one with five members, each receiving the present salary of \$15,000 a year.

PROGRAM OF ASSOCIATION MEETING

Wisconsin Electrical Association

A paper entitled "How to Overcome Some Operating Difficulties of Small Electric Utilities" and a paper on the effects of high taxation of public service companies in Wisconsin have been added to the program of the meeting of the Wisconsin Electrical Association to be held in Milwaukee, Wis., on Jan. 20, 21 and 22. The program of papers of special interest to central station and electric railways intended to be presented at this meeting was published in the *ELECTRIC RAILWAY JOURNAL* of Jan. 9, page 113.

Financial and Corporate

PREDICTION OF PROSPERITY

Recent interviews of this paper with manufacturers of railway apparatus indicate that a much larger number of inquiries have been received from possible purchasers than for many months. Some companies, especially among those handling the smaller supplies, report larger sales during December than at any time since the outbreak of the European war. A similar investigation among railway managers indicates rather a waiting condition, pending a more definite settlement of the general industrial conditions and the money market. They feel more encouraged and believe a revival of general business would soon be reflected in their gross receipts, but with the poor records for 1914, and the uncertainties which are bound to exist during the continuance of the war, are cautious about branching out. This attitude is most apparent in the districts of the country which have most felt the business depression, like the cotton and manufacturing districts. In financial circles the sentiment is more optimistic than for some time. The financial situation at present, with gold actually being imported and a large credit balance in most of the European capitals, could hardly be improved, and moderate sales of American securities for foreign holders could easily be financed, although there is no evidence yet of such sales as were feared before the opening of the New York Stock Exchange.

According to a recent interview with L. C. Haynes, vice-president East St. Louis & Suburban Railway, East St. Louis, Ill., the swinging back of the pendulum of public sentiment toward the fair treatment of railroads by legislative bodies is tending to inspire confidence in railroad managements. Consequently the feeling of the financial interests, to which the railroads must look for aid in carrying out betterment plans, is improved. Continuing along this line, Mr. Haynes said:

"There seems to be a growing disposition to cease trying to fix upon the railway managements of to-day guilt for the actions of their predecessors of one to three decades ago. There seems also to be an increasing appreciation of the fact that railway securities are generally held to-day by private investors who purchased in good faith and who are fairly entitled to the protection of their investments, provided only and always that rates charged for transportation of freight and passengers be not excessive."

Mr. Haynes declared that public utilities are being retarded by federal and state laws which tend to take the profit out of promotion. In his opinion, last December was the worst month in recent history for railway earnings, but 1915 will be the best year ever from a safe business standpoint. A large number of orders for railway supplies will be placed and East St. Louis in particular will be benefited by these.

OUTLOOK IN NORTHWEST

At the recent annual meeting of the British Columbia Electric Railway, Ltd., Vancouver, B. C., Can., held in London, the chairman, R. M. Horne-Payne, stated that the last year had been a bad one and that the immediate prospects are unfavorable on account of the war. The monthly traffic returns up to October, as compared with the previous year's results, showed a falling off in net earnings at the rate of between \$450,000 and \$500,000 a year. As for the outlook, the chairman said:

"I do not think that we can hope for any marked improvement in conditions during the current financial year, but it is reasonable to look for an improvement in the latter half of 1915. This improvement may arise from two sources—namely, from the final extermination of the enemy's cruisers in the Pacific and South Atlantic Oceans, and from good prices for wheat and a large crop in the prairie provinces of Canada. Either of these factors would immediately resuscitate business in British Columbia.

"Whenever the revival comes it will be found that this period of depression has been for the permanent good of the province, and that in several important ways new conditions have been established enabling its sounder and more rapid development. The cost of living, especially in the matter of rentals, will have considerably decreased, and with this a lower basis of wages will be in force."

ANNUAL REPORT

Wisconsin Railway, Light & Power Company

In submitting its first report of operations from Feb. 10, 1913, the date of beginning business, to Sept. 30, 1914, the Wisconsin Railway, Light & Power Company, Milwaukee, Wis., presents a statement of earnings compiled from the company's annual report to the Railroad Commission of Wisconsin for the twelve months ended June 30, 1914. This company owns the electric railway and power companies in Winona and the electric railway in La Crosse. A comparative statement for the year ended June 30, 1913, compiled by consolidating the accounts of these constituent companies so as to reflect as accurately as possible the operating conditions of the year, is also shown. These statements are as follows:

	1914	1913
Gross earnings	\$385,947	\$357,259
Operating expenses.....	\$221,829	\$224,729
Taxes	26,287	23,611
Net earnings	\$137,831	\$108,919
Annual interest on \$1,200,000 of first security bonds and \$220,000 of underlying bonds	71,000	
Balance available for interest on junior liens, depreciation, etc.....	\$66,831	
Annual interest on \$1,025,000 of temporarily second security bonds.....	\$51,250	
Less credit being one year's interest on \$225,000 of temporarily second security bonds held by trustee to pay for future improvements	11,250	
Total	\$40,000	
Balance	\$26,831	

The following comparative statement shows the earnings and operating expenses of the company for the six months ending Sept. 30, 1913 and 1914. As the Winona Railway & Light Company was not added to the new company until early in March, 1913, this six months' statement comprises the longest period in which it is possible to give an actual comparison of earnings and operating expenses of the new company.

	1914	1913
Operating revenues	\$182,958	\$179,503
Operating expenses (excluding taxes)....	\$104,677	\$106,302
Taxes	14,365	12,060
Net operating revenues.....	\$63,915	\$61,140
Non-operating revenues.....	1,583	1,493
Net earnings	\$65,499	\$62,633

Until Aug. 1, 1914, the company's earnings from electric light, power and street railway showed a constant increase. Since that date, while the electric light and power earnings have suffered but a small loss, the street railway earnings in both La Crosse and Winona have fallen off materially as compared with 1913 and are still showing a decrease. This condition is directly attributable to the general depression caused by the European war. The company has used every endeavor to reduce expenses to meet the loss in earnings, and the completion of numerous improvements has assisted in reducing the operating cost so that the net earnings still show a slight gain over 1913.

Upon the completion of the new substation now under construction at La Crosse, it is expected to operate the electric railway entirely by water power reinforced when necessary by steam from Winona. This will considerably reduce the operating expenses of the La Crosse street railway system.

During the period ending Sept. 30, 1914, the company accumulated a surplus in its reserves of \$5,224, of which \$5,034 is in the injuries and damages reserve. New construction and improvements to the street railway property in La Crosse have cost \$20,665. The total cost of four new cars in Winona and the change of seven old cars for one-man operator was \$11,893. The total cost of all the lands, new construction, equipment, improvements, betterments and rehabilitation was \$168,194.33. A portion of this amount was charged directly to operating expenses, a portion to depreciation and rehabilitation and a portion to new construction.

On March 10, 1914, the company began furnishing from Winona power to the Chicago, Milwaukee & St. Paul Rail-

way for operating its automatic block signal system between La Crosse, Wis., and Wabash, Minn., a distance of 60 miles. The cost of putting up the necessary electric feeders to supply the system was \$1,695 and the earnings at present on the contract are at the rate of \$2,940 per annum.

ELIMINATION OF EXCESS CAPITALIZATION

The Public Service Commission for the Second District of New York has issued an order by which it expects to straighten out the tangled finances of the Buffalo, N. Y., street railway lines which were consolidated into the International Railway. This action was taken just before the final consideration by the commission of the International Railway's large extension, the high speed line to Niagara Falls. The order lays down the method by which the company is to charge off the remainder of the excess capitalization of \$12,000,000 which the commission found in its constituent companies at the time of the consolidation. For some time these companies had been competing in Buffalo and vicinity, and much of the property which had been duplicated for the purposes of this competition was rendered useless by the consolidation, though theretofore it was a legitimate charge for capital in the operating companies. In many cases there were parallel tracks, duplicate car-houses and other equipment.

In the order approving the consolidation the commission provided that this excess amount should be charged off from year to year until at the end of forty years the company would be capitalized at its actual value. The present order, which simply covers the completion of this process, provides that in charging off certain remaining items the company shall follow in determining their value the appraisal of the property made by B. J. Arnold, Chicago, at the time of the consolidation.

MEETING OF HUDSON COMPANIES

At the annual meeting of the Hudson Companies, New York, N. Y., on Jan. 12, John R. Waterbury and Oscar L. Gubelman were elected directors to succeed A. S. Wing and E. W. Taintor. Mr. Taintor, who was displaced by about a vote of 11 to 2, represented the complaining preferred stockholders referred to in the ELECTRIC RAILWAY JOURNAL of Jan. 2.

In his remarks to the stockholders, W. G. Oakman, president, said:

"There have not been any transactions of importance during the year, except the renewal of the mortgage of \$6,500,000, due April 23, 1914, upon the property of the Greeley Square Realty Company. In connection with the extension of this mortgage, and in furtherance thereof, the company purchased at par \$427,000 of Greeley Square Realty Company first refunding mortgage bonds. The purchase was authorized by the vote of the directors. No director or officer had or has any interest, direct or indirect, in these bonds or the purchase—or any stockholder, so far as known."

After the meeting Mr. Taintor issued a statement criticizing the management of the company. According to a previous circular issued by Mr. Oakman, covering points such as brought up by Mr. Taintor, the company purchased from bankers in January, 1908, following the panic of the previous year, \$1,000,000 of Hudson & Manhattan Railroad first mortgage 4½ per cent bonds and \$250,000 of its common stock, at par and interest for the bonds, as a part of the consideration for the purchase of the company's \$3,000,000 of notes. The need of funds was then urgent and this action was taken in the belief that the securities purchased were worth and would ultimately realize the price paid for them. Furthermore, the cancellation of the agreement by which the railroad company agreed to pay the Hudson Companies certain sums, if earned, by way of interest was necessary as a part of the readjustment of 1913. As the readjustment managers insisted upon the cancellation, a refusal to permit this would have endangered the whole readjustment, the cessation of which would have meant a loss to the preferred stockholders. The questions arising out of the purchase of the bonds and the cancellation of the deferred interest agreement have been submitted to independent counsel with a view to ascertaining whether the

Hudson Companies have any legal grievance. Action on a proposed appropriation of \$5,000 for further examination in the company's affairs was postponed until the receipt of information on these two transactions. Thereafter the examination will be completed.

LEGAL STREET RAILWAY BONDS

The Massachusetts Public Service Commission has transmitted to the bank commissioner the list of street railways incorporated in Massachusetts which appear from the returns made by them to have annually earned and properly paid, without impairment of assets or capital stock, an amount in dividends equal to at least 5 per cent on their outstanding capital stock in each of the five preceding years. The companies included in the list follow: Bay State Street Railway, Boston & Revere Electric Railway, East Middlesex Street Railway, Fitchburg & Leominster Street Railway, Holyoke Street Railway, Milford & Uxbridge Street Railway, Nahant & Lynn Street Railway, Springfield Street Railway, Union Street Railway, West End Street Railway, Worcester Consolidated Street Railway. The Milford & Uxbridge Street Railway was added to the list this year.

Ardmore (Okla.) Electric Railway.—John F. Easley, secretary of the Ardmore Electric Railway and editor of the *Ardmorite*, has been appointed receiver of the company.

