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Removal of Snow and Ice and Track Sprinkling

Costs of the removal of snow and ice and the sprinkling of tracks of the Detroit United Railway System, published in the ELECTRIC RAILWAY JOURNAL of May 22, 1909, page 949, constitute one form of partial taxation and public benefit with which the public, as a rule, has little, if any, familiarity. The removal of snow and ice is necessary, in part if not in whole, for safe and speedy operation of the railway, while travel is made more pleasant for passengers if the dust on the streets is laid by systematic sprinkling; yet these are some of the costs that may reach excessive amounts. Whether or not these expenses are considered as legitimate elements in the cost of operation, they are, in many communities, requirements that add materially to the outgo which has to be met before earnings on the investment can be computed, and the better understanding there is by the public of this fact, the nearer will come the time of solution of problems of the utility corporations.

Following Up Wheel Records

When car wheels are purchased under a guaranteed life it is clearly most important for all transportation and mechanical department employees to co-operate in securing accurate records of the service performance obtained. The failure to keep proper records of all specially numbered test wheels means that the company may not obtain the full life gurantees on doubtful sets, and may therefore lose wear which should be obtained on unmarked lots. Unless a company can show by its records that the guarantee has not been met, assuming that the wheels do not wholly fulfill the requirements, the only thing it can do is to buy new wheels at the market price. Too much care cannot be insisted upon in the accuracy of these records, kept, as they must be in the main, by subordinate employees in charge of car houses. If a tag is attached to a truck when it is shipped from the car house to the shop, the correct wheel numbers and the total mileage they have made should be written on it, and if an index card is kept in the car house for a truck and its wheels, the same care should be observed.

Economy in Brake Shoe Operation

The importance of securing the maximum wear from brake shoes that is consistent with safe service is generally realized as a principle of economical operation in electric railway circles, but the cost of throwing away or rather scrapping a shoe before its useful life has expired is not always appreciated in its effect on the operating expenses of the system as a whole. On a road with a large number of car houses it is most instructive to keep records of the weight of the scrap brake shoes which come in from time to time. If the question has not been followed up before the weighing begins, the chances are that some interesting differences in the scrap weight of the same types of shoes will be found. Even on a road where the car-house men have been cautioned not to scrap the shoes too soon, the differences in the records of the several houses will often be large enough to justify a special study of the subject. Thus, in one case, the average shoe weight was 9.5 lb., while a neighboring house on the same system

scrapped its shoes of the same type at 17.2 lb. The weight of scrapped shoes of a type used on some large semi-convertible cars varied from 14.4 to 18.2 lb. per shoe. Now, on a large system where from 20,000 to 30,000 shoes are used per year, a small difference per shoe amounts to an appreciable sum of money. In the case of one company which uses about 600 new shoes per week, it was figured that an average difference of 3.7 lb. of brake-shoe scrap per shoe costs the company 9.25 cents. This meant that if the car house foremen scrapped their shoes at an average weight of 6.3 lb. instead of at 10 lb., there would be a saving of $1,875 per year, after allowing for the scrap value. The company would have to carry almost 40,000 more passengers in the year to pay for the unused shoe material.

A Study of Franchises

A criticism of the existing standard form of franchises for street railroad companies in Greater New York, written by Delos F. Wilcox, chief of the bureau of franchises of the Public Service Commission, First District, has been published in pamphlet form by the commission. While substantially all the important franchises now outstanding in the city are perpetual, and do not, therefore, enter into a consideration of the form of future grants, the subject is of extreme and of increasing importance as the population and resultant transit needs develop. The pamphlet has been sent to the Board of Estimate and Apportionment of the city, accompanied by a letter from the commission requesting a conference with the board on the subject.

Since Jan. 1, 1908, several applications of relative unimportance have been presented to the commission for approval of franchises granted by local authorities, and favorable action taken thereon; and others, some of considerable importance, are either pending or will come up soon for consideration. Mr. Wilcox says that examination of the franchises presented to the commission for approval indicates that the Board of Estimate and Apportionment makes use of a standard form, "modified in any particular case only so far as may be necessary to meet the peculiar conditions of the case." This form was developed before the broad regulative powers of the State were embodied in the Public Service Commissions law, which took effect on July 1, 1907. Before taking up in detail the criticisms which his study brought out, Mr. Wilcox states that the enactment of the Public Service Commissions law (which was passed in spite of the opposition of the authorities of New York City) rendered unnecessary certain features of the standard form, other features of which were in conflict with the new policy of State regulation.

The principal points of the present franchise policy of New York City, relating to street railways, are discussed in the pamphlet in the following order: (1) Period of grant. (2) Compensation. (3) Reversion of the property. (4) Assignment of franchise. (5) Joint use of tracks. (6) Motive power. (7) Consents and time of construction. (8) Municipal supervision of construction and service. (9) Rate of fare. (10) Paving obligations and removal of snow and ice. (11) Readjustment of tracks. (12) Annual report. (13) Forfeiture and penalties. (14) Franchises subject to railroad law. (15) Time allowed for securing approval of Public Service Commission.

These titles are sufficiently comprehensive so that readers who are familiar with the requirements of the Public Service Commissions law will understand the points of possible conflict.

The discussion by Mr. Wilcox of the topic of compensation leads naturally and, in any fair consideration, inevitably to the question of fares and service. "It appears to be the policy of the city division of franchises," he writes, "to secure from each grantee the largest possible initial payment and the largest possible annual payments thereafter." Time, which alone can bring about the solution of many troublesome problems, has shown the folly of this course in more than one community; and we cannot agree wholly with the conclusion that "this policy and the provisions of the charter upon which it is founded * * * until very recently appeared to be progressive and necessary." Many concessions have been exacted from public utility corporations which were not at any time in the interest of the whole community, however desirable they may have "appeared" to be to the taxing bodies or to those municipal officials who, for political or other reasons, tried to make the closest bargains possible. Mr. Wilcox recognizes clearly that the burdens of illogical and unbusinesslike arrangements in such cases are transferred to the public "by means of inefficient service, high rates or the neglect of equipment." Although this ultimate development may thus seriously incommode the traveling public, the accumulating burdens are always of more dangerous import to the owners of securities of the properties; and the conservation of their investment should be as much a public charge as any that can be undertaken.

Discussing further the fundamental requisites demanded by proper consideration of these measures, the author declares that "the main purpose of a franchise as now conceived is to provide the best possible service at the lowest rate consistent with the financial stability of the undertaking." There is no doubt that, if all relations between municipalities and public utility companies were conceived and carried out in pursuance of this doctrine, assuming that "financial stability" means profitableness, the permanence of such corporations would be assured.

Like many other documents emanating from similar authorities, the report is evidence of the new point of view in public utility corporate affairs—one which, if taken wisely, consistently non-political, seeking the fair balance between various interests, safeguarding property rights—can be of unmeasured public service.

Revenue Mileage Records as a Gage of Shop Efficiency

The managers of some of the large electric railways have found it valuable to issue monthly comparisons to the maintenance foremen showing the relative number of pull-ins or other delays occurring in the territory served by each inspection depot. The simplest bulletins of this kind present only the number of cars maintained on each division and the percentage of crippled cars as derived from the reports of the transportation superintendents to the head office. It is much more desirable, however, for the sake of fairer comparisons to base "defect" percentages on the reports of the maintenance forces, as motormen either through ignorance or design may turn in good cars as bad.

These monthly comparisons can be made of even greater worth by preparing them on a revenue mileage basis as is done by the Brooklyn Rapid Transit Company. The records on this line show what each division has done in operated mileage as compared with the losses through bad up-keep and also the losses due to collisions, broken windows and other causes beyond shop control. By checking such figures with the average mileage of the cars operated by each division it is not difficult to determine whether careful maintenance is profitable in the end. Thus, on a division where the average daily service from a car is 80 miles, an increase to 88 miles through the elimination of breakdowns would make it possible to get along with 10 per cent less rolling stock without changing the motors or the gear ratio. Except when in for painting every appropriate car on the road should be available during the rush hours. While this ideal is rarely attainable on an extensive city system it can be approximated by having enough reserve equipment to permit a car unit to leave the shop just as quickly as it is possible to substitute sound trucks, motors, controllers or other equipment. The exact value of such practice can be determined only by a revenue mileage record which shows from month to month the proportion between lost mileage and service mileage on every division of the system.

Apprenticeship Course in New York

It is interesting to record this week the first public announcement of an electric railway company to establish an apprenticeship course, or, as it is called, a street railway training school, for young men desiring to start in the electric railway business. This is a plan which has been urged by the committee on education of the American Street & Interurban Railway Association, and has also been followed with great success by a number of the electrical manufacturing companies, as well as by many electric lighting and gas companies. In these industries, as our readers know from the reports of the committee on education, it has proved very successful. No one now claims, least of all the college authorities, that a man who has passed through college is immediately able to take up any specialized line of business. But he has had a mental training extending over a number of years, and, other things being equal, after a few years to allow him to acquire a practical experience, he should be superior to the man who has not had the same education or advantages. If there is no opening in the electric railway business for these men, they will go into other lines of work, where there is a desire and competition for their services. The need of trained men, however, is probably as great, if not greater, in the railway business than in any of those mentioned, and there seems to be no reason why a plan of providing a way by which young men can be trained to an acquaintance with part of the details of the street railway business should not be equally, if not more, successful.

The plan of the Metropolitan Street Railway Company, as outlined in its statement published elsewhere, is to commence the school in a modest way. At present, it is proposed to limit the membership at any one time to approximately eight men, or two to each of the main departments—maintenance of way, electrical, equipment and transportation. But we presume that if the experiment proves successful, the number of students will be increased. Candidates are limited to those who already possess a good scholastic training, and they must bring testimony to this effect from the dean or other presiding officer of the school from which they come. We presume that the company does not expect that the three to six months allowed for each department will make the student an expert in that branch of the business, but it will at least afford an opportunity for those in charge to determine whether he has an aptitude for the work which can be developed by longer service. If the candidate succeeds at the end of that time in securing a permanent position he will certainly be assisted by the experience which he has gained in the other departments, and be a better all-round man.

In this connection it is interesting to notice the emphasis laid upon the qualification of general knowledge in the Union Pacific and Southern Pacific systems of railroads. When Mr. Harriman assumed the presidency of practically all of the corporations comprising these lines he was confronted with the problem of designing an organization which would economically and efficiently supervise their operations. The task was no easy one, as the lines included 22,000 miles of track, but the success secured is a matter of common knowledge. Some features of the methods employed were outlined in the paper read last week by Mr. Kruttschnitt, vice-president and director of maintenance and operation, Southern Pacific Company, before the New York Railroad Club. It includes not only a student course, but office work, for all the engineers of the company, and a plan of rounding out the experience of the most important outside officials of the company by detailing them to temporary special duty at the Chicago office, and also to other branches of the company's work. In this way the official returns to his own division or department with the viewpoint of the Chicago office, some knowledge of the other properties and a better appreciation of the problems of their correlation. During his absence his understudy in his own position has been tried out for future advancement. The latter plan not only teaches the assistant how to assume responsibility, but it gives him an insight into the difficulties of management, and thus assists him to co-operate better with the manager in the future.

It is an almost inevitable tendency, when a person is doing one thing constantly, to get into a rut and not do that one thing as well as he might otherwise. Everything which affords an opportunity of broadening his horizon, such as visits to other properties, attendance at conventions, reading the technical papers and learning what others are doing along the same general lines, and how other allied departments in the same industry conduct their work, is beneficial to the man and to the company which employs him. We know of instances where very satisfactory results to all concerned have followed the transfer of men in responsible positions from one road to another belonging to the same financial interest. Each man had exhausted the possibilities, so far as he was concerned, of the office which he had held, but under new surroundings and with a different force, although each simply changed places, he was able to accomplish more. This is not probably often necessary if a man has the capacity within himself to develop, but indicates what can be done.

ROLLING STOCK STANDARDIZATION IN BROOKLYN—RECORDS AND FORMS

The Brooklyn Rapid Transit Company is now completing the rebuilding and standardization of nearly 4000 passenger, mail, freight and service cars operated over a city and suburban system comprising 71 miles of elevated and 528.3 miles of surface lines, measured as single track. This imposing task is in itself but a part of the thorough rehabilitation program which was laid down six years ago when the present administration took hold of Brooklyn traction affairs. Since that time fully $40,000,000 has been appropriated for betterments and new construction in all departments. Of this sum, $10,000,000 has been spent for new rolling stock and the sums of $2,500,000 and $1,500,000 laid out, respectively, for the reconstruction and standardization of the elevated and surface rolling stock. Now the greater part of the equipment consists of new or modernized cars which are adequately maintained in first-class shops and car houses. In consequence, the splendid improvement in the transportation service and the reductions in maintenance cost are demonstrating fully that these great disbursements have been wisely made for the benefit of both the public and the company.

REHABILITATION OF THE ROLLING STOCK.

Of all the departments which were to undergo renovation none presented a greater diversity in apparatus and maintenance than that devoted to the rolling stock. There was not only a most perplexing variety of cars and motive equipment, but few facilities, and no definite standards existed for keeping the equipments in running order. Every foreman had his own ideas as to the proper intervals for inspection and general overhauling, while record systems to check the value of their practices were entirely absent. These vital problems had to be attacked by the organization of a mechanical department, to which the following labors were intrusted: Rebuild all operative cars to standards harmonizing with new designs to be originated for the surface and elevated lines; equip adequate car houses and shops; formulate maintenance practice for each class of rolling stock; devise a record system for planning and following out from the executive office as a clearing house every detail of the mechanical department's activities. During the entire period when this extensive program was being carried out, and despite the large amount of rolling stock passing through the shops, the car-mileage in the passenger, freight and mail service kept on rapidly increasing. Thus it will be noted from the accompanying mileage table that in January, 1909, the elevated passenger mileage was 2,496,313 car-miles against 1,485,773 for the same month of 1903. The comparative figures on the surface lines for the same periods were 3,495,776 car-miles and 2,754,356 car-miles. In addition, it was necessary to operate a very heavy mileage of non-passenger cars.

STANDARDIZATION PROGRAM

The standardization of the rolling stock was laid out according to a definite schedule, which has been very closely maintained. The work on the elevated cars was begun in January, 1904, and completed in June, 1906. The surface cars were then taken up and will be completed about the end of June of this year. The changes in rolling stock are classified in the accompanying table, which shows that 3423 cars were reconstructed, 1626 cars purchased or built in the shops, and that 704 out of 944 single-truck cars were withdrawn from service. The total number of cars of all types available for the schedules of 1909 is 3924.

The standardization of the elevated equipment was described in the Street Railway Journal of Aug. 13 and 20, 1904. These reconstructed cars have been in service for four years, yet few essential alterations have been required in them since they left the shops. Slight changes have been made in such items as drawbars and contact shoes. More recently, the company has been experimenting with slack adjusters, and has decided also to equip its elevated cars with the latest form of the Westinghouse gradu-

Month.	Elevated passenger.	Surface passenger.	Freight.	Mail.	Express.	Miscellaneous.	A.R.T. ash.
1903.							
January....	1,485,773	2,754,356	507	14,066	13,592	297,375	2,153
February..	1,329,217	2,433,849	1,712	12,108	11,370	253,231	1,766
March.....	1,522,497	2,825,883	988	13,948	13,097	272,306	1,536
April.....	1,516,077	2,865,586	1,611	13,882	14,651	272,930	4,076
May.....	1,647,291	3,235,459	4,548	13,548	15,495	274,885	4,688
June.....	1,903,050	3,172,632	1,386	13,882	21,207	270,088	3,816
July.....	2,189,798	3,456,241	1,646	14,057	21,949	303,150	4,202
August....	2,117,754	3,253,477	1,759	13,983	17,384	270,780	3,247
September..	1,864,952	2,826,982	2,233	13,536	17,000	172,940	3,255
October....	1,710,780	2,603,497	3,918	14,403	17,000	152,785	2,049
November..	1,566,121	2,521,149	5,453	12,753	17,000	142,099	2,767
December..	1,517,478	2,757,590	3,408	14,081	12,403	145,257	1,975
1904.							
January....	1,452,267	2,645,456	3,993	13,620	10,825	125,682	1,929
February..	1,372,919	2,528,497	8,957	12,669	10,251	101,179	8,454
March.....	1,517,218	2,785,103	6,412	14,403	11,212	88,224	24,592
April.....	1,540,018	2,771,636	18,976	13,882	10,813	69,704	29,078
May.....	1,781,370	3,177,722	20,596	13,529	12,193	102,568	33,321
June.....	1,887,195	3,421,127	19,141	13,882	15,779	156,440	29,112
July.....	2,066,860	3,615,880	18,566	13,659	16,473	155,847	28,606
August....	1,992,528	3,498,816	20,908	14,403	17,436	140,496	29,953
September..	1,733,190	3,082,662	20,815	13,093	15,964	98,466	34,554
October....	1,491,864	2,781,876	22,614	13,543	13,027	67,018	36,876
November..	1,477,387	2,764,800	18,294	12,762	12,365	59,174	38,174
December..	1,605,395	2,882,173	16,890	13,680	13,449	65,269	43,241
1905.							
January....	1,625,092	2,757,685	14,358	13,243	10,578	65,348	43,653
February..	1,518,682	2,570,377	13,236	14,507	9,100	70,127	42,772
March.....	1,780,177	3,060,715	13,354	17,530	11,586	68,235	52,523
April.....	1,761,431	3,097,505	15,617	16,046	11,050	77,214	47,825
May.....	2,044,634	3,476,399	16,538	16,739	14,225	80,757	45,502
June.....	2,184,128	3,730,904	21,785	16,517	17,628	88,908	44,120
July.....	2,494,270	3,985,534	31,647	16,267	17,265	132,688	41,215
August....	2,311,134	3,781,603	28,713	17,131	17,433	115,516	39,860
September..	1,996,331	3,329,927	28,938	16,125	15,530	78,756	46,304
October....	1,805,213	3,179,393	31,822	16,659	12,737	63,552	41,787
November..	1,735,581	3,082,328	31,211	15,733	12,560	57,566	56,456
December..	1,792,091	3,178,727	25,303	16,268	13,952	50,699	63,665
1906.							
January....	1,895,991	3,184,507	25,118	16,739	13,319	56,514	61,334
February..	1,777,002	2,891,257	18,128	14,507	11,459	52,231	58,166
March.....	1,981,590	3,275,928	20,491	18,357	13,262	61,384	63,714
April.....	2,001,226	3,271,920	23,855	14,819	12,999	60,837	55,667
May.....	2,249,036	3,655,562	27,175	16,739	15,448	80,864	48,884
June.....	2,346,591	3,752,417	32,649	16,517	17,851	83,470	44,171
July.....	2,771,394	4,011,649	34,724	16,268	18,709	85,178	37,469
August....	2,718,840	3,873,523	39,977	17,131	19,729	71,923	35,752
September..	2,380,536	3,557,729	37,620	14,204	17,104	58,366	35,954
October....	2,094,394	3,322,360	27,003	15,522	15,351	57,777	47,749
November..	2,041,056	3,206,729	18,966	14,281	12,511	53,415	53,539
December..	2,205,113	3,299,743	17,188	19,022	13,346	52,730	64,662
1907.							
January....	2,205,722	3,276,886	19,544	20,145	13,551	57,479	60,622
February...	1,974,386	2,825,002	11,084	17,585	12,013	65,414	51,602
March.....	2,258,658	3,333,461	19,955	20,064	13,012	65,319	64,363
April.....	2,274,656	3,400,498	30,453	19,826	13,603	60,692	60,825
May.....	2,536,879	3,702,035	34,991	20,157	14,060	64,927	49,843
June.....	2,678,053	3,766,900	38,274	19,339	16,416	56,949	41,172
July.....	3,121,603	4,096,038	45,173	20,157	17,887	61,798	37,003
August.....	3,049,982	4,090,437	44,144	20,551	17,997	63,872	35,499
September..	2,511,118	3,632,910	20,795	18,944	14,862	62,013	33,059
October....	2,331,837	3,572,595	18,938	20,551	13,349	60,014	48,114
November..	2,239,806	3,397,896	16,467	19,037	11,926	53,039	55,117
December..	2,362,934	3,521,519	10,983	19,669	11,952	55,577	64,230
1908.							
January....	2,403,145	3,490,822	11,392	20,188	9,025	63,022	66,702
February...	2,288,239	3,229,939	9,829	18,338	8,540	62,206	64,506
March.....	2,395,394	3,561,662	12,840	20,096	13,270	63,872	69,199
April.....	2,416,257	3,561,890	15,569	19,861	10,888	67,912	61,205
May.....	2,625,889	3,770,450	15,441	10,710	11,709	61,232	48,623
June.....	3,094,091	3,992,492	14,126	10,816	13,584	58,828	43,270
July.....	3,282,108	4,034,213	17,431	20,188	13,589	50,506	38,659
August.....	2,860,222	3,901,334	16,415	20,108	13,475	50,948	34,415
September..	2,544,126	3,685,125	12,262	19,462	13,060	49,500	40,591
October....	2,414,584	3,624,018	11,162	20,587	12,214	62,312	47,785
November..	2,346,377	3,420,884	9,057	18,585	10,305	56,702	55,630
December..	2,524,577	3,606,136	6,693	20,188	11,424	60,350	59,207
1909.							
January....	2,496,313	3,495,776	5,731	19,710	.....	55,918	1,795
February...	2,258,541	3,226,534	6,045	17,612	.....	50,554	787
March.....	2,567,190	3,672,469	8,816	20,587	.....	57,756	.....

Statement of Brooklyn Car Mileage for the Years 1903, 1904, 1905, 1906, 1907, 1908, 1909 to March 31.

ated release, quick recharge air brakes to insure even better braking than the present apparatus affords. The 269 elevated trailers are absolutely identical in every important respect.

The very extensive changes in the surface rolling stock will be described in a series of articles, taking up each portion of car equipment by itself, showing also how the

company has made adaptations in apparatus and created new car designs for its peculiar traffic conditions. These descriptions will be supplemented by articles on auxiliary matters which were brought up during standardization, such as manufacturing, specifications for metal products, shop management and methods, etc.

When standardization began all the elevated rolling stock for the Eastern Division at East New York had to be cared for in a small engine shed and an old combination paint and carpenter shop, neither of which had any pits. Even at Thirty-sixth Street, on the Southern Division, nothing better was available than the remnant of a burnt shed which had housing and short pits for six cars only. In contrast to this the company has since provided fireproof storage and shop facilities as follows: Ninth Avenue and Maspeth surface car houses, elevated car house at Fresh Pond and the combined storage and elevated shops at East New York and Thirty-sixth Street. All of these

Cars.	
	ROLLING STOCK ADDED SINCE 1902
555	Surface, semi-convertible.
452	Surface, convertible.
218	Elevated, convertible.
203	Elevated, closed.
4	Electric locomotives, one for surface only (built by railway).
161	Surface utility.
19	Surface utility (built by railway).
4	Snow plows (pneumatic operation throughout).
10	Elevated utility cars, including an instruction car.
1,626	
	Note.—All of the foregoing are motor cars except 30 freight trailers.
	ROLLING STOCK RECONSTRUCTED SINCE 1903
77	Surface single-truck, closed.
505	Surface double-truck, closed.
462	Surface double-truck, semi-convertible.
202	Surface double-truck, convertible.
163	Surface single-truck, open.
750	Surface double-truck, open (under way).
100	Surface double-truck, semi-convertible (standardized only).
251	Surface double-truck, convertible (standardized only).
67	Surface single-truck, sand and salt.
15	Surface wreckers (rebuilt from single-truck closed passenger).
204	Surface, miscellaneous.
269	Elevated trailers (from steam coaches).
183	Elevated motors (from steam coaches).
175	Elevated motors.
3,423	
	ELIMINATION OF SINGLE-TRUCK CARS
430	Open cars operated in 1902.
163	Open cars operated in 1909.
514	Closed cars operated in 1902.
77	Closed cars operated in 1909.
704	Cars withdrawn in all.
	CARS IN SERVICE FOR 1909 SCHEOULE
605	Surface, closed.
554	Surface, semi-convertible.
453	Surface, convertible.
919	Surface, open.
398	Surface, miscellaneous.
507	Elevated, closed.
203	Elevated, semi-convertible.
218	Elevated, convertible.
67	Elevated, miscellaneous (including locomotives).
3,924	

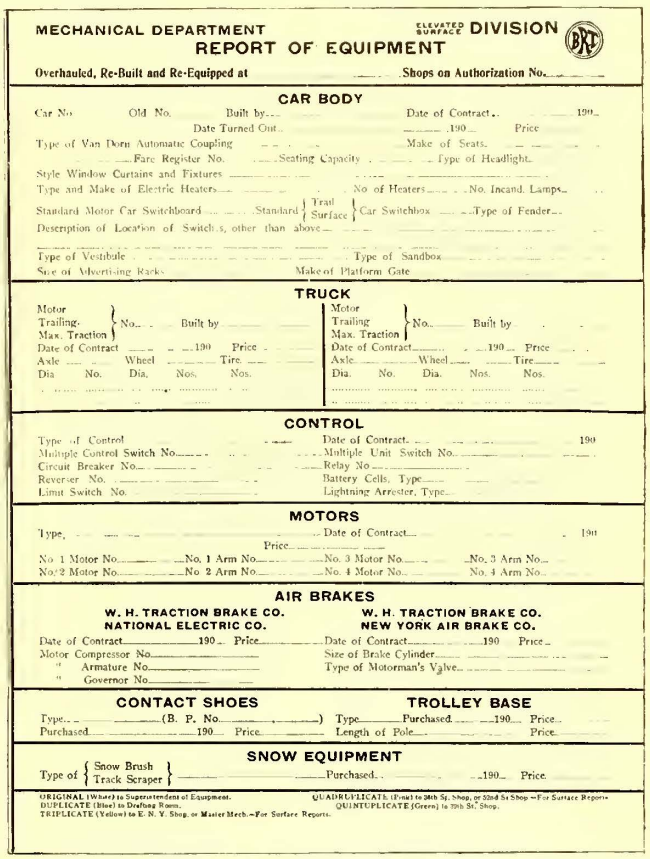
Changes in Brooklyn Rolling Stock Since 1902.

have been described at various times in the STREET RAILWAY JOURNAL, the ELECTRIC RAILWAY REVIEW and the ELECTRIC RAILWAY JOURNAL. The company also converted during 1902 and 1903 the Thirty-ninth Street terminal for the reconstruction of all elevated cars and the surface convertible cars. All other surface cars have been changed over at the Fifty-second Street shops.

THE PLACE OF THE RECORD SYSTEM IN CAR MAINTENANCE

The figures which have already been given to indicate the size of the Brooklyn Rapid Transit system are sufficient to indicate the necessity which existed before standardization could even be started for a plan of keeping equipment records of the many cars, of their progress through the shops and of their behavior in operation. In fact, it would be difficult to exaggerate the important position the record system has come to hold, as it has gradually been amplified to attain the same accuracy which exists in a modern factory. To-day not the smallest detail in inspection, repair and manufacture fails to drop into the groove prepared for it. Despite the immense number of items which are thus classified, the forms are not very numerous and do not require a large clerical force to keep them up to date.

The great interlocking feature of the system is that every record, except duplicates, is filed at the executive offices of the mechanical department. This has made it a simple matter to compare the performance of every class of car and apparatus used on the different lines, and has made it possible to fix upon the most suitable inspection and maintenance standards for elevated and surface equipments. For example, up to the end of 1908 the time interval was the only feasible practice for inspection and overhauling, but since then the mileage basis has been found practicable for the surface cars and the same principle will soon be applied to elevated cars. Records of all important car parts now are kept according to mileage, but the reduction in


MECHANICAL DEPARTMENT
ELEVATED SURFACE DIVISION
REPORT OF EQUIPMENT
BRT
Overhauled, Re-Built and Re-Equipped at ____ Shops on Authorization No. ____

CAR BODY
Car No. Old No. Built by... Date of Contract.. 190..
Date Turned Out.. ..190.. Price
Type of Van Dorn Automatic Coupling ... Make of Seats.
...Fare Register No. ...Seating Capacity ... Type of Headlight..
Style Window Curtains and Fixtures
Type and Make of Electric Heaters... No. of Heaters... No. Incand. Lamps..
Standard Motor Car Switchboard ... Standard { Trail / Surface } Car Switchbox ...Type of Fender...
Description of Location of Switches, other than above...
Type of Vestibule ... Type of Sandbox...
Size of Advertising Racks Make of Platform Gate

TRUCK
Motor / Trailing / Max. Traction { No.. Built by
Date of Contract ..190.. Price
Axle ... Wheel ... Tire...
Dia. No. Dia. Nos. Nos.
Motor / Trailing / Max. Traction { No.. Built by
Date of Contract ..190.. Price
Axle ... Wheel ... Tire...
Dia. No. Dia. Nos. Nos.

CONTROL
Type of Control ... Date of Contract.. 190
Multiple Control Switch No... Multiple Unit Switch No...
Circuit Breaker No... Relay No...
Reverser No... Battery Cells, Type...
Limit Switch No. Lightning Arrester, Type...

MOTORS
Type, ... Date of Contract... 190
Price...
No. 1 Motor No... No. 1 Arm No... No. 3 Motor No... No. 3 Arm No...
No. 2 Motor No... No. 2 Arm No... No. 4 Motor No... No. 4 Arm No...

AIR BRAKES
W. H. TRACTION BRAKE CO. NATIONAL ELECTRIC CO. | W. H. TRACTION BRAKE CO. NEW YORK AIR BRAKE CO.
Date of Contract... 190.. Price... | Date of Contract... 190.. Price...
Motor Compressor No... | Size of Brake Cylinder...
" Armature No... | Type of Motorman's Valve...
" Governor No...

CONTACT SHOES
Type... (B. P. No...) Purchased... 190.. Price...

TROLLEY BASE
Type... Purchased... 190.. Price...
Length of Pole... Price...

SNOW EQUIPMENT
Type of { Snow Brush / Track Scraper } Purchased... 190.. Price...

ORIGINAL (White) to Superintendent of Equipment. QUADRUPLICATE (Pink) to 38th St. Shop, or 52nd St Shop—For Surface Reports.
DUPLICATE (Blue) to Drafting Room. QUINTUPLICATE (Green) to 39th St. Shop.
TRIPLICATE (Yellow) to E. N. Y. Shop, or Master Mech.—For Surface Reports.

Fig. 1—Brooklyn Records—Car Equipment Sheet Filled Out at the Shop (8 3-4 In. x 12 In.)

types of equipment has already made it possible to measure brake shoes on the ton-mile unit. The record system is also of great value in checking up the true costs of the numerous articles now made by the mechanical department for both itself and other divisions of the Brooklyn Rapid Transit System. In fact, manufacturing has become such an important factor that the department's records and practices in this respect will have to be treated in a separate article.

THE PRINCIPAL RECORD FORMS IN MAINTENANCE WORK

The fundamental form of the entire car record system is the "Report of Equipment" shown in Fig. 1. This is filled out by the local shop superintendent for every car that comes in for general overhaul or the installation of its original equipment. It gives every important item of information on the car body, the trucks, the electrical apparatus, the current-collecting devices and the snow equipment.

PERMANENT DATA AND DIMENSIONS

Car No.
Standardized 190 Originally Car No. Later No.
Type of car
Builder
When built
Side doors { Original / Converted
Total weight of car body
" " " inc. trucks and equipment
Length of car body
" over platforms
" face to face of car couplings
Height of car body
" above rail to top of trolley stand
" to center of draw bar head
Width over step
" " eaves
" of platform opening at gate
" " bolster { Built in / Supplementary
Distance C. to C. of king bolts

Make of automatic car couplings
" " fare registers
" " platform gates
" " heaters Type
" " seats
" " trolley pole and stand
Style of seating Capacity
" " curtains and fixtures
Number of heaters
Size of advertising sign racks
Standard motor car switchboard
" trail car switchbox
Heat and light couplings
Adapted to Type of motor
Truck wheel base No. 1 end { Motor / Trailing
" " " No. 2 end { Motor / Trailing
Adapted to Type of truck { Motor / Trailing Size of wheels

Fig. 2—Brooklyn Records—Permanent Data Card (5 In. x 8 In.)

