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Inheritance in Railway Apparatus and Methods

Modern manufacturing is carried out on such a large scale that many of its products necessarily are compromises not wholly ideal for any individual user, but the best which can be universally employed. The cost of the patterns, dies and tools for each customer's particular wants would be so great that uniformity is financially desirable. On the other hand, the buyer can often afford to alter the equipment in accordance with the peculiar demands upon his road, because such changes are of continuous benefit to him. These facts explain why manufacturers do not avail themselves eagerly of all the apparent improvements made by customers in their products. Nevertheless, there is sometimes a mysterious retention of vestiges of old forms and methods which are carried along from design to design just as the veriform appendix is transmitted from generation to generation. Like the latter, the uses of these parts have disappeared, but not their ability for making trouble. The cove panel on many cars immediately suggests itself as an example. In very crowded and narrow streets the use of a cove panel may occasionally permit a car to pass the hub of a standing vehicle drawn up close to the sidewalk, but in most instances it constitutes an entirely unnecessary expense to the railway company. The old plan of obliging the railway company to pave between its rails and for a short distance each side is another relic of horse-car days. This rule was perfectly proper at one time, but now that the railway company is the only occupant of the streets which does not use the pavement, the continuation of this practice is absurd. In apparatus one finds not infrequently unnecessary joints, contact pieces or other parts because originally they were required and the manufacturer has not yet installed machinery to make them in any other way. Standardization of car parts is desirable, but it should not be synonymous with thoughtless adherence to obsolete forms and methods.

Curve Easements

It is the practice of most interurban railway roadmasters and section foremen to ride over the line on the high-speed cars and make notes of the location of particularly bad joints and hard-riding curves. The section foremen give attention to these defects as they are noted, usually on their own initiative. Low joints can easily be remedied by judicious tamping, but it is a much more difficult matter to correct the errors in alignment which cause cars to ride hard when entering or leaving curves. Nearly all of the high-speed interurban track now being operated was originally built with easement curves. The form of the spiral ends of these curves is mathematically correct and can hardly be improved upon. The variations in radii of the spiral are very slight, and it is not possible to detect errors by the eye alone. The center stakes must be set carefully with the aid of a transit, and, once set, they should be rigidly adhered to. Without a transit, and usually without any idea of the location of the original center lines of the curve, the section foreman squints along the rail with one eye and shifts the track in or out as he thinks best. It is possible to ease off a plain circular curve in this way so that it will ride as smoothly as a curve which is put in with accurate spirals on staked centers. The result, however, is to increase the sharpness of the center of the curve, and oftentimes to improve its riding qualities at one point

to the detriment of the alignment at some other point. It is not an unusual occurrence to find curves anywhere from 3 in to 1 ft. off the centers as originally staked out.

When a car enters or leaves a curve with a lurch, something is wrong with the car itself or with the track alignment. If all the cars behave in the same way, then the fault must lie with the track, and the chief engineer, not the section foreman, should be advised. A re-survey of the curve will usually locate the trouble, which may be either in the alignment near the point of curvature, or the superelevation of the outer rail and the run-off beyond the end of the spiral. Section foremen can be depended upon to bring the track to good surface and alignment on tangents by rule of thumb and good eyesight alone. The best of them, however, cannot approach the accuracy of a transit in correcting bad curves.

Subway Station Design in Massachusetts

By its decision favoring the general character of the stations designed by the Boston Elevated Railway Company for the new subway to be built in Cambridge, Mass., the Railroad Commissioners set the seal of approval upon an important principle of terminal and way station arrangement. Rival plans for these stations were submitted to the board by the engineers of the city of Cambridge, but in finding them less advantageous the board emphasizes the point that, while long walks are a disadvantage in the transfer of passengers between trains and surface cars, congestion is thereby reduced, traffic separated according to its origin and destination, and the general movement of travel facilitated.

The most interesting design from the engineering point of view in connection with the Cambridge stations is that for Harvard Square terminal. The railway company has endeavored to avoid here the features of design which have proved more or less troublesome at the elevated terminal stations built in 1901 at Dudley Street and Sullivan Square. At Dudley Street the surface cars and elevated trains are brought to substantially the same level of tracks, and transfer is free and bodily without check or warrant across platforms separating the two classes of service. Both surface cars and elevated trains pass through the station on looped tracks. At Sullivan Square the elevated trains used a through loop track, but the surface cars are berthed at the ends of stub tracks arranged in the manner familiar to patrons of steam railroad terminals. Only a short platform space separates the trains and cars here, as at Dudley Street. This arrangement undoubtedly makes for rapid transfer between cars and trains when traffic is light, but when the movement of travel through the station is heavy the unrestricted platforms and absence of positive channels along which traffic must move tend to create considerable congestion. Passengers walk or run across the inter-track spaces at cross-purposes, and free, flexible travel is thereby handicapped.

At the Harvard Square station, however, different platforms are provided for the transfer between trains and cars coming from different directions, and these platforms are connected in plan by well-lighted, clean and substantially straight passages, which automatically separate opposing streams of travel, while avoiding ascending stairways except in the climb from the platform nearest the street to the surface. Even this is a short flight, and will be traversed by a comparatively small number of patrons of the road, presumably, since the bulk of the traffic will proceed further on connecting cars. No small advantage of the Harvard Square design is the possibility of holding in close check all tendencies of transportation bargain hunters who exhaust their ingenuity in trying to take a round trip for a single fare. While these passageways are, of course, somewhat long, as pointed out by the commission in its decision, they will clearly be of the greatest value in reducing congestion at times of great travel, especially in connection with the intercollegiate football matches and other games of Harvard University on the adjacent Stadium and Soldiers' Field. Economy of operation will also lie with the plan favored by the company and now accepted by the board.

There can be few engineering problems solved without the sacrifice of at least some desirable conditions, and, as a whole, there is no question that the Harvard Square plan will prove to be an advance over the earlier designs for subway stations under the peculiar conditions of transferring found in Boston. The design of the station at Central Square and, in principle, that at Kendall Square, need not be discussed at this time, as it is a simple case of installing two train tracks between two parallel platforms and arranging for easy access to and from the street above, where transfers can be effected between the cars running on the street level.

Falling Telephone Wires

When electric railways were first constructed it was considered necessary to protect the trolley wires by "guard" wires, but these were found to constitute a graver source of trouble than that which they were intended to prevent, so their use has now disappeared. It is comparatively rare that accidents are caused by foreign wires falling on trolley wires, so that there are not very many decisions in the law covering cases of this kind, but the question came up recently before the Supreme Court of Missouri in a case against the telephone and electric railway companies of Kansas City, both of whom were made defendants.

During an evening storm a telephone wire on one of the electric railway poles, formerly a part of the local telephone system but later abandoned, was broken and fell over the trolley wire and the next morning at 6 o'clock a child was killed by coming accidentally in contact with it. The evidence as to the time at which the wire broke and whether the telephone company had been notified of the accident was conflicting. Two persons the previous evening had noticed that the wires were sagging, but had not broken, and stated that they had called up the telephone company and had notified it of the condition of the wire, but no employee of the company was found to have received this message. The railway company, so far as the evidence went, was ignorant of the fact that its trolley wire was crossed. The court, in the decision which appears in 116 *Southwestern Reporter,* page 528, held that there was nothing to indicate negligence on the part of either of the defendants. It admits that after the public use of the

wire had been discontinued it should have been removed from the railroad pole, but says "the liability for such negligence is governed by the consequence that could reasonably be anticipated to follow from the negligent act." The court did not think anyone would expect that telephone wires carried parallel to a trolley wire and 15 ft. from it would be likely to become crossed with it. Neither did the court consider that the notification by telephone already mentioned was sufficient to involve the telephone company in responsibility for the resulting accident. On this point the court said:

We are not saying or implying that notice in such case might not be given by telephone, but notice given to some one, without knowing to whom it is, and no evidence that it reached the person or concern for whom the notice was intended, is no notice at all.

As there was nothing to indicate that the railway company had any reason to anticipate or detect the defect and as it occurred at night, when the inspectors were not engaged in their work, blame could not attach to the railway company. It was held, therefore, to be one of those unavoidable accidents for whom no one could be held directly responsible.

As will be seen, stress was laid in the decision upon the kind of notice given each company of the accident, to the extent to which it could have been foreseen and to the care required to have detected it after its occurrence. If, in any one of these points, the defense of either company had been defective it would probably have lost the case. But the law does not presuppose extraordinary wisdom or foresight. The company may have been negligent in letting an unused trolley wire remain on the poles, but if there was but little likelihood, as in this case, of the wire coming in contact with the power wire the lack of care was not sufficient to make the company culpably negligent. If, however, the telephone wire had been carried across the trolley wire, where its contact with the latter would have been a natural result of its breakage, the decision would probably have been different.

The Avoidance of Accidents

Of the unfortunate accidents which have befallen new electric installations the most conspicuous have occurred on newly electrified steam railroads; the public regret which they occasioned is greater only in degree than that which has arisen from other and lesser accidents on smaller properties in other parts of the country. The latest of these was reported last week, the result of a head-on collision on the Chicago, Lake Shore & South Bend Railway.

When a wreck occurs on a railway it is the custom to institute a rigorous inquiry designed to disclose the cause, to locate the responsibility therefor and to make it possible to provide adequate safeguards against the danger of a repetition of accident from the same source. If defective equipment or track appears to have been the cause the repairs which are made may help to raise the standard to which the employees in the departments affected will endeavor thereafter to conform; if the responsibility should be located definitely upon one or more employees the problem of discipline and future prevention is made more complex. If an employee is found to have caused an accident by wilful neglect of ordinary precautions or non-observance of clear and simple rules the utmost that the management can administer in the way of discipline is summary and ignominious discharge. The effect of discipline of an employee because he may have been the careless or the unwitting contributory cause of an accident depends very largely, so far as its influence on the other employees is concerned, upon the extent of their desire to hold their positions in good standing and upon the measure of their personal loyalty to the company and to the officials to whom they report directly. Some men feel the full measure of responsibility for life which they assume when they operate a car filled with passengers; but the negligent, indifferent attitude of a few others is so notorious that the chief inspector of the Railroad Commission of Indiana, who has been painstaking in his efforts to improve the operating methods of railroads, has stated publicly that a law should be passed providing a penalty for employees of electric railways who neglect to observe rules. It is plain that the large majority of employees are reasonably careful in their methods; if they were not the number of accidents on all roads would be startling.

It is easy for the public, without much understanding of the facts, to censure the management of a road which is unfortunate enough to have a wreck involving the loss of life. When a new enterprise is developed or a new property constructed the difficulties of establishing a reliable service are enormous. All of the employees are new to their work, and time, the principal means of separating the careful from the careless, is lacking. This is particularly the case with an electric railway because its revenues are derived from a service that is essentially personal in its character and the mistakes of operation, whether due to faulty methods or to faulty interpretation by the employees of perfect methods, unfortunately affect those who take advantage of the service offered. The manufacturer of a commodity, a desk, for instance, does not have to consider the danger that his product may involve loss of life if his employees should fail to study and observe carefully all the rules which have been formulated for their guidance; but extreme and continual care is required from the operating official of an electric railway.

If any methods can be adopted whereby the danger of operation on a new line may be lessened they should be made part of the preliminary training of initial employees. It is too clear for argument that a new road cannot secure at the outset advantages in the selection of trained employees for important service equal to those enjoyed by a long-established line, which has been able to develop the standard of its men through years of operation. If a new line can supplement its prescribed course of training before starting operation by a preliminary period of rigorous experimentation it will be desirable. Many men without long experience fail to appreciate how fast they travel on a car propelled by electric power or how important it is to give strict compliance to rules for safety which railroad experience has shown to be necessary; effort and expense that may be required to impress employees with these facts will be repaid well.

MAIN SWITCHBOARD OF PRATT STREET POWER STATION, BALTIMORE

An article in the Street Railway Journal for May 9, 1908, described certain parts of the work of reconstructing and extending the power plant equipment of the United Railways & Electric Company, of Baltimore, which has been carried on during the last two years by L. B. Stillwell under a contract with that company. Those who read this article will remember that the large system of the company, operating some 800 cars, was supplied with power a few years ago from seven power plants equipped exclusively with direct-current apparatus.

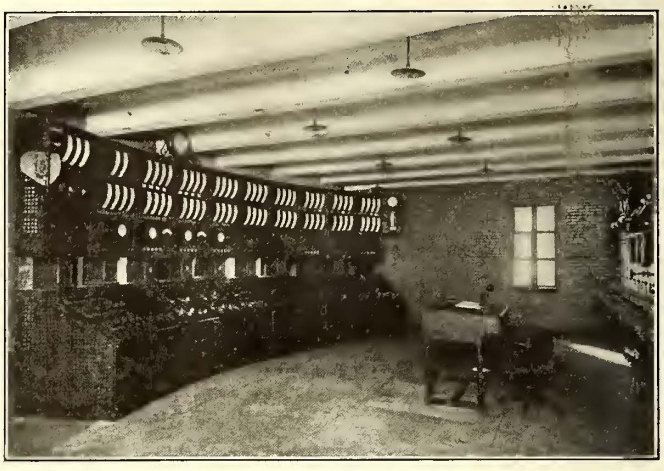
The new plants, now approaching completion, provide for the supply of the entire system, with the exception of the Bay Shore service and a small section in the extreme northwesterly portion of the city, from the Pratt Street power house, which has been equipped largely with alternating-current apparatus generating three-phase current at a potential of 13,000 volts. At Bay Shore, a small

Baltimore Switchboard—Oil-Switch Gallery

direct-current power house co-operates with the Pratt Street supply during the summer months, and at Owings Mills a direct-current equipment of 780 kw supplies lines in the immediate vicinity, which at the present time cannot be supplied advantageously from Pratt Street.

The steam plants which have been shut down have been replaced by substations equipped with transformers and rotary converters, of which five, equipped with high-class modern machinery, are now in operation.

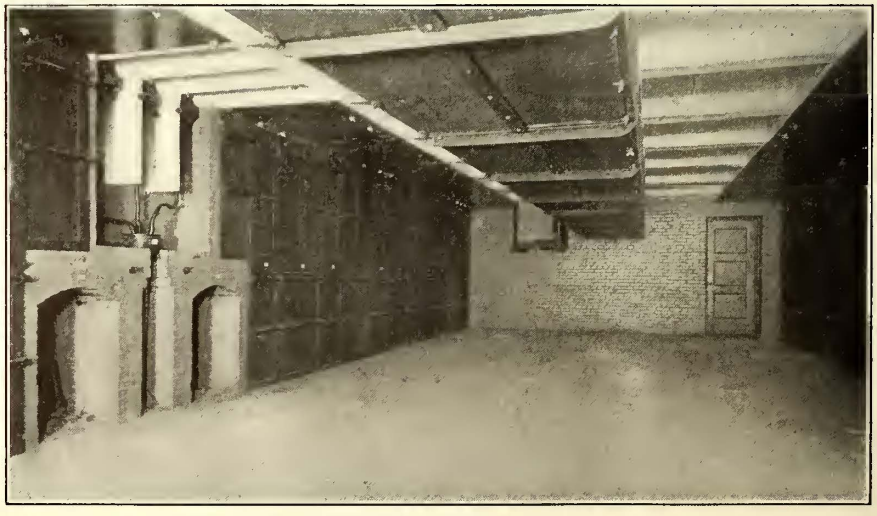
The arrangement of the Pratt Street power house is unusual in the fact that the boiler house is placed between two engine rooms. When the work of reconstruction was undertaken by the present consulting engineers of the company, one of these engine rooms was equipped with five 2000-kw alternators driven by reciprocating engines, while the other contained one 5000-kw engine-driven alternator and three 1800-kw direct-current generators. The work of shortening the power house, which was necessitated by the decision to widen Pratt Street after the Baltimore fire, which involved the need of moving the three 1800-kw direct-current generators and re-erecting them upon new foundations, was described in our previous article, as was also



Baltimore Switchboard—A. C. Control Board

the erection of a second 5000-kw engine-driven alternator and a 5500-kw turbo-alternator.

The problem of switch gear arrangement and connections for operating a plant comprising two widely separated engine rooms equipped with generating units exhibiting great variety both in respect of type and output was still further complicated by the necessity of providing for the utilization of a large amount of power expected to be transmitted from the water-power plant of the McCall Ferry Power Company on the Susquehanna, and by the necessity for continuing the provision for possible interchange of power in case of emergency with the Westport power plant of the Consolidated Electric Light & Power Company. After careful consideration of the conditions, both immediate and prospective, it was decided to erect in engine room No. 1, at Pratt Street power house, a switchboard structure arranged for the ultimate installation of all switch gear, busbars, cables, control apparatus and instruments required not only by the present plant, but by the maximum power equipment which can be constructed on the land owned by the company at Pratt Street, and by a possible 40,000 kw of power from an outside source.



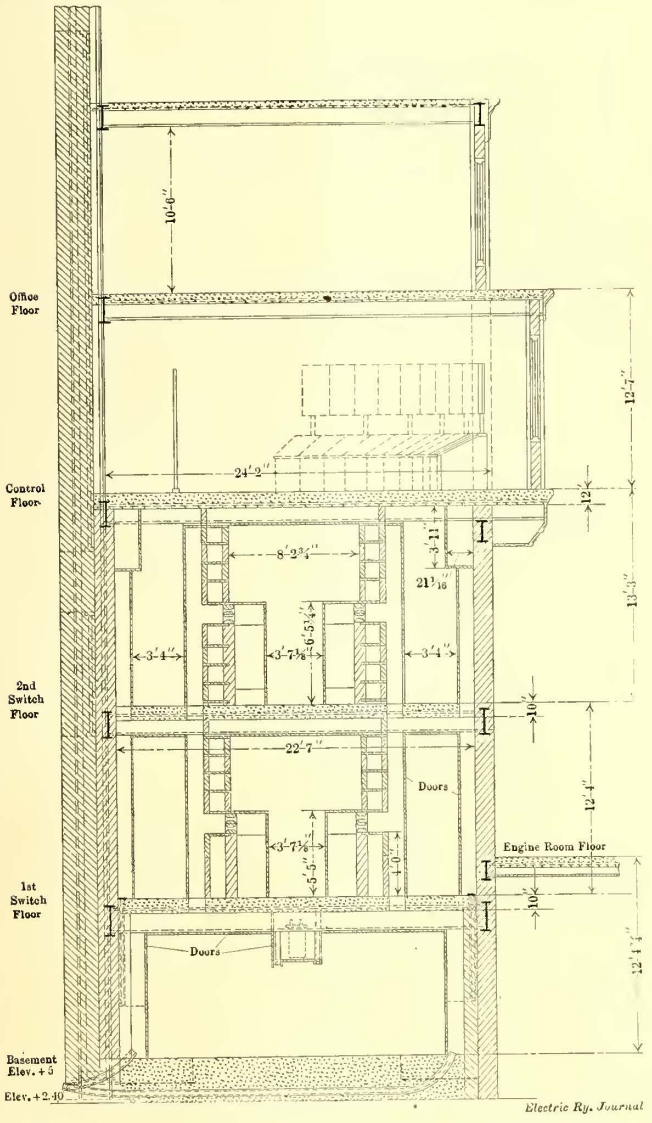
Baltimore Switchboard—View in Basement

The new switchboard is now in successful operation, and it is now possible to supplement the article printed in the issue of May 9, 1908, by a description of this remark-

ably compact, flexible and effective organization of switching apparatus.

The arrangement of the switchboard is such that no wires cross each other, and the runs are, without exception, short and direct. From the basement, where all the feeders leave, up to and throughout the structure, each conductor carrying high-tension current is in a compartment by itself.

The switching structure proper is 25 ft. wide, about 85 ft. long, three stories and basement in height, and is enclosed by a brick wall. The basement is used for all the feeder ends and series transformers required by them. The first floor is used for the main busbars, the group feeder busbars, feeder oil switches, and for the leads from the alternators with their series transformers. On the second floor are located the alternator busbars and oil switches, and the third floor is devoted to the control and operation of all high-tension apparatus, as well as of the exciter, field and auxiliary systems. The fourth floor will be used for offices.

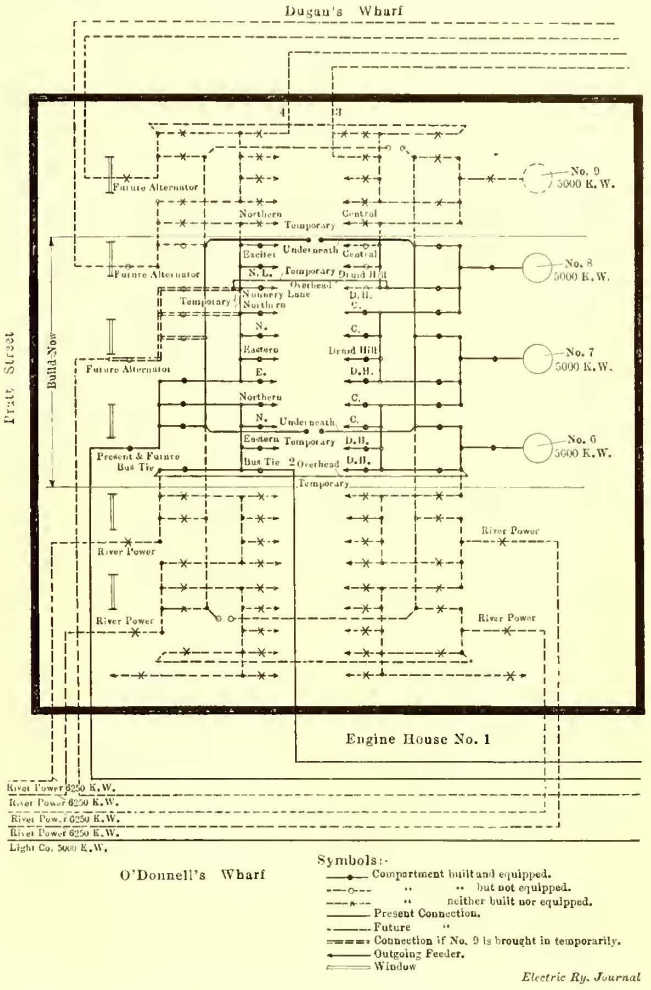


Baltimore Switchboard—Cross-Section Through Oil-Switch and Bus Structure, Control and Office Floors

An elevation in cross-section of the structure is shown above and the arrangement of conductors is given on page 764.

HIGH-TENSION BUSES

The most noteworthy feature of the high-tension bus system used in this structure is its great flexibility. The main busbars form a ring, with disconnecting switches at two points. The alternator and the feeder-group busbars from another ring, each alternator section of which is connected to the main and group busbars through oil switches. By this means, as may be seen by reference to the diagram below, it is possible to by-pass any desired section



Baltimore Switchboard—Single-Line Diagram of High-Tension Connections for Engine House No. 1

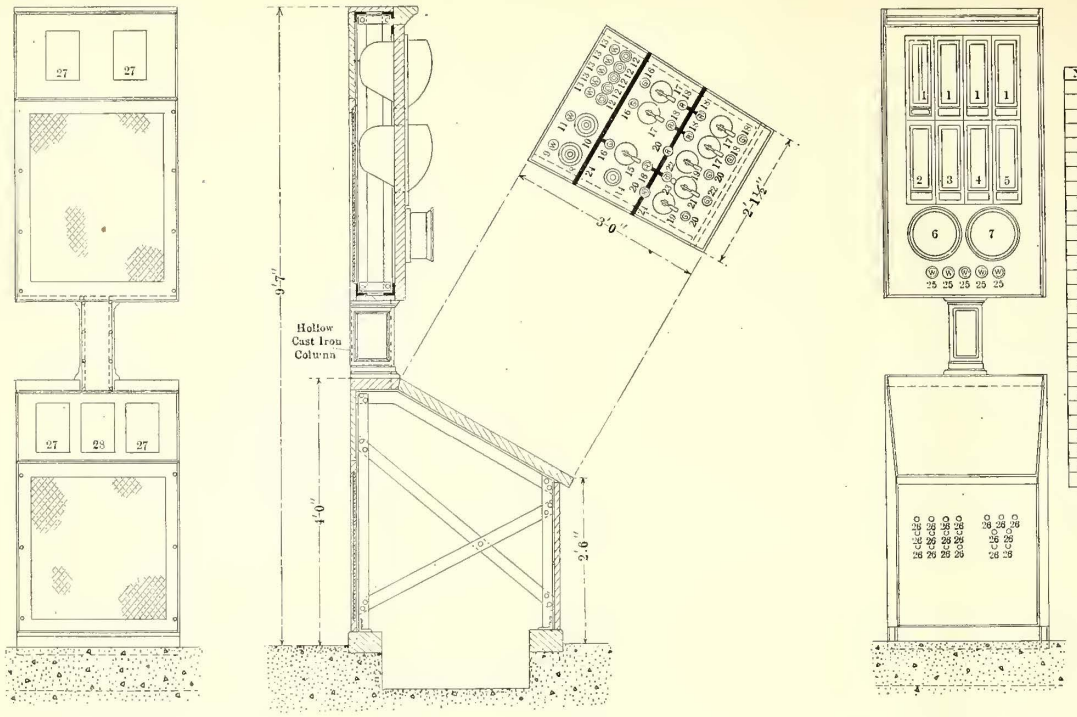
or sections, under almost any conditions, without interfering with the continuity of service on all other sections of the system. The high-tension feeders are taken off the feeder-group buses, there being four feeders connected to each bus. Each generator may be connected to the main bus or to either one or both of two feeder-group buses.

A permanent grounding system is run throughout the switchboard structure, having receptacles at various points to receive flexible leads, for grounding transformer cases, switch bases, all buses, oil switch pots and feeder cables.

HIGH-TENSION CONTROL BOARD

The alternating-current control bench is built in a semicircle comprising 22 sections of black marine-finished slate, and is supported upon a structure of cast iron. Only 10 panels of this bench board are being installed at present, and the five pedestals now in use in the old house are to be transferred to the new control house. One panel of the bench board is shown in detail on the next page.

Miniature buses corresponding diagrammatically to one phase of the high-tension buses are arranged on the control bench. Adjacent to these strips are pilot lights corresponding to the high-tension switches. By noting the lamps burning and their position relative to the copper bus,



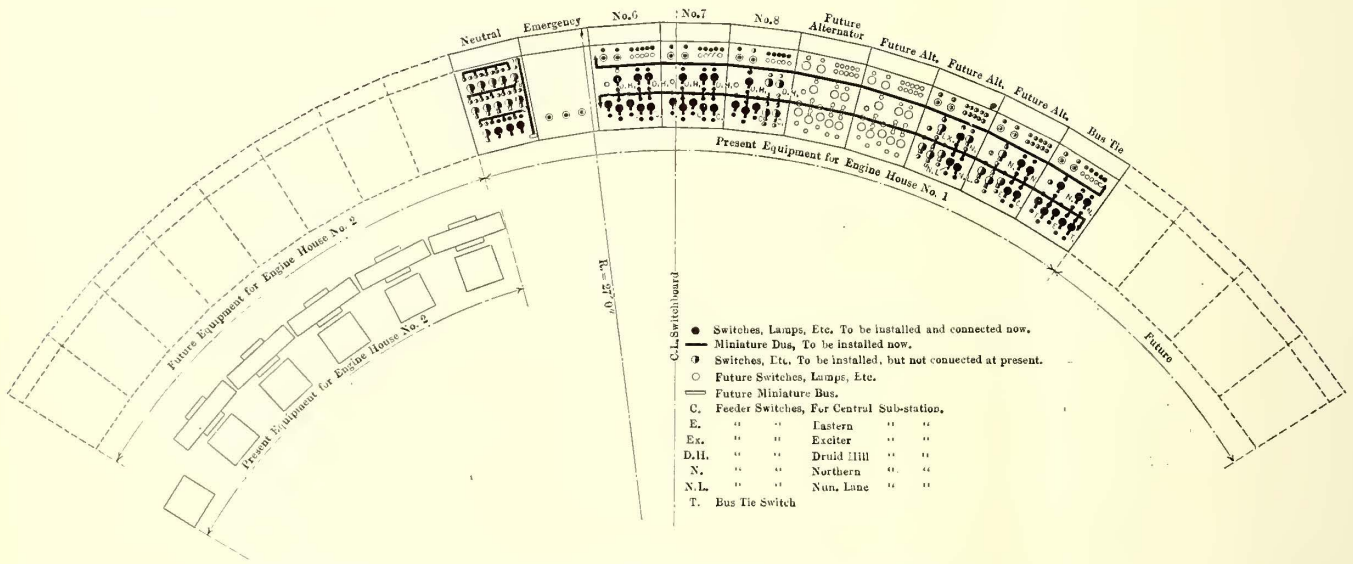
Index to Meters, Lamps, Switches, etc.

No.	Description
1	A.C. Feeder Ammeter
2	Alternator Ammeter
3	Voltmeter
4	Power Factor Indicator
5	Indicating Wattmeter
6	Recording Wattmeter
7	D.C. Field Ammeter
8	Engine Governor Control Wheel
9	Signal Lamp for Ditto
10	Field Rheostat Control Wheel
11	Lamp indicating Steps on Rheostat
12	Push Button for Engine Signals
13	Indicating Lamp for Ditto
14	Pull Switch for Tripping Field Sw.
15	Oil Sw. Control Sw. for Main Bus
16	Indicating Lamp for Ditto
17	Oil Sw. Control Sw. for Feeder
18	Indicating Lamp for Ditto
19	Oil Sw. Control Sw. for Group
20	Indicating Lamp for Ditto
21	Oil Sw. Control Sw. for Alternator
22	Indicating Lamp for Ditto
23	Synchronizing Receptacle
24	Miniature Bus
25	Indicating Lamp for Relay
26	Testing Receptacles
27	Time Limit Relay for Feeder
28	Time Limit Reverse Cur. Relay for Alt.

Note:- Letters G, R & W on Signal Lamps indicate respectively Green, Red & White.

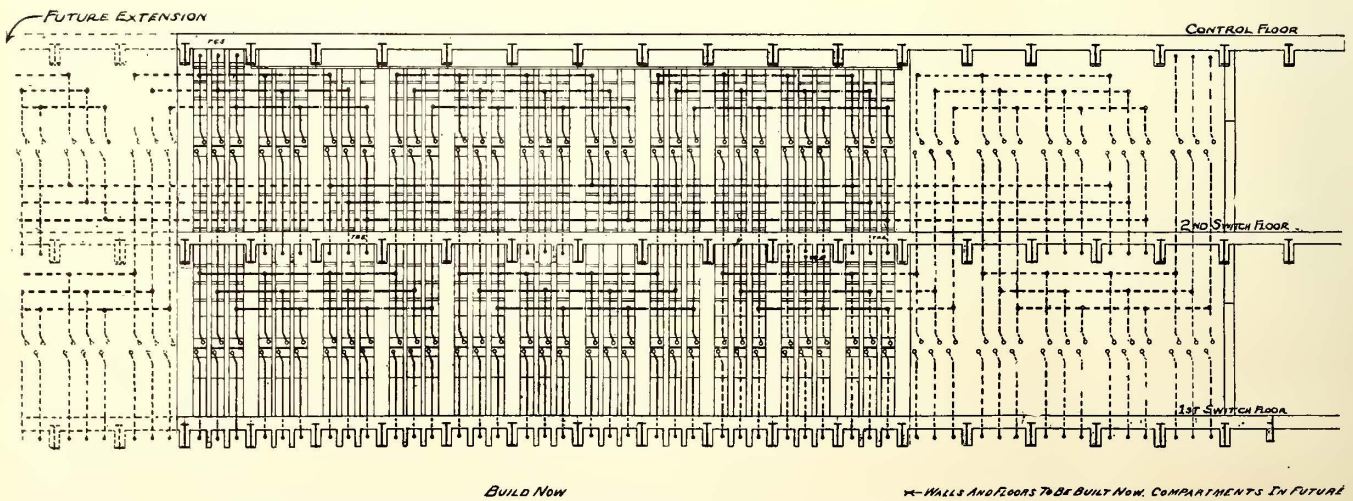
Electric Ry. Journal

Baltimore Switchboard—Plan and Elevation of Panel for Alternator and A. C. Feeder Control



Electric Ry. Journal

Baltimore Switchboard—General Plan of A. C. Control Board



Baltimore Switchboard—Longitudinal Section of Oil Switch and Bus Structure

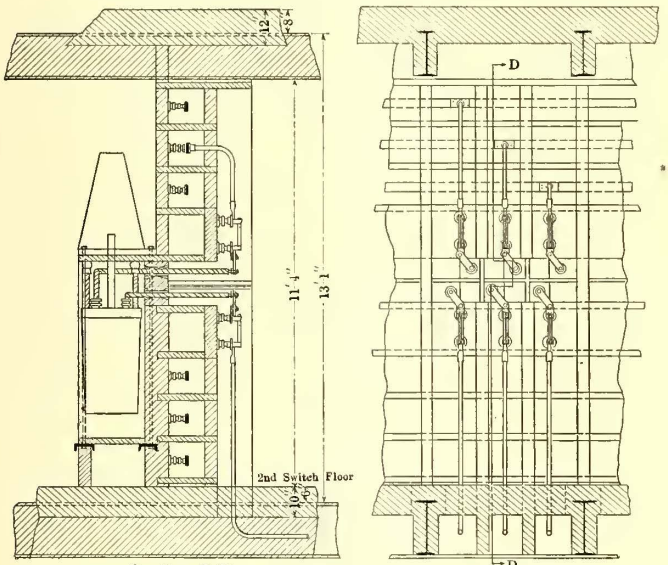
the operator may at a glance see the status of all circuits, busbars and switches.

One section of the control bench is fitted with standard testing instruments. On every bench containing ammeters, voltmeters and other instruments there are plug receptacles connected to buses running to the testing instruments, and so arranged that, by means of plugs, any instrument may be connected to the standard instruments for comparison. The test instruments provided for are voltmeter, ammeter, power factor meter, indicating wattmeter, recording wattmeter and frequency meter.

Each generator section of the bench is provided with five push buttons for signaling to the engineer, and three switches for controlling the engine and generator. One of these three trips the field switch, another controls the governor motor, and a third controls the field rheostat motor.

EXCITER SWITCHBOARD

This switchboard is located on the control floor, opposite to and facing the curved bench board. There are 25 black marine-finished slate panels, provided with a full complement of apparatus, instruments, etc., especially arranged to control all exciter, field, auxiliary, battery and lighting



Baltimore Switchboard—Cross-Section of Oil Switch and Bus Compartment

circuits. These circuits are 110 volts, as are also the alternating-current instrument circuits, so that no current of a higher potential than 110 volts is brought to the control floor. The exciter and auxiliary buses are entirely separate and cannot be thrown together, though the exciters may be connected to either bus. Control circuits are fed normally from the battery, but in emergency may be connected either to the exciter bus or to the auxiliary bus.

The present battery is of 600 amp-hours' capacity, and is located in a detached building in the rear of the power plant, but provision has been made on the switchboard for replacing this battery by one of 2000 or 3000-amp capacity, which can be thrown on the exciter system in case of need.

BUSBAR AND OIL SWITCH STRUCTURE

The busbar and oil switch structure is shown in the elevation and in some detail on this page. It is built of light-colored shale brick, with concrete slabs, poured as the structure was made. Each busbar is supported vertically in the center of a 12-in. square runway, on insulators attached to blocks of soapstone set in the brick wall. One new and interesting feature is the isolation of the oil switch leads by the insertion of a stone slab between each, as shown in detail cross-section.

Throughout the structure copper tubing is used for all high-tension single-conductor leads, and each lead is placed in the center of a 12-in. square runway and supported on triple petticoat insulators with barriers between phases, and covered with removable fireproof doors. All series and potential transformers, disconnecting switches, etc., are protected in a similar manner.

A comprehensive system of pipes and ducts is installed for the reception of the cables, the main feature of which is the complete isolation of each group of cables belonging to a machine unit and the installation of each cable in a separate conduit. In the switchboard structure all control and direct-current power cables are carried in loricated and fiber conduits from the control switchboards to the basement and to the manholes, these pipes being laid in the floor filling and built into the walls, so as to be hidden completely from view and making the communication of trunk to contiguous cables practically impossible.

All three-phase high-tension cables are run in vitrified tile and fiber conduits buried in the floors and walls. The single-phase leads from the generators are placed in vitrified tile ducts that are suspended from the engine room floor beams on a concrete slab.

TESTING TRANSFORMER

A high potential transformer is installed on the basement or cable floor, with its leads connected to busbars supported on a structure along the whole length of the ceiling, as shown in the section and in the photographic view of the basement. This transformer is of 150-kw capacity, with a capacity of 300 kw for a minute or more. With it the voltage can be steadily raised from 3000 volts to 50,000 volts. Views are also shown on page 762 of the curved control switchboard and of the second switch floor, which in general appearance resembles the first floor.

THE POWER CONSUMPTION OF THE BLANKENESE-OHLSDORF SINGLE-PHASE LINE

During January of this year a power-consumption test was made on the Blankenese-Ohlsdorf division of the Prussian State Railways to determine whether the motor manufacturer had met the guarantees for the several sections. The single-phase portion of the route is 26.6 km (16.5 miles) long, and is operated at 25 cycles, 6000 volts. The equipments tested comprise 54 sets of Winter-Eichberg motors rated at 115 hp on the one-hour basis. The results of the tests were exceedingly gratifying, and the power consumption was found to average only 33.6 watt-hours per ton-kilometer (about 48.7 watt-hours per ton-mile), while the guaranteed average was 41.3 watt-hours per ton-kilometer (about 59.8 watt-hours per ton-mile). These equipments were furnished by the Allgemeine Elektricitäts Gesellschaft and 25 more are under construction for this railway.

Estimates have been made of the cost of converting to electric traction the Central Railway of Peru, which consists of nearly 200 miles of track. The road rises 16,000 ft. in the Andes Mountains in a distance of 110 miles. Ample water power is available for generating electricity and the cost of electrifying the entire road is placed at $3,750,000.