Brocklyn (N. Y.) Rapid Transit Company.—At the annual meeting of the stockholders of the Brooklyn City Railroad, held on Jan. 12, the retiring directors were elected, with the exception of Edward D. White, who resigned. Mr. White is succeeded by Henry F. Noyes.

California Railway & Power Company, San Francisco, Cal.—The Bankers' Trust Company, New York, as agents for the California Railway & Power Company, on Dec. 31 drew by lot for redemption 1000 shares of this company's prior preference stock.

Central Park, North & East River Railroad, New York, N. Y.—The minority stockholders of the Central Park, North & East River Railroad have won a point in their fight to sue former directors of the old Metropolitan Street Railway system for personal liabilities on account of a decline in the value of property. The United States District Court of Eastern Pennsylvania has overruled the demurrers of the three Philadelphia directors, Thomas Dolan, P. A. B. Widener and George W. Elkins, establishing the plaintiff's claim of the right to sue. The previous course of the court actions on this subject, in both New York and Pennsylvania, may be followed by referring to the *ELECTRIC RAILWAY JOURNAL* of April 4, 1914, May 16, 1914, and June 27, 1914.

Chicago (Ill.) Railways.—Henry A. Blair, chairman Chicago Railways, has issued a statement to the following effect: "Considering the number of inquiries relative to dividends of series 1 and 2, the directors and finance committee held a meeting and decided that owing to the present financial situation as well as the antagonistic attitude of the city towards the company at the present time, it is advisable to defer declaring any dividends."

Dayton (Ohio) Street Railway.—At the annual meeting of the Dayton Street Railway on Jan. 4 John Schantz was elected a director to succeed E. W. Hanley, resigned. Mr. Hanley relinquished the position of treasurer several months before on account of illness, and P. H. Worman has now been chosen as his successor.

Electrical Securities Corporation, New York, N. Y.—The Guaranty Trust Company, New York, successor as trustee to the Standard Trust Company, is inviting proposals for the sale of as many bonds of the third series of the Electrical Securities Corporation as can be purchased for \$74,152.50 and as many bonds of the eighth series as can be purchased for \$54,000, at not exceeding 103 and accrued interest in each instance. Sealed proposals will be received at the trustee's office until Jan. 18. All bonds accepted will be paid for on Jan. 20, 1915, upon delivery, interest ceasing after that date.

Fairmount Park Transportation Company, Philadelphia, Pa.—A recent circular issued to the stockholders of the Fairmount Park Transportation Company stated that according to the last annual report the company had a float-

ing debt of \$26,403, including \$10,000 in loans from stockholders. On April 1 \$18,750 of interest will be due on the company's first mortgage bonds, and changes to reduce operating costs will require \$10,000, making a total of about \$55,000 to be provided by April 1 or possibly \$50,000 with increased earnings. On account of this showing it was proposed to the stockholders (a) to raise \$50,000 by the issuance of 6 per cent five-year debentures, convertible after two years into 6 per cent preferred stock, par for par, with a 50 per cent preferred stock bonus; (b) to reduce the par value of all capital stock, including the \$250,000 of full paid treasury stock, from \$50 to \$10 per share; (c) to convert the treasury stock thus reduced into 6 per cent cumulative preferred stock and to increase the amount of the latter to \$100,000, \$75,000 to be reserved for retiring the debentures and \$25,000 for future financing; and (d) to allow stockholders to subscribe for the \$50,000 of debentures on the basis of one \$100 debenture for every seventy shares of reduced stock. In order to make this reorganization effective, 85 per cent of the debentures must be subscribed for. Up to Jan. 5 the holders of \$1,153,650 of the \$2,000,000 of capital stock had deposited their holdings with the Fidelity Trust Company, Philadelphia, and subscribed to their pro rata share of the debentures.

Federal Light & Traction Company, New York, N. Y.—Guy P. Gannett, vice-president of the Augusta Trust Company, has been elected a director of the Federal Light & Traction Company.

Hanover & McSherrystown Street Railway, Hanover, Pa.—At the annual meeting of the Hanover & McSherrystown Street Railway on Jan. 11 B. W. Frazier, H. F. Hansell and John E. Zimmerman were elected directors to succeed J. W. Steacy, F. G. Metzger and G. W. Bell.

Interborough-Metropolitan Company, New York, N. Y.—The Interborough-Metropolitan Company has made a new deed of trust to the Bankers Trust Company, New York, as trustee, to secure an issue of \$3,000,000 of ten-year 6 per cent collateral trust gold notes, the authorization of which was noted in the *ELECTRIC RAILWAY JOURNAL* of Jan. 2. The proceeds of this issue are to be used for the retirement and payment of the remainder of the company's \$4,000,000 of 6 per cent notes due on July 1, 1915. An amount of \$1,000,000 was taken up on Jan. 1, 1915, and the remaining notes have already been exchanged for the new notes. The new notes are dated Jan. 1, 1915, and due on Jan. 1, 1925, but subject to call for redemption or purchase for the sinking fund at par on any interest date on thirty days' notice. They are supported by a sinking fund of \$300,000 yearly, beginning on Nov. 1, 1915, and are secured by pledge of \$15,270,100 of the \$17,495,060 of capital stock of the New York Railways.

Lehigh Valley Transit Company, Allentown, Pa.—At the recent annual meeting of the Lehigh Valley Transit Company, H. J. Steele of Easton was added to the directorate to represent Easton interests, in view of the removal of President Fehr from that city to Allentown.

Ogden, Logan & Idaho Railroad, Ogden, Utah.—It is reported that the Ogden, Logan & Idaho Railroad, which was formed last October by the consolidation of the Ogden Rapid Transit Company and the Logan Transit Company with a capitalization of \$5,000,000, as noted in the *ELECTRIC RAILWAY JOURNAL* of Oct. 31, 1914, will soon hold a meeting to authorize a \$10,000,000 mortgage. The company at the time of consolidation announced that it planned the construction of 71 miles of extensions, including lines to Preston, Idaho, and Huntsville, Utah, and an extension of the Brigham City line to Logan. The new bond issue will be for financing these extensions and other improvements.

Pacific Gas & Electric Company, San Francisco, Cal.—The Pacific Gas & Electric Company has filed an application with the California Railroad Commission for authority to issue \$4,000,000 of 5 per cent one-year gold notes to be dated Dec. 15, 1914, and to be used in refunding \$4,000,000 of its 5 per cent one-year gold notes dated March 25, 1914. The company proposes to issue these notes at not less than 98 and to pledge as security for their payment \$5,000,000 of its convertible general lien bonds and \$5,000,000 of its general and refunding mortgage gold bonds. The company has also filed a supplemental application with the commis-

sion for authority to sell its general and refunding mortgage gold bonds at not less than 85. The commission last July authorized the company to issue \$5,000,000 of these bonds on the condition that it should later secure from the commission a supplemental order specifying the minimum price at which they were to be sold.

Portsmouth Street Railway & Light Company, Portsmouth, Ohio.—John Nickerson, Jr., New York and St. Louis, and Baker, Ayling & Company, Boston, are offering the remainder of the \$500,000 first mortgage 6 per cent bond issue of the Portsmouth Street Railway & Light Company at 101 and interest to yield about 6 per cent. More than \$400,000 of these bonds has already been sold. The bonds are dated July 1, 1914, and are due in annual serial instalments of \$25,000 at 100 and interest from 1918 to 1920, inclusive, and at 101 and interest from 1921 to 1935, inclusive. In 1935 the amount to be retired is \$75,000. The bonds are callable at 102½ and interest on any interest date. This company furnishes electric light and power to Portsmouth and New Boston and electric railway service to these two towns and to Sciotoville. It has 14 miles of track and equipment of twenty-six cars, mostly of the "pay-as-you-enter" type.

San Diego Consolidated Gas & Electric Company, San Diego, Cal.—On Jan. 6 the California Railroad Commission rendered a decision authorizing the San Diego Consolidated Gas & Electric Company to renew three promissory notes totaling \$55,000, held by H. M. Bylesby & Company and bearing interest at the rate of 7 per cent per annum.

United Railroads, San Francisco, Cal.—Jesse W. Lillenthal, president United Railroads of San Francisco, and the creditors of the Solano Irrigated Farms project have under consideration a plan of rehabilitation for the latter which it is believed will result in saving the investment of the railway and other stockholders therein. It is understood that the United Railways Investment Company, which controls the United Railroads of San Francisco, will not be financially interested as a company in any rehabilitation proceedings that materialize.

Southern Traction Company of Illinois, East St. Louis, Ill.—A hearing for creditors' claims against the Southern Traction Company of Illinois will be heard in Chicago on Feb. 8, 1915. This was announced by Walter Lindley, special referee in bankruptcy, at the conclusion of a similar session at East St. Louis, Ill., on Jan. 5, 1915.

United Traction Company, Pittsburgh, Pa.—A conference was held on Jan. 7 between James B. Callery, president United Traction Company of Pittsburgh, and the committee representing holders of the company's preferred stock. This committee, composed of Henry G. Bringle, Philadelphia Trust Company; Arthur V. Morton, Pennsylvania Company; J. C. Neff, Fidelity Trust Company, and C. M. Wood, Wood Estate, was appointed, as noted in the ELECTRIC RAILWAY JOURNAL of Jan. 9, to take action regarding the anticipated passing or payment in scrip of the semi-annual 2½ per cent cumulative preferred dividend usually paid on Jan. 1. After the conference it was announced that a proposition of half of the preferred stockholders would be submitted by Mr. Callery to the board of directors when it meets in New York.

Virginia Railway & Power Company, Richmond, Va.—The Philadelphia Stock Exchange has listed an additional \$240,000 of the first and refunding mortgage 5 per cent bonds of Virginia Railway & Power Company, thus making a total of \$12,253,000.

Winnipeg (Man.) Electric Railway.—William A. Reid & Company, New York, and the Dominion Securities Corporation have sold all of an authorized issue of \$1,500,000 of 6 per cent one and two-year gold notes of the Winnipeg Electric Railway, recently offered at 100¼ for the first class and at par for the second. These notes are dated Jan. 15, 1915, and are due half on Jan. 15, 1916, and half on Jan. 15, 1917. They are redeemable at 102½ per cent and interest at any interest date on notice. The company owns 100 miles of electric railway in Winnipeg and controls 165 miles in all, besides doing a local gas, electric light and power business.

DIVIDENDS DECLARED

Brooklyn (N. Y.) City Railroad, quarterly, 2 per cent.
 Dayton & Troy Electric Railway, Dayton, Ohio, quarterly, 1¼ per cent, preferred.
 Greene & Coates Streets Railroad, Philadelphia, Pa., quarterly, \$1.50.
 Manchester Traction, Light & Power Company, Manchester, N. H., quarterly, 2 per cent.
 Milwaukee Electric Railway & Light Company, Milwaukee, Wis., quarterly, 1½ per cent, preferred.
 New Hampshire Electric Railways, Haverhill, Mass., 2 per cent.
 Philadelphia Company, Pittsburgh, Pa., quarterly, 1¼ per cent, common, payable in scrip.
 Public Service Investment Company, Boston, Mass., \$1.50, preferred; \$2, common.
 Tampa (Fla.) Electric Company, quarterly, \$2.50.
 Toronto (Ont.) Railway, quarterly, 2 per cent.
 United Railways & Electric Company, Baltimore, Md., quarterly, 50 cents, common.