WHEEL RECORD Shop

Wheel No.		Diam. of Centre		Material		Wheel Fitted by		Pressed on by	
		Made by		Purchased		Put in Service		Tons Pressure	
		Diam.	Material	Made by		Purchased	Put in Service	Fitted by	
Axle No.									
Tire No.									
Put in			Removed			No. Days	Tire		
Car No.	Date	Measurement	Date	Cause	Measurements	in Service	Loss	Turned	Ground	Work Done by

Electric Ry. Journal

Armature No. Purchased Date of Contract

Type Sold or Scrapped

CAR NO.	DATE		COILS				COMMUTATOR				LEADS	INSPECTION Out Running	SHAFT				PINION		BANDS		Rew'd	MECHANICAL DEFECTS					CAR SHOP
	In	Out	Gd.	S.C.	O.C.	Bk.L.	W.O.	S.C.	Gd.	Rgh.			Bk.	Spg.	Cut	W.O.	Loose	W.O.	Loose	Bk.		Rub P.P.	Hot or W.O. Bearings	Struck S.in S.	Struck by L.	Damaged W.or S.	

Electric Ry. Journal

Compressor No. Mfd. by
Type Owning Co. Date of Purchase

Date Installed	Car No.	Date Removed	Shop	Cause	Overhauled Date	Overhauled Shop

Motor No.
Type Mfd. by
Rating H.P. Owning Co. Date of Purchase

Date Installed	Truck No.	Car No.	Date Removed	Shop	Cause

Truck No. Mfd. by
Type Owning Co. Date of Purchase

Motor or Trailing Truck	Date Installed	Car No.	Date Removed	Shop	Cause

Controller No. Mfd. by
Type Owning Co. Date of Purchase

Date Installed	Car No.	Date Removed	Shop	Cause	Overhauled Date	Overhauled Shop

Electric Ry. Journal

Fig. 3—Brooklyn Records—Headings of Differently Colored Record Cards (5 In. x 8 In.) for Wheels, Armatures, Compressors, Motors, Trucks and Controllers

When thus filled out, the original form goes to the superintendent of equipment, who adds the contract prices of the items and parts listed. The four copies without prices are distributed to the shops and drafting room, as indicated on the bottom of Fig. 1. Thus each form is a complete

Shop Date 190

CHANGE OF EQUIPMENT

I have this day **REMOVED** the following equipment from Car No. ..... as checked below:

Description	Check	Type	No. of Each Changed	Cause
Controller				
Motor				
Truck				
Resistance				
Trolley Stand				
Circuit Breaker				
Fuse Box				
Main Switch				
Fender				

I have this day **PLACED** the following equipment on Car No. ..... as checked below

Description	Check	Type	No. of Each Installed
Controller			
Motor			
Truck			
Resistance			
Trolley Stand			
Cir. Breaker			
Fuse Box			
Main Switch			
Fender			

When this form is used for Shifting Equipment for Winter or Summer service, the words "Season Change" should be inserted in Cause column; when equipment is removed for any other reason, the cause for same should be given

Equipment removed at ..... Shop, has been sent to ..... Shop

Remarks: .....

Foreman.

..... Shop.

ORIGINAL (white) to be forwarded immediately to Mechanical Engineer's Office. DUPLICATE (yellow) to be retained at Shop.

Fig. 4—Brooklyn Records—Shop Foreman's Report on Transfer of Apparatus (8 1-4 In. x 10 3-4 In.)

story of any given car, even to the number of the authorization which specified the work to be done on that car when it went into the shops.

When Fig. 1 is received from the shop the information

Comparative Monthly and Yearly Tabulations of Trolley and Contact Shoe Troubles

	1904	1905	1906	1907	1908	1909	1910	1911	1912	1913	TOTAL
JANUARY											
FEBRUARY											
MARCH											
APRIL											
MAY											
JUNE											
JULY											
AUGUST											
SEPTEMBER											
OCTOBER											
NOVEMBER											
DECEMBER											
TOTAL											

Electric Ry. Journal

Fig. 5—Brooklyn Records—Specimen of Monthly Card Summary of Different Equipment Defects (5 in. x 8 in.)

DAILY REPORT OF SURFACE PASSENGER CARS AVAILABLE AND CARS HELD IN AT SHOPS

5.00 P. M. 190

Type of Car	Schedule	HELD IN AT 39th St. Shop	52nd St. Shop	Car House Shops	Available
Single Truck, Closed					
Standard, Closed					
Semi-convertible					
Convertible					
Single Truck, Open					
Double Truck, Open					
TOTALS					

Car House Shop	Car No.	Reason for Holding Car

Fig. 7—Brooklyn Records—Heading of Superintendent of Equipment's Report on Cars Held in or Available (8 In. x 10 3-4 In.)

on the same is transferred to a permanent data card, Fig. 2, which is accompanied by a group of differently colored cards bearing separate heads, as follows: Car body; motor truck; trailing truck; motors and armatures; controller reverser and operating head; limit magnet and switches; storage batteries, jumpers and grids; operating box and circuit-breaker; motor compressor and governor; M valve, triple and brake cylinder; air piping and hose; sleet scrapers, brushes and snow equipment; contact shoes, beams and trolley. These detail cards are for the running record of defects to equipments, an entry being made whenever the particular part has been reported in trouble by the transportation department to the shops. Detail wheel, armature, controller, motor shell, motor compressors and truck frame record cards are kept also in separate files, with blanks for the cars on which they are used successively. The headings of these cards are reproduced in Fig. 3. The information for these cards is transferred from the daily logs from each shop, which in turn are based directly on operating trouble reports. The permanent data card, Fig. 2, is not affected unless a change in type of equipment has been introduced. When changes are made, particularly from open to closed cars and vice versa, the shop foreman sends in the "Change of Equipment" sheet shown in Fig. 4.

The reported defects of equipment are also totalized daily on cards for every day of a year, and then for entire months of succeeding years, as shown in Fig. 5. These defect tabulations give the data for the curves of different kinds of troubles which are prepared from time to time by the drafting department, and which are of great value

Shop.	Cars maintained per month.	Cars maintained per day.	Cars "run in" found defective.	Cars "run in" found O. K.	Cars "run in" total all causes.	Average % maintained March, including all "run ins."	Average % maintained March, minus cars found O. K.	Average % maintained April, including all "run ins."	Average % maintained April, minus cars found O. K.
Eastern Division (Surface):									
Ridgewood	8,280	276	52	20	72	0.9	0.7	0.9	0.6
Halsey Street...	1,890	63	13	2	15	0.9	0.8	0.8	0.7
Maspeth	2,070	69	21	3	24	1.8	1.7	1.2	1.0
Crosstown	4,680	156	55	10	65	1.0	0.8	1.4	1.2
East New York.	7,680	256	98	6	104	1.4	1.3	1.4	1.3
Southern Division (Surface):									
Ninth Avenue..	5,880	196	46	31	77	1.7	0.7	1.3	0.8
Fifty-eighth St..	5,730	191	41	18	59	0.9	0.9	1.0	0.7
Flatbush	3,870	129	32	3	35	1.7	1.6	0.9	0.8
Canarsie	3,540	118	40	10	50	1.9	1.5	1.4	1.1
Bergen Street..	4,140	138	71	37	108	2.0	1.4	2.6	1.7
Totals	47,760	1,592	469	140	609	1.4	1.1	1.3	1.0
Elevated Division:									
Eastern	14,490	483	123	16	139	1.4	1.3	1.0	0.8
Southern	9,990	333	115	16	131	1.2	1.1	1.3	1.2
Fresh Pond....	3,360	112	17	1	18	0.5	0.5	0.5	0.5
Totals	27,840	928	255	33	288	1.2	1.1	1.0	0.9

Monthly "Run-in" Comparisons of Passenger Cars on Percentage Basis

when the question of buying equipment is under consideration.

The original defect record begins with the motorman who turns in a report of the type shown in Fig. 6. In general, all that he has to do is to indicate the kind of trouble by a check mark opposite the printed line for the same. Whether the car is taken out of service immediately or not, a copy of the report must go to both the shop foreman and the division trainmaster so that a check is placed on the shop foreman immediately. The shop foreman in transmitting his daily report of cars turned in to him as defective places side by side the motorman's assumed cause and the actual cause as determined in the shop, in addition to giving a record of the time lost on the line and in making repairs.

Both the motormen's and shop foremen's defect reports are summarized daily for elevated and surface divisions on a report, which is signed jointly by the supreintendents of transportation and equipment, and which goes to the general manager as a condensed and undisputed account of the day's troubles. At the end of every month the superintendent of equipment sends out to all shop foremen two comparative reports. One of these shows the number of cars maintained at each car house for the preceding two months, with the number and percentage of "run ins." It is rather interesting to note from the accompanying reproduction of this report that in almost every instance some of the cars reported defective were found all right upon inspection. The second report sent to the foremen compares the depots on a revenue mileage basis. Two columns are reserved in this report for incorrect motormen's reports and for mileage lost through causes beyond the control of the mechanical department.

In connection with the run-in reports it is of importance to know how many cars are available for the heaviest service, namely, between 5 p. m. and 7 p. m. This information is secured by telephone and given to the transportation department on separate forms for the elevated and surface equipments. Fig. 7 shows the form used for the reports of the surface equipments, and Fig. 8 that for the elevated equipments. Confirmations of these reports (Fig. 9) are sent daily to the trainmasters interested to enable them to check up the figures with the shop representatives.

Shop	Revenue Mileage for Month	No. of Cars Maintain'd	Average Mileage per Day per Car Maintain'd	Cars "Run In": Found Defective Mechanically or Electrically	Found O. K. on Examination	Due to Collisions or Causes For Which Condition of Equipment is Not Resp'ble	Total all Causes	Number of Revenue Miles Made per Car "Run In": Found Defective Mechanically or Electrically	Found O. K. on Examination	Due to Collisions or Causes for Which Condition of Equipment is Not Responsible	Total all Causes
Surface—											
58th Street	449,862	176	82.4	26	4	24	54	17,302.4	112,465.5	18,744.2	8,330.8
9th Avenue	398,378	195	65.9	32	57	16	105	12,449.3	6,989.0	24,898.6	3,794.0
Flatbush	353,775	127	89.9	49	6	15	70	7,219.9	58,962.5	23,585.0	5,053.9
Canarsie	300,974	115	84.4	46	14	12	72	6,542.9	21,498.1	25,081.1	4,180.2
Ridgewood	582,888	268	70.1	49	13	14	76	11,895.7	44,837.5	41,634.9	7,669.6
Halsey Street	154,944	62	80.6	7	2	9	18	22,134.8	77,472.0	17,216.0	8,608.0
East New York	600,748	250	77.5	90	5	14	109	6,675.0	120,149.6	42,910.5	5,511.4
Bergen Street	306,369	136	72.7	48	23	14	85	6,382.7	13,320.4	21,883.5	3,604.3
Crosstown	321,639	157	66.1	33	8	9	50	9,746.6	40,204.9	35,737.7	6,432.8
Maspeth	198,155	70	91.3	33	4	4	41	6,004.7	49,538.7	49,538.7	4,833.0
	3,667,732	1,556	76.0	413	136	131	680	8,880.7	26,895.1	27,997.9	5,393.7
Elevated—											
South Division	981,829	333	95.1	106	15	11	132	9,262.5	65,455.3	89,257.2	7,438.1
East Division	1,161,258	483	77.5	191	21	3	215	6,079.8	55,298.0	387,086.0	5,610.5
Fresh Pd. Division	272,293	112	78.4	17	1	1	19	16,017.3	272,293.0	272,293.0	14,331.2
	2,415,380	928	83.9	314	37	15	366	7,692.3	65,280.5	161,025.3	6,591.2

Monthly Revenue Mileage Comparison of Cars Reported "Run in" at Car-Houses

STATEMENT SHOWING ELEVATED CARS AVAILABLE FOR SERVICE, 5 P.M.

.....190....

Held In At

Type of Car	Schedule	39th St.	E.D.L.	E.D.I.	F.P.I.	S.D.L.	Available
Trailers	269						
600's Motors	84						
700's "	58						
800's "	59						
900's "	37						
1000's "	100						
1100's "	20						
1200's "	100						
1300's "	100						
1400's "	100						
Total....	927						

NUMBER OF CARS HELD IN AT EACH SHOP, AND DETAILED REASONS FOR HOLDING THEM

Material required to place these cars in service:

Fig. 8—Brooklyn Records—Daily Statement of Available Elevated Cars (8 1-2 In. x 10 3-4 In.)

DAILY REPORT OF CARS HELD IN

.....SHOP

5 P.M.....19....

Inspector of Equipment:

Confirming telephone message to your office, following cars were held in at 5 p.m., this date:

Car No.	Reason for Holding Car in

Original to Inspector of Equipment.
Duplicate to Depot Master or Train Master.

ORIGINAL.

.....
Foreman.

BROOKLYN RAPID TRANSIT SYSTEM.
Mechanical Department.
DAILY REPORT OF CARS HELD IN.

.....Shop.

5 P.M.,.....19....

Inspector of Equipment:

Confirming telephone message to your office, following cars were held in at 5 p.m., this date:

Car No.	Reason for Holding Car In.

Original to Inspector of Equipment.
Duplicate to Depot Master or Train Master.

.....
Foreman.

Fig. 9—Brooklyn Records—Confirmation of Daily Report on Cars Held In (8 1-2 In. x 10 3-4 In.)

BASES OF INSPECTION AND OVERHAULING

With the approaching completion of the work of standardization and the assistance of the record system it has become feasible to introduce the mileage system for all surface maintenance. Since Jan. 11, 1909, the surface air-brake cars are being inspected about every 800 miles and the hand-brake cars every 600 miles. The overhaul period

has not yet been fixed, but will probably range from 10,000 miles to 20,000 miles, according to the type of motor equipment. A larger mileage will be adopted if found safe. Miscellaneous cars have been on the mileage basis since November, 1908. Formerly all surface cars were inspected weekly, while the overhauling period was either 60 or 90 days, according to the motor equipments, as follows: 60 days for GE-800, GE-57, GE-64, West. 68 and West. 81 motors; 90 days for GE-80, West. 93, West. 93-A-2 and West. 101-B motors. The inspection and overhauling record of the individual surface cars is now kept at headquarters on a card of the type shown in Fig. 10. Every day each foreman receives the form, Fig. 11, giving a list of his cars which have approached the inspection or overhauling mileage. The shop foreman must then call on the depot master for these cars and turn in a report on Fig. 12 at the end of the day, showing how many of them were received for examination up to 5:30 p. m. of the same day and how many were overdue for attention. It also indicates the cars due for overhauling the following day.

Mechanical Department.....Division

INSPECTION AND OVERHAULING RECORD OF CAR EQUIPMENT

Total Mileage From .....19....., To .....19.....

Car No..... Inspection Basis.....Miles. Overhauling Basis .....Miles

INSPECTION						OVERHAULING					
Date of Inspection	Mileage Since Last Inspection	SHOP	Date of Inspection	Mileage Since Last Inspection	SHOP	Date of Overhauling	Mileage Since Last Overhauling	SHOP	Date of Overhauling	Mileage Since Last Overhauling	SHOP

Electric Ry. Journal

Fig. 10—Brooklyn Records—Mileage Card (5 In. x 8 In.)

At present the elevated equipment is still on the time basis. Both motor and trail cars are inspected on an alternate three and four-day period, as Sundays and holidays are omitted. The elevated utility cars are inspected weekly. All motor cars except those of the new 1400 series are overhauled every 60 days. The 1400 type is overhauled every six months, but after four months extra care is paid to the inspection of bearings and clearance between the armatures and pole pieces of the West. 300 interpole motors used on these cars.

BROOKLYN RAPID TRANSIT SYSTEM

Mr. .....Division Date.....

Foreman.....Shop

DEAR SIR: As per mileage basis in effect at present, the cars numbered below will this date be placed over the pits for a thorough general inspection. Mileage made by each car since its last general inspection appears opposite the corresponding car number.

CAR No.	MILEAGE	CAR No.	MILEAGE	CAR No.	MILEAGE	CAR No.	MILEAGE	CAR No.	MILEAGE

Fig. 11—Brooklyn Records—Heading of Order to Foreman on Cars Due for Mileage Maintenance (5 In. x 8 In.)

Brooklyn Rapid Transit System

MECHANICAL DEPARTMENT

.....Shop Date.....19.....

Statement showing Numbers of Cars for Inspection and Overhauling

INSPECTION CARS (copied from N. S. 841 of even date)				OVERHAULING CARS	
			Numbers of cars on this statement which were not received up to 5.30 p. m. on above date.	Nos. of Cars for Overhauling 7 a. m. 19	Numbers of cars which were not received up to 5.30 p. m. on above date.

Fig. 12—Brooklyn Records—Heading of Foreman's Daily Report on Cars Inspected, Overhauled or Overdue (8 1-2 In. x 10 1-4 In.)

To simplify the inspection of all elevated cars, a large sheet, such as partially reproduced in Fig. 13, is printed, showing the numbers of the cars, the divisions over which they are operated and the days of the week on which they should be cared for. All that the shop foreman needs to do, therefore, is to hold certain cars on specified days without waiting for any notices from headquarters. At the end of the day, however, he sends in to the superintendent of equipment lists of all cars inspected and overhauled. The shops are provided with several forms of their own, including cards for the signatures of inspectors doing the different classes of work. In such accidental cases as when a car has been scratched up and requires a little painting or touching-up, the work is authorized on the special form illustrated in Fig. 14.

UNIFORMITY IN INSPECTION AND OVERHAULING

To avoid all misunderstanding as to what is implied by the terms "run-in," "inspection" and "overhauling," the head of the mechanical department has issued instructions on these points from time to time to prevent diverse practices on different divisions. A "run-in" is defined as follows: "When it becomes necessary for any reason to replace any car in service, the car replaced shall be considered a 'run-in.'" The following instructions are issued to foremen on the scope of elevated inspection and overhauling work, but the same practices apply largely to the surface cars.

Inspection consists of the thorough examination of and light repairs to all parts; the renewal of all worn, broken, bent, strained or burned parts that can be renewed or repaired within a reasonable length of time, and that will allow sufficient time for the inspection of all cars on the day on which they become due for inspection. When defects are found to be such that they cannot be repaired as outlined, the foreman must be immediately notified, so that

Motorman's Report of Defects in Motor/Trailing Car No.

.....A.M.
Date .....190 Route.....
.....P.M.

Length of Detention.....Min's. Train No.....

Place of Trouble.....

Motorman .....No.....

Conductor .....No.....

Place laid up.....

Car Body Troubles	Control Troubles
End Door	Circuit Breaker
Side Door	Circuit Breaker Magnets
Side Glass Broken	Operating Box
End Glass Broken	Controller
Door Glass Broken	Reverser
Curtain	Operating Head
Ventilators	Miscellaneous
Bell	Limit Magnet
Bell Cord	Hood Switches
Light & Light Switches	Series Multiple Switch
Heaters or Heater Switches	Resistance Grids
Platform Gate	Jumpers, Seven Point
Safety Gate	Four Point
Platform Chain	Receptacles, Seven Point
Pull Chain	Four Point
Broken King Pin	Jumps in Series
Draw Bar	Jumps in Multiple
Coupling Link	Slow in Series
Car Seats	Slow in Multiple
Car Floor Dirty	Storage Batteries
Trolley Pole	Storage Battery Switches
King Pin Cover	
Head Lights	**Air Brake Troubles**
Markers and Tail Lights	Brakes do not release quickly at times
Motor Troubles	Brakes release on lap
Armature Trouble	Brakes do not stop train quickly enough
Motor Flashed	Equalized Air Pressure
Motor Bucked	Motorman's Valve Stiff
Motor Leads	Low Train Line Pressure
Motor Bearings	Governor does not cut out
Truck Troubles	Compressor not working
Motor Truck	Compressor Fuse blown
Trailing Truck	Train Line Pipe
Flat Wheel	Reservoir Hose
Hot Box	Train Line Hose
Brakes Noisy	Air Whistle
Broken Brake Rigging	
Truck Noisy	
Contact Shoe Trouble	**Dead Car**
Contact Shoe Beam	**Track and Signal Defects**

Please check mark opposite defect reported. If the defect cannot be readily located give in addition to check mark, particulars which will assist in locating trouble. *Original* (white) of this report MUST be sent to Shop with defective car and given *Division Shop Foreman*; send *carbon copy* (yellow) to *Division Train Master*. In case the trouble is such as to allow the car to remain in service report will be made out and both original and duplicate sent to *Division Train Master* who *must immediately* forward *original* to *Division Shop Foreman*.

Fig. 6—Motorman's Defect Report (4 In. x 8 1-2 In.)

△ 100 Books 2-18-9 O—29504

BROOKLYN RAPID TRANSIT SYSTEM

BRT Surface / Elevated } Division

Date..... 19

To Superintendent { 39th St. Shop / 52d St. Shop } No.....

Car No.....is in need of the following repairs:

.....Shop

.....Foreman

Approved:

.....Supt. of Equipment

The above repairs are now completed.
If not satisfactory, please advise at once.

Date.....19

.....Supt. { 39th St. Shop / 52d St. Shop }

ORIGINAL—To Supt. of Equipment for approval; then to Repair Shop. To be returned to Supt. of Equipment when work is completed, and then to point of issue.
DUPLICATE—To Superintendent of Equipment.
TRIPLICATE—To be retained in book by Shop Foreman.

Fig. 14—Form Used for Scratch Repairs (4 In. x 7 1-2 In.)

he may have the repairs made in the overhauling shop or by men specially assigned to the work. The inspection also embraces the cleaning and lubrication of all easily accessible wearing parts, the renewal of weak springs and the proper adjustment of all adjustable parts. All parts are so inspected and maintained that the cars will run until next inspection without danger or without need of any further attention.

Overhauling in the case of motors and motor trucks consists of the renewal of all worn, broken or strained parts, including wheels, bearings, hangers, etc.; the tightening or renewal of all rivets, bolts, braces, etc.; the cleaning of all motors and parts, and the repainting of motor shells, fields and armatures with insulating and fireproof varnishes; the cleaning and alignment of brush-holders; the tightening and turning of all loose, flat, or rough commutators, the replacement of armatures when the commutator is worn to its limit or for any other electrical or mechanical defects. In general, the motors and trucks must be put in such shape that they could be kept in continuous service for 90 days if necessary without causing any trouble or needing any repairs other than the light ones made on regular inspection. The trailer trucks must get the same attention as outlined for motor trucks.

Overhauling the line switches, circuit-breakers, controllers and reversers consists of the renewal of all worn, broken or burned parts; the cleaning of all parts and the repainting of insulating parts with insulating varnish; the cleaning and lubricating of all wearing parts, and the tightening of all nuts, screws, stud bolts, etc. Overhauling batteries consists of discharging, removing the elements and electrolyte from the jars; cleaning the jars and elements; renewing any plates that may be necessary; burning on of leads and the reassembling of batteries; refilling with electrolyte acid of the proper specific gravity and recharging the completed battery.

Overhauling compressors consists of the renewal of all worn or broken parts, and the regrinding of valve seats; the cleaning of motor parts and the repainting with insulating varnish; the removal of all oil and the cleansing and refilling of oil wells. This work is done at the Thirty-ninth Street elevated shops only, where it has been specialized. The overhauling of the brake cylinders of both the motor and trailer cars consists of the removal of pistons, the renewal of packing leathers, the thorough cleaning and relubrication of cylinders and the renewal of springs or other parts where necessary.

The periods for general inspection and overhauling of elevated cars have already been given, but the following should be added with reference to certain details: Motors and motor trucks are overhauled every 60 days, and the trailer trucks of motor cars when found to be necessary upon regular inspection. Line switches and circuit-breakers are overhauled every 60 days; controllers and reversers (both unit-switch group and drum type) once a year; batteries every six months; compressors once a year, and brake cylinders once a year. The trucks of the trailer cars are overhauled when found to be necessary upon regular inspection and the brake cylinders are overhauled once a year.

The three-day inspection of elevated motor and trailer-car equipment includes all parts, excepting batteries and

BROOKLYN RAPID TRANSIT SYSTEM

MECHANICAL DEPARTMENT EFFECTIVE_____190

ELEVATED LINES VOID AFTER_____190

STATEMENT SHOWING INSPECTION DAYS OF ELEVATED PASSENGER AND MISCELLANEOUS CAR EQUIPMENT

EASTERN DIVISION

MOTOR CARS

DUE FOR INSPECTION Mondays and Thursdays			DUE FOR INSPECTION Tuesdays and Fridays			DUE FOR INSPECTION Wednesdays and Saturdays		
CAR No.	CAR No.	CAR No.	CAR No.	CAR No.	CAR No.	CAR No.	CAR No.	CAR No.
656	925		600	900		628	913	
657	926		601	901		629	914	
658	927		602	902		630	915	

TRAILING CARS

DUE FOR INSPECTION Mondays & Thursdays	Tuesdays & Fridays	Wednesdays & Saturdays
CAR No.	CAR No.	CAR No.
122	34	
123	35	
124	36	

FRESH POND INSPECTION SHOP

738	747		700	708		719	727		25	1
739	748		701	709		720	728		26	2
740	749		702	710		721	729		27	3

MISCELLANEOUS CARS

DUE FOR INSPECTION

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
697	097	697	097	097	697
3	095	3051	3	695	3003
3008	3011	696	3151	3000	3007

SOUTHERN DIVISION

MOTOR CARS

DUE FOR INSPECTION Mondays and Thursdays			DUE FOR INSPECTION Tuesdays and Fridays			DUE FOR INSPECTION Wednesdays and Saturdays		
CAR No.	CAR No.	CAR No.	CAR No.	CAR No.	CAR No.	CAR No.	CAR No.	CAR No.
1066	1236		1000	1210		1033	1222	
1067	1237		1001	1211		1034	1223	
1068	1377		1002	1330		1035	1224	

TRAILING CARS

DUE FOR INSPECTION Mondays & Thursdays	Tuesdays & Fridays	Wednesdays & Saturdays
CAR No.	CAR No.	CAR No.
237	142	
238	157	
239	169	

MISCELLANEOUS CARS

DUE FOR INSPECTION

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
3009	3013	3015	3060	3001	3005
3012	3014	3016	3001	3004	3000
4	2	1	3050	2	1

THIRTY-NINTH STREET ELEVATED SHOP

Date	FEBRUARY		MARCH																												
			1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	11th	12th	13th	14th	15th	16th	17th	18th	19th	20th	21st	22nd	23rd	24th	25th	26th	27th	28th	29th	30th	31st
Car Nos.	23rd-24th-25th-	3102 3103 698	3106 3107	3108 3105	098	3037	3038	3039	Sunday	3020	3021	698	3022	3023	3024	Sunday	3025	3020	698	3027	3028	3029	Sunday	3030	3031 3032	698	3033 3034	3035 3030	3100 3101	Sunday	3102 3103	3104 3105	698

CORRECT

Electric Ry. Journal *Superintendent of Equipment*

Fig. 13—Brooklyn Records—Portion of Sheet Showing Inspection Days for Elevated Equipment

arc headlights, as follows: Trolley wheels, poles and stands; lamps, lamp sockets, markers, light circuits and headlight stands; heaters, heater circuits and fire extinguishers; switch boxes, switchboards, switches and fuses; all parts of car body, including the bell cords, register cords, emergency cords, signal bells, ventilator opening device, sash, doors and locks, gates and railings, steps, traps, seats, seat backs, etc.; all brake apparatus, including motorman's valves, gages, conductor's valves, governors, compressors, whistles, triple valves, cylinders and reservoirs, hose, brake levers, rods, pins, carriers, hand brakes and rigging; all control apparatus, including unit-switch groups, drum type controllers, reversers, line switches, circuit-breakers, master controllers, motors, trucks and draft rigging; contact shoes and shoe beams, shoe leads and fuses, motor leads, and four and seven-point receptacles. Batteries are inspected every 30 days and arc lights every day.

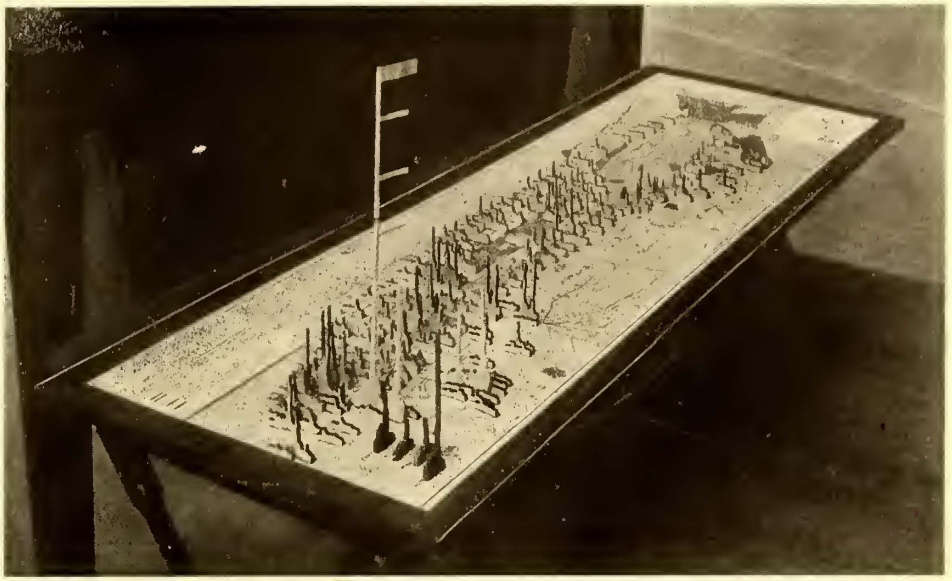
SECOND ARTICLE

The second article in this series on rolling stock standardization will classify the cars now in service and describe their power equipment standards and specifications.

TRAFFIC RECORDS OF PUBLIC SERVICE COMMISSION, NEW YORK CITY

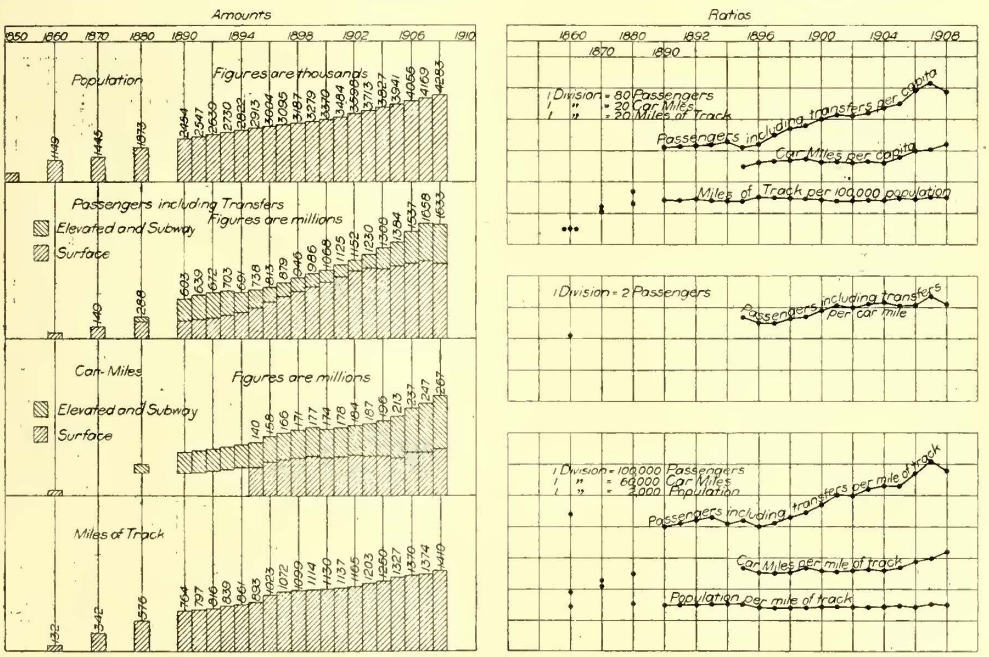
An account of the exhibits furnished by the New York Public Service Commission, First District, for the Conference on City Planning and Municipal Art, was published in the ELECTRIC RAILWAY JOURNAL of May 8, 1909, page 890. The exhibition, which was held at the Twenty-second Regiment Armory, New York, was concluded on May 16.