HEARING ON MILWAUKEE FARE CASE BY WISCONSIN RAILROAD COMMISSION

After the presentation of testimony before the Railroad Commission of Wisconsin, at Milwaukee, on April 2, in the case relating to the city rates of fare of the Milwaukee Electric Railway & Light Company, an adjournment was taken to a time hereafter to be fixed, in case it should be thought advisable to offer further testimony. The following testimony has been given on behalf of the company, in addition to that reported in previous issues of the Electric Railway Journal:

ADDITIONAL TESTIMONY OF C. N. DUFFY

C. N. Duffy, comptroller of the company, was recalled for further examination on March 31.

A question was asked by Lester C. Manson, special assistant city attorney, regarding the practice of the company in charging to maintenance or depreciation, and Mr. Duffy stated that the operating expenses carried all of the current ordinary repairs, renewals and replacements, while those that were uncurrent or extraordinary were charged in depreciation reserve, with the exception that the power plant had charged practically all of its extraordinary expenditures of this nature in operating expenses until the subject came up in June, 1907, in connection with the charge for a smokestack mentioned in the testimony of Mr. Davidson, published in this issue.

In the adjustment of the accounts of the company the property that was scrapped, displaced, sold or disposed of otherwise was credited to the property account, and its value was written off the books through depreciation reserve. Incidentally, $126,000 had been written off in two years in that way.

The maintenance expenditures of the company included

EARNINGS AND EXPENSES OF MILWAUKEE ELECTRIC RAILWAY & LIGHT COMPANY (RAILWAY ONLY), SUBMITTED BY C. N. DUFFY, COMPTROLLER.

(A)

As per books, less taxes paid and charge for depreciation based on 5.37 per cent of physical property.

Nineteen hundred and eight figures, based on cash investment, balance Dec. 31, 1906, as per report of Dickinson, Wilmot & Sterrett, plus additions and betterments in 1907 and 50 per cent of additions and betterments in 1908.

Nineteen hundred and seven figures, based on cash investment, balance Dec. 31, 1906, as per report of Dickinson, Wilmot & Sterrett, plus 50 per cent of additions and betterments in 1907.

	1908.	1907.
Gross earnings from operation	$3,223,179.82	$3,221,912.44
Operating expenses (including unexpended "reserve charges" in "operating expenses," as follows: 1908, $42,374.10; 1907, $63,311.64)	1,678,704.88	1,684,066.73
Net earnings from operation	1,544,474.94	1,537,845.71
Deductions:		
Taxes, as paid	*200,343.99	165,057.34
Depreciation	†599.353.07	‡580,558.07
Total deductions	$799,697.06	$745,615.41
Net income from operation (exclusive of providing for amortization of cash investment, interest on working capital, or contingencies over and above the sums unexpended in "reserves," $42,374.10 in 1908 and $63,311.64 in 1907)	744,777.88	792,230.30

	1908.	1907.
	Per cent.	Per cent.
Percentage of net income to cash investment of §$14,893,512.58 in 1908 and ¶$14,543,512.58	5.00	5.45
Percentage of net income to value, based on tax levy for the year 1908, as per assessment of Wisconsin State Board of Assessment, $17,000,000 (80 per cent of $21,250,000)	4.38	4.66
Percentage of net income to property and plant capitalization, in 1908, $19,865,000; in 1907, $19,200,000 (80 per cent of capitalization outstanding on Dec. 31, 1908 and 1907, respectively, as per books)	3.75	4.13
Percentage of net income to cost of property and plant, in 1908, $20,536,000; in 1907, $20,181,000 (80 per cent of cost of property and plant on Dec. 31, 1908 and 1907, respectively, as per books)	3.63	3.93

*Eighty per cent of total taxes paid.

†In 1908, 5.37 per cent on $11,161,137.17, computed as follows: $10,586,137.17, balance Dec. 31, 1906, as per report of Dickinson, Wilmot & Sterrett, plus additions and betterments in 1907, $450,000, and 50 per cent of additions and betterments in 1908, $125,000.

‡In 1907, 5.37 per cent on $10,811,137.17, computed as follows: $10,586,137.17, balance Dec. 31, 1906, as per report of Dickinson, Wilmot & Sterrett, plus $225,000, 50 per cent of additions and betterments in 1907.

§Compiling $14,318,512.58, balance Dec. 31, 1906, as per report of Dickinson, Wilmot & Sterrett, plus additions and betterments in 1907, $450,000, and 50 per cent of additions and betterments in 1908, $125,000.

¶Compiling $14,318,512.58, balance Dec. 31, 1906, as per report of Dickinson, Wilmot & Sterrett, plus 50 per cent of additions and betterments in 1907, $225,000.

(B)

As per books, less taxes paid and charge for depreciation based on 10 per cent of gross earnings. Actual earnings at present rates of fare and assumed earnings based on ticket fares, seven for 25 cents.

	Based on actual gross earnings of 1908, as per books. Rate of ticket fares, six for 25 cents, or 25 for $1.	Based on gross earnings of 1908, if rate of ticket fares had been seven for 25 cents in place of six for 25 cents, or for $1.	Based on actual gross earnings of 1907, as per books. Rate of ticket fares, six for 25 cents, or 25 for $1.	Based on gross earnings of 1907, if rate of ticket fares had been seven for 25 cents in place of six for 25 cents, or for $1.
Gross earnings from operation	$3,223,179.82	$2,907,373.41	$3,221,912.44	$2,911,904.84
Operating expenses (including unexpended "reserve charges" in "operating expenses," as follows: In 1908, $42,374.10; in 1907, $63,311.64)	1,678,704.88	1,678,704.88	1,684,066.73	1,684,066.73
Net earnings from operation	1,544,474.94	1,228,668.53	1,537,845.71	1,227,838.11
Deductions:				
*Taxes as paid	200,343.99	200,343.99	165,057.34	149,556.96
Depreciation (10 per cent of gross earnings)	322,318.00	290,737.00	322,191.26	291,190.48
Total deductions	$522,661.99	$491,080.99	$487,248.60	$440.747.44
Net income from operation (exclusive of providing for amortization of cash investment, interest on working capital, or contingencies over and above the sums unexpended in "reserves," $42,374.10 in 1908 and $63,311.64 in 1907)	1,021,812.95	737,587.54	1,050,597.11	787,090.67

*In 1908, 80 per cent of total taxes paid; in 1907 taxes figured as amount actually paid, or amount that would be paid on reduced gross earnings based on reduced rate of fare, seven tickets for 25 cents.

	Based on actual gross earnings of 1908, as per books. Rate of ticket fares, six for 25 cents, or 25 for $1.	Based on gross earnings of 1908, if rate of ticket fares had been seven for 25 cents in place of six for 25 cents, or for $1.	Based on actual gross earnings of 1907, as per books. Rate of ticket fares, six for 25 cents, or 25 for $1.	Based on gross earnings of 1907, if rate of ticket fares had been seven for 25 cents in place of six for 25 cents, or for $1.
	Per cent.	Per cent.	Per cent.	Per cent.
Percentage of net income to cash investment of $14,893,512.58 in 1908 or $14,543,512.58 in 1907, computed as stated in (A) above. See notes § and ¶ at foot of Table (A)	6.86	4.95	7.22	5.41
Percentage of net income to value, based on tax levy for the year 1908, as per assessment of Wisconsin State Board of Assessment, $17,000,000 (80 per cent of $21,250,000)	6.01	4.34	6.18	4.62
Percentage of net income to property and plant capitalization, $19,865,000 in 1908, $19,200,000 in 1907 (80 per cent of capitalization outstanding Dec. 31, 1908 and 1907, respectively, as per books)	5.14	3.71	5.47	4.10
Percentage of net income to cost of property and plant, $20,536,000 in 1908, $20,181,000 in 1907 (80 per cent of cost of property and plant, Dec. 31, 1908 and 1907, respectively, as per books)	4.98	3.59	5.21	3.90

in operating expenses were 9.9 per cent of gross earnings in 1907 and 9 per cent in 1908. The Chicago ordinances allow 6 per cent for "maintenance and repairs," and Mr. Duffy said that that amount was unquestionably not adequate. The question of drawing the line as to where maintenance stopped and depreciation began was a very large one, due largely to the policies of different companies, conditions of operation, type of apparatus and various other things. For instance, Mr. Duffy had stated in conventions of accountants that if a company had maintenance broad enough to include the up-keep of the property there would be no depreciation. The use of 9 or 10 per cent of the gross earnings of the Milwaukee Electric Railway & Light Company had not been broad enough for that purpose.

Submitting the detailed report of daily earnings on page 768, Mr. Duffy said that all of the car-miles traveled and all of the time required by the trip of every car operated over each one of the 24 lines, city and suburban, the four Racine city lines and each of the three interurban lines were absolutely segregated one from another.

Mr. Manson asked what proportion of the total expense of maintenance of the Public Service Building was charged against the railway department of the Milwaukee Electric Railway & Light Company. Mr. Duffy's recollection was that in 1907 about 85 per cent was charged to the railway and 15 per cent to lighting, on the basis of the proportionate gross earnings of each. About 15 per cent of the 85 was charged to the Milwaukee Light, Heat & Traction Company. The Public Service Building was charged by the lighting department 2 cents per kilowatt delivered for the power which was consumed in the building. The same practice was followed with utility equipment and car house.

Referring to special accounts in the operating expenses of the Milwaukee Light, Heat & Traction Company, Mr. Manson mentioned the fixed monthly charge against utility service to cover depreciation. Mr. Duffy stated that the bookkeeping entry was to debit utility equipment and credit depreciation reserve with a fixed amount every month. For instance, the charge for the utility service in 1907 was

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(C)

As per books, less taxes paid and charge for depreciation based on 5.37 per cent of physical property. Actual earnings at present rates of fare and assumed earnings based on ticket fares, seven for 25 cents.

	Based on actual gross earnings of 1908, as per books. Rate of ticket fares, six for 25 cents, or 25 for $1.	Based on gross earnings of 1908, if rate of ticket fares had been seven for 25 cents in place of six for 25 cents, or for $1.	Based on actual gross earnings of 1907, as per books. Rate of ticket fares, six for 25 cents, or 25 for $1.	Based on gross earnings of 1907, if rate of ticket fares had been seven for 25 cents in place of six for 25 cents, or for $1.
Gross earnings from operation	$3,223,179.82	$2,907,373.41	$3,221,912.44	$2,911,904.84
Operating expenses (including unexpended "reserve charges" in "operating expenses," as follows: $42,374.10 in 1908, $63,311.64 in 1907)	1,678,704.88	1,678,704.88	1,684,066.73	1,684,066.73
Net earnings from operation	1,544,474.94	1,228,668.53	1,537,845.71	1,227,838.11
Deductions:				
*Taxes as paid (80 per cent of total taxes paid)	200,343.99	200,343.99	165,057.34	149,556.96
Depreciation	†599,353.07	†599,353.07	‡580,558.07	‡580,558.07
Total deductions	$799,697.06	$799,697.06	$745,615.41	$730,115.0
Net income from operation (exclusive of providing for amortization of cash investment, interest on working capital or contingencies over and above the sums unexpended in "reserves," $42,374.10 in 1908 and $63,311.64 in 1907)	744,777.88	428,971.47	792,230.30	497,723.08

*In 1908, 80 per cent of total taxes paid; in 1907 taxes figured as amount actually paid, or amount that would be paid on reduced gross earnings based on assumed reduced rate of fare, seven tickets for 25 cents.

†In 1908, 5.37 per cent on $11,161,137.17, computed as follows: $10,586,137.17, balance Dec. 31, 1906, as per report of Dickinson, Wilmot & Sterrett, plus additions and betterments in 1907, $450,000, and 50 per cent of additions and betterments in 1908, $125,000.

‡In 1907, 5.37 per cent on $10,811,137.17, computed as follows: $10,586,137.17, balance Dec. 31, 1906, as per report of Dickinson, Wilmot & Sterrett, plus $225,000, 50 per cent of additions and betterments in 1907.

	Based on actual gross earnings of 1908, as per books. Rate of ticket fares, six for 25 cents, or 25 for $1.	Based on gross earnings of 1908, if rate of ticket fares had been seven for 25 cents in place of six for 25 cents, or for $1.	Based on actual gross earnings of 1907, as per books. Rate of ticket fares, six for 25 cents, or 25 for $1.	Based on gross earnings of 1907, if rate of ticket fares had been seven for 25 cents in place of six for 25 cents, or for $1.
	Per cent.	Per cent.	Per cent.	Per cent.
Percentage of net income to cash investment of $14,893,512.58 in 1908 or $14,543,512.58 in 1907, computed as stated in (A) above. See notes § and ¶ at foot of Table (A)	5.00	2.88	5.45	3.42
Percentage of net income to value, based on tax levy for the year 1908, as per assessment of Wisconsin State Board of Assessment, $17,000,000 (80 per cent of $21,250,000)	4.38	2.52	4.66	2.93
Percentage of net income to property and plant capitalization of $19,865,000 in 1908, $19,200,000 in 1907 (80 per cent of capitalization outstanding Dec. 31, 1908 and 1907, respectively, as per books)	3.75	2.16	4.13	2.59
Percentage of net income to cost of property and plant, $20,536,000 in 1908, $20,181,000 in 1907 (80 per cent of cost of property and plant, Dec. 31, 1908 and 1907, respectively, as per books)	3.63	2.09	3.93	2.47

CASH INVESTMENT, INCLUDING BOND DISCOUNT AND PERCENTAGE OF NET INCOME TO SAME.

	1908.	1907.
Balance Dec. 31, 1906, as per report of Dickinson, Wilmot & Sterrett	$14,318,512.58	$14,318,512.58
"Bond discount," excluded by Dickinson, Wilmot & Sterrett in original cost of property, $8,885,644.17	1,036,055.83	1,036,055.83
Eighty per cent of "bond discount," excluded by Barrow, Wade, Guthrie & Co., city's accountants	104,631.98	104,631.98
Eighty per cent of "bond discount," as per company's books in 1907	80,000.00	80,000.00
Fifty per cent of additions and betterments, as per company's books in 1907	.....	225,000.00
Additions and betterments in 1907 (100 per cent)	450,000.00	.....
Eighty per cent of "bond discount," as per company's books in 1908	180,550.41	.....
Additions and betterments in 1908 (50 per cent)	125,000.00	.....
	$16,294,750.80	$15,764,200.39

1908.		1907.	
Percentage of net income of $744,777.88 to $16,294,750.80, see Table (A)	4.57%	Percentage of net income of $792,230.30 to $15,764,200.39, see Table (A)	5.03%
Percentage of net income of $1,021,812.95 to $16,294,750.80, see Table (B)	6.27%	Percentage of net income of $1,050,597.11 to $15,764,200.39, see Table (B)	6.66%
Percentage of net income of $737,587.54 to $16,294,750.80, see Table (B)	4.53%	Percentage of net income of $787,090.67 to $15,764,200.39, see Table (B)	4.99%
Percentage of net income of $744,777.88 to $16,294,750.80, see Table (C)	4.57%	Percentage of net income of $792,230.30 to $15,764,200.39, see Table (C)	5.03%
Percentage of net income of $428,971.47 to $16,294,750.80, see Table (C)	2.63%	Percentage of net income of $497,723.08 to $15,764,200.39, see Table (C)	3.16%

$89,000 odd; the value of the performance of the work, measured by unit prices, was $114,000, leaving $25,000. The difference represented the difference between the actual cost of performing the service and what the service would have cost had it been performed by an outside company; the difference was credited to the depreciation reserve of the railway company, which owned the utility service. In the calculation of cost there were included the operating expenses, charges for inquiries and damages, insurance, taxes, interest and depreciation. The true cost was what it would have cost the company to have the work done by an outsider.

ADVANTAGES OF JOINT OPERATION

A question regarding the relative advantages accruing to the Milwaukee Electric Railway & Light Company and the Milwaukee Light, Heat & Traction Company was asked by Mr. Manson, and Mr. Duffy stated that 95 cars of the traction company were operated on the interurban lines tage to an interurban road to have a terminus in a large city, it would be a great deal more of an advantage to have the arrangement which the Milwaukee Light, Heat & Traction Company has with the Milwaukee Electric Railway & Light Company, permitting the passengers to be transferred and carried to any point in the city of Milwaukee.

Edwin S. Mack, of counsel for the company, said that the history of the line was that the traction company was built after the city road, and was constructed in order to constitute a feeder to the city lines. Mr. Mack did not doubt that it was an advantage to the Milwaukee Light, Heat & Traction Company to be connected with the Milwaukee Electric Railway & Light Company, but the point was that it was an equal, if not a much greater, advantage to the Milwaukee Electric Railway & Light Company to be connected with the Milwaukee Light, Heat & Traction Company. The advantage of operating two systems to-

THE MILWAUKEE ELECTRIC RAILWAY & LIGHT COMPANY, REPORT OF PASSENGER EARNINGS, SUBMITTED BY C. N. DUFFY, COMPTROLLER.

Saturday, March 27, 1909. Compared with Saturday, March 28, 1908.

Time.	Temperature. This year. High.	This year. Low.	Last year. High.	Last year. Low.	Weather. This year.	Weather. Last year.
5 A. M. to 8 A. M.	32	32	32	30	Cloudy	Cloudy
8 A. M. to 11 A. M.	35	35	33	31	"	"
11 A. M. to 2 P. M.	38	38	34	34	"	"
2 P. M. to 5 P. M.	38	38	34	34	"	"
5 P. M. to 7 P. M.	37	37	33	33	"	"
7 P. M. to 10 P. M.	35	35	33	33	"	"
10 P. M. to 12 P. M.	32	32	31	30	"	"
Average temperature for 7 periods	35	35	33	32		

Commutation tickets collected.			
4c	72,951	4c	71,158
4 1-6c	112,384	4 1-6c	101,600
	185,335		172,758

Lines.	Mileage. This year.	Mileage. Last year.	Car hours. This year.	Car hours. Last year.	Passenger earnings. Per car mile. cents. This year.	Per car mile. cents. Last year.	Per car hour. Dollars and cents. This year.	Per car hour. Dollars and cents. Last year.	Passenger earnings. This year.	Passenger earnings. Last year.	Increase or Decrease.
Wells-St.-F'll Ave., City.	4,320	4,483	484	517	32.19	31.67	2.87	2.75	$1,390.64	$1,419.58	*$28.94
Wells St.-F'll Ave. I. U.	189	....	16	....	30.23	..	3.57	..	57.13	.....	57.13
Fond du Lac-Nat. Aves.	2,815	2,585	288	287	28.30	30.26	2.77	2.73	796.74	782.17	14.57
Walnut St.-Nat. Ave...	2,687	2,796	309	315	29.51	28.45	2.57	2.53	793.05	795.45	*2.40
Eighth Ave.-Third St..	2,283	2,187	256	234	29.02	26.66	2.59	2.49	662.49	583.15	79.34
Burnham-3d Sts., City..	2,592	2,753	267	287	26.18	23.08	2.54	2.21	678.64	635.28	43.36
Burnham-3d Sts., I. U.	155	....	18	..	12.85	..	1.11	..	19.92	.....	19.92
Oakland-Delaware Aves.	2,885	3,501	299	378	22.73	21.43	2.19	1.98	655.68	750.20	*94.52
Holton-Mitchell Sts....	2,685	2,628	291	292	25.59	25.17	2.36	2.27	687.19	661.39	25.80
Muskego Ave.-8th St...	2,655	2,154	291	240	24.07	24.82	2.20	2.23	639.03	534.57	104.46
Clybourn-Wisconsin St.	1,222	1,337	147	161	38.53	31.81	3.20	2.64	470.78	425.30	45.48
Twelfth-Wisconsin Sts.	2,420	2,549	292	311	34.26	29.54	2.84	2.42	829.08	752.96	76.12
State-Wisconsin Sts....	2,174	2,262	267	274	37.00	36.02	3.01	2.97	804.47	814.72	*10.25
First-Ave.-Vliet St....	1,658	1,655	188	189	23.07	21.53	2.03	1.88	382.50	356.24	26 26
Howell Ave.-Vliet St..	1,955	1,881	218	219	23.78	22.60	2.13	1.94	464.91	425.12	39.79
North Ave.....	1,356	1,057	166	117	25.23	24.11	2.06	2.18	342.15	254.79	87.36
P. S. Bldg.-St. Francis.	767	....	79	..	22.96	..	2.23	..	176.09	.....	176.09
Total	34,818	33,828	3,876	3,821	28.29	27.17	2.54	2.41	$9,850.49	$9,190.92	$659.57

Comparison with current date:	Mileage. Month to date.	Mileage. Year to date.	Car hours. Month to date.	Car hours. Year to date.	Car mile to date.	Car hour to date.	Passenger earnings. Total for month.	Total for year.
This year.....	923,191	2,892,956	102,249	320,495	25.92	2.34	$238,783.82	$749,736.40
Last year.....	887,407	2,845,045	99,358	320,855	24.47	2.17	218,445.38	696,165.94
Increase or decrease.....	35,784	47,911	2,891	*360	1.45	.17	20,338.44	53,570.46
Per cent increase or decrease.....	4.03	1.68	2.91	*.11	5.93	7.83	9.31	7.70

*Decrease

only, and the railway company had the benefit of the use of that equipment when it received credit for fares for Milwaukee passengers without payment of fixed charges on the equipment. The traction company had the benefit of the use of 11 cars of the railway company that were operated partly within and partly ouside of the city. When the interurban cars entering Milwaukee crossed the city fare limit point they were charged with the expense of operation of the cars. The railway company had the benefit of the use without cost of about 11 miles of single track and of other property belonging to the traction company.

Further questions were asked by Mr. Manson about the advantage accruing to the Milwaukee Light, Heat & Traction Company through its entrance to the city of Milwaukee. The witness stated that while it would be an advantage to the railway and light company had the better of the bargain.

Mr. Duffy added that in the use of property the Milwaukee Electric Railway & Light Company undoubtedly enjoyed all the advantages that were definitely fixed when it had the use of 95 cars and 11 miles of track. If Mr. Manson knew some of the conditions that obtained in some of the other cities in reference to the interurban problem and how endeavors had been made to work out a basis of application, he would have a greater appreciation of what the Milwaukee Electric Railway & Light Company enjoyed.

Responding to a question as to what account the expense incurred in paving was charged, the witness said that it was charged according to the character of the work per-

formed and how the expense was incurred. If the city of Milwaukee repaved a street and the company was charged as a property owner for its proportion, the expense was placed in taxes. If the maintenance of way department, in keeping the track repaired, had occasion to restore the pavement, the expense was charged to operating expenses. If the maintenance of way department reconstructed a track, and in connection therewith had paving to do, the expense was charged to the work order covering the work, which in the case of reconstruction would be placed finally in depreciation reserve. If an entire new track was built and paving or repaving was necessary, the expense would be charged to construction.

The accompanying statement was submitted by Mr. Duffy, showing the charges against depreciation reserve for the railway in 1907.

RECONSTRUCTION, RE-EQUIPMENT, BETTERMENT, UNCURRENT AND EXTRAORDINARY EXPENDITURES CHARGED TO DEPRECIATION RESERVE—RAILWAY—YEAR 1907.

Roadway and track		$188,097.06
Overhead and underground electric system		8,410.68
Buildings and improvements		721.17
Car bodies, trucks and electrical equipment		95.35
*Miscellaneous—		
Property sold or scrapped in 1907	$18,405.08	
Less credit	2,136.71	16,268.37
		$213,401.93

*Details of property sold or scrapped in 1907—

Motors	$5,500.00
Flat cars	1,200.00
Power plant machinery	737.08
Clocks	118.00
Cars	7,649.52
Miscellaneous	1,063.77
	$16,268.37

DISTRIBUTION OF POWER PLANT ACCOUNTS

In the distribution book covering operation of power plants and substations the various items and charges were assembled by plants, and at the end of the month there was deducted from the total expense shown, at a charge of 2 cents per kw-hour, all the power not used for railway or light; the railway and the two companies were charged on the basis of car-hours and the light on the basis of the wattmeter consumption.

In 1907 the total expense of operating the power plants was $581,247.06, divided as follows: Electric current for railway system, $353,307.94; electric current for lighting system, $163,249.18; steam for heating purposes, $24,968.47; electric current for all other purposes than railway and lighting systems, $39,721.47.

The number of transfer passengers could increase and had increased without regard to the change in revenue passengers. There was a more rapid increase in the transfer business than in the revenue passenger traffic.

The statement of Mr. Duffy regarding efficiency of management as an element which should be taken into consideration in computing a proper basis of return was brought up, and Mr. Duffy stated that the Milwaukee railway, or any other road, might furnish satisfactory service with present management, and be able to eke out some measure of return on the investment, while another management would put the property into bankruptcy. No amount of salary would put certain capacity into a man or draw certain service from him. The witness knew of two companies, each of which had had at its head a man who was not capable, in his judgment, of filling the position, both of whom received very large salaries.

In these cases the character of the service rendered, the condition of the property and the measure of return to the owners emphasized what he said. The stockholders paid for something they did not get. If either of the men he had in mind were operating the Milwaukee property they could not haul passengers for 5-cent fares, let alone 4-cent fares, judging by what they had done in their own cities. Very often a man's efficiency was overrated; his efficiency ought to be judged by his results. The results were evident in the form of increased facilities and better services without correspondingly increased cost, so that the public that used the service did not pay an undue charge for it.

Mr. Duffy made a correction of a statement made by him before the commission as it appeared in the transcript and was copied in the Electric Railway Journal of March 27, 1909, page 555, in which he was quoted as saying that the ad valorem tax on the non-operative property for 1908 nearly exhausted the reserve for taxes. It was the ad valorem tax on the operative property, taking the place in that year of the 5 per cent tax on gross earnings, that exhausted the reserve for taxes.

The witness also made a statement amplifying his discussion regarding the practice of the company in loaning money to employees who were in need of funds because of sickness or death in the family. No interest was charged on these advances. They were regarded as part of the relation of employer and employee. The man was employed by the company and expected to continue, and in time to catch up. The men appreciated this privilege.

ADDITIONAL TESTIMONY OF MR. DAVIDSON

Charles J. Davidson, chief engineer of power plants of the company, was recalled for cross-examination on March 30.

In answer to an inquiry regarding the steam furnished to the Milwaukee Central Heating Company, Mr. Davidson said that the greater portion was exhaust steam, but he could not state the percentages of exhaust and live steam. It was more economical to operate an engine and use the exhaust steam for heating or other purposes, if such other purposes existed, than it would be to secure the increased efficiency of the engine by running it at its high efficiency condensing and taking the necessary live steam from the boilers. But in spite of that fact, considerably more steam would be used than if the steam was furnished for the engine alone. All of the engines under consideration in the Oneida Street plant were compound engines. Practically only one engine was run non-condensing in 1907 in that plant.

A question was asked about the manner in which the price of 35 cents per 1000 lb. for steam sold by the Milwaukee Electric Railway & Light Company to the Milwaukee Central Heating Company was fixed. The witness said that the price was predicated upon the cost of operating the plant before the Milwaukee Central Heating Company property was acquired. When the plant was operated under its most efficient condition a price was made which would leave the cost per kw-hour to the Milwaukee Electric Railway & Light Company approximately as nearly as possible what it was before the heating company business existed. To be conservative a little allowance was made to be sure that the price was enough to cover the cost. It was probably a little in excess; the Oneida Street plant probably profited a little by the transaction.

The cost of operation of the Oneida Street plant would be affected slightly by the arrangement to furnish steam to the Milwaukee Central Heating Company in other respects than in the coal consumed per kw-hour. That would depend, however, upon other conditions. At certain seasons of the year there would be no additional cost. Under conditions of maximum operation a little additional labor

would be required in the boiler room. The policy had been pursued consistently of preserving as nearly as it could be calculated by any means the price per kw-hour which would have obtained had no steam been taken by the heating company. The price for steam furnished to the heating company had varied. The same price for steam furnished to the heating company had been made at the Public Service Building as at the Oneida Street plant.

A high-efficiency compound engine like those at the Oneida Street plant, designed for condensing operation, would lose 25 per cent or 30 per cent of its efficiency by being operated non-condensing, but the loss in efficiency of an equally high-grade modern steam-turbine when run non-condensing would be considerably more.

LOSSES BY AGE AND WEAR

Testifying as to the life of generator parts, Mr. Davidson stated that a set of brushes might last three or four hours or three or four years. The cost of replacing brushes was charged to current maintenance. The commutators on the three largest machines in the Oneida Street plant were about ready for renewal; they had been used a little less than nine years. The life of a commutator was determined by its use, not its age. Renewals of commutators were charged to current maintenance in the case of small machines, but when the company was ready to replace the commutators of the machines at the Oneida Street plant, which would cost a great many thousands of dollars, a work order would be issued and the expense would be charged to depreciation reserve account. In two of the Oneida Street machines the windings have had to be replaced probably five or six times, and the expense was charged to current maintenance. Other generator-parts, subject to replacement, were the laminated core, which might be injured by an armature short circuit, and the armature spokes.

Replacements of parts of the boilers were charged to current maintenance. From time to time practically every element that entered into the boilers had to be replaced. A time was always reached, however, when the large parts of a boiler of the type used by the company would not be worth anything because the expensive part of the boiler was no longer repairable.

Taking up the direct examination of the witness, Mr. Mack asked whether the price paid for steam heat was just to the railway. Mr. Davidson stated that in his judgment it was a reasonable division. He was equally interested in producing results for both of the companies, and the price was as nearly equitable as they had known how to make it. In fixing the price, allowance was made for depreciation and for interest on the investment. The price paid by the Central Heating Company, of Detroit, to the Edison company of that city up to within a comparatively short time was 20 cents per 1000 lb.

A question was asked by Mr. Mack as to the increase or decrease of cost of labor after the line had been passed which marked the maximum efficiency of a given force of labor. The witness stated that just as soon as the maximum capacity of one man had been reached and an additional man had to be employed it was very rarely the case that the proportion was such that the additional man could be employed fully and advantageously, although it might be necessary to have him. One man was the least that could be employed.

In a majority of cases in electric railway and light power plant work a change in the art had made it necessary to supersede machines before the time had been reached when maintenance became excessive, and it appeared cheaper to replace than to try to keep the machine as a whole and replace it part by part. This statement applied more strongly to certain classes of machines, and it was absolutely true as to all of the old marine-type engines in the old Edison plant at Milwaukee. Those machines reached the stage where maintenance was excessive before they were put out of operation, and if they were not obsolete it would be cheaper to throw them away and buy new machines even of the same type than to try to repair them now.

APPORTIONMENT OF MAINTENANCE CHARGES

The apportionment of charges as between current maintenance and depreciation reserve was subject to revision in the comptroller's office and an instance had occurred where the department charged a smokestack to current maintenance and in the comptroller's office the charge was revised and placed in depreciation reserve. In asking a question about the apportionment of these charges, Mr. Mack said that he merely wanted to bring out the fact that the company attempted in its central administration to have uniformity of practice and at the same time there was a good deal of difference of opinion as to where to draw the line between maintenance and construction.

Mr. Davidson stated that it was a matter of conservatism and honesty on the part of the head of the department not to try to make a showing at the expense of the depreciation reserve account, and if there was any question so far as he was concerned about the matter he tried to err on the side of charging a repair to current maintenance rather than subject himself to the possible criticism of having attempted to show a cheap rate of kw-hour output by charging to depreciation reserve account.

The effect of age upon machinery, provided proper care is taken of it when it was not in use, depends somewhat on what the machinery is. Commutators do not rust or corrode, and there is very little chance that anything would happen to them. On the other hand, it is very difficult to prevent a good deal of deterioration when engines, pistons, etc., were not in use.

Answering a question from Mr. Manson about the cost of steam supplied to the heating company, Mr. Davidson said that his reputation was at stake just as much on the results he secured in one case as in the other, and he had tried to take into account all of the various factors which existed or might arise from time to time in order to give the railway company the current at exactly the price or possibly a little more, enough so as to be conservative, that it would have if the heating company did not exist.

Mr. Mack said that it would appear by the examination by counsel for the city as if it were the deliberate policy of the company to increase all charges so far as possible on the railway end of the system and save them on every other feature of the business. Mr. Davidson stated that absolutely no policy of that kind had been followed. Of the live steam produced at the Oneida Street plant the witness estimated that about 3 per cent was furnished to the heating company in 1908.

Commissioner Roemer said that the company had made something by disposing of the steam to the heating company over what it would have made if it had condensed the steam and used it in the boilers. Mr. Davidson said that it was a more economical use of the steam; a greater percentage of the thermal value of the steam was used in that way than if it was condensed after it left the engine. Mr. Mack asked what was the most recent development in the Oneida Street power plant. The witness said that the company had been required recently by the city building

inspector to remove, replace or reconstruct the entire portion of the building which was made up of terra-cotta cornice. He should estimate that this repair would cost in the neighborhood of $10,000. That would be charged to depreciation reserve account.

W. J. Curtis, of counsel for the company, asked if the building was properly constructed in that respect in the first place and Mr. Davidson said that it was.

COST OF GOING VALUE

Mr. Mack introduced as evidence on March 30 a statement compiled by Prof. M. E. Cooley relating to the Milwaukee Central Heating Company to illustrate his idea of the cost of going value. The business of this company has not yet reached a profitable point, and Professor Cooley testified that the expense of conducting the business until it should earn a reasonable return on the investment was properly an element of capital cost of the property. Professor Cooley, Mr. Mack stated, had assumed that the company would begin to make a profit on Dec. 31, 1912, simply because he wanted to have his diagram show a profit within the length of the sheet of paper that he had, and that was as far in the future as he could go. The idea was intended simply to be illustrative of the theory. A letter on this subject from C. N. Duffy, comptroller of the company, to Professor Cooley was also submitted in evidence. Mr. Duffy made the following statement:

In examining the figures I am afraid that you have been too optimistic with respect to "gross earnings," as I do not believe that the earnings of 1909 will reach $85,000, $37,000 more than in the year 1908, 70 per cent. Neither do I think the "gross-earnings" will increase in the years 1910, 1911 and 1912 as you have shown them, reaching $240,000 in the year 1912. I should think that an accumulative increase of 25 per cent per annum in gross earnings is all that we could reasonably expect; this would make the gross earnings in 1912 $120,000 instead of $240,000, as shown, or just 50 per cent of the required amount to overcome a deficit. This would mean on my basis that the $240,000 gross earnings would not be reached before 1915, if reached in that year.

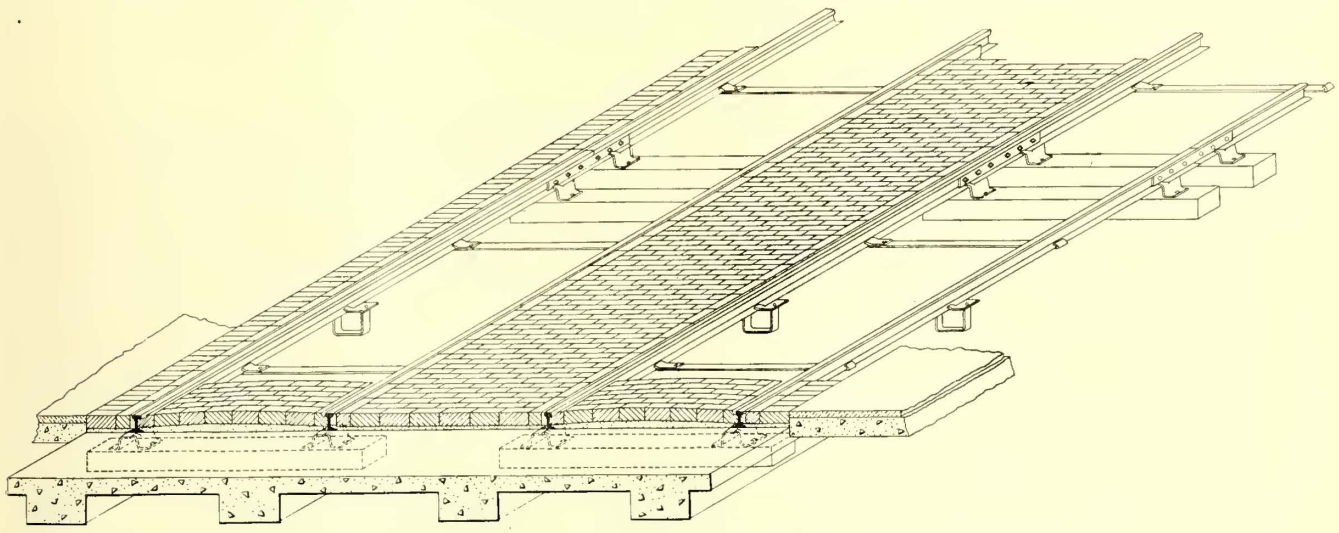
In other words, the first 10 years of operation would produce a deficit, while you figure that the seventh year of operation would get the results of operation to a point where there would be no deficit.

On the other hand, the cost of the property may not reach the figures you show, which would reduce the amount necessary for "return," "depreciation" and "taxes," but I think your operating expenses for the years 1909, 1910, 1911 and 1912 are figured too low.

T-RAIL IN PAVED STREETS AT CHARLOTTE, N. C.

The method employed by the Charlotte (N. C.) Electric Railway, Light & Power Company in constructing about 15,000 ft. of T-rail track in paved streets during 1908 is shown in the accompanying engraving. The company's franchise requires it to pave between tracks and for 2 ft. on either side of its tracks, and as the latter are spaced 10 ft. apart between centers, the company paved a width of approximately 18 ft. at the center of the street, with the exception of an intermediate strip between the tracks that was laid at the expense of the city. The paving used was vitrified brick, which was laid at the same time as the new track. The track and paving were laid on a concrete foundation having a 9-in. x 18-in. longitudinal concrete beam under each rail, with a 5-in. slab connecting the tops of these beams and acting as a base for the pavement.

During construction only one line of track was disturbed at a time, and that line for not more than two city blocks, while the opposite parallel track was maintained in service. Upon the removal of the rails, fastenings and ties of the old track, the street was graded to a depth of 10 in. to lines parallel to the proposed street grade and to a width of 8 ft. The sub-grade thus prepared was compacted thoroughly with a 10-ton steam roller. All soft, spongy places caused by imperfect back filling in the trenches, or otherwise, were refilled with material selected from the original street surface.



T-Rail in Charlotte, N. C.—Isometric Drawing Showing Track Construction

In the prepared foundation, trenches were cut for 6-in. x 7-in. ties, these trenches being of 6 in. greater depth, width and length than the ties shown in the drawing. At the rail joints, which were placed opposite in the track, these trenches were spaced 20 in. apart on centers, and in the balance of the track 12½ ft. apart on centers. The filling material from the street surface was deposited under each tie and tamped thoroughly in place. Standard chair plates for A.S.C.E. 80-lb. rail were spiked to the ties thus set, and the rails laid to slack gage with opposite joints and angle connections as mentioned. Spaced equally between the ties were placed tie plates, each carried by a chair of special type, designed to anchor the rails to the concrete base to be laid later. At intervals of 6 ft. 3 in., except at the joints, special tie rods were set to maintain the spacing of the rails. These rods had a hook on both ends, which engaged the outer edge of the flange of both rails;

on the inside of both rails a strap of iron, attached to the rod by means of a bolt in a slot, engaged the inner edge of the rail flanges. The design of this bolt and slot made the position of the strap adjustable, so that the exact spacing of the rails could be obtained.