ELECTRIC RAILWAY MONTHLY EARNINGS

AURORA, ELGIN & CHICAGO RAILROAD, WHEATON, ILL.

Period	Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1m., Nov., '14	\$160,928	*\$105,053	\$55,875	\$42,576	\$13,299
1 " " '13	171,974	*112,725	58,349	37,495	20,854
5 " " '14	944,718	*583,628	361,080	215,883	145,197
5 " " '13	968,233	*581,350	386,883	186,844	200,039

BERKSHIRE STREET RAILWAY, PITTSFIELD, MASS.

Period	Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1m., Nov., '14	\$72,156	*\$64,896	\$7,260	\$17,315	†\$10,055
1 " " '13	76,365	*73,271	3,094	15,344	†12,250
5 " " '14	448,206	*399,892	48,315	85,922	†37,607
5 " " '13	465,957	*379,701	86,255	75,358	10,897

CLEVELAND, PAINESVILLE & EASTERN RAILROAD, WILLOUGHBY, OHIO.

Period	Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1m., Nov., '14	\$30,998	*\$17,689	\$13,389	\$10,880	\$2,509
1 " " '13	30,188	*18,017	12,171	10,483	1,689
11 " " '14	395,802	*213,327	182,574	120,887	61,683
11 " " '13	392,398	*212,250	180,148	114,683	65,465

CONNECTICUT COMPANY, NEW HAVEN, CONN.

Period	Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1m., Nov., '14	\$623,592	*\$474,675	\$148,916	\$98,386	\$50,530
1 " " '13	645,252	*550,349	94,903	88,371	6,532
5 " " '14	3,670,039	*2,650,636	1,019,404	492,245	527,159
5 " " '13	3,760,009	*2,640,578	1,119,430	448,779	670,651

MEXICO (MEX.) TRAMWAYS

Period	Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1m., Nov., '14	\$320,693	*\$213,495	\$107,198
1 " " '13	301,523	*140,208	161,311
11 " " '14	3,156,226	*1,467,841	1,688,386
11 " " '13	3,344,925	*1,754,757	1,590,167

NEW YORK (N. Y.) RAILWAYS

Period	Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1m., Nov., '14	\$1,095,043	*\$681,081	\$413,962	\$366,614	\$47,348
1 " " '13	1,175,107	*715,879	459,228	371,683	87,545
5 " " '14	5,864,073	*3,553,255	2,310,818	1,838,735	472,083
5 " " '13	6,136,310	*3,687,939	2,448,371	2,176,722	271,599

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

Period	Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1m., Nov., '14	\$24,005	*\$22,692	\$1,312	\$7,876	†\$6,564
1 " " '13	24,344	*16,926	7,419	7,626	†207
5 " " '14	190,596	*138,334	52,261	39,379	†12,882
5 " " '13	185,514	*131,835	53,679	38,367	†15,312

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

Period	Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1m., Nov., '14	\$37,939	*\$44,602	\$6,683	\$6,313	†\$12,996
1 " " '13	34,226	*54,336	20,110	5,576	25,686
5 " " '14	187,739	*215,734	27,995	30,008	†58,003
5 " " '13	173,186	*248,301	75,116	26,574	101,690

NORTHERN OHIO TRACTION & LIGHT COMPANY, AKRON, OHIO.

Period	Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1m., Nov., '14	\$286,732	*\$186,009	\$100,724	\$50,261	\$50,453
1 " " '13	265,099	*184,001	81,095	49,373	31,722
11 " " '14	3,319,704	*2,040,014	1,279,691	556,365	723,326
11 " " '13	2,989,155	*1,829,359	1,159,797	511,533	648,264

RHODE ISLAND COMPANY, PROVIDENCE, R. I.

Period	Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1m., Nov., '14	\$398,705	*\$343,126	\$55,579	\$117,300	\$61,721
1 " " '13	413,312	*319,898	93,415	109,223	15,808
5 " " '14	2,412,872	*1,724,294	688,577	591,800	96,777
5 " " '13	2,470,001	*1,693,502	776,499	530,879	245,620

WESTCHESTER STREET RAILWAY WHITE PLAINS, N. Y.

Period	Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1m., Nov., '14	\$19,769	*\$21,686	\$1,917	\$1,315	†\$3,232
1 " " '13	19,673	*21,209	1,536	1,118	†2,658
5 " " '14	123,452	*116,640	6,812	6,225	587
5 " " '13	117,809	*108,312	9,497	5,280	4,217

*Includes taxes. †Deficit.

Traffic and Transportation

THE "JITNEY" BUS

Hearing on Bus Regulations in Los Angeles—San Diego Company Outlines Its Position

Scenes of disorder were narrowly averted at the hearing held at the City Hall in Los Angeles, Cal., on Jan. 4 by the public utilities committee of the City Council to consider the proposed legislation to govern the operation of the "jitney" bus traffic in that city. The crowd in attendance overflowed into the corridors and the anterooms. So wide was the divergence of opinion that measures had to be taken to preserve order. The demand for regulation was presented in petitions from the Merchants' & Manufacturers' Association, the Realty Board, the Chamber of Commerce and from prominent merchants, bankers and citizens. Herbert J. Goudge spoke for the Chamber of Commerce. The views which he expressed were upheld by Percy H. Clark for the Realty Board. Two street railway trainmen pleaded for such regulations as would protect the 4500 employees of the railway companies and prevent them from being thrown out of employment.

The gist of the appeals of the representatives of the bus owners was that the Council should provide for loading zones in the downtown districts and traffic rules that would prevent undue congestion on the street. They favored only a moderate indemnity bond being exacted from each bus owner to guarantee compensation to persons injured by the buses. Councilman Roberts, chairman of the committee, announced at the conclusion of the hearing that the committee would take all of the suggestions offered and consult with the city attorney relative to drafting an ordinance covering the situation.

W. Clayton, vice-president and managing director of the San Diego (Cal.) Electric Railway, has addressed to the Council of that city a communication in which he outlined the position of the company with regard to the "jitney" bus in part as follows:

"The San Diego Electric Railway has made no complaint to the Council in relation to the 'jitney' bus. All that we desire to do is to state the effect the continued operation of the 'jitney' bus, if not regulated, will have upon the affairs of the company, and incidentally upon the growth and prosperity of the city.

"The company stands in a peculiarly unsatisfactory position in regard to this 'jitney' bus competition. As far as we can learn there are probably 125 buses operating in the city daily—some all the time, and some for only short periods during the time of heavy travel. All kinds of people are running buses.

"The money we are losing to the 'jitney' bus amounts to interest on more than \$2,000,000, and the company is crippled to that extent at least in its policies for extensions and car service. The company pays into the city treasury 2 per cent of its gross receipts, and into the State 4 per cent of its gross receipts. What we and other corporations pay into the State relieves the citizens of San Diego of paying State taxes. All the taxes for running the State are for the most part collected from railroads, street railways, power and light companies, etc.

"In addition, the total amount of money expended on street paving during the last three years and ten months was \$361,985, or practically 11 per cent of our gross receipts. Now the bus does not pay anything beyond a tax on the automobile and a small license tax to the city, so the city loses 2 per cent on gross receipts otherwise collected by the railway company. The State is also losing 4 per cent of the gross receipts because the 'jitney' bus pays no proportion of its gross receipts either to the city or to the State. The bus has no paving to maintain.

"Our greatest objection to the 'jitney' bus is that it operates over streets on which we already have franchises, running a little ahead of the street car and sniping the passengers. With very few exceptions, you do not find buses operating on streets where there is no street car line.

"We are unable to make any further improvements or to complete the improvements we have already commenced, solely for the reason that the competition of the bus has so

reduced our receipts that we must conserve every dollar to enable us to pay interest on the investment we already have. We cannot make any further investment until such time as we know exactly how far the bus can reduce our income.

"The San Diego Electric Railway never has paid more than a reasonable rate of interest on the investment. In all its history, it has been conducted along the same lines upon which the Railroad Commission now demands all public utilities shall be conducted. When we went before the Railroad Commission quite recently for the purpose of obtaining an issue of bonds, Max Thelen, who tried the case, remarked from the bench that we were the cleanest corporation financially the commission had yet had before it.

"We have been asked a number of times to make some suggestions to your honorable body as to what should be done about the 'jitney' bus, but that is the one thing we wish to avoid. We have stated the company's case against the bus, and now leave the whole matter without prejudice in the hands of the Council and the citizens of San Diego and prefer that whatever action the Council may take shall be based on suggestions from parties not directly interested in the street railway business."

For the ten days ended Jan. 7 not less than fifty automobile owners applied to the city clerk of Seattle, Wash., for permits to operate "jitney" buses within the city limits. A fee of \$4 per year for license to operate is charged by the city. Councilman Hesketh has had a bill passed to regulate those who drive automobiles for hire, which includes drivers of "jitney" buses. This bill requires that drivers shall be twenty-one years of age or more; that they shall submit to a physical examination to prove their ability to handle a car, and that sworn testimonials of at least two citizens shall be filed with the city before obtaining a license. Every applicant must submit two photographs of himself. One is filed in the comptroller's office and the second is attached to the license, which must be shown on request of the public authorities.

ALBANY SERVICE ORDER CONTEST

Long Statement by President Sims Indicating Appeal from Commission Service Order

The United Traction Company, Albany, N. Y., filed with the Public Service Commission of the Second District of New York on Jan. 8 a letter indicating that formal application will be made for a rehearing on the order of the commission regarding service, referred to in the *ELECTRIC RAILWAY JOURNAL* of Dec. 19. The letter from Clifford S. Sims, vice-president, discusses in much detail the orders of the commission and, submitting a lengthy financial history and analysis of the affairs of the United Traction Company, says the performance of some of the commission's orders would threaten the company with bankruptcy. In connection with the schedule requirements of the commission's order, Mr. Sims says that in view of the steadily declining revenue and increasing operating expenses of the company, the officers are firmly convinced that a readjustment of the schedules on all of the lines of the company is essential to its successful life. Mr. Sims asks that the electrical expert and statistician of the commission make a thorough inspection and analysis of the car schedules of the entire system, to the end that "all our lines may return to us a rate of income above operating expenses more nearly in accord with such averages as are shown by car lines in cities whose population and general surrounding conditions approximately conform to those of the communities which we serve." He enclosed a copy of a letter to the commission, containing an elaborate analysis of the company's operating returns and comparing it with that in other cities.