By the courtesy of the commission, statistical and other information which was used as a basis for part of the exhibit has been made available for publication. The illustrations and statistics which are published herewith relate to (1) a relief chart showing the ticket sales by hours on a typical day on subway and elevated lines in Greater New York and at each East River Bridge and ferry, and (2) to the increase in population, passenger traffic, car-miles operated and miles of track of the street railways in Greater New York.



Relief Chart, Showing Hourly Ticket Sales at Subway and Elevated Stations and at East River Bridges and Ferries

The relief chart, of which a photograph is published herewith, is a map of Manhattan Island, showing the routes of the various lines treated and the location of the stations, with blocks of wood to indicate the total sales of tickets at each station during every hour of what was assumed to be a typical day, Wednesday, Feb. 17, 1909. While the reproduction of the relief chart shows the scheme of display followed with this subject, it does not permit of sufficiently large or clear representation in these pages by photograph to indicate as well as the diagrams from which the blocks of wood were modeled, the results depicted. The accompanying diagrams relating to this feature of the exhibit show perfectly the hourly ticket sales at important stations of the New York subway during the typical day described. Each square, it will be observed, represents 200 people. It will be noted from these diagrams that there is a very sharp increase at some of the stations twice a day, where a rush-hour movement develops both morning and evening. This is the situation at stations like Grand Central, where the morning rush of in-bound suburbanites finds a counterpart in a heavy traffic in both directions at the close of the business day, and at Brooklyn Bridge, where the great rush of traffic, as at Grand Central, keeps up most of the day, with an accentuated movement at the usual morning and evening peak hours.



Historical Chart of Street Railway Traffic in Greater New York, Prepared by the Bureau of Statistics and Accounts, New York Public Service Commission of the First District, April, 1909. (Most of the statistics for the years prior to 1901 are derived from F. R. Ford's compilation in the "Street Railway Journal," Oct. 5, 1901.)

An interesting record of traffic movement is presented by the chart indicating the hourly ticket sales at the Times Square station of the subway. While two rush-hour movements are indicated by the records of this station, they differ from the other noteworthy instances in that there no morning rush develops; the hours of busy traffic are at 6 p. m. and at 12 p. m., after the theaters have closed. Bion J. Arnold, in his report to the commission on the traffic of the New York subway [see ELECTRIC RAILWAY JOURNAL of Jan. 30, 1909], stated that the business at the Times Square station was increasing more rapidly than that at the Grand Central station, making it probable that the Times Square station may soon handle as many pay passengers as the Grand Central station.

Another feature of the diagrams to which especial at-

tention should be called is the comparatively light number of ticket sales at the outlying subway stations.

The large amount of business offered at the Atlantic Avenue terminal in Brooklyn in the morning, as shown by the diagram, gives the subway the valuable and much-desired return haul which fills the vacant seats that existed in the subway cars on the return haul from the business section to the upper end of the island before the extension under East River was opened for traffic.

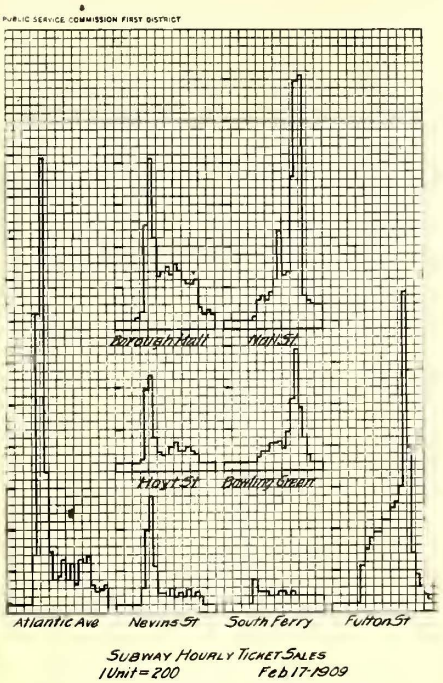
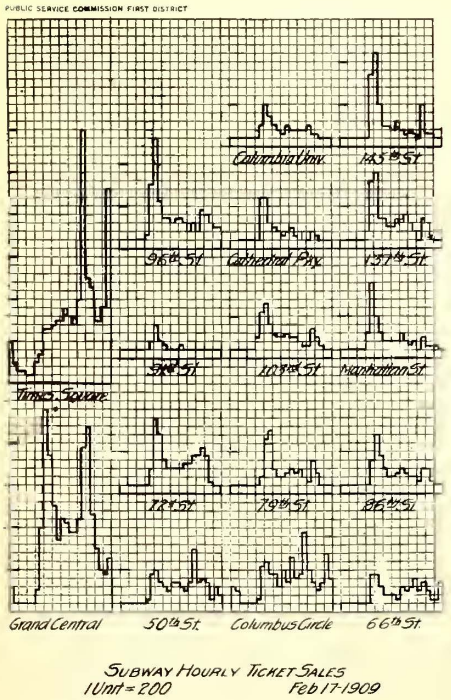


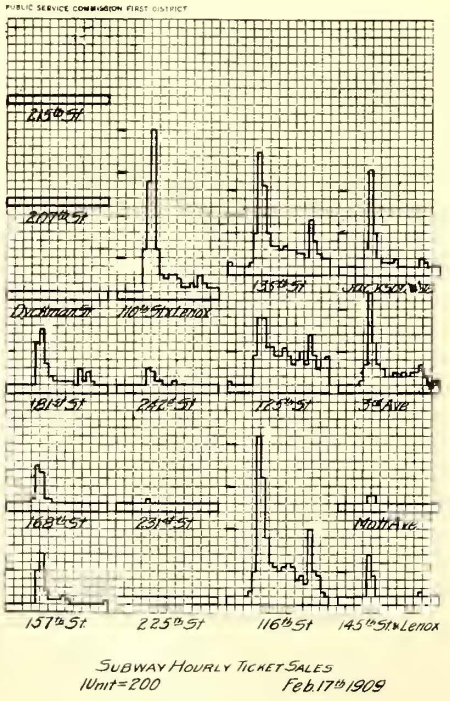
Diagram of Subway Ticket Sales

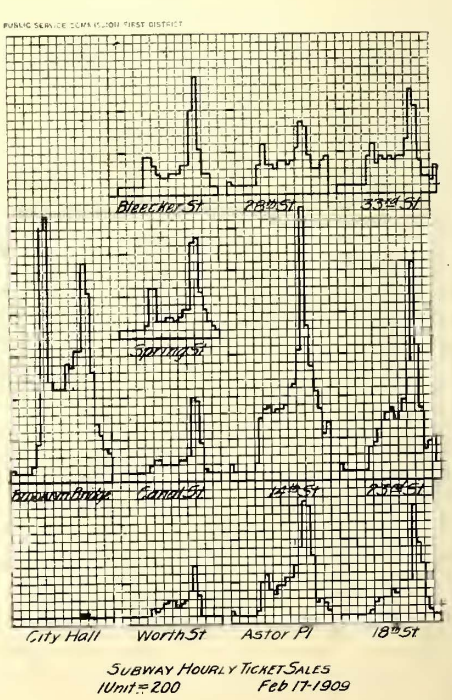
The table of figures of ticket sales at the subway stations on the typical day selected for the test shows the total sales during the 24 hours and also states separately the totals reported for the hours from 8 a. m. to 9 a. m and 5 p. m. to 6. p. m., respectively. During these two rush hours extra ticket-sellers and choppers are on duty at a number of the stations. While it is recognized that the totals of ticket sales at each station are not identical with the total passenger movement from that station, owing to the numbers of people who supply themselves with tickets in advance of their needs, it was believed that the compilation of the data would indicate reasonably well the traffic at the different stations and the relative importance of each from a traffic standpoint. The total number of ticket sales is shown to have been in excess of 800,000.

SUBWAY TICKET SALES BY STATIONS, FEB. 17-19, 1909.

Station.	Feb. 17, 1909.	8-9 a.m. Feb. 17, 1909.	5-6 p.m. Feb. 17, 1909.
Atlantic Avenue	37,118	10,900	1,304
Nevins Street	12,938	2,816	511
Hoyt Street	11,730	2,320	667
Borough Hall	24,915	4,100	1,100
South Ferry	4,718	503	305
Bowling Green	13,003	360	2,930
Wall Street	27,436	703	6,025
Fulton Street	37,026	1,480	7,676
City Hall	2,332	100	302
Brooklyn Bridge	51,100	6,303	5,208
Worth Street	7,725	280	1,445
Canal Street	10,752	462	2,003
Spring Street	14,707	1,160	2,322
Bleecker Street	14,211	700	2,003
Astor Place	21,148	1,201	2,914
Fourteenth Street	40,128	1,701	6,510
Eighteenth Street	14,931	500	2,805
Twenty-third Street	29,492	902	5,225
Twenty-eighth Street	15,940	1,200	1,710
Thirty-third Street	17,559	1,200	2,510
Grand Central	42,102	4,800	3,905
Times Square	37,790	1,300	6,025
Fiftieth Street	12,799	1,000	1,460
Columbus Circle	18,253	1,200	1,900
Sixty-sixth Street	10,124	940	800
Seventy-second Street	13,325	1,801	906
Seventy-ninth Street	8,922	1,302	560
Eighty-sixth Street	9,603	1,400	402
Ninety-first Street	4,625	800	221
Ninety-sixth Street	14,732	2,605	605
Lenox:			
One Hundred & Tenth St.	15,841	4,000	400
One Hundred & Sixteenth St.	21,206	3,000	651
One Hundred & Twenty-fifth St.	19,610	1,800	1,043
One Hundred & Thirty-fifth St.	16,465	2,110	461
One Hundred & Forty-fifth St.	4,850	700	200
Mott Avenue	2,320	200	160
Third Avenue	11,820	1,240	480
Jackson Avenue	8,545	1,014	218
Prospect Avenue	12,057	1,505	621
Simpson Street	6,362	902	504
Freeman Street	7,430	951	205
One Hundred & Seventy-fourth St.	1,190	160	20
One Hundred & Seventy-sev'th St.	4,200	340	240
One Hundred and Eightieth St.	2,865	280	90
One Hundred and Third Street	10,133	1,302	303
Cathedral Parkway	7,683	1,135	244
Columbia University	7,234	1,000	400
Manhattan Street	9,450	1,004	404
One Hundred & Thirty-sev'th St.	12,338	1,800	410
One Hundred and Forty-fifth St.	11,199	2,155	320
One Hundred & Fifty-seventh St.	6,892	1,410	242
One Hundred and Sixty-eighth St.	4,805	902	120
One Hundred and Eighty-first St.	7,880	1,500	590
Dyckman Street	608	130	100
Two Hundred and Seventh St.	390	60	42
Two Hundred and Fifteenth St.	120	4	5
Two Hundred & Twenty-fifth St.	885	140	71
Two Hundred and Thirty and Two Hundred and Thirty-first Streets	816	112	20
Two Hundred & Forty-second St.	3,983	500	240
Total	800,361	87,395	81,163







Diagrams of Subway Ticket Sales

POPULATION AND TRAFFIC STATISTICS

In preparation of the diagram published on page 979, illustrating the increases in population, passenger traffic, car-miles and miles of track, the figures used by the commission for the years prior to 1901 are based upon those given by Frank R. Ford in the article written by him which

SURFACE AND ELEVATED TRAFFIC RECORDS, NEW YORK CITY.

Year.	Population (000 omitted).	Passengers (including transfers) (000,000 omitted).	Car-miles operated (000,000 omitted).	Miles of track.
1901	3,484	1,125	178	1,137
1902	3,598	1,152	184	1,165
1903	3,713	1,230	187	1,203
1904	3,827	1,308	196	1,250
1905	3,941	1,384	213	1,327
1906	4,055	1,537	237	1,370
1907	4,169	1,658	247	1,374
1908	4,283	1,633	267	1,410

appeared in the STREET RAILWAY JOURNAL of Oct. 5, 1901. The figures for the subsequent years shown in tabular form, are partly estimated. The figures indicate a density of traffic in 1901 on the 1137 miles of surface and elevated track for which the returns are given of 989,000 passengers (including transfer) per mile of track; in 1908 this had increased to 1,159,000.

APPRENTICESHIP COURSE IN NEW YORK

The receivers of the Metropolitan Street Railway Company have decided to establish an apprenticeship course for young men desiring to learn the electric railway business. This step was announced in a circular recently issued by Oren Root, general manager for the receivers. Copies of these circulars were sent to the presidents of 20 of the principal Eastern engineering schools and universities. The institutions selected were as follows: Amherst College, Brooklyn Polytechnic Institute, Brown University, Cornell University, Cambridge Manual Training School, Dartmouth College, Hamilton College, Massachusetts Institute of Technology, Pratt Institute, Princeton University, Purdue University, Rensselaer Polytechnic Institute, Stevens Institute of Technology, Syracuse University, Tufts College, Union College, Williams College, Wesleyan University, Worcester Polytechnic Institute, Yale Sheffield Scientific School.

A copy of Mr. Root's circular follows:

It is my intention to establish a practical training school for young men, particularly graduates of high schools, manual training schools, colleges or universities, who have had more or less technical training and who intend to enter upon the vocation of operating street railroads.

It is the aim to make the conditions advantageous to the young man who has an inclination to enter upon work of this character, but who, from lack of knowledge of practical conditions, does not feel able to make a definite decision. Such a man, under the proposed plan, will be afforded an opportunity of acquainting himself with the details of this work, while at the same time receiving a salary which, with strict economy, will enable him to be self-supporting. He may thus determine for himself whether he is fitted and has a liking for employment of this character; on the other hand, the Metropolitan Street Railway Company will profit by the experiment in that it will be possible to test the capacity, ability and adaptability of applicants, who will constitute a body of candidates from whom men may be chosen when it becomes necessary to fill vacancies in the regular operating staff.

During the first year the student will be paid at the rate of $15 per week. In order to give him a general idea of the railroad system, he will be assigned to duty in the Maintenance of Way, the Electrical, the Equipment and the Transportation departments, spending three months in each department.

MAINTENANCE OF WAY DEPARTMENT

Students will be assigned to field work in connection with the renewal of rails and installing special track work in the streets, involving all of the various features which enter into this situation, such as the efficient and economical handling of men, the performance of tasks with a minimum amount of delay to car and street traffic, the laying of asphalt and other pavement, etc. Assignments will be made to other engineering works, such as the making of surveys, designing of special track work, compilation of estimates of cost, designing and construction of buildings, problems incident to fireproof car-house construction and miscellaneous matters such as distribution of charges, time-keeping, etc.

ELECTRICAL DEPARTMENT

During his three months' tour of duty in this department the student will be given an opportunity to familiarize himself with the conduit and feeder system, i. e., the location and character of the various cables, both high and low tension, by means of which the electrical energy is transmitted from the power station to the cars on the street. Questions involving the maintenance of this complicated system will be presented to the student. He will have an opportunity of observing the practical measures adopted to overcome difficulties incident to the work. He will also receive experience in electrical and steam engineering in the power house, where alternating current is generated at a high voltage, and in the substations, where the current received from the power station is reduced to low voltage and converted into direct current. Special assignments will be made to the students from time to time to ascertain the ability and capacity of these men.

EQUIPMENT DEPARTMENT

While working in this department the student will be given duties in the car houses and in the repair shops. He will become acquainted with the practical difficulties incident to the maintenance of car equipment under operating conditions and the methods followed in making minor repairs, as well as the more comprehensive overhauling—such as the rewinding of armatures, repairing of commutators, replacing of fields, etc. The student will also obtain some machine shop experience, covering blacksmithing, lathe turning and metal work in general.

TRANSPORTATION DEPARTMENT

Upon entering this department the student will be assigned to the school for motormen, where he will learn to operate a car, as well as become familiar with the function of each part of its mechanism. Subsequently he will be assigned to duty as a conductor or motorman for a short period. Following this experience, he will be given a thorough course of instruction by the officials of the Transportation Department, and thus become acquainted with the details of regulating the service under normal conditions and in emergencies. A certain period of time will also be devoted to learning routine work in the division offices, such as time-keeping, checking up of cash received from conductors, the making of accident and other reports, etc. The student will be assigned to special work from time to time for the purpose of testing his powers of observation, analysis and deduction.

MEMBERSHIP QUALIFICATIONS

It is expected that the membership in this school will be limited to approximately eight men at any one time, thus involving an assignment of two such men to each of the departments above mentioned during each three months' period, but the employment of students under such conditions will in no way constitute a guarantee that they will be continued in the service unless they are found to perform their duties in a satisfactory manner. On the other hand, they will be dropped if they prove incompetent; but if they complete the first year of apprenticeship, they will be definitely assigned to that department for the performance of the duties of which they havev manifested the greatest ability, and, dating from the time of such appointment, they will be paid at the rate of $20 per week.

After they have been so employed for one year, or, in other words, after the expiration of their second year's service with the company, if there are any vacancies in the permanent staff of the company, these men will be given permanent positions; but, if not, they will be awarded a certificate of service stating the character of the work

which they have performed and containing such recommendation as they may be entitled to receive.

It should be distinctly understood by those men who think they would like to take advantage of the opportunity thus afforded that the tasks which they will be called upon to perform will often involve night and Sunday work, as the street cars in New York City are operated 24 hours a day during the entire year. It is not recommended that any man should apply for such a position as above described unless he is strong physically and is prepared to perform hard work.

In considering applications, preference will be given to those men who have received a technical education, including such courses as electrical or mechanical engineering, as a knowledge of such subjects will be of material advantage to the student. The lack of such a training, however, will not preclude the consideration of an application, nor will it necessarily militate against the success of the student in departments of the company where this technical training is not indispensable. Applications will be received from men who have been out of school or college for several years, as well as from men who are to be graduated this year.

Any man who feels that he can fill the requirements and who desires to enter upon such an apprenticeship may file his application with F. T. Wood, assistant to the general manager for receivers, Metropolitan Street Railway Company, 621 Broadway, New York City. Such application, however, should be filed in person at the above-mentioned office before June 15, or between July 1 and July 15 of the current year.

Application blanks will be forwarded upon receipt of request therefor, addressed to Mr. Wood. Such applications should be indorsed by the president of the institution of which the applicant is a member, the dean of the faculty or some member of the faculty who is personally cognizant of the qualifications of the applicant; or, in the case of men who have been out of school or college several years, the application should be indorsed by present or recent employers of the applicant.

Copy of Application Blank

Application for Appointment to Training School

Name in full
Residence
Age
Previous business experience (if any)
Character of education, i. e., degree or diploma received
School or college (name of institution)
Sciences studied and to what extent
Name of parent or guardian
Occupation of parent or guardian
Address of parent or guardian
Signature of applicant

(Note.—Applications should be indorsed by the president of the institution of which the applicant is a member, the dean of the faculty or some member of the faculty who is personally cognizant of the qualifications of the applicant, or, in the case of men who have been out of school or college several years, the application should be indorsed by present or recent employers of the applicant.)

CHICAGO ORDINANCES

At a recent meeting of the committee of fifty, which is investigating the street railway problem in Detroit, a letter written by Walter L. Fisher, of Chicago, to Paul C. Renaud, secretary of the committee, was presented. Mr. Fisher, who is special traction counsel for the city of Chicago, wrote:

I am completely at a loss to understand upon what information or misinformation any one could have made the statement that the Chicago traction ordinances have in any way failed to accomplish all that was expected of them. In my opinion, and I think in the opinion of all disinterested and intelligent observers here, they have thus far been a complete success. Conditions have, of course, not been ideal, but no one has expected to achieve perfection under this or any other form of handling the street railway question. Under our ordinances there has been such a radical improvement in service as to amount to a practical revolution, and this improvement is rapidly increasing. It will continue to increase with the rehabilitation of our tracks and equipment. Not only have the Chicago traction ordinances not proved a failure, but, upon the exact contrary, their practical success has been recognized here and elsewhere, and steps are now under way, in Chicago and in other cities, to apply the principles which they embody to the settlement of other utility controversies.

PRODUCER GAS PLANTS FOR SMALL CENTRAL STATIONS*

By W. B. Head, Stephenville (Tex.) Light & Water Company

Few central stations in the small towns are paying interest on the money invested in them. The small steam plant at best is an extravagant affair. The load factor is usually very low. Nearly all small steam plants are equipped with engines which use 40 lb. to 50 lb. of steam per hp-hour. A common return tubular boiler which requires from ¼ lb. to 1/3 lb. of coal to make 1 lb. of steam is the kind generally found in the small central station. In such a plant we usually find steam pumps for boiler feeding and oftentimes a long-stroke steam pump attached to a deep well furnishes water, saturated with scale-forming minerals for steam purposes. The pumps require 100 lb. to 150 lb. of steam per hp-hour, and the scale puts a first-class insulation between the fire and the water. It is safe to say that 75 per cent of the small steam plants in Texas are operating under conditions which require from 10 lb. to 15 lb. of coal per brake hp-hour. A producer plant operating on Texas lignite will show an enormous saving over such plants.

Several builders of producer plants are guaranteeing a fuel consumption of 2 lb. to 3 lb. of lignite per brake hp-hour on a 50 per cent load factor. Texas lignite can be had at a cost of about one-half that of Oklohoma coals (the kind most generally used in steam plants in Texas).

The most important question uppermost in the minds of all prospective purchasers is the reliability of a producer plant. After a year's experience with a 100-hp unit the writer feels safe in saying that a first-class producer plant is as reliable in every respect as a steam plant. A somewhat better class of labor is needed to operate a producer plant than a steam plant. Skill on the part of the engineer is not so necessary as carefulness; this especially applies to the engine. Any piece of heavy machinery, of many parts, operating at high speed, requires the best of attention.

The cost of lubrication is about one-third more than that of a steam engine.

The question of the durability of the producer plant is one that pertains almost entirely to the engine, as there is almost nothing about the rest of the plant to depreciate. Compared with a steam engine, it is considerably more in the writer's opinion.

The cost of installation is about 40 per cent more than that of a steam plant.

There are a few points, it might be well to mention, that should be considered by the prospective purchaser: First, the amount of water necessary for the tar extractor and scrubber, also the amount needed for cooling the engine cylinders. There are many places where it would be almost impossible to secure sufficient water for these purposes without providing cooling systems, and thus using the water over again. Care should be exercised in locating the producer room. The floor should be high enough to give the water from the tar extractor considerable fall in order that it may get out of the building easily. In cold weather the tar becomes thick and is hard to pass through a sewer without considerable fall. Some sort of skimming device should be provided to separate the tar from the water, in order that the tar may be saved. Producer plants of 100 hp and larger should always have included with the installation a coal elevator for charging the producer.

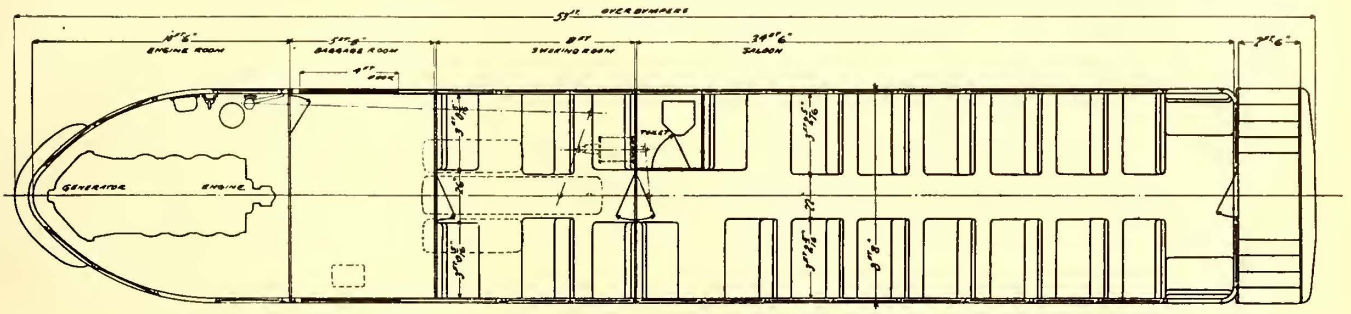
*Abstract of paper read before Southwestern Electrical & Gas Association, Dallas, Tex., May 20 to 22, 1909.

A NEW TYPE OF GASOLINE-ELECTRIC CAR

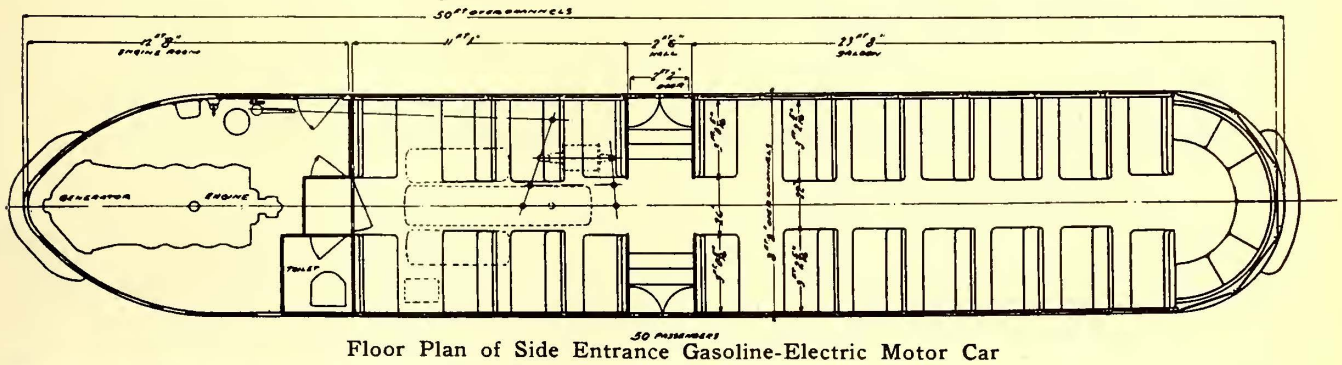
An account of the first gasoline-electric car built by the General Electric Company for the Delaware & Hudson Railroad was published in the STREET RAILWAY JOURNAL for Feb. 10, 1906, and a description of the second and lighter car was published in the STREET RAILWAY JOURNAL for June 29, 1907. Since the latter time the General Electric Company has given considerable attention to the subjeet of gasoline-electric cars and has designed a number. They are mounted on double trucks and the forward truck is equipped with two standard railway motors of 100 hp each. The power plant consists of a gasoline engine and an electric generator of 125 hp and a controller similar to a standard railway controller. The speed of the cars is from 50 m.p.h. to 60 m.p.h. and the car can be started, stopped and reversed without stopping or changing the direction of rotation of the gasoline engine. The company believes that the flexibility and easy operation afforded by the electric drive more than counterbalance any advantage secured by a mechanical connection between the engine and the axles.

The accompanying photographic engravings illustrate a car which has recently been built by the company with a seating capacity of 50 passengers and an 8-ft. baggage space. The line engravings show plans of cars of similar type designed by the company, but with slight modifications of seating arrangements.

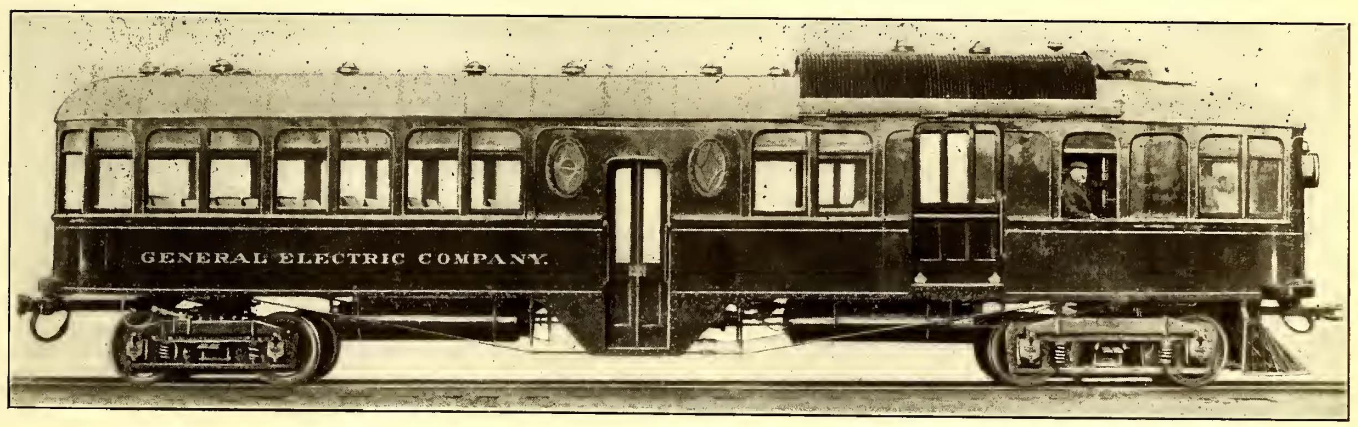
The car illustrated in the photographs is mounted on two trucks. The forward motor truck has a wheel base of 6 ft. 6 in., is equipped with 33-in. wheels and weighs 9500 lb. The rear truck is substantially the same as the motor truck, but with 5-ft. 6-in. wheel base and of somewhat lighter construction. It weighs 6750 lb. The motor truck is equipped with two GE-205, 600-volt commutating pole railway motors mounted directly upon the axles with nose suspension and equipped with standard gear cases.



Floor Plan of Gasoline-Electric Motor Car with Baggage Compartment



Floor Plan of Side Entrance Gasoline-Electric Motor Car



Exterior View of Gasoline-Electric Motor Car

The power plant consists of an eight-cylinder, 100/125 hp, 550 r.p.m., four-cycle gasoline engine of the "V" type, direct connected to an eight-pole, 80-kw, 600-volt commutating pole generator and direct-coupled, 3½-kw, 32-volt exciter.

The engine cylinders are 8 in. diameter by 8 in. stroke and are constructed of soft, close-grained, gray cast iron. Water jaekets are cast integral with the cylinders. Exhaust and inlet valves are of nickel steel and are on the same side. Pistons are of the trunk type and connecting rods are drop-forged machinery steel. The crankshaft is

of high-carbon machinery steel, forged in a slab and machined to size. Lubrication is secured by automatic forced-feed oiler, supplying oil to all wearing surfaces. Engine cooling is provided by means of thermo-siphon circulation in radiators of the fin tube type of 2000 sq. ft. cooling surface and 60 gal. capacity, suitably placed on the roof of the car. The cooling system is arranged so that it may

Passenger Compartment of Gasoline-Electric Motor Car

be filled from the exterior of the car. All parts of cooler and engine can be readily drained.

The ignition system consists of high-tension magneto and plugs. The carbureter is of the overflow type with adjustable control for warm air supply. The gasoline is supplied to the carbureter by means of a plunger pump mechanically driven from the engine. An auxiliary hand pump is also provided for starting.

An air pump driven from the main crankshaft of the engine supplies air for the brakes and whistle. This pump cylinder is 4 in. diameter by 4 in. stroke and has a displacement of 16 cu. ft. of free air per minute when running at 550 r.p.m., which is the normal operating speed of the engine.

The gasoline tank is of steel and of 90 gal. capacity. It is located under the car body and is filled from the exterior of the car. Two strainers are supplied between gasoline inlet and engine. Only one pipe leads from this tank to the gasoline pump, leaving the former at the top.

The controller connects the motors progressively in series and in parallel and the voltage applied to them is controlled by varying the strength of the generator field. This is accomplished by the movement of a handle on the controller. The controller is provided with a reversing handle to change polarity of the armature current in relation to the field current of the motors and thus reverse the car. Substantial handles for regulating the engine spark and throttle are conveniently placed on the motor controller.