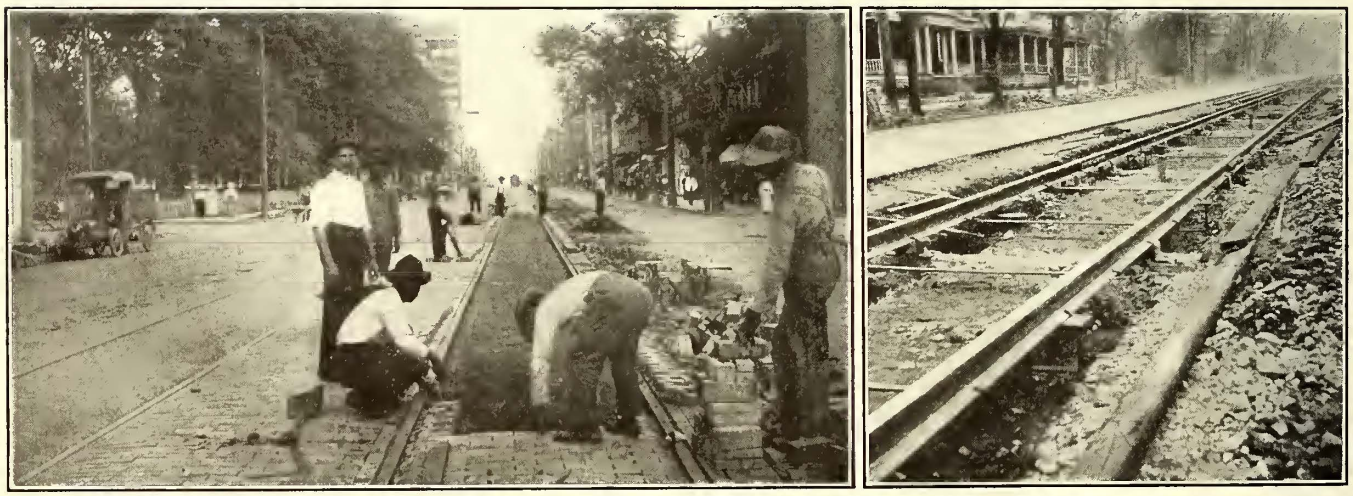
When the ties, rails, chairs and tie rods were set for a length of track, an 8-in. x 20-in. trench was cut longitudinally under each rail. In both of these trenches temporary forms, consisting of 1-in. boards held in position by outside stakes, were set for the concrete beams under the rails. Forms also were set 14 in. from the outside of each rail and to such height that the 5-in. base of concrete provided for the pavement extended to within 5 in. of the top of the rails. In these forms concrete, consisting of 1 part Portland cement and 3 parts sand and 6 parts broken stone, was laid to the lines shown in the drawing. The anchors, tie rods and rail chairs are embedded in concrete; the tops of the ties extend up into the 5-in. slab between the beams and their ends are embedded in the latter.

The sand and broken stone for the concrete were delivered to storage piles along the side of the street, with a space of 10 ft. to 12 ft. between these piles and the track. The concrete was made in a Foote portable mixer, which was moved along between the storage piles and the track as the work on the base progressed. The sand and broken stone were shoveled directly from the storage piles into the charging hopper of the mixer. The concrete was delivered from the mixer to place in the track by means of wheelbarrows.

For 14 in. on the outside of each rail, 1 to 2 mortar was spread to a thickness of 1 in. on the concrete base. On the mortar course was laid directly a standard vitrified paving block, a header course being placed along the rail and the balance of the 14-in. space filled out with stretchers. A joint ¾ in. wide at the top, left between the row of headers and the rail, was filled with asphalt mastic to provide for any movement of the latter. Between the rails a cushion of sand 1 in. thick at the rails, and with a crown of 1 in. at the center of the track, was spread on the concrete base. On this cushion the paving blocks were laid at right angles to the track in regular courses, and in making the closures half-brick or bats were permitted only on one side. At intervals of 75 ft. transverse 1-in. expansion joints were filled with 15 per cent pure asphaltum and 85 per cent finely ground rock dust, mixed and heated on the line of the work. The proportions of asphaltum were increased as required to secure the proper plasticity of the mastic compound.

When the brick were laid and the expansion joints filled, the surface was rolled with a 10-ton steam roller. The joints between the brick were then filled with grout, consisting of 1 part cement to 2 parts sand, with enough water added to give a consistency of thick cream. This grout was brushed over the surface with rubber-tipped floats until the joints between the bricks were filled completely. The grout thus poured was covered with a thin coat of sand to protect it until the cement had set.

All the materials except the bituminous mastic used along the outside of the rails and for the expansion joints were provided by the street railway company at approximately the following prices: T-rails, 90 lb. to the yard and in 90-ft. lengths, at $35.65 per ton; ties, 35 cents each; tie rods, 55 cents; anchors, 55 cents, and chairs, 42 cents. Plates, bolts, washers, and so forth, were also furnished at average prices. The amounts allowed the contractors for other construction materials were as follows: Broken stone, $1.50 per cubic yard; sand, 60 cents per cubic yard; cement, most of which was of the Atlas brand, $1.82;



T-Rail in Charlotte, N. C.—Laying Brick Pavement Betweeen Rails and Track Prepared for Concrete Base

standard paving brick, $32 a thousand; whole groove brick, $46 a thousand, and half-groove brick, $27 a thousand.

The work was done under the direction of Hazlehurst & Anderson, consulting engineers, of Atlanta, by the Atlanta Construction Company at the following unit prices:

Track was taken up and relaid at 34 cents per linear foot, rails unloaded and distributed at 90 cents per ton, excavation for foundation and concrete beams at $2.00 per cubic yard, brick pavement laid at 42 cents per square yard.

The first contract for 7500 ft. of track was finished Aug. 20, 1908, at an expense for labor and materials amounting to $38,692.38. Of this amount the labor item was $9,117.27.

At the time of estimating the cost of materials T-rail was worth at the mill $10 per ton less than the grooved-girder type so generally used in street railway track on paved streets. The estimated cost of actual construction of the two types of rail was approximately the same. Hence the estimated saving to the company was $10 per ton on some 320 tons of steel on the two contracts.

The alignment and surface of the track laid in this manner that has been in operation for about eight months are exceptionally good. It is also stated that the operation of cars over these tracks seems to be entirely satisfactory.

DISCUSSION OF NEW ACCOUNTING SYSTEM FOR WISCONSIN PUBLIC UTILITIES

The new accounting system prescribed for the Wisconsin public utilities by the Railroad Commission of that State was discussed at a joint meeting of the Wisconsin Electric & Interurban Railway Association, Fox River Gas & Electric Association, and Northwestern Electrical Association, held at Sheboygan, Wis., on April 12 and 13. About 50 representatives of operating companies were present. Ernest Gonzenbach, president of the Northwestern Electrical Association, presided. Papers were read by Halford Erickson, member Wisconsin Railroad Commission; George Allison, comptroller Wisconsin Electric Railway and Eastern Wisconsin Railway & Light Company, and B. G. Broad, auditor Milwaukee Northern Railway. Abstracts of these three papers appear elsewhere in this issue.

Mr. Gonzenbach arranged for the entertainment of convention visitors by special trips to the power plant of the Sheboygan Light, Power & Railway Company, and to the plant of a large coal-loading and sorting company. Through the courtesy of the Milwaukee Northern Railway a visit was made to the gas engine-driven generating station of the company at Port Washington.

APPLICATION OF THE NEW ACCOUNTING SYSTEM

Mr. Allison distributed copies of the schedule of accounts which he had arranged under the new classification for the use of the Wisconsin Electric Railway and the Eastern Wisconsin Railway & Light Company. The discussion on this paper was introduced by C. N. Duffy, comptroller of the Milwaukee Electric Railway & Light Company, who said that he was pleased to learn that Mr. Allison had found the accounting system prescribed by the commission to be adapted so well for the use of the variety of properties represented by Mr. Allison. The public utilities of Wisconsin were fortunate in having such a broad-minded commission, and the system of accounts laid down was easily adaptable for either large or small utilities. It might be possible for some of the larger companies to serve their own needs with a smaller number of accounts, but if the commission required additional subdivisions for its needs the utility companies should be willing to fulfill its requests.

A. D. Alt, manager Mondovi Electric Light Company, had not yet adopted the new accounting system, because a number of questions were under consideration with the commission. The lighting plant was an offshoot of a flour mill which obtained its power from a hydraulic plant, built primarily to run the mill, and from an auxiliary steam plant built for the same purpose. Both or either methods of generating power were used as conditions demanded, and the mill and light plant employees were engaged in both kinds of work in no regular way. Mr. Alt asked for suggestions as to the proper apportionment of the power costs, so that the accounting system prescribed by the commission might be followed for the lighting plant. No electrical current was supplied to the mill, but the light plant generator was belted to the hydraulic turbine shaft, which operated the mill machinery.

Mr. Duffy explained his view that it was the purpose of the commission to obtain as clearly as possible cost figures for the generation of power by gas, steam and water, and that such figures should be given willingly by the companies because of their value for comparative uses by the commission. He would suggest that Mr. Alt ascertain the total cost of developing power for both the mill and the lighting plant, and then apportion the cost according to the best possible estimate of the quantity of power required to generate the electric current used. Later in the discussion, Mr. Duffy's suggestion was approved by a representative of the commission.

Irving P. Lord, Waupaca Electric Light & Railway Company, called attention to the fact that many lighting plants in Wisconsin were operated in connection with grist and saw mills; these plants would not be possible, and the service would not be available unless one kind of plant could depend upon the other. The conditions at Waupaca resembled the power situation with the Mondovi company in that the Waupaca Light & Railway Company obtained its power from a water-power plant when water was available and at other times from a steam auxiliary. It was found that the income of the railway and the lighting departments was about equal, and that the power requirements were fairly evenly divided; therefore, in keeping the accounts the charges for fuel, labor and general maintenance were made one-half to railway and one-half to lighting.

Mr. Allison, when questioned, stated that in the method of accounting as outlined by him it was the practice to pass all accounts through one voucher journal, and then recapitulate at the end of the month, by using a distribution sheet and taking the distribution direct from the vouchers. An adding machine was very useful in this work.

METHODS OF CHANGING ACCOUNTING SYSTEM

After the presentation of his paper, Mr. Broad asked for information as to the methods followed by other roads in accounting for ticket earnings. Some companies based their daily earnings on a count of the ticket sales and others on a count of the tickets redeemed. On the Milwaukee Northern road the percentage of cash fares received on trains amounted to but 10 per cent of the total receipts, and was getting smaller as people became accustomed to the use of tickets and mileage books. It was the practice of that road, when tickets or mileage were sold, to consider the money received as earnings.

Mr. Gonzenbach stated that it had been the practice of the Sheboygan Light, Power & Railway Company for several years to count the canceled tickets turned in by conductors and make out "daily earnings" reports on the basis of the tickets turned in. The monthly statements, however, showed the amount of money taken in, and of course there were discrepancies between the sum of the daily earnings for any one month and the monthly earnings. He thought it the best plan on a moderate sized road to account for the money as it was received.

Mr. Duffy outlined the ticket accounting methods followed by the Milwaukee Electric Railway & Light Company. When tickets were sold ticket sales and ticket cash were credited, and unused tickets being liabilities, ticket sales and ticket cash were debited when the tickets were taken up on the car. Tickets constituted liabilities until they were presented for transportation, after which the earnings should be credited and the ticket sales and cash debited. The Milwaukee company had about $60,000 outstanding tickets and 81 per cent of the business of the road was done in tickets.

Mr. Allison said that on the roads which he represented the amount of ticket sales was so small comparatively that he hardly thought it worth the expense to count all canceled tickets and carry a "tickets credited" account. Mr. Duffy was undoubtedly right as to principle, but with a

small railway, where it was too great an expense to count the tickets, Mr. Allison favored Mr. Broad's method.

Mr. Broad said that the Milwaukee Northern road kept an accurate record of all passengers carried and that number, when divided into the gross receipts from those passengers, gave a result which did not vary 5 cents either way for any month during the year.

August Westermeyer, auditor, Sheboygan Light, Power & Railway Company, had accounted for earnings for five years under the system advocated by Mr. Duffy and for the past year had accounted for earnings under the system advocated by Mr. Broad. He stated that the average results showed that for his company the additional expense for counting tickets received was not warranted.

Halford Erickson, member of the Wisconsin Railroad Commission, after presenting his address on the principles of rate making, of which an abstract is published elsewhere in this issue, introduced William J. Hagenah, accounting expert for the commission, who spoke in part as follows:

STATEMENT OF WILLIAM J. HAGENAH

The classification of accounts which we have prescribed is the result of a careful study of the systems in use in this State and also those in other States. Our investigation has been as thorough as it has been possible to make it. With the assistance of the different State associations and of some of the largest and some of the most active properties in this State, we have perfected a system of accounting which we think will be satisfactory to all. We will admit that a great many of the items appearing in our forms heretofore have never been part of the records of utilities in this State, and therefore we asked you to co-operate with us. The responses to this request were not as satisfying as they might have been, possibly due to a feeling of hesitancy. However, we have tried to prepare a classification which would suit the different utilities without establishing a precedent.

The classification is divided into two major groups, Class A and Class B. The underlying principle of these accounts is the same for each class regardless of the size of the utilities. It was our purpose to prepare a classification which would admit of comparisons between the accounts used by the smaller companies and the detail accounts of the large companies.

We have also adopted in this classification another feature which consists of determining a classification of accounts by which all power used, whether produced, rented or purchased, would be accounted for. Of course steam power is the most common in use, but there is hydraulic power, and gas power generation is used quite frequently also. There is the cost to be determined of the power that is purchased, and if each utility will keep an accurate record of this the question of power accounting, whether steam, gas, hydraulic or otherwise, will be simplified. Manifestly, it will be unfair to each utility to compare the cost of power that is generated with steam with the cost of power generated by hydraulic means. This comparison should be made at the place where hydraulic and steam power are generated under the same conditions. If we did not have the separate accounts defined in this classification it would manifestly be impossible to determine the cost of power, whether for commercial purposes or for traction purposes. This cost should be made public to the patrons of particular utilities. True costs can be determined in no other way than by the separation of accounts and with the system properly followed by utilities the commission can determine whether the basis of sale is satisfactory and just to the public buying the utilities' products, and whether it should be satisfactory to the utility.

In case of hydraulic utilities we have further divided to include the transmission and transformation accounts and where needed the storage battery account. In each case, however, these accounts are separate and distinct. When the cost of gas power production is compared with the cost of steam power production at the steam power plant it is necessary that the cost in each case shall equal the worth at each point. Consequently, the cost of hydraulic power would be the cost of the steam power at the place where it was delivered.

In treating undistributed accounts in the list it is requested that those companies which prefer to distribute or itemize certain accounts shall indicate in each case the account into which the items have been distributed so that in analyzing adjustments can be made by the commission.

Accurate depreciation records have never been kept with the possible exception of a few utilities in the State. We have been unable to prescribe a basis upon which the depreciation should be allowed. The percentage is not stated in this classification. It is known, however, that depreciation is going on constantly, and it is desired that the physical and financial standing of each utility be known. This can be provided for either by making actual reduction from the revenue or gross earnings, or by making a fictitious entry in the nature of an open or unadjusted account.

It is desired that the utilities treat taxes as an operating expense. In view of the fact that operating expenses do not include depreciation and some contingencies which are incidental to a business of this nature, they are not a proper representation of the efficiency of the management or the propriety of the account.

APPORTIONING POWER COSTS

Mr. Hagenah was questioned regarding the proper charges and accounts to be used in reporting for the combined mill and electric light plant described by Mr. Alt. Mr. Hagenah said that the plant primarily was operated as a commercial business or a utility business. The proper accounts should be kept to show the total cost of power and the kw-hours produced; at the end of a month a careful analysis of the cost of the current should be made and then the power used by the electrical department should be charged against it. The first thing to do was to find the cost of the service and charge it to the electric department.

Mr. Duffy said that as rates for current were fairly well established in Wisconsin the electrical department should charge itself with the purchase of current from the hydraulic department just as if that current had been sold to some other company; and the question for the management to decide was the exact rate per unit to be used in making the charge.

Mr. Gonzenbach called attention to the fact that in determining this unit rate it would be necessary to take into account the fixed expense for the plant and have the rate include a charge for the readiness-to-serve condition.

Commissioner Erickson stated that in order not to work any hardship on the electric railways, the Wisconsin commission had been inclined to accept in general the railway accounts formulated by the Interstate Commerce Commission. The Wisconsin commission had decided to adopt the Interstate classification with the exception of that part which related to power plant output. For that subject it desired the public utilities to adopt the classification provided for the electric light companies. Thus, he would recommend that the combined railway and lighting properties which were to change over to a specified system of accounting on July 1, adopt the Interstate Commerce Commission classification for the railway end, and the Wisconsin commission accounts for the electric light department. While the Wisconsin commission had prescribed a classification of accounts for electric utilities it was not the intention that the companies be compelled to keep these accounts. The purpose was largely to have a system of accounts under which the utilities could make detailed and definite reports to the commission. The accounts might be subdivided to suit any convenience of the utilities so long as they were not separated until they could not be combined properly in reports to the commission.

RATE-MAKING FOR PUBLIC UTILITIES*

BY HALFORD ERICKSON, MEMBER RAILROAD COMMISSION OF WISCONSIN

The so-called public utility law of this State has made it one of the duties of this commission to prescribe uniform systems of accounting for the various public utilities which are included in the provisions of this law. Our commission has endeavored to comply with this requirement. To that end we have prepared classifications of accounts, together with blank forms for annual reports. Some of these classifications and forms have already been sent out and are now in the hands of the parties for whom they are intended. Others are in the hands of the printer; and there are also some that are ready for the printer. The printing, however, is not likely to require a great deal of time and we, therefore, expect to be able to distribute them among the various utilities at an early date.

In developing these classifications and forms we have earnestly endeavored to perfect systems of accounts that are not only sound from a theoretical point of view, but that also will fit in with or apply to the various conditions under which the different utilities are operating. To this end we have made as thorough a study of accounting principles as it was possible for us to make in the time allotted for this work. We have also examined a large number of accounting systems now in use in this and other States. We have held frequent conferences with representatives of the various utilities in this State for the purpose of obtaining their views and co-operation in this work. We have also carried on a voluminous correspondence with most of these utilities for the same purpose. The result is that the work we have performed represents views and thoughts that have been obtained from many sources and in a great variety of ways.

Upon some of the utilities in this State, particularly the larger ones that can afford to, and that keep very complete and up-to-date records of both their financial and other transactions, our demands for information and suggestions have indeed been heavy.

These demands have invariably been cheerfully met. Their managers, comptrollers and accountants have not only devoted a great deal of time to our work, but they have also opened their books and records for our inspection. This assistance has been of great value to us. Many of those who have thus assisted us are present here. I take this opportunity of expressing my personal appreciation, as well as that of the commission, for all the courtesies that in various ways have been extended to us by those who are operating public utilities in this State.

Our efforts in connection with this work have been mainly directed toward the development of such classifications and statements of the gross earnings, operating expenses, net earnings, fixed charges, expenditures for construction, and the operating statistics generally of the various utilities as would seem to be demanded by existing conditions, and as it is thought would aid us and everybody concerned in obtaining a better understanding of the many intricate problems that are constantly arising in connection with the operation of these utilities.

It is not my intention to here enter upon any detailed discussion of these classifications or work, either as a whole or in part. All I had thought of doing at this time is simply to point out a few facts which tend to show the importance of a detailed classification of the operating expenses and a correct and suitable system of accounting from the point of view of rate-making, and to understand the conditions under which the plants are operating. In order to do this it will be necessary for me to say something about the investments that are required in such plants and the relation which both the earnings and the expenses bear to these investments. In this connection it will also be necessary to call attention to the nature of the services or products that are rendered by such plants and to the rates that are charged by them for these services, as well as to certain other facts that are more or less closely related to the question under discussion.

*Abstract of paper read before the joint meeting of Wisconsin Electric & Interurban Railway Association, Northwestern Electrical Association and Fox River Valley Gas & Electrical Association, at Sheboygan, Wis., April 12, 1909.

SCIENCE OF RATE-MAKING IN A BACKWARD STATE

There are many reasons why I desire to emphasize rate-making at this particular time. Rate-making is one of the most important features in the management of public utilities. The rates they charge for the services they render constitute the means by which their revenues are obtained. It is because of the right to make such charges that private capital enters such undertakings.

One would think that a feature as important as this ought to be thoroughly understood, not only by those who make and collect such rates, but by those who pay them. But this is not always the case. In many instances there appears to be an almost woeful lack of sound information as to how a reasonable, just and equitable rate schedule should be built up. The result is that many of the rate schedules that are now in effect appear to be built up on mere guesses, without much of any reference to any other factor than expediency. They are often so constructed as to be inequitable to both the owners and the customers of a plant, and to make extensions of the business almost impossible except perhaps by underhanded methods. All this has led to a situation that is far from what it should be. It is to a considerable extent responsible for the fact that the science of rate-making is in a more backward state and, generally speaking, less well understood than almost any other feature that pertains to the operation and management of such utilities.

A rate schedule to be sound must to a considerable extent be based upon the cost to the plant of furnishing the services it covers. By this is not meant that this cost is the only element that enters into rate-making. There are many factors that must be considered in this connection, but none of these would seem to be of more or even of as much importance as the cost in question. As this cost depends upon the value of the plant or the amount of interest the owners are entitled to thereon, as well as on the operating expenses, depreciation and other items of this character, it is manifest that rate-making must be very closely connected with accounting and other operating records. In fact, this connection is so intimate that a correct method of rate-making is almost out of the question unless the financial and other records are properly kept. The former is dependent upon the latter. Some reference to what is involved in fixing rates would, therefore, not seem to be out of place here.

It is not my purpose, however, to endeavor to outline in full any sound method of rate-making. All I desire to do, all I hope to be able to do, is simply to briefly discuss a few of the more important elements that should be considered in this connection; most of these elements, which are so essential in building up a rate schedule, can be obtained and made available only where all the records of the utilities are properly kept.

EXTENSIVE FIXED INVESTMENT REQUIRED

Public utility corporations are of such character that in order to be properly equipped for performing the services which they render to the public, they require an extensive and costly fixed investment. An electric plant, for instance, must have large power houses and other buildings, costly machinery of various kinds, miles of wire and pole lines, and a great deal of other equipment. All this costs money. In fact, the investment required is usually several times as great as the annual gross earnings. This is also in a measure true of many manufacturing plants, although since these may be kept more steadily in operation their annual sales usually constitute a considerable proportion of their investment. In commercial enterprises, on the other hand, the fixed investment is relatively small and their capital is usually turned over several times each year.

While in some respects the products of public utilities may be regarded in the same light as other manufactured commodities, a little examination of their nature will show that this is not in every respect in accordance with the facts. Electricity, for instance, seems to differ from the ordinary manufactured articles in this, that it is more in the nature of a service than of a commodity. This is also true of transportation. While gas and water are in a sense commodities, the character of their delivery and use is such that even gas plants and pumping works are performing services for their customers rather than produc-

ing commodities for them. The fact that all of these utilities are producing something which is measured and sold at given prices per unit, very much like ordinary manufactured articles, would not seem to change the situation in this respect.

Electricity also differs from ordinary manufactured goods in this, that it cannot be manufactured at a constant rate and stored and disposed of as the demand for it may dictate. For some productive undertakings, for instance, the situation is such that the time of production can be determined by their management. For other undertakings, again, the conditions are such that the time of production is determined by the parties who are served. In the case of many manufacturers it matters but little just when their plants are in operation as their products can be and usually are stored until wanted. In other cases, again, such as in electric plants, the service they furnish must be rendered when desired by their purchasers. For those who come in the former class the size of the plant can be adjusted to the total output. For those who come in the latter class the size of the plant is determined by the maximum instantaneous demand. For a given demand the plant must be as large when this demand continues only a short time per day as if it were constant throughout the entire 24 hours.

A plant that must stand ready to furnish service the moment it is called upon to do so is also apt to have a relatively high cost for fuel for power and for wages. In other words, the cost per unit of the services they render is apt to be relatively much greater than it would be if the demand was more constant. While electric plants furnish the best example of plants that come in the latter class, what is true of electric plants in this respect is also in the main true of gas plants and water works. While the latter have some advantages over electric plants in the way of storing their products, these advantages are by no means as great as in other manufacturing industries. Gas, because of its nature, can be kept only for a limited time. This is also true of water. Both must also be kept under constant pressure, which of itself is costly. The equipment of an electric railway in a city must be adequate to accommodate the heavy travel that often occurs mornings and evenings, although the equipment then required may be very much greater than the equipment that is needed during the rest of the day.

The furnishing of electricity is a service that must be rendered simultaneously with the demand for it, and since electricity cannot be stored it is evident that the generating, distributing and measuring equipment of the plant must be ample for handling the maximum demand that may be made upon it, even if this demand does not last but a few minutes or hours each day.

From these facts it is clear that the size or the capacity of an electric plant is determined by the instantaneous maximum demand that is made upon it by its customers. In other words, this demand fixes the investment that is necessary for the performance of the services in question. Since the period during which this demand continues each day is usually comparatively short, it also follows that the investment required for such plants when measured by their output or product is found to be relatively very high.

DETERIORATION AN EXPENSE

These facts relating to the nature of the services furnished by electric plants and to the relation between the investment and the output, are important because of the light they throw on the expenses that are involved. The plants are deteriorating with age. This is due partly to wear and tear and partly to natural decay and obsolescence. This deterioration is an expense. It must be met by the owners and is properly chargeable against the revenues. The same is true of a reasonable rate of interest on the amount invested. Both of these items depend very largely upon its size or capacity. That is, they are greater for larger than for smaller plants. Taxes and insurance are other items that come in the same class, and this is also the case for certain other expenses. The greater proportion, if not all of these expenses, is directly proportional to the investment. They increase with increases in the investment. As the investment in turn depends upon the maximum instantaneous demand, these expenses are also more or less closely dependent upon this demand. This is as true for each user of current as for the plant as a whole.

The items of expense which have thus been explained are usually classed under the head of fixed expenses and constitute that part of the total cost which as a rule is not affected by the output or by the extent to which the plant may be used. They are as large when the output is at a minimum or even when there is little or no output as when it stands at the maximum. What has been said concerning them clearly indicates that they are as great for a consumer connected with the plant who is using little or no current, but whom the plant must hold itself in readiness to serve, as for a consumer with a like installation who is using a great deal of current. The former has the capacity to demand current at any time to the full extent of his installation. This the plant must be ready to furnish. In other words, the capacity of the plant must be great enough to meet this demand when called for.

The expenses thus spoken of are as stated directly dependent upon the investment that is required for the consumers, and that must be made in order that they may be served. But they constitute only a part of the cost of operation. The plant must be kept running in order to produce and deliver current whenever it is called upon to so deliver it. In other words, the plant to render the service required must not only be a completed plant but it must be kept in constant operation. To keep it in operation, however, entails further outlays. No electric plant can be kept running or be made to produce anything except at considerable expenditure for fuel or power, water, waste, oil, lamp renewals, and for such repairs, renewals, labor, supervision and other items as are required for the operation of the plant and depend upon the same. These items are called the running or variable expenses and they depend upon the output. They increase as the output increases and practically in the same proportion.

DETAILS OF FIXED AND VARIABLE EXPENSES NECESSARY

In order to be able to make rates that are just and equitable, and to obtain a safe basis for the greatest possible extension of business of the plant, it is absolutely necessary to have on hand full data showing the details and the totals of both the fixed and of the variable expenses of a plant. Such knowledge, it seems to me, is essential both to the rate-makers and the managers. Without it much of the work of both must, to a large extent, be based upon estimates rather than upon actual facts.

While detailed information with respect to both the fixed and variable expenses of a plant is almost indispensable, such information is not easily obtained. The reason of this is found in the nature of these expenses. Some items, for instance, are such that they come directly in either one class or the other, and can be easily picked out. Other items again are such that while they come wholly within one or the other of the two classes, they are usually so mixed up with each other that they cannot be separated except by careful classification and recording at the time they are incurred. There are still other expense items which do not come wholly within either class and which, therefore, will have to be apportioned between these two classes on some arbitrary basis, which arbitrary basis in turn will largely depend on the relation which the balance of the two classes of expenses bear to each other. In fact, most of the expense items are so inter-related that they cannot be exactly separated between the fixed and variable classes except by a careful classification and analysis upon the original records. This may apply to such items as interest, depreciation, etc., as well as to many other items.

Since a classification of expenses which has thus been found to be necessary is combined with so many obstacles and difficulties, the question naturally arises: How can the separation be best and most economically made? The answer to such a question has already been suggested. It is, that such separation cannot often be accurately made except when the accounts and records are properly kept and adjusted to conditions under which the plants are operated. While the accounting systems which we have prepared should not be classed with cost accounting, they have been prepared with a view of so classifying the various expense items that in most instances under them the work of separation may become easier than now is the

case, and that safe bases may be found upon which to apportion the common items.

It is true that our classifications do not go as far in this respect as might be desirable. At the same time they go as far in this direction as it was possible to make them go without coming in too serious conflicts with present practices of accounting that are regarded as sound from other points of view. In fact, the necessity for a more accurate separation of the fixed and variable expenses than is possible under many of the present methods of accounting constitutes one of the strongest arguments for improvements in accounting methods in so far as public utilities are concerned.

COST OF THE PLANT

What has been thus said with respect to correct classifications and records of the operating expenses proper would also seem to apply with equal force to the cost of construction and extensions as well as to the operating statistics in general.

The cost of the plant should be known, because of the important part it plays in fixing the value of the plants for rate-making purposes, or in fixing that value upon which the owners are entitled to reasonable returns. Operating statistics generally, which are too numerous to specify here, are also necessary, not only to those who are making the rates, but to those who are managing the plant. In fact, they are almost indispensable to both of these functions.

The subject of rates and rate-making is one that is very close to us. In one form or another it is involved in most of the cases that come before the commission. While we are doing all we can in solving this problem we find it an exceedingly difficult one to deal with. While many of the principles and facts that should be considered in rate-making are now fairly well understood the bottom has not been reached. I am quite certain that those among us are few who do not have a great deal to learn before we can say that this subject has been fully mastered. To make a rate schedule that under all conditions is equitable to each of the various classes of customers; that yields a reasonable return on the investment, or that is fair and just to all concerned; and that will also assist in promoting or extend the use of the current, is, indeed, a difficult task. It is a task that is worthy of the best efforts not only of those who are actually operating such plants, but of commissions such as ours. It is a problem in the solution of which we need your earnest and frank co-operation.

RECORDS SHOULD BE FULL

Besides those given there are numerous other reasons why the financial, and even other records, should be as complete and as detailed as possible. One of these is that without such records it is almost impossible to obtain a correct statement of the net earnings of a plant. Correct statements of the net earnings are necessary in order to understand both the financial and the rate situation of any given company. This is self-evident. Yet the accounts of so many companies are so incomplete that they often do not contain nearly all the elements that must be taken into consideration in preparing an accurate statement of the net earnings. In many cases no account at all is taken of depreciation. In other cases again depreciation is inadequately stated. Many other items are also over- or understated. The cost of ordinary repairs, or maintenance, for instance, is sometimes charged to construction, while in other cases maintenance expenses include items for new additions which belong either in the construction or in some other account. The result is that the accounts of such companies are often misleading, and point to conclusions that are entirely at variance with the actual situation.

When the operating expenses fail to include all items that should be included therein, the net earnings become overstated and show a false prosperity of the plant. When the operating expenses include more than there should be included in them the net earnings become understated and indicate that the plant is not as prosperous as it actually is. The situation in both cases is apt to be injurious to the plant. In the former case it may lead to rate and other complaints that are not warranted by the conditions, and which would not have arisen if the actual situation had been known. Under the latter showing the plant in the long run is apt to be injured in other ways.

PRACTICAL APPLICATION OF THE NEW WISCONSIN ACCOUNTING SYSTEM*

BY GEORGE ALLISON, COMPTROLLER, EASTERN WISCONSIN RAILWAY & LIGHT COMPANY AND WISCONSIN ELECTRIC RAILWAY

The object of this paper is to show the practical application of the new accounts in connection with a combined railway, electric and gas utilities company.

We realize that every company in the same line of business will show the final net results from operation in practically the same general form. All companies do not, however, follow uniform methods of accounting to arrive at these results. Owing to these conditions, I am compelled to deal strictly with the various new classifications as they have been applied to the systems of accounting formerly in use by our companies, the Eastern Wisconsin Railway & Light Company, at Fond du Lac, and the Wisconsin Electric Railway Company, at Oshkosh.

The system used in the railway department at Fond du Lac was based virtually on a condensed classification as adopted by steam railroads, while at Oshkosh the American Light & Traction Company's form was used.

I wish to emphasize that in adopting the new form it was necessary for me to consider, in addition to our Wisconsin companies, three Illinois companies, two of which are operating on hydraulic power.

For the convenience of members, copies of our new form have been prepared. These forms have been made on a duplicator, for the reason that we have not as yet adopted a standard printed form, preferring to try the system, so as to permit any changes or additions in the accounts or statistics, if found necessary.

RAILWAY DEPARTMENTS

In the railway departments we have adopted Class B, and in the electric and gas departments Class A.

Beginning with the city railway department, operating revenues, under "revenue from transportation," we have used "passenger," "chartered car" and "miscellaneous" revenues. In addition to this, we separate "tickets collected" and have opened this account for our own information and convenience.

In the interurban railway department we have made use of a few necessary extra accounts in addition to those adopted for the city department. Formerly we considered receipts from advertising and the various rental accounts for the separate departments as "revenues from transportation," but under the new classification these now appear as "revenues from sources other than transportation."

Our previous monthly exhibits of gross earnings have been condensed somewhat, and the new subdivisions of accounts for operating revenues are giving us greater detail, combined with speedy reference.

Our former arrangement of schedule of operating expense accounts, although condensed and somewhat different from the new arrangement prescribed, was, on the whole, very satisfactory.

The principal change in all of the classifications is the addition to operating expenses of "depreciation," "taxes" and "contingencies."

In "way and structures" we have found it advantageous to go a little beyond Class B by subdividing the "maintenance of roadway and track" and adding "maintenance of paving," "removing ice and snow" and "cleaning and sanding track." These last two accounts were formerly in use with our company and were then included under "conducting transportation."

We find it somewhat difficult to apportion the proper charges to the many subdivisions of "maintenance of electric lines," and in the future will probably adopt Class C for this item. Our previous system classified all of this maintenance under "overhead system repairs." Our report at present shows but one account for "miscellaneous maintenance of way," and we may find it advisable to open additional accounts under this heading, to guard against having too many doubtful items charged to this account.

Formerly we made all subdivisions of charges direct to

*Abstract of paper read before Wisconsin Electric & Interurban Railway Association, Sheboygan, Wis., April 12.

their respective accounts, and therefore did not use the term "other operations, debit" or "credit."

Under "equipment" it was necessary to add the "maintenance of power plant equipment" and "maintenance of substations, transformer station and storage battery equipment." Both of these were formerly included under our Fond du Lac system in the proportion of "power" charged to "conducting transportation." "Traffic expenses" were included under "conducting transportation."

The next group of operating expenses is "conducting transportation." Owing to the fact that our power is subdivided among the different departments, I have made but one proportionate charge under this heading, excluding "maintenance of the power plant equipment." I will later go into the details of our general power plant expenses account.

For our own reference, we have found it necessary to separate the "wages of motormen" from those of "conductors."

An account has also been opened for the "heating of cars." These subdivisions are not required by the commission. We have also included "power purchased," for the reason that this charge is made on account of our interurban railway only.

Under "general expenses" we have also made a proportionate charge on account of distribution to the various departments.

The group of "undistributed accounts" for the various departments includes "injuries and damages," "insurance," "rent of track and terminals," all of which formerly were included under "conducting transportation." In the standard classification these accounts are under "general." The "stationery and printing" was charged to "general expense." "Rent of equipment" was not provided for in the old classification.

It has been necessary to open an additional "undistributed account" as a general charge, for the reason that we have some items that are of a general character and not chargeable to any particular department.

Having referred to "depreciation," etc., together with "revenue from sources other than transportation," we come to the "proportion of deductions from gross income." In order to correctly distribute this charge to the different departments it is necessary to know the actual capital stock and bond issue for each department.

ELECTRIC UTILITIES DEPARTMENT

We next have the electric utilities department, the operating revenues of which are identical with those that were formerly in use. All of the non-operating revenues are additional accounts except the "profit on merchandise sales" and the "wiring and installation work." There is much more detail in the new subdivision of operating expenses prescribed by the commission. The charge for "power" is made proportionate, the same as in the railway departments. Formerly our "customers' installation and repairs" included the following new accounts: "Labor removing and resetting meters," also "transformers," both of which now appear under "distribution." "Customers' premises expenses" is now listed under "consumption." Our former account for the repairs and replacement of tools and implements of this department is now charged to "miscellaneous distribution system operating labor" and "supplies and expenses." We now also have an additional account, "meter department supplies and expenses."

"Maintenance of transformers" and "Maintenance of meters" were formerly combined as one account.

The group of "consumption" accounts are identical with those formerly used.

A number of accounts under "commercial" were formerly included in the "general salaries and expenses" account, except "promotion of business salaries and commissions" and "supplies and expenses," which was known as one account, "canvassing and advertising."

"General expense," proportionate charge, follows the same routine in this department as in the railway; and this also applies to the gas department.

GAS DEPARTMENT

In the gas department, among the "operating revenues," the only additional account necessary was "power earnings." Under the "non-operating revenues" we formerly had but one account, "profit on merchandise," and this included the profit on "piping and connections."

Reference to the operating expenses of this department shows that the prescribed accounts, in general, have gone into greater detail than we had heretofore.

Under the "production" group we had but one account, "manufacturing labor," and this included the following new accounts: "Retort house labor," "purifying labor," "miscellaneous labor" and "operating labor for steam." The "water for steam" and the "retort supplies and expenses" were called "manufacturing supplies."

All of the maintenance accounts were grouped in a "works repairs" account.