Reviewing the financial history of the United Traction Company Mr. Sims submits figures to show that a total of \$1,994,287 has been expended or must be expended for additions and betterments from Jan. 1, 1907, to Nov. 30, 1915. This includes new lines and extensions, improvements to roadway and track paving, bridges, signal apparatus, distribution system and power plant equipment and cars and equipment. Mr. Sims' comment is that much of this new capital investment not only creates no new revenue, but

actually involves further operating expense "to provide additional comfort for existing traffic." The figures indicate that though the passenger revenue per car-mile has increased from 23 cents to 26 cents, operating expenses per car-mile, including taxes, have increased from 14.99 cents to 20.47 cents. Mr. Sims says that this reduction of the difference between passenger car-mile revenue and expense from 8.01 cents to 5.53 cents is due to the fact that the company cannot collect any more than 5 cents for fare, and that the westward movement of the city's population added greatly to the length of haul per passenger. He sees no way for relief from this condition except by the addition of a reasonable charge for transfers or by more efficient use of equipment only to be attained by an increase in the speed of cars beyond the present limit fixed by municipal ordinance. He also refers to the fact that the reduction of the fare to Rensselaer by the commission has cost the company \$21,000 a year and that the sale of school tickets has meant an approximate loss in revenue of \$4,300.

The increased pay of the men, Mr. Sims says, has increased the cost of service \$243,700, with no corresponding increase in revenue, pointing to the fact that the last increase is counted as effective during only a part of 1914. Taxes have increased from \$88,500 in 1906 to \$222,600 in 1914. His figures show that the cost of road and equipment was \$10,202,082 on Jan. 1, 1907, and \$11,990,059 on Nov. 30, 1914, or an increase of \$1,787,977. The changes in the other figures of revenue and expenses during this period Mr. Sims shows to be as follows: Increase in gross revenue, \$600,000, 10 per cent; increase in operating expenses, \$700,000, 18 per cent; decrease in net earnings from operation, \$77,000, 10 per cent; increase in taxes, \$134,000, 151 per cent.

Mr. Sims says that these figures show that with an actual increase of cash expended for road and equipment of \$1,787,977, there was a decrease of about \$211,000 in the operating income available for interest and dividend. This represents a return of only 3.87 per cent on the cost of road and equipment, or even less than that on the total capital sum devoted to the service of the public. Mr. Sims estimates that the total cost of carrying out the provisions of the commission's last order will be \$900,270. There is to be added to this \$206,310, the cost of work now under way, mostly pursuant to orders of the commission, making a total of \$1,106,580, which the company must borrow.

Mr. Sims does not know how this additional sum can be secured, in view of the fact that all the bonds under the present mortgages of the company authorized have been sold. It would be impossible for the company to borrow this money without security. In view of the fact that the consolidated mortgage bonds are now quoted at but 89½ bid, 90 asked, and in view of the present condition of the security market, due to the European war, there is no demand for the best railroad securities. Hence the company could not hope to finance an issue of bonds with a lien junior to that of its present issues, the reduction of the company's dividend rate from 4 per cent to 2 per cent having placed its bonds out of the class legally available for savings banks and trust estate investment.

CHICAGO SERVICE QUESTIONS

The Better Public Service Association has been formed by some of the members of the Cook County real estate board. This organization plans to take up service questions in Chicago before the State Public Utilities Commission. In order to harmonize the differences regarding questions of service between the city administration, the railway companies and the Board of Supervising Engineers, Bion J. Arnold, chairman of the board, arranged for a meeting of the chairman of the local transportation committee, the commissioner of public service, the city traction supervisor and L. A. Busby, president of the Chicago Surface Lines. At this conference various service standards were discussed but no definite action was taken. In connection with a service standard the local transportation committee of the Council now has in its hands a draft of an ordinance providing for a seat per passenger during any fifteen-minute period outside of the rush hours, which include the time between 6:30 and 9 a.m. and between 4:30 and 7 p.m. on each week day. Exceptions to the terms of this ordinance, however, state that they do not apply

where natural or physical causes prohibit, or where the full track capacity is being utilized. Track is considered as used to full capacity when the headway is twenty-five seconds or less.

WASHINGTON PROFIT-SHARING CHECKS

Full Text of Letter of President King Transmitting 1914 Profit-Sharing Checks—Provision for Faithful Hereafter

The maximum profit-sharing checks of the Washington Railway & Electric Company, Washington, D. C., for 1914, were for \$21.17 each. The letter transmitting the checks, addressed on Jan. 2 to conductors, motormen, depot clerks and starters by C. P. King, president of the company, was as follows:

"Herewith you will find check representing your portion of the 1914 profit-sharing fund.

"A year ago, when I had the pleasure of sending profit-sharing checks for 1913, each man one year or more in the service received \$42.53; the previous year the sum was \$28.72. In my letter accompanying the checks I spoke a word in regard to 1914, as follows: 'Now as to 1914. You want your profit-sharing fund to be larger. So do I. Let me suggest a watchword for the year, "Safety First," "Eternal vigilance is the price of safety" and its reward shows directly in the profit-sharing fund.'

"As I wrote those words I little thought they were to prove a bad omen for the new year. Instead of expenditures for accidents and damages being less, they are largely increased. From the list of settlements I select three, for example: On March 6, 1914, one for \$7,500; May 9 another for \$5,000 and Nov. 28 one for \$10,063. These three accidents alone have diminished your profit-sharing check \$30.76. There are many others—more, in fact, than ever before.

"In the same letter I said, 'Watch your fares,' and pointed out that an extra nickel collected each round trip would increase your profit-sharing check by \$21. Did this thought strike home and develop activity advantageous to both of us? On the contrary, abundant evidence is before me of carelessness in the handling of fares.

"In some degree a smaller profit-sharing fund is accounted for by diminished passenger receipts. This is not surprising when it is remembered that the Inauguration largely increased the earnings, and contributed to the fund of 1913. But this is not the point, and its bearing upon the situation is slight. Again, it may be said that we have had an 'off year,' 'hard times,' 'business depression,' etc. Making full allowance for this, my point is that the traffic increase in Washington during the year 1914 (giving due consideration to Inauguration) is not reflected in our passenger earnings. Irresistibly the conclusion is forced upon me that general co-operation has been lacking. Some men have given it with complete fidelity, and we honor them for it, but others have been careless and indifferent. Both classes suffer, for under our profit-sharing plan as operated during 1912-1913-1914 no satisfactory way was found to discriminate between the man who was efficient and the one who was not. However, a plan has been adopted for 1915 which will give recognition to the faithful ones, both by marking them for preferment and increasing their share in the profits.

The figures for 1914 are as follows:

Gross passenger receipts, less District of Columbia tax of 4 per cent.....	\$2,645,139
26 per cent appropriated for trainmen's wages and accidents	687,736
Accidents and damages.....	\$114,495
Disbursed for wages.....	557,714
	<hr/>
Profit-Sharing Fund	\$15,527

"This amount is now being distributed among 817 men, as follows:

667 men in service one year or more, each.....	\$21.17	\$14,120.39
17 men in service 11 months, each.....	19.39	329.63
9 men in service 10 months, each.....	17.64	158.76
12 men in service 9 months, each.....	15.88	190.56
12 men in service 8 months, each.....	14.12	169.44
3 men in service 7 months, each.....	12.33	36.99
22 men in service 6 months, each.....	10.57	232.54
5 men in service 5 months, each.....	8.81	44.05
14 men in service 4 months, each.....	7.05	98.70
10 men in service 3 months, each.....	5.28	52.80
7 men in service 2 months, each.....	3.52	24.64
39 men in service 1 month, each.....	1.76	68.64

"I send you greetings for 1915. I am not satisfied with 1914. I know that with hearty co-operation far better results can be achieved during the new year. This is my hope, and I do not hesitate to say that if you transportation men will measure up to a standard easy of accomplishment, your profit-sharing check for 1915 will surprise you."

PASSES DISCONTINUED IN ATLANTA

The issuance of pass books to officers, employees and others was discontinued by the Georgia Railway & Power Company, Atlanta, Ga., on Jan. 1. The new order does not, however, affect persons whose uniforms have hitherto entitled them to ride, this exemption embracing city policemen, firemen, sanitary inspectors, other public employees in uniform and uniformed employees of the company. It does, however, affect "plain clothes" policemen. Their fare must be paid hereafter by themselves or the city. Except officers and employees of the company not in uniform they are the only ones included in the withdrawal. No other persons received pass books. The company will refund the fares of all employees traveling in the interest of the company. The fares of United States mail carriers are paid in a lump sum under annual contract by the federal government; and when the carriers are not in uniform they will pay cash. City policemen and firemen, and other uniformed public employees, are carried without charge. There is no contract requiring this, but the courtesy was validated several months ago by the Legislature.

For more than twenty years the officers and the employees of the company have ridden free almost as a matter of course. Then came the days of the anti-pass laws, and city officials, newspaper men and all others who had ridden without charge until that time were set upon their own resources as to fare. Some time ago the company drew a distinction among its own non-uniformed employees. Ticket books of a certain color, not renewable before a certain date after issue, were distributed among the office workers, the theory being that they would ride to and from home a certain number of times per month but would not travel for the company upon business. Ticket books of another color were issued to others connected with the company whose duties might require them to ride often on the company's affairs. These latter books were renewable at any time. Investigation in behalf of the board of directors at the end of 1914 developed that the pass books issued during the year had attained an astonishing value figure. Thereupon the practice was ended, the directors surrendering their own passes by their own action.

POLICE RESPONSIBLE

Mr. Whitridge, Hinting at Police Ingratitude, Offers Cash for Blockade Photos

F. W. Whitridge, president of the Third Avenue Railway, New York, N. Y., on Jan. 13 prepared a notice to the public to be posted in all cars of lines under his control. The notice reads:

"It is well known that whenever there is a snowstorm in this town the service of the surface street railroads deteriorates, and it is apparently impossible to run the cars on any schedule at all. This is because the tracks are used by every sort of vehicle to the exclusion of the cars, and in most cases quite unnecessarily. The city authorities, through the police, are mainly responsible for this condition and for the inconvenience to which the public is subjected. The Police Department demands from the companies hundreds of free passes, and from mere gratitude it should give more protection to our tracks than we now receive.

"In the hope of attracting their attention to the annoyances which their inattention causes the public, the Third Avenue Railway desires to collect photographs of the way in which vehicles are allowed to impede the traffic, and to this end it will pay \$10 for each of the best photographs and \$5 for each of the next best photographs after the next considerable snowstorm showing how its cars are blocked by trucks, omnibuses, motors and other vehicles. These photographs are to be sent to the office of the company, Third Avenue and 130th Street, each bearing the name and address of the photographer and the place and exact time when the photograph was taken."

NEW COMPANY PUBLICATION

The Mahoning & Shenango Railway & Light Company, Youngstown, Ohio, has begun the publication of *Em-an-Ess Electric News* monthly "to promote the safety of employees and patrons, to encourage courtesy toward the public and to increase efficiency in serving the people through a spirit of common helpfulness." The paper is 6 in. wide by 9 in. long and the first issue, dated December, 1914, contained twenty-four pages and cover. The paper is to be compiled by employees under the editorial direction of the department of public relations, which is in charge of Frank Wirt, and it is to be distributed free to all persons employed by the company. In its editorial introduction the company said in part:

"The *Em-an-Ess Electric News* herewith makes its bow. Of course a foreword, a bit of explanation, therefore, is in order. The *Em-an-Ess Electric News* is intended solely to be a little magazine and newspaper for employees of the Mahoning & Shenango Railway & Light Company and its affiliated companies, a publication that will occasionally edify and always entertain every man and woman connected with the company in any capacity.