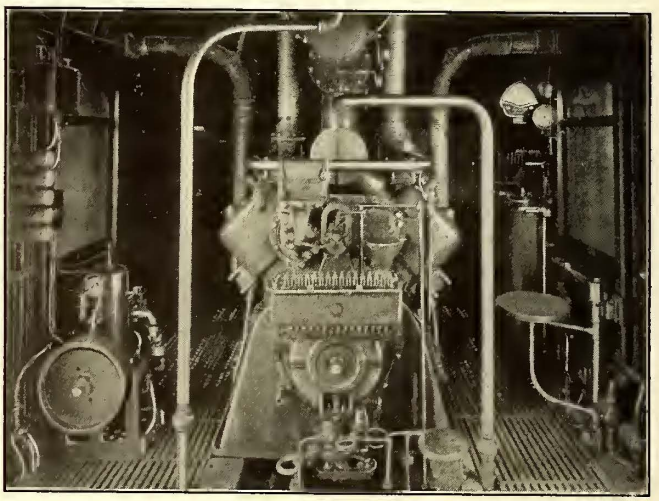
The manufacturers have developed a special controller, which can be arranged for operation from either the self-contained power plant or from the 600-volt overhead trolley circuit of an electric railway system. When operating from the self-contained power plant the speed of the motors is governed as described above. When operating from the overhead trolley the motors are controlled in the usual manner, i.e., series-parallel connections with intermediate steps obtained by placing resistance in the main circuit. The same handle accomplishes both operations. Interlocking devices are provided to prevent operation from one circuit when there is a connection with the other.

Combined straight and automatic air brakes are provided, the straight air being for use when the car is operated alone and the automatic air for use when hauling a trailer furnished with standard automatic brake equipment. The compressed-air supply is provided by the single-cylinder, single-acting pump direct driven from the main crankshaft of the gasoline engine, already described. An auxiliary ratchet hand brake is provided in the engine compartment.

The gasoline engine is started by compressed air from the main reservoir through a distributing valve to the several cylinders in succession. For recharging the reservoirs if necessary when the main engine is shut down a 3¼-in. x 4-in. single-cylinder, single-acting air pump direct connected to a 4-hp, single-cylinder, two-cycle gasoline engine is furnished as part of the equipment and is located on the left side of the engine compartment. This auxiliary air pump equipment is complete and includes all necessary accessories, such as carbureter, ignition outfit, cut-out cocks, valves, etc.

The car is electrically lighted by 25-volt incandescent lamps. Current is supplied from the exciter when the main engine is running and from a 12-cell storage battery located under the car body when the main engine is shut down. Automatic means are provided for switching the lights from one circuit to the other and also for charging the battery from the exciter. A 32-cp incandescent headlight is provided as part of the equipment.

The car body is heated by a system of hot water circu-



Power Plant of Gasoline-Electric Motor Car

lation on the thermo-siphon principle, the heat being obtained from the exhaust gases.

The car is also equipped with an air whistle, gong, suitable signal starting bell, etc.

At the annual meeting of the American Railway Association in New York on May 19, F. A. Delano was re-elected president. The association is composed of officers of the principal steam railroads of the United States, Canada and Mexico, and represents nearly 250,000 miles of road. Its committee on safety appliances reported that out of a total of 2,182,476 freight cars, 97 per cent were equipped with air brakes on Jan. 1, 1909. Of the locomotives in service, 58,425, representing 99 per cent, were equipped with air brakes.

ANNUAL CONVENTION OF SOUTHWESTERN ELECTRICAL AND GAS ASSOCIATION

The fifth annual convention of the Southwestern Electrical & Gas Association was held at Dallas, Tex., on May 20, 21 and 22. The meetings were said to be the most successful ever held and exceeded in numbers registered those of previous years. More than 340 members and guests were in attendance. The supply men not only made a very attractive exhibit of their materials, but also conducted one interesting session of the convention program.

At the first session, after an address of welcome by a city official and a response of Sam A. Hobson, and other introductory business, the annual address of the president was read by R. B. Stichter, general manager, Texas Traction Company, Dallas, Tex. Matters of association policy were considered in this address, and several recommendations were made. Later in the session a committee was chosen to draft resolutions regarding the president's suggestions, and the report of this committee (H. S. Cooper, Galveston, and L. L. Stephenson), as adopted by the association, follows in abstract:

REPORT OF COMMITTEE ON PRESIDENT'S ADDRESS

Your committee on the president's address beg to report that they find in that paper several pertinent and important suggestions which they believe should be brought specifically to the attention of your body and action taken upon them by you.

(1) A committee on "uniform city laws" or ordinances.—From the context in the president's address your committee would judge that the principal duty of such a committee would be clerical and statistical and, therefore, the committee is of the opinion that this matter can better be covered by a fixed office and officer specially devoted to that and similar purposes.

(2) A "publicity department" to consist of certain members of the executive committee; your committee believes that the remarks above in regard to the "uniform city laws committee" applies equally as well to this subject.

STANDARDIZATION

(3) The appointment of two "standardization" committees: one on standardization of parts, materials, supplies, etc., one on standardization of accounts.

Your committee believes that both of the subjects are proper work for action by committees.

Your committee recognized the fact that final standardization of all matters connected with the business of the members of this association will be passed on and determined by the National Association and it is with this very fact in mind that it makes the recommendation for the appointment of these committees.

Such previous work by the national organizations has hitherto been somewhat circumscribed by time and by territory. Its only method of obtaining general information in regard to any subject of standardization has been by correspondence and the filling of fixed interrogating forms. To try to obtain information in such important matters over such an immense territory as the whole United States is too great a task for any one organization.

The only way to thoroughly accomplish these ends is to subdivide this work among the different State and divisional associations, to let them obtain the information desired on any standardization subject, not only from their own membership which, collectively, will number many companies not included in the national association, but from every company within their territory. Let these local and divisional associations appoint their own standardization committees to collect, collate and integrate the information and replies it receives and, in connection with the executive committee, decide on the phase or particulars of any desired standardization and with full regard to the needs, conditions or peculiarities of the special section or territory covered by each local or divisional association. These sectional or divisional final results can then be presented to the national associations and if necessary the national committees be composed of the chairman or a representative member of every local or divisional committee, which committee will then have before it the final and decisive results of the whole United States in only 10 or 12 sections instead of a mass of hundreds of indecisive and contradictory replies from only a portion of the many companies to be affected by the desired standardization. Such a method of procedure will not only greatly facilitate the final decisions, but such decisions will be more likely to be those that are most generally useful or most general improvements.

In such a method of procedure the characteristics or needs of any special section, say, such for instance, as is covered by this association, will be brought into full notice where by the present method of a few replies—perhaps contradictory—from this section these characteristics or needs might not be in any way emphasized.

"Standardization" is a compromise of opinions and an average of local or sectional conditions and the best compromise is where every one gives up a little and the closest average is where the largest number is taken to average from. Subdivision of this work of compromise and average will facilitate the results in time and will not only not affect those results erroneously but, on account of the subdivided information giving truer and fuller results from each section, the final results will be more generally accurate and acceptable.

For these reasons your committee urges that this association at this meeting not only take decisive and immediate action in regard to this matter, but that it authorize and empower its executive committee to urge on every sectional or divisional association in the United States a similar action to the end that the national association may obtain the benefit of such action at the earliest possible moment.

(4) The fixing of a permanent office of this association and the election or appointment of a permanent official whose exclusive business shall be to have charge of such office and to attend to all the business of the association that is not executive or financial or that is not placed in charge of special or general committees or officers. This will include such work as has been mentioned by the president under classes 1 and 2, which work, being purely statistical and clerical, would come under this official and could best be done by him.

The permanent assistant secretary will later be appointed by the executive committee.

SMALL PRODUCER PLANTS

The first paper, "Producer Gas Plants for Small Central Stations," was presented by W. B. Head, manager, Stephenville (Tex.) Light & Water Company. An abstract of this paper will be found elsewhere. When questioned Mr. Head stated that his producer plant had given no trouble from clinkers. If any clinkers did form from air holes through the fire bed they were taken out as they would be from an ordinary fire arch under a boiler. His gas engine was rated at 100 hp and the plant had a load factor of approximately 50 per cent. In a run of 12 hours but 2 bu. of ashes would accumulate, thus showing the good burning qualities of the producer. It was stated to be perfectly feasible to store producer gas in a reservoir for emergency use. To maintain a thick fuel bed Mr. Head's down-draft producer often was run with the firing doors open for admitting an extra amount of air.

The question of the safety of down-draft producers was discussed. One member cited the death of an employee killed while removing clinkers from such a producer in the San Angelo Power & Traction Company plant. Another member replied that such accidents were not due to the plant, but to carelessness and to the use of poor fuel.

H. M. Moore, Austin, called attention to a suction producer plant in Mexico which was not operating in a highly successful way because the quality of the gas was so poor that the engine cylinders frequently were fouled, requiring

extra engines for maintaining continuity of service. There were eight engines in the plant and a large tank was used for storage. Mr. Moore also stated that both large and small gas-producer plants were capable of generating current at low costs. One economy was effected by settling the tar out of the discharged water. This tar was salable and could be conserved by a simply built settling tank.

On the question of fouling Mr. Head said that this trouble depended, of course, largely upon the care in making the gas. His engine, which drove one 65-kw, two-phase, 1100-volt and one 20-kw, d.c., 220-volt machine, was rated at 100 hp and because the gas engine operated jointly with steam equipment an excellent opportunity was afforded for getting a close idea of its reliability and efficiency, both of which factors were excellent. The engine operated 24 hours per day for six days a week and was shut down only for six hours on Sunday. The engine was fully loaded all the time possible because in this way current could be had cheaply for deep-well pumping work and for running the steam plant auxiliaries. With an average load factor of 50 per cent the engine would deliver 1 hp per hour on 3 lb. of lignite. A reduction in the monthly cost of fuel from $1,000 to less than $200 had been brought about by the gas engine equipment.

Prof. A. C. Scott, University of Texas, said that he had analyzed many samples of lignites from all parts of the State and had found very little variation in the gas-making components of these fuels. With such vast quantities of this fuel available he thought the gas-producer field a very fertile one. It should be possible to purify the gas so that there would be no fouling. Professor Scott described the large installation of gas engines at Gary, Ind., operating on blast-furnace gas.

Mr. Head had had no trouble with scale in the cooling jackets because he kept the water rapidly circulating, not allowing it to become heated and deposit its impurities. The same water was used over and over for this purpose and was cooled in a pond.

Fred M. Lege, Jr., Brush Electric Light & Power Company, Galveston, said that the water cost for a gas-producer and engine plant was about one-eighth of that for a condensing turbine plant of the same horse-power. Even with low-priced lignite, higher efficiency as to fuel cost would be had if anthracite coal were purchased and used in an up-and-down-draft producer. Reliability so obtained was a most important factor and the lignite was comparatively expensive to handle on account of the amount needed to equal anthracite which also was far cleaner.

Professor Scott said that the manufacturers had not given the gas producer for burning lignite enough attention to put it on as perfect a basis as producers for burning other fuels.

Other members spoke of the good results had from lignite-burning gas-producer plants throughout the Southwestern States.

A representative of the Westinghouse Machine Company stated that his experience had shown that Texas lignite did not require a peculiarly constructed producer for good results, but care should be used to install a producer large enough to burn the extra amount of this fuel required on account of its low heat value. White lignite from the vicinity of Dallas made good clean gas. The process of making gas in producers was to burn coal as poorly as possible, using a very thick bed so that there would be a large amount of fuel gasified. The process was simple and would be of great value to Texas power users. The operation of a gas-producer engine plant did not require any higher degree of skill than for a steam plant, but there still was a scarcity of experienced operators.

RELATION OF LEGAL AND CLAIM DEPARTMENTS

H. S. Cooper, manager, Galveston Electric Company, read his paper on "The Scope of the Legal and Claim Departments and Their Relation to Each Other." A general discussion followed. Attorney Knight, of the Dallas Consolidated Street Railway Company, stated that 99 out of 100 personal injury cases were decided according to "accidents of trial" rather than points of law. Thus the present judge and jury system had largely to do with any hardships that might be inflicted against corporations. He favored Mr. Cooper's plan of segregating the work of the legal and the claim departments.

E. T. Moore, general manager, Dallas Consolidated Street Railway Company and Dallas Electric Light & Power Company, did not favor drawing the line closely between the two departments or between any other two departments. The departments should be able to get on without too great separation of authority.

Mr. Cooper held that there should be a line on one side of which would be the claim department and on the other the legal department. Thus neither would do the work of the other.

W. C. Forbess, general passenger and claim agent, Northern Texas Traction Company, Fort Worth, read a paper on "The Organization and Operation of a Claim Department." The present jury-choosing methods were criticised in the course of the discussion which followed this paper.

EXHAUST STEAM TURBINES

Fred M. Lege, Jr., Brush Electric Light & Power Company, Galveston, presented a paper on "Exhaust Steam Turbines." When questioned, Mr. Lege said that in a given plant it would be preferable to install two or more exhaust steam turbines rather than one large one on a common exhaust main, because unless the load were uniform and of the proper amount the reciprocating engines might sometimes operate with undue back pressure and at lower economy than if more than one exhaust steam turbine was used. The exhaust steam turbine was an emergency unit which should be connected flexibly with the exhaust trunks of the reciprocating engine plant so that the number of units could be adjusted to load conditions. The adaptability of the exhaust steam turbine to existing plants was discussed by several members, including H. D. Ratcliff, of the General Electric Company, who was familiar with the design of several successful exhaust steam turbine plants installed by that company, and stated that exhaust steam turbines for d.c. work were now being built with horizontal shafts to facilitate keeping the commutator clean. These turbines had commutating poles to prevent sparking at the brushes.

The association approved several changes in the by-laws, among which was a clause limiting the active membership of the association to the following States: Texas, Louisiana and New Mexico, U. S. A., and the Republic of Mexico.

The second afternoon session largely was conducted by the supplymen with C. W. Hobson in the chair. E. J. Pietzger thanked the active members for the courtesy extended to the manufacturers and their representatives and others spoke on the subject of co-operation between all interests.

At the beginning of the last day's session a paper on

"Why We All Should Become Members of the American Street & Interurban Railway Association," by Anton H. Classen, president, Oklahoma Railway Company, was read in the absence of its author by L. E. Gould, Western editor, Electric Railway Journal.

Professor Scott, editor of the association "Question Box," then took the chair and a general discussion of several subjects followed. The first question was: "Is the subdivision of accounts as suggested by the National Association a good one, either from an accounting or an operating standpoint? Is it of very great use to small or medium-size roads? Can you suggest a better one for the operating department? If so please give same and reasons therefore." Answering this group of questions, H. S. Cooper told of the reasons for the first promulgation of the standard accounting system which, he said, was a good schedule for financing or taxation work, but not perfect from an operating standpoint. For example, a car consisted of three distinct parts, body, trucks and electrieal equipment. Yet the schedule of accounts did not subdivide the maintenance charges for these three parts. David Daly, manager, Houston Electric Company, said that the Stone & Webster property managers had subdivided several of the accounts into 15 or 20 divisions so that detail costs could be kept distinctly separate for comparative purposes. This practice had great value in determining the efficiency of any department from month to month as eompared with that of another road or with the same road for a previous month.

Mr. Lege made the same criticism of the National Electric Light system of accounts as Mr. Cooper for the railway system and his company had subdivided several accounts as stated by Mr. Daly.

For a small property Mr. Head thought there was no other factor of management so important as "system." Small properties often found it difficult to get accurate and detail accounting, but any extra labor for such results would be well spent. His company tried to keep complete detail accounts so that the officers might know actual operating costs. Detail accounts were kept for plumbing, housewiring, the storeroom, etc. Carcful watch was kept over the tool- and stores-rooms. Mr. Head criticised the average small plant because it did not keep accounts accurately enough to show its operations effectively.

Mr. Cooper suggested that each company send to the permanent office of the association in Dallas a schedule of its accounts showing the variations from the standard system and presenting the reasons for such variations.

ELECTION OF OFFICERS

At the closing session the reports of the secretary and treasurer were presented and approved and the eustomary votes of thanks were given the officers. During the past year there had been a gain of 25 active and 34 associate members. The finances were in excellent condition. The following officers were installed to serve during the coming year: President, W. B. Head, Stephenville; first vice-president, W. B. Tuttle, San Antonio; second vice-president, J. E. Carroll, Beaumont; third vice-president, C. H. Dunbar, Houston; secretary, E. T. Moore, Dallas; treasurer, A. E. Judge, Tyler. The meeting place and date for the next convention will be announced by the executive committee.

The following firms were among those exhibiting at the Dallas convention:

American Electrical Works, Phillipsdale, R. I.
Atlas Railway Supply Company, Chieago, Ill.
Birney Pay-on-Platform Company, St. Louis, Mo.
Buda Foundry & Manufacturing Company, Chicago, Ill.
Chicago Fuse Wire & Manufacturing Company, Chicago.
Columbia Incandescent Lamp Company, St. Louis, Mo.
Duncan Electric Manufacturing Company, Lafayette, Ind.
Electric Appliance Company, Chicago, Ill.
Electric Service Supplies Company, Philadelphia, Pa.
Electric Traction Supply Company, St. Louis, Mo.
Gammeter Multigraph Company, New York.
General Electric Company, Schenectady, N. Y.
Goldschmidt Thermit Company, New York.
Hobson Electric Company, Dallas, Tex.
H. W. Johns-Manville Company, New York.
H. Mueller Manufacturing Company, New York.
Keystone Fibre Company, Chester, Pa.
Lagonda Manufacturing Company, Springfield, Ohio.
Moloney Electric Company, St. Louis.
Nernst Lamp Company, Pittsburgh, Pa.
Ohio Brass Company, Mansfield, Ohio.
Pacific Electric Heating Company, Ontario, Cal.
St. Louis Car Company, St. Louis, Mo.
Texas Machinery & Supply Company, Dallas, Tex.
Tunstolier Company, Cleveland, Ohio.
Wagner Electric Company, St. Louis, Mo.
Western Electric Company, Chicago, Ill.
Westinghouse Electric & Manufacturing Company, Pittsburgh, Pa.
Weston Electrical Instrument Company, Newark, N. J.
Wonham, Magor & Sanger, New York.

STANDARD LOCATION FOR THIRD RAIL WORKING CONDUCTORS

The committee on standard location for third-rail working conductors of the American Railway Association presented a progress report to the association at its meeting in New York last week. The committee, from all information which it has been able to collect, believes that the existing standards for third-rail working conductors are working well in actual practice, and that the question of location of overhead conductors is receiving attention on the limited number of roads which are using a traction system requiring same. The report continues:

No radically new electric traction systems have been developed since the date of last report, so that the committee does not believe that it can make any useful suggestions or recommendations at this time.

There has been, however, a modification proposed in the direct eurrent propulsion system, which, if successful, may suggest some change in the standard location of third-rail. This system, using a direct current of from 1200 to 2000 volts on the third-rail is in the experimental stage, and it is too early to say whether or not it will be either successful or economical for heavy railway service. If it should come into use, however, it must be borne in mind that no more space will be available for insulation with these higher voltages. The committee considers it is inadmissable to encroach on the established clearances or to break the present standard third-rail gage.

As regards overhead working conductors, the committee has no new facts to bring before the association since the report of October last, and believes it is yet too early to determine finally the limitations for such conductors.

The cost of operation of the Filovia system of trackless trolleys in use in Italy is reported by an investigator for the Sheffield (England) Tramways Committee to be from 12 cents to 15 cents per car-mile. The ears are single decked and seat only 24 passengers and their weight is indicated by the fact that they are equipped with two motors of only 10 hp eaeh. The Schiemann trackless trolley system used in Mulhausen, Alsace, is said to cost only 10 cents per car-mile. These cars have front-wheel drive. The Mercedes-Stoll system used in Vienna is said to cost 9 cents per car-mile to operate. The cost of overhead line for these systems is about $15,000 per mile and the cost of the motor cars with equipment is $3,000 a piece.

CONFERENCE ON INTERURBAN RULES

The conference to discuss the subject of rules for the government of employees on interurban railways, called by J. N. Shannahan, chairman of the committee on interurban rules of the American Street & Interurban Transportation & Traffic Association, was held at the New Willard Hotel, Washington, D. C., May 25. The following, among others, were present:

H. Clifford Eddy, Interstate Commerce Commission.
John P. Dohoney, Pennsylvania State Railroad Commission.
J. N. Shannahan, Washington, Baltimore & Annapolis Electric Railway.
H. A. Nicholl, Indiana Union Traction Company.
C. Loomis Allen, Utica & Mohawk Valley Railway.
W. H. Collins, Fonda, Johnstown & Gloversville Railroad.
J. A. DuBois, Cedar Rapids & Iowa City Railway.
C. D. Emmons, Ft. Wayne & Wabash Valley Railway.
J. L. Adams, Norfolk & Portsmouth Traction Company.
P. P. Crafts, Iowa & Illinois Railway, Clinton.
J. E. Duffy, Syracuse Rapid Transit Railway.
R. E. Danforth, Public Service Railway, Newark, N. J.
J. J. Doyle, Washington, Baltimore & Annapolis Electric Railway.
J. W. Brown, West Pennsylvania Railways, Connellsville, Pa.
B. V. Swenson, American Street & Interurban Railway Association.
Henry W. Blake, Electric Railway Journal.
Edmund J. Burke, Blake Signal & Manufacturing Company.

Mr. Allen called the meeting to order and explained that the conference would consider the rules which had been submitted by the committee on interurban rules at the meeting of the Transportation & Traffic Association last year at Atlantic City. Criticisms and suggestions on last year's report had been solicited by the committee, and a number of suggestions had been received by mail. Invitations to attend the present meeting had been extended to the various railroad and public service commissions in all States which possessed such commissions, and also to the Interstate Commerce Commission, and he was glad to see representatives of some of these commissions present.

Mr. Shannahan then took the chair and announced that the rules would be taken up consecutively as presented at the Atlantic City convention. He said the wording decided upon at this meeting would be tentative only, and, of course, might be changed at the Denver convention by the association.

GENERAL RULES

No changes were suggested under General Rules until No. 26 was reached. This read:

Packages.

Employees must not carry packages, letters or newspapers, for any one not having business with the company, without an order from the proper authority.

Mr. Shannahan said he had received a criticism of this rule from Mr. Peck, of Schenectady, to the effect that the rule was ambiguous. After some discussion, it was decided to omit the words "not having business with the company," but to make no other change in the rule.

Rules 27-30 were approved.

Rule 31 was amended by agreeing that rules required by the laws of the different States should be embodied in the books of the companies operating in that State.

DEFINITIONS

In Rule 50, definition of "train," it was decided to change the word marker to markers.

Mr. DuBois asked why the committee omitted the definition of "train of superior direction." Mr. Emmons replied that it was done intentionally, as the committee did not consider it desirable to establish one direction as superior. Mr. DuBois favored the American Railway Association practice in establishing such a superior direction, and suggested the following definition from the American Railway Association code:

Train of Superior Direction.

A train given precedence in the direction specified in the time-table as between trains of the same class.

Note.—Superiority by direction is limited to single track.

A discussion then ensued on the desirability of having a "superior direction." Mr. Crafts and Mr. Nicholl, among others, expressed themselves as opposed to the practice.

Mr. DuBois then read a communication, based upon a paper read by him before the Iowa Association and published in May 1, 1909, issue of the Electric Railway Journal, page 835. He said in part:

COMMUNICATION FROM J. A. DUBOIS

I have some very serious objections to the code of rules as proposed by this association, as stated in my paper before the Iowa State convention. Taking our line, for example, and there are many other lines probably similarly situated: We are operating both freight and passenger trains, and handling regular freight cars, such as live stock, coal and other cars, and interchanging same with steam roads. We have through freight rates over steam lines, do through billing over steam lines, make our reports to them, and in inspecting freight cars to and from connecting lines we are governed by M. C. B. Association rules.

We have been operating now for about five years, and we have used the standard rules of the American Railway Association, with but possibly a very slight change, and they have met the requirements fully. Our delays are few. We have at various times operated steam trains of other companies over our line, and in such cases it proved a very easy matter, as our rules were standard and men could readily understand them. The time is fast coming when there is bound to be more or less interchange between steam and interurban lines, and as long as our reports, billing, M. C. B. Association rules, per diem and demurrage rules have to be the same, why not have the same standard rules for operating our trains? Then, when it comes to operating steam trains over your line, as we have done at various times, and I suppose others have done the same, how much better and safer it will make it. I fully understand that there are small interurban lines which could not use the standard code entirely, but provision could be made for such roads which would meet local requirements.

Many interurban lines hire men who have formerly been in the employ of steam lines, and, with a few exceptions, they make the very best of employees, and it would be better to have rules that they have been used to than to have something different, to which they might attach a wrong meaning. Again, the rules of the American Railway Association are the result of years of actual experience—conditions which have been studied out and improved upon until they have attained the high degree of excellence they now have.

One point more I wish to bring out. Do not fill up a rule book with a lot of unnecessary rules. Make them brief and to the point. The ground can be covered, as a rule, in few words just as well as by using a lot of space.

Interurban lines of any length should be handled by time card prescribing class, number, direction and schedules of all regular trains and such other special instructions as are necessary. We do not, as a rule, issue many orders unless there are extras or freight trains out, and then only to help a train along as necessary. We have operators at various stations, and most of our orders are given through them to train crews, but each train crew has a telephone, with which they can secure their own orders at places where no operator is employed. If a superior train is not at a meeting point when an inferior train arrives, they plug in at once, and if dispatchers can help them any farther it can be done.

The same practice is followed when meeting by train

order. Most of our orders, when issued through an operator, are put out before the train arrives, a plan which saves time. We use a No. 31 and a No. 19 form. The conductor is required to sign a No. 31 order and complete obtained on his signature from dispatcher before being acted upon. Both copies are then delivered to the conductor, and he delivers one to his engineer, who reads it aloud to the conductor. Both must understand the order alike before acting upon it. No. 19 orders are handled in the same manner as No. 31 orders, except that no signature is taken, but complete is given by a dispatcher as soon as the order has been repeated correctly to him. This order can be handed on to train crew by operator without stopping them for it. No. 31 orders are used to restrict the rights of a train and a No. 19 only to confer right upon.

Our city business is not very extensive at the present time, so we have omitted city rules from our book and put a few necessary rules in our time table. As a great many of the interurban lines control and operate city cars, I think it well to include rules for same as far as possible, but I would suggest that they be confined to themselves and not mixed up with interurban rules.

Mr. Shannahan suggested that the points made by Mr. DuBois be taken up in connection with the different rules as they were reached by the committee.

Mr. Crafts stated that one of the points made by Mr. DuBois was in connection with freight trains, and thought it would be well for the representatives from the Middle West to explain the practice followed there.

Mr. Nicholl stated that on his road freight trains are second class and inferior to first-class trains, but have their positive meets. Mr. DuBois said that his road required second-class trains and extra trains to clear first-class trains.

Mr. Emmons said he had no second-class trains, but runs his freight trains as extras. The dispatcher gives meet-and-pass orders. The rules provide for the regular trains carrying flags in case the telephone is out of order.

Upon motion, it was decided not to establish precedence in direction.

Mr. Collins criticised the wording of Rule 62, giving a definition of "current of traffic."

Mr. DuBois suggested the wording of the American Railway Association, as follows:

Current of Traffic.
The movement of trains on a main track, in one direction, specified by the rules.

The wording finally selected was as follows:

Current of Traffic.
The direction in which trains will move on double track, under the rules.

The next point discussed was on the retention of the definitions of "meeting point" and "passing point." These terms were defined as follows:

Meeting Point.
A place where opposing trains, i. e., trains moving in opposite directions, meet by schedule or train order.

Passing Point.
A place where trains moving in the same direction pass by schedule or train order.

Mr. Crafts explained that he had found it desirable to make this distinction. Mr. Emmons also testified to the same necessity. It was decided to retain the definitions.

The chairman explained that the definitions of block signals (Rules 71-76) were the same as in the American Railway Association code. It was decided to retain them. No changes other than those mentioned were made in the definitions.

STANDARD CLOCKS

The next rules discussed were Nos. 77-80, on standard time. Mr. Emmons called attention to the fact that there was no definition of a standard clock. Under the Indiana rules the standard clock is that in the dispatcher's office. On motion, it was decided to incorporate the following additional definition in the rules:

Standard Clock.
The clock in the dispatcher's office and such others as may be hereafter designated are standard clocks.

Mr. Brown called attention to Rule 79, which provided a form of certificate for the watch inspector, and suggested a rule forbidding adjustment of watches except by the inspector. Mr. Emmons thought that if an inspector was suspicious of a watch he could hold it for a day or two, until he found out whether it was correctly adjusted. Mr. Crafts said that men might be compelled to set their own watches occasionally, and it would not be well to forbid them from doing so. No change was made in the rule.

TIME TABLES

Rule 83, the first rule under time tables, was approved.

Rule 84 read as follows:

Supersedure of Time Tables.
Each time table, from the moment it takes effect, supersedes the preceding time table, and all special instructions relating thereto, or conflicting therewith, and trains shall be run as directed thereby subject to the rules.

Mr. DuBois suggested the corresponding rule of the American Railway Association be substituted. This rule is as follows:

Supersedure of Time Tables.
Each time table, from the moment it takes effect, supersedes the preceding time table, and its schedules take effect on any division or subdivision at the leaving time at their initial stations on such division or subdivison. But when a schedule of the preceding time table corresponds in number, class, day of leaving, direction and initial and terminal stations, with a schedule of the new time table, a train authorized by the preceding time table will retain its train orders and assume the schedule of the corresponding number of the new time table schedules on each division or subdivision date from their initial stations on such division or subdivision. Not more than one schedule of the same number and day shall be in effect on any division or subdivision.

Mr. Collins said he was in favor of allowing the rule to remain as it was. A new schedule usually goes into effect at midnight, and on most interurban roads there are few cars out after that hour. He thought it would be safer to run these cars on train orders rather than to allow them to assume the rights of a new train. For interurban operation this is better practice. Mr. Adams, Mr. Danforth, Mr. Eddy and others expressed themselves in the same way. It was decided to make no change in the rule.

No changes were suggested in Rules 85 to 91.

SIGNAL RULES

Mr. Crafts suggested a modification of Rule 92. At present it reads:

Who Must Have Signal Appliances.
Employees whose duties may require them to give signals must provide themselves with the proper appliances, keep them in good order and ready for immediate use.

His own rule on this subject is patterned largely upon that employed by the Chicago & Northwestern Railway, and reads as follows:

Who Must Have Signal Appliances.
Employees whose duties may require them to give signals must provide themselves with the proper appliances, keep them in good order and ready for immediate use. Those giving signals must locate themselves so as to be plainly seen, and make them in such a manner as to be readily understood. The utmost care must be exercised by train men to avoid taking the wrong signal when two or more trains are passing each other at stations or in yards. Unless both the conductor and motorman are positive the signal is given for them they will not move their train until communication is made by word of mouth.

After some discussion, Mr. Craft's suggestion was approved.

No changes were made in Rules 93 to 94.

VISIBLE SIGNALS

No changes were made in Rules 95, 96 or 97, but there was considerable discussion of Rule 98. At present this rule reads:

Violent Signals.

Any object waved violently on or near the tracks signifies danger. Motormen must bring their train under full control and proceed at slow speed until they are sure the track is clear and that it is safe to proceed.

Mr. Crafts thought violent signals by any person should be considered as a stop signal. A train might be stopped unnecessarily occasionally, but in general it is a safer plan to follow this plan rather than not stop the car. This is the American Railway Association rule.

Mr. Emmons did not approve of stopping the car. He thought it would lead to abuse by persons who would want to board cars between stopping points. Practically the same degree of safety can be secured by slowing down as required by the rule. Mr. Shannahan thought that few roads would enforce the rule if the suggested change was made. It was decided to leave the rule as it was originally.

Upon motion of Mr. Nicholl, it was decided to add to the lamp signals, cuts of the signals to be used on the rear and front ends of trains as shown in the American Railway Association rules. On some double-track roads with narrow devil strips it may be necessary to change slightly the location of the inside markers if this is done, but this was not considered a serious obstacle. It was also decided to incorporate in the report of the committee the same illustrations showing the method of giving lamp signals for "apply air brakes" and "release air brakes" used in the American Railway Association code.

AUDIBLE SIGNALS

The question of audible signals was then discussed, but no change was made in them as printed.