DISTRIBUTION

The operations were formerly classified into two accounts, "distribution labor" and "distribution supplies." The "maintenance" accounts, being identical, did not require any changes. The subdivisions for the "commercial" accounts required the same changes as installed in the electric utilities department, because we had but one account, and this was known as "canvassing and advertising."

The changes installed in the balance of the accounts for this department harmonize with those in the railway and electric utilities departments, explained previously.

APPORTIONMENT ACCOUNTS

I will now take up the general accounts, from which proportionate charges to the various departments are made. The "power plant expenses" account is apportioned on the basis of the kw-hour for the different departments. The "general expense" and "undistributed (general)" accounts are charged on the basis of the gross earnings for each department.

In connection with the "power" account, you will note that in addition to "steam power" I provided for "hydraulic power." This was necessary because some of our Illinois companies are operating by water-power. I have tried a combined power account for steam and hydraulic, but found it would not answer our purpose, owing to the fact that if for any reason the Illinois companies should be compelled to run on steam power, we would find it very difficult to determine the exact cost of either power.

While, in reality, there are no new accounts in the power item over those formerly used, the commission's accounts are in much greater detail. The power accounts which I have adopted are so arranged that, while there is a considerable difference between the various power accounts for the different departments, we can give the commission all the information required from any of the departments without being obliged to go into any additional details. On account of a variation in the new arrangement of the "maintenance of power plant" charges for the railway department and electric utilities department, I have found it necessary to show one subdivision of the total power charge including "maintenance," and another excluding "maintenance." In the railway department this maintenance is included under "equipment" group.

In the "general expense" account you will find the addition of the account "Railroad Commission expense."

There have also been added the maintenance accounts for the general office buildings, fixtures and grounds and the office equipment.

UNDISTRIBUTED GROUP OF ACCOUNTS

I have found it necessary to establish among the general charges an "undistributed" group of accounts, which covers "stationery and printing" not chargeable to any department, and also includes the "operation of the general stores department," "maintenance of stores equipment" and "maintenance of stores department buildings, fixtures and grounds."

On account of operating but one storeroom for all of our departments, we found it extremely difficult to properly subdivide the accounts to the different departments, and after a conference with William J. Haganah, statistician of the commission, the general form that we have adopted was approved by the commission.

We next have the group called "recapitulation of all departments." It is unnecessary for me to enter into any lengthy explanation of this; suffice it to say that if an ab-

breviated general statement of all the accounts is sought, it will be found here.

A considerable amount of detail is required for the "construction and equipment" accounts of the various departments. It is rather difficult to follow the numerous detailed accounts, but I agree with the commission that it is advisable to start with a large number of accounts and reduce these as the occasion arises and necessity requires.

The "stock" accounts have been reported to us under one general account in the general balance sheet, "material and supplies on hand." We have a separate stores department system.

The statistics for the various departments have been adopted to meet our immediate requirements, and, therefore, should not be considered final. We are trying them out, and shall add or drop statistics from time to time, as necessity requires.

We are comparing this year with 1908, putting both on the new classification prescribed by the commission. This involves considerable additional work, but we feel that we will get the benefit of the same in our monthly reports for next year.

With our companies the next application of the new systems of accounting has entailed considerable labor, yet, as in the case of Mike O'Hara, we have found it possible to meet the situation by diligently applying ourselves to the task. Mike O'Hara, who was long on work but short on spelling, got a job on the police force of Milwaukee. Soon after he reported for duty, a policeman was wanted to shoot a horse that had broken a leg. Mike was assigned to the job. He boarded a car and got off at Sixth Street. Walking down a few blocks he found the crippled horse and with two shots put the horse out of its misery. He then got out his notebook to put down the name of the horse, the owner, etc., and then looked up to see the name of the street on which the accident occurred. The street sign showed Sobiesky and Kosciusko Streets. Mike looked at this jumble of letters for a minute. His pencil wavered. He then put the book back in his pocket, caught the horse by the tail and dragged him to the next corner.

As explained in the early part of this paper, the systems of accounting previously in use at Fond du Lac and Oshkosh were not uniform, the Oshkosh property being a recent acquisition. It was apparent that a standard form or monthly report for both offices was a necessity. The idea of putting into effect the Railroad Commission's new classifications of accounts was coincident with the desire to standardize the reports.

COMMISSION'S ACCOUNTS WELL ARRANGED

As we began the work of changing over to the new system it became self-evident that the commission's accounts were well arranged, and in rearranging the electric and gas utilities departments we were surprised and pleased to observe the well-designed manner in which the various accounts of these departments could be meshed with those of the railway. Upon observing these conditions in the actual work, I could not refrain from remembering the spirit evinced by our commission in striving hard to harmonize accounts of a similar nature, but pertaining to different departments.

The commissioners have been exceedingly courteous and have responded most generously to our numerous requests for information and assistance. They have been the first to break away from the position of the Interstate Commerce Commission, that the old steam railroad classification must be followed, and by so doing we feel that they are abreast with the times and have set a good example for other commissions.

Four three-phase locomotives possessing a number of novel features have recently been built for the Valtellina Railway by Ganz & Company, Budapest. Each carries one 8-pole motor and one 12-pole motor, both of which are connected to the three pairs of driving wheels by crank-arms. When running with the 8-pole motor alone the speed is 40 m.p.h. and the tractive effort is 12,100 lb. With the 12-pole motor alone the speed is 26 m.p.h. and the tractive effort 12,100 lb. and with both motors in cascade the speed is 16 m.p.h. and the tractive effort is 14,500 lb. The total weight of the locomotives is 62 tons.

METHODS OF CHANGING THE OLD ACCOUNTS TO THE NEW*

BY B. G. BROAD, AUDITOR AND PURCHASING AGENT, MILWAUKEE NORTHERN RAILWAY

The Railroad Commission desires that we redistribute our accounts and maintain them hereafter in an intelligible form so it may judge accurately the condition of each public utility over which it has jurisdiction and recommend, possibly, necessary changes that may better the community served and the company's property.

There should be no serious difficulty in arranging the mechanical appliances to secure the bookkeeping results nor should the "methods of changing the old accounts to the new" be a scare-crow. We receive money as before and spend it as sparingly now, if not more so, than a year or so ago. Therefore, it is a question of distribution only. We used to be able to keep all of this record on one book which we carried in our hip pocket, with the result that we knew we made money or lost money, but were unable to analyze or tell truly why we did. Now, we prepare our accounts and methods as carefully as an engineer draws his specifications and, I personally believe, much more so. We must absolutely know the details of all departments, the policy of the management and the scheme of financing in order to record truly the operations of a company, as every act of every officer or employee is reflected in the accounting department sooner or later. The accounting department is the pocketbook of the individual which, as you know, is the vital part of any business.

It is necessary to bear these facts in mind when changing over the old records to the new, and be mindful to look at the situation in its entirety so as not to be lost in a mass of detail. There are several methods of effecting this change; among them I suggest:

First—By closing your books as at any fiscal period and reopening them under the new schedule. This can be done very easily by preparing beforehand the forms and educating the heads of departments and employees to the use of the new schedule. The capital accounts will remain the same, as will the cost of property and all fixed accounts, such as taxes and reserves. The open construction and equipment accounts will probably need adjustment unless they be absorbed into capital and property accounts. The only difficult point in this method is to teach the operating heads of departments to distribute their expense according to the new schedule.

Second—There is that laborious, painfully accurate but fruitless attempt at redistribution by practically rewriting your books. I have known companies to hire so-called experts to check over old books and try to make dead history read as a modern narrative with the result that either their object is lost before they are through or their story is the same old pitiful canard. Just think what a job it would be to change the charge on 10,000 or more vouchers, to recapitulate these charges to sense; to reclassify the earnings of each day for several years and to uncover the fact that dividends paid were not really earned, as we had neglected to provide any "Duffy" reserves.

REDISTRIBUTION BY PERCENTAGES

However, there seems to me to be a fairly good scheme as a third suggestion toward redistributing open accounts while still operating our cars, lighting systems and gas jets. That is, a percentage system.

The new classification follows closely the standard adopted heretofore by public utilities in other States; especially is this true of the classification for electric railways, as is shown by the following comparison:

The grouping of the operating expenses of the standard classifications which has been adopted by the American Street & Interurban Railway Accountants' Association is as follows:

Maintenance of way and structures.
Maintenance of equipment.
Operation of power plant.
Operation of cars.
General.

*Abstract of paper read before Wisconsin Electric & Interurban Railway Association, Sheboygan, Wis., April 12, 1909.

In the new Wisconsin classification the accounts are grouped as follows:

Way and structures.
Equipment.
Conducting transportation.
Traffic.
General.
Undistributed.

From this comparison it will be noted that the first two headings in each grouping are practically similar. The next two, "operating of cars" and "operation of power plant," are grouped together under one heading, "conducting transportation," although the subdivisions or refinement accounts are kept practically the same. These were amalgamated probably to conform with the provisions of the Interstate Commerce Commission, which, you know, is prone to abide by the counsels of steam railroad accountants who know nothing of a central power station, but consider power as a part of a train.

"Traffic" has been added as a new group; and, well, too, as we are now quite ambitious imitators of commercial railroads, with our lodge-joining general agents, genial park managers and publicity departments. Certain items that were included in the general account of the standard classification have been segregated and placed under a new group called "undistributed." This refinement is readily taken care of by percentage, provided that local abnormal charges are considered, such, for instance, as a very heavy charge because of accidents. As all accidents were charged to "damages" under the old classification, you will readily see that one expensive accident would sadly derange the entire percentage scheme.

DISTRIBUTION OF TOTAL OPERATING EXPENSES

As the grouping of these two classifications is so similar you can see that, having the relative percentage of the old standard, it is an easy matter to prorate the operating charges to the new distribution. Roughly I have figured the percentage of the American standard as follows:

	Per cent
Maintenance of ways and structures	8½
Maintenance of equipment	8½
Operation of power plant	35
Operation of cars	32
General	16

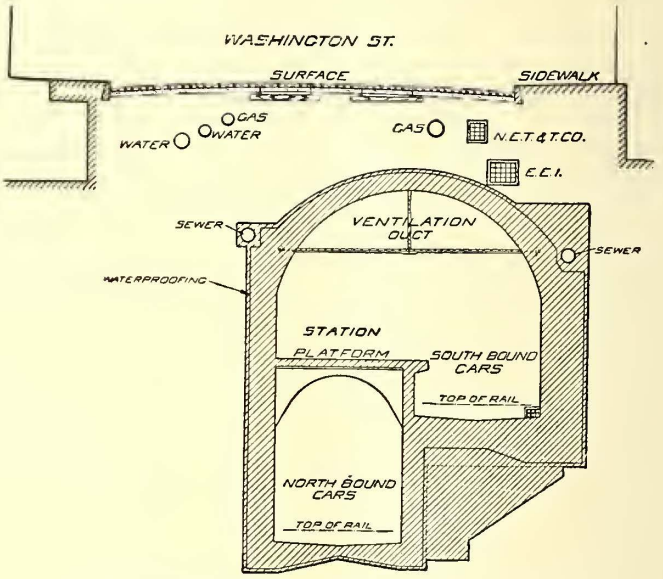
Although these proportions are taken from a yearly record, still they may vary somewhat, but an average may readily be obtained by application to any road that has used the old standard. Further refinement may be obtained by working out the percentage of the subdivisions and applying the same method of disposition. As stated before, the capital and property accounts do not need to be changed. The open construction and equipment accounts must be dealt with individually as local conditions may warrant.

The revenue accounts are practically the same as the old standard except under different names and can readily be redistributed to comply with the new provisions. Care should be exercised in keeping charges against revenue out of operating expenses, for often gross operating expenses are swelled abnormally by amounts that should be deducted from the revenue and should not be charged into operating expenses, such as park receipts, rental of cars maintained by the company, etc.

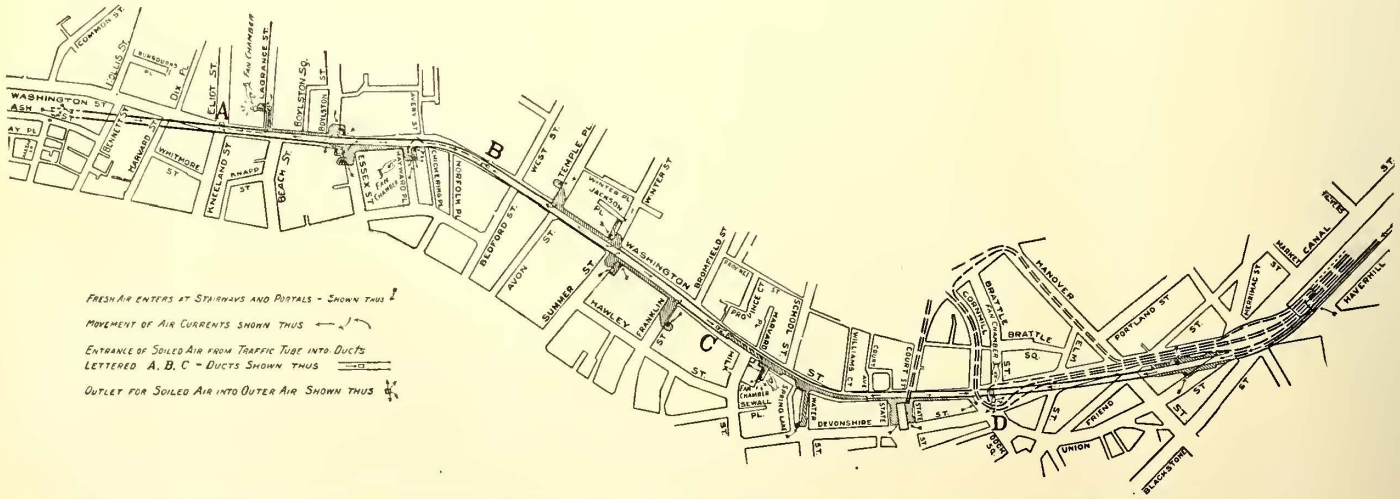
There may be methods that seem more simple as the local conditions may require; for as the methods of making the change are left to us individually to work out as best fits our bookkeeping systems, the task is merely a local one and should not cause undue worry. The essential thing to consider in making this change of old accounts is to have it a true record and thoroughly intelligible to the managing officers and the Railroad Commission.

VENTILATION OF THE WASHINGTON STREET TUNNEL, BOSTON

In the account of the Washington Street subway, Boston, published in the Electric Railway Journal for Nov. 28, 1908, a short statement was published of the system of ventilation employed. As in the original Boston subway and in the East Boston tunnel, fresh air is admitted at the stations and portals and withdrawn from the tunnel at points about midway between.



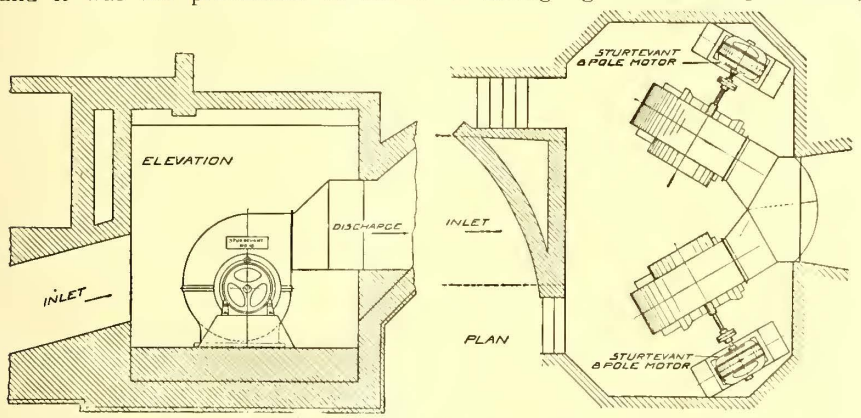
Cross Section of Tunnel at Milk Street Station



Plan of Washington Street Tunnel, Boston, Showing Location of Fan Chambers and Direction of Air Flow

The map shows the location of the fan chambers and the direction of air flow, which is indicated by arrows. At each of the four points, *A, B, C* and *D,* the air in the

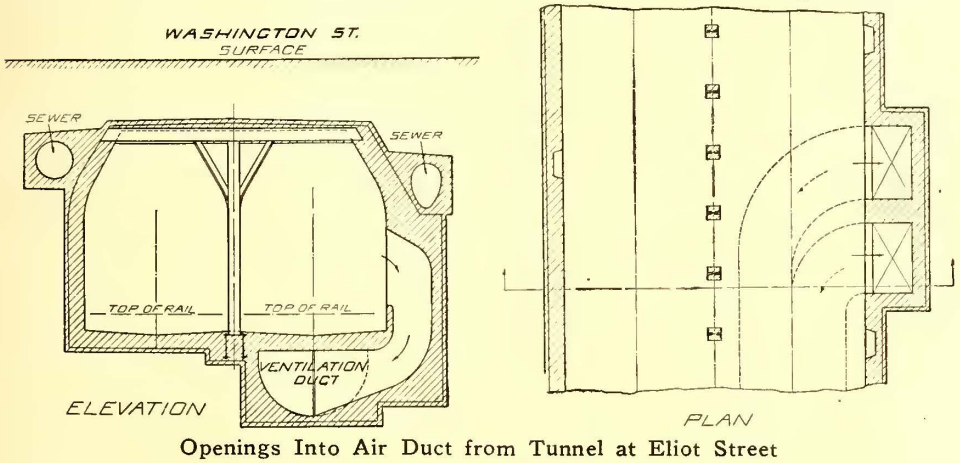
tunnel enters a duct which leads to the nearest fan chamber. In some cases the ducts are beneath the tunnel, as at Eliot Street, or at the side, and in other places, such as at Milk Street, they are above. These ventilating ducts have a cross-sectional area of at least 40 sq. ft., which results in a velocity of air in the tunnel of about 1 ft. per second, equivalent to a change of air in each section of at least three times per hour. The vitiated air is discharged by means of ducts, because the location of the buildings made it impossible to discharge the air at the points where it was desired to take it from the tunnel, and it was not practicable to deliver it through grated



Fan Chamber at Lagrange Street

areas in the sidewalk on account of the large number of people passing in the daytime.

As an example of the operation of the ventilating system, the section having the fan chamber near the Old South Meeting House, at Milk Street, may be considered. Air enters at the entrances at Summer Street, Franklin Street, the Old South Meeting House, Water Street and the Old State House, at State Street, as shown by the arrows, to the arch duct *C*. The foul air entering the duct at *C* flows to the fan chamber near the Old South Meeting House, which is a distance of about 270 ft., and is there discharged into the atmosphere by means of the motor-driven electric fan. At La Grange Street, Haymarket



Openings Into Air Duct from Tunnel at Eliot Street

Place and the Old South Meeting House the exits for foul air on what was formerly private ground. At Adams Square, however, the discharge is through a grated opening on the easterly side of the Adams monument.

The fans used for ventilating the Washington Street Tunnel are of the Sturtevant multivane type, driven direct-connected by Sturtevant eight-pole motors. These fans consist of a wheel made up of 60 blades securely riveted to the side plates and to the steel arms, the other extremity of which is cast in the hub. The blades are spooned to add strength and stiffness to the wheel and to distribute equally the air pressure within the fan. The speed varies from 225 to 250 r.p.m., and the capacity of the fans is 25,000 ft. of air per minute.

BRAKES*

BY F. D. MILLER, NATIONAL BRAKE COMPANY, BUFFALO.

During the month of March I was invited by some of your members to address a few words to the committees of the Iowa State Legislature on the subject of brakes, and more particularly on the comparison of the modern hand brake with the air brake for service on medium-weight city cars. After these hearings your Mr. Crafts addressed a letter asking me to prepare a paper embodying as much of the argument used before the Legislature as might be of interest to you. It is quite a different proposition to speak to a legislative committee on a subject with which they are not supposed to be conversant and to address the same words to men who are perfectly familiar with all the points covered, and expect to receive from them the same attention and interest. I shall, however, try to make good my promise.

There are very few roads which do not have, no matter what the weight of the car or whether equipped with air brakes or not, a hand brake by which the car can be controlled, not only under ordinary circumstances, but in cases of emergency. The only force which can be utilized in stopping a car is that which arises from the resistance which the rails present to the sliding of the wheels. Hence the problem of designing a brake rigging resolves itself into determining what is the maximum of this force and in laying out a rigging which will give a pressure between the shoe and the wheel just under that required to slide the wheel.

To determine the maximum retarding force we must determine the coefficient of friction between the wheels and the rails. This obviously will vary with the weather conditions and the condition of the rail, but from a large number of experiments it is found to average about 0.18 of the weight of the car on the rail. The weight, and not the length of the car, as in the case of the bill before your Legislature, is the proper starting point for considering what method of braking shall be used. With a coefficient of 0.18 between the rails and the wheels, there is required to skid the wheels a ratio of brake shoe pressure to the total weight on the braked wheels as follows: At 7½ m.p.h., 70 per cent; at 20 m.p.h., 95 per cent; at 40 m.p.h., 120 per cent, and so on. These considerations fix the limit of efficient braking pressure, as, of course, as soon as they are exceeded the brakes will lock the wheels of the car and therefore place it out of control, for, as you all know, there is less friction between a sliding wheel than can be obtained between a brake block and a rolling wheel. Theoretically, other factors which have to be considered in determining the maximum retarding force are the effect on the car body and upon the passengers. For ordinary stops, where the comfort of the passengers is considered, the rate of retardation, or decelleration, should not exceed 3 ft. per second per second. In extreme cases it may go as high as 7 or 8, but this not without danger to the passengers within the car, as they will undoubtedly be thrown

*Abstract of paper read before the Iowa Street & Interurban Railway Association, Cedar Rapids, Iowa, April 22-24, 1909.

from their seats and the car body itself subjected to severe strain. A distance of 20 ft. is the least in which a car traveling 8 m.p.h. can be brought to a stop without shaking up the passengers within the car. The same car traveling at the rate of 10 m.p.h. might be brought to a stop within 30 ft., but it would entail a much more violent shaking up of the passengers. It is hardly practical to stop a car traveling 10 m.p.h. within a distance of 30 ft., or a car traveling 12 m.p.h. within a distance of 40 ft., or a car traveling 14 m.p.h. within a distance of 60 ft., or a car traveling 16 m.p.h. within a distance of 80 or 90 ft., and so on. These distances are independent of the kind of brake; they simply show the limits within which any brake must operate.

The improved hand brakes now on the market have been thoroughly tested, and it is a fact that their retarding force is equal to that which can be applied with comfort to the passengers. It follows, therefore, that for the ordinary service stop the hand brake is in every way suitable for cars under the interurban class.

When it comes to the question of handling emergency stops the hand brake has the advantage of simplicity. There is very little to get out of order, and the motorman, instead of being able to throw on all his power at once, thus increasing the liability to slide the wheels, quickly but gradually brings to bear against the wheels the maximum of efficient braking pressure. Should the wheels begin to slide he is at once conscious of it and can instantly release.

At this point it may be interesting to outline the method by which we proceed to lay out a brake rigging, and for the purpose of illustration I select one of the cars of the Third Avenue Railroad, of New York City. The car in question measures 35 ft. 11¾ in. over the crown piece and weighs approximately 26,640 lb. Following the usual practice, the brake rigging is designed to yield a pressure equal to 100 per cent of the light weight of the car. These cars are equipped with Peacock brakes, and, starting with a 12-in. ratchet handle, with the use of the small size Peacock brake, which has a gear ratio of 14 to 34, a 50-lb. pull on the ratchet handle will yield approximately 770 lb. on the chain. Dividing the weight of the car by this number, we obtain as a result a little less than the whole number 35, which is the ratio to 1 we must obtain by means of the brake rigging and trucks to give the required braking power. The trucks on this car are the Brill maximum traction trucks, and the ratio on these trucks is 6.38 on the large wheels, and 3.19 on the small, or a total of 9.57 on one truck. As this is a double-truck car, the total for both trucks is 19.14. By dividing the weight of the car, 26,640, by 19.14 we obtain 1392 as the number of pounds which must be developed on the radius bar, so by means of the levers under the car we have to increase the 770 lb. to 1392. By a proper placing of the fulcrum point it is possible to bring the greatest braking pressure on the forward truck, no matter from which end the car is operated. This is very desirable, for in braking a car the weight is thrown forward to the front truck, so that with an equal braking pressure on both trucks the wheels of the rear truck will slide first.

The improvements in hand brakes have all been aimed toward the reduction of the time necessary to their full application. There are many companies which, perhaps, have had a great deal of difficulty with the brake arrangement on the old type of maximum traction trucks, where there was usually so much slack that it required a great deal of both time and winding to apply the brakes. I speak of this type of truck, not because it has sinned more than others in this respect, but simply for purposes of illustration. The brake arrangement on this particular style of truck has been immeasurably improved by an invention of J. S. McWhirter, superintendent of car equipment of the Third Avenue Railroad, and the patent purchased by The J. G. Brill Company, which manufactures the trucks. A detailed drawing may be found on page 383 of the Electric Railway Journal of Feb. 27, and, as noted there, the braking weight on the pony wheels may be varied by changing the position of the fulcrum suspended from the bell-hanger lever. In the case of the trucks in use on this car, the pony wheels bear 33 per cent of the braking weight, but to get back to the matter of slack in brakes, there is almost no lost motion on the brakes of this truck. What little there is arises on account of the journal boxes rather than anywhere else, so that the formula for levers may be depended upon to give the exact chain travel for any weight of car. In the case of the car being used as an example, it was found that the leverage ratio necessary to develop the required braking power was 1 to 35. The shoes clear the wheels by 3/16 in., hence the proportion $35 : 1 :: x : .1875$, and x equals 6½ in., or the chain travel necessary to take all the slack out of the brake. While speaking of this chain travel it is interesting to note the difference when the large-size Peacock brake is used with a gear ratio of 12 to 48. For the same weight of car the leverage necessary is only 21.3 : 1 instead of 35 : 1. Substituting these numbers in the above formula, x equals a little less than 4 in. When it comes to setting the brakes this difference in chain travel becomes more apparent. In the case of an actual experiment with one of the Third Avenue cars it was found that with the small brake 10½ in. of chain was wound, while with the large brake only 6⅛ in. were wound. This matter of chain travel becomes important in designing a hand brake to be used in connection with the air brake, for here the hand brake must be so designed as to take care of the greatest piston travel likely to occur.

Many companies, no doubt, have been confronted with the problem of designing a hand brake which will work efficiently along with the air brake on the cars which have thus been equipped. For a long time it was the exception to find a car equipped with air brakes where the hand brake was equally effective in controlling it. Such is no longer the case. There are many designs which furnish a hand brake with which the modern city car, up to 40,000 lb. in weight, can be operated and controlled down steep grades or on the level as well as by any other means. The subject of designing a hand-brake rigging to work in conjunction with air is, however, large enough for a paper by itself.

Many improvements have also been made in the details for the rods and levers which go to make up the brake layout. That used by the Metropolitan Street Railway, of New York City, embodies perhaps as many of these as any that could be mentioned. By means of safety stops and proper designs of jaws they have a brake rigging whose efficiency would not be materially affected if the different pins should be broken in two under the shearing strain and drop on the roadway.

INSPECTION AND MAINTENANCE OF ROLLING STOCK*

BY W. F. RABER, GENERAL MANAGER, OTTUMWA RAILWAY & LIGHT COMPANY

The rolling stock of the street railway property usually represents but a fraction of the total investment, yet by no other one thing is the company so critically judged by the public as by the condition of its cars. A city is often known by its street cars, so is the company operating them. No other part of the equipment comes in such close daily contact with the public, which will give but a passing recognition for the thousands of dollars invested in power plants, track and overhead equipment, but which is vitally interested, and rightly so, in the cars. The interest, perhaps, is not so much in the kind of car operated as the condition in which they are kept. New equipment cannot be bought every few years, but the cars in service can be kept clean, well painted and in good repair. The writer does not believe in spasmodic repairing, cleaning and painting, but in constant effort in the up-keep of the rolling stock, whether it be new or old. Prosperity is sometimes an excuse for laxity in the up-keep of rolling stock as well as business depression. The company that keeps its property at the highest point during prosperity can best afford to retrench during a depression.

The prime requisite for the inspection and maintenance of rolling stock is a well-organized and thoroughly balanced force of employees. No other department in a street railway organization needs as efficient a force of employees as the car shops. The size of the force and the

*Abstract of paper read before the Iowa Street & Interurban Railway Association, Cedar Rapids, Apr. 22-24, 1909.

number of shop departments, of course, depends on the size of the property operated. The manager or superintendent can give only a small portion of his time each day at the barns, hence this very important department must be entrusted to a foreman or master mechanic who is fully capable of keeping the equipment as a whole at its highest efficiency at all times at a reasonable cost. Too much credit cannot be given to him when he has fully performed the duties entrusted to him. He must be encouraged by allowing him to take the full initiative, even though mistakes occur; let him have full sway and he will uncover many "tricks in the trade"; consult him when contemplating changes in equipment, for he has ideas along practical lines that will assist in making a final decision and will save the company money when the up-keep of the equipment is making a bad showing on the operating ledger. If the property is large enough, the same may be said of the foreman, painter, carpenter, machinist, electrician, and the heads of all departments.

Provide suitable workshops and ample storage barns. It is economy to have the storage barn near the repair shop, although not necessarily under the same roof. Provide storage room for every car, for there is some time out of the 24 hours that they should be sheltered. It is gratifying to see the advocates of storage yards are getting fewer each year. Aside from the fire risk there is no other excuse for exposing rolling stock to the elements. Build barns and shops according to the recommendations of the underwriters and no complaint can be made on the insurance rate, and to a great extent the decay of the rolling stock can be prevented.

Regarding the shop and tools, provide as much pit trackage as practical in the repair shop and have the pits well heated. Separate the paint shop from the main workshop, so as to avoid smoke and dust, provide plenty of daylight and have it well heated. Separate the supply room from the shop and issue material on requisition only. Equip the shop with such tools and machinery as the property will permit of. For the average small road it will be well to have a forge, lathe, drill-press, boring mill, shaper, grinding wheels, a wheel press, an air or vacuum cleaner, an armature lift and portable crane. When rebuilding of car bodies is undertaken a limited amount of wood-working machinery is indispensable.

The average city car should be thoroughly inspected in every detail at the end of about 1500 car miles run if given a good general inspection every night at the barn and a running inspection on the line once each day. The periodical inspection should begin at the trolley and end at the brake rigging in a systematic manner, giving attention to the entire equipment, and renewing only such parts as are necessary or test out below standard. Major repairs, such as armature, fields, bearing, journal, wheels and brakes should always be repaired or renewed at this inspection, and never left for the night crews. The foreman should use his own shop kinks to the best advantage possible. There is a tendency at these general inspections to renew parts that have not yet reached the scrapping point. Here is where judgment must be used and standards of wear adopted. This is particularly true of trolley wheels, contact fingers, motor brushes, brake shoes and car wheels.

Particular attention should be given to brush tension and condition of the field coils. There is no standard for brush tension, but where the track is rough it requires considerable more than factory standards. Weak fields are the forerunner of more electrical trouble than any other part of the electrical equipment. Set a standard and test the fields often; if any are found below standard, remove them at once and replace with new or repaired coils. Vacuum treatment given to weak and apparently worthless field coils will often restore them so that they are good for years of services. Impregnated coils often last longer than new coils untreated, and the cost is about equal to the scrap value of the untreated coil.

Sweep and dust cars every night; if the shop or barn is equipped with compressed air or vacuum cleaning apparatus this work can be done easier and better than by hand. A thorough or general cleaning once a week will suffice. Use a terminal cleaner inside. A fountain brush and hose are very rapid and effective on the outside. There is no better disinfectant to use in cleaning cars than soap and water. Some of the later types of cars are constructed so that they can be cleaned inside with hose and brush, but there is still room for improvement, and it is surprising that car builders at this late date do not give more attention to the details of construction with the idea of sanitation in view. Railway men should demand some radical improvement along this line. They will welcome the day when a car can be built that is vermin proof.

The paint shop should be in charge of a man who can do lettering and striping and understands the mixing of paint and the preparation of the body from the beginning of the operation. Paint specifications furnished by paint manufacturers, as a rule, are satisfactory, but a practical car painter will work many a kink and short cut that brings results which are often superior and at less expense. New cars fresh from the builders are, as a rule, only moderately well painted, in spite of the most rigid specifications. This is due to the rush in getting them out. A car properly painted in the railway company's shop will outwear a car from the factory about two to one. For new cars, give the body a coat of varnish after about six months' use, then each year, if the car is in daily use. Inside finish will usually look well for two years, except the floors, seat frame and vestibule, which will require about the same attention as the outside of the body. Car bodies well painted and thoroughly seasoned will last for years if followed each year or 18 months with a coat of varnish and an occasional touching up before applying the varnish. To have cars look well at all times adopt standard colors and maintain them. Use only a medium grade of varnish and apply it often, particularly on open cars when the wear is greater and the high-grade varnish is scuffed as readily as the medium grade.

Keep constantly at your rolling stock. If necessary, reduce the working force so that when the winter cars are out the shops can be working on the summer equipment. This will give better results in the long run than to bunch the work into short seasons. A better force of men can be kept together, which means much to your company.

HOW TO HANDLE ACCIDENTS*

BY ARTHUR G. RIPPEY, ATTORNEY CLAIM DEPARTMENT, DES MOINES CITY RAILWAY COMPANY AND INTERURBAN RAILWAY COMPANY

A claim department is purely a business proposition. It is simply a means for protecting the companies so far as practicable against the expense incident to claims that are without legal basis and are founded either upon misapprehensions as to legal rights or upon a deliberate purpose to defraud the companies by the assertion of manufactured claims. To justify itself, the claim department must save more than it costs. The work which the department at Des Moines attempts to do divides itself into two classes; one is the prevention of accidents, and the other minimizing the expense after an accident has occurred.

INSTRUCTIONS TO TRAINMEN

The claim department makes it a point to see that specific instructions are given to employees along the lines that experience has developed involve the most danger. Motormen are not only cautioned generally as to the effects of carelessness, indifference and inefficiency in operating cars, but in addition to this their attention is called to the fact that the danger of accident is enhanced by any disobedience to rules, such as failure to make crossing stops; permitting unauthorized persons to operate a car; drinking, either on or off duty; failure to ring the gong at intersections or when passing teams or vehicles; passing standing cars without first coming to a stop; starting cars without the proper signal, and so on. In the same way conductors are impressed with the importance of knowing, when signals are given for the cars to start, that no one is in the act of boarding or alighting from the cars, and of properly flagging railroad crossings, and of attention to their rear lights, and to the display of proper signal flags. They also are strictly warned as to drinking and as to the absolute necessity of compliance with orders and are told what to

*Abstract of a paper read before the Iowa Street & Interurban Railway Association, Cedar Rapids, Iowa, April 22-24, 1909.

do in emergencies, as protecting the car by flagging in each direction when a car is off the track on a steam railroad crossing or when it has stopped there for lack of power. In general, the claim department attempts to supplement the work of the operating department, which promulgates the rules and fixes penalties for their disobedience by making clear to the operating employees the reasons for the rules and the consequences, in the way of accident, which may ensue if they are violated.

Both motormen and conductors are instructed as to the absolute necessity of prompt and complete accident reports. In case of an accident which results either in a personal injury or in damage to property of any consequence, the employees in charge of the car are required to immediately notify the superintendent and claim department by telephone, and where there is a personal injury the company's surgeon as well. To facilitate the prompt giving of these notices, we are now installing an independent telephone lead, to be used exclusively for this purpose. Where the damage is to property only and is very slight, the report is made by the train crew when it comes in from its trip.

ACTION IN CASES OF SERIOUS ACCIDENTS

In case of a personal injury, the claim agent and surgeon upon receiving the notice mentioned immediately proceed to the place where the accident occurred, the surgeon to care for the injured persons and to aid in removing them either to a hospital or to their homes, and the claim agent to assist the crew in securing witnesses and in ascertaining the exact cause of the accident. It is the duty of the trainmen to secure the names and addresses of all persons who saw, or might have seen the accident, or who know anything material bearing upon the question of liability.

If the accident is of any consequence the trainmen are immediately taken from their car to the claim office, where we obtain from them written detailed statements, which are signed by them. An investigator is then given the names and addresses of all the witnesses and is sent out with instructions to obtain a detailed written statement, signed by each. We also endeavor to secure immediately a written signed statement from the prospective claimant. We regard it as of the utmost importance to do this while the facts are still fresh in his mind, and when, if he has the disposition to misstate them, he has not the information to do this effectively. If he has given a detailed written statement over his signature, it is probable that he will not later manufacture a story out of whole cloth entirely at variance with the facts.

We also make it a rule immediately after the accident to go through the neighborhood where the accident occurs, looking for witnesses and to take statements from every one in the vicinity, whether he claims to know anything with reference to the accident or not. This we consider to be of great importance. Our experience is that if a suit is brought the plaintiff ordinarily does not know the names of the passengers upon the car and has few witnesses of that kind, but that the plaintiff's witnesses are persons who happen to be in the vicinity, such as some one standing in a doorway or looking through a window or on the street a block away, who saw the accident. We have observed that this class of witnesses is very positive in its statements as to how the accident occurred and is generally thoroughly convinced of the defendant's negligence. As an illustration of the value of taking statements of this character, we have now a suit pending in which the plaintiff is asking for $20,000 and is relying upon the testimony of a witness who was in a building about a block distant. Shortly after the accident occurred we secured a written statement from this witness to the effect that she was in this building over a block away, so located that she could not see the accident and that she did not see it and that she knew nothing of it until some time afterward. If this case is ever tried and this witness attempts to testify along the lines which I understand the plaintiff now expects, her written statement may prove somewhat of an embarrassment to her.

STATEMENTS BY CLAIMANTS

We have claimants, and doubtless others have the same experience, who refuse to sign a statement prepared by us to cover contingencies of this kind. We request them to present their claims in writing to us. For this purpose we have had a blank printed. This blank covers the salient features of the accident and provides space for the amount of damages to which the claimant thinks himself entitled. Few claimants refuse to make out statements of this character, and it is our experience that if the claim ripens into a suit, the plaintiff's knowledge that he has presented a specific claim in writing has a salutary effect and his testimony on the trial usually does not vary much from the statements presented in the written claim.

Wherever it is possible, I induce the claimant to come to my office where I take a detailed account of the accident in the form of questions and answers. That is, I ask the claimant questions such as would be asked a witness if he were on the stand, covering all of the material matters which I know of or which I can anticipate. These questions and the answers of the claimant as they are given are taken down in shorthand by my stenographer and are then transcribed and read over by the claimant and signed by him. This I regard as the most satisfactory statement which can be obtained. The short statement written up in longhand is usually a statement of mere conclusions and is only an outline. A statement such as I have referred to covers the details and it is much more difficult for the claimant later to evade it or to explain away what he has said.