"It will appear monthly, coming from the press about the first of the month. It will be a common meeting ground for all departments, railway, electric and gas. In its columns we hope for a free exchange of views, so that the trainman may become better acquainted with the lineman, the trackman with the power-house man, the active outside worker with the man in the office, and so on all along the line of diversified employment that goes to make up the Em-an-Ess System.

"We all are, as it were, members of one large commercial family, and it is well for members of a family to be acquainted. Then in introducing itself with this issue the *News* cannot better express the purpose of its being than to say it hopes, as time passes, to make all of us better acquainted with one another so that we may share the joys and problems of living."

HEARINGS ON BROOKLYN SERVICE

Hearings are being held by the Public Service Commission of the First District of New York to determine the advisability of operating more cars over the Brooklyn Rapid Transit surface and elevated lines, as recommended by Joseph Johnson, chief of the commission's transit bureau, based upon the results of his recent investigation into the company's service. The company is represented at the hearings by D. A. Marsh and C. L. Woody, attorneys, and S. W. Huff, vice-president.

At the hearing on Jan. 7 Mr. Johnson was questioned by the company's attorneys as to his technical qualifications for conducting an accurate expert investigation. Mr. Johnson said that he based his recommendation for a 10 per cent increased operation in the number of cars upon the results of reports submitted by competent inspectors who had completed civil service examinations. He contended that the company was operating fewer cars over the Brooklyn bridge than a month ago before the question was brought up. The railway contended that Mr. Johnson had neglected to consider the serious effects of the much lowered scheduled speed which would be occasioned by the operation of more cars.

On Jan. 9 Mr. Johnson suggested that moving pictures be taken to supplement his report on the overcrowded conditions of the surface cars. At this and at a subsequent hearing on Jan. 13 John Weigel, chief of the time-table bureau of the company, was the principal witness. Mr. Weigel said that just as the early operation of the present Atlantic Avenue subway had very materially reduced the traffic over parallel surface lines, express train operation following third tracking of the elevated system and the new Fourth Avenue subway trains would reduce the number of cars necessary for adequate surface transit. The railway company complained that the delay of the commission in approving the new subway contracts had retarded the relief of the surface cars congestion. For this reason no provision had been made for the purchase of new cars. Commissioner Williams ascribed the delay in this work to failure promptly to receive the approval of the abutting property owners. The rehearing was to continue on Jan. 15.

INCREASE IN WAGES IN LITTLE ROCK

The Little Rock Railway & Electric Company, Little Rock, Ark., has announced an increase in the wages of its trainmen. C. J. Griffith, general manager of the company, issued a statement in part as follows in regard to the increase:

"The action taken by the directors is the result of plans which we have had in mind for some time. The bonus system is a feature which we long have contemplated and which has been made possible by the co-operation of our men in the matter of reducing accidents.

"During the early part of 1914, in a conference with our employees, I told them that I believed the Little Rock Railway & Electric Company would inaugurate a system of bonuses from the money saved to the company through the lessening of damage claims. The directors have approved that plan and have gone even further, in agreeing to distribute virtually every cent saved to the company, the distribution to be shared in by the employees.

"The safety campaign which we have been rigidly pursuing has proved its value in the highest degree. We reduced the number of accidents in 1914 more than 12 per cent over the number in 1913, and with the continual improvement of our safety system we believe the number will be lowered further in 1915. The company saved approximately \$7500 last year as a result of decreased number of casualties. This is the sum we are willing to turn back to our employees in 1915.

"The increase in wages granted to our motormen and conductors was recommended because an increase has not been given them since Jan. 1, 1911. The increase is 1 cent an hour. This will give us a maximum wage of 26 cents, which is the highest paid by any company operating in a city of this size in the United States."

The new scale went into effect on Jan. 1.

Increase in Fare Contemplated.—The St. Louis (Mo.) Electric Terminal Railway, one of the properties of the Illinois Traction System, is preparing to apply to the Missouri Utilities Commission for permission to increase its fare from 5 cents to 10 cents between St. Louis and Granite City, a distance of approximately 6 miles. A valuation of the property is now being made.

Montreal "Safety First" League.—A "safety first" league, composed of the public utility corporations, is being formed in Montreal, Que. The Bell Telephone Company, Montreal Tramways, Canadian Pacific Railway, Telegraph Department, Great North Western Telegraph Company, Westmount Corporation Light & Heat Department, Montreal Public Service Corporation and Montreal Light, Heat & Power Company will probably enter the league.

Lady Conductors in Jacksonville.—Cars of the Jacksonville Railway & Light Company, Jacksonville, Ill., which is included in the Illinois Traction System, recently carried lady conductors in addition to the regular conductors and the money collected by them in excess of the regular fare was turned over by the company to the Associated Charities of the city. This courtesy to the ladies was arranged through W. B. Miser, general superintendent of the Illinois Traction System at Jacksonville.

Appeal Taken from Fare Decision.—The receivers of the Interurban Railway & Terminal Company, Cincinnati, Ohio, have appealed to the Ohio Supreme Court from a decision of the Circuit Court of Hamilton County. This decision held that the railway must charge only a 5-cent fare between Pleasant Ridge, a suburb of Cincinnati, and the business section of the city. The importance of this fare reduction in the matter of the receivership of the company was noted in the *ELECTRIC RAILWAY JOURNAL* of Oct. 10, 1914.

Fixed Stops in Winnipeg.—Judge H. A. Robson, the public utilities commissioner of Winnipeg, Man., is considering the advisability of requiring the Winnipeg Electric Railway to make certain changes in its operating schedule. Among the suggestions are the location of stopping places at standard distances of 500 ft. apart, irrespective of whether these points are at street corners or not; loop tracks at vantage points all over the city or stations to hold emergency cars for use in maintaining the schedule where the

regular cars are delayed. It is also suggested that a signal system be installed so that the police who are regulating the traffic may be in constant communication with one another and so minimize delays.

New Augusta-Aiken Fares in Future.—R. W. Spofford, general superintendent of the Augusta-Aiken Railway & Electric Corporation, Augusta, Ga., made the following announcement recently in regard to putting into effect the new fares allowed by the Railroad Commission of South Carolina: "Recognizing the general financial conditions of this section it has been decided that the new rate of fares shall not go into effect until some future time. I wish to correct the impression that this increase in rate will amount to 100 per cent. In the first place, the through rate to Aiken will not be more than 40 cents and some of the rates for some of the present zones will not be increased at all. Our regular patrons will be taken care of by some form of commutation ticket which will be sold at a very small increase over the present rate, and I can assure the people of Belvedere and vicinity that there will be no increase for school children coming to North Augusta. It is my intention to publish in the newspapers and post in the various stations along our lines a map showing the new system of zones and fares with a full explanation of same, so that our patrons may become familiar with them when the new system is put into effect."

Change in Fares on New York State Line.—The Fonda, Johnstown & Gloversville Railroad, Gloversville, N. Y., has filed a new tariff with the Public Service Commission of the Second District of New York effective on Feb. 1, 1915. Local round-trip fares are to be advanced 5 cents between Gloversville and Fort Johnson, 10 cents between Gloversville and Amsterdam, Cranesville, Hoffmans and Schenectady, and 5 cents between Johnstown and Fort Johnson, Amsterdam, Cranesville, Hoffmans and Schenectady. The fare for fifty-four-trip commutation ticket between Amsterdam and Schenectady will be advanced from \$8 to \$8.50. Ticket books containing sixteen coupons, each good for passage in either direction between Johnstown and Gloversville (except on limited cars) between the hours of 6 and 7:45 a. m. and 5 and 6:20 p. m. (except on Sundays), and between 12 noon and 1 p. m. Saturdays, will be sold at \$1 per book. The sale of twenty-coupon workmen's tickets between Gloversville and Johnstown at \$1 will be discontinued. The fare of \$1 for ticket book containing twenty-four coupons each good for a 5-cent ride in Gloversville and Johnstown, or between these stations, will be canceled and the sale of such tickets discontinued. The fare of \$1 for ticket book containing twenty-four coupons, each good for a 5-cent ride within the corporate limits of Amsterdam, is to be canceled by the company and the sale of such tickets discontinued.

Change in Fare on Maine Road.—The new passenger tariff of the Atlantic Shore Electric Railway, Sanford, Maine, to go into effect on Feb. 1, has been made public. Among the most radical changes made from the old tariff are the cancellation of all reduced rates now in force, including commutation tickets, strings of five coupons, workmen's tickets and juvenile tickets, the extension of 6-cent cash fare zones and the limitation of tickets to not less than nine coupons to the strip, to be sold for 50 cents per strip. The new ticket rate of nine coupons for 50 cents will be an advance of five-ninths of 1 cent on each fare over the present rate of five coupons for a quarter, and an advance of 1 1/5 cents for each fare over the present workman's limited ticket rate. The cash fare will be 6 cents, the same as at present, with the exception of extension of certain fare zones all along the line, where transfers will be issued. The following paragraphs relating to baggage are from the new tariff: "No piece of baggage will be accepted for transportation which is too large to be put upon the front platform of car, or is too heavy to be handled by car crew. Large baby carriages and bicycles will not be accepted for transportation. No baggage in bad order, or too fragile to withstand ordinary handling, will be accepted for transportation, except at risk of owner. No baggage will be transported unless identified by the owner, and the Atlantic Shore Electric Railway does not guarantee to forward baggage on same car with the owner, but will do as the exigencies of each case may require."

Personal Mention

Mr. H. T. Jones, heretofore acting general superintendent of the United Railroads, San Francisco, Cal., has been appointed general superintendent of the company.

Mr. Thomas H. Mather, formerly chief engineer of the Empire United Railways, Syracuse, N. Y., has been appointed commissioner of public works of Syracuse.

Mr. W. A. Steckel, formerly roadmaster of the Empire United Railways, Syracuse, N. Y., has been appointed first deputy commissioner of public works of Syracuse.

Mr. Nathan Anthony, Boston, Mass., has been elected president of the Hartford & Springfield Street Railway, Warehouse Point, Conn., to succeed Mr. W. A. Tucker.

Mr. George S. West, Boston, Mass., has been elected secretary of the Hartford & Springfield Street Railway, Warehouse Point, Conn., to succeed Mr. Arthur Perkins.

Mr. O. G. Talmadge, heretofore connected with the Chicago (Ill.) Surface Lines, has been elected president and a director of the Chicago & Interurban Traction Company, succeeding Mr. John L. Matson, deceased.

Mr. H. M. Hagerman, Bangor, Pa., has been appointed general counsel of the State Belt Electric Street Railway to fill the vacancy created by the resignation of Mr. J. Davis Brodhead, who has been appointed judge of the Northampton County Court.

Mr. Charles Harris, who has been superintendent of the Cincinnati, Milford & Loveland Traction Company, Cincinnati, Ohio, has been elected president of the company to succeed Mr. C. H. Kroger, who has disposed of his interest in the company.

Mr. S. H. Russ, who has been assistant secretary and assistant treasurer of the Gray's Harbor Railway & Light Company, Aberdeen, Wash., has been appointed to a similar position with the Hot Springs (Ark.) Street Railway. Both companies are controlled by the Federal Light & Traction Company, New York, N. Y.