In Rule 102 a suggestion was offered that the word "responsible" be omitted from the clause:

Any responsible employee or other person may take the place of the motorman in flagging, in order that he may attend to getting his car off of the crossing.

The chairman explained, however, that the word "responsible" was used to exclude Italian laborers or other irresponsible employees, and that the word "responsible" was understood by the context to apply to the phrase "or other person."

The next subject discussed was communicating signals. Mr. Emmons pointed out that the use of three bells for "when train is standing, back the train," and also for when train is running, "stop at once, emergency," was confusing. He knew of a serious accident due to this cause. A motorman had run past a stop and received three bells to back. While backing he received another three bells to stop, but, thinking it meant to back harder, did so and ran into a man.

Mr. Duffy read the American Railway Association rules on this point, as follows:

SOUND.	INDICATION.
(a) Two.	When train is standing, start.
(b) Two.	When train is running, stop at once.
(c) Three.	When train is standing, back the train.
(d) Three.	When train is running, stop at next station.
(e) Four.	When train is standing, apply or release air brakes.
(f) Four.	When train is running, reduce speed.
(g) Five.	When train is standing, call in flagman.
(h) Five.	When train is running, increase speed.

It was finally decided to adopt the following:

Communicating Signals.

CONDUCTOR TO MOTORMAN.

SOUND.	INDICATION.
(a) One.	When train is running, stop at next station.
(b) Two.	When train is standing, start forward.
(c) Three.	When train is running, stop at once, emergency.
(d) Four.	When train is standing, back the train.
(e) Four.	When train is running, reduce speed to four (4) miles per hour until two (2) taps of the bell or two whistle cord signals are given, when the train will proceed at scheduled speed.
(f) Five.	When train is standing, call in flagman.

MOTORMAN TO CONDUCTOR.

(a) One.	Come forward.
(b) Two.	Pull trolley down to roof.
(c) Three.	Set rear brakes.
(d) Four.	By motorman is signal to conductor that he wishes to back train, and must be answered by conductor before train is backed.
(e) Five.	Watch trolley.

Rules 105 and 106 were approved, it being understood that the motorman will answer the conductor by two short blasts of the whistle.

MAIN SIGNALS

Rule 107 relates to headlights. Mr. Eddy asked the opinion of the members about dimming arc headlights in cities. He said he was considering the recommendation of such a regulation for local conditions. Mr. Crafts thought it desirable to dim the headlights in cities. Mr. Emmons held the opposite view. Mr. Danforth thought the prejudice against undimmed headlights is passing away on account of the frequent use of four or five searchlights on automobiles. It was decided not to adopt any regulation in regard to dimming headlights in the rules.

No changes were made in Rules 107 to 109.

There was considerable discussion of Rule 110. It read:

Marker Signals.

Two green flags by day, and two or more red lights at night, will be displayed on the rear of every train.

Mr. DuBois objected to the green rear flags, as they made the rear of a train look too much like the front. A delegate pointed out that this similarity was especially the case on a third-rail train, where there was no trolley pole to indicate the direction of the train. It was finally decided to change the rule to the following, which is practically the same as in the American Railway Association code:

The following signals will be displayed, one on each side of the rear of every train, as markers, to indicate the rear of train: By day a green flag; by night green lights to the front and side, and a red light to the rear, except when the train is clear of the main track, when a green light must be displayed to the front, side and rear.

No change was made in Rules 111 to 116.

Mr. Crafts criticised Rule 117, which read as follows:

Car Repairmen's Signals.

A blue flag by day and a blue light by night, displayed at one or both ends of a car or train, indicate that workmen are under or about it. When thus protected it must not be coupled or moved. Workmen, before placing themselves in a dangerous position in or about a car or train, must display a blue signal, and the same workmen are alone authorized to remove such signals. Other cars must not be placed on the same track so as to intercept the view of the blue signals, without first notifying the workmen.

Upon motion, it was finally decided to adopt this rule, with the addition of the following, which is a slight modification of a sentence in the Iowa & Illinois rule on this subject:

When making repairs to cars in service repairman must see that motorman's circuit breaker is opened and reverse lever handle in his possession before doing any work.

No changes were made in Rules 118 to 120.

SEMAPHORE SIGNALS

No changes were made in Rules 121 to 124 under this section.

USE OF SIGNALS

No changes were made in Rules 125 to 133. It was suggested that extra trains might give a different signal as an additional warning to track men, instead of the regular signal required under Rule 130, but Mr. Emmons explained that the Indiana Railroad Commission had considered this subject carefully and had prescribed the rule as it appears at present.

CLASSIFICATION OF TRAINS

Rules 200 and 201 were unchanged. Upon motion of Mr. DuBois, Rule 202 of the proposed code relating to rights of extra trains was changed by the omission of the words shown in brackets below:

Extra Trains.

Extra trains are [of] inferior [class] to all scheduled trains of whatever class, and have no rights except those conferred upon them by train order.

MOVEMENT OF TRAINS

Rule 203, as contained in the 1907 report of the committee, read as follows:

Trains Leaving Initial Station.

A train must not leave its initial station on any division, or a junction, or pass from double to single track, until it has ascertained whether all trains due have arrived or departed. Where train register is maintained it shall be the duty of conduetor to register and to note carefully whether all trains due have arrived. If the motorman or conductor cannot reach the dispatcher, the train will proceed on time table rights, then call from all sueceeding telephone stations until he has suceeeded in reaching the dispatcher.

Mr. DuBois suggested that the following clause from the American Railway Association code be adopted in place of the paragraph quoted above:

A train must not leave its initial station on any division or subdivision, or a junetion, or pass from double to single tracks until it has been ascertained whether all trains due, which are superior, or of the samc class, have arrived or left.

Mr. Nicholl read the Indiana rule on the subject, as follows:

Trains Leaving Initial Stations.

A train must not leave its initial station on any division, or a junction, or pass from double to single track, without orders or clearance, and until it is ascertained, by asking the dispatcher, whether all trains due have arrived or departed, mentioning particularly the last train due, giving the train number. If in such case the motorman or conductor cannot reach the dispatcher, the train will proceed on time table rights, "protected by the flag"; then call from all succeeding telephone stations until he has succeeded in reaching the dispatcher.

He said, however, that since putting the Indiana rules into effect his company had had a very serious sleet storm, which tied up all of its trains, destroyed all of its telephone lines, and in some instances its trolley lines; and it was found impossible to operate a train over the lines, if the Indiana rules had been followed precisely. This particular rule is going to be changed to read somewhat as follows:

If in sueh cases, in case the motorman or conductor cannot reaeh the dispatcher, the train will proceed on time table rights, proteeted by flag; then to eall from all succeeding telephone stations until he succeeds in reaching a dispatcher.

Mr. Nicholl explained that they had another rule that a train does not necessarily lose its rights under such circumstances.

Rule 203 was finally approved as follows, the words added appearing in italics:

Trains Leaving Initial Station.

A train must not leave its initial station on any division, or a junction, or pass from double to single track, *without order or clearance,* until it has ascertained whether all trains due have arrived or departed. Where train register is maintained it shall be the duty of conductor to register and to note carefully whether all trains due have arrived. If the motorman or conductor cannot reach the dispatcher, the train will proceed on time table rights, then call from all succeeding telephone stations until he has succeeded in reaching the dispatcher.

Rule 204 was left unaltered. Rule 205 was made to agree with Rule 202 by changing the word "scheduled" to "such." As now approved, it reads as follows, the words omitted appearing in brackets, the word added in italics:

Trains of Inferior Class.

A train of inferior class must in all cases keep out of the way of trains of a superior elass, and must clear the time of [scheduled] *such* trains five minutes unless a meeting or passing order has been given.

Rule 206 was changed by the addition of the words "between reporting stations." The revised rule is given in full below, with the added words appearing in italics:

Scheduled Trains Have Equal Rights to Meeting Points.

All scheduled trains of the same class, or sections of scheduled trains, have equal rights to scheduled meeting points *between reporting stations.*

Rule 207 was then considered. It read as follows:

Set Switches for Opposing Trains.

At meeting points between trains, either by schedule or train order, should the train that is to occupy the main track arrive first, it will be the duty of the conductor of such train to promptly set the switch for the siding, so that the train to be met can take the siding with the least possible delay.

Mr. Shannahan said that he had received a criticism of this rule as being ambiguous, from W. R. W. Griffin, general superintendent of transportation, Rochester lines. He read certain portions of Mr. Griffin's letter, which appears below:

ROCHESTER, N. Y., May 19, 1909.

MR. J. N. SHANNAHAN, Chairman,
Committee on Interurban Rules:

DEAR SIR.—Inasmuch as the electric interurban roads are operating closer each year to the standard operation of steam railroads, and also that a great many of the interurban roads are hiring and using men of steam railroad training, and in a great many cases where electric operation is taking place over steam tracks intermixed with steam operation, I believe it far better that the American Street & Interurban Railway Association adopt a standard code in which the general rules are not only identical, but numbered the same as in the American Railway code, making such specific changes as are absolutely necessary to meet the difference of conditions between the steam and electric motive power, also making a specific change between the method of receiving train orders by telegraph and telephone, all other mutual conditions remaining the same. This would leave a chance of free interchange of men without confusing rules and numbers, for the reason that the majority of rules are learned and referred to by number entirely.

Referring to the book specifically, under section of train signals, I believe that rules given under Nos. 110, 111, 112 and 113 should be worded and the operation to be the same as the American Railway Standard Code.

Rule 202, I should have the word "class" after "inferior" struck out entirely.

Under Rule 203, if the train is allowed to leave the terminal without an order from the dispatcher, I can see no reason why he should call up at all succeeding telephone stations, but continue under his time table rights as specified under the rule.

Rule 207 is ambiguous when compared with Rule 206.

Rule 212 I believe to be a detriment to any road, because if the time table of a road is correct there is no reason why extras cannot take care of themselves when the telephone is out of commission as easily as when telephone is in com-

mission. That being the case, Rule 213 should not be adopted.

Rule 230 should be as follows: "Regular trains ——— hours behind either their scheduled arriving or leaving time at any station lose both rights and schedule, and can thereafter proceed only as authorized by train order."

Under rules for movement by train order no provision is made of a specific rule as to receiving orders at a station where operators are maintained. A good many of our roads to-day maintain stations and operators at several points, and use them in connection with their train dispatching. I believe that the rules governing the receiving of train orders in the cases where operators are maintained should be identical to the American Railway Standard Code and up to the point of the completion of the order. This completion should be made by one of the crew, preferably the conductor, by signing the order with his train number and his name, reading the order and these signatures to the dispatcher, who will then, if the order is correct, give the completion and the time of completion, then the order to be treated the same as under the American Railway Standard Code.

In cases where orders are transmitted directly to the crew, one of the crew could act entirely in the same capacity as the operator did in the first instance, the other could complete the order in the same manner as in the first instance.

Referring to form of train order blank No. 275, personally I do not believe that this should be used or given any consideration whatever, and cannot see any good excuse for it. I am of the belief that any stereotyped form of order has a tendency to lead to carelessness. I fully believe that no order should be used except one that is handwritten. Such being the case, the party who reads the order to the dispatcher for its completion has surely got to read this order word for word on account of the difference in writing, and not repeat an order in a parrot fashion as in a stereotyped form.

The question has been raised that this form of order adds speed, but I do not see that this is the case. We have operated one road whose scheduled speed is from 28½ to 37½ m.p.h., which is divided into five blocks with six blocking stations. No train of any description can pass these stations without a specific order—either a clearance or "may go" order, or a regular "31" order.

These clearance or "may go" orders are issued by number and by the dispatcher, and records of them are kept the same as with the regular "31" order. During the last year in the operation of this road 282,000 orders were issued by the dispatcher, and at no time was there so much as a five-minute delay due to the issuing and handling of orders. Consequently, I am unable to see the philosophy of adopting this rule under the plea of gain of time.

Mr. DuBois suggested that the man who operates the switch should walk ahead a certain distance or else cross the tracks.

Revision of the rule was postponed. Rules 208 and 209 were accepted as printed.

There was considerable discussion on Rule 210, which prescribed the spacing of trains running in the same direction. The rule, as given in the code, reads as follows:

Distance Required Between Following Trains.

Trains running in the same direction must keep not less than three thousand (3000) ft. apart, except in closing up at stations or meeting points. When the view is obscured by curves, fog, storms, or other cause, they must be kept under such control that they may be stopped within the range of vision.

There was a division of opinion as to whether the spacing should be in distance or in time. Mr. Emmons suggested the rule be changed to read: "Unless some form of block signal be used, clearing at least five minutes apart, trains running in the same direction must keep," etc.

Mr. DuBois suggested that the reading be, "Unless some form of block signal is used, trains running in the same direction must keep five minutes apart, except in closing up at stations or meeting points." There seemed to be no satisfactory way of determining the time interval, and this motion was lost.

No change was made in Rule 211. Rule 212 appears below:

Defective Telephone.

When unable to reach dispatcher on account of defective telephone, all extra trains will lose their rights as extra trains, and such extra trains whose movement is essential to the maintenance of the passenger service, will become sections of regular scheduled trains as provided in Rule 213. All other extras at once clearing main track and remaining clear until telephone service is restored.

The chairman read the criticism of the rule by Mr. Griffin, of Rochester, as published above. He then explained that the rule compelled a train which is ordered to report at a station, and finds a telephone out of order, to lose its rights.

Mr. DuBois thought that the rule would delay the movement of trains. He said that an extra train is supposed to clear the regular trains (that is, those shown by the timetable) by five minutes. He thought there was no reason why an extra train cannot proceed and clear those five minutes with the telephone out of commission, just as it did when the telephone was in commission. This is the practice on a number of steam roads which use telephones for dispatching. Mr. Nicholl remarked that the steam roads were assisted by having a superior right of direction. No change was made in the rule.

Rule 213 is given below:

Arrangements for Sections When Telephone Defective.

When telephone line is out of order, any scheduled train when requested by conductor of any train, may carry signals for such, as a section following, without first obtaining orders from the ..... Scheduled train, under such arrangement, will immediately display signals, though extra train must not follow the regular train until it is certain that signals are so displayed.

It was modified by the addition of the following words suggested by Mr. Brown as an addition to the rule: "The conductor of trains desiring signals displayed shall issue second section order in duplicate, as per No. 3, Form F, Rule 280, to be duly signed by the respective conductors. Both copies of the order to be turned in by the conductor of the respective trains."

No changes were made in Rules 214 to 218.

Under Rule 219, Mr. Crafts stated that he thought the rule was not sufficiently explicit, and suggested his own rule on the subject. This rule is the same as that employed on the Chicago & Northwestern Railroad, and follows:

Protect Train When Stopped.

In case a train is stopped on the main line between stations, or is delayed under circumstances under which it may be overtaken by another train, the conductor or flagman must immediately go back with not less than two torpedoes, and a red flag by day, or red and white lanterns and two red fusees by night, and at night place a red fusee in the center of the track five hundred (500) ft. behind the rear of the train, proceeding by day or night to a point not less than fifteen hundred (1500) ft. distant from rear of train or until he reaches a point beyond that distance where the danger signal can be seen not less than one quarter of a mile by the motorman of an approaching train. The flagman will at once place one torpedo on the rail and will remain at such point until a train has arrived or until he is recalled. The motorman of approaching train on seeing flagman's signal will immediately acknowledge signal as evidence that it has been seen. When the flagman has been recalled and no approaching train has arrived, he will place a second torpedo on the rail two hundred (200) ft. nearer his train than the first and return with all possible dispatch to his train. On exploding one torpedo the approaching train will be brought to a full stop, and thereafter proceed with extreme caution, expecting to find some obstruction on the track. When the second torpedo is exploded, the motorman will know that the flagman has been recalled

and will proceed cautiously, keeping a sharp lookout for the train ahead. Immediately on the sound of the whistle reealling flagman, if there is not a clear view to the rear for one quarter of a mile (11 poles) the train should be moved ahead at a speed not more than six (6) miles per hour, until a point is reached where the traek is straight for one quarter of a mile in the rear of train, always bearing in mind that the time of the flagman's return is the period of greatest risk.

When the eharaeter of the road or weather makes it neeessary, the flagman should go to a greater distanee with signals, so as to insure absolute safety. When any train has been stopped by a preeeding train in the manner above mentioned, the conductor of the last train must use the same precautions with regard to any following trains as those heretofore described. When it is neeessary to proteet the front of a train, the same precaution shall be observed by the motorman or a flagman. In the case of a ear break-down, however, the motorman after leaving protecting signals may return to his train to make necessary repairs and may call in his eonductor to assist him.

The dispateher shall immediately be notified of any stoppage between stations, and when orders have been reeeived to proceed, train shall be run to front signals and same removed from track before proceeding.

Conductors and motormen are held jointly responsible for the proper protection of their train under all eireumstances.

Mr. DuBois stated that the rule used on his road was similar to that of American Railway code.

The chairman explained that the rule of the committee did not permit as much latitude as that of the American Railway Association, as it specified at least 1000 ft., but did not limit the zone of protection to this distance. In discussing Mr. Crafts' rule, Mr. Emmons stated that if it was carried out literally in some places on his line the conductor would have to go back a long distance. He thought the present rule covered the case. Specific instructions could be issued to cover local conditions by any management, but these instructions need not be embodied in the rule book. The important point is that the conductor and flagman should go back immediately, and this is printed in the rule in large type.

The rule was adopted in the form originally recommended by the committee, as follows:

Protect Train When Stopped.

219. When a train stops or is delayed under eireumstanees under which it may be overtaken by another train, the CONDUCTOR OR FLAGMAN MUST GO BACK IMMEDIATELY WITH RED SIGNALS A SUFFICIENT DISTANCE TO INSURE FULL PROTECTION. NOT LESS THAN ONE THOUSAND (1000) FEET. When recalled he may return to his train, first plaeing two torpedoes on the rail when the conditions require it. The front of a train must be protected in the same way when necessary, by the motorman. The duty herein required of the eonduetor or motorman may be performed by the other when desirable for any reason.

There was no discussion on Rules 220 to 229.

The discussion of 230 brought up again the question of dispatching delayed trains. Mr. Nicholl urged that trains be allowed to proceed by flagging. Mr. Doyle pointed out that there was nothing in the rules to prevent this.

Mr. DuBois said that if trainmen were expected to proceed under the flagging method, they should be authorized to do so under specified circumstances and conditions.

Mr. Nicholl gave more in detail the particulars of the storm during which his telephone system was interrupted. He said that at one end of the line the storm was much more severe than at the other, and the sleet on the rails and on the wire prevented the train leaving the terminal. Therefore, when the other train got to the waiting point it stopped there and could go no further. The next train stopped, pushing his meeting point back. Trains were leaving the other terminal every hour, until four or five were bunched at the switches. The only thing to do then was to send a train to tell the last one to tell the one ahead of him to flag ahead, and for that man to do the same, and in that way finally to open up the block. It would not have been possible to have moved the traffic under the proposed rules.

Mr. Allen suggested there might be a provision for use in the event of a great storm or other emergency, so as to get the car to a place of safety, but did not think a situation of that kind could be covered by the same rule as one designed to provide for a 10-minute or 20-minute or 30-minute delay. The eonditions are not the same.

Mr. Nicholl replied that the provision proposed was only when the telephone was out of commission and goes into effect rarely. In the case of a 10-minute or 20-minute or a 30-minute or an hour delay the telephone is used. His plan had been submitted to the Indiana Railroad Commission, and was being considered favorably. Mr. Nicholl said the Indiana rules add a provision to exemplify what "protected by a flag" meant. Then there was another rule to call the dispatcher, supposing the train had not arrived. There are also two other rules, as follows:

> When a train reaehes a meeting point and finds a train or trains have not arrived, the motorman or conductor shall eall the dispatcher for orders, as provided in Rule 51. If the train is a regularly scheduled train, the motorman and the conductor of the train may proceed under flagging, under Rule 113-A, keeping in mind that the approaehing train might be approaching at high speed.
>
> When trains running in opposite directions are to be moved toward each other by train orders, the train whose rights are to be restricted, when possible must first reeeive the order and the complete before the order is given to the train to be moved against it or toward it, where the train whose rights are to be restricted is blocked by authorized agents or operators, as per Rule 152.

The latter rule was found to be necessary where a train is leaving a terminal and the telephone wire between the blocking station and the terminal is down. The dispatcher would be unable to give any orders against that train, because he had not first given that train an order to control its operation. Therefore by sending a block to one of the blocking stations it would block that train and give the operator an opportunity to advance other trains against it. The company's rules are the result of long study on the subject and experience of operating under the old rules.

Mr. Emmons suggested that in view of the importance of the subject, Mr. Nieholl be requested to formulate suggestions in regard to rule or rules for advancing trains under flags, and that his suggestion be made a subject of discussion at the next meeting of the rules committee, so that it could be taken up at the Denver convention. This was put in the form of a motion and carried.

It was decided to strike out Rule 231 as unnecessary. No changes were made in Rules 232 to 234.

RULES FOR MOVEMENT BY TRAIN ORDERS

Upon motion of Mr. Emmons, the following words were added to Rule 250: "Train orders shall be numbered consecutively, commencing with No. 1 at midnight."

Upon motion of Mr. Nicholl, the word "motor" was substituted for "car" in Rule 254.

The committee then took up Rule 256. In the present rules, it will be remembered, the rule provides for the dispatcher giving the order to the motorman, who repeats it to the eonductor while the conductor writes the order. Mr. Shannahan explained that the committee had decided instead to recommend a different rule, in which the motorman writes the order. Other changes are made as indicated in the parallel columns on the next page:

Original Rule.

To obtain orders at telephone stations, the motorman will call the dispatcher and report train number and location. The dispatcher will then give such orders as are necessary, the conductor writing the order as given to the motorman and repeated by the motorman, plainly and without abbreviation, on the blank with carbon copies provided for that purpose. When the conductor has finished writing the order the motorman will repeat it to the dispatcher, who will O.K. the same if it is correct. The motorman will thereupon indicate such O.K. upon the order by signing his name to it. The conductor will then repeat the train order without abbreviation to the dispatcher, who will then complete it by giving the initials of the superintendent or other designated authority, and the time of completion, which initials and time shall be promptly written on the order. When the order has been properly completed, the conductor will sign his name to it, after which he will deliver one copy to the motorman, and the order will be in full force and effect. If for any reason the line should fail before the dispatcher completes the order, it is of no effect, and must then be treated as if it had not been given.

Revised Rule.

To obtain orders at telephone stations, the motorman will call the dispatcher and report train number and location. The dispatcher will then give such orders as are necessary to the motorman, who will write the same plainly and without unauthorized abbreviation on the blank provided for that purpose, with sufficient carbon copies for each member of the crew, and when he has finished writing the order he will read it to the train dispatcher, who will O.K. the same, if correct. The motorman will thereupon sign his name upon the order. The conductor will then read the order to the dispatcher and, if correct, the dispatcher will complete the order by giving the initials of the superintendent, or other designated authority, and the time of completion, which initials and time of completion, together with the signature of the conductor, shall be promptly written upon the order by the conductor, after which the order shall be in full force and effect. If, for any reason, the line should fail before the dispatcher completes the order, it is of no effect and must then be treated as if it had not been given.

Mr. Burke remarked that the rule did not take both members of the crew from the ear at the same time. This was desirable. Mr. Nicholl doubted whether it was neeessary to have two men take the order. Mr. Crafts suggested that the portion requiring the motorman to read the order back to the dispatcher be omitted. He suggested that the motorman take the order from the dispateher, sign his name to it, after which the conduetor would read the order back to the dispatcher and obtain it complete.

Mr. Emmons thought it advisable to have two voiees over the telephone. He referred to a ease where "7" in the repetition was mistaken for "11" until the seeond voiee indicated the error. Now, as an additional precaution, the number "11" is referred to as "one-one."

The revised rule, as indicated in the right-hand parallel column, was then accepted.

Rule 257 was approved. Mr. Crafts ealled attention to the fact that Rule 258 did not provide for the agent receiving the order. He suggested the following clause, whieh was approved:

> When an order is given through an agent, he must read it back to the dispatcher and eomplete it in the same manner as a conduetor. The conductor and motorman receiving such an order must each read it aloud back to the agent, and receipt for same by placing their initials upon it before detaching the copies intended for them.

Rules 261 and 262 were changed by the omission of the words enclosed in braekets.

Call Dispatcher if Opposing Train Has Not Arrived.

> When any train reaches a meeting point and finds that the train or trains to be met have not arrived, the motorman [or conductor] shall immediately call the dispatcher for orders, as provided in Rule No. 256.

Manifold Copies of Train Orders.

> The person receiving a train order must write it in manifold during transmission [and if they cannot at one writing make the requisite number of copies must trace others from one of the copies first made].

Rules 263 to 267 were approved. Rule 268 was referred to Mr. Nieholl for revision, as it was related to the rules previously assigned to him. No change was made in Rules 269 to 274.

FORM OF TRAIN ORDER BLANKS

There was a long discussion on Rule 275, *et seq.*, on train order blanks. After a discussion, it was decided to adopt the A.R.A. forms exeept as regards train orders and with sueh ehanges in verbiage as would be required by the different service.

DUTIES OF EMPLOYEES

The rules under this division from 300 to 352 were approved. In Rules 353 and 354 the words "general manager" were stricken out. As revised, the title of any officer can now be used as desired.

Mr. Crafts quoted his rule on "passing ears" in connection with Rule 356. It read:

> When passing standing trains on double traek in cities and at stations train must come to a full stop before reaching rear end of standing train, proceeding cautiously only when the way is known to be clear, the gong to be rung until well clear of standing train.

After diseussion it was deeided to make no ehange in the rule. Rules 357 to 373 were unehanged.

There was some diseussion on Rule 374, whieh provides:

Cars Blockaded.

> In the event of a blockade of cars from any cause, cars in such blockade must not all attempt to start at one time, but at such intervals as will not overload the power.

It was suggested that cars going in one direction should start first. No change was made in the rule. In Rule 399 the word "signals" was changed to "markers." No other ehange was made in Rules 375 to 412.

ACCIDENT AND PERSONAL INJURY CASES

Rule 430 was eliminated as it was identical with Rule 24. No other change was made in the aecident and personal injury rules.

EJECTMENTS

Under ejectments Mr. Crafts thought the conditions under which ejectments are legal should be explieitly stated. His rule contained the statement that the ejectment "should not be in sueh a plaee, in such weather or at sueh unreasonable hours of the night as might easily endanger the life or safety of the person ejeeted. In no case shall an ejectment be made at a greater distance than one-half of a mile on a traveled highway from a dwelling known to be inhabited." Mr. Collins pointed out that the statutes on this subject varied in eaeh State and it was decided to leave that matter to the loeal attorneys.

The meeting then adjourned.

COMMITTEE ON WELFARE OF EMPLOYEES

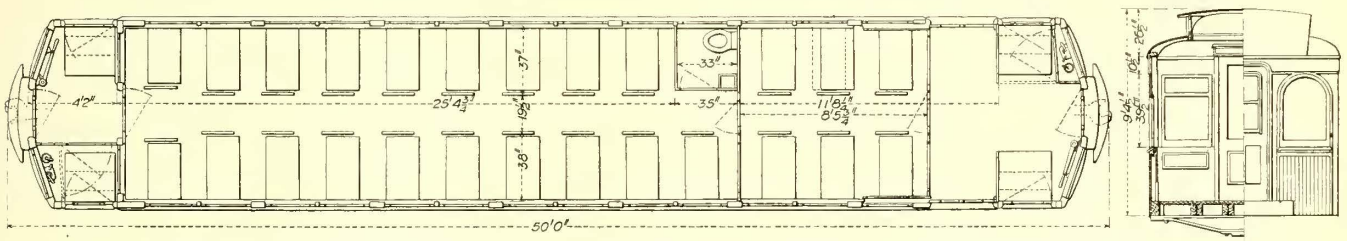
The committee on welfare of employees of the American Street & Interurban Railway Association, E. G. Connette, ehairman, met May 8. Among the subjects which will reeeive attention by the committee is that of the fostering of club spirit. It is felt by the committee that where companies have facilities entertainments for employees and their families should prove profitable if combined with lectures presented in an attraetive manner on topics of personal interest, whieh might embrace the expense and effeet upon the health of the use of liquor, ete.

The committee will also discuss further the advisability of the merit system of discipline and will also consider plans for a savings assoeiation and pension systems.

WASHINGTON, BALTIMORE & ANNAPOLIS CARS

The Washington, Baltimore & Annapolis Electric Railway Company is making arrangements to operate its cars to the Treasury Building in Washington over the city tracks instead of stopping at the present terminal in the suburbs. The present cars are 62 ft. 2¾ in. long over the buffers, 9 ft. ¾ in. wide and weigh 58 tons complete without passengers. They are equipped with 500 hp in motors and geared for 70 m.p.h. To permit operation in the lower part of Washington the company will be obliged to use cars of 50 ft. extreme length, 8 ft. 9 in. extreme width and weighing 40 tons without passengers. It therefore placed an order on May 15 with the Niles Car & Manufacturing Company, Niles, Ohio, for 27 double-end combination passenger, smoking and baggage cars which will fulfil the new conditions. As shown on the accompanying plan, the new cars have a convertible motorman's cab in each vestibule to allow passengers to enter at each side of the rear and on the right-hand side of the front when running with either end of the car forward. The company has also purchased one 50-ft. express car body and 66 Baldwin Class 78-25 trucks for these 28 new car bodies, three of the present combination car bodies and two of the present express car bodies, which are shorter than the present passenger cars.

The new passenger cars will be fitted with four GE 75-hp motors geared for a maximum speed of 55 m.p.h. The car-body length will be 40 ft.; the length over buffers, 50 ft.; the width over all, 8 ft. 9 in.; the height under sills to the top of the roof, 9 ft. 4½ in.; the distance between truck centers, 27 ft. 6 in.; weight of car body, 27,000 lb., and seating capacity, 50. The bottom frame will have four 6-in. steel I-beams and two ⅝-in. x 7¾-in. steel plates, all filled with yellow pine on both sides. The four I-beams will extend under the vestibules from buffer to buffer.



Plan and End Elevation of New Car for Washington, Baltimore & Annapolis Railway

The vestibules are to have 27-in. swinging doors in the centers for train service and a 27-in. swinging door on each side with triple steps covered with Edwards automatic self-raising steel trap doors. Each end is to be fitted with Janney automatic M. C. B. radial drawbars and buffers and the Niles steel pick-up fender. The convertible motorman's cab is to be located at the left-hand side of the front end and the right-hand side of the rear end. It will be formed by a swinging door to isolate the motorman when longitudinal to the car and to inclose the controlling apparatus when it is transverse to the car.

Next to the vestibule at one end of the car there will be a small baggage compartment with a 34-in. baggage door on each side. The smoking compartment will have three windows on each side and be next to the baggage compartment. A dry-hopper toilet-room will be in the main passenger compartment against the smoking partition.

In external appearance the cars will be of the Niles twin-window or Pullman type with plate glass in all the lower side windows and doors and art glass in Gothic and deck sashes. The interior is to be of selected mahogany with natural-wood finish, full Empire ceiling. The floor in both passenger compartments is to be covered with inlaid linoleum. Hale & Kilburn leather seats will be used.

Each end of the car is to be fitted with Nichols-Lintern air sanders arranged to conduct the sand under the leading wheels by a flexible connection between the car body and iron pipes rigidly attached to the ends of the trucks. Lindstrom bronze levers and worms control the hand brakes at each end of the car. Electric heaters will be employed.

The trucks are to be of the Baldwin Class 78-25 of 6-ft 6-in. wheel base with Standard 36-in. forged rolled-steel wheels, 3-in. tread, flange 1⅛ in. wide and 15/16 in. deep with rims 2½ in. thick. The axles will be of hammered steel 5½ in. at motor bearings, 6 in. at gear seat and 5 15/16 in. at wheel seat. The journals will be 4¼ in. x 8 in. Symington ball center and side bearings and Symington semi-steel journal boxes will also be used.

A NEW SOLDER

A new kind of solder, called tinol, which was originated in Germany, has recently been put on the market by the American Tinol Company, of Philadelphia.