ACCIDENT FILES

It is our purpose to keep on file a complete history of each case, including the signed statements of the claimants and of all witnesses and the crew, the original report of the accident, a plat made by our engineer, photographs showing the car and all surroundings, all records showing the condition of the car and its equipment, with reports of its inspection, and reports of the weather bureau if material. In other words, we attempt to obtain at once and to file away for future reference, everything which we anticipate may become material in the event of a controversy.

PAYMENT OF CLAIMS

In the absence of an emergency, a claim agent who authorizes the payment of the company's money for personal injuries or damage to property without having made a thorough and complete investigation of the accident and having before him all of the facts, has failed to perform his duty to the company. Without this information, the fundamental inquiry as to the company's liability cannot be answered. As soon as we are able to form an intelligent opinion as to the question of liability, if the case is one for an adjustment, we attempt to compromise it. Except in cases of serious personal injury, and very frequently in such cases, delay increases the amount which it is necessary to pay in order to secure a settlement. The lawyers who make it a business to solicit claims of this kind do not delay and when a claimant has given one of them a contingent contract for 50 per cent the difficulty in making a just settlement is very much increased.

It is gratifying to know that there is at least one exception to this rule. Last fall a careless motorman started a fire in one of our cars, causing a panic among the passengers and injuries to several of them. One was a farmer living in an adjoining county. Within a few days we had a letter from his lawyer, who is a lawyer of standing in his community, advising us of the accident and stating that at the time they did not know the extent of the injuries and that when they were fully informed as to them they would be glad to take up the matter of a settlement. We wrote back, telling him that when he wished to take the matter up we should be glad to consider it with him. Some three months afterward this lawyer came in. He said his client had suffered pain in one of his arms and they feared a permanent injury, but this had disappeared; that he had suffered pain in his groin which had continued for a good while, but this had gone; that he incurred some expense on account of a physician and for three months had not been wholly disabled but had been able to do about one-half of his customary work upon the farm. When we asked how much he thought his client ought to have, the lawyer replied that under the circumstances any reasonable man ought to be satisfied with $20. We agreed with him and sent him a check and voucher to close the settlement.

As to the settlement of small claims as a matter of policy, without reference to the question of liability, it is perhaps

impossible to lay down any hard and fast rule. There is a constant conflict between the question of expense and the universal indisposition to be imposed upon. As a general proposition no claim which is wholly without any merit should be compromised simply because the amount which the plaintiff proposes to settle for is small. Further, it is sound policy to refuse to settle small claims where it is clear that they may be defended with entire success. The payment of claims falling within either of these two classes is unwarranted encouragement to the subsequent assertion of like claims. It is against sound business policy as well as sound public policy. On the other hand, where there is any doubt about a small claim and where the claim is asserted in good faith, the company, in my judgment, is warranted in making a settlement wherever it can be done upon a basis that is obviously more economical than a contest would be.

In making settlements, if the claim involves a large amount, I consult with the general counsel of the company and with the manager before opening negotiations with the claimant. Settlements are made by the claim department. We have printed forms of release. We almost invariably pay claims by check, regarding this as an advantage, as the checks are made payable to claimants and the indorsements of the claimants are required in order to enable them to obtain the money. Where a suit has been brought upon the claim, in addition to a release and voucher, we insist upon having a stipulation of settlement signed by the party and a dismissal of the case signed by the plaintiff, with a release by the plaintiff's attorney of any attorney's lien that has been filed.

CLAIMS OF ADMINISTRATORS OR GUARDIANS

If the claim is asserted by the administrator of a decedent or guardian of a minor and a settlement is made, whether suit has been brought or not, we first satisfy ourselves that the law in regard to the appointment of the legal representative has been fully complied with. After this is done, we require the legal representative to file in the proper court a petition for authority to settle the claim and to secure an order of court authorizing the settlement. After the settlement has been made, the legal representative reports the settlement to the court, attaching a copy of the release. We then have an order of court approving the form of the release and ratifying and confirming the settlement. When this has been done we pay over the money.

A concrete illustration of the importance of care in these matters recently occurred with us. We had made a settlement of a death claim. Within a day or two before the running out of the statute of limitations, the court, acting upon the motion of a lawyer who should have known better, issued a citation requiring the administrator to appear immediately and show cause why he should not at once commence a suit against the Des Moines City Railway Company. The administrator was able to show, in response to this citation, that the reason he did not institute suit was that he had settled the matter pursuant to an order that the court had theretofore made authorizing him to do so, and this was the end of it.

COST OF CLAIMS TO THE COMMUNITY

The growing importance of this matter of personal injury claims, not only to the companies but to the public at large, is something that very few people appreciate. The taxpayers of our county annually contribute enormous sums of money to carry on our courts. In our district court there are four divisions: the criminal division, the equity division and two law divisions, one for odd numbered and one for even numbered cases. The judges who are presiding in these two law divisions advise me that over one-half of their time is devoted to the trial of cases predicated upon injury to persons or damage to property. In other words, in Polk County nearly one-half of the expense incident to the maintenance of the courts is caused by the activity of the personal injury lawyer, so-called, in his efforts to realize upon his 50 per cent contingent contracts. It would be a great surprise to taxpayers generally to know the extent of the burden which these lawyers are imposing upon them as well as upon us; and the community would be greatly benefited, not only financially but ethically, if this superfluous energy could be diverted to other channels.

In the millennium the ideal traction company will not have any claim department, because the ideal way of handling accidents is not to have them. So long, however, as the persons who operate the cars are human, and the persons who ride in the cars are human, and the persons who use the streets are human, accidents will be inevitable; therefore the claim agent need have no fear that his occupation will not continue. All that the claim department can hope to accomplish is to aid in preventing accidents by increasing the efficiency of the operating force and to aid in minimizing the results of accidents by maintaining and increasing the efficiency of the claim department itself.

APPLICATION OF INTERSTATE SYSTEM OF ACCOUNTS TO STREET AND INTERURBAN RAILWAYS*

BY H. E. WEEKS, SECRETARY AND TREASURER, TRI-CITY RAILWAY, DAVENPORT, IOWA

In order that we may duly appreciate the work done in formulating the system of accounts which has been adopted by the Interstate Commerce Commission, let us briefly review the history of the American Street & Interurban Railway Accountants' Association.

The Street Railway Accountants' Association was organized at a meeting held at Cleveland, Ohio, on March 23 and 24, 1897. The object of the association, as stated by the constitution, was to bring together those engaged in the accounting departments of street railway companies for the interchange of ideas, to promote the adoption of a uniform system of accounts and to improve the work of the accounting department. At that meeting a committee was appointed to draw up a standard classification of operating expense accounts. This committee, which consisted of three of the ablest accountants in the street railway business, reported to the first annual convention, held at Niagara Falls, N. Y., October, 1897, a system of operating expense accounts. The convention devoted a large part of its time to the consideration of the report. Each account was discussed, and when necessary amended. The classification was not adopted, however, until the convention held in October, 1898.

At the convention held in October, 1904, the committee on standard classification of accounts was empowered by resolution to revise the classification if it was deemed advisable or advantageous to do so. This action was taken with the thought particularly in mind of amplifying the classification to cover specifically the operation of interurban railways, most of which had entered the field since the promulgation of the classification.

The committee reported to the 1905 convention that in its opinion no change should be made in the present classification of accounts, but that subsidiary accounts should be provided, and made specific recommendations as to what they should be. The question was again reported on by the committee at the 1907 convention and a large amount of time was given to the discussion and amendment of a tentative classification, which was finally referred back to the classification committee for final revision with power to act.

This classification is in substance the classification which was finally adopted by the Interstate Commerce Commission with the exception that the Interstate Commerce Commission does not treat discount and commission on securities issued for construction purposes or to raise funds for construction, as a proper capital expenditure, chargeable to expenditures for road and equipment.

The adoption of this classification was brought about only after strenuous efforts by officials representing a capitalization of about $2,000,000,000 of street and interurban railway interests. The fact that these men were willing to sacrifice their valuable time to attend the conferences with the Interstate Commerce Commission indicates the importance to the industry of the matter at issue.

The Interstate Commerce Commission proposed to adopt a system of street railway accounts patterned largely after the existing steam railroad classification, and the adoption of a classification by the commission was rendered impor-

*Abstract of a paper read before the Iowa Street & Interurban Railway Association, Cedar Rapids, Iowa, April 22-24, 1909.

tant by the fact that the State commissions of a number of the States had expressed the intention of adopting the classification promulgated by the Interstate Commerce Commission. The matter would otherwise have been of comparatively little importance, as comparatively few electric roads conduct an interstate business.

When the impracticability of the application of steam road accounting to electric railway work and the necessity of at least three groupings of accounts for roads, according to size, was brought to the attention of the commission by these men acquainted with the needs of the industry, the commission recognized the importance of adopting the classification which had been perfected after years of work on the part of those familiar with the requirements of the street and interurban railway industry.

The 39 accounts of the original classification of the Accountants' Association covered in a comprehensive manner all the requirements of the urban railways. The accounts added in the new classification are nearly all made necessary by the growth of the interurban business. Although but few roads in the State of Iowa are compelled by law to adopt the Interstate Commerce Commission classification, there is not a road in the State that can afford not to adopt it.

Practically all existing financial records, statistics and blanks of the street and interurban railway companies of the country are based upon the classification. The Census Bureau and other statistical departments of the National and State governments have been using it for nine years. This fact alone makes available data of inestimable value for comparative purposes. In these days the manager who is unable to make an analytical comparison of the results of his operation with other roads and profit by the application of more economical methods thus brought to his attention will be supplanted speedily by a more progressive man. The adoption of the classification renders possible the close analysis of operating methods of a property necessary to efficient administration.

Another reason for the adoption of the classification was necessary, the fact that already there are 30 States whose laws give to the State railway commission or other legally constituted body, jurisdiction over electric railways and that these commissions have signified their intention to adopt the Interstate Commerce Commission classification, should be indication enough of the tendency of the times to induce all to fall in line and put their records in shape to make comparison when they are compelled to adopt the classification.

DEVELOPMENT OF TRAFFIC ON INTERURBAN LINES*

BY C. M. CHENEY, GENERAL FREIGHT AND PASSENGER AGENT WATERLOO, CEDAR FALLS & NORTHERN RAILWAY

Most interurban railway managers have come to realize that the knowledge of traffic development gained by steam railway traffic men through years of practical experience, and methods practised by the steam railways in creating and holding traffic are the methods that interurban lines should adopt and follow to a considerable extent. A thorough knowledge of the methods used by steam roads in locating industries, solicitation of business, proper handling of claims and accounts, is invaluable to the interurban traffic officer. It puts him on an equal footing with the representatives of the steam roads and in a sense gives him an advantage, as he is in a position to know exactly what the steam roads are doing, and he can work out many plans which will be pleasing to the shippers, remunerative to his company and not thought of or considered possible by the steam roads. This knowledge also brings him in close touch with and widens his acquaintance among steam road representatives, which is also very desirable, especially when working out joint tariffs and divisions. A thoroughly organized traffic and industrial department with a competent and well posted man in charge is desirable for any electric interurban line engaged in the handling of passenger, freight and express business, no matter how small its mileage may be. That most managers now concede this fact and have departments of this kind has contributed much toward their success during the past three or four years.

*Abstract of a paper read before the Iowa Street & Interurban Railway Association, Cedar Rapids, Iowa, April 22-24, 1909.

FREIGHT TERMINALS

In the development of competitive business we have found that a very important item to consider is proper terminal facilities and track connection with at least one steam road. While most of the interurban lines located in the Central West have fairly good terminals, some have not and have hesitated about acquiring better and more extensive terminal facilities on account of the seemingly big expense, on the ground, perhaps, that the amount of prospective business in sight will not justify the outlay of money required. In a sense an interurban line engaged in the handling of freight without terminals is in about the same position as a merchant trying to run a store without a building. The amount of freight business which such a road is able to develop is necessarily limited to less than carload merchandise. The possession of good terminal facilities increases the opportunities for the development of freight business and gives an interurban line a standing not only with the shippers, but with steam lines as well.

A few years ago the Waterloo, Cedar Falls & Northern had very limited freight terminals in the City of Waterloo and had track connection with but one steam line, reached only through the city streets. Freight cars could be handled at night only and abutting property owners protested. The management decided that good freight terminals were necessary in order to develop and handle carload business and an outer belt line extending around the north and east side of the city was built, connecting with the steam line terminals and with large freight depot facilities in the city which were leased for a long term of years. At the terminus of the Denver division, 17 miles north, another connection with the Chicago Great Western was effected at the same time. The electric line through these connections afforded the Chicago Great Western a much shorter route to points on its line north and west and a traffic contract was entered into whereby freight destined to or coming from points north and west of Waterloo was turned over to the Waterloo, Cedar Falls & Northern for handling. This arrangement opened up a new territory for the Waterloo jobbers and enabled the steam and electric lines to jointly develop not only business in the new territory, but much competitive business which the steam line did not previously enjoy on account of inability to meet the time made by other competitive lines.

Last year an additional belt line was built around the west side of the city through a new factory district and track connections made with two other steam lines entering Waterloo. The completion of this track furnished freight transfer points with four steam lines and an outer belt line three-fourths of the way around the city. Side tracks were built into the various industries in the new factory district and a station opened with an agent in charge.

The construction of this line has furnished from two to four cars of business per day since the opening of the station. The completion of this line also puts the Waterloo, Cedar Falls & Northern in a position to compete as an intermediate line with a steam road for interchange switching between two other steam roads. An electric locomotive and switching crew were put on to handle industry and interchange switching and is now interchanging between the railways from 5 to 25 cars per day.

LOCATING NEW INDUSTRIES

The location of industries on interurban tracks is an important factor in the development of business and an interurban company is in about an equal position with steam lines in the matter of locating industries. It is necessary to keep in touch with the various commercial bodies and keep posted on what industries are seeking locations, also to get hold of these prospective shippers first if possible and show them over the line, explaining to them the many advantages to be had in locating along the interurban tracks. Other arguments which can be advanced are that the electric road is a small line, a local concern perhaps, on the ground and in position to give immediate attention in the matter of side tracks without going through a lot of red tape; good switching facilities, and if desired

the handling of less than carload freight to and from their doors; good car service for their working force, and many other small advantages that can lawfully be extended. Several of the most important industries on the tracks of the Waterloo, Cedar Falls & Northern were located through efforts of this kind. One of these industries in particular the first year gave approximately 500 cars of business and the next year over 700 cars. An industry just located this month has already turned 30 cars of business to the electric line.

Much business may be developed by keeping in close touch with contractors and material men. It has been found that by watching the awarding of contracts and getting after the successful contractor immediately, it is often possible to get material such as cement, brick, plaster, hollow blocks, stone, sand, etc., purchased from points in territory tributary to the electric line, and that in return for the small attention and effort given the material is invariably routed by way of the interurban road.

While the Waterloo, Cedar Falls & Northern has been watching the development of competitive business, it has not neglected the development of local business, and as a result the small local towns are quite well represented in all lines of business, having good stores, lumber yards, elevators, stock, grain and produce dealers. Six or seven co-operative creameries deliver to it their butter shipments for Chicago and New York at various country road crossings. This butter is picked up in through refrigerator cars and amounts on an average to one carload each week during the winter, and two cars each week during the summer months.

The writer is continually trying to locate different business enterprises in our local towns and has met with good success. Care is also taken to see that wide-awake stock and grain buyers are cultivated in the local towns, and the result is that the interurban road is getting each year many cars of stock and grain from territory directly tributary to competitive steam lines.

As an illustration of what may be accomplished in a small way in the promotion of business in a local territory with little effort, the writer had occasion to visit one of the small country towns on the line about four years ago. While in conversation with the cashier of one of the banks it was learned that he was corresponding with four or five Illinois farmers relative to buying farms and locating at some point in Iowa. Following this up the writer made a trip to Illinois to see these farmers, expecting if successful to get the haul on six or seven cars of emigrant movables. They were interested and subsequently bought farms and located at different points along the line. These new settlers happened to be progressive farmers and immediately began tilling their farms. They also interested other farmers in doing the same thing, and as a direct result from 75 to 125 cars of drain tile have been shipped into this territory each year since that time against practically nothing in preceding years.

The matter of development of less than carload shipments, or package freight, milk shipments and express shipments has been carefully looked after, and good increases are continually being shown in this business. Some years ago when package freight was first handled between Waterloo and Cedar Falls it was necessary to meet dray line competition in order to get the business, the towns being but 8 miles apart. A motor freight and express car was equipped, a schedule of two trips each way per day for this car was arranged and a determined effort made to get the business. By degrees the dray line competition has been eliminated and nearly all the package freight between the two cities is now being handled by motor express cars. This car is also handling in connection with the Chicago Great Western, Chicago merchandise shipments into Cedar Falls amounting to several thousand pounds daily. This joint arrangement was made possible owing to the fact that the steam road had for years been unable to get this business on account of its inability to meet the time made by other competitive lines. This car is also run through the factory district handling package shipments to and from the various factories, which is an arrangement that is daily developing new revenue.

Much success has been met in the matter of working up milk shipments for city dairies from farmers along the line. This milk is picked up at country road crossings by the passenger cars and is handled by ticket arrangement, each can bearing a ticket of the required denomination. Milk tickets are on sale and may be purchased at any of the company's stations. The Wells-Fargo Express Company operates over the entire line, and therefore the development of express business is left largely to that company, the results so far being exceedingly satisfactory to the railway company.

PASSENGER TRAFFIC

In the development of passenger traffic the methods pursued must, to a large extent, depend upon the local conditions. The first and most important item to consider is the building up of the steady travel. Every possible encouragement should be given to suburban living. The arrangement of convenient schedules and granting of commutation rates will accomplish much in this direction. The assistance given in locating industries in cities employing large working forces adds materially to the daily receipts. This is especially noticeable on the line between Waterloo and Cedar Falls. A large number of working people who live in one city and have employment in the other are being handled each day on that line; also quite a number of working people who have suburban homes on the line between the two cities.

The Waterloo, Cedar Falls & Northern sells six tickets for a quarter, good on city and interurban lines. The sale of these tickets has been pushed vigorously for several years and has aided to a great extent in the development of steady travel. For several seasons the sale of combination Chautauqua tickets on the interurban line has been vigorously pushed. This ticket includes round-trip transportation to the city, good each day, and admission to all Chautauqua entertainments during the season. Each year a large number of these tickets have been disposed of, bringing in considerable outside revenue to the Chautauqua Association, helping them to perfect a strong organization and put on high-class attractions. The amount of net revenue directly derived from the sale of these tickets is not very remunerative to the railway company, but the business indirectly developed on the other lines by reason of the increased value of the attractions put on by the Chautauqua Assembly has been well worth the effort put forth in the sale of the combination tickets.

PARKS

A good first-class amusement park located on the line at a convenient point will develop a large amount of business. In the smaller cities it is generally a hard matter for an amusement park not owned by the local electric line to exist, the attendance usually being too small to pay the expense of maintenance. An amusement park is located on the line of the Waterloo, Cedar Falls & Northern between Waterloo and Cedar Falls which so far has proved an exception to this rule. This park has been running for two seasons past and has met with very good success. The railway company has made it a practice to assist the management in every manner possible in the way of advertising through newspapers, placing neat and showy banners on cars, running popular excursions at various times during the season from country stations and furnishing plenty of cars to properly handle the crowds. It has also aided from time to time in the way of cash donations to assist in securing large and costly special attractions.

Joint ticket arrangements with some of the steam roads make it possible to sell through tickets to all points. This arrangement has been the means of developing a large business. Cars on the interurban divisions are scheduled to make connection with Chicago Great Western trains at Denver Junction, 17 miles north of Waterloo, and in connection with this steam road a large number of passengers are handled from strictly competitive towns.

In the development of business of all kinds the writer has found that the best success is attained by continually watching the corners, keeping in close touch with the various commercial bodies, assisting in locating new industries, improving the car service and making it evident to shippers, merchants, manufacturers and the general public that the electric line is alive to the situation, is looking out for their interest as well as its own and that at all times it is ready and willing to earn a dollar.

TRACTION REHABILITATION CONTROVERSY IN CHICAGO

Price, Waterhouse & Company, the certified auditors who were authorized by Mayor Busse, of Chicago, to investigate the books and accounts of the Board of Supervising Engineers and the Chicago City Railway Company, rendered reports to the Mayor on April 10. The report on the Board of Supervising Engineers follows:

REPORT ON BOARD OF SUPERVISING ENGINEERS

In conformity with your instructions, we have examined the books and accounts of the above board for the period of practically two years, commencing with its organization in April, 1907, up to Jan. 31, 1909, our examination being for the two-fold purpose of (1) inquiring, in connection with and as a part of our investigation of the accounts of the Chicago City Railway, into the contracts and other records kept by the board in relation to the expenditures for the rehabilitation of the railway, and (2) verifying the expenditures of the board itself, and we beg to report as follows:

There is every evidence that an effective control is maintained over the progress of the rehabilitation work and all expenditures in connection therewith. Very full and complete records are kept with respect to the expenditures and the accounts are in agreement with those of the railway company. If anything, there has been a tendency to elaborate the bookkeeping and accounting records, which to some extent has involved a duplication of the detailed accounts kept by the company, but these methods have been adopted advisedly and with a view to making the records of the board self-contained and independent of those of the company.

With regard to the matter of rebates to which we refer at some length in our separate report on the railway, we found that the board was fully informed regarding these special arrangements, but for its knowledge whether or not all rebates are credited that should be, we believe that in the main it must depend on the good faith of the officials of the company. Regarding the matters of accounting, to the treatment of which exception is taken in our report on the railway, these are, of course, matters as to which differences of opinion might well exist.

As to the board's own expenditures, we cannot do better by way of informing you of the amount and character of these expenditures than to submit an abstract thereof which is enclosed with and made a part of this report. We would add that we made a careful analysis of the various expense accounts and investigated all items of any importance and found properly approved vouchers on file therefor.

According to figures shown in the board's books, which figures we have verified for ourselves so far as related to the Chicago City Railway, the total cost of the rehabilitation amounted, up to Jan. 31, 1909, to $25,490,890.58 (including therewith the addition between June 30, 1906, and Feb. 1, 1907, as well as the 15 per cent added under the ordinance to the expenditures since Feb. 1, 1907). This total is made up as follows:

Chicago City Railway	$15,169,629.37
Chicago Railways Company	10,007,352.76
Calumet & South Chicago Railway	313,908.45
	$25,490,890.58

The total expenditures of the board were $397,224.51, which is slightly over 1½ per cent of the rehabilitation expenditures. In view of the importance of the work, the magnitude of the amounts involved and the character of the services desired, the above ratio of expense would not appear to be unreasonable or excessive.

We take pleasure in acknowledging that all information requested was promptly furnished and every facility was extended to our representative for the purpose of this examination.

REPORT ON CHICAGO CITY RAILWAY

The report on the Chicago City Railway was a more voluminous document. It stated that the company keeps two sets of books, one the "partnership" books, the other the "individual" or corporation books, and that the accountants were denied access to the latter as a whole, although they were given permission to inspect in the individual books any specific item arising in the partnership books which seemed to call for such further inspection.

The first important charge against the company was that it had included in the cost of reconstruction, and hence in the amount on which the company had received 15 per cent for carrying on and financing it, under the ordinance, certain percentages of the operating expenses of the maintenance of way and other departments, including the store department, and percentages of the salaries of general officers and clerks and of general expenses. The total amount so charged, on which 15 per cent had been paid, was $571,903. The accountants said that the ordinance on this subject reads: "There shall be added 10 per cent of such amount [cost of rehabilitation] as a fair and proper allowance of the company for conducting the said work and furnishing said equipments and 5 per cent for its services in providing funds therefor." The accountants believe that the charges criticised, or at least some part of them, should have been covered by the 10 per cent allowance specified in the ordinance for carrying on the work of rehabilitation.

Another point discussed in the report was that the company was wrongfully allowed $16,608 as contractor's profit and brokerage on a final payment of $110,722, made subsequent to Feb. 1, 1907, on 100 cars ordered and received before Feb. 1, 1907. The ordinance went into effect Feb 1, and the question was whether this material was purchased subsequent or prior to that date.

In regard to rebates the accountants said they found properly credited a rebate of $4,000 on one rotary converter which cost $36,300, but that they found no similar credit for another converter purchased about the same time, although the statement was made by the company that such credit had been made in the individual books.

Considerable attention, at the request of the Mayor, was given to the subject of rebates, and the report contains the names of the companies from which the largest amounts in rebates were secured, and in the case of one manufacturer an abstract of the basis upon which rebates were calculated. In this instance the rebate for certain apparatus was 5 per cent on the price given in the official contract. For other apparatus it was $2 per kilowatt on a total of $18.15 per kilowatt. The accountants found that the total amount credited in the partnership books for rebates in the two years under inspection was $126,425, with $8,369 still to be received.

The report concludes by condemning the policy of rebates, and stating the belief of the accountants that in the long run equipment and materials could be purchased as economically in the open market, dealing alike with the different manufacturers without fear or favor of any.

ANSWER TO CHARGES

In answer to these charges it was stated in Chicago that the Board of Supervising Engineers had directed a letter to the accounting firm in which the disputed point was explained in detail. In this letter, which was signed by the chairman of the board, Mr. Arnold pointed out that there was an item of $24,000 in trade discounts credited to the partnership account, which, in his judgment, should go to the individual account of the company, but as there was a doubt the city was given the benefit of it, and the amount was held as a guarantee fund to cover any small errors or discrepancies that might be found. As no such errors were found, Mr. Arnold suggested that the

amount far more than offset the $16,000 criticised by the accountants. The report of the auditors to the Mayor did not mention the $24,000 trade discounts which it is said the company might properly transfer from the partnership to the individual account.

INTERVIEW WITH MR. ARNOLD

Mr. Arnold, in speaking of these reports in New York last week, said:

I am glad to see that Price, Waterhouse & Company gave the Board of Supervising Engineers a clean bill of health. I do not believe that any erroneous charges will be found on any of the books of the railway company if a full knowledge of all the conditions is had. The charge mentioned of $571,903 for office and other operating expenses was an item well known to the board, and covered the expense of storage yards, superintendence and other overhead charges necessitated by the rehabilitation work and on which by the ordinance the company is entitled to the contractor's profit of 10 per cent for carrying on the work and 5 per cent brokerage, making a total of 15 per cent. The charge of $16,608 was the contractor's profit and brokerage under the ordinance on a final payment of approximately $110,000 made for cars during March, 1907. This was during the period between the dates Feb. 1, 1907, when the ordinance went into effect, and May 1, 1907, when the Board of Supervising Engineers was completely organized. The question of this allowance was fully discussed at the time, and was unanimously approved by the members of the board, including the representatives of the city. I do not recall the circumstances of the other items, but all vouchers of the company have been carefully checked up by the auditors of the Board of Supervising Engineers and by the auditors in behalf of the city, Marwick, Mitchell & Company, and all questions relating to them have been approved by the special traction counsel of the city, Walter L. Fisher. All rebates have also been checked by the manufacturers concerned, and the payments have tallied in every case. The practice of giving and accepting rebates by the company in purchases from various manufacturers has been necessary to secure the most favorable terms of purchase, and the city as well as the company has secured benefit from this practice.

STATEMENT FROM MR. FISHER

In an interview which appeared in the Chicago *Record-Herald* of April 15, Walter L. Fisher, special traction counsel for the city, said:

I agree with the auditors on the item of the $16,000, and hold that the company was not entitled to contractor's profits on the $110,000, which should have been paid when the cars were delivered before the passage of the ordinance. The auditors were clearly wrong, however, in questioning the item of $572,000 allowed in the rehabilitation costs. The same thing applies to the Chicago Railways Company as well as the City Railway Company, but the supervising engineers have strictly followed the ordinances.

The Lorain Steel Company was recently awarded the contract for furnishing special work and rails to the Glasgow (Scotland) Municipal Tramways in competition with all of the steel manufacturers of the United Kingdom. The American firm bid $4,600 and $5,300 on two lots of special work whereas the lowest bids from any of the British manufacturers for the same work were $5.700 and $5,650, respectively. The bids on heavy girder rails were $30 per ton, by the Lorain Steel Company, and $47.50, by the lowest British bidder.

The high-speed electric railway which the Cairo Electric Railways & Heliopolis Oases Company is building between Cairo, Egypt, and Heliopolis is nearing completion. A 10,000-hp generating station is being built at Choubrah, on the banks of the Nile River, which will not only supply current for the railway, but also for lighting in Heliopolis and for power purposes in Cairo.

HISTORY OF THE OMAHA & COUNCIL BLUFFS STREET RAILWAY

As earlier announced in these columns, the Omaha & Council Bluffs Street Railway on Jan. 24 began publishing, through the medium of the Omaha daily press, weekly articles comprising a history descriptive of that company. In the foreword announcing this interesting series, G. W. Wattles, president, over whose signature each article appears, said:

It is the policy of the Omaha & Council Bluffs Street Railway Company to comply with all reasonable and just demands of the communities it serves. For some years past there has been a growing demand in all cities of the country for information regarding the business operations of public-service corporations. To meet this demand and in a friendly spirit give to this community such information as it is entitled to know regarding the affairs of the street railway company, it has been decided by the board of directors of this company to publish weekly articles in the Sunday editions of our daily papers, which will give an outline of the history, the development, the operation and the financial conditions of our company.

The first street railway in Omaha was paid for by local business men. In 1867 a franchise was granted to the Omaha Horse Railway Company, and cars were started June 16, 1869. The stubborn fight of the Omaha business men to build their own road and keep it running in the face of losses and other discouragements is the base of several sorrowful chapters in Omaha's street railway history. The road started with "first-class cars and horses." It was 2 miles long, and experienced no expansion in five years. The first car, bought second-hand in Chicago for $700, is now the "single piece of property of the horse railways of Omaha that remains intact in existence." An illustration of this omnibus car, with its body pivoted for turning with the horses at the ends of the line, was presented in the Electric Railway Review for Aug. 10, 1907, page 165.

The rate of fare at the beginning was 10 cents. Money was lost so rapidly that fare boxes were installed and the conductors discharged. In an endeavor to increase the riding the rate of fare was cut to 5 cents in 1870. Drivers worked 14 hours a day and received $1.50. W. H. Smith, now general manager, began service as a driver in 1872. Within two years he was made superintendent.

In 1878 the bondholders foreclosed, and the property was purchased by W. W. Marsh, who controlled it for five years and built several extensions. The addition of the "Park" line in 1880 brought about the first transfer station in Omaha, and passengers were given bodily transfer under the supervision of a switch tender. From 1878 to 1883 the road paid operating expenses, but there were no profits. About 35 cars were operated. At this time the road was again reorganized, but without a change of name. The career of the newly organized Omaha Horse Railway lasted until April 1, 1889. During this period the city grew rapidly and many extensions were demanded. Streets were regraded, and this called for new tracks. Also double tracks were built on some streets. The road made money, but all profits were put into the extensions and betterments of the property.

In 1889 there were 25 miles of horse-car track, and then began a demand for some better method of operation. The management was not anxious to spend large sums in adopting new motive power that might soon be superseded by electricity. Competition at that time was popularly believed to be a solution of public utility problems. This

is evidenced by the fact that in Omaha, subsequent to granting a franchise for cable roads, the City Council granted franchises for two electric railways at the same time and under the same conditions. A competing road, the "Cable Tramway Company of Omaha," was granted a franchise in 1874. "No limit was placed on the duration of the franchise; no rate of fare was specified, and nothing was said about transfers." A bonus of $40,000 was subscribed for the new road to be paid if operation would be hastened and a bitter fight was carried on between the companies both in court and out.

Doubt as to the validity of the cable-road franchise caused the formation of a new company known as the Omaha Cable Tramway Company. A franchise ordinance conferring rights for a period of 40 years and authorizing the company to occupy and use practically any and all the streets in the city, mentioned specifically, was submitted to the people at a special election May 22, 1888, and was approved by a majority of votes. For power this franchise permitted "endless cables, electricity, compressed air, steam motor (under certain conditions), or by such other motor as may now or hereafter prove to be practicable." This is the principal franchise under which the present company is operating. The validity of the first cable franchise, however, was later sustained by the State Supreme Court. When the second franchise described was granted there were three separate railway organizations operating or building in Omaha. Both roads were menaced by electric lines and so consolidation resulted in 1889.

Franchises were granted to two electric lines—Omaha Motor Railway Company and Northwestern Street Railway Company—in 1887. The former road began operating in 1889. Six months before this road began operating the consolidated horse and cable railways had made contracts for electrical equipment. A consolidation with the Motor Railway was brought about in the fall of 1889.

Competition caused the erection and equipment of two expensive electric power houses and one cable power house where there might have been but one, and duplicates in many miles of track, all of which could have been avoided had the people preferred to deal with and encourage the existing company instead of granting franchises to new organizations and inviting competition.

The eight years preceding the Trans-Mississippi exposition, held at Omaha in 1898, were lean for the consolidated street railway because of the hard times preceding and following the panic of 1893, bicycle competition from 1893 to 1896 and reconstruction, extension and electrical equipment. Four small roads were taken over in this period. The exposition year brought earnings double those of any previous year and for the first time in the history of the Omaha roads, 30 years, there was a surplus in the treasury greater than the immediate demands. A dividend of 2 per cent was paid in 1898 and by 1902 4 per cent was paid. "It is now realized by the management, however, that these apparent profits consisted of money which should have gone to make up a renewal or depreciation fund."

A consolidation of the Omaha and the Council Bluffs Bridge roads took place in 1902, which brought the present company, the Omaha & Council Bluffs Street Railway Company, into existence. Following this the entire property was rebuilt and re-equipped and since then many extensions have been made. Among the improvements are the following:

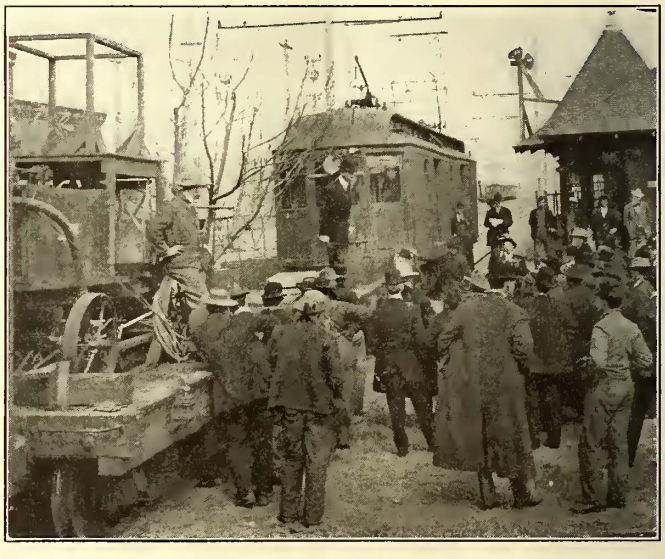
New 10,000-hp power station.
New substations.
Track with 73-lb. girder rails.
Replacement of old cars with new 40-ft. cars mounted on double trucks.
Large brick shop and car house.
Overhead rebuilt.
Five lines double tracked.
Seventeen extensions made.

In 40 years the road has grown from 2 miles of single track with four horse cars, to a system of 140 miles of track with 350 modern double-truck cars. Following sections of the history will describe the physical features of the present property.

THE INLAND EMPIRE FRUIT SPECIAL

The Inland Empire System, which operates through a rich fruit district in Washington, instituted a "Fruit Special" last year to carry lecturers from town to town to instruct the owners of orchards along the line in the best methods of fruit raising and handling. This novel experiment by an electric railway was so successful that it was repeated this year. The lecturers were professors from the Washington State Agricultural College and of the University of Idaho,

Two Four-Car Trains at Spring Valley Junction, 40 Miles South of Spokane



Lecturer on Inland Empire Fruit Special Explaining Methods of Tree Culture

who started from Colfax on Wednesday evening, March 31, and completed their itinerary at Palouse on April 3. The railway company provided for good audiences by sending out a program showing when the train would reach each station and what subjects would be discussed. The lectures were accompanied by demonstrations in planting, spraying and pruning fruit trees on the flat car shown in the illustration.

That the passenger service of the Inland Empire System is being pushed as energetically as the freight business is proved by the accompanying view of the two four-car trains meeting 40 miles from Spokane, at Spring Valley Junction, where the Colfax, Washington and Moscow Idaho, divisions diverge. Each train is made up of two trailers and two motor cars.

CONVENTION COMMITTEE AT DENVER

The committee of the American Street & Interurban Railway Association, appointed to investigate the advantages of various Western cities for the convention of the association next fall, left Chicago Saturday evening, April 17, for Denver, where it arrived on April 19, and is making its headquarters at the Brown Palace Hotel. The members of the committee taking part in the trip are: John I. Beggs, president, Milwaukee Electric Railway & Light Company, Milwaukee, Wis.; E. C. Foster, first vice-president, New Orleans Railway & Light Company, New Orleans, La.; A. E. Lang, president, Toledo Railways & Light Company, Toledo, Ohio, and B. V. Swenson, secretary, American Street & Interurban Railway Association. Hon. James F. Shaw, president of the Boston & Worcester Electric Companies, expected to be a member of the party, but important duties in connection with the Massachusetts Senate, of which he is a member, prevented at the last moment his accompanying the party. The American Street & Interurban Railway Manufacturers' Association also appointed a committee, which is accompanying the committee of the railway association. The gentlemen composing this committee are: President, Joseph R. Ellicott, of the Westinghouse Traction Brake Company, New York; vice-president, Charles C. Peirce, manager railway department, General Electric Company, Boston, Mass.; James H. McGraw, president, McGraw Publishing Company, New York; E. M. Williams, manager street railway sales department, Sherwin-Williams Company, Cleveland, Ohio, and secretary, George Keegan, Interborough Rapid Transit Company, New York City.

It will be remembered that at the last meeting of the association the selection of a convention city was left to the executive committee, and that at a meeting of the executive committee, held in New York Jan. 28-30, it was decided that the convention should be held in some city west of the Mississippi River. Subsequently, it was decided to visit several cities west of the Mississippi River before the final decision should be reached. Denver is the first city to be visited by the committee.

According to a British contemporary, a narrow-gage electric railway is contemplated to connect Pretoria with the Rand district in the Transvaal. The distance is about 33 miles.