Mr. A. G. Rogers, for the last four years chief clerk of the Gray's Harbor Railway & Light Company, Aberdeen, Wash., has been appointed assistant secretary and assistant treasurer of the company, to succeed Mr. S. H. Russ, whose appointment to the Hot Springs (Ark.) Street Railway is referred to elsewhere in this column.

Mr. D. D. Curran, elected president of the New Orleans Railway & Light Company, New Orleans, La., will resign as president of the New Orleans & Northeastern Railroad, the Alabama & Vicksburg Railroad and the Vicksburg, Shreveport & Pacific Railway, but will continue with the properties as chairman of the board of directors.

Mr. Walter A. Draper, former president of the Chamber of Commerce of Cincinnati, Ohio, was made an honorary member of that organization on Jan. 5, in recognition of his excellent service in increasing the membership of the chamber from 800 to 2000 during his administration. Mr. Draper is vice-president of the Cincinnati Traction Company.

Mr. J. M. Pneuman, formerly master mechanic of the Annapolis Short Line, has been appointed electrical engineer of the Buffalo, Lockport & Rochester Railway. Previous to his connection at Annapolis Mr. Pneuman spent four years at Stamford, Conn., as foreman of electric locomotive and car maintenance of the New York, New Haven & Hartford Railroad.

Mr. Lee H. Landis, formerly general manager of the Ocean Shore Railroad, San Francisco, Cal., has been named as general manager of the Fresno & Interurban Railway, now building from Fresno to Clovis, Sanger and other points. Mr. Landis has been assistant to the president of the Tidewater Southern Railroad for three years. He was made president of the San Jose Terminal Railway several months ago.

Mr. John E. MacLean, Cohoes, N. Y., has been appointed counsel for the United Traction Company, Albany, N. Y., to succeed Mr. Patrick C. Dugan, resigned. Mr. MacLean acted as attorney for the United Traction Company during 1907 and 1908, while Mr. Dugan was deputy state comptroller under Governor Martin H. Glynn. Mr. MacLean is

assistant to Mr. Lewis E. Carr, attorney for the Delaware & Hudson Company, which controls the United Traction Company through stock ownership.

Mr. Walter H. Gaither, who has been appointed a member of the Public Service Commission of Pennsylvania by Governor Tener, as noted in the ELECTRIC RAILWAY JOURNAL of Jan. 2, will serve for a term of two and one-half years, beginning on Jan. 19, 1915. Mr. Gaither was born in Foxburg, Clarion County, Pa., forty-five years ago, and was engaged in newspaper work in Pittsburgh for several years. He was secretary to Governor Tener during his term as Congressman and served in the same capacity during Mr. Tener's term as Governor.

Mr. J. W. Simons, whose appointment to the position of superintendent of transportation of the Chicago & Milwaukee Electric Railroad, Highwood, Ill., was noted in the ELECTRIC RAILWAY JOURNAL of Jan. 9, entered the employ of the Chicago & Milwaukee Electric Railroad as a motorman on May 21, 1905, and was made dispatcher on April 28, 1913. On June 1, 1913, Mr. Simons was promoted to chief dispatcher, and on July 1, 1914, he was again promoted, being made trainmaster, which position he retained until he was promoted to superintendent of transportation, to succeed Mr. G. S. Henry, advanced to general superintendent.

Mr. John E. Greeley, president and general manager of the Indianapolis & Louisville Traction Railway, Scottsburg, Ind., received a New Year's greeting in the form of a telegram, signed by every employee of the road, which reads as follows: "The employees of the Indianapolis & Louisville Traction Railway take this means of assuring you of their appreciation of the cordial relationship that exists between the management and themselves, and of pledging you their heartiest support and co-operation with a view of making the year 1915 a most prosperous one for the road." Mr. Greeley has been identified with the operation of the road since its construction in 1907, and has served as general manager since 1911.

Mr. G. S. Henry, whose appointment as general superintendent of the Chicago & Milwaukee Electric Railroad, Highwood, Ill., was announced in the ELECTRIC RAILWAY JOURNAL of Jan. 9, is the eldest son of Mr. Charles L. Henry, president and general manager of the Indianapolis & Cincinnati Traction Company, Indianapolis, Ind. He began his electric railway career in the shops of the Indiana Union Traction Company, but in 1906 accepted a position with the Indianapolis & Cincinnati Traction Company, under his father. Several promotions advanced him to the position of traffic manager, from which he resigned in September, 1913, to become superintendent of transportation of the Chicago & Milwaukee Electric Railroad.

Mr. G. F. Soule, who has been identified with steam road electrification for several years, has recently accepted the position of inspector for the electrification of the Chicago, Milwaukee & St. Paul Railroad with headquarters at Butte, Mont. Mr. Soule started in the electric railway business with the Boston (Mass.) Elevated Railway and remained with that company for six years. He then spent five years with the New York, New Haven & Hartford Railroad in the construction of trolley and transmission lines and the electrification of steam lines. From New Haven he went to Butte, Mont., as general foreman in charge of the Butte, Anaconda & Pacific Railway electrification. Returning East, Mr. Soule has been general line foreman for the Bay State Street Railway at Lynn, Mass., during the past year.

Mr. Harry G. D. Nutting has been appointed manager of the engineering department of the John E. DeWolf Company, investment bankers, Milwaukee, Wis. Mr. Nutting will assist the buying department in the investigation of public utility issues and will also have general charge of the public utility properties controlled by the company. His office will be with that of the John E. DeWolf Company, in the Railway Exchange Building, Milwaukee. He will also continue to devote his attention to his private practice as consulting engineer on public utility problems. Mr. Nutting was formerly an engineer for the Wisconsin Railroad Commission, has managed a number of municipally and privately owned properties, and was recently assistant to the president of the Wisconsin Public Service Company, Wisconsin Railway, Light & Power Company and the Evanston (Ill.) Railway Company.

Mr. R. B. Stichter, who has been elected vice-president of the Texas Traction Company and the Southern Traction Company, Dallas, Tex., was born at Louisiana, Mo., on April 18, 1876, was educated in private schools there and at Drexel Institute, Philadelphia, Pa., from the mechanical engineering department of which institution he was graduated with the class of 1897. Mr. Stichter engaged in consulting engineering work until 1900, when he became general manager of the Cleburne Electric & Gas Company, Cleburne, Tex. In 1904 the property of the Sherman Gas & Electric Company, Sherman, Tex., was rebuilt under his direction and a new Diesel engine plant was installed which attracted attention on account of its economy in operation and maintenance. Upon the completion of this work Mr. Stichter became general manager of the company and served in that capacity until the spring of 1907, when he accepted the position of general manager of the public utility properties of the J. F. Strickland Company, consisting of electric light and gas plants at Cleburne, Sherman, Bonham, Dublin, Hillsboro and Waxahachie, Tex. In the spring of 1909 the Texas Traction Company, operating an interurban railway from Dallas to Sherman, 66 miles, was added to the group and in 1910 the Denison & Sherman Railway, consisting of an interurban railway from Denison to Sherman, 10½ miles, and local lines in both cities, were added. In 1911 the electric light, gas and street railway properties in Waco, Tex., were added. About this time the construction of the Southern Traction Company's interurban system was begun. This comprises a line 64½ miles long between Dallas and Corsicana and a line 98 miles long from Dallas to Waco. With the completion of the Southern Traction System, the traction properties of the Texas Traction Company, including the interurban from Dallas to Denison and local city lines in McKinney, Sherman and Denison, and the Southern Traction Company, including the interurban from Dallas to Corsicana and Waco and local city lines in Corsicana, Waxahachie and Waco, were put under the management of the Strickland-Goodwin Management Association with Mr. Stichter as general manager. The lighting properties passed to the Texas Power & Light Company. On Jan. 1, 1915, the management association was dissolved and Mr. Stichter was elected vice-president of the Texas Traction Company and the Southern Traction Company with active duties. From 1907 to 1910 Mr. Stichter served as secretary of the Southwestern Electrical & Gas Association and was elected president of the association in 1910. Mr. Stichter is also vice-president and a director of the Security National Bank, Dallas, the second in size in north Texas.



R. B. STICHTER

OBITUARY

W. S. West, president of the Valdosta (Ga.) Street Railway, is dead.

Charles S. Price, for eighteen years general manager of the Cambria Steel Company, and later its president, died on Jan. 10 at his home in Westmont, Pa., of heart disease. Mr. Price was born in West Chester, Pa., in 1852, went to Johnstown in 1876 as a draughtsman, and rose to the highest office within the gift of the company.

Ernst Cronbach, manager of the railway department of the Allgemeine Company, Berlin, Germany, has been killed in battle in Galicia. Mr. Cronbach was born in 1878 and was graduated from the Vienna Technical High School. He then entered the employ of the Austrian Union Electrical Company. Following the consolidation of the Union and the Allgemeine Companies he became connected with the consolidated company at Berlin, finally becoming head of the railway department. His interest in American traction development was shown by an extended tour which he took through the United States a couple of years ago.

Construction News

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

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

RECENT INCORPORATIONS

***Norwich, Colchester & Hartford Traction Company, Hartford, Conn.**—Chartered in Connecticut to build an electric railway to connect Norwich, Bozrah, Lebanon, Colchester, Marlborough, Glastonbury and East Hartford. Incorporators: Frank Cronin, Arthur Manning and Wells Strickland.

***Portland, Vancouver & Northern Interurban Railway, Vancouver, Wash.**—Application for a charter has been made by this company in Washington to build an electric railway between Vancouver and Portland. Franchises over the Columbia River, Interstate Bridge and in Portland have been applied for. Capital stock, \$300,000. Incorporators: Henry Crass and George W. Forks, both of Vancouver, are interested.

***Marietta-Parkersburg Interurban Company, Parkersburg, W. Va.**—Chartered in West Virginia to build a 10-mile electric railway from Parkersburg to Marietta, Ohio, on the western bank of the Ohio River. Capital stock, \$10,000. Incorporators: John Kaiser, E. Clark, Jr.; C. C. Middleswart and M. M. Rose, Marietta, and H. H. Archer and Kenner B. Stephenson, Parkersburg.

FRANCHISES

Birmingham, Ala.—Birmingham Railway, Light & Power Company has asked the Council for a franchise for a line from the intersection of Fifteenth Avenue South and Twentieth Street South to Key Circle in the Milner Land Company's new division in Birmingham.

Tuscaloosa, Ala.—The Birmingham-Tuscaloosa Railway & Utilities Company has received an extension of time until Feb. 1 in which to complete the electric railway in Tuscaloosa.

Los Angeles, Cal.—The Pacific Electric Company has asked the Board of Public Works for an extension of ninety days to improve its portion of Lake View Avenue between Temple Street and Glendale Avenue in Los Angeles.

Indianapolis, Ind.—The Board of Public Works has received an extension of time on its franchise until June 1, 1915, to complete the proposed new line in West Tenth Street, from Bismarck Avenue to Tibbs Avenue in Indianapolis.