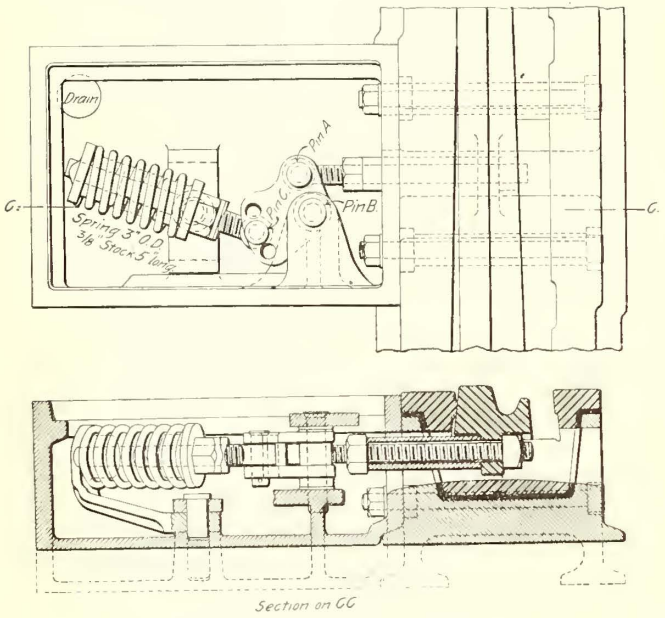
As is well known to every metal worker, all alloys of lead and tin on melting in contact with air form oxides or dross. The presence of such oxides prevents metallic union of the solder with the metal to be joined. The so-called fluxes, as acid or muriate of tin, rosin, etc., serve to protect the melting solder against direct contact with the air, and hence against such oxidation.

Tinol, the new soldering mixture, consists of finely granulated solder, each grain coated with a fatty organic substance which is neither acid or alkaline. This coating or "flux" begins to melt before the solder, but is not completely evaporated until the solder has set, thus protecting the solder fully against oxidation during the entire operation. The mixture of granulated solder and fatty flux forms a paste of a consistency that allows its easy application by knife blade, glazier's spatula, stiff bristle brush, or even with the fingers. As it is convenient for some work to use solder in stick and in wire form, tinol is also made up in rods and wires of different sizes, ranging from 8 mm (0.3150 in.) down to 1 mm (0.0393 in.). These rods and wires are all hollow and contain the same flux used in the tinol paste. Any source of heat may be utilized, as a gasoline or alcohol torch, hot poker or soldering iron. For light work, an ordinary wax match will answer. One advantage of the fine granulation of the solder is that much less heat is needed than with bar solder, since each grain melts much more readily.

Among the joints recently made with this solder are some with sheet lead of 0.018 in. thickness, with a joint of 7/16 in. x 3½ in., sheet lead of 0.018 in. thickness soldered to 0.022-in. sheet steel with a joint of ½ in. x 3½ in., two iron plates of 0.117 in. thickness soldered with a joint of 1¾ in. x 4¾ in., and for wires and cables.

A NEW DESIGN OF TONGUE SWITCH AND SPRING LOCKING DEVICE

The Lorain Steel Company, Johnstown, Pa., has recently begun the manufacture of a new design of tongue switch for electric or steam railway tracks in paved streets. The distinguishing feature of this new type of switch is the large bearing surface of the tongue at the heel. The heel is cylindrical in shape, 9½ in. in diameter, and is of the same thickness as the main body of the tongue. It is offset from the center line of the tongue, the center of the heel being on the gage line of the straight rail. This effectually prevents the tongue being shifted by the passage of a wheel over the heel. On the underside of the heel, and cast integrally with the tongue is a lug which projects downwardly through a hole about 3½ in. in diameter, cored in the main casting. This lug is not depended upon to center the heel of the tongue, as the sides of the offset cylinder are ground to a perfectly true circle and the hole in the main casting is also ground out perfectly true to receive the heel in a perfect mechanical fit. The heel has a total effective bearing area on the main casting of 60 sq. in., which is about five times the area provided in most designs of tongue switch fastenings.

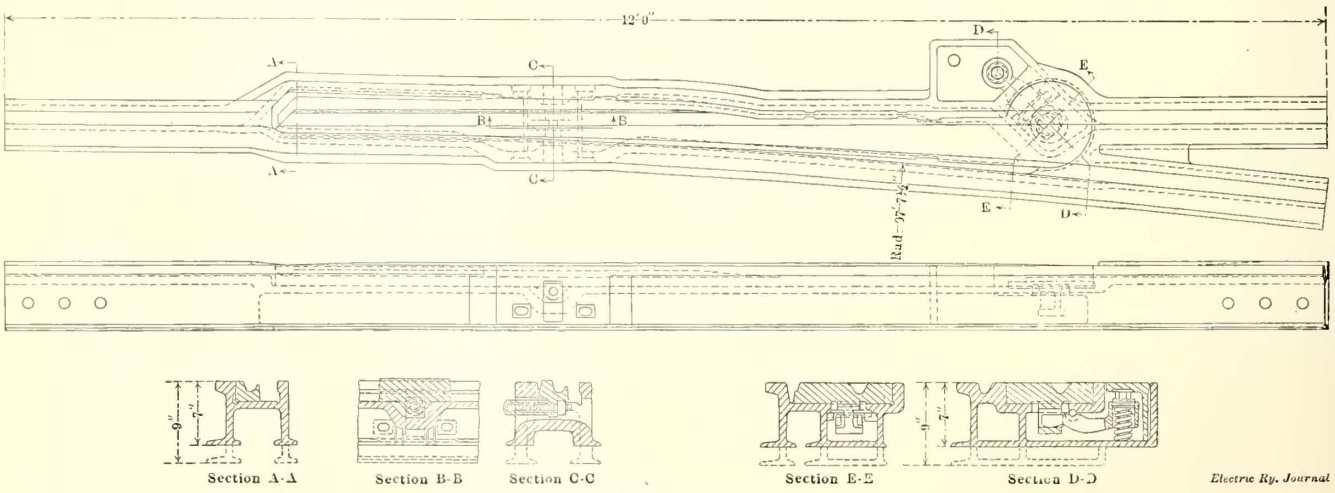


Spring Switch Locking Device

The lug on the under side of the heel is provided as a means of retaining the tongue to a perfect bearing on the main casting under any conditions of snow, ice or mud. The lug is formed with two projecting shoulders at the bottom. A short lever arm having a forked end engages with the lug and fulcrums against the top section of the main casting. At its outer end this lever is formed with a cup which encloses a small but stiff spiral spring. A bronze adjusting screw is provided for varying the upward pressure of this spring. The strength of the spring and the proportions of the short lever arm are such that a pressure of more than 2 tons downward on the heel of the tongue can be produced. This pressure is ample to retain the tongue at all times firmly on its bearing and yet is not too great to permit the tongue to be thrown with the ordinary switch iron. If it is desired to remove the tongue from the switch, the cover plate of the small box formed on one side of the main casting near the heel of the tongue can be taken off, and by loosening the adjusting nut the spring and lever can be quickly removed. The tongue is then free to be lifted out of the switch. This type of tongue fastening is used with solid manganese steel construction, and also for the company's well-known "Guarantee" construction, in which the main casting is of high-grade carbon steel and the tongue and inserted bed plate of special hard manganese steel.

All switches of this type have provision made for attaching a box to either side of the main casting containing a locking mechanism for holding the tongue in one position or the other, or mechanism for operating the switch from a distant point, either electrically or mechanically. The tongues of all switches are provided with a small lug on the under side near the point for attaching these locking or switch-throwing devices. In this connection the simple locking device which The Lorain Steel Company has perfected is of interest. The details are shown in one of the accompanying engravings.

A short bell crank is pivoted on lugs cast on the side wall of the switch-lock box. One arm of this bell crank is connected by an adjustable bolt to the lug cast on the bottom of the switch tongue. The other arm is drilled with three holes. A stiff spring 5 in. long and 3 in. in diameter is mounted on a swinging arm in the back of the box, and an adjustable stem inside the spring is connected by pin *C* to the ball crank through one of the three holes. The lengths of the bell-crank arms and the relative positions of the pins are such that when pin *C* is placed in the middle hole of the bell-crank arm the switch tongue will be held firmly by the pressure of the spring in either position to which it is thrown by a switch iron. By shifting

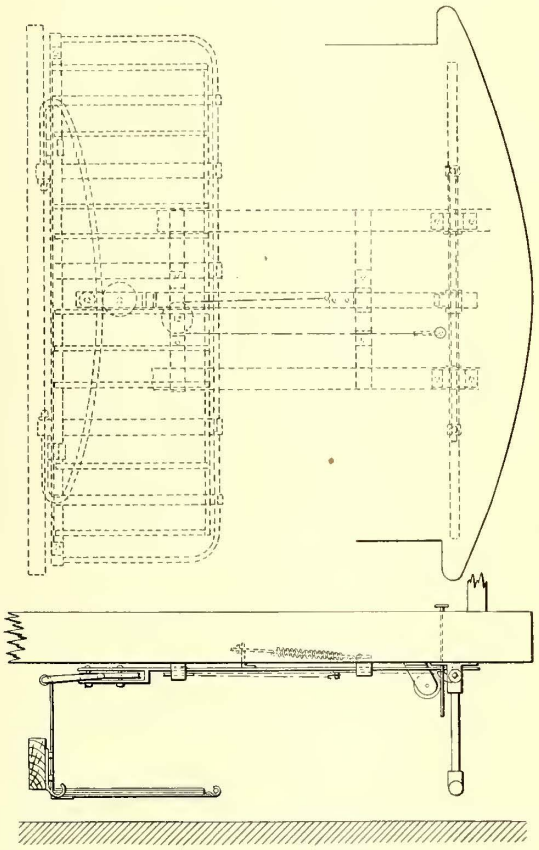


Tadpole Tongue Switch

the pin to one or the other of the outside holes the tongue can be held normally for either the straight track or the diverging track, at the same time permitting cars to run through as in the case of a spring switch. The spring-locking device is extremely simple and is not likely to get out of order. Ample provision is made for adjustment to take up any wear.

IMPROVED WHEEL GUARDS FOR THE METROPOLITAN STREET RAILWAY COMPANY, NEW YORK

As announced last week, the Metropolitan Street Railway, New York, has ordered 50 wheel guards of the latest type made by the Parmenter Fender & Wheel Guard Company, Boston, Mass. This requisition covers the 1909 model, which embodies many improvements over the earlier Parmenter guards, and is the result of 15 years' experience in the design and operation of car safety devices. The new guard can be reset from the platform if desired. It is always attached to the car trucks, and when applied to a double-truck car can be operated on curves as well as on tangents. It is said to be absolutely non-oscillating on single-truck cars, as the gate or apron is not suspended from the car body. The new anti-vibrating hanger is intended to overcome any rigid vibration from the truck and to carry the guard more flexibly than if the latter were attached to the car body. This elastic suspension should greatly decrease the maintenance cost of this design of wheel guard.

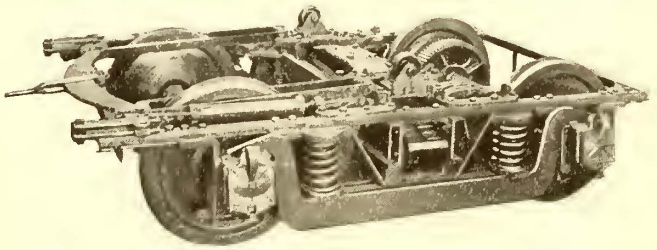


New Design of Wheel Guard for Metropolitan Street Railway, New York

The Parmenter fender, also manufactured by this company, made the highest number of points at the Schenectady tests of the Public Service Commission for projecting fenders with platform trip. The records show that it was successful in picking up both standing and prostrate dummies.

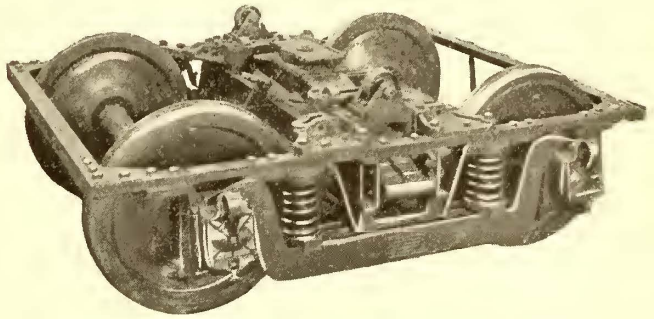
MOTOR AND TRAILER TRUCKS FOR THE SEATTLE, RENTON & SOUTHERN RAILWAY

The Baldwin Locomotive Works have recently built eight motor and an equal number of trailer trucks for the Seattle, Renton & Southern Railway. As shown in the accompanying illustrations, both trucks are of the M.C.B. equalized pedestal type, and are generally similar in design and construction. They are built for standard-gage track. The motor trucks are called by the builders Class 79-25, and will carry a centerpin load of 22,500 lb. They are arranged for West. 304 motors, inside hung, with bar suspension. The wheel base is 6 ft. 7 in.; the wheels are 34 in. in diameter and the journals are 5 in. x 9 in. In accordance with the most recent electric railway practice, these trucks are equipped with solid forged and rolled steel wheels, supplied in the present case by the Standard Steel Works.



Motor Truck for Seattle, Renton & Southern Railway

The side frames are of forged iron, measuring 1¾ in. x 3 in., while the end frames consist of 3-in. x 3-in. angles. The transoms consist of 9-in. channels secured to the end frames by cast-steel gussets. Double coil springs support the truck frame on the equalizers, and the bolster springs are double elliptic. The seats for these springs are of cast steel hung on the swing links and tied transversely by a pair of 2½-in. x 2½-in. angles. The bolsters are also of cast steel. The equipment includes inside-hung brakes and roller side-bearings.



Trailer Truck for Seattle, Renton & Southern Railway

The trailer trucks are designed for a centerpin load of 17,750 lb. They have a wheel base of 5 ft. 6 in., and are similar to the motor trucks in construction, except that most of the parts are lighter. The equipment includes Standard forged and rolled steel wheels, similar to those used under the motor trucks.

For the severe requirements of interurban work on electric railways, the M.C.B. type of truck, with rolled-steel wheels and parts machine fitted, has proved particularly suitable, and the designs above described embody the latest features of this style of truck as constructed by this builder.

The receipts from traffic on the London County Council Tramways for the year ending March 31, 1909, were $9,007,000, an increase over last year of $882,500.

News of Electric Railways

Cleveland Traction Situation

Judge Tayler's plan of settling the Cleveland traction problem by insuring a return of 6 per cent on the capital invested and the lowest fare consistent with good service was endorsed by the City Council of Cleveland sitting as a committee of the whole on May 21. At this meeting, Mayor Tom L. Johnson, however, did not insist upon the holding plan which he proposed some time ago, and this was considered a hopeful sign. City Solicitor Baker asked Horace E. Andrews, president of the Cleveland Railway, if he would consider dual management of the system, stripped of the holding-plan idea.

Mayor Johnson refused to concur in the proposition of Mr. Andrews, made some days before the meeting on May 21, to submit the whole matter to Judge Tayler and each side abide by his decision. Mr. Andrews said he had so much confidence in Judge Tayler that he would be willing to have him write a franchise under which the company would operate for the next 25 years. Mayor Johnson said that there were two reasons why this could not be done. One is that Judge Tayler had said he was not willing to undertake the task and another is that the administration is not willing that he should do it.

On the evening of May 22 Mayor Johnson and the City Council flatly refused the proposition of Mr. Andrews that Judge Tayler be requested to write a franchise. Mr. Andrews told the administration that the directors of his company had agreed to be bound by the terms of the franchise that Judge Tayler would write, in advance of it being written. On a resolution presented by Councilman Horner, embodying this proposition, the vote was 13 to 3 against it, some of the members not voting, evidently being loath to oppose the proposition. Mr. Horner explained that the members of Council would not be bound to accept the ordinance, as framed by Judge Tayler, but that they would have something before them, including the Tayler plan in detail, upon which they might work to advantage. Mr. Andrews reiterated that it would be useless for the Cleveland Railway to agree to be bound in advance if the City Council would not likewise agree to accept the terms in advance.

Mayor Johnson said that he admired and respected Judge Tayler, but that he could not permit him to assume the duties of Mayor or Councilman. He insisted that Judge Tayler take up nothing but the differences that exist between the company and the city, and said that upon many points Judge Tayler, because of lack of experience in street railway matters, would not be competent to pass judgment. Councilman Haserodt moved that a list of the points of difference be presented to Judge Tayler for advice. Mr. Andrews asked for time to consider this, and it is possible that his answer will depend upon whether the Council will agree to be bound by his finding on the points presented to him.

Mr. Andrews finally agreed to arbitrate the value of pavements involved, if the city would submit all other questions to Judge Tayler and abide by his decision. He said he had been holding up this matter until he learned what the city would do regarding the treatment of stockholders of the Cleveland Railway and the original holders of stock of the Forest City Railway.

The resolution adopted by the directors of the Cleveland Railway relative to submitting all matters to Judge Tayler says in part:

"Resolved, That it is the sense of this board 'that the street car question be settled upon the so-called Tayler plan.'

"Resolved, That we recognize that there probably exist honest differences of opinion as to certain details of the Tayler plan, and that we can think of no better or fairer way of bringing the long-continued discussions about such details to a conclusion than to offer to refer the interpretation and decision of all points in the Tayler plan to the author of that plan, namely, Judge Tayler himself.

"Resolved, That, desiring not to prolong the discussion of points of difference, we think it wise not to attempt any specific answer to Mr. Baker's questions, nor to lay down any ultimatums, believing that our offer to leave the decision of all such differences to Judge Tayler will furnish the speediest and most practical way, and the way most acceptable to the people of this community, for the final settlement of this much-vexed question."

At the meeting of the Council committee of the whole on the evening of May 17, Judge Tayler was invited to address the members. He said he regretted that a settlement had not been reached and that he would not have proposed a settlement on the plan he has suggested if he had supposed that the valuation fixed a year ago was to be changed. The task of a revaluation was too large to be repeated at this time, but with that out of the way, the Judge said he felt that means were provided to satisfy the needs of the people with a settlement that would give them the lowest fare at all times commensurate with good service. Judge Tayler stated that the maximum fare should be large enough to attract capital to rehabilitate the system and provide for extensions and that he thought six tickets for 25 cents would be sufficient for all purposes.

F. H. Goff, who served as arbitrator for the Cleveland Electric Railway in the negotiations a year ago, was requested to explain the so-called "gentlemen's agreement" which served as rules of procedure at that time. He said he believed the Cleveland Railway had conformed to the terms of the agreement.

Mayor Johnson has unfolded a holding company plan, the directors to be divided equally between appointments made by the city and by the company. Mr. Andrews said that he had stated at the outset he would never consider a plan of leasing the property to a holding company.

H. J. Schmidt submitted a bid at 3-cent fare for the franchise of Payne Avenue on May 18. Just why he did not bid for the other routes claimed to be open is not clear. The Cleveland Railway submitted bids on all routes open at the time for that purpose, the fare to be 5 cents cash, six tickets for 25 cents and transfers to all its lines. No cash deposit was made with the bids of the Cleveland Railway, as the company is operating lines. The city solicitor objected to this, however. The Cleveland Railway replied that the advertisement was not fair, as the company would be compelled to give transfers, while other bidders did not incorporate a transfer clause in their bids. It was requested that other bids be asked under conditions fairer to the old company. If this request be not allowed, the company stated that its bids are made under protest.

Arrangements for the Master Car Builders' and Master Mechanics' Convention

The Railway Supply Manufacturers' Association has issued a circular, outlining the arrangements which have been made for the coming conventions of the American Railway Master Mechanics' Association and the Master Car Builders' Association, to be held in Atlantic City June 16-23. The Master Mechanics' convention will be held on Wednesday, Thursday and Friday, June 16-18, and the Master Car Builders' convention will be held on Monday, Tuesday and Wednesday, June 21-23. The meetings of both associations will be held on Young's Million-Dollar Pier, as in the preceding year. The Marlborough-Blenheim Hotel has been selected as headquarters for both conventions, and the presidents, executive committees and secretary will have offices there. The registration booth will be in the entrance hall of the Million-Dollar Pier. In order that a correct record may be made of the members in attendance it will be necessary to register once for each convention.

The Manufacturers' Association has recently increased the available exhibit space on the Million-Dollar Pier to a total of about 65,000 sq. ft.; practically all of this space has been assigned. The arrangement of exhibits has been designed to be unusually attractive.

Yearly membership dues of the Railway Supply Manufacturers' Association are $25, and include one membership badge. Additional badges may be obtained by members for their representatives and ladies in attendance at the conventions for $5 per badge.

The Trunk Line Association this year offered a round trip rate on account of the conventions of a fare and three-fifths on the certificate plan, but owing to the difficulty experienced in previous years it was not thought advisable to accept this rate. Excursion rates of a fare and one-third for the round trip have been announced, however, as applying from Chicago and St. Louis and other points in that immediate territory. A special train will be run over the Pennsylvania Railroad, leaving Chicago at 5:30 p. m. June 14, on which the round trip rate will be $26 and the single fare rate $19.50.

The exhibit booths will be ready for the installation of exhibits on June 1, with the exception of booths on the west side of the main building and in the south half of Machinery Hall, which will not be ready until June 10. The

installation of exhibits may be begun on these dates and must be completed not later than the night of June 15. All freight shipments of apparatus to be exhibited should be plainly addressed to the company making the shipment, giving also the exhibit space number, and they should be marked "Million-Dollar Pier, care of Eldredge Express Company, Atlantic City, N. J." The usual arrangements have been made with the Eldredge Express Company and P. E. Lane for carting the shipments between the railroad station and the exhibit spaces on the pier, and for labor and material in erecting the exhibits. Furniture and rugs for the booths can be rented for the eight days of the convention from Joseph L. Shoemaker & Company, 926 Arch Street, Philadelphia, Pa.

On May 17 the secretary of the Railway Supply Manufacturers' Association, E. G. F. Smith, removed his offices temporarily to the Million-Dollar Pier, Atlantic City, N. J., where all communications relative to arrangements for exhibits should be sent.

Transit Affairs in New York

Corporation Counsel Pendleton, of New York, in answer to a statement made by Chairman Willcox of the Public Service Commission, says that it is within the province of the commission, as the successor of the old Rapid Transit Commission, to make an agreement with the New York Central & Hudson River Railroad for the removal of the tracks in Eleventh Avenue, as provided in the unrepealed Saxe law. The Saxe law provided that the city should have the power to condemn if the company and city did not come to an agreement about the removal of the tracks in a year, expiring March 26, 1907. No agreement was reached, and Mr. Willcox said that the period for agreement ended before the present commission was created. In his statement the Corporation Counsel said that the commission can proceed under the Saxe law.

The Brooklyn Rapid Transit Company is preparing to make service changes in the near future which will increase materially the facilities on its elevated lines and make it much easier for its patrons to travel in Brooklyn. Of its own initiative the company has had maps prepared showing the layout of all surface and elevated lines in the borough, with the stations on the elevated roads and the time of the departure of trains for the various points of destination.

The Public Service Commission has ordered the Brooklyn Rapid Transit Company to maintain in rush hours on week days, excepting Saturday afternoons, the maximum service on all its elevated lines that can be furnished with safe operation. At other times the company is required to offer facilities as follows: Where the headway is 5 minutes or less, sufficient cars must be operated past all stations to provide seats for at least as many passengers a there may be on four consecutive trains; where there is a headway of between 5 and 10 minutes, the order stipulates that three consecutive trains shall furnish the test; where the headway is between 10 and 20 minutes, it is two consecutive trains, and where the headway is 20 minutes or more there must be seats enough for every passenger in every train.

Time for the completion of two of the lower sections of the bridge loop line subway has been extended until Aug. 1 by an order of the Public Service Commission. Work on these sections has been held up by request of Mayor McClellan pending the construction of the foundations of the new Municipal Building. The loop subway will connect the Williamsburg, the Manhattan and the Brooklyn bridges.

The Public Service Commission has granted the New York City Interborough Railway permission to put into effect on May 29 a new tariff supplement, providing for a new routeing of the cars on the lines coincident with the opening of the new Sedgwick Avenue line. This will establish new transfer points, including the 8-cent transfer at the 238th Street station of the Broadway branch of the subway. The 8-cent transfer includes the ride on the surface car and on the subway.

The Public Service Commission has discontinued proceedings against the receivers of the Metropolitan Street Railway for the improvement of the service on the company's Fourteenth Street and Christopher Street lines as traffic has recently decreased and the service is now considered adequate.

Electrification of Canadian Lines Under Consideration.—The Dominion Government of Canada and the Provincial Government of New Brunswick have under joint consideration a plan to equip with electricity the eastern section of the National Transcontinental Railway from Quebec to Moncton.

Construction of Cambridge Subway Begun.—The Boston (Mass.) Elevated Railway has begun the construction of the Main Street subway in Cambridge, ground having been broken on Massachusetts Avenue in the Dana Hill section. A shaft is being sunk at the corner of Bay Street to afford soil tests and an exit for material excavated.

Electrification of Branch of Delaware & Hudson Company Possible.—The Rutland Railway, Light & Power Company, Rutland, Vt., is negotiating with the Delaware & Hudson Company with a view to electrifying that company's lines from Castleton to Eagle Bridge, N. Y., and from Fair Haven to Whitehall, N. Y., and operating them in connection with its present lines. If the negotiations now pending are not concluded, the Rutland Railway, Light & Power Company will probably build from Fair Haven to Castleton Corners or Hydeville to Poultney.

Report of Indiana Commission.—The annual report of the Indiana Railroad Commission, now in press, will contain 700 pages, 150 of which will be devoted to electric railways. The commission will recommend that several laws now in force be amended, and that a number of new measures be passed by the next Legislature. The commission desires especially the passage of laws to prevent trespassing and to provide a systematic plan for the elimination of grade crossings. The report will review the conferences that have been held between the commission and the managers of electric railways and cite the good results that have followed the observance of the uniform rules by the electric railways.

Chamber of Commerce of Cleveland Reports on Underground Rapid Transit Proposal.—The directors of the Chamber of Commerce, Cleveland, have made public their report on the proposal made to the city by the Cleveland Underground Rapid Transit Company for a franchise for an underground electric railway. The directors say that the term for which the grant is sought is too long, and that an ordinance containing the provisions asked by the company would work materially to the detriment of the city by preventing other companies from securing an entrance to the city. They say that in the main the proposal of the company is a good one, and would favor its passage if the changes are made which they have suggested.

Boston Matters Go to Joint Committee for Report.—Three important questions affecting the Boston Elevated Railway have been referred by Governor Draper to the Boston Transit Commission and Railroad Commission sitting jointly. The questions have to do: (1) with the proposed consolidation of the Boston Elevated Railway and the West End Street Railway, (2) authorizing the Boston Elevated Railway to invest in the stock and securities of other companies, and (3) the proposed elevated structure from Sullivan Square to Medford. In one way or another the three matters have been long before the Legislature. The Legislature now turns them over to the two commissions, for a report to the Legislature of 1910 before the second Saturday of January.

Program of Accounting Section, National Electric Light Association.—Separate meetings of the accounting section of the National Electric Light Association will be held during the convention at Atlantic City next week. The accounting section will have an all-day session on Thursday, June 3, and possibly a session on June 4 in addition. The following papers will be read before the accounting session: "Depreciation," by G. E. Claflin, United Electric Securities Company; "Payroll Problems," by W. E. Freeman, cashier, New York Edison Company; "Cost Accounting," by H. R. Kern, Philadelphia Electric Company; "Care and Handling of Supplies," by J. L. Bailey, treasurer, Consolidated Gas, Electric Light & Power Company, Baltimore; "Branch Office Accounting," by E. J. Allegaert, auditor, Public Service Corporation of New Jersey.

Convention of Pennsylvania Engineers.—A convention of the engineers of Pennsylvania will be held at Harrisburg, June 9-11, to organize an association to hold annual conventions in that State. The association will operate within the charter of the Engineers' Society of Pennsylvania, with 900 members and a club house at Harrisburg. The opening exercises will take place at the Industrial Exhibition, at Chestnut Street Hall. In the afternoon an organization will be effected and in the evening a reception will be given at the Board of Trade Auditorium. June 10 and 11 will be devoted to elections. Special trips are also proposed. The papers to be presented relate to sanitation, civil and mining engineering, forestry, mechanical engineering and electrical engineering. Among the papers is one on the Panama Canal, by Arthur P. Davis, of the Roosevelt board of consulting engineers, or by Lieut. W. H. Hodges, assistant engineer of the Isthmus Canal Commission. Those who desire to attend should communicate with Edw. R. Dasher, secretary convention committee, Engineers' Society of Pennsylvania, Harrisburg.

Estimate of Cost of Reconstructing San Francisco Railway as a Municipal Line.—Since the Aldermen of San

Franeisco passed to print an ordinance to submit to the voters of the city a bond issue of $1,950,000 to cover the cost of reconstructing the Geary Street, Park & Ocean Railroad and extending the line to the Cliff, City Engineer Manson has submitted two estimates for the reconstruction of the property, one for an overhead electric railway from Geary Street and Kearny Street to the ocean, with a branch to the park, and the other for a conduit line with an overhead extension to the ocean and a branch along Tenth Avenue to the park. The cost of an overhead electric railway, as presented by Mr. Manson, is $1,994,232, and of a conduit line with a trolley extension, $2,258,000. The question of rebuilding the Geary Street, Park & Ocean Railroad as a municipal undertaking was originally considered in 1906, at which time it was estimated that the cost of reconstructing the property would be $710,000. This estimate was taken as the basis for the proposed issue of $1,950,000 of bonds by the city for reconstructing and extending the line.

Graduate Study at Massachusetts Institute of Technology.—In the recent report of Arthur A. Noyes, acting president of the Massachusetts Institute of Technology, particular emphasis is placed on the provision now made at the institute for advanced study leading to the higher degrees of Master of Science, Doctor of Philosophy and Doctor of Engineering. These courses are described in a bulletin entitled "Advanced Study and Research." Another important movement which also supports the cause of advanced study has been the establishment of the new research laboratory of applied chemistry. This laboratory co-operates with the research laboratory of physical chemistry. It is hoped that a research laboratory of applied electricity may soon be established. There now are 215 students at the Institute of Technology who are graduates of the courses of the institute or other institutions, many of whom are taking undergraduate engineering work. Others are pursuing the advanced or graduate instruction.

Terminal Plans Under Consideration in Baltimore.—The Pennsylvania Railroad has formally protested to the City Council of Baltimore against the passage by it of an ordinance requiring the company to use some motive power other than steam in the tunnels and open cuts in Baltimore through which all trains between Washington, Baltimore, Philadelphia and New York are run. Geo. Gibbs, chief engineer of electric traction of the Long Island Railroad, which is controlled by the Pennsylvania Railroad, presented an estimate of the cost of changing the motive power of the company's terminal line in Baltimore to electricity, which showed that the expense involved would total $6,000,000, a sum which is deemed prohibitive. The discussion of the terminal problem in Baltimore has resulted in a proposition being submitted to the city by Henry W. Williams, Baltimore, for a four-track railroad tunnel under Pratt Street. Mr. Williams has refused to discuss the plan in detail or to say who is associated with him, but has announced that the plan as proposed by him has been pronounced practical by his own engineers and consultants who were especially employed to consider the plan. He says that from the rough cursory plans that have thus far been developed it is estimated that the proposed line would cost $15,000,000.