The Dolter surface contact system has been abandoned on the London County Council Tramways' line between Mexboro and Swinton, and the overhead trolley has been installed.

COMMUNICATION

DISCHARGED EMPLOYEES

The Louisville Railway Company,
Louisville, Ky., April 14, 1909.

To the Editors:

There is no question that has given so much concern to the railway companies and is of more importance than the employment as motormen and conductors of men who have been discharged by other companies. There is nothing more demoralizing to the service than trainmen who are incompetent, dishonest and unfit for their positions, but many street railway companies will employ men, regardless of their previous conduct with other companies, and thereby injure the standing of their own employees. I have known men, discharged for almost every crime in the calendar, who would apply to other railways for employment and be put into service without a question. Is it any wonder that the cost of the claim departments throughout the country has increased to such an alarming extent? Some system should be in force on the railways throughout the country that would encourage honesty, capability and proficiency, but this can never be done by the employment of men whose conduct was of such character as to render them unfit for service in the company that discharged them. I have known men to work up damage suits against certain companies, then, after their exposure and discharge, to go to other systems and secure employment, no questions being asked. I have known men discharged for riot, attacking cars and breaking the law in many ways, employed by other companies within 24 hours from the time they had served jail sentences. I have known employees to enter into combinations with ambulance chasers, disreputable lawyers, to mulct the companies for damages, but after being discovered and discharged, these same men had no difficulty in securing employment on another railway. These things, in my opinion, degrade the positions of motorman and conductor with every company.

A few years ago, when the railways were more careful in regard to the men whom they employed, the cost of the claim department was insignificant compared with what it is to-day. Expensive safety appliances have been adopted to reduce accident claims, but seem to have no effect, and will not until the various companies adopt some plan whereby an improvement can be made in the employment of trainmen. Men who rob and steal from one company will certainly do the same thing with another company when employed in the same position. It has almost reached the point now that many employees will not stay on any system for any length of time because they feel that they can do just as they please until caught, and will then secure positions with other companies.

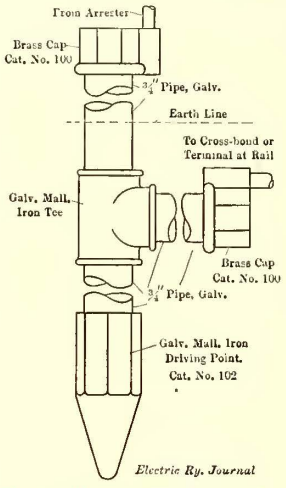
It seems that if a united effort was put forth by the various companies the positions of motormen and conductors could be so elevated that when a man received such a position he would be encouraged to hold it. More care in the original selection of the men and greater pains in their teaching would, to a great measure, improve the character of the men in these important positions. If a man knew that when he was let out of the service of one company for misconduct he would have a hard time securing employment with other railways, it would certainly bring about a better class of employees. The two most important positions on an electric railway, so far as money making and saving are concerned, are those of motor-

man and conductor. If these men are thoroughly competent and honest, the whole problem of paying dividends is solved. I should like to see this question discussed by the American Street & Interurban Railway Association, to see if a plan cannot be adopted whereby the system of employment can be improved.

J. T. Funk,
General Superintendent.

AN EFFICIENT GROUND FOR LIGHTNING ARRESTERS

The Electric Service Supplies Company, Philadelphia, Pa., has made a specialty of lightning protection for electric railways, and has installed many thousands of its type E.G. Garton-Daniels arresters under a guarantee. The efficiency of this type of arrester, or in fact of any type, depends very largely on the ground connection employed. Not only should a ground wire be run from the arrester, but on railway circuits a connection should also be made from the ground wire to one of the rails. With such a connection, at the instant of static discharge, the line, the ground and the rails are at equal static potential. If no rail connection to the arresters is used, at the instant of discharge the line and the ground are of the same static potential, but the rails for the moment act as one plate of a static condenser whose path of easy discharge is through the car to the line. Where bare copper wires are used, leading from the ground line to the arresters and to the rails, corrosion often destroys the connection in two or three years. The accompanying engraving shows the details of a new method, devised by the Electric Service Supplies Company, for making the double connection, which is simple, inexpensive and durable. Instead of wires, ¾-in. galvanized-iron pipe cut to suitable lengths is used. The vertical pipe is capped at the bottom with a malleable iron driving point, and the connections to the rails and the arrester are made by special brass caps having terminals for the short connecting wires.



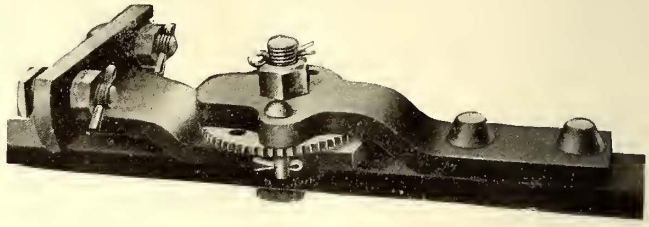
Grounding Device for Lightning Arresters

AN ADJUSTABLE SWITCH ROD

The Buda Foundry & Manufacturing Company, Chicago, Ill., has added to its extensive equipment of track tools the adjustable switch rod shown in the accompanying cut. This tool is intended to make the proper adjustment of switches so easy that employees will have no excuse for neglecting this important feature of track maintenance. One of the strongest merits asserted for this design is that it is unnecessary to remove the center, or main retaining bolt, to effect the adjustment. Only the auxiliary pin at the side is removed and the eccentric moved in the desired direction after which the auxiliary pin is returned. When the auxiliary pin is in the position illustrated the adjustment is within ⅛ in., but this can be reduced to 1/16 in. by putting the auxiliary pin on the opposite side and at the same time throwing over the eccentric wheel to correspond.

The objection offered by the manufacturer of this rod against rods requiring the removal of the main retaining bolt is that when the bolt is rusty it can only be removed by cutting off the nut. If the workman who makes the adjustment has no suitable substitute the switch would have to be spiked in position until the necessary repairs could be made.

The No. 1 Buda rod ordinarily is fitted with adjusting



Adjustable Switch Rod

means at both connections with the switch point in order that with the switch stands set approximately true each point may be adjusted to its stock rail without shifting the stand. The No. 2 rod has one adjustment and the No. 3 rod is usually rigid.

MISSOURI ELECTRICAL CONVENTION

The third convention of the Missouri Electric, Gas, Street Railway & Water Association was held at the Colonial Hotel, Springfield, Mo., April 15, 16 and 17. President William B. Hays, of Poplar Bluff, in his presidential address, gave a brief review of the history of the association. It was organized in St. Louis, Oct. 21, 1907, with 20 members. One convention had been held since then, in April, 1908. The membership is now 50.

The session Thursday afternoon was opened by a paper on "Insurance on Public Service Plants," by C. W. Hough, general manager of the Consolidated Light, Power & Ice Company, of Joplin. Mr. Hough and Judge David D. Hoag, secretary of that company, are getting up an insurance exchange for electric light and power stations to be conducted along the lines of a mutual company and similar to the insurance exchange that exists among ice manufacturers.

Insurance to the amount of $400,000 has been subscribed, and policies will be issued when $1,000,000 has been subscribed. The cost of insurance is to be equal to the actual losses paid members, plus 25 per cent for conducting the business. Several members testified to the saving in cost of insurance which the ice manufacturers' insurance exchange has effected. A considerable number of electric light companies represented also manufacture ice. The other papers read were on "Tungsten Lamps," "Equitable Rate Making," "Engineering Experimental Stations," "High-Tension Transmission," "Office System and Accounting," "Keeping Operating Records," and "Operation of Steam Boilers with Chain Grate Stokers."

At the executive session the rules were changed so as to admit water companies, and the name was changed to Missouri Electric, Gas, Street Railway & Water Association.

The following officers were elected for the ensuing year: President, W. K. Bixby, Springfield; first vice-president, R. Irvine, Marshall; second vice-president, F. E. Murray, Louisiana; third vice-president, P. A. Bertrand, Jefferson City; secretary-treasurer, C. L. Clary, Sikeston.

The next convention of the Missouri Electric, Gas, Street Railway & Water Association will be held in Jefferson City on April 14, 15 and 16, 1910.

News of Electric Railways

Cleveland Traction Situation

On April 14 Judge Tayler granted Receivers Bicknell and Scott, of the Municipal Traction Company, authority to expend about $113,270 for improving the tracks where most needed. The receivers made application to pay for this work from the maintenance and renewal fund, and under these circumstances the court felt free to grant the request. The receivers intend to relay the tracks on portions of various streets with 104-lb. steel rails in 6 in. of concrete. In addition, the receivers may spend $25,000 in improving the tracks on Superior Avenue and Payne Avenue. More money is needed for improvements, but the receivers will probably be unable to obtain it until the special fund for that purpose accumulates.

At the meeting of the Council committee of the whole on April 14, the time was taken up largely by the discussion of the wording of the clause in the proposed ordinance relating to boards of arbitration. It was finally decided that a protest might be made to the court by either side if the appointee should be found to be prejudiced.

Attorney Thomas H. Hogsett presented a clause, incomplete in detail, as a substitute for the one in the Baker draft relating to interurban cars. It provides for a 5-cent fare and transfers at certain points. The place for car-mileage is left blank, but provision is made that earnings in excess of the charge for operating over the city tracks shall be put into a fund to meet possible deficits. Every five years the surplus is to be added to the interest fund of the Cleveland Railway, and a readjustment of the charges is to be made. Control of the operation of the cars and schedules by the city is qualified by adding the word "reasonable" in the portion relating to that point and only the dead weight of cars is to be considered in negotiations relating to them.

In order to simplify matters, President Andrews, of the Cleveland Railway, and Attorney Ginn, of the Cleveland, Southwestern & Columbus Railway, agreed to discuss terms upon which the Lorain Avenue tracks of the Cleveland, Southwestern & Columbus Railway might be purchased by the Cleveland Railway Company. Officials of the Northern Ohio Traction & Light Company also stated their willingness to extend the contract under which the Cleveland Railway operates 1500 ft. of its tracks from the city limits to Garfield Park and the loop at that point.

Mayor Johnson stated that some of the contracts provided that crews of the Cleveland Railway should take charge of the interurban cars when they enter the city, and said that he thought the right ought to be retained to compel all interurban cars operated in Cleveland to be manned by crews of the Cleveland Railway, although it might never be necessary to exercise authority under the stipulation. No expression of opinion regarding this point was offered by the representatives of the interurban companies. It would probably not meet with their approval, however.

Representatives of the city delayed answering the request of Attorney Hogsett for some disposition of the right of the interurban roads to use subways in the future by saying that arrangements of this kind could not be taken up at this time. All the interurban companies desire the right to use a subway if built. Mayor Johnson and City Solicitor Baker say that only all-metal cars should be allowed in a subway. Such other restrictions would probably be made that the regular interurban cars would be prohibited from operating in the subway. Attorney John G. White stated that the vital weakness of the general plan under consideration is that it offers no incentive to progress in the development of the street railway system.

At a meeting held in the office of Attorney Hogsett on April 16, representatives of the interurban railways decided upon terms under which they are willing to operate in connection with the local system. One of the features of the plan is that they pay the Cleveland Railway a sum equal to the cost of operating their cars over the tracks necessary to reach the center of the city. If there is a deficit under the plan of fare adopted the interurban companies will pay their share of the loss incurred. The companies will agree to reasonable regulation of the routing of interurban cars, but not to any regulation that would add to the cost of operation and increase the revenue to the city system. They are willing to pay the cost of operation in full, but are not willing that their cars should be so handled as to enable passengers on the city lines to ride at less than cost.

The latest draft of an ordinance prepared by City Solicitor Baker provides that the interurban railways shall make up any deficit that occurs, and that should there be any surplus from the revenue derived from city business, it shall go to the interest fund of the Cleveland Railway. Representatives of the companies say that such an arrangement is unfair and not in accord with the idea of the Tayler plan. Mr. Baker's ordinance also contemplates a charge of 30 cents per car-mile for the operation of interurban cars on the city lines, whereas the representatives of the interurban companies have presented figures purporting to show that the cost is less than 20 cents per car-mile. They claim that the city's charges for maintenance and depreciation of tracks and special work and for current are excessive.

Another objection is that the city wishes strictly to regulate the operation of express cars. This would hamper the movements of these cars to such an extent that they would be worthless to the companies and to merchants and other business concerns. The manager of one of the systems entering Cleveland said that unless the city is willing to make more favorable terms with the interurban companies the merchants of the city will suffer severely, as trade will be diverted to other cities.

In his campaign for M. B. Excell for Congress, as the successor of Senator Burton, Mayor Johnson is injecting the 3-cent plank again, preparatory to his race for re-election to the Mayor's office this fall.

The latest draft of the proposed ordinance contains the provision that the fare shall be 5 cents cash on all lines operated on Euclid Avenue that in any way contribute to the service in East Cleveland until a new contract is made with East Cleveland and approved by the city. The representatives of the Cleveland Railway objected at the meeting on April 13 to the trivial conditions that have been worked into the clause relating to forfeiture of the franchise.

Most of the morning of April 19 was taken up by a discussion of the question of whether interurban railways should be allowed to reduce their fares below 5 cents. Mayor Johnson and members of the City Council objected to any agreement that would allow them to reduce the rate. The Mayor stated that he questioned the wisdom of allowing the cars to stop for passengers at all. Attorneys F. H. Ginn and T. H. Hogsett said that the interurban companies ought to have the same right that city companies enjoy. If there is a surplus after the deduction of operating expenses sufficient to warrant it, the interurban companies should be permitted to reduce the fare. City Solicitor Baker said that the interurban companies should not be permitted to charge a fare that would make them active competitors of the city companies. The question of issuing transfers at certain points was also discussed. Mayor Johnson stated that he felt this would be of doubtful benefit to the interurban companies. At present transfers are not issued, but the city fare must be paid by those who ride inside the city limits. No agreements were reached upon important points.

Unprecedented Ice Jam at Niagara Submerges "Gorge Route"

One of the most remarkable and unprecedented ice jams in the history of Niagara occurred on April 9 in the lower gorge of the river, between the Whirlpool and the mouth of the river. The ice piled to a height of 25 ft. to 30 ft. along the rapids in the lower gorge and to a height exceeding 50 ft. just below the Suspension Bridge at Lewiston. The jam was caused by a fierce gale on Lake Erie on April 8, which broke up the ice in the lake and drove it in immense quantities into Niagara River and over the falls. On April 9 the wind shifted to the north over Lake Ontario and checked the flow of the ice out of the river below the falls and backed the water and ice in the lower gorge to a flood level of 40 ft., which is 12 ft. higher than the record of previous years.

The roadbed and tracks of the Niagara Gorge Railroad or "Great Gorge Route," which are laid along the bank of the river from the Whirlpool Rapids to Lewiston, a distance of 3 miles, at only a slight elevation above the rapids, were buried under ice varying in depth from a few feet at the whirlpool to 25 ft. and 30 ft. at Lewiston. Considering the weight of the ice piled on the tracks and roadbed only a small amount of damage was done to the railroad. The cakes and floes were packed so tight against the cliffs back of the tracks by the swift current that an ice wall was formed over and alongside the roadbed protecting it from the rush and swish of the ice-laden current which the jam had raised to a higher level than the tracks. When the jam broke and the water receded the ice bank

or wall toppled over into the rapids without injuring the roadbed. There were a few small washouts between "Giant Rock" and "Devil's Hole," where the damage to the tracks was most serious, but they were confined to the outer track.

The steel trestle between "Giant Rock" and "Devil's Hole" was undisturbed except for a wooden trestle, which was washed away. As soon as it became apparent that the jam would cover the tracks and carry away the poles the company cut the feed cables into sections and pulled them up the bank out of reach of the ice. Two hundred men were put to work to clear the tracks of ice, rebuild the parts of the line washed out, put in new poles, replaced cables, etc., and by April 17 one track was nearly ready for service and it was expected the entire line would be restored and in operation by May 1. The company's property at Lewiston was not damaged as it is located on the bank of the river out of reach of the ice jam. The Lewiston & Youngstown Railway, which runs from Lewiston to Youngstown and Fort Niagara Beach, was uninjured as the tracks of the company are located on the upper bank of the river some distance from the brink. The power house of the Ontario Power Company under the bank below the Horse Shoe Falls on the Canadian side was partially submerged, the flood rising over the sills of the windows, which are 35 ft. above the level of the river, and water and ice poured over the float on which the turbines and generators are installed, compelling the company to suspend temporarily. No permanent damage was done to the power house or its machinery, however, and as soon as the jam broke and the river receded the water was pumped out and the generators were dried and prepared for service. Both the Rochester Railway and the Syracuse Rapid Transit Railway, which receive power from Niagara, were compelled, however, to operate their reserve plants for a short period.

A second ice jam occurred on April 19, the immense quantities of ice from Lake Erie going over the falls on April 18 and 19, "grounding" under the jam in the lower Niagara River below Lewiston and forcing the water up the gorge, thus submerging the tracks of the Niagara Gorge Railroad with water and ice, and making it necessary to stop repair work. On April 20 the ice jam had risen to a height of 62 ft. at Lewiston, or within 18 ft. of the floor of the Suspension bridge connecting Lewiston and Queenston. A mile of track of the Niagara Gorge Railroad had been cleared, but the ice again submerged about one-fourth to one-half of this track. On April 20 it did not appear that much additional damage had been done by this second rise of the river, but all work will have to be suspended until the water again recedes, and it is questioned now whether the repair work can be completed by May 1. In any event, the outer track, which it had been hoped would be in operation by April 24, will not be ready for service by that date.

Letter from President Shaw

Hon. James F. Shaw, president, American Street & Interurban Railway Association, has sent the following letter to the presidents and general managers of street and interurban railway companies of America:

"At the mid-winter meeting of our executive and other committees, held in New York a few weeks ago, there was much discussion by those present on the question of how to bring about a better understanding on the part of the public of the difficulties and problems which confront electric railway operating companies. It was the general consensus of opinion that if the people knew more about the electric railway side of the problem, much of the adverse sentiment which is now prevalent in many places would disappear and would be replaced by a helpful, healthy sentiment."

President Shaw continues that one method of accomplishing this result, and which demands the co-operation of the different companies, is the reprinting in the public press, in whole or in part, of articles of interest to the general public which appear from time to time in the technical press. The association has made arrangements with the electric railway papers by which copies of these papers containing articles of particular value for this purpose be furnished by the secretary on application.

Letter from President Winsor

Paul Winsor, chief engineer of motive power and rolling stock, Boston Elevated Railway Company, Boston, Mass., and president of the American Street & Interurban Railway Engineering Association, has sent the following letter to the associate members of that association:

"As is well known, there is a campaign on foot to increase the associate membership of the American Street & Interurban Railway Association. The results so far have been extremely gratifying, the number of associate members having been increased by about 150 per cent since the 1908 convention.

"The executive committee of the Engineering Association at its last meeting, realizing the possible good that might result from a concerted and persistent effort on the part of our membership for the acquisition of new members, went on record as favoring such a campaign on our part and instructed the president and secretary to issue a circular letter to the members, urging them to interest themselves in this direction.

"Undoubtedly a large field for operations is left, as there are certainly a great many men identified with the engineering work of active members who are eligible but are not enrolled in the membership, and whom we should make a strong effort to get. It is not to be implied, however, that you are requested to confine your efforts entirely to men who would ally themselves with the Engineering Association, as in many cases it is very probable that close association exists with men who would naturally ally themselves with one of the other allied or affiliated associations. Each member is therefore urged to appoint himself a committee of one on increase in membership, and to work energetically with the desired end in view.

"The badge of membership in the American Street & Interurban Railway Association and its affiliated associations is also commended to the associate member as the best means of exciting and maintaining that esprit de corps so essential for the realization, to the fullest extent, of the spirit of organization.

"Please remit applications and dues direct to the secretary of the Engineering Association, 552 Harrison Avenue, Boston, Mass., making checks payable to the American Street & Interurban Railway Association."

Public Service Commission Files Suit for Damages.—Papers have been served on Frederick W. Whitridge, receiver of the Third Avenue Railroad, New York, in an action begun by the Public Service Commission of the First District of New York to recover the statutory damages of $5,000 a day for 15 days on account of the construction of the Fort George loop of the Third Avenue Railroad by the company without waiting for the consent of the commission.

Present for Newton W. Bolen.—Newton W. Bolen, superintendent of transportation of the Public Service Railway of New Jersey, and his wife were surprised at their home in West Hoboken on April 14 by a delegation of officials and employees of the company who journeyed from Newark in the private car "Public Service." Mr. and Mrs. Bolen were given a silver service and an immense bouquet of American beauty roses, the occasion being the 25th anniversary of their marriage.

Non-Resident Lectures at the University of Minnesota.—Edward P. Burch, consulting engineer, Minneapolis, is giving a course of 10 lectures on "Electric Traction for Railway Trains" at the College of Engineering of the University of Minnesota. The subjects of the lectures are: "History of Electric Traction," "Advantages of Electric Traction," "Characteristics of Steam Locomotives," "Characteristics of Electric Locomotives," "Motor Car Trains," "Electric Railway Motors," "Power Required for Trains," "Steam, Gas and Water-Power Plants," "The Transmission System," "Electrification of Railroads."

Committee from Detroit Studying Situation in Cleveland.—Chairman Eddy, F. A. Smart, D. M. Ireland, Frank Kennedy, W. C. Pasha and Paul C. Renaud, acting as a sub-committee of the committee of 50 appointed by Mayor Breitmeyer of Detroit to study the street railway situation in Detroit, went to Cleveland on April 14 to consider street railway matters there insofar as the conditions in Cleveland may affect the situation in Detroit. Their principal work was to study the system of appraisement used in arriving at a valuation of the local Cleveland properties. They also conferred with the officers of the Cleveland Railway and Mayor Johnson.

Hearing of Joint Commission on Boston & Eastern Tunnel.—The Massachusetts Railroad Commission and the Boston Transit Commission, sitting as a joint board at the request of the Legislature, held a hearing on April 14 on the proposed tunnel of the Boston & Eastern Electric Railroad under Boston Harbor. The general plans of the company were presented to the joint board by Moorfield Storey, Boston, counsel for the company, who explained that the company has practically secured from the Railroad Commission a statement that the public convenience of the road has been demonstrated; that the company is now be-

force the Legislature to secure permission to build a tunnel under Boston Harbor and bring it up to the business center to a terminus near Post Office Square, where arrangement would be made for connection with other lines if necessary. W. H. Coolidge, attorney for the Boston & Maine Railroad, said that the road would injure existing companies.

Convention of the Southwestern Electrical & Gas Association.—Arrangements are being made this year for a very large attendance at the convention of the Southwestern Electrical & Gas Association, at Dallas, May 20-22. Headquarters will be at the new Southland Hotel, where arrangements have been made for displaying the exhibits. For this purpose, the billiard room as well as several vacant rooms in the basement of the hotel have been secured. Manufacturers desiring space should at once send their applications to D. G. Fisher, 300 Commerce Street, Dallas, Tex. The available space has been divided up into areas of about 40 sq. ft. each, and each manufacturer who is a member of the association will be furnished with one space without charge. A fee of $10 for each additional space will be made. Current will be supplied at 110, 250 and 500 volts direct current and at 220 volts, single phase and two phase at a charge not to exceed 5 cents per kw-hour for power, and 10 cents for lighting.

Freshet Damage in the East.—The Middle Atlantic and New England States were visited by a very severe rainstorm on April 14. Streams generally assumed freshet proportions and electric railways and railroads suffered severely in some instances. The worst conditions were reported in Vermont and New Hampshire around the head waters of the Connecticut, Merrimac and Androscoggin Rivers. The water in the Connecticut River at Holyoke was especially high. In Brattleboro, Vt., farther up the river, the water reached the highest point ever recorded there. The West River branch of the Central Vermont Railroad was washed out in several places, and the Brattleboro Electric Light Company had to abandon the operation of its main plant temporarily on account of the rise of water. Several manufacturing plants in St. Albans, Vt., had to shut down temporarily, and the St. Albans Street Railway also had to suspend operation for a time. In Waterbury, Conn., the Connecticut Company had to suspend its lighting service and the operation of cars temporarily in Naugatuck, Woodbury, Middletown, Watertown, Oakville, Waterville, Cheshire and Thomaston.

Electrification Plans of the Long Island Railroad.—The Long Island Railroad has recently placed a number of important contracts for equipment and rolling stock preparatory to carrying out during the spring and summer the electrification of several of its branch lines. The company proposes to build two additional tracks between Winfield and Jamaica, a distance of 8 miles; to construct a 2-mile two-track connection between the main line and the Montauk division; to build a freight connection between its Montauk division and the freight yards at Long Island City, a distance of ½ mile, and to build the proposed cross-island trolley from its railroad station at Huntington to Amityville, a distance of 18 miles. Contracts for the material for this work have all been awarded. In connection with the construction of these lines there will follow the development of the company's power transmission system, and substations will be built at Huntington, Farmingdale and Winfield, all of which will be supplied with power from the main station of the company in Long Island City. The apparatus for these substations has been purchased. In addition, the Long Island Railroad has contracted for the reconstruction of 50 miles of its main line for third-rail operation. Motor equipments for 50 cars have already been ordered, and the company expects to contract within the next 60 days for 125 steel motor cars complete.

Commissioners to Consider Transit Routes in New York.—Nine commissioners to consider subway routes and other rapid-transit matters were appointed on April 16 by the Appellate Division of the Supreme Court. The appointments were made as the result of a recent application by the Public Service Commission of the First District of New York in accordance with the terms of the Public Service Commissions law. Randolph Hurry, Edward C. Crowley and Richard W. Hallaman were named to look into the Manhattan Bridge route, revised; Summer G. Gerard, Thomas A. Janvier and Thomas B. Kilburn will take testimony in regard to the Canal Street route, and William G. Davis, Douglas Mathewson and William H. Ellison will consider the River Avenue elevated and subway route. The commissioners will hold public hearings to determine whether the lines in question shall be built. If their reports favor the construction and operation of the routes they will be taken, when confirmed by the court, in lieu of the consents of the property owners along the lines of the proposed routes. The select committee of the Board of Estimate and the sub-committee of the Public Service Commission appointed to confer on the Fourth Avenue subway for Brooklyn met on April 16. Comptroller Metz, who has opposed the construction of the Fourth Avenue line, now says that if Borough President Coler, of Brooklyn, will secure releases from 90 per cent of the property owners along the line as to damages he (the comptroller) will consent to the construction of the first three sections of the line. The Public Service Commission of the First District of New York has approved the contracts of the six sections of the road.

LEGISLATION AFFECTING ELECTRIC RAILWAYS

Connecticut.—The judiciary committee has returned an unfavorable report on the public utilities bill. The chairman said that the committee was unanimous in its decision that the bill reported by the special commission of 1907 ought not to become a law. He moved to table the bill and that it be made the order of the day for April 21. The question of seats for motormen on suburban lines came before the railroad committee again on April 15. The bill had been reported adversely, but was assigned another hearing by special request. It was urged by some that the measure be passed as a permissive act. A resolution which has been favorably reported by the railroad committee provides for the extension of the life of various rights controlled by the Connecticut Company until Nov. 1, 1910. If the railroad commissioners in 1910 find that at least 25 per cent of the proposed lines has been actually constructed the franchises are continued until the rising of the Legislature in 1911. The Senate has passed resolutions authorizing the Connecticut Railway & Lighting Company to extend its lines in Watertown and to build a line from Milford to Derby by way of Orange.

Iowa.—A resolution has been adopted by the Senate providing for the appointment of a joint committee to investigate utilities and report to the Thirty-fourth General Assembly. The House has rejected the bill requiring street cars more than 35 ft. long and weighing 35,000 lb. to be equipped with power brakes.

Massachusetts.—An important action of the House of Representatives during the past week occurred with reference to the bill providing for the establishment of an 80-cent rate for gas in East Boston. On Tuesday the House passed this bill to be engrossed. On Wednesday Speaker Walker took the floor and secured a reversal of the previous day's vote through reconsideration on the ground that the passage of the bill would injure the State's long-established policy of assigning rate-making powers in connection with public-service corporations only to suitably experienced and technically qualified commissions. Speaker Walker stated that if the Legislature should attempt to make rates for public utilities the practice would discourage investment in railway, lighting and telephone properties and that it would be disastrous to both the companies and the welfare of the State. The House killed the bill by a vote of 91 to 77. The committee on street railways has reported a bill to authorize the Connecticut Valley Street Railway to fund its floating debt and to refund its funded debt, and the bill has been given a first reading in the House. This committee has also reported a bill authorizing bond and stock issues for specified purposes under the approval of the Railroad Commission. The Smith bill defining further the purposes for which stock and bonds may be issued by street railways has been reported to the Senate by the committee with the recommendation that the measure be referred to the next Legislature. The Senate bill authorizing the General Electric Company to use a part of the tracks of the Pittsfield Street Railway has been given a third reading, passed to be engrossed and sent to the House for concurrence.

New Jersey.—A trolley freight bill has been passed. The first Gaunt measure was vetoed by Governor Fort, as mentioned in the ELECTRIC RAILWAY JOURNAL of April 17, 1909. A second measure was then introduced by Mr. Gaunt. The Governor signified his opposition to the second measure and a third was prepared to meet his wishes and introduced. It was signed on April 16. The bill provides that street railways throughout the State may carry freight and express matter without obtaining the consent of the common councils or other governing bodies of the municipalities. Such traffic, in municipalities having over 12,000 population, must be confined to the hours between 11 p. m. and 6 a. m., unless the governing body of the municipality consents to other hours. In municipalities having less than 12,000, freight and express matter may be carried at any hour of the day or night. The provisos enact that, first, no perpetual franchise shall be granted; second, that the Voorhees act, taxing the gross receipts of street

railway companies 3 per cent this year and ½ per cent additional each year up to 5 per cent, shall be applied to receipts for freight and express traffic, and all other acts relating to taxation shall also apply; third, that the limited-franchise act shall not be by implication repeated; fourth, that this act may be altered, repealed or modified at the will of the Legislature. The attempt at public-utility legislation was lost. Senator Gebhardt tried to force the issue, but was suppressed. At the eleventh hour he introduced a bill which was a copy of the Pierce bill, for which the Martin bill was substituted, and moved its consideration without reference. Senator Frelinghuysen moved that the bill go to the railroad and canal committee, and the motion was carried. Subsequently Governor Fort and the Republican Senators conferred and it was decided to keep the Martin bill in committee in the Senate.

New York.—The annual appropriation bill, which has passed both the Senate and Assembly, aggregates $22,497,153, an increase of about $1,600,000 over last year's appropriations. The finance committee has reduced the appropriation asked for by the Public Service Commission of the Second District by about $80,000, practically one-quarter of the amount asked for to carry out the work of the commission for the coming year. In the Assembly on April 15 two concurrent resolutions were adopted providing for legislative committees appointed not by the Governor but by the Lieutenant-Governor and the Speaker of the House, to sit during the summer months to deliberate on the proposed charter revision for New York City, and the question of whether the telegraph and telephone companies shall be included among the corporations now under the supervision of the Public Service Commissions and report to the next session of the Legislature. These resolutions, after their adoption in the lower house, were sent to the Senate for concurrence. The Assembly has passed the O'Malley bill, which puts directly up to the courts the responsibility for the collection of the $26,000,000 special franchise tax which the corporations of New York City have been evading for years. The Senate committee on cities on April 14 reported the Travis bill to amend the Rapid Transit act, especially in the direction of prescribing "indeterminate" franchises for rapid transit growth in New York. Joseph H. Choate, counsel for the receiver of the Third Avenue Railroad, opposed the extension of the powers of the Public Service Commissions on April 14. He attacked a clause in the proposed amendments giving the commissions sweeping power in ordering through routes and joint fares. The clause would apply to the transfer situation in New York City, which is now up for adjudication in the courts. Mr. Choate held that it would be more seemly for the commissions to await the judgment of the highest courts in the matter than to reach out for powers of regulation that were never contemplated in the original Public Service Commission act.

Rhode Island.—Under the State constitution the session of the Legislature which convened on Jan. 5, 1909, continues for 60 days. These 60 days expired on April 20, but as there is considerable business on file, the session this year will continue from 3 to 11 legislative days. Up to and including April 8, 356 measures had been presented for action. Of these 6 public laws, 61 resolutions, 5 business charters or amendments to charters, 7 charters other than business or amendments to such charters, have become laws. Of the bills still pending 9 have been passed by the Senate, but have not yet been acted upon by the House; 8 have been passed by the House, but have not yet been presented to the Senate for concurrent action; 129 are on the files of the judiciary committees, 72 are before the finance committees, 12 are before the committees on corporations, 42 are on the files of the other committees, and 5 have been indefinitely postponed. In Rhode Island the Governor has no veto power, and a bill is enacted upon its passage by both houses in concurrence when properly engrossed. Fewer railroad measures than usual have been presented for consideration this year, and of them only one has been passed. It amends the act incorporating the Pascoag & Providence Street Railway, so as to give the company permission to file application with the Town Councils of the several towns for the location of its tracks on or before June 1, 1911, instead of by March 1, 1904. On the files are the following: An amendment to the charter of the Western Rhode Island Railway which extends the time for location and completion of the main lines of the company to June 1, 1911; an act authorizing the Providence, Warren & Bristol Railroad to increase its capital stock; an act to protect steam railroad passengers and employees, and an act authorizing the town of Foster to exempt the Providence & Danielson Railway from taxation until July 20, 1916. If this last measure passes it will be the first one to exempt a railroad from direct taxation.

Financial and Corporate

New York Stock and Money Market

April 20, 1909.

The Wall Street stock market during the week has been irregular and trading has been less active than it was at the beginning of the month. Spasmodic advances and reactions have occurred, and sales have been largely professional and manipulative. At the same time there is an undeniably strong tone, the result of the improved condition of the steel trade and the partial revival of business. Trading in traction stocks has been less active but prices have been well maintained.

The money market continues to be easy, with demand light and cash reserves in the banks heavy. Quotations to-day were: Call, 1¾ to 2½ per cent; 90 days, 2½ per cent.

Other Markets

The daily average of transactions in Philadelphia Rapid Transit during this week has been about 10,000 shares. The price has been pushed up until a top record has been made at 35¾. Union Traction has also been somewhat active, but price changes have been insignificant.

A few transactions in Boston Elevated and West End, and a few in Massachusetts Electric have been recorded, but they have been principally for odd lots. Prices have remained practically unchanged.

In the Chicago market, Subway and Chicago Railways, Series 2, are the only issues that show signs of life. Trading has been meagre and without character.

Transactions in Baltimore are still confined to trading in the bonds of the United Railways & Electric Company. These are still active. The 4s are selling at 87¾ and the incomes at 55½.

In the auction of securities in New York last week, $2,500 Brooklyn City Railroad Company first mortgage 5 per cent bonds were sold at 103.

Quotations of various traction securities as compared with last week follow:

	Apr. 13.	Apr. 20.
American Railways Company	45½	46
Aurora, Elgin & Chicago Railroad (common)	a39	*a39
Aurora, Elgin & Chicago Railroad (preferred)	a90	*a90
Boston Elevated Railway	131¼	131½
Boston & Suburban Electric Companies (common)	*15	*15
Boston & Suburban Electric Companies (preferred)	*70	*70
Boston & Worcester Electric Companies (common)	*a11	15
Boston & Worcester Electric Companies (preferred)	*a56	a58
Brooklyn Rapid Transit Company	76⅛	76⅝
Brooklyn Rapid Transit Company, 1st ref, conv. 4s	85½	85⅜
Capital Traction Company, Washington	*a137	*a137½
Chicago City Railway	*a190	*a190
Chicago & Oak Park Elevated Railroad (common)	*a4½	*a4½
Chicago & Oak Park Elevated Railroad (preferred)	*a11	*a11
Chicago Railways, ptcptg. ctf. 1	*a112	*a112
Chicago Railways, ptcptg. ctf. 2	*a41	*a41
Chicago Railways, ptcptg. ctf. 3	*a29	*a28½
Chicago Railways, ptcptg. ctf. 4	*a11½	*a11½
Cleveland Electric Railway	*a78	*a78
Consolidated Traction Company of New Jersey	*76½	a77½
Consolidated Traction Company of New Jersey, 5 per cent bonds	*105¼	a106½
Detroit United Railway	58	57
General Electric Company	158½	158
Georgia Railway & Electric Company (common)	*83	82
Georgia Railway & Electric Company (preferred)	*87½	*85
Interborough-Metropolitan Company (common)	15	15⅛
Interborough-Metropolitan Company (preferred)	43	44⅛
Interborough-Metropolitan Company (4½s)	78¼	78¾
Kansas City Railway & Light Company (common)	*a42	*a44
Kansas City Railway & Light Company (preferred)	*a83½	*a83
Manhattan Railway	143½	143¼
Massachusetts Electric Companies (common)	*14¼	14
Massachusetts Electric Companies (preferred)	72	71
Metropolitan West Side, Chicago (common)	*a18	a18
Metropolitan West Side, Chicago (preferred)	*a52	a52
Metropolitan Street Railway	23	*23
Milwaukee Electric Railway & Light (preferred)	*a110	*a110
North American Company	83	83½
Northwestern Elevated Railroad (common)	*a23	*a23
Northwestern Elevated Railroad (preferred)	*a69	*a68½
Philadelphia Company, Pittsburg (common)	41½	42
Philadelphia Company, Pittsburg (preferred)	41¼	42¼
Philadelphia Rapid Transit Company	32½	35
Philadelphia Traction Company	92½	93
Public Service Corporation, 5 per cent col. notes	*a100½	a100¼
Public Service Corporation, ctfs	*a82½	a81
Seattle Electric Company (common)	*a91½	*91½
Seattle Electric Company (preferred)	*a98	*a98
South Side Elevated Railroad, Chicago	55½	*a56
Toledo Railways & Light Company	12¾	12⅝
Third Avenue Railroad, New York	29½	30¼
Twin City Rapid Transit, Minneapolis (common)	104	103½
Union Traction Company, Philadelphia	56¼	56¾
United Railways & Electric Company, Baltimore	11	12¼
United Railways Investment Company, San Francisco (common)	a40	*a37½
United Railways Investment Company, San Francisco (preferred)	a57	56
Washington Railway & Electric Company (common)	a43½	*a43⅛
Washington Railway & Electric Company (preferred)	*a91	*a92
West End Street Railway, Boston (common)	96¼	97½
West End Street Railway, Boston (preferred)	*a110½	*a110
Westinghouse Electric & Manufacturing Company	—	82½
Westinghouse Electric & Manufacturing (1st preferred)	*117	119

a Asked. * Last sale.