Newbury, Mass.—The Massachusetts Northwestern Street Railway has asked the Council for a franchise for its line in Newbury to Parker River pavilion. No franchise was ever granted this company for this section of the line, so that the petition is one to merely legalize the location of tracks which the company now holds.

***Lincoln, Neb.**—An electric interurban railroad from Nowata to Vinita by way of Centralia in Craig County is being projected by the Farmers' Street Car Association of Lincoln, Neb.

Buffalo, N. Y.—The International Railway has asked the Public Service Commission, Second District, for permission to build a line between Niagara Falls and Lockport.

Columbus, Ohio.—The East Linden Electric Railway has received a franchise from the County Commissioners for a line from the end of the Leonard Avenue line to East Linden. About ½ mile will be in Columbus and 3 miles in the county. [E. R. J., Jan. 9, '15.]

Cincinnati, Ohio.—The Cincinnati, Newport & Covington Railway has received a twenty-five-year franchise to use certain streets to bring its cars from the bridge across the Ohio River to the business district of Cincinnati. In return the company has agreed to pay a franchise fee of \$12,000 the first year, and an addition of 3½ per cent each succeeding year of the period. It also agreed to pay \$65,000 in settlement of the claim for car licenses held against it by the city. Several objections were brought against the proposition by various members of Council, but the majority felt that additional burdens would make it impossible for the company to accept the franchise.

East Linden, Ohio.—The East Linden Railway has received a twenty-five-year franchise from the Council in East Linden. The proposal to extend the line to include Leonard Avenue was abandoned because it was found that a franchise had already been granted another company over a portion of the route.

Ottawa, Ont.—The Ottawa & St. Lawrence Electric Railway has asked the Ontario Legislature to extend the time for the construction of the proposed railway from Ottawa to Morrisburg and along the St. Lawrence River to Brockville and Braeside, on the Ottawa River, and along the Ottawa River to Ottawa; and for permission to build a branch line, or deviate the main line so as to serve Smiths Falls; and to extend the line from Russell to Embrum, and northerly to South Indian. The company is also asking for a change of name, and for authority to use steam or other motive power instead of electricity as in the original charter. [E. R. J., Nov. 21, '14.]

Portland, Ore.—The County Commissioners have granted an extension of the franchise of the United Railways on the Linnton Road, in accordance with a request of the Council and Public Dock Commission. Some time ago the franchise was revoked to take effect on Feb. 1. The company is seeking to readjust its franchises in Portland so that it can retain the privilege of operating freight and switching lines on a number of streets. Several important questions have arisen in regard to these franchises which could not be settled as soon as anticipated and for this reason the extension was asked.

Easton, Pa.—The Easton Transit Company has received a franchise from the Council to reconstruct its lines in South Easton. The company has also requested that it be allowed to lengthen the switch at the top of Chestnut Street, College Hill. H. R. Fehr, president.

Montreal, Que.—The Montreal Tramways Company has asked the Council for a franchise in Mount Royal.

Ogden, Utah.—On Dec. 22 the City Commission granted a franchise to the Salt Lake & Ogden Railway and the Ogden, Logan & Idaho Railway to construct standard gage tracks in Lincoln Avenue between Twenty-third and Twenty-fourth Streets in Ogden. The new track will lead into the joint terminal of the lines at Ogden. The Salt Lake & Ogden Railway operates south of Ogden and the Ogden, Logan & Idaho Railway north of the same point. The franchise is for fifty years.

Newport News, Va.—The Newport News & Hampton Railway, Gas & Electric Company has received a franchise from the Council for an extension down Jefferson Avenue to the municipal small boat harbor in Newport News.

Clarkston, Wash.—The City Council has granted a franchise to A. G. Nortz and associates to operate an electric railway from the Lewiston-Clarkston bridge through and over certain streets of Clarkston. Work on the bridge will be begun in a few days. Franchises have been granted in Lewiston and over the interstate bridge. Electrical concerns will submit bids at once for the equipment, which will cost approximately \$15,000. [E. R. J., Jan. 2, '15.]

Delafield, Wis.—A certificate of convenience and necessity has been granted The Milwaukee Light, Heat & Traction Company to operate a second power transmission utility in Delafield.

TRACK AND ROADWAY

Gadsden, Bellevue & Lookout Mountain Railway, Gadsden, Ala.—During 1915 this company plans to build its 30-mile line between Gadsden and Center.

Oakland, Antioch & Eastern Railway, Oakland, Cal.—The 12-mile line between Dixon and Dixon Junction, which connects the Sacramento Valley Electric Railway with the Oakland, Antioch & Eastern Railway, has been completed and is now being operated under contract by the latter company.

Pacific Electric Railway, Los Angeles, Cal.—This company is expending \$105,000 for betterments on its line from San Bernardino to Highland and Patton.

Fresno (Cal.) Interurban Railway.—During 1915 this company plans to build its 21½-mile line between Fresno, Clovis and Centerville.

San Francisco (Cal.) Municipal Railway.—A resolution that has been unanimously recommended by the Public Utilities Committee of San Francisco provides for extending the Stockton Street line of the Municipal Railway across Market Street and southward for a distance of three-fifths of a mile to the Southern Pacific station at Third and Townsend Streets in San Francisco. The resolution requests the Board of Public Works immediately to prepare an estimate of the cost of such track or appurtenances belonging to the United Railroads as the municipal line would use jointly with that company, and further declared the intention of the city to pay to the United Railroads one-half the estimated cost of the construction of such tracks and appurtenances, as provided by law.

New York, New Haven & Hartford Railroad, Stamford, Conn.—During 1915 this company expects to build 2 miles of sidings along its main line.

Hartford & Springfield Street Railway, Warehouse Point, Conn.—Notice has been given by this company of its intention to have introduced into the incoming legislature a bill to so amend its charter as to secure the privilege of building a branch line to connect Thompsonville and Suffield. The plan is to build a line from the local waiting station through Main Street, Thompsonville, and across the Connecticut River to unite with the present Suffield road at a point on Mapleton Avenue, a distance of approximately 3 miles.

Washington Railway & Electric Company, Washington, D. C.—About 1.75 miles of new track will be built by this company during 1915. The company plans to expend \$200,000 on extensions of its lines in Washington.

Chicago (Ill.) Surface Lines.—This company is under contract with the city of Chicago to build 20 miles of track this year.

Joliet & Eastern Traction Company, Chicago, Ill.—Two new directors were added at the annual election of the stockholders of this company, making the total seven directors. Daniel Peterkin, Chicago, receiver for the Joliet & Southern Traction Company under the bankruptcy proceedings, and F. C. Eckman, Joliet, are the two new directors. [E. R. J., Sept. 19, '14.]

Kankakee-Urbana Traction Company, Urbana, Ill.—An extension to Paxton is being planned by this company.

Public Utilities Company, Evansville, Ind.—During 1915 this company expects to build its 2-mile Bell Street extension in Evansville.

Union Traction Company, Coffeyville, Kan.—Plans are being considered by this company to extend its lines.

Hutchinson (Kan.) Interurban Railway.—This company plans to build 1 mile of new track in Hutchinson during 1915.

Salina (Kan.) Street Railway.—Plans are being considered by this company to build a double track line to the new union station in Salina.

Topeka (Kan.) Railway.—During 1915 this company plans to build ½ mile of new track in Topeka.

Louisville (Ky.) Railway.—This company plans to begin work on the reconstruction of its West Chestnut Street line, crossing over to Madison Street and extending thence west to Shawnee Park, a distance of 1 mile or more.

Winnipeg (Man.) Electric Railway.—It is announced that the line from Stony Mountain to Stonewall, Man., 7½ miles, built by the subsidiary Winnipeg, Selkirk & Lake Winnipeg Railway, has been placed in operation. [E. R. J., Sept. 19, '14.]

Worcester (Mass.) Consolidated Street Railway.—Plans are being made by this company to double track its line on Pleasant Street from Richmond Heights to Moore Avenue, with the probability of extending the double tracks to Tatnuck Square later in Worcester.

Detroit, Almont & Northern Railroad, Detroit, Mich.—During 1915 this company plans to build its 9½-mile line between Almont and Imlay.

Twin City Rapid Transit Company, Minneapolis, Minn.—Plans are being considered by this company to extend its lines in the part of Ramsey County between Hamline Avenue on the east, the city limit on the west, Langford Avenue

on the south, and Larpenteur Avenue on the north in St. Paul.

Kansas City, Lawrence & Topeka Railroad, Kansas City, Mo.—A line to connect Zora, De Soto, Endora and Lawrence, 25 miles, will be built by this company during 1915.

Big Horn Canyon Irrigation & Power Company, Billings, Mont.—Surveys have been completed for the line to be built from a point near Custer, Mont., to Big Horn Canyon, 68 miles. John J. Harris, Hardin, president. [E. R. J., Aug. 8, '14.]

St. John (N. B.) Railway.—This company plans to construct 1½ miles of new track in St. John during 1915.

***Franklin, N. H.**—Citizens of Penacook and Boscawen are reported to be interested in efforts to have the electric railway at Penacook extended to Boscawen Plains.

Manhattan Bridge Three-Cent Line, Brooklyn, N. Y.—During 1915 this company expects to build ½ mile of new track.

Newbern-Ghent Street Railway, Newbern, N. C.—Plans are being made by this company to extend its tracks about 1 mile to the Union Station in Newbern.

Toledo, Bowling Green & Southern Traction Company, Findlay, Ohio.—About 2 miles of double track will be relaid with 100-lb. rails in Findlay during 1915.

Lancaster Traction & Power Company, Lancaster, Ohio.—During 1915 this company plans to build 1 mile of new track in Lancaster.

Toronto (Ont.) Civic Railway.—The City Council has begun work on a double track line from Dundas Street to Quebec Avenue on Bloor Street West in Toronto. A temporary track has been laid, but the permanent work will not be begun until next spring.

Guelph (Ont.) Radial Railway.—This company has been authorized to construct a line on Suffolk Street in Guelph. A. H. Foster, general manager.

Toronto, Ont.—On Jan. 1 the ratepayers voted in favor of an expenditure of \$343,000 on a civic car line from the Canadian Pacific Railway tracks at Yonge Street to Broadway and Mount Pleasant Avenues. The ratepayers sanctioned by by-law the expenditure of \$425,000 for the extension of the civic car line. This will likely include a line on Lansdowne Avenue south from St. Clair to the Canadian Pacific Railway tracks and a line for North Toronto, extending from Yonge Street easterly to the intersection of Broadway Avenue and Mount Pleasant Road.

Pacific Power & Light Company, Astoria, Ore.—This company plans to build 1 mile of new track in Astoria during 1915.

Roseburg, Ore.—It is reported that work will be started in the spring on the railroad line which is to be constructed between this place and Coos Bay on the coast. This city voted \$500,000 in bonds toward this project and it is estimated that this sum will build about 15 miles of the line. It is presumed the road will be an electric railway.

Southern Oregon Traction Company, Medford, Ore.—This company will build another mile of new track within the next few months. This extension will begin at the west end of its completed track on Main Street, near Central Avenue, and will extend west on Main Street to the city limits. It is imperative that the company build 1 mile of track within the city limits during the year in order that it does not forfeit its franchise with the city, but it is probable that considerable more track will be constructed and operated than required by the franchise. Overtures have been made to the company having for their purpose the extension of the line east to the Hillcrest orchards and the coal mine and it is not improbable that this will be done.