Philadelphia Transit Situation.—Mayor Reyburn, of Philadelphia, has declined to arrange for a conference between himself and the other representatives of the city of Philadelphia on the board of directors of the Philadelphia Rapid Transit Company and the committee of 15, which was named at a recent meeting of the citizens of Philadelphia to take up with the company the question of fares and street railway conditions in general. The Mayor says that he does not propose to extend to the committee any courtesies that are not extended to private citizens and that he is always available to the public at his office in the City Hall. On May 20 the Pennsylvania Railroad Commission informed G. H. Burnham, Jr., president of the City Club of Philadelphia, that the members of the commission would confer with him informally on May 29, in Harrisburg, at which time Mr. Burnham will explain to the commission the desires of the club in connection with matters affecting street railway service in Philadelphia. John Y. Boyd, of the commission, has been in Philadelphia for several days, acquainting himself with local conditions, so as to be familiar with the situation in Philadelphia when it comes before the commission for consideration on May 29. It is expected now that the suit of Elmer E. Brode, attacking the validity of the contract between the city of Philadelphia and the Rapid Transit Company, will come up for a hearing in the Common Pleas Court within a few days. The case has been delayed for some time by legal technicalities. The employees of the Philadelphia Rapid Transit Company sent to John B. Parsons, president of the company, on May 24, a letter asking that concessions be made in their favor. The officials of the company point out that an increase of 1 cent an hour has been granted the employees, effective on July 1, and that the special committee of the board of directors of the company is studying the transfer system with a view to making concessions to the public and also has under consideration the previous communication of the men concerning the terms and conditions of their service with the company.

LEGISLATION AFFECTING ELECTRIC RAILWAYS

Connecticut.—The Senate has concurred in the action of the House in passing a resolution for a joint select committee of nine members and two Senators, to consider the subject of public utility legislation and submit a bill not later than June 8. Senators Barnum and Middleton have been named as the representatives of the Senate on this committee. Closely following the action of the Senate in concurring with the House in the matter of public service legislation, a meeting of the new public utility committee was held, and Senator Barnum was chosen chairman. He subsequently announced that hearings will begin in a few days. The committee will have at its disposal the stenographic report of the previous hearings before the judiciary committee, so as to avoid going over the same ground again in oral hearings. Members who propose amendments to the bill will probably be asked to file them with the clerk of the committee as soon as possible, in order that they may receive consideration. The hearings before the judiciary committee on the question of public service legislation were reviewed in the issues of the Electric Railway Journal of April 3 and April 17, and in view of the testimony taken at that time it is probable that the committee which now has the matter in hand will devote such time as is at its disposal not to discussions about public sentiment, but to a detailed consideration of the practical features of the bill which it is to report. According to Senator Barnum it is more than likely that the committee will assign a day to a hearing on the financial control of public service corporations, another day to a hearing on the control of rates of public service corporations and another day to a hearing on the control of the management and operation of public service corporations.

Massachusetts.—The Senate has passed to be engrossed the bill to authorize street railways to issue securities for supplying working capital. The committee on railroads and the committee on street railways sitting jointly have been authorized to visit Berkshire County in connection with the bills before the Legislature to provide for the consolidation of the Bennington & North Adams Street Railway with the Berkshire Street Railway. The resolve to provide for an investigation and report relative to public improvements for the Boston metropolitan district has been ordered to a third reading by the House. Rapid transit projects fall within the scope of this bill, and it is planned to have these incorporated in suitable bills at different periods when a study of the metropolitan district is made. The Senate has passed to be engrossed the resolve to provide for an investigation of the advisability of allowing the Boston & Eastern Electric Railroad to build a tunnel and subway in Boston as previously described in these columns. The House has introduced an amendment to the franchise tax law, providing that the half of the corporation franchise tax which now goes to the cities and towns where the stockholders have residences shall go to the State. This is an extension of the McCarthy bill, which sought to have all the corporation tax go to the cities or towns where the company does business instead of dividing it with the municipalities in which the stockholders live. If the amendment should be adopted the State would receive an addition of $1,000,000 per year to its revenue through the redistribution effected. The Senate report of the committee on street railways, referring to the next Legislature the Smith bill to define further the purposes for which capital stock and bonds may be issued by street railways, has been amended on the motion of Senator Grimes by the substitution of the bill to permit stock and bond issues to provide working capital. Governor Draper has vetoed the bill which provides that eight hours shall constitute a day's work for public employees. The House has passed to be engrossed and sent to the Senate a resolve to provide for an investigation of the advisability of constructing additional rapid transit lines in Boston, as previously noted in these columns. The bill giving directors additional rights in voting and in accepting locations for street railways has passed both branches and will shortly be considered by the Governor. The Governor has signed the bill extending to Dec. 31, 1910, the limit in the act of 1908 authorizing the consolidation of the Boston Elevated Railway and the West End Street Railway.

Financial and Corporate

New York Stock and Money Market

May 24, 1909.

During the past week trading has been dull and prices strong on the New York stock market. Almost every net price change recorded has been an advance, but the transactions have been limited and generally professional. The outside public appears to be indifferent. The strongest interests are the steel shares, those of the Trust and of the leading independents as well having recorded advances. United States Steel common continues to be the favorite speculative issue of the market, and it has been pushed above 60. The traction issues are only fairly active and, as a rule, show fractional recessions on the week's trading.

The bond market continues strong and active and rates for money show no disposition to advance. Quotations today were: Call, 1½ to 2 per cent; 90 days, 2¼ to 2½ per cent.

Other Markets

Rapid Transit has continued to be the most active traction issue in the Philadelphia market. There has been a loss of about one point during the week, and the close today was at 33⅝. Union Traction has been moderately active at prices that were practically unchanged.

In the Boston market, traction issues were practically neglected. Occasional lots of Boston Elevated and of Massachusetts Electric find their way into the market, but prices are entirely nominal.

There is little interest in traction issues in Chicago, even Subway shares, which were active a week ago, having dropped out of trading within the last few days. Series 3 and 4 of the Chicago Railways issues have been offered in small lots, the former at 26 and the latter at 9⅞.

In Baltimore, United Railways bonds are the only traction securities in which there is any interest. These continue to be active in all the issues. The closing to-day was: Incomes, 58½; 4s, 87½, and funding 5s, 81.

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

	May. 18.	May 24.
American Railways Company	a46	45¾
Aurora, Elgin & Chicago Railroad (common)	*38½	a38
Aurora, Elgin & Chicago Railroad (preferred)	*89	a87½
Boston Elevated Railway	127	128½
Boston & Suburban Electric Companies (common)	*16	*15½
Boston & Suburban Electric Companies (preferred)	*72	71
Boston & Worcester Electric Companies (common)	12	11
Boston & Worcester Electric Companies (preferred)	a58	a56
Brooklyn Rapid Transit Company	79½	79
Brooklyn Rapid Transit Company, 1st ref. conv. 4s	88¼	88⅝
Capital Traction Company, Washington	*133	*135¼
Chicago City Railway	a190	a190
Chicago & Oak Park Elevated Railroad (common)	4	*4
Chicago & Oak Park Elevated Railroad (preferred)	*15	*15
Chicago Railways, ptcptg. ctf. 1	a110	a110
Chicago Railways, ptcptg. ctf. 2	a38½	a38
Chicago Railways, ptcptg. ctf. 3	a28	a28
Chicago Railways, ptcptg. ctf. 4s	a10	a10
Cleveland Electric Railway	*78	*78
Consolidated Traction Company of New Jersey	*78	a79
Consolidated Trac. Co. of N. J., 5 per cent bonds	a107½	a107
Detroit United Railway	*58	a58½
General Electric Company	160½	161
Georgia Railway & Electric Company (common)	a86	85½
Georgia Railway & Electric Company (preferred)	a85	*85
Interborough-Metropolitan Company (common)	16¼	16
Interborough-Metropolitna Company (preferred)	45⅜	44⅝
Interborough-Metropolitan Company (4½s)	79	78½
Kansas City Railway & Light Company (common)	a50	a49
Kansas City Railway & Light Company (preferred)	86	a86½
Manhattan Railway	*146	a148
Massachusetts Electric Companies (common)	a14	a14
Massachusetts Electric Companies (preferred)	70½	a71
Metropolitan West Side, Chicago (common)	a18	a18
Metropolitan West Side, Chicago (preferred)	a53	a53
Metropolitan Street Railway	27	a28
Milwaukee Electric Railway & Light (preferred)	*110	*110
North American Company	82¾	82½
Northwestern Elevated Railroad (common)	a24	a24
Northwestern Elevated Railroad (preferred)	a72½	a71
Philadelphia Company, Pittsburg (common)	43	42⅞
Philadelphia Company, Pittsburg (preferred)	a44¼	44
Philadelphia Rapid Transit Company	34⅞	33⅝
Philadelphia Traction Co.	92½	a93
Public Service Corporation, 5 per cent col. notes	a101	a100¾
Public Service Corporation, ctfs.	a89½	a89½
Seattle Electric Company (common)	97½	*97½
Seattle Electric Company (preferred)	90	99⅞
South Side Elevated Railroad, Chicago	a58	a60
Toledo Railways & Light Company	*10¼	11⅛
Third Avenue Railroad, New York	30¾	28½
Twin City Rapid Transit, Minneapolis (common)	*106½	a105⅛
Union Traction Company, Philadelphia	57	57
United Railways & Electric Company, Baltimore	a12½	*12¾
United Railways Inv. Co., San Francisco (com.)	*36⅜	a38½
United Railways Inv. Co., San Francisco (pfd)	54½	a55
Washington Railway & Electric Company (common)	*42⅞	*43
Washington Railway & Electric Company (preferred)	*92⅞	*90¾
West End Street Railway, Boston (common)	93½	92¼
West End Street Railway, Boston (preferred)	*110	*110
Westinghouse Electric & Manufacturing Company	84¼	84
Westinghouse Elec. & Mfg. Company (1st pref.)	120	121

aAsked. *Last sale.

Earnings of Greater New York Railways

A summary of the quarterly returns of street railways and railroads operating in New York City, covering the quarter ended Sept. 30, 1908, has been made public by the New York Public Service Commission, First District. The earnings from operation and the operating expenses as reported by the various companies are as follows:

QUARTER ENDED SEPT. 30, 1908.

	Gross earnings from operation.	Operating expenses.	Net earnings from operation.
Hudson & Manhattan R. R.	$121,373.05	$127,898.04	*$6,524.99
Interborough Rapid Transit Co.	5,328,887.63	2,675,709.70	2,653,177.93
Brooklyn Rapid Transit system	5,117,661.14	3,085,552.03	2,032,109.11
MANHATTAN AND BRONX.			
Dry Dock, East Broadway & Battery R. R. Receiver	$166,346.99	$120,241.35	$46,105.64
Forty-second St., Manhattanville & St. Nicholas Ave. Ry. Receiver	308,918.20	190,624.31	118,293.89
Third Avenue R. R. Receiver	790,995.55	548,026.26	242,969.29
Southern Boulevard R. R.	22,676.40	15,991.35	6,685.05
Union Railway of New York Receiver	468,872.81	343,403.40	125,469.41
Total—Third Avenue Railroad system	$1,757,809.95	$1,218,286.67	$539,523.28
Central Park, North & East River R. R (Aug. 6 to Sept. 30)	89,197.22	79,754.59	9,442.63
Metropolitan Street Ry. Receivers (Aug. 1 to Sept. 30)	2,238,275.41	2,047,438.84	190,836.57
New York City Ry. Receiver	1,205,663.38	1,360,660.28	*154,996.90
New York City Interboro. Ry.	35,528.79	37,430.01	*1,901.22
Westchester Electric R. R.	111,614.60	132,515.70	*20,901.10
Total—Manhattan and B'x	$5,438,089.35	$4,876,086.09	$562,003.26
BROOKLYN AND QUEENS.			
Bush Terminal R. R.	$6,715.49	$4,369.21	$2,346.28
Coney Island & Brooklyn R. R.	480,856.11	331,317.89	149,538.22
Long Island Electric Ry.	60,601.17	41,961.49	18,639.68
Marine Railway	3,853.50	3,701.33	152.17
New York & Long Island Traction Co.	99,038.75	57,946.32	41,092.43
New York & Queens Co. Ry.	274,261.15	225,879.10	48,382.05
Ocean Electric Ry.	54,414.37	20,486.80	33,927.57
Van Brunt St. & Erie Basin R. R.	12,941.48	10,197.69	2,743.79
Total — Brooklyn and Queens (exclusive of B. R. T. system)	$992,682.02	$695,859.83	$296,822.19
RICHMOND.			
Richmond Light & R. R. Co.	$103,498.30	$81,326.53	$22,171.77
Southfield Beach R. R.	5,161.30	1,460.83	3,700.47
Staten Island Midland Ry.	91,669.76	67,922.77	23,746.99
Staten Island Ry. (steam railroad)	66,223.73	54,582.20	11,641.53
Staten Island Rapid Transit Ry. (steam railroad)	159,928.07	134,652.54	25,275.53
Total—Richmond	$426,481.16	$339,944.87	$86,536.29
Grand total	$17,425,174.35	$11,801,050.56	$5,624,123.79

*Deficit.

Conneaut & Erie Traction Company, Girard, Pa.—The property of the Conneaut & Erie Traction Company was sold under foreclosure on May 12, at Erie, to John McDonald, acting for the bondholders' reorganization committee.

Denton Interurban Railway & Power Company, Denton, Tex.—The property of the Denton Interurban Railway & Power Company will be sold under foreclosure at Denton on July 6, 1909. The property has been inventoried at $51,651.73, and there are outstanding against it liens for $50,822. Those who desire to bid should address E. F. Bates, receiver, Denton, Tex.

Egerton Tramway Company, Ltd., Stellarton, N. S.—The purchase of the property of the New Glasgow Electric Light Company, New Glasgow, N. S., by the Egerton Tramway Company, Ltd., was noted in the ELECTRIC RAILWAY JOURNAL of May 22, 1909, page 961. The New Glasgow Electric Light Company has been furnishing service in the towns in which the Egerton Tramway Company, Ltd., operates. The name of the Egerton Tramway Company, Ltd., has been changed to the Pictou County Electric Company, Ltd., and contracts have recently been placed for new power equipment, totaling about $35,000.

Metropolitan Street Railway, New York, N. Y.—Judge Lacombe, in the United States Circuit Court, signed an order on May 24 postponing the sale of the property of the Metropolitan Street Railway under the foreclosure of the Guaranty Trust Company's $12,500,000 mortgage, from June 29 to Nov. 18, or later. The reason assigned was the inability of the United States Circuit Court of Appeals to hear the appeal of the Guaranty Trust Company from certain features of the foreclosure decree until its October term. Judge Lacombe says in his order postponing the sale:

"Although the decree of foreclosure and sale in this suit was entered on March 18, the mortgagee has so delayed the prosecution of the appeal that the last day on which a motion could be made for a hearing has passed without bringing it to the attention of that court. The appeal cannot be heard until the next term, which opens Oct. 11. Under these circumstances sale cannot be had before Nov. 18. The special master will take the necessary steps to adjourn it accordingly."

Metropolitan West Side Elevated Railway, Chicago, Ill.—On page 924 of the ELECTRIC RAILWAY JOURNAL of May 15, 1909, the terms were outlined which the committee, composed of Ira M. Cobe, E. K. Boisot and Samuel Insull, proposed for leasing the Northwestern Elevated Railroad, the Chicago & Oak Park Elevated Railroad and the South Side Elevated Railroad. The plan of the committee is to lease all the elevated railways in Chicago on the basis of guaranteed yearly rentals, and the committee has since submitted its offer for leasing the Metropolitan West Side Elevated Railway. The Central Terminal Company, through which the separate lines will be leased, has agreed to guarantee dividends of 3 per cent annually on the outstanding preferred stock of the Metropolitan West Side Elevated Railroad from 1910 to 1912, inclusive. In 1913 and 1914 it agrees to pay 3½ per cent on the preferred and 1 per cent on the common stock each year; in 1915, 3½ per cent on the preferred and 1½ per cent on the common; in 1916, 4 per cent on the preferred and 1½ per cent on the common; in 1917 and 1918, 4 per cent and 2 per cent, respectively, each year; in 1919, 4½ per cent on the preferred and 2 per cent on the common, and in 1920 4½ per cent on the preferred and 2½ per cent on the common stock. The maximum rates of 5 per cent on the preferred stock and 2½ per cent on the common stock are to be paid in 1921 and thereafter during the term of the lease.

New Orleans Railway & Light Company, New Orleans, La.—The directors of the New Orleans Railway & Light Company have decided upon a financial plan which involves the creation of a $50,000,000 bond issue, of which $5,000,000, it is said, will be purchased at 85 by Bertron, Griscom & Jenks, New York, who recently bought $2,400,000 bonds of the company. The plan also provides that the preferred and common shareholders shall part with 25 per cent of their stock holdings at 40 and 15, respectively, and the New York banking firm will be given two members on the board of directors. The proposed $50,000,000 of bonds will bear interest at the rate of 5 per cent, and $30,000,000 will be held in the treasury against the $30,000,000 4½ per cent bonds now outstanding. The other $20,000,000 will be issued from time to time, and the proceeds will be devoted exclusively to extensions and betterments and for the purchase of new equipment, with the exception of a sufficient amount to take up $1,266,000 debenture notes outstanding. A circular will be sent out to stockholders asking their approval of the plan by June 28.

Philadelphia Company, Pittsburgh, Pa.—The directors of the Philadelphia Company have authorized an issue of $5,000,000 of 10-year 5 per cent debenture bonds convertible into common stock of the company on the basis of 20 shares of stock for each bond of a par value of $1,000. The company has sold $2,500,000 of the issue to Ladenburg, Thalmann & Company and Blair & Company, New York. A large part of the money secured from the sale of the bonds will be advanced by the Philadelphia Company to the Pittsburgh Railways and the Allegheny County Light Company for extensions and improvements. In order to provide for the conversion of these bonds, a special meeting of the stockholders of the Philadelphia Company has been called for July 22 to authorize an increase in the capital stock from $42,000,000 to $47,000,000, the additional $5,000,000 being in common shares.

Rockford & Interurban Railway, Rockford, Ill.—E. W. Clark & Company, Philadelphia, Pa., and Hodenpyl, Waldbridge & Company, New York, N. Y., have taken an option on the stock of the Rockford & Interurban Railway. The company operates 103 miles of line between Freeport, Ridott, Pecatonica, Winnebago, Rockford, Cherry Valley, Belvidere, Rockton, Beloit and Janesville.

Virginia Passenger & Power Company, Richmond, Va.—At a meeting of the reorganization committee of the Virginia Passenger & Power Company the following officials of the new company which is to take over the Richmond properties, which were purchased at public sale, were announced: Frank J. Gould, chairman of the board of directors; William Winthrop, president; Fritz Sitterding, vice-president; Henry W. Anderson, vice-president and general counsel, and the following directors: Frank J. Gould, Edwin Gould, William Winthrop, P. M. Chandler, Charles S. Whelen, Douglass Robinson, R. Lancaster Williams, Fritz Sitterding and Henry W. Anderson.

Traffic and Transportation

Accidents on Electric Railways of Indiana for Quarter

The Railroad Commission of Indiana has made public the following comparative summary of accidents on the interurban electric railways in the State for the three months ended March, 1908, and the three months ended March, 1909.

	1908. 3d Qr.	1909. 3d Qr.
WHERE—		
On passenger trains	57	22
On station grounds	0	3
CAUSES—		
Collisions	35	12
Derailments	17	0
Getting on and off moving trains	2	9
Getting on and off trains after stops are made	0	3
Miscellaneous	3	1
RESULTS—		
Deaths	1	1
Fractures or dislocations	4	1
Sprains	3	6
Cuts and bruises	45	14
Miscellaneous	4	3
TO TRAVELERS ON HIGHWAYS		
WHERE—		
Travelers on highways in vehicles	5	11
On foot	3	3
CAUSES—		
Struck on crossings	7	10
Teams frightened	1	4
RESULTS—		
Deaths	5	4
Sprains	2	2
Cuts and bruises	1	8
Miscellaneous	0	0
TO EMPLOYEES		
EMPLOYMENT—		
Conductors	1	2
Motormen	5	1
Laborers	0	3
CAUSES—		
Collisions	5	0
Miscellaneous	1	3
Fell from cars	0	3
RESULTS—		
Deaths	0	1
Fractures or dislocations	1	0
Sprains	0	0
Cuts and bruises	5	5
Miscellaneous	0	0
TO TRESPASSERS		
WHERE—		
Trespassers on tracks	3	11
Miscellaneous	0	2
RESULTS—		
Deaths	3	7
Fractures or dislocations	0	6

Collisions, 0; derailments, 2.

The following table shows the total casualties on the interurban railways:

	1908. 3d Qr.	1909. 3d Qr.
Deaths	9	13
Injured	71	45

The following table shows the total casualties on all the railroads:

DEATHS	1908. 3d Qr.	1909. 3d Qr.
Steam railroads	74	60
Electric railways	9	13
Total deaths	83	73
INJURED		
Steam railroads	298	284
Electric railways	71	46
Total injured	369	330

Wheel Guard Hearing in New York

On Thursday, May 20, Commissioner Maltbie presided at another hearing before the Public Service Commission of District No. 1, on the subject of wheel guards for the Metropolitan Street Railway, New York. James L. Quackenbush, of counsel for the railway, said that the equipment order issued by the commission on April 28 had taken his company quite unawares, as up to the actual issue of the order no intimation had been given as to whether fenders would be required in addition to wheel guards. Nevertheless, since March 1 the Metropolitan Street Railway had ordered three different types of approved wheel guards, and a number of each kind was now in service. There was still considerable doubt as to which of these was best adapted for the service, and the railway wished to give them more extended service tests before equipping the large number of cars which it operates. The wheel guards now on trial are the Parmenter, Hudson-Bowring and No. 7 Sterling-Meaker automatic guard. Bids for the installation of these guards had already been asked and received, although the company

reserved the right to ask for tenders on and to try other guards. Mr. Quackenbush said that blue prints and specifications of the types under consideration could be submitted to the commission within two weeks. As for completely equipping all cars by Aug. 1, 1909, the rate set by the commission, the company's inquiry of the wheel-guard makers had shown that it would be practically impossible to deliver and apply so many guards within such a brief period. Commissioner Maltbie asked whether the wheel guards already in service were being properly maintained and whether the elevation of the wheel guards had to be varied. H. H. Adams, superintendent of shops and equipment for the railway company, replied that both the automatic wheel guards and the old rigid, plow guards were being kept in good order. Should one of the trial wheel guards be removed for some reason, it is replaced for the time being by a plow guard rather than to have none at all. With the new wheel guards, great clearances are obtained—say 4 in. to 5 in.—so that trouble from striking paving blocks is less likely than with the rigid guards. The variations in height above the rail were due to differences in paving at various points on the routes.

The commission has not yet decided whether it will grant the desired extension to the Metropolitan Street Railway Company.

Finding in Boston & Worcester Street Railway Fare Case

The Railroad Commission of Massachusetts has issued the following decision in the case of the petition of the Mayor, the city solicitor and others of Marlborough and the Selectmen of Framingham regarding the increase of fare on the Boston & Worcester Street Railway:

"These petitions have been heard and considered together and by consent of all parties certain other municipalities have been heard. The petitioners contend that a recent increase of fare on this system is unreasonable.

"After the hearings were concluded the board requested and has received from the company comparative monthly statements of passenger receipts for January, February, March and April, 1908-1909, and has before it a comparative statement of earnings and expenses for the three months ending Dec. 31, 1907-1908, and a like statement from Jan. 1 to April 1, 1908-1909.

"A study of these statements and of the annual returns of the company, and our independent investigation of the property and the investment, convince us that the existing rate of fare is neither unreasonable nor excessive, and we therefore make no recommendation that the company decrease said rate. We reserve the right, however, either upon our initiative or upon complaint, to make recommendation to the company at the close of the financial year ending Sept. 30, 1909, or later, if occasion shall disclose.

"During the hearing certain recitals in the grants of location to some of the predecessors in title of the Boston & Worcester Street Railway were called to our attention. The legal effect of these recitals is not before us, and upon them we indicate no opinion. If they create enforcible obligations between the parties, appropriate remedy may be had in the courts of the Commonwealth."

Another Line in Washington Equipped with Pay-As-You-Enter Cars.—The Washington Railway & Electric Company, Washington, D. C., has placed pay-as-you-enter cars with longitudinal seats in operation on its Eleventh Street line.

Fare Reduction Asked in Massachusetts.—The selectmen of Westford have asked the Massachusetts Railroad Commission to reduce the fare on the Lowell & Fitchburg Street Railway between Westford Centre and Brookside from 10 cents to 5 cents. A hearing will be given by the commission.

Readjustment Asked by Employees at Evansville, Ind.—The agreement between the employees of the Evansville & Southern Indiana Traction Company, Evansville, and the company regarding wages and the terms of service entered into in 1907 expires in July and the employees have asked that the conditions of the agreement be modified. The men desire that the present rate of wages, 17, 18 and 19 cents, according to the term of service, be so changed that there shall be only two grades of employees, who shall receive 19 and 20 cents an hour. They also desire that the clause covering the employment of non-union men be changed. On May 17, F. M. Durbin, general manager of the company, had not replied to the communication of the employees in which their demands were stated.

New Schedule on Hartford-Rockville Line.—Having completed new turnouts at Cove Lane and Woodland, the Connecticut Company has readjusted the schedule of its line between Hartford and Rockville and has reduced the running time between the two cities from one hour and a half to one hour and a quarter. The first car leaves Rockville for Hartford at 6:22 a. m. and the second at 6.52 a. m. Thereafter cars leave hourly at 52 minutes past the hour until 10.52 p. m. On Sunday the first car leaves Rockville at 5.62 a. m. Thereafter the schedule is the same as on week days. The first car leaves Hartford for Rockville at 7.07 a. m. Thereafter cars leave hourly until 4.07 p. m., then 4.37 p. m., 5.07 p. m., 5.37 p. m. and then hourly at 7 minutes past the hour until 10.07 p. m. On Sunday the first car from Hartford leaves at 7.07 a. m. Thereafter cars leave at 7 minutes past the hour until 11.07 p. m.

Accident on Chicago Elevated Railroad.—More than 20 persons were injured in a collision on May 17 between a local Ravenswood and a Wilson Avenue express train of the Northwestern Elevated Railroad. The local train had stopped preliminary to approaching the Kinzie Street station and the express crashed into it from the rear. Mason B. Starring, president of the Northwestern Elevated Railroad, is reported by the Chicago *Record-Herald* to have said: "The collision was unfortunate, but in my opinion it was due to the carelessness of the motorman in charge of the express train. There is no safety device, automatic or otherwise, yet known that can overcome human carelessness. Our employees are under the strictest orders with regard to the operation of trains and our investigation has failed to disclose any reasonable excuse for the motorman not stopping his train. He was running in broad daylight and on a straight track."

Fast Service Between the Ohio River and Western Points.—The Youngstown & Ohio River Railroad, Youngstown, Ohio, has established an hourly service between Lisbon and East Liverpool, on the Ohio River. In connection with the lines of the Northern Ohio & Light Company between Cleveland and Canton and the lines of the Stark Electric Railroad, Alliance, Ohio, between Canton and Salem, good service is furnished between Cleveland and East Liverpool. Connections may also be made over the Lake Shore Electric Railway at Cleveland for Toledo and for points in Indiana. The Youngstown & Ohio River Railroad was described in the ELECTRIC RAILWAY JOURNAL of June 13, 1908. It connects Salem, Washington, Leetonia and East Liverpool and is built almost entirely on a private right of way. At East Liverpool a new Y has been built, which enables the operators to turn the cars. The absence of this improvement compelled the company to furnish only a temporary service for several months and materially increased the time over the road.

Providence Company Discontinues Park Band Contribution.—The Rhode Island Company, Providence, R. I., will not contribute to the fund for music at Roger Williams Park during the summer this year. The policy of the company in the past has been to contribute $2,000 each year toward defraying the expense of music at the park, the city expending about $2,500 for the same purpose. The company began the practice of contributing to the fund for bands at the park many years ago, but the territory in the vicinity of Providence has grown so rapidly that demands have been presented to it by other communities to which the company's lines extend for similar donations for parks located within their boundaries. The company feels that in view of these circumstances it must refuse hereafter to contribute to the fund for Roger Williams Park, as it cannot afford to contribute to the funds in all of the separate municipalities. It seems also that the concerts at Roger Williams Park are less popular than when first begun, and consequently the number of passengers carried by the company to the park has decreased materially.

Transfers in Buffalo.—Two resolutions have recently been introduced in the Council of Buffalo asking the International Traction Company to modify the transfer system adopted by it on March 21, 1909, and described briefly in the ELECTRIC RAILWAY JOURNAL of Feb. 27, 1909, page 391. A suit involving the legality of the new system is pending in the Municipal Court before Judge Hodson, and Thomas Penney, president of the International Traction Company, issued the following statement after the introduction of the resolutions in the Council: "Our intention is to abide by the decision of the courts whatever may be the outcome. If the system be declared illegal we will not attempt to enforce it, while if the courts declare in our favor there will be no use in bringing further suit against the company. As I have received no communication from the Board of Aldermen in regard to submitting a copy of the transfer plan to that body I have nothing to say on that matter. I desire to state again that the company is not holding up the transfer system as unassailable. It may have its faults, it may work for the inconvenience of some of the patrons of the road, but the plan is the very best that the company has been able to offer."

Personal Mention

Mr. M. L. Newton has been appointed consulting engineer of the Waterloo, Cedar Falls & Northern Railway, Waterloo, Ia., with headquarters at Waterloo.

Mr. T. E. Rust has been appointed chief engineer of the Waterloo, Cedar Falls & Northern Railway, Waterloo, Ia., with headquarters at Waterloo, vice Mr. M. L. Newton, transferred.

Mr. H. D. Perkins has resigned as superintendent of bridges and buildings of the Illinois Traction System to become connected with the Standard Contracting Company, Cleveland, Ohio.

Mr. Edward Bock, formerly train dispatcher on the Metropolitan West Side Elevated Railway, Chicago, Ill., has been appointed superintendent of the Chicago & Milwaukee Electric Railroad with headquarters at Highwood, Ill.

Mr. C. N. Duffy, comptroller of the Milwaukee Electric Railway & Light Company, has been elected a member of the newly-created board of regents of Marquette University, Milwaukee. This is a non-sectarian board of prominent residents of the city, established to further co-operation and closer union of interests between the city of Milwaukee and the University.

Mr. H. W. Weber, storekeeper of the Metropolitan West Side Elevated Railway, Chicago, Ill., for the last four years, has accepted a position as general storekeeper for the Hudson & Manhattan Railroad, New York, and will enter on his new duties on June 1. Mr. Weber entered the service of the Metropolitan West Side Elevated Railway in the capacity of a clerk in the store-room about six years ago.

Mr. E. M. Addis has been appointed general manager of the Tri State Gas & Electric Company, Brattleboro, Vt., operating the Brattleboro Street Railway and the Brattleboro Gas Light Companies, which control the electric railway, electric light and gas properties in Brattleboro, West Brattleboro, Dummerston, Vt., and Hinsdale, N. H. Mr. Addis succeeded Mr. F. P. Woy, who resigned some time ago to open an office in Madison, Wis., as a consulting engineer.

Mr. D. Pfeil, Mr. A. Hettler and **Mr. H. Meyer,** of the Siemens & Halske Company, Berlin, Germany, are visiting the United States and will spend three or four weeks in studying electrical and mechanical development here. Mr. Pfeil is a director of the railway signaling department. Mr. Hettler is works manager at Wernerwerke and Mr. Meyer is an engineer on the railway staff. Mr. Pfeil visited the United States in 1894, and is impressed very much with the progress made in the intervening 15 years. The itinerary of the party embraces Schenectady, Niagara, Chicago, Cincinnati, Pittsburg, Washington and Philadelphia.

Mr. De Witt C. McMonagle, general manager of the Wallkill Transit Company, Middletown, N. Y., has been elected president of the company, and will hereafter act as president and general manager. Mr. McMonagle has been a resident of Middletown for many years, and has been identified with various local enterprises in Middletown. For 20 years he was senior member of the wholesale drug firm of McMonagle & Rogers. When he retired from the company he became manager of the Consumer's Light & Power Company, Middletown, and remained with the company until its property was sold to the Orange County Lighting Company. Mr. McMonagle is vice-president of the First National Bank and is treasurer of the Orange County Telephone Company. He was appointed general manager of the Wallkill Transit Company in March, 1907.

Mr. Cecil G. Rice, manager of credits of the Colonial Trust Company, Pittsburgh, Pa., has been appointed superintendent of the claim department of the Pittsburgh Railways Company, to succeed Mr. John Francies, who was recently elected warden of the Western penitentiary. Mr. Rice went to Pittsburgh from Fairmont, W. Va., in 1899, and entered newspaper work, in which he remained until 1904, when he became a special investigator attached to the Pittsburgh detective bureau. Mr. Rice resigned from police service in January, 1907, to become private secretary to Mr. James D. Callery, president of the Pittsburgh Railways Company, and later was appointed general agent of the company in charge of the employment department. In March, 1908, he entered the operating department of the Pittsburgh Railways Company, but in August, 1908, he was appointed manager of credits and of the bond department of the Colonial Trust Company, being elected a member of the Pittsburg Stock Exchange to represent that institution.

OBITUARY.

Bradford Shinkle, formerly vice-president of the Hemingray Glass Company, Covington, Ky., died on May 7, 1909.

Hugh H. Hamill, president of the Trenton Trust & Safe Deposit Company and a trustee of Princeton Theological Seminary, died at his home in Trenton, N. J., recently. Mr. Hamill was born in Lawrenceville, N. J., in 1851, and after graduating from Princeton University, established an office as an attorney at Trenton. He was president of the Real Estate & Tile Company, Trenton, and a director of the Public Service Corporation of New Jersey, the Mercer Trust Company, the American Light & Traction Company, the National Carbon Company and the Schenectady Trust Company.

Henry H. Rogers, of the Standard Oil Company, who died on May 19, was interested in many railroads and electric railways, although not actively associated with the companies. After many years of independent operation in the early business, Mr. Rogers became connected with Charles Pratt, who with his associates largely controlled the oil trade in New York and vicinity, and in 1874 in connection with Mr. Pratt, Mr. John D. Rockefeller, Mr. William Rockefeller and others organized the Standard Oil Company, in the management of which he was active until his death. Mr. Rogers was president of the Richmond Light & Railroad Company, Staten Island, and was financially interested in the Atlantic Coast Electric Railway, Asbury Park, N. J., and the Staten Island Midland Railway, Staten Island, of which his son, Mr. H. H. Rogers, Jr., is an officer. Mr. Rogers was also a director of the United States Steel Corporation, the Atchison, Topeka & Santa Fe Railroad, the Chicago, Milwaukee & St. Paul Railroad, the Delaware, Lackawanna & Western Railroad, the Union Pacific Railroad, the National Transit Company and many other railroad and industrial corporations.

Ervin G. Long, who has been engaged in the electric railway equipment business in New York for more than 14 years, died very suddenly on May 18. Though he had previously an extensive experience in the railway and electrical field, Mr. Long first became known in the street railway business through his connection with the Peckham Truck Company. Afterwards he was vice-president and manager of sales of the Peckham Manufacturing Company, severing his connection with that concern about the time of the resignation of Mr. Edgar Peckham. He then engaged in a general supply business for his own account, giving particular attention to the export trade. In December, 1908, Mr. Long returned from a five months' trip to Japan, where he negotiated important special business for American manufacturers. Two years ago Mr. Long organized the E. G. Long Company, with himself as president and Mr. E. H. Mays as secretary and treasurer. The E. G. Long Company does a large domestic business throughout the country in addition to its export trade, and the business of the company will not be affected by Mr. Long's death, it being continued without interruption at the present address by his former associates, with Mr. E. H. Mays in charge.

NEW PUBLICATIONS

Trolley Trips Through New England and Hudson River Valley. Hartford, Conn.: The Trolley Press, 1909; 132 pages; illustrated. Price, 16 cents by mail.

The 1909 edition of this publication has been enlarged and its scope increased to include all New England and the Hudson River Valley. The information has been brought up to date and is official. Forty maps show the routes traveled by the different lines, and numerous half-tone engravings well printed convey an excellent idea of the territory through which some of the lines extend. In addition, there is a brief description of the principal routes, and the hotels and points of interest in the large cities are all given. The cities and the different routes are indexed separately. The routes of 11 main trips in New England, four main trips in the Hudson Valley and 35 side trips in New England are tabulated and indexed. There is also a complete itinerary of the trip between New York, Boston and Portland, Maine, and a map of the route and the connecting lines. There are innumerable trolley guides devoted to a limited territory or locality, and a number which have essayed to cover through trips, but none have, perhaps, succeeded better than "Trolley Trips Through New England and the Hudson River Valley" in presenting the matter in logical order and in bringing out forcibly the natural beauty and the historic and civic associations of the territory which they have taken for their special province.

Construction News

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

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

RECENT INCORPORATIONS

***Upper Broadway Railway, New York, N. Y.**—Incorporated to build a double-track street railway in Manhattan, 3½ miles long, from Twelfth Avenue along Manhattan Street to Broadway to St. Nicholas Avenue to Fort George Avenue. Capital stock, $750,000. Directors: M. D. Wilson, A. F. Wainwright and Chas. F. Hedden, New York.

***Troy Mercantile Milling & Power Company, Troy, Ore.**—Incorporated to construct an electric railway from Troy to Hurricane Creek, a distance of about 12 miles. Capital stock, $20,000. Incorporators: R. W. Barkham and H. E. Merryman. Principal office, Enterprise.

California & Centerville Street Railway Company, Harrisburg, Pa.—Incorporated to construct a 5-mile street railway in Washington County. Capital stock, $30,000. Incorporators: M. H. Francies, president; W. J. Weaver, H. C. Dunn, Jos. McLain and Harris Booker, California. [E. R. J., April 24, '09.]

***Westmoreland & Red Boiling Springs Railroad, Nashville, Tenn.**—Application has been made by this company for a charter to build a railway from Westmoreland to Red Boiling Springs. Capital stock, $5,000. Incorporators: A. R. Dean, H. C. Smith, E. K. Lamb, W. A. Smith and J. B. Kemp.

***Metropolitan Steam & Electric Railway, San Antonio, Tex.**—Chartered in Delaware to build electric railways in Texas. Capital stock, $100,000. Incorporators: J. W. Marmion, San Antonio; M. Kaufman and E. L. Squires, Wilmington, Del.

FRANCHISES

Mesa, Ariz.—A franchise has been granted to Dr. A. J. Chandler, president of the Consolidated Canal Company, for a double-track electric street railway on Main, Macdonald and Center Streets. [E. R. J., Feb. 13, '09.]

***Los Angeles, Cal.**—The Board of Supervisors has granted to P. Janss a franchise to build a single or double-track railway along Stephenson Avenue and Whittier Road.

***Monterey, Cal.**—H. R. O'Bryan has applied to the Board of Supervisors for a franchise to build a street railway over certain streets in Monterey County.

Hartford, Conn.—The Legislature has extended the franchise of the East Hartford & Windsorville Street Railway to Nov. 1, 1910, in which to build its railway from East Hartford to Windsorville. [E. R. J., Feb. 1, '08.]

Rantoul, Ill.—The City Council has granted the Chicago, Kankakee & Champaign Electric Railroad, Kankakee, a franchise for an electric railway on Church Street in Rantoul. [E. R. J., Feb. 20, '09.]

North Manchester, Ind.—The City Council has granted a franchise to J. A. Barry representing the Wabash & Northern Traction Company for an interurban railway from Wabash to Warsaw. This grant completes the last link in the chain of franchises required.

New Orleans, La.—An ordinance providing for the sale of a street railway franchise was introduced recently in the City Council by Mr. Virgin, by request. The franchise is to be sold by the Comptroller at public auction in block, the bidder offering to pay no less than one-half of 1 per cent of the gross annual income, less taxes, to be awarded the franchise for a period of 50 years, from June 30, 1910.

Worcester, Mass.—The Board of Aldermen has given the Worcester & Providence Street Railway an extension of time until Dec. 1 in which to lay its tracks in Worcester. [E. R. J., May 15, '09.]

Dewitt, N. Y.—The Town Board has granted the Syracuse Rapid Transit Railway a franchise to cross the thoroughfares between Eastwood and East Syracuse. It is said to be the intention of the company in the near future to begin operations looking toward the double tracking of the line between Syracuse and East Syracuse by way of the Burnet Avenue route.

Port Jervis, N. Y.—The Common Council has granted an electric railway franchise to the Port Jervis & Delaware Valley Railroad in Port Jervis, from the Barrett Bridge, through Pike, King and Third Streets and under the Erie Railroad to the north side of Jersey Avenue. The franchise provides that construction must begin between Jan. 1 and July 1, 1910. F. A. Sawyer, president. [E. R. J., Dec. 19, '08.]

Cincinnati, Ohio.—The first public meeting before the Council committee on street railways on the franchise requested by the Southwestern Ohio Traction Company was held on May 21. William M. Ampt stated that the city is not properly safeguarded by the franchise. It developed that the Cincinnati, Wilmington & Xenia Traction Company, which will ask for a franchise similar to the one sought by the Southwestern Ohio Traction Company, proposes to build a line between Cincinnati and Columbus.

Marshfield, Ore.—J. F. Clark and J. H. Somers have been granted a franchise by the County Commissioners for an electric railway over the county road between Marshfield and Coquille. The holders of this franchise are said to be connected with the move of the Coquille Mill & Mercantile Company in recently securing a franchise for an electric railway and power plant in Coquille. [E. R. J., April 10, '09.]

Charleston, S. C.—The Charleston & Summerville Electric Railway has petitioned the Board of Aldermen asking for an extension of time on its franchise. The company is constructing an electric railway between Charleston and Summerville, 25 miles.

Chattanooga, Tenn.—An ordinance has been introduced in the Board of Aldermen granting to S. W. Devine, Chattanooga, a 40-year franchise for the construction and maintenance of a street railway in Chattanooga. [E. R. J., Feb. 13, '09.]

Lynchburg, Va.—The Board of Aldermen has granted a franchise to the People's Improvement Company for a street railway to Fairview Heights, about 1 mile from the city. [E. R. J., May 22, '09.]

Wheeling, W. Va.—The City Council has granted a franchise to the Rapid Transit Railway to construct an electric railway over certain streets of Wheeling. A. M. Shenk, Wheeling, president. [E. R. J., April 10, '09.]

Centralia, Wash.—The City Council has passed the franchise granting the Twin City Light & Power Company the right to build and operate an electric railway on the streets of Centralia. The franchise was vetoed by Mayor J. P. Guerrier. [E. R. J., April 17, '09.]

TRACK AND ROADWAY

Birmingham & Edgewood Electric Railway, Birmingham, Ala.—This company is reported being organized by residents of Birmingham to build a 3½-mile street railway from the end of the South Highlands line to Red Mountain. Among those interested are D. M. Drennen, A. G. Smith and G. T. Brazleton. [E. R. J., Oct. 17, '08.]

Honolulu Rapid Transit & Land Company, Honolulu, Hawaii.—This company expects to build a 5-mile extension during the present year between Honolulu and Pearl Harbor.

Chicago (Ill.) Railways.—It is announced that this company will extend its line along Fullerton Avenue from Milwaukee Avenue west to Fortieth Avenue, a distance of 1¼ miles.

Danville, Kankakee & Crescent Traction Company, Crescent City, Ill.—It is stated that this company has begun surveying the route for its proposed electric railway between Kankakee and Danville. J. P. Sterrenberg, Crescent City, is one of the incorporators. [E. R. J., April 24, '09.]

***Mascoutah, Ill.**—A meeting of citizens of Mascoutah was held there recently, at which Edward L. Thomas and David O. Thomas, of Belleville, presented a proposition for the construction of an electric railroad between Mascoutah and Belleville, which was accepted. A subscription list was put into circulation for the purpose of raising $30,000 for the right-of-way and construction and $10,000 was raised before adjournment.

Springfield & Jacksonville Electric Railway, Springfield, Ill.—This company has filed a deed making the St. Louis Trust & Savings Bank trustee in an authorized bond issue of $800,000. The company expects to begin work about June 1 on its projected electric railway between Springfield and Jacksonville. The greater portion of the right-of-way between the two cities has been secured and negotiations are in progress for the purchase of the remainder. The work of grading has been awarded the Franklin Construction Company, St. Louis, Mo. The Springfield City Council will be petitioned for a franchise within a few weeks. Headquarters, 500 Myer Building, Springfield. [E. R. J., April 10, '09.]

Dixon, Rock Falls & Southwestern Electric Railway, Tampico, Ill.—This company has let a contract for the construction of its proposed railway from Sterling to Rock Island to the Burns Construction Company, Anderson, Ind. About 5 miles of track in the vicinity of Tampico was laid last fall. The contract calls for completion of the line into Rock Island by 1911, and the plan is to finance the railway by issuing bonds for construction of the line

in sections as the work progresses. Work will be started at Sterling and it is proposed to extend south to Rock Falls, thence to Tampico, Hooppole, Geneseo and Rock Island.

Ft. Wayne, Ind.—It is reported that the plan of building an electric railway from Ft. Wayne to Chicago via Goshen has been revived by Henry W. Williams, Ft. Wayne.

Sioux City, Ia.—The interests back of the proposed Sioux City, Climbing Hill & Ida Grove Electric Railroad have secured the services of R. H. Baldwin, Chicago, Ill., to examine and prepare a preliminary report upon this project, which is a 60-mile freight proposition serving a heavy stock shipping district without adequate railroad facilities. [E. R. J., March 12, '09.]

Waterloo, Cedar Falls & Northern Railway, Waterloo, Ia.—This company expects to let contracts within the next few weeks for the construction of two concrete culverts.

Manhattan City & Interurban Railway, Manhattan, Kan.—Joseph T. West, secretary of this company, which is building a street railway in Manhattan, advises that 2 miles of track are completed, together with the car house and power station. It is expected that the line will be in operation on June 1.

Benton Harbor-St. Joe Railway & Light Company, Benton Harbor, Mich.—This company has awarded a contract to McLane & Company, Detroit, for the grading of a 10-mile extension from Benton Harbor to Colonia. Contracts for material for this new line were awarded as follows: Rails from the Carnegie Steel Company; overhead material from the Electric Service Supplies Company; poles from F. Cartwright, South Bend, Ind.; ties from Lombard & Rittenhouse, Hastings, Mich.

Marquette County Gas & Electric Company, Ishpeming, Mich.—This company advises that it is rebuilding its line between Ishpeming and Negaunee.

Anoka-Minneapolis Suburban Railway Promotion Company, Minneapolis, Minn.—Announcement is made that this company will have surveyors in the field within the next week on the preliminary survey. The railway will extend from Anoka to Minneapolis. [E. R. J., April 10, '09.]

Kansas City & Olathe Electric Railroad, Kansas City, Mo.—This company has begun the work of extending its line from Shawnee to Greenwood, a distance of 3 miles. It is the plan to extend the railway to Lawrence.

Buffalo & Lake Erie Traction Company, Buffalo, N. Y.—This company has placed an order for 800 tons of 9-in. girder rail with the Lorain Steel Company for its Buffalo terminal construction. The company has also placed an order with the Pennsylvania Steel Company for about $20,000 of special work to be installed in Buffalo.

Hudson & Manhattan Railroad, New York, N. Y.—This company announces that it will construct 12 miles of single track during the present year.

***Ardmore, Okla.**—It is reported that a deal is under way to build an electric railway from Ardmore to Springer, Okla., and that the Lorena Park Amusement Company is interested. Among those interested are: W. C. De Witt and Burt A. Simpson, Ardmore, and James C. Mort.

Columbus, Plain City & Urbana Traction Company, Columbus, Ohio.—Charles A. Heath writes that this company has been incorporated for the purpose of building a railway to connect Columbus, Plain City and Urbana. Contracts have not yet been awarded nor any other preliminary work taken up beyond filing the articles of incorporation. Headquarters, 711 Harrison Building, Columbus. [E. R. J., May 15, '09.]

Portland Railway, Light & Power Company, Portland, Ore.—This company advises that it expects to build 7 miles of new track during the present year.

Central Pennsylvania Traction Company, Harrisburg, Pa.—This company expects to begin soon the construction of about 1½ miles of new track in Harrisburg. Material for this work has been purchased.

Pittsburgh (Pa.) Railways.—This company is said to be completing plans for extending its lines from West Washington into the industrial section of Washington, connecting with the Canonsburg line at Tylerdale and forming a loop around the west and north sides of town.

Waynesburg & Monongahela Street Railway, Waynesburg, Pa.—It is stated that this company, which will build an electric railway line from Waynesburg to the Monongahela River this year, has practically completed negotiations for the taking over of the Brownsville, Masontown & Smithfield Street Railway, which already has a section of its railway built. The plans of the latter concern call for the construction of an electric railway from Masontown across the Monongahela River to Carmichaels to connect with the Waynesburg & Monongahela Street Railway and also connecting with the West Penn Railways at Masontown. W. J. Sheldon, vice-president and general manager. [E. R. J., March 27, '09.]

Montreal & Southern Counties Railway, Montreal, Que.—Contracts have been awarded by this company as follows: Orders for special steel rails and steel tubular poles have been placed, and special brackets for the Victoria Bridge ordered from the Monarch Electric Company, Montreal; trolley poles to A. H. Cummings, Coaticook; special switch ties to Rixon-Ainslie-Stoddard Company, Owen Sound; special track work to the Montreal Steel Works and the Canadian Ramapoo Iron Works, Niagara Falls; spikes to the Nova Scotia Steel Company. [E. R. J., Jan. 9, '09.]

Chicago, Burlington & Quincy Railway, Deadwood, S. D.—This company, which operates an electric railway between Deadwood and Lead, is considering the extension of this line to Spearfish Gulch.

***Watertown, S. D.**—It is stated that E. Stanley, E. E. Simpson and C. E. Edwards and capitalists from Des Moines, Ia., have let to the Chicago Engineering Construction & Security Company a contract to build an electric railway between Watertown and Lake Kampeska, 6 miles.

Johnson City (Tenn.) Traction Company.—This company expects to award contracts during the next two weeks for the building of a 1½-mile extension.

Wheeling (W. Va.) Traction Company.—G. O. Nagle, general manager of this company, states that the improvements to be made to the lines of the company during the present year consist of the rebuilding of 3 miles of track, purchase of eight new cars and various other changes in connection with permanent betterments. Orders were placed last week for 112,000 lb. of copper, feeder and trolley. There is no increase in the capacity of the power stations contemplated for the present year.

Rapid Transit Railway, Wheeling, W. Va.—This company, recently incorporated under the laws of West Virginia with $1,000,000 capital stock, has organized by electing A. M. Shenk, president; Edward Steiffel, vice-president, and J. D. Merriman, secretary and treasurer. This company proposes to build an electric railway connecting Pittsburgh and Wheeling. [E. R. J., April 10, '09.]

Sparta-Melrose Electric Railway & Power Company, Sparta, Wis.—J. N. Braun, president of this company, advises that the right of way for this railway has been purchased. The proposed line will connect Sparta and Melrose, 28 miles. The company intends to operate a McKeen motor car and a General Electric gasoline-electric car. Several bridges will be built, but contracts have not yet been let for them, or for the repair shops and a car house, which will be erected at Sparta. Capital stock authorized, $300,000, of which $200,000 has been issued. On May 1 the company placed on the market an issue of $300,000 in 5 per cent, 40-year first mortgage bonds to be secured by a sinking fund. The Western Transportation Company, American National Bank Building, St. Paul, Minn., has taken over the holdings of the Sparta-Melrose Electric Railway & Power Company and will construct the line. Officers: J. N. Braun, St. Paul, Minn., president and general manager; H. O. Sargeant, vice-president; Asa B. Karns, secretary; E. A. Schwedler, Lacrosse, Wis., treasurer; Bert Cummings, superintendent; Clayton Oehler, Sparta, chief engineer. [E. R. J., July 4, '08.]

SHOPS AND BUILDINGS

Public Service Corporation, Newark, N. J.—This company has awarded to the F. D. Hyde Company, New York, N. Y., the contract for the general work involved in the construction of its proposed Hoboken terminal station.

Central Pennsylvania Traction Company, Harrisburg, Pa.—This company is building a new concrete car house in Harrisburg. Material has been purchased.

POWER HOUSES AND SUBSTATIONS

Frederick & Middleton Railroad, Frederick, Md.—This company has placed a contract with the Erie City Iron Works for 1 165-hp, high-pressure stationary boiler to be in place about June 15.

Pictou County Electric Company, Ltd., Stellarton, N. S.—This company, formerly the Egerton Tramway Company, Ltd., which has recently taken over the New Glasgow, Ltd., Company, advises that contracts have been placed for engines, generators, condensers, poles, etc., during the past month to the amount of about $35,000.

Johnson City (Tenn.) Traction Company.—This company has purchased recently 2 120-kw G. E. 500-volt motor-generator sets.

Manufactures & Supplies

ROLLING STOCK

Interstate Railways, Philadelphia, Pa., will purchase a number of new cars for service on its various lines.

Waterloo, Cedar Falls & Northern Railway, Waterloo, Ia., is in the market for five single-truck 30-ft. city cars for September delivery.

El Paso (Tex.) Electric Railway lost one locomotive and three cars in a fire which destroyed several of the company's buildings.

Columbus Railway, Light & Power Company, Columbus, Miss., will purchase within the next two months three sets of double trucks with 4-ft. 6-in. centers and 33-in. wheels.

Pacific Electric Railway, Los Angeles, Cal., it is reported, will purchase the 50 cars which it was reported in the ELECTRIC RAILWAY JOURNAL of May 15, 1909, it contemplated constructing.

Wheeling (W. Va.) Traction Company, reported in the ELECTRIC RAILWAY JOURNAL of Dec. 19, 1908, as contemplating the purchase of several double-truck cars, will order eight new cars this week.

Lowell & Fitchburg Street Railway, Ayer, Mass., mentioned in the ELECTRIC RAILWAY JOURNAL of April 3, 1909, as having lost some rolling stock by fire, has ordered two cars from the Wason Manufacturing Company.

Philadelphia (Pa.) Rapid Transit Company has just purchased 10 more all-steel elevated cars, complete, from the Pressed Steel Car Company, Pittsburg. They will be built and equipped practically the same as the cars mentioned in the ELECTRIC RAILWAY JOURNAL of March 20, 1909.

Manhattan City & Interurban Railway, Manhattan Kan., has purchased four trailers from the Baldwin Equipment & Supply Company, Chicago, and four single-truck motor cars from MacGovern, Archer & Company, New York.

West Jersey & Seashore Railroad (Elec. branch of Penn. R. R.), Camden, N. J., has purchased several express cars from the American Car & Foundry Company, and three sets of motor and trailer trucks from the Baldwin Locomotive Works, Philadelphia.

Washington, Baltimore & Annapolis Electric Railway, Baltimore, Md., has ordered 27 interurban combination cars 50 ft. long and one express car of the same length from the Niles Car & Manufacturing Company, Niles, Ohio. It has also purchased 66 type 78-25 Baldwin trucks for use on these cars.

Wilkes-Barre & Wyoming Valley Traction Company, Wilkes-Barre, Pa., has purchased 10 semi-convertible compartment cars from The J. G. Brill Company. The cars will be 42 ft. over vestibule, 8 ft. 6 in. wide over sills, have wooden bodies and composite underframes and will be finished in cherry. Each car will be equipped with Allis-Chalmers air brakes and two Westinghouse 101-B motors.

New York & North Shore Traction Company, Roslyn, N. Y., has drawn the following specifications for the three semi-convertible cars reported in the ELECTRIC RAILWAY JOURNAL of April 17, 1909, as having been ordered from the G. C. Kuhlman Car Company:

Seating capacity.....48	Headlights .....Imperial
Length of body..33 ft. 4 in.	Motors.....West. 101-B
Over vestibule...43 ft. 4 in.	Registers .....Ohmer
Width over sills.. 8 ft. 3¾ in.	Sanders .....Lintern
Over posts at belt. 8 ft. 6 in.	Seats.....Hale & Kilburn
Bumpers .....Brill	Step treads, Universal or Mason
Destination signs.....Wason	Trucks.....Brill No. 27-F1
Gongs .....Dedenda	
Hand brakes.....Peacock	

Sacramento Electric Gas & Railway Company, San Francisco, Cal., is constructing 10 new cars in its own shops with the following details:

Type of car.....California	Curtain material..Leatheroid
Seating capacity.....48	Fenders .....Clark
Weight, total.....13¼ tons	Gears and pinions .....GE
Length of body..20 ft.	Headlights .....Boesch
Width over sills..7 ft. 8 in.	Motors GE-54
Over posts at belt. 8 ft. 2 in.	Paint .....Valentine
Height from top of rail to sills..... 2 ft. 6 in.	Registers .....Ohmer
	Sash fixtures.....Greenburg
Sill to trolley base. 9 ft. 4¾ in.	Seats .....Walkover
Body .....Wood	Seating material.....Ash
Interior trim.....Ash	Springs..Detroit Spring Co.
Underframe.....Ore. pine	Trolley poles.....Shelby
Brakes.....Rope and lever	Trolley base.....GE
Car trimmings, Greenburg & Sons	Trucks .....Company's
	Varnish .....Valentine
Control system.....K-10	Wheels .....Griffin

Cedar Rapids & Iowa City Railway, Cedar Rapids, Ia., has specified the one motor and one trail car, mentioned in the ELECTRIC RAILWAY JOURNAL of May 22, 1909, as being built by the Niles Car & Manufacturing Company, Niles, Ohio, to be 58 ft. long. The motor car will be single end, with passenger, smoking and baggage compartments, and the trailer will be double end, with but one compartment. Both cars will be mounted on Baldwin 84-30 trucks, and will be run in a train. The body length will be 47 ft. 4 in., over buffers 57 ft. 8 in., width over panels at sills 9 ft. 7½ in., over all 9 ft. 10 in., and height under sills to top of roof 9 ft. 6¾ in. The car bodies will weigh 36,000 lb., and the motor car will seat 54, while the trailer will seat 60. Other details of interest are: Janney M. C. B. drawbars, Standard forged-rolled steel wheels, four Westinghouse 75-hp motors, Nichols-Lintern air sanders, H. & K. No. 99-EE seats, Peter Smith No. 1 hot water heaters, and Edwards sash locks.

Southern Cambria Railway, Johnstown, Pa., has just ordered four interurban cars of the Pullman type from the Niles Car & Manufacturing Company, Niles, Ohio. The specifications follow:

Seating capacity.....50	Gongs .....Niles
Weight.....27,000 lb.	Hand brakes.....Lindstrom
Length over all...48 ft.	Heating system...Hot water
Width over all... 8 ft. 10 in.	Journal boxes....Symington
Sill to trolley base.. 9 ft. 5 in.	Motors GE-205
Body .....Wood	Roofs.....Steam coach
Interior trim.....Mahogany	Sanders .....Nichols-Lintern
Underframe .....Semi-steel	Sash fixtures.....Edwards
Brakeshoes .....Standard	Seats.....H. & K. 99-EE
Car trimmings.....Niles	Seating material, Plush and leather
Center bearings..Symington	
Control system.....GE	Trolley retrievers...Knutson
Couplers .....Niles	Trucks, type..Baldwin 78-25
Curtain material...Pantasote	Ventilators..... Niles
Pilots .....Niles	Wheels .....Standard
Gears and pinions.....GE	

Blue Hill Street Railway, Canton, Mass., has drawn the following specifications to be followed in the construction of its seven semi-convertible cars ordered from the Wason Manufacturing Company, besides those mentioned in the ELECTRIC RAILWAY JOURNAL of May 22, 1909:

Seating capacity.....32	Hand brakes.....Peacock
Length over vest...31 ft.	Heating system.Consolidated
Width over sills.... 8 ft. 6 in.	Headlights ...Crouse-Hinds
Over posts at belt.. 8 ft. 9 in.	Journal boxes...Symington
Height from top of rails to trolley base...12 ft. 6 in.	Registers .....International
	Seating material..Red plush
Body .....Wood	Trolley retrievers....Wilson
Interior trim.....Mahogany	Trolley base.Sterling-Meaker
Underframe .....Composite	Door fix.....Wallace S. Co.
Couplers.....Van Dorn	Safety tread.....Mason
Curtain fixtures....National	Track scrapers.....Root
Curtain material...Pantasote	Curtain rollers....Hartshorn
Fenders .....Pfingst	Signal lights.....Dietz
Gongs.....P. Wall Mfg. Co.	Trolley wheels and harps, Bayonet

The five 10-bench open motor cars are similar in all respects to the semi-convertible cars except that they will have a seating capacity of 50.

TRADE NOTES

Walter A. Zelnicker Supply Company, St. Louis, Mo., advises that Edward Elson, its general representative, now has his headquarters at Hotel Denechaud, New Orleans, La.

J. J. Nielsen, who has been associated with the engineering department of A. L. Drum & Company, Chicago, Ill., has resigned to accept a position with the Sanitary District of Chicago, where he will have charge of the drafting-room on electrical work. Mr. Nielsen is a graduate of Purdue University, class of 1905.

Root Spring Scraper Company, Kalamazoo, Mich., advises that the Root spring scraper (formerly manufactured by the Kalamazoo Railway Supply Company) will be more reliable than ever before on account of a new spring device which has recently been patented and which will prevent the scraper from dropping.

Castolin Company of America, St. Louis, Mo., announces that it has secured the sole agency in the United States for the Castolin process for brazing cast-iron. Results of this method in practice are shown in a recent publication issued through the office of this company, Wright Building, St. Louis, Mo.

Baldwin Locomotive Works, Philadelphia, Pa., has received an order for 18 interurban and four city short wheelbase trucks from the Michigan United Railways; six sets of trucks from the Buffalo, Lockport & Rochester Ranlway, and five sets of interurban trucks from the Conneaut & Erie Traction Company.

Slack Manufacturing Company, Springfield, Vt., is a partnership formed by W. W. Slack, president of, and H. K. Parkman, secretary of Gilman & Son, Inc., Springfield, Vt., and G. C. Parker, sales manager of Wm. J. Smith Company, New Haven, Conn., for the purpose of manufacturing and selling abrasive metal cutters. Messrs. Slack, Parkman and Parker will continue to hold their present positions with their respective companies.

Dorner Railway Equipment Company, Chicago, Ill., has sold the Chicago, Lake Shore & Northern Indiana Railway, South Bend, Ind., 30 Westinghouse No. 49 motors; the Chippewa Valley Railway, Light & Power Company, Eau Claire, Wis., three GE-1000 motors; the Cedar Rapids & Iowa City Railway & Light Company, Cedar Rapids, Ia., one 18-ft. Brownell car, rebuilt and equipped with Westinghouse 12-A motors; the Albia Interurban Railway, Albia, Ia., one 18-ft. car fitted with GE-52 motors; and the Parsons Electric Railway & Light Company, Parsons, Kan., three 10-bench open cars, equipped with Brill trucks, GE-800 motors.

J. G. Brill Company, Philadelphia, Pa., has appointed Robert H. Thompson representative of The J. G. Brill Company and of its constituent, the American Car Company, in Colorado, South Dakota, North Dakota, Montana, Utah, Wyoming, New Mexico and Western Texas. Mr. Thompson's headquarters will be at Denver, Col. Mr. Thompson, who is a son of George Thompson, superintendent of motive power of the Denver, Northwestern & Pacific Railroad, is a graduate in mechanical engineering of the University of Nebraska, and for the past three years has been with the Buda Foundry & Manufacturing Company, Chicago, and the Engineering & Equipment Company, Denver.

Crocker-Wheeler Company, Ampere, N. J., reports the following recent orders: Two 1999-kva, 6600-volt, 3-phase, 25-cycle alternating-current generators for the Nordberg Manufacturing Company, Milwaukee, Wis.; an 800-kw, 575-volt, direct-current generator for the Houston (Tex.) Electric Company; two 3-phase, 2300-volt, 50-cycle alternators, having a combined capacity of 550 kva, for the municipal plant at Pasadena, Cal.; a motor-generator set consisting of a 3-phase, 60-cycle, 2300-volt, synchronous motor and a 575-volt, direct-current dynamo, having a capacity of 300 kw, for the Boise Valley Railway Company, Boise, Idaho; a 100-kw generator with a range in potential of from 125 to 250 volts, for Charles Wouter, Chicago, and a similar order from the Timken Detroit Axle Company, Detroit, Mich., for a