Annual Report of United Railways & Electric Company of Baltimore

Gross earnings of the United Railways & Electric Company of Baltimore amounted in the year 1908 to $6,834,802, a decrease of $183,279, or 2.61 per cent from the previous year. Operating expenses, which amounted to 48.18 per cent of gross earnings, showed a decrease of $176,749 from the total expenditure in 1907. The number of car-miles run decreased 0.7 per cent. Results of operations for three years compare as follows:

	1908.	1907.	1906.
Miles of track	401.2	396.2	394.5
Gross earnings	$6,834,802	$7,018,081	$6,583,102
Operating expenses	3,293,338	3,470,087	3,220,942
Net earnings	$3,541,464	$3,547,994	$3,362,160
Other income	3,240	6,505	4,725
Total net income	$3,544,704	$3,554,499	$3,366,885
Charges, taxes, etc	2,637,182	2,487,942.	2,365,587
Net divisible income	$907,522	$1,066,557	$1,001,298
Extraordinary expenditures	813,751	1,028,899	980,000
Surplus	$93,771	$37,658	$21,298
Operating expenses—per cent of gross earnings	48.18	49.44	48.93

Included in the operating expenses as shown were $195,098 expended for maintenance of way and $380,386 for maintenance of equipment, a total of $575,484. This sum is equivalent to 8.4 per cent of gross earnings. From the net income available from the year's operations there was appropriated for extraordinary expenditures $813,751, which is equal to 11.9 per cent of gross earnings. The total expended from earnings, therefore, for maintenance and "extraordinary expenditures" was $1,389,235, or 20.3 per cent of the gross revenue. W. A. House, president of the company, in calling attention in the report to the appropriation of over $800,000 for extraordinary expenditures, states that "in addition thereto, $337,474 has been expended under the arrangement made with the Maryland Electric Railways Company for purchases, construction, etc., of property leased to your company. Notwithstanding these large expenditures, there has been an actual decrease during the year in accounts and notes payable of $291,703."

Referring to the rehabilitation of the property begun several years ago, Mr. House states that "during this period 182.6 miles of city track, out of a total of 234.6 miles, have been reconstructed or electric or cast-welded. In some cases tracks which have been reconstructed have also been electric-welded. Five car houses and terminal stations, of the latest and most approved fireproof, concrete construction, have been erected. In every instance the car houses have been located after a thorough study of conditions and with a view of saving car-mileage. The car house system is now nearly completed, the company having but two new buildings in immediate contemplation, for both of which funds are now in hand.

"During this period 530 cars have been purchased and placed in operation, and the company's equipment is adequate for present requirements. The capacity of the power generating stations has been increased from 16,879 kw to 35.405 kw, and six new substations have been constructed with a capacity of 28,000 kw.

"While your power station capacity has been increased, it should be borne in mind that six small power stations, equipped with old and obsolete apparatus, have been abandoned, and modern equipment installed at Pratt Street to provide for the closing down of these stations."

An abstract of other features of the report of Mr. House follows:

"The total amount of taxes, including park tax, cost of paving streets, track changes necessitated by regrading of streets, sewerage commission work, widening of streets, etc., was $722,865, or more than 10½ per cent of the gross revenue of the company, as against $694,246 in 1907, a net increase of $28,618. The park tax for the year was $423,640, as against $435,066 in 1907, a decrease of $11,426.

"Capital account was increased $21,530, covering improvements at Pratt Street power house. The sum was derived from sales of disused property, the amounts received from which were credited to capital account, as received, and deposited in a special fund and disbursed by order of court. Of the special fund referred to there was also $10,303 applied with the consent of trustees to electric welding of tracks, making total expenditures from sales of such property for the year $31,833, leaving a balance of $30,797 to be invested subject to order of court.

"In the extraordinary expenditures account are also included capital expenditures, but, in accordance with the policy of the company adopted at the time of the acceptance of the funding plan, these are carried in the above account, subject to final action by the board of directors.

"During the year 65 pieces of special work were installed and 5639 joints electrically welded on 9-in. girder rail, equivalent to 25.59 miles.

"The work of the sewerage commission has interfered with tracks and operations at a number of points, necessitating heavy outlays on the part of the company, as well as causing loss of revenue. To continue the regular service and preserve the integrity of structures, special arrangements had to be made with the commission at a number of points.

"The commissioners for opening streets were extremely active in carrying on their operations during the year, entailing a very heavy expenditure upon your company in cooperating with them in connection with the laying of improved paving. In some instances the tracks, trolley poles and overhead structure had to be changed considerably in order to conform to the new line and grade established by the city. At some places in order to lower the tracks it was necessary to drill through 6 ft. of solid rock, and at others to change the alignment as much as 5 ft."

Various other instances are given, showing "how onerous was the indirect tax imposed upon the company during the year by the operations of the various city departments, approximating an outlay of $114,544.

"In view of the work covered by the supplemental agreement with L. B. Stillwell, dated Aug. 27, 1907, not having been fully completed at the expiration of the contract, Sept. 1, 1908, a new agreement was entered into with him on Aug. 12, 1908, terminating June 1, 1909, under which Mr. Stillwell will continue to give supervision to the additions and improvements, now nearing completion, to the company's power plants. The delay has been due chiefly to the difficult nature of the work, it being necessary to carry on operations without interruption to the power service.

"In December, 1908, it was decided by the Baltimore City Court, on appeal from the Appeal Tax Court, that the easements of your company in the streets of Baltimore are subject to valuation and assessment for taxation. An appeal to the Court of Appeals has been taken from this decision—the contention of your company being that the tax of 9 per cent upon gross receipts (the so-called park tax) constitutes and represents all the taxable value of the street easements which the company enjoys.

"In conformity with the policy of publicity, and with a view to acquainting the public with the various problems encountered in the operation of a large street railway system, and the efforts that are being made to render the best service practicable, the publication of a series of bulletins in the daily papers was inaugurated, running through a period of 10 weeks. These bulletins invited suggestions, criticisms and complaints. Some of the suggestions received were found to be excellent and were adopted. It is believed that the results attained by these publications have been beneficial both to the company and its patrons.

"Prior to the consolidation there was no general exchange of transfers between the different companies, and, in some cases, 3 cents was charged for this privilege. As evidencing the extent to which this privilege has been availed of by patrons since July 1, 1890, when the universal free transfer system became effective, the following table is given:

	Transfer points.	Direction privileges.	Transfers used.
1900	71	544	*15,000,000
1901	160	1,250	35,342,134
1902	160	1,215	39,363,604
1903	166	1,279	42,788,205
1904	166	1,288	43,932,219
1905	172	1,322	49,292,821
1906	186	1,496	53,413,492
1907	186	1,504	55,165,581
1908	193	1,615	54,587,949

*Estimated.

"From this it is seen that 40 per cent of all passengers used transfers.

"While the traveling public has greatly profited by this liberal use of transfers, the general use, and, in many cases, abuse of the transfer privilege has steadily grown until the average rate now received per capita is but 3.45 cents; and, after deducting the park tax of 9 per cent upon gross receipts within the city, a net per capita revenue of only 3.15 cents.

"The average per capita revenue and the cost of transportation have been gradually but surely approaching each other, due to long rides taken for a nickel, the increase in cost of materials of all kinds and the advance in rates of pay of employees.

"It should be recognized that the service given by the company in transportation represents the commodity which it has for sale, and, by reason of legislative enactment, this

is a fixed rate of 5 cents for adults and 3 cents for children. Therefore, we endeavor to impress upon the public and upon municipal officials the fact that, as the margin of profit on the sales of this commodity is unreasonably reduced, the ability of the company to perform its functions of efficient service and to lead in the development of the city and the increase in the taxable basis is impaired.

"There were sold during the year 17 old cars to net $9,200. Since the substitution of the semi-convertible air-brake cars for the smaller type cars 127 of the latter have been sold to net $63,283."

Traffic statistics contained in the report compare as follows:

	1908.	1907.	1906.
Car-mile revenue, cents	25.55	26.06	25.30
Car-mile expenses, cents	12.31	12.87	12.37
Car-miles run	26,764,145	26,953,727	26,035,327
Revenue passengers	138,400,994	142,114,995	133,785,601
Transfers used	54,587,949	55,165,581	53,413,492

Annual Report of North American Company

The income account of the North American Company for the year 1908 shows total revenues of $1,723,186, divided as follows: Interest received and accrued, $409,541; dividends received, $1,287,539; profits and compensation for services, $26,106. The expenditures were as follows: Salaries, legal expenses, net rentals and all other expenses of administration, $91,962; taxes, $5,261; interest paid and accrued, $176,800. The balance of $1,449,163 was carried to undivided profits, making a total in that account as of Dec. 31, 1908, of $3,445,777.

C. W. Wetmore, the president, in announcing the resumption of dividends by the declaration of 1¼ per cent, payable on April 1, 1909, said that when the circular was issued on Nov. 8, 1907, giving the reasons why it had been decided to omit the dividend payable on Dec. 1, 1907, "it was hoped that the effects of the panic might be short-lived and that the payment of dividends might be resumed at an early date, but the intensity of the business depression, the uncertainties of the Presidential campaign and the consequent delay in the sales of securities of the railway and lighting companies, in which the North American Company is an investor, and to which it had made large advances, have enforced postponement until now."

In revaluing the assets as of Dec. 31, 1907, the directors wrote off $2,290,365.73 from the undivided profits "in view of the universally low range of market values then prevailing and of the uncertainty as to the extent and duration of the industrial and general business depression, then beginning to be felt, and of its effect upon the earnings of the companies" in which the North American Company is an investor. The report continues that "in the judgment of the board, the conditions resulting from the panic of 1907 were fully met by this reduction, and therefore no changes of valuation have been made as of Dec. 31, 1908.

"During the past year, as well as in 1907, because of the adverse financial conditions prevailing, capital expenditures by all of the companies have been limited to such as were deemed to be imperatively required to meet the present demands of their business, or as were unavoidable, because of franchise obligations or engagements previously entered into. The total amount of these expenditures was $3,744,195.72, as compared with $6,087,491.35 for the year 1907."

A description is given in the report of the properties of the West Kentucky Coal Company, in which the North American Company is interested, and of the Mississippi River Power Distributing Company, the entire stock of which is owned by the North American Company. This company has made a 99-year contract with the Keokuk & Hamilton Water Power Company, whereby power will be transmitted and delivered to the Union Electric Light & Power Company, the Laclede Gas Light Company and the United Railways Company of St. Louis.

Boston (Mass.) Elevated Railway.—By a vote of 209,669 to 40 the stockholders of the West End Street Railway at a special meeting on April 14 instructed the directors to appear before the Legislature in favor of the new terms for the consolidation of the West End Street Railway and Boston Elevated Railway, as proposed by the stockholders' protective committee, of which F. S. Mead is chairman, and also to request that House bill 48, the consolidation measure, be amended in accordance with the new plan. Briefly, the stockholders desire 8 per cent dividends from the date of consolidation, added security for the stock of the Boston Elevated Railway to be received in exchange for the stock of the West End Street Railway, and the distribution of certain assets of the West End Street Railway.

Delaware & Hudson Company, Albany, N. Y.—The following statement regarding the electric railways in which it is interested was contained in the annual report of the Delaware & Hudson Company for 1908, made public recently: "The earnings of the electric lines fell off through the general depression of business. They were particularly affected by reason of the partial closing down for several months of the plants of the International Paper Company, General Electric Company and the American Locomotive Company. There was a decrease in net earnings of the United Traction Company of $29,701.30; of the Hudson Valley Railway of $74,366.80; of the Troy & New England Railway of $905.30, and of the Schenectady Railway (including Electric Express Company) of $55,196.57. The net earnings of the Plattsburgh Traction Company increased $1,478.99. A dividend of 4 per cent was declared on the capital stock of the United Traction Company for the year 1908. No dividends were declared by the other companies."

Eastern Ohio Traction Company, Cleveland, Ohio.—The plans which have been suggested for reorganizing the Eastern Ohio Traction Company contemplate separate organizations for the Cleveland & Eastern Railway and the Chagrin Falls division of the company. Bonds to the amount of $800,000 are to be sold for the Cleveland & Eastern division, each bondholder to have the same interest he now holds, and, in addition, accrued interest in preferred stock and his proportion of common stock. Of the common stock $500,000 is to go with par of the new bonds and a like amount will be held in the treasury, to be issued with additional bonds if found necessary. For the Cleveland & Chagrin Falls division it is proposed to organize a company with $500,000 capital stock to purchase the property. With this will be an authorized issue of $500,000 of 20-year bonds bearing 6 per cent interest. Of this amount $232,000 will be issued to take up the present first mortgage bonds and interest. A syndicate will be formed to take enough bonds in addition to complete the purchase price of the property. Stock will go with the bonds in this instance also. The Eastern Ohio Traction Company has been in the hands of R. E. Beatty as receiver for some time.

Indianapolis, New Castle & Toledo Electric Railway, New Castle, Ind.—Judge Carter, of the Superior Court, has directed the Union Trust Company, Indianapolis, Ind., receiver for the Indianapolis, New Castle & Toledo Electric Railway, to issue receivership certificates for a sum not to exceed $450,000, and to ask for bids until May 3 for the completion of the line between Indianapolis and New Castle.

Interstate Railways Company, Philadelphia, Pa.—The bondholders' committee of the Interstate Railways Company met on April 16 and received the report of Stone & Webster, Boston, Mass., who were retained to report on the physical condition of the property of the company. No action was taken at the meeting. It is stated that another meeting will be held soon to consider the matter in detail.

Miami (Fla.) Electric Railway.—The property of the Miami Electric Railway has been sold to satisfy a judgment secured against the company by the Empire Trust Company, New York. A franchise for the construction of the road was granted to J. H. Tatum & Company in 1895, and 3 miles of track were laid and three cars were operated. At the sale, the property was disposed of in parts to various interests.

Mineral Wells (Tex.) Electric System.—The street railway and lighting properties known as the Mineral Wells Electric System were sold at public auction recently to D. T. Bomar, of Broad & Bomar, Fort Worth, for $75,000. The plant is not in operation, and no definite plans have been made with respect to the resumption of business. The properties consist of about 6 miles of street railway, an electric lighting plant and a 30-ton ice plant. The Mineral Wells & Lakewood Park Street Railway is in no way connected with the properties purchased by Mr. Bomar.

New England Investment & Security Company, Springfield, Mass.—In the suit brought by holders of preferred stock in the New England Investment & Security Company to require the New York, New Haven & Hartford Railroad to place upon their securities a guarantee of the railroad in accordance with an agreement, the Connecticut Supreme Court has found in favor of the stockholders. The New York, New Haven & Hartford Railroad refused to carry out the agreement on the ground that Massachusetts laws prohibited such action.

New Orleans Railway & Light Company, New Orleans, La.—At the meeting of the stockholders of the New Orleans Railway & Light Company held on April 12, Oscar

L. Putnam was elected a director to succeed Albert Baldwin, Jr., and Robert J. Wood was elected a director to succeed Charles Godchaux. At a meeting of the directors on April 14 the officers were re-elected.

Northwestern Elevated Railroad, Chicago, Ill.—It is stated that the committee composed of Samuel Insull, Ira M. Cohe and E. K. Boisot, which has plans under consideration for merging the elevated railways in Chicago, will make public a plan for leasing the companies to a central corporation on April 30.

Portland Railway, Light & Power Company, Portland, Ore.—An issue of $1,000,000 of three-year collateral trust 5 per cent coupon notes of the Portland Railway, Light & Power Company dated May 1, 1909, and due May 1, 1912, but subject to call on 60 days' notice at 101, are being offered by Bond & Goodwin, New York and Boston, at 99¼ and interest. The Guaranty Trust Company, New York, is trustee of the issue. The notes are secured by deposit at 75 of the general mortgage 5 per cent gold bonds due in 1935.

Public Service Corporation, Newark, N. J.—The Public Service Corporation of New Jersey gives notice to holders of its $6,250,000 convertible notes, dated May 1, 1906, and maturing Nov. 1, 1909, that they may present the notes between April 15 and May 1 for conversion into an equal amount of preferred stock at par, that is, at the rate of 10 shares of preferred stock for each $1,000 note. This is in accordance with the provisions of the issue.

Second Avenue Railroad, New York, N. Y.—Judge Lacombe of the United States Circuit Court has handed down an order in the suit of the Guaranty Trust Company, New York, against the Second Avenue Railroad, extending the time for taking testimony in the suit until July 9, 1909. The complainant is allowed up to and including May 9 to submit testimony in chief. The defendant is allowed from that time until June 9 to submit testimony, and the complainant is given from June 9 to July 9 to submit testimony in rebuttal.

Toledo Railways & Light Company, Toledo, Ohio.—At a meeting of the directors of the Toledo Railways & Light Company held on April 14 the appointment of a stockholders' protective committee was authorized. The mode of selecting the committee was not decided upon. Albion E. Lang, president of the company, denied a report that the protective committee would ask for an extension of the franchise in Toledo. He said that the question was not mentioned during the meeting.

United Railways Investment Company, San Francisco, Cal.—The sale has been ordered by the United States Court, at San Francisco, of the property of the Stanislaus Electric Power Company, Stanislaus Railway, the Tuolumne Water Power Company and the Union Construction Company for May 10. These companies were placed in the hands of receivers several weeks ago, and the present sale is for the purpose of completing a deal by which the Stanislaus water-power properties will come into the possession of the United Railroads of San Francisco, and it is presumed that the United Railways Investment Company will be the only bidder at the sale.

United Traction Company, Albany, N. Y.—Spencer Trask & Company and the Guaranty Trust Company, New York, have purchased $350,000 consolidated mortgage 4½ per cent bonds of the United Traction Company. The proceeds will be used to liquidate certain short-term loans of the company.

Vincennes Traction & Light Company, Vincennes, Ind.—The interest of B. G. Hudnut and his associates in the Vincennes Traction & Light Company has been purchased by S. S. Bush and S. A. Culbertson, Louisville, and others, who are interested in the Rome Railway & Light Company, Rome, Ga.; the Pascagoula Street Railway & Power Company, Scranton, Miss., and the Jackson Railway & Light Company, Jackson, Tenn. New officers have been elected by the Vincennes Traction & Light Company as follows: S. A. Culbertson, president; S. S. Bush, vice-president and general manager; Attilla Cox, secretary and treasurer.

Virginia Passenger & Power Company, Richmond, Va.—The property of the Virginia Passenger & Power Company is advertised to be sold under foreclosure at Richmond, Va., on May 5. It will be offered first as three parcels and then as a whole. Parcel 1 consists of all property covered by the Richmond Passenger & Power Company mortgage of Jan. 1, 1900; parcel 2 of all property included in the South Side Railway & Development Company mortgage, dated July 1, 1899, and parcel 3 of all the property embraced by the mortgage of the Virginia Passenger & Power Company, dated June 18, 1902.

Traffic and Transportation

Passenger Traffic in Brooklyn

The gross receipts of the Brooklyn Rapid Transit Company are from $3,000 to $4,000 a day greater than a year ago, and occasionally are as much as $5,000 a day more than a year ago. Notwithstanding this the gross receipts of the company for the first eight months of the fiscal year are between $350,000 and $400,000 less than the same period of the previous year, and the company has to meet an increase of $258,000 in taxes. Operating expenses have been reduced, however, and other economies have been worked so that there is a slight net improvement over 1908.

E. W. Winter, president of the company, attributes the substantial saving in operating expenses to the extensive additions and improvements that have been made during the last few years. For the six years ended with the current fiscal period the Brooklyn Rapid Transit Company will have expended $40,000,000 for improvements and betterments. Of this amount approximately $5,000,000 has been provided from net earnings and $35,000,000 from bonds. For the first eight months of the current fiscal year the company has spent between $3,000,000 and $4,000,000 for new construction. Perhaps the most important work which it now has in hand is the completion of improvements to the Williamsburg power station, in which turbines are being installed. It is expected that the economies in operation which will result from the installation of the turbines will work materially to the benefit of the company in reducing operating expenses and the cost of power production.

When the subway to Brooklyn was placed in operation by the Interborough Rapid Transit Company, there was considerable speculation regarding the probable effect of the extension on the earnings of the Brooklyn Rapid Transit Company. The morning and evening rush at the Brooklyn Bridge has been reduced materially by the new line, but new centers for the distribution of traffic in Brooklyn have been established at Borough Hall and at Nevins Street and Flatbush Avenue. In regard to the effect of the subway on the Brooklyn Bridge traffic of the Brooklyn Rapid Transit Company, President Winter says:

"At the time the Interborough Rapid Transit Company opened its Brooklyn tunnel extension there was a perceptible decrease in bridge traffic, amounting in the aggregate possibly to 30 per cent, but at the present time I should say that the decrease is only about 12 per cent to 15 per cent. That, however, does not indicate that it has hurt the Brooklyn Rapid Transit Company's business as a whole to the extent mentioned. As a matter of fact, as I predicted before the tunnel to Brooklyn was completed, the ultimate result has been favorable to the Brooklyn Rapid Transit Company, as there has been a perceptible increase in short-haul business in Brooklyn which more than offsets the loss in bridge travel. Another beneficial result of the tunnel to Brooklyn has been that it enables us to operate our bridge trains and cars much more efficiently and the traveling public enjoys a more prompt service than previously was possible. We are able now to run on an average of a train a minute in and out of the New York terminal of the bridge division, there being fewer stops and delays."

Possibilities of Through Trips on New England Electric Lines Discussed

As outlined in the article entitled "Special Excursion Service," which was published on page 569 of the Electric Railway Journal for March 27, 1909, the representatives of 20 electric railway companies in New England met at the Nayassett Club, Springfield, Mass., on April 12 at the invitation of Thomas C. Perkins, vice-president of the Hartford & Springfield Street Railway, and L. S. Storrs, president of the New England Security & Investment Company, to consider excursion traffic in general and the possibilities offered in New England for through traffic, especially the New York-Boston trip.

The meeting was preceded by a dinner. Mr. Perkins explained that the meeting was the first of the kind ever held in New England. He was anxious that the officials should become acquainted with one another. There were many benefits which would come as a result of a common study of the matter of making connections so as to facilitate through travel. For instance, such travel was little understood by the public between Springfield and New Haven, between which cities through travel was soon to become a matter of course, just as it had become a matter

of course between Boston and Worcester. He explained why through travel was more popular in eastern Massachusetts than in the western sections of the State, and pointed out the need for information bureaus and accurate traffic circulars and literature.

H. H. Faulkner, passenger agent of the Boston & Northern Street Railway, declared that there is a natural increase in travel by electric railway, but that traffic should be fostered and encouraged. From practical experience he had found that the principal facts that prospective patrons wished to learn for long-distance travel were the following: Where to change cars, the running time and the fares. The department of which he has charge had produced maps and prepared articles for papers showing how to travel by trolley as far north as Waterville, Me., and as far south as New York City. At the office of the department on Washington Street, Boston, as many as 500 persons had applied for assistance in planning tours in one day.

Taking up the subject of long-distance travel, Mr. Faulkner said that the property with which he is connected is divided into 16 divisions, and that the superintendent of each division is always on the alert to obtain information about long-distance traffic, but that it was a difficult problem. Mr. Faulkner said that he had received by mail a request from a woman teacher for a map which she could exhibit in her schoolroom. A trolley map was a novelty, and it was educational, she said. It is of great interest in the teaching of geography. In a general discussion of long-distance travel the idea of a school map, that of a vacation by trolley and that of wedding tours by trolley came in for much interested scrutiny. Mr. Perkins went into the matter of a general time table for trolleys between Boston and New York.

H. E. Stone, of the Boston & Worcester Street Railway Company, told about the use of a decorated arrowhead as a souvenir. He had distributed these to school children, who wore them as tags in their buttonholes, and at home the souvenirs were made use of for bookmarks. He also said that his company had issued a folder containing distances and schedules for through travel from Boston to New York, and that he had received a request for one of these from a Massachusetts man now in California.

Mr. Perkins outlined a plan for a special trip from Boston through Springfield to New York, on which there should be representatives of the press of the largest cities along the line. This plan included a stop over night at Hartford and a banquet, at which Mayor Hooker would speak. H. C. Page, general manager of the Springfield Street Railway, spoke of the desirability of the trip to Greenfield and Mount Tom in the summer, and explained how this could be made by through passengers from New Haven and Hartford. J. A. Taggart, general manager of the Connecticut Valley Street Railway, brought up the matter of through ticketing and of the interchange of cars. N. D. Winter, president of the Northampton Street Railway, discussed the question of the expense involved in adopting some of the plans proposed and the probable return on the money expended to create traffic. F. H. Hewitt, superintendent of the Middletown Street Railway, and L. S. Risley, superintendent of the New Britain lines of the Connecticut company, also spoke. Mr. Risley advocated the running of through cars.

Funeral Car Operating Agreement in Chicago

The Chicago City Council has approved an operating agreement between the Calumet & South Chicago Railway and the Chicago & Southern Traction Company, whereby these roads will jointly operate funeral cars in the southern part of the city. The principal provisions of the agreement follow:

"The Chicago & Southern Traction Company authorizes the Calumet & South Chicago Railway to operate funeral cars or trains over its lines from the intersection of Vincennes Road and 103d Street, Chicago, to three cemeteries reached by the Morgan Park branch of the company in Cook County. The Chicago & Southern Traction Company shall furnish electrical power and install necessary sidings for trains of funeral car and one trailer—operated by employees of the Calumet & South Chicago Railway. The funeral cars of the Calumet & South Chicago Railway shall be similar to the cars now operated by the Chicago & Southern Traction Company and shall not weigh more than 60,000 lb. No passengers other than members of the funeral party shall be transported over the lines of the Chicago & Southern Traction Company. The Calumet & South Chicago Railway agrees to pay the Chicago & Southern Traction Company $2.30 for each funeral car and $1.20 for each trail car, for each round trip to and from any cemetery; and the Chicago & Southern Traction Company is not to collect or receive any fares from passengers on funeral trains. An accounting for the compensation paid by the Calumet & South Chicago Railway to the Chicago & Southern Traction Company shall be made on or before the fifteenth of each month. The Calumet & South Chicago Railway shall be liable for any negligence of its own employees in regard to the operation of the funeral trains over the tracks of the Chicago & Southern Traction Company. Funeral cars shall be marked 'Through Car' and be run on schedules furnished by the Chicago & Southern Traction Company. The Calumet & South Chicago Railway shall at its own expense defend all actions brought against the Chicago & Southern Traction Company arising from the exercise by the Calumet & South Chicago Railway of the rights granted by the Chicago & Southern Traction Company. The agreement shall remain in force until the expiration of the Chicago & Southern Traction Company's ordinance on May 2, 1913, or until the expiration of any extension of that ordinance which may not prohibit the granting of the privilege."

Accidents in New York in March

The Public Service Commission of the First District of New York has issued the following summary of accidents on the lines within its jurisdiction in March, 1909, as compared with March, 1908:

March.	1909.	1908.
Car collisions	82	148
Persons and vehicles:		
Struck by cars	942	905
Boarding	574	574
Alighting	513	454
Contact electricity	20	27
Other accidents	1,794	2,245
Totals	3,985	4,353
Injuries:		
Passengers	1,550	1,525
Not passengers	520	632
Employees	364	474
Totals	2,434	2,631
Serious (included in above):		
Killed	20	44
Fractured skulls	17	8
Amputated limbs	6	1
Broken limbs	32	33
Other serious	151	101
Totals	226	187

Trespassing on Railroad Tracks in Indiana

As has been previously noted in the Electric Railway Journal, the attempt to secure special legislation at the recent session of the Indiana Assembly to prevent trespassing on railroad tracks failed. In order to assist the movement against trespassing on tracks, the Indiana Railroad Commission has addressed a circular to all the steam and electric railways in the State calling attention to the present statute. The commission comments on the existing law as follows:

"Under this law (Indiana statute, 1908; section 2280) your notification to the public not to walk upon and along your tracks will subject them to the penalties of prosecution, if such notice be ignored. This may be accomplished by erecting bulletins conspicuously warning all persons not to use the tracks as footways. The commission hereby recommends that bulletins be erected by you at all points where the public is likely or is accustomed to trespass upon tracks, and which are especially dangerous by reason of speed of trains, obstructions to the view, numbers of trespassers, time when trespassing occurs, etc. The commission also recommends that you secure as far as possible the co-operation of prosecuting attorneys of districts traversed by your road, bringing to their attention all violations of the above statute, and assisting in securing convictions. Orders should be issued to your employees to maintain a strict lookout for violations of the statute and report the same to their company, with names of violators, and all facts necessary to secure convictions. Notification of your compliance with the above recommendations is requested."

Hearing on Transportation of Military Supplies in Massachusetts.—The Massachusetts Railroad Commission gave a hearing on April 9 regarding the conditions under which it should authorize the transportation of military supplies by street railways, electric railroads and elevated railways as provided in the bill to that effect just passed by the Legislature. No one was present to define the restrictions suggested in the law.

Winona Interurban Railway Files Tariff.—The Winona Interurban Railway, Winona Lake, Ind., filed its tariff schedule with the Indiana Railroad Commission under the new law on April 16. The basis of the rate is 2 cents per mile, with a minimum charge of 5 cents. The charge between points is a multiple of five nearest to the amount produced by multiplying the distance by the rate. Ten cents extra on each trip will be charged passengers who fail to purchase tickets when they board a car at a station where there is a ticket office. Ticket agents are required by law to be in their offices ready to sell tickets for 30 minutes prior to the departure of any passenger car. Where no ticket offices are maintained the regular ticket rate will be charged.

Easter Egg Hunt at Little Rock.—The Little Rock Railway & Electric Company, Little Rock, Ark., conducts an Easter egg hunt annually at its park for the mothers and children of the city, the families of the employees of the company and the orphans from the State and private orphanages in Little Rock, all of whom are the guests of the company for the day. The hunt gives more pleasure to the children than any other celebration during the year, and as the impressions on young people generally are lasting and as the children know that the hunt is given by the company for their benefit, a good opinion is conveyed of the treatment of the public by corporations. The hunt on April 11 was the fifth one of the kind. It took place at 3:30 p. m. Cars to the park followed each other at intervals of 7½ minutes. The eggs were concealed in stumps and in the ground, and some were covered with leaves in a tract of several acres in the east end of the park. The children were admitted on signal to the ground where the eggs were hidden, and in 40 minutes all but three of the eggs had been found. An egg wrapped in gold leaf carried a cash reward of $3 to the finder, and several eggs wrapped in tin-foil carried prizes of 50 cents each. G. J. Griffith, superintendent of the company, distributed the prizes from the band stand.

Circular in Indiana on Switch Stands and Signal Lights.—The Railroad Commission of Indiana has addressed the following circular to all steam and electric railroads in the State: "Complaint has come to the commission that the railroads in this State do not, in all cases, use adequate signal lamps, the same being objectionable because of improper construction, lack of care in maintenance, character of oil used, or from other causes. The commission hereby recommends that specific orders be given to all enginemen, motormen and sectionmen to keep strict lookout for all signal failures, including failures of switch lamps and report the same promptly to their proper officers in every instance, and that the latter follow up such reports with diligence. The commission also recommends that, where switches are located close together, so that their respective signals cannot readily be distinguished, they be indicated by switch stands of different heights, so placed out of range that the danger of confusion will be avoided. It is further recommended that each railroad cause an inspection to be made of the lights in and about their stations, to ascertain if there are any white lights at or near such stations, which, by reason of location or intensity, interfere with the engineer's view of signals."

Service to Coney Island.—The Brooklyn Rapid Transit Company has announced that it proposes to increase the value of its service to Coney Island this summer by diverting express trains from the Sea Beach line to the Brighton Beach line, which has four tracks between Church Avenue, Brooklyn, and Coney Island, a distance of 5 miles, and on which division there are no grade crossings. Trains operated via the Sea Beach line descend to the surface from the elevated at Thirty-sixth Street and Third Avenue, but the section of the city between Thirty-sixth Street and Coney Island has increased in population so rapidly that the company feels it can serve the public more advantageously and protect its own interests better by diverting trains to the Brighton Beach line. The desire of the company to simplify operation to Coney Island has been accomplished gradually. This summer there will be only two railroad terminals at Coney Island—Culver and West End—from which both surface cars and elevated trains will be dispatched. The first step looking to the relief of the situation at Coney Island was taken when the Culver terminal was remodeled two or three years ago and made ample for the needs of the Brighton Beach and Culver elevated lines and the Reid Avenue, Nostrand Avenue, Tompkins Avenue and Vanderbilt Avenue, and Union Street surface lines, which approach Coney Island through Gravesend Avenue. The Sea Beach terminal at Luna Park will be abandoned and Sea Beach trains will run into the rebuilt West End terminal. No change will be made in the service between Coney Island and Sheepshead Bay.

Personal Mention

Mr. E. H. Maggard has been appointed general freight and passenger agent of the Petaluma & Santa Rosa Railway, Petaluma, Cal., to succeed Mr. Fred Whitney.

Mr. Hugh J. McGowan, president of the Indianapolis Traction & Terminal Company, Indianapolis, Ind., who has been abroad for about a year, has largely regained his health.

Mr. W. F. Goble, who has been general foreman of the Los Angeles & Redondo Railway, Los Angeles, Cal., has been appointed superintendent of the mechanical department of the company.

Mr. Franklin L. Lyle, vice-president of the Commonwealth Trust Company, Philadelphia, Pa., has been elected president of the Citizens' Passenger Railway, Philadelphia, Pa., to succeed Charles E. Ellis, deceased.

Mr. John B. Parsons, president of the Philadelphia (Pa.) Rapid Transit Company, has returned to Philadelphia after a six-weeks' trip in Europe with Mr. P. A. B. Widener, a director of the Philadelphia Rapid Transit Company.

Mr. C. N. Kellogg, Jr., who for the last three and one-half years has been manager of the El Paso (Tex.) Electric Company, will hereafter be located in Dallas, Tex., where he will manage a securities department for Stone & Webster, Boston, Mass. Mr. Kellogg will continue as manager of the El Paso Electric Company, however, and will visit El Paso from time to time. During his absence from El Paso his duties will devolve upon Mr. H. S. Potter, general superintendent.

Mr. S. D. Wager has resigned as master mechanic of the Toledo, Port Clinton & Lakeside Railway, Genoa, Ohio. Mr. Wager began his railroad career on April 1, 1891, from which time until Dec. 1, 1903, he was connected with the transportation departments of the Lake Shore & Michigan Southern Railroad, the Chicago, Rock Island & Pacific Railroad and the Missouri, Kansas & Texas Railroad. From Jan. 1, 1903, to June 15, 1906, he was connected with the construction and operating departments of the Toledo & Indiana Railway and the Toledo, Port Clinton & Lakeside Railway. On June 15, 1906, Mr. Wager was appointed chief train despatcher of the Toledo, Port Clinton & Lakeside Railway, and on Nov. 15, 1907, he was promoted to general shop foreman of the company. He was made master mechanic of the company in July, 1908.

Mr. A. P. Lathrop has been elected president of the American Light & Traction Company, New York, to succeed Mr. Emerson McMillin, who has been elected chairman of the board of directors, a newly created position. Mr. Lathrop was formerly vice-president and treasurer of the company, and Mr. J. M. McCarthy, who has been a vice-president, has also been elected treasurer to succeed Mr. Lathrop. Mr. Marion McMillin, who has been assistant secretary, has been elected a vice-president of the company, but will retain the position of assistant secretary. Mr. Lathrop, the new president, was born in Columbus, Ohio, and was educated in that city. He began his business career with the Columbus Gas Company and for several years was secretary of the company. He resigned from the Columbus Gas Company to become manager of the St. Paul Gas Company. He became connected with the American Light & Traction Company soon after it organized.

OBITUARY

Joseph Russell Jones, for many years president of the West Division Street Railway, Chicago, is dead. Mr. Jones had been a resident of Illinois since 1838. He was a personal friend of Presidents Lincoln and Grant and was Minister to Belgium under the administration of President Grant. Mr. Jones was 86 years old.

Charles E. Ellis, president of the Citizens' Passenger Railway, Philadelphia, Pa., a subsidiary of the Philadelphia Rapid Transit Company, is dead. Mr. Ellis was 74 years old and had been a sufferer from neuralagia and rheumatism for some time. He was born in Philadelphia, and previous to the organization of the Philadelphia Rapid Transit Company took an active interest in street railway affairs in Philadelphia.

Charles M. Preston, president of the Kingston (N. Y.) Consolidated Railroad, died on April 16 at Kingston after a lingering illness. Mr. Preston was 61 years old at the time of his death, and had been actively engaged in financial matters for many years. In 1890 he was appointed superintendent of banks by Governor Hill, and held this position for two terms. Subsequently he was successively president of the Equitable Securities Company, the Securities Company and the Kingston Consolidated Railroad.

Construction News

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

An asterisk (* indicates a project not previously reported.

RECENT INCORPORATIONS

***Danville, Kankakee & Crescent Traction Company, Crescent City, Ill.**—Incorporated to build an electric railway from Danville to Crescent City and Kankakee. Capital stock, $10,000. Incorporators: E. E. Meyers, George H. Clark, Louis Schwer, F. J. Nassels, U. S. G. Humphries, Henry R. Voigt, Fred. G. Nightingale and J. P. Sterrenberg, Crescent City.

***Cincinnati, Louisville, Lexington & Maysville Traction Company, Frankfort, Ky.**—Incorporated for the purpose of constructing an electric railway between Cincinnati and Lexington and another between Maysville and Louisville. The two lines would thus cross each other at Dry Ridge. They will aggregate about 250 miles in length. Capital stock, $10,000,000. Officers: W. T. S. Blackburn, Dry Ridge, president; J. Glascock, vice-president; John McCoy, secretary.

***Southwestern Ohio Traction Company, Cincinnati, Ohio.**—Incorporated for the purpose of forming a terminal for all the interurban lines entering Cincinnati by the construction of a combined elevated and subway line. The terminal is to be in the vicinity of Third Street and Smith Street, and the elevated section of the line would run from there east over Third Street to Martin Street; then around the hill at Eden Park and through a tunnel that would carry the tracks under Walnut Hills to Norwood. A branch line would connect with the Cincinnati, Georgetown & Portsmouth Railroad and the various branches of the Interurban Railway & Terminal Company which enter the city at Carrel Street. Headquarters, Second National Bank Building. Capital stock, $10,000. Incorporators: George B. Goodhart, Charles C. Benedict, William J. McCauley, C. B. Matthews and Harry T. Klein. John E. Bleekman is the promoter of the enterprise.

***Clinton (Okla.) Street Railway.**—Chartered to build a 10-mile street railway in Clinton. The Clinton Railroad Construction Company, with $10,000 capital stock, has also been chartered by the same people. Capital stock, $50,000. Directors: C. W. Goodwin, R. O. Hunt, M. L. Holcombe, Charles H. Lamb, E. N. Tittsworth, A. N. Curry, E. A. Humphrey and B. A. Little, Clinton, and H. Smith, Arapahoe, Okla.

***California & Centerville Street Railway, California, Pa.**—Application will be made on May 10 for a charter for this company, which proposes to build a street railway from California to Centerville. Applicants for the charter are: M. H. Francis, W. J. Weaver, H. C. Drum, Harris Booker and Joseph McLain.

***Finleyville Southern Street Railway, Finleyville, Pa.**—A charter will be asked for by this company to build a 14-mile electric railway from Finleyville to Bentleyville. The route is practically that of the old Pittsburg Southern Railroad, which was graded and never used. Promoters: A. H. Anderson, S. C. Wilson, F. M. Hayden, T. M. Hayden, J. E. Hayden and H. B. Hayden.

***Nashville & Crocker Springs Rapid Transit Railway, Nashville, Tenn.**—Incorporated to construct an electric railway from Nashville to Crocker Springs, a distance of 12 miles. It will connect with the Nashville Railway & Light Company's line at First Street. Engineers will be put in the field at once to make the surveys and contracts will be awarded within the next 30 days. Incorporators: Lee Guggenheim, president and general manager; W. F. Webb, vice-president; R. B. Jones, secretary; J. A. Witherspoon, James B. Carr, F. Roddy, W. W. Moorehead and Frank B. Marr. Headquarters, 302 First National Bank Building, Nashville.

FRANCHISES

Oakland, Cal.—A. W. Maltby and Joseph Napthaly, representing the Oakland & Antioch Railway, have applied to the Board of Supervisors for an extension of the company's permit to build lines through the Alameda-Contra Costa County tunnel. It is desired that the permit extend for 25 years, for which the applicant agrees to provide the floor, light and place safety gates on both ends of the tunnel. [E. R. J., Feb. 6, '09.]

***Santa Barbara, Cal.**—S. A. Moss has applied to the Board of Supervisors for a franchise for an electric railway from Manzanita station to a point above Coyote Creek.

Omaha, Neb.—The Nebraska Traction & Power Company has applied to the Douglas County Commissioners to extend its franchise so it can lay its rails across the Q Street viaduct over the Burlington Railroad Company's tracks, permitting it to connect its track with that of the Omaha & Council Bluffs Street Railway. [E. R. J., April 3, '09.]

Camillus, N. Y.—The Town Board has granted the Rochester, Syracuse & Eastern Railroad, Syracuse, a franchise to construct its railway across the northerly section of Camillus.

New York, N. Y.—The Board of Estimate and Apportionment has approved the application of the New York & Queens County Railway for a franchise to construct a connection between the tracks on Debevoise Avenue and Jackson Avenue, Queens Borough.

Cobourg, Ont.—The Town Council has granted a franchise to the Cobourg, Port Hope & Havelock Electric Railway to enter Cobourg. [E. R. J., Jan. 30, '09.]

Minot, S. D.—The proposition of granting a street railway franchise to Messrs. Graves and Kempers has been turned down by the people of Minot by a vote of 377 to 141.

TRACK AND ROADWAY

British Columbia Electric Railway, Vancouver, B. C.—This company has awarded a contract to the Great Northern Aluminum Company, Montreal, Que., for 390 miles of aluminum wire.

Los Angeles & Mt. Washington Railway, Los Angeles, Cal.—This company advises that it expects to have its incline railway, connecting Mt. Washington with the Los Angeles street railway system, in operation by May 1. Current is purchased from the Pacific Light & Power Company. The equipment of the station on the summit of Mt. Washington consists of one 30-kw Westinghouse motor, direct connected to a Halliday grip, which in turn operates the cable. The third rail system is being installed. The line is narrow gage and about 3000 ft. in length. Two cars will be operated. The company owns a 10-acre park on the summit, where it will immediately erect a tourist hotel. All contracts for the construction of the railway have been awarded to the Llewellyn Iron Works, Los Angeles, with the exception of the contract for the roadbed, which has been let to the Mercereau Bridge & Construction Company. Office, 140 West Fifth Street, Los Angeles. Capital stock authorized and issued, $150,000. Bonds authorized, $60,000; issued $25,000. Officers: Robert Marsh, president; J. E. Marsh, first vice-president; John Howze, second vice-president; A. St. C. Perry, secretary-treasurer and general manager. all of Los Angeles. [E. R. J. Aug. 8, '08.]

San Joaquin Valley Electric Railway, Stockton, Cal.—This company is perfecting arrangements preliminary to beginning the construction of its proposed line to connect Stockton, Modesto, Riverbank and intervening towns, the idea being to complete the railway during the summer. The franchises and rights-of-way have all been secured, surveys have all been made, and the company will be prepared to receive bids for material about June 1. The line will be 44 miles long, standard gage, and six cars will be operated at first. The details of the power arrangements have still to be arranged. Stockton and Modesto are both trading centers, and it is estimated that upward of 50,000 people will be served by the line. Authorized capital stock, $1,000,000, of which $150,000 of stock has been subscribed; authorized bond issue, $1,000,000. Office, Savings & Loan Bank Building, Stockton, Cal. G. O. Broadhurst, Stockton, chief engineer; Morris L. Brackett, Stockton, Cal., and the Metropolitan Life Building, New York, vice-president. [E. R. J., Nov. 7, '08.]

Shore Line Electric Railway, New Haven, Conn.—This company has awarded a contract to Robert N. Ford, New Haven, for 65,000 ties.

East Pensacola City Company, Pensacola, Fla.—This company announces that it has awarded a contract to the Stone & Webster Engineering Corporation, Boston, Mass., for the construction of its proposed street railway, which is to extend from Pensacola to East Pensacola, a distance of one and one-half miles. Construction work is now under way. John E. Stillman, manager. [E. R. J., Feb. 27, '09.]

Cedarville, Ill.—Henry Richart, Cedarville, who is interested in the proposed 35-mile interurban electric railway from Freeport through Cedarville, Red Oak, Buena Vista and Orangeville, Ill., to Monroe, Wis., advises that a company has not yet been organized to construct the proposed railway. Meetings have been held in Cedarville and Rock Grove and committees appointed to confer with the Freeport Business Men's Association. [E. R. J., June 20, '08.]

Wood River, East Alton & Bunker Hill Traction Company, East St. Louis, Ill.—Announcement is made that this company has completed surveys and procured all rights

of way and franchises for its proposed electric railway, which is projected from Wood River to East Alton, Bethalto, Moro, Bunker Hill, Dorsey, Gillespie and Litchfield, a distance of 30 miles. It has not yet been decided when contracts will be awarded. Headquarters, East St. Louis. Capital stock, authorized, $100,000. Officers: J. T. W. Rudisell, president and general manager; R. E. Maney, vice-president; S. B. Knepper, secretary; R. M. Smith, treasurer; Rude Engineering Company, engineers, all of East St. Louis. [S. R. J., May 23, '08.]

Galesburg & Kewanee Electric Railway, Kewanee, Ill.—It is reported that this company plans to extend its line from Galva to Galesburg, Ill. R. H. Hayward, general manager.

Central Railway Company of Iowa, Clinton, Ia.—This company advises that it is now ready to receive bids on earthwork and bridges for its proposed 83-mile electric railway between Clinton and Dubuque. Thos. J. Wilcox, Clinton, president and general manager.

Iowa City, Ia.—D. A. Ruse, secretary of the Rundell Land & Improvement Company, holder of the local street railway franchise, informs the Electric Railway Journal that a new company, to be known as the Iowa City Electric Company, will soon be organized to construct the proposed street railway in Iowa City. It is probable that construction work will be started during the summer. [E. R. J., Sept. 5, '08.]

Corinth & Shiloh Electric Railway, Corinth, Miss.—Announcement is made that this company is negotiating with capitalists for the construction of its proposed railway, which is to connect Corinth and the United States National Park at Shiloh, a distance of 25 miles. It has not yet been definitely decided what the motive power will be, but is probable that electricity will be used. Officers: A. Rubel, president and treasurer; S. H. Rubel, vice-president and general manager; M. T. Byrum, secretary, all of Corinth.

Moberly, Mo.—Chas. A. Wellman, member of Manning & Wellman, Ottumwa, Ia., confirms the report that this company proposes to build an electric railway in Moberly and an interurban railway from Moberly to Huntsville, making a total of 8 miles. The promoters expect to furnish the sum of $40.000 and will require the same amount to complete the railway. Incorporation papers have not yet been filed. [E. R. J., April 10, '09.]

Nebraska Traction & Power Company, Omaha, Neb.—W. D. Crist, general manager of this company, writes it is planned to have the proposed eight-mile electric railway from Omaha, through South Omaha, Ralston to Pappillion, in operation within 30 days. Power will be purchased from the Omaha Electric Light & Power Company and transmitted to Ralston, where the company will build a substation. Two passenger cars and 10 freight cars will be operated. [E. R. J., April 3, '08.]

Trenton, Lakewood & Atlantic Railway, Trenton, N. J.—A deal has just been consummated by which Charles R. Le Compte, Harry J. Terwilliger, Ernest Le Compte, Nicholas MacDonald, Lakewood; James H. Butcher, J. Arthur Butcher, Ardena; Captain R. A. Clark, Point Pleasant, have taken over the property and franchises of the Trenton, Lakewood & Atlantic Railway. About 4 miles of the railway has been built between Point Pleasant and Lakewood. It is said that the new company will file articles of incorporation and will at once complete the line between Point Pleasant and Lakewood and extend it to Trenton, via Allentown.

Long Island Railroad, Long Island City, N. Y.—This company has recently placed contracts for the following construction work: Two additional tracks from Winfield to Jamaica, 8 miles; two track connections between the main line and Montauk division, 2 miles; freight connection between Montauk division and freight yards at Long Island-City, ½ mile; cross island line of the Huntingdon Railroad from Huntingdon to Amityville, 18 miles. Contracts have also been placed for 50 miles of third-rail construction for electric operation.

Malone, Ft. Covington & Hopkins Point Railway, Malone, N. Y.—A. A. Edwards advises that construction has been started by this company on its proposed 20-mile electric railway between Malone, Westville, Ft. Covington and Dundee, Que. A power plant will be built three miles north of Malone. The repair shops will be located at Malone. Capital stock authorized, $200,000. Officers: J. H. Scott, president and general manager; W. E. Smallman, vice-president; L. C. Haskell, secretary and treasurer; A. A. Edwards, superintendent and purchasing agent; W. Smith, engineer.

New York & North Shore Traction Company, Mineola, N. Y.—This company has filed a certificate with the Secretary of State, announcing the following proposed extensions of its electric railway: From Middle Neck road and North Hempstead turnpike, near Roslyn, to the easterly limit of the Borough of Queens. From Broadway in Little Neck to Tenth Street in Bayside. From Tenth Street and Broadway in Bayside to Bell Avenue, Bayside. From Tenth Street and Broadway, in Bayside, to the former village of Whitestone. The Public Service Commission of the Second District has given its permission and approval to the company to begin construction and operation of its railway in Mineola, and has also approved of a change of its route through that village.

Hickory (N. C.) Railway.—M. E. Thornton writes that preparations are being made for starting construction work on this proposed electric railway within the next two months. Plans are also being completed for the constructin of a hydro-electric plant on the Catawba River. It is the intention to have the railway completed to that point in order to haul the material and equipment for the plant. The railway will connect Catawba Springs, Newton, Brookford, Hildebran and Cliffs. A repair shop will be built at East Hickory. Capital stock authorized, $2,000,000; issued, $25,000. Bonds authorized, $7,000,000. Officers: M. E. Thornton, Box 443, Hickory, president and general manager; L. B. Buchanan, vice-president; B. F. Campbell, secretary; C. M. Blalock, treasurer. [S. R. J., Sept. 7, '07.]

Cleveland (Ohio) Subway Company.—This company has changed its name to the Cleveland Underground Rapid Transit Company, and in addition has asked for franchises which will enable it to connect the present Broadway station of the Nickel Plate Railway with the central part of the city and with the site of the proposed new union station for steam roads. It is rumored that the Nickel Plate tracks will be electrified and used to bring the interurban lines into the city. [E. R. J., April 17, '09.]

Toledo, Wabash & St. Louis Railroad, Toledo, Ohio.—It is stated that Louis Pilliod, Swanton, and Charles H. Nauts, Toledo, two of the original promoters, are forming plans for the reorganization of the company to the end that its purpose of establishing a through line paralleling the Wabash Railway between Toledo and St. Louis may be carried out. Considerable construction work was done in Ohio and between Maumee and Neapolis the grading, bridges and culverts were all completed. [S. R. J., May 11, '07.]

Zanesville & Meigs Valley Traction Company, Zanesville, Ohio.—This company, which proposes to build an electric railway from Zanesville to Beverly, announces that construction work will be started within six months. Estimates are now being made for financial interests. No contracts have yet been awarded. Headquarters, People's Savings Bank Building, Zanesville. E. R. Meyer, Zanesville, president. [E. R. J., Sept. 5, '08.]

El Reno (Okla.) Interurban Railway.—The Oklahoma City chamber of commerce, it is stated, has agreed to raise the sum of $50,000 for the El Reno Interurban Railway which proposes to construct an interurban electric railway between Oklahoma City and El Reno, a distance of 25.5 miles. It is the intention of the company to begin construction work as soon as the $50,000 has been subscribed. Henry Schaefer, El Reno, president. [E. R. J., Sept. 19, '08.]

Sapulpa & Interurban Railway, Sapulpa, Okla.—This company, which proposes to build an electric railway from Sapulpa, via Kiefer to Glenpool, has awarded the contract for grading to P. McNerney, Sapulpa; and the contract for bridges to the Kansas City Bridge Company, Kansas City, Mo. H. E. Clark, president.

***Brockville, Ont.**—At a meeting of the Town Council on April 13, a letter was read from T. M. Kirkwood, Toronto, asking the Council to agree to guarantee the interest on the bonds of a company for 20 years to an amount of $25,000 per mile for an electric railway from Toronto to Montreal.

London & Northwestern Railway, London, Ont.—D. A. Stewart writes that this company proposes to build an electric railway from London to Sarnia, passing through Hyde Park, Melrose, Lobo, Poplar Hill, Park Hill and to Grand Bend, a popular summer resort, a distance of 114 miles. It is the intention to begin work within six months. An application is now before the Ontario Legislature for a charter. The company plans to operate 15 cars and to erect a repair shop at London. The railway will be bonded for $30,000 per mile. Capital stock, $500,000. [E. R. J., Feb. 20, '09.]

Clarion & East Brady Electric Railway, Clarion, Pa.—G. E. Arnold, Clarion, writes that this company is now working on the preliminary survey for its proposed 25-mile electric railway, which is to connect Clarion, Sligo, Rimersburg and East Brady. The surveys are in charge of George S. Baton & Company, Pittsburg. It is the inten-

tion of the company to start the construction of its proposed railway within two months. [E. R. J., Jan. 16, '09.]

York (Pa.) Railways.—This company has recently awarded a contract to John W. Stahle to build the West Borough extension of its West Market Street line. The company is said to have purchased all the material necessary for this extension.

Georgetown Railway & Light Company, Georgetown, S. C.—H. C. Case, 2215 Land Title Building, Philadelphia, president of this company, which has taken over the holdings of the Georgetown Electric Company, writes that it is planned to take up the construction of the proposed local street railway during the summer. A franchise has already been secured. [E. R. J., Jan. 23, '09.]

***Newport, Tenn.**—P. C. Ottinger, Knoxville, is reported to be promoting a plan for an electric railway between Newport and Greenville, Tenn.

Gainesville, Whitesboro & Sherman Railway, Gainesville, Tex.—It is stated that this company will let construction contracts about May 1 for building its line, construction work on which was started two years ago. The line will be operated by gasoline.

Galveston-Houston Electric Railway, Houston, Tex.—This company has filed an amendment to its charter increasing its capital stock from $3,000,000 to $3.500,000. [E. R. J., March 13, '09.]

Ft. Worth, McKinney & Bonham Electric Railway, McKinney, Tex.—J. L. Lovejoy advises that this company has been organized for the purpose of building an electric railway from Ft. Worth to Bonham, via Fresno, McKinney and Blue Ridge. The company has not yet been incorporated. It has not yet been decided when contracts will be awarded. Officers: J. L. Lovejoy, McKinney, president; B. F. Pope, secretary; H. E. Smith, treasurer. [E. R. J., July 4, '08.]

Panhandle Electric Railway & Power Company, Spokane, Wash.—This company has filed amended articles of incorporation which provide for the construction of an electric railway from Priest River, Idaho, to Priest Lake, thence up the river to the Canadian line, while a line from Spokane to Priest River is also proposed. [E. R. J., June 27, '08.]

Wellsburg, Bethany & Washington Traction Company, Wellsburg, W. Va.—Announcement is made that this company has completed plans for a 7-mile extension of its railway from Bethany to across the State line to Avella.

Pan-Handle Traction Company, Wheeling, W. Va.—It is reported that this company has a plan under consideration for double-tracking its railway from Glennova to Wheeling.

SHOPS AND BUILDINGS

Tampa-Sulphur Springs Traction Company, Tampa, Fla.—This company plans to build an addition to its car house to be 80 ft. x 210 ft. It is also considering the purchase of a wheel press and boring machines.

Chicago & Southern Traction Company, Chicago, Ill.—This company advises that it has rebuilt the old power station of the Chicago Electric Traction Company into a car repair shop, fully equipped with tools for all kinds of motor and car repairs. The company expects to purchase one car wheel lathe for turning 36-in. steel wheels.

Delta Electric Light, Power & Manufacturing Company, Greenville, Miss.—This company has just completed a new car house and repair shop.

Schuylkill & Dauphin Traction Company, Williamstown, Pa.—This company has awarded a contract for an extension to its car house to be 40 ft. long.

POWER HOUSES AND SUBSTATIONS

Sunbury & Northumberland Electric Railway, Sunbury, Pa.—This company is considering the purchase of 1150-kw and 1200-kw rotary converters. These will be second-hand and will be two-phase, 60 cycles, 2300-500-volt, direct current.

Western Ohio Railway, Lima, Ohio.—This company has purchased and will shortly install a 1000-kw generator in its power station.

Omaha, Lincoln & Beatrice Railway, Lincoln, Neb.—This company is now erecting a distributing lighting plant at Bethany Heights, which will supply this town with street lighting and also for business purposes. It will probably be completed by May 15. The estimated cost, according to the present plans, is about $4,500.

Long Island Railroad, Long Island City, N. Y.—This company advises that it expects to build three substations, at Huntington, Farmingdale and Winfield. Equipment for these stations has already been contracted for.

Manufactures & Supplies

ROLLING STOCK

Norfolk & Bristol Street Railway, Foxboro, Mass., will purchase four GE-1000 motors in the next few weeks.

Hagerstown (Md.) Railway has ordered one combination passenger and baggage car from the Cincinnati Car Company.

Pacific Electric Railway, Los Angeles, Cal., has ordered 50 50-ton steel underframe flat cars from the Pressed Steel Car Company.

Indiana Union Traction Company, Anderson, Ind., has purchased one 28-ft. closed motor car from the Dorner Railway Equipment Company, Chicago.

Illinois Central Electric Railway, Canton, Ill., has ordered one work car from McGuire-Cummings Manufacturing Company, Chicago.

Schuylkill & Dauphin Traction Company, Williamstown, Pa., has purchased four 10-bench open cars from I. S. Van Loan Company, New York.

Parsons Street Railway & Electric Company, Parsons, Kan., has bought three 10-bench open motor cars from the Dorner Railway Equipment Company, Chicago.

Goldsboro (N. C.) Traction Company, a proposed road, will be in the market shortly for from two to four motor cars. E. T. Oliver, manager, Goldsboro, N. C.

Chicago & Southern Traction Company, Chicago, Ill., has purchased one 4000-gal. sprinkler car from the McGuire-Cummings Manufacturing Company, Chicago.

People's Traction Company, Galesburg, Ill., is in the market for two trailer cars. The order for these cars will be placed through the Knox Engineering Company, Chicago.

Hagerstown (Md.) Railway has purchased one double-truck closed car from the Cincinnati Car Company, to be equipped with New York Car & Truck Company's No. 25 trucks and to be delivered May 1, 1909.

Walla Walla (Wash.) Valley Traction Company, reported in the Electric Railway Journal of Feb. 20, 1909, as contemplating the purchase of two cars, advises that these cars have been bought and are now in service.

Keokuk Electric Railway & Power Company, Keokuk, Ia., mentioned in the Electric Railway Journal of April 3, 1909, as being in the market for three 18 or 20 ft. car bodies, advises that it will purchase second-hand cars.

Sparta Electric Railway & Power Company, Sparta, Wis., through the Western Transportation Company, St. Paul, Minn., contemplates purchasing a General Electric gasoline-electric motor car and a McKeen motor car for use on its line when completed.

Northern Ohio Traction & Light Company, Akron, Ohio, is in the market for one city car and for one 52-ft. private car. The report that the order for the private car had been placed, as mentioned in the Electric Railway Journal of March 27, 1909, is denied.

St. Joseph Railway, Light, Heat & Power Company, St. Joseph, Mo., mentioned in the Electric Railway Journal of March 27, 1909, as having purchased five cars from the American Car Company, advises that these cars were ordered from the St. Louis Car Company.

Newton Street Railway, Newtonville, Mass., mentioned in the Electric Railway Journal of April 10, 1909, as being in the market for 36 motors, has purchased 30 GE-67 motors from the General Electric Company and six 101-B motors from the Westinghouse Electric & Manufacturing Company.

Chatham, Wallaceburg & Lake Erie Railway, Chatham, Ont., has purchased an additional 25-ton electric locomotive for freight service. It has also contracted to equip its entire rolling stock with Westinghouse automatic air brakes, and to change two of its cars from single-end to double-end cars.

Brooklyn (N. Y.) Rapid Transit Company, has placed an order with the Westinghouse Traction Brake Company, New York, for approximately 1000 AML and ATL air-brake equipments for motor and trail cars respectively. This means that, with the exception of the present compressors and pump governors, every portion of the air-brake apparatus of the equipment of the company will be replaced as promptly as operating and shop conditions permit.

Mason City & Clear Lake Railway, Mason City, Ia., mentioned in the Electric Railway Journal of April 17, 1909, as having purchased three cars, advises that it has

bought only two passenger, smoker and baggage compartment cars from the American Car Company, which are 57 ft. 3 in. over all and equipped with GE-73 motors and type M control. Forsyth curtain fixtures, Pantasote curtain material, Van Dorn No. 18 drawbars, Smith heaters, Winner seats and Brill No. 27-E2 trucks were also specified. Murphy Varnish Company's paint was used. In addition the company has bought three second-hand cars, which will be fitted up for freight service.

Galveston (Tex.) Electric Company, mentioned in the Electric Railway Journal of April 17, 1909, as having purchased 15 cars from the American Car Company through Stone & Webster, has specified the five cars of the Narragansett type to be 37 ft. 6 in. long over all, 30 ft. over corner posts, 36 ft. over dashers, 9 ft. 5 in. wide over all, and to seat 60. Other details of interest are:

Underframe, Z-bar sills, 8 in. x 3 in. x ½ in.	Gongs, P. Wall Mfg. Company
Brakes .... Sterling-Meaker	Motors ..... two GE-81
Ceilings, Indestructible Fiber Company	Paint ..... Masury
Controllers K-10	Registers .... International
Destination signs .. Hunter	Seats ..... Brill reversible
Drawbars, Brill-Hovey pattern	Varnish, Pratt & Lambert and Robt. I. Clark & Company

The other 10 9-bench open cars will be 30 ft. 2 in. long over all, 28 ft. 8 in. over dashers, 22 ft. 8 in. over bodies, 7 ft. ½ in. wide inside, 7 ft. 10 in. wide over all, and will seat 45. They will have a composite underframe and two GE-54 or 81 motors each. Other than the above modifications the cars will be the same as the 5 Narragansett cars.

Tide-Water Power Company, Wilmington, N. C., mentioned in the Electric Railway Journal of April 17, 1909, as having purchased four Brill semi-convertible cars and three closed cars from The J. G. Brill Company, has specified the closed cars to be 51 ft. over all, to have a body length of 40 ft. 6 in., a width over posts of 8 ft. 4 in., and a seating capacity of 68. Other details follow:

Brake Shoes, American B. S. & Foundry Company	Motors, two Westinghouse, No. 112
Bumpers...Brill Angle Iron	Seats .. Brill, pushover type
Ceilings ..... Agasote	Signal bells ..... Retriever
Couplers ..... Van Dorn	Trucks, type and make, Brill, No. 27-E1
Curtain fixtures ..... Acme	Wheels ..... Schoen
Gongs ..... Dedenda	

The semi-convertible cars will have bodies 20 ft. 8 in. long, with a length over vestibules of 30 ft. 1 in. and will be equipped the same as the closed cars except in the following details: Westinghouse 12-A motors, Winner seats, Brill No. 21-E trucks and cast-iron wheels. Besides these changes the four cars will be equipped with Peacock brakes and Dayton brake handles, Consolidated heaters and Neal headlights.

Central Pennsylvania Traction Company, Harrisburg, Pa., mentioned in the Electric Railway Journal of April 17, 1909, as having purchased 10 cars, has bought only 8 cars, which will all be of the semi-convertible type. Five of the cars will be 29 ft. 5 in. long over all, 8 ft. over all in width, will have 20-ft bodies, width inside, 7 ft., wheel base 7 ft., and seating capacity of 28. Other details of interest follow:

Height from top of rail to trolley board, 11 ft. 1 in.	Hand brakes.....Peacock
Body ..... wood	Heating system, Consolidated
Underframe ..... wood	Headlights .. Crouse-Hinds
Brakes ..... Peacock	Motors, Westinghouse 101-C
Curtain fixtures.. Burrowes	Registers .... International
Curtain material..Pantasote	Sanders ..... Dumpit
Drawbars ..... Brill-Hovey	Trucks, type and make, Brill No. 21-E
Gongs ..... Brill	

The three other cars will be 41 ft. 1 in. long over all, 8 ft. 2 in. wide, with a body length of 30 ft. 8 in. and an inside width of 7 ft. 11 in., a 4-ft. 6-in. wheel base and a seating capacity of 44. These cars will be equipped the same as the five cars mentioned above, except for the following: National A-4 air and Brill hand brakes, Brill 27 G-1 trucks, and National wheels.

TRADE NOTES

Case Manufacturing Company, Columbus, Ohio, has recently changed its name to the Case Crane Company.

Frank Ridlon Company, Boston, Mass., has removed its offices from 200 Summer Street to 251 A Street.

Chambers & Hone, New York, N. Y., consulting engineers, have removed their offices from 15 William Street to the 18th floor of 1 Liberty Street.

National Brake & Electric Company, Milwaukee, Wis., has moved its Chicago office from the fifth floor of the First National Bank Building to suite 1344 of the same building.

Picrome Hide Company, Syracuse, N. Y., has changed its name to Quride Company. The office and factory will still be located at Syracuse, N. Y. This company manufactures Quride covering for car seats.

Delta Electric & Manufacturing Company, 304 Commercial National Bank Building, Chicago, Ill., reports that it has received orders for the Universal non-inductive grounding device from some of the largest railways of the country.

Metal Finishing Company, Union City, Conn., has opened an office in New York City at 24 State Street. F. W. Brownrigg and A. M. Stevenson will be in charge. This company manufactures the Beardsley patent insulator pins, brackets, frog switches, etc.

Whiting Foundry Equipment Company, Harvey, Ill., has appointed L. G. Henes, representative of the company for cranes and foundry equipment, covering California, Nevada and Arizona. Mr. Henes will have his office in the Monadnock Building, San Francisco, Cal.

Standard Electric Accumulator Company, New York, N. Y., held a special meeting of the board of directors last week, at which the following officers for the ensuing year were elected: President, Thomas Nelson, Jr.; vice-president, James W. Johnson; secretary and treasurer, C. de Waal.

Duplex Non-Arcing Trolley Company, New York, N. Y., was recently incorporated with a capital of $2,000,000, to manufacture trolley wheels, harps and bases and other mechanical devices. The directors are Arthur O'Leary and Frederick J. Ryan, of Providence, R. I., and Walter R. Lee, of New York.

Liberty Manufacturing Company, Pittsburg, Pa., has discontinued its arrangement with the Advance Packing & Supply Company and made new arrangements with regard to the handling of its goods in Chicago by opening an office at 1201 Manhattan Building, which will be in charge of W. M. Burns and G. M. Porter.

A. M. Gilbert died on April 14, at Santa Barbara, Cal. Mr. Gilbert was formerly president of the Buda Foundry & Manufacturing Company, Chicago, Ill. About two years ago he retired from the presidency of the company and went West for his health. Mr. Gilbert was at one time connected with Fairbanks, Morse & Company, and previously was with the Crane Company.

American Brake-Shoe & Foundry Company, Mahwah, N. J., and Chicago, Ill., has established a manganese steel department in New York City, and is prepared to furnish manganese steel for mine car wheels, sheave rolls, crusher parts, etc. The company is now rolling manganese steel in rounds, flats and other shapes, and has well-equipped foundry, machine and grinding shops devoted exclusively to furnishing manganese steel in any shapes that may be desired.

Crocker-Wheeler Company, Ampere, N. J., has engaged Edmund Lang at its main office in Ampere, N. J., to take charge of its repair department. Mr. Lang was connected for a number of years with the Wheeler Engineering & Condenser Company, and more recently has given attention to other branches of power equipment. The company announces that the Carnegie Steel Company has added to its 1550 hp in Crocker-Wheeler Form W motors at its Duquesne plant three more motors of the same type aggregating 225 hp.

C. & G. Cooper Company, Mt. Vernon, Ohio, shipped on March 4 to the Tennessee Coal, Iron & Railroad Company, Ensley, Ala., a 42 and 78 x 54 cross-compound condensing Cooper Corliss engine which required 15 cars for its transportation. Delivery of this engine was promised in four months, but was made fully 40 days ahead of time. This engine will drive a 2500-kw Crocker-Wheeler alternator. A similar engine now being completed for the Packard Motar Car Company, Detroit, Mich., will drive a 25,000-kw Western Electric d. c. generator.

R. W. Hunt & Company, Chicago, Ill., consulting engineers, have recently announced that they are planning to make a specialty of reports and valuations of steam and electric railroads, light, heat and power plants. These valuation reports are useful in determining stock and bond issues and for the purchase of properties. The organization which R. W. Hunt & Company have built up in their extensive work of inspecting and valuing railroad materials and equipments, and their extended experience with valuation of industrial plants, fits them especially for undertaking the valuation of railway systems.

A. Eugene Michel, who has for the past three years been manager of the Geo. H. Gibson Company, advertising engineers, has just opened new offices at 1572 Hudson Terminal Buildings, New York. Mr. Michel will in future confine his efforts as an advertising engineer to the promotion of steam specialties and apparatus, power transmission appliances and machine tools, and will limit his clientele to the number of firms to whose work he can give personal attention. Mr. Michel is a graduate engineer, associate member of the A. S. M. E., and has had 11 years of advertising and engineering training, which includes practical experience in machine design, testing, etc. Among the accounts which he will handle are the following: The Watson-Stillman Company, the Bird-Archer Company, the Diamond Chain & Manufacturing Company, and James Beggs & Company.

Western Electric Company, Chicago, Ill., reports that its business for March made a better showing than any of the preceding months of the fiscal year, which began Dec. 1, 1908. It is said that in contrast with the period in 1906, when the electrical business reached its greatest expansion, the present rate of operation is still far behind, but in comparison with the same period a year ago the improvement shown is striking. March sales were at the rate of about $48,000,000 a year, and the rate for the four months ended with March was about $45,000,000 a year. The company is still increasing the number of its employees, having added to its force about 2000 men since Dec 1, 1908. It now is employing in all about 17,000 persons. The additions to the Hawthorne plant are being pushed ahead and will be complete this summer. Foreign returns have been received for December and January, but they show a slight increase in comparison with December and January, 1907-'08.

Ward S. Arnold has become connected with the electric railway interests of the Westinghouse Electric & Manufacturing Company in the Middle West, and also the steam turbine sales department of the Westinghouse Machine Company. Mr. Arnold will make his headquarters in Chicago, but he will also assist the Minneapolis, Kansas City, St. Louis, Cincinnati, New Orleans and Dallas offices of the Westinghouse Electric & Manufacturing Company in railway work. Mr. Arnold, who is a brother of B. J. Arnold, the consulting engineer, and of W. L. and R. G. Arnold, of the Arnold Company, has heretofore been connected with the General Electric Company, the Stanley Electric Manufacturing Company and the Bullock Electric Manufacturing Company, always in the railway field. Since 1904 he has been engaged in the contracting business with George Townsend, formerly of Townsend, Reed & Company, of Indianapolis. During the last five years Messrs. Arnold and Townsend have built among other electric roads the Indianapolis & Western, now a part of the Terre Haute, Indianapolis & Eastern, and the Niles-St. Joseph (Mich.) extension of the South Bend & Southern Michigan Railway Company. Mr. Arnold is familiar with all branches of electric railway work, including engineering, construction and financing, and he cannot fail to prove a valuable acquisition for the Westinghouse interests.

Philip G. Gossler, vice-president of the J. G. White Company, is resigning his active connection with that corporation, and from June 1 will be associated with the well-known banking house of A. B. Leach & Co. in a special consulting and administrative capacity. This marks a distinctly new departure in the relations between financial houses and engineers, in that it places with the financial interests as a member of their own organization an engineer capable of passing authoritatively on all the engineering questions that come up in connection with the acquisition, development and operation of public utility properties. Mr. Gossler, ever since his graduation from the Pennsylvania State College in 1890, has been actively engaged in the fields of electric lighting, power and traction, and has made a most enviable reputation. At the beginning of his career, connected with the Edison General Electric Company, he joined the staff, soon after, of the United Electric Light & Power Company of New York City, and took up central station work. In 1895, he went to Montreal, where he became general superintendent and electrical engineer of the Royal Electric Company, whose remarkable growth is one of the features of the electrical industries on this continent, especially with regard to the utilization of water power, long-distance transmission, and original methods of selling current. While in Canada Mr. Gossler was president of the Canadian Electrical Association, and contributed during the period a number of important papers and discussions to engineering bodies. Since his connection with the J. G. White Company he has been actively engaged in consolidating and directing a number of electrical companies. Mr. Gossler will continue his connection with the J. G. White Company and with these various properties, such as the Eastern Pennsylvania Railways Company, as director, etc. The esteem and affection in which he is held by his present associates are attested by the complimentary dinner given him this week by the officers and staff of the White company.

ADVERTISING LITERATURE

Frank Ridlon Company, Boston, Mass., has issued a list of second-hand electrical machinery which it has for sale.

The Metal Finishing Company, Union City, Conn., has just issued a new bulletin, No. 100, on insulator pins, brackets, etc.

MacGovern, Archer & Company, 114 Liberty Street, New York, has just published its new list of materials on hand for railways, power plants, etc., dated April, 1909.

Dean Brothers Steam Pump Works, Indianapolis, Ind., have printed two interesting color plates illustrating typical simple and duplex pumps of their manufacture.

Wicks Brothers, Saginaw, Mich., show in their April stock list a large variety of steam boilers, engines, heating machinery, condensers, feed-water heaters and electrical machinery.

Ohmer Fare Register Company, Dayton, Ohio, has published in pamphlet form facsimiles of commendatory letters on the Ohmer register received from many prominent electric railways.

Canton Culvert Company, Canton, Ohio, has issued a pamphlet on its "No-Co-Ro" metal, which is especially recommended for culverts because of its strength and non-corrosive qualities.

Arthur S. Partridge, St. Louis, Mo., has printed Schedule No. 28, showing a number of open cars available for immediate shipment, together with lists of engines and generators suitable for railway stations.

Weston Electrical Instrument Company, Newark, N. J., is sending out a novel postcard under the head of Weston Correspondence School, "Course in Economics," and relating to the low maintenance cost of Weston instruments.

Charles F. Johnson, Cleveland, Ohio, has just printed List No. 70, which shows a large amount of miscellaneous generating and motor apparatus for railway purposes, including transformers, electric and steam locomotives, cars and rails.

Allis-Chalmers Company, Milwaukee, Wis., has issued a bulletin on two interurban and electric railways which it has equipped. These are the Winona Interurban Railway and the Indianapolis, Crawfordsville & Western Traction Company.

Joseph Dixon Crucible Company, Jersey City, N. J., has published several interesting articles in its April number of *Graphite.* Among these articles are "The Melting Points of Lubricating Compounds" and "How Graphite Lubricates."

Industrial Instrument Company, Foxboro, Mass., is distributing Bulletin No. 22, describing its standard electric time systems for industrial plants. This company has also printed some pamphlets on its standard gages and the Eclipse oil filter.

Hess-Bright Manufacturing Company, Philadelphia, Pa., is distributing sheets 33 and 34 of series 336 showing respectively the various ball-bearing mountings for automobile-driving sprockets and ball-bearing mountings for electric motors and journals.

Buda Foundry & Manufacturing Company, Chicago, Ill., has just issued the 1909 edition of its comprehensive general catalog No. 127. As in the past, this catalog presents detailed descriptions of a great many railway tools and supplies. It contains more than 300 pages.

Veeder Manufacturing Company, Hartford, Conn., has reprinted in pamphlet form a paper on tachometers, presented at the December, 1908, meeting of the American Society of Mechanical Engineers. This company has also prepared Booklet No. 14, on Form C tachometers.

Duff Manufacturing Company, Pittsburg, Pa., has published a catalog describing the "Duff-Bethlehem" forged steel hydraulic jacks, which are forged entirely of steel. The catalog lists a large number of types and capacities and gives other information for ordering this apparatus.

Rossiter, MacGovern & Company, Inc., New York, N. Y., has just issued their April list of apparatus for immediate delivery to electric railway companies. This issue lists a large number of a.c. and d.c. motors, generators, rotary converters, electrical instruments, transformers, railway motors, steam engines and boilers. The company also has a number of closed and open cars for sale.