Milwaukie, Ore.—The Portland & Oregon City Railway Company has accepted the franchise granted by the City Council of Milwaukie and has started to build its line in that city. Grading on the streets granted in the franchise has been begun and the work will be pushed forward to the northern city limits of Milwaukie from Portland. Construction of this interurban railway, it is announced, will be continued actively. The southeast branch of the line will be built to Baker's Bridge this year, and later will be extended to Viola and the smaller towns in that section, which have been asking for railway connections with Portland for ten years.

Charleston Consolidated Railway & Lighting Company, Charleston, S. C.—Plans are being considered by this company to extend its line from the United States Navy Yard to North Charleston.

***Houston & Beaumont Interurban Railway, Beaumont, Tex.**—Plans are being considered by this company to build a line to connect Beaumont, Houston and Anahuac. Anson Miller, G. L. Tufts and L. W. Schwartz, Anahuac, are interested.

Dallas (Tex.) Consolidated Electric Company.—This company has completed its 1½-mile extension to the Southern Methodist University in Dallas and will place it in operation at once.

Salt Lake & Utah Railroad, Salt Lake City, Utah.—The 18-mile line between Provo, Springville and Payson will be built by this company during 1915.

Utah Light & Traction Company, Salt Lake City, Utah.—About 1 mile of new track will be built by this company during the year.

Seattle, Wash.—The extension of Division "A," of the Seattle Street Railway into Fremont and Ballard to Market Street and Leary Avenue, at a cost of approximately \$100,000, to be paid from the electric railway bond issue authorized two years ago, is contemplated in a resolution introduced by Councilman Erickson at a recent meeting of the Council. The resolution provides for the submission of the extension proposition to the voters at the general election on March 2. The proposed extension will tap Division "A" a short distance south of its carhouses, on the south side of the Lake Washington Canal, across the Canal at Fremont and enter Ballard by the way of Leary Avenue. Division "A" runs from Third Avenue and Pine Street to Thirteenth Avenue West and Nockerzon Street, on the south shore of Salmon Bay, a distance of 4.1 miles.

Casper (Wyo.) Street Railway.—Work will be begun by this company in May on its 3½-mile line in Casper. The repair shop will be located in Casper. Capital stock authorized, \$100,000. Officers: J. B. Fleming, 40 Wall Street, New York City, president; Harley B. Beagle, Casper, secretary. [E. R. J., June 20, '14.]

SHOPS AND BUILDINGS

Birmingham Railway, Light & Power Company, Birmingham, Ala.—This company has completed its new building at First Avenue and Twenty-first Street, in Birmingham, and will soon move its offices to this new structure.

Boston (Mass.) Elevated Railway.—The Massachusetts Public Service Commission gave a public hearing on Jan. 5 upon the petition of residents of Cambridge for an additional station in the Cambridge subway between Harvard and Central Squares. The petitioners contended that rapid transit would be furthered for the Dana Hill residential district of the city by the proposed station.

POWER HOUSES AND SUBSTATIONS

Birmingham-Tuscaloosa Railway & Utilities Company, Birmingham, Ala.—This company has placed an order with the Westinghouse Electric & Manufacturing Company for one 500-kw, 600-volt, six-phase, sixty-cycle rotary converter; three 185-kva, 2300-volts to rotary-voltage transformers, and a switchboard for its substation.

Ithaca (N. Y.) Traction Corporation.—This company will place in operation in its power plant a 937-kva a.c. Curtis steam turbo-generator and switchboard equipment. The General Electric Company will build and install the unit.

Steubenville & East Liverpool Railway & Light Company, East Liverpool, Ohio.—A new substation is being built by this company on Wilson Avenue in Steubenville. The structure will be 48 ft. x 130 ft. and of structural steel and concrete construction. It will have a capacity of 3000 kw. The cost of the buildings and equipment is estimated to be about \$60,000.

Ogden, Logan & Idaho Railway, Ogden, Utah.—About \$200,000 will be expended upon improvements to this company's line. They include an extension from Lewiston to Preston and a new brick depot. Grading has been begun 2 miles north of Lewiston. All of the trackage and overhead material necessary for the construction of the entire extension has been ordered.

Manufactures and Supplies

ROLLING STOCK

Slate Belt Electric Street Railway, Pen Argyl, Pa., will purchase during 1915 one interurban car complete, with motors.

San Angelo (Tex.) Street Car Company will purchase during 1915 three or four medium sized second-hand single-truck closed cars.

Winona Interurban Railway, Warsaw, Ind., expects to purchase during 1915 one 60-ft. freight and express car body.

Cushing Traction Company, Muskogee, Okla., has ordered two all-steel, double-end interurban passenger cars, with seating capacity of forty-eight and about 45 ft. over all, from the Cincinnati Car Company for its new 1500-volt d.c. line.

Interborough Rapid Transit Company, New York, N. Y., has issued inquiries to about twelve car-builders on prices on 478 all-steel car bodies to replace the composite car bodies now in operation in the New York subway.

London & Port Stanley Railway, London, Ont., has ordered five all-steel motor passenger cars from the Jewett Car Company, which will be equipped with Baldwin trucks and O. B. couplers. Four trailers, which were ordered from the Preston Car & Coach Company, will be equipped with trucks built by the National Steel Car Company, Hamilton, Ont.

Pacific Electric Railway, Los Angeles, Cal., noted in the ELECTRIC RAILWAY JOURNAL of Nov. 14, 1914, as having ordered twenty-four all-steel interurban cars from the Pressed Steel Car Company, has specified the following details of this equipment:

Seating capacity	60	Curtain fixtures,	
Weight of car body (approx.)	50,000 lb.	Cur. Sup. Co.	
Bolster centers, length.	.34 ft.	Fenders	Eclipse
Length of body over end sills,	47 ft. 2 in.	Gears and pinions.	G.E.
Length over buffers,	58 ft. 1 in.	Hand brakes,	
Width over sills.	9 ft. 2 in.	St. Louis high power	
Width over all, at eaves,	9 ft. 4 1/4 in.	Heaters	Consol.
Height, rail to sills,	3 ft. 7 3/4 in.	Headlights	Crouse-Hinds
Height, sill to trolley base,	9 ft. 9 3/8 in.	Journal boxes.	Symington
Interior trim,	wood, steel finish	Motors,	
Headlining	Agasote	4 G.E., 354A, inside hung	
Roof	oval	Registers	Ohmer
Airbrakes	West. automatic	Sash fixtures.	O. M. Edwards
Axles	Vanadium steel	Seats.	H. & K. No. 300
Bumpers	Hedley	Seating material.	plush
Cables	G.E.	Step treads,	
Control	G.E., type M	Mason safety carborundum	
Couplers	West.	Trolley catchers.	Ideal
Curtain material.	Pantasote	Trolley base,	
		Ry. std. pneumatic	
		Trucks,	
		Swinging bolster built-up	
		type.	
		Ventilators	automatic
		Wheels.	36-in. rolled steel

TRADE NOTES

Williams, Dunbar & Coleman, New York, N. Y., specialists in public utility securities, have issued a small calendar for 1915.

Newman Clock Company, New York, N. Y., has issued a sheet relative to its watchman's clock for safeguarding life and property.

Barron G. Collier, Inc., New York, N. Y., has moved its New York offices to the Candler Building, 220 West Forty-second Street.

Reynolds Electric Company, Chicago, Ill., which now manufactures small motors, has issued Bulletin No. 201, describing its type A induction single-phase a.c. motors in fractional horsepower sizes of 1/20, 1/12, 1/8 and 1/6 hp.

C. L. Benjamin, for the past eight years advertising manager of the Cutler-Hammer Manufacturing Company, Milwaukee, Wis., and one of the best-known advertising men in the Middle West, has announced that he has acquired an

interest in the Klau-Van Pieteron-Dunlap, Inc., advertising agency and will have an active part in its work.

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., has appointed H. H. Seabrook, formerly district manager of the company in Baltimore, to the position of district manager in Philadelphia. Owing to the consolidation of territories the Philadelphia offices will hereafter embrace that previously covered by the Philadelphia and Baltimore offices. Mr. Seabrook succeeds J. J. Gibson, who became manager of the tool and supply department at East Pittsburgh.

Union Electric Company, Pittsburgh, Pa., has issued price lists and sheets describing and illustrating its pole anchors, tamping bars, cement tampers, cement or dirt rammers, and Loxon lamp guards. The anchor has unusually great expansion when placed in the soil, which tends to increase the resistance, with little digging necessitated. The anchor requires but one man to install it and no extra tools. All that is necessary is to place the anchor in the bored hole, tamp the rail down and apply the strain.

Lee P. Hynes has resigned as vice-president of the Railway Utility Company to become secretary and general manager of the Thermo Electric Regulator Company, Chicago, Ill. Mr. Hynes has been in the railway supply business for over twelve years. After leaving the University of Michigan in 1902 he was for a time in the drafting room of the Illinois Steel Company, South Chicago, Ill., leaving there to go with the Safety Car Heating and Lighting Company in 1903. In 1911 he was elected vice-president of the Railway Utility Company in charge of the engineering and manufacturing department.

ADVERTISING LITERATURE

Ohio Brass Company, Mansfield, Ohio, has issued a folder describing and illustrating its air-sander equipment for slippery rails. The diaphragm or center valve can be mounted behind or at either side of the engineer's valve and the handle rotated so as to be in reach of the motorman's lamp when his hand is on the air handle. The flexible bronze diaphragm between the valve stem and plunger absolutely prevents escape of air and eliminates all packing. The folder also describes the O. B. chime whistle and whistle valve.

NEW PUBLICATION

American Handbook for Electrical Engineers, edited by Harold Pender, Ph.D., professor of electrical engineering, University of Pennsylvania. Published by John Wiley & Sons, Inc., New York, 1914. 7 x 4 1/2 in., pp. xviii + 2023, \$5 net.

Wiley & Sons, Inc., have issued an electrical handbook upon which a large and competent staff of editors has been at work for three years. The result is a comprehensive series of articles which have been arranged according to the plan explained below. The test of use is required in order to determine the success of the editor of a handbook so that no attempt will be made by the reviewer to refer critically to the merits of the text which must be temporarily evaluated in terms of the reputations of the respective authors. This can be done because the author's name is signed to each article. The following brief outline can therefore give only the general editorial plan. The book is put together in encyclopedic form, articles being arranged alphabetically by topics. Theory and practice are largely covered in separate articles, so that the reader can have one or the other separately as he requires. Where practicable a standard outline forms the basis of the articles as follows: general description and definitions; brief statement of application; principles of operation; design; testing; performance; specifications; installation; operation; dimensions, weights and costs, and bibliography. In addition to articles on electrical engineering topics, there are many on related mechanical and civil engineering subjects. A profusion of tables, of course, forms a prominent feature of the book. The topical arrangement necessarily scatters the articles relating to a given general subject. The titles are, however, gathered together under general headings in a "topical list of articles" at the front of the books. There is a general index of more than fifty double-column pages at the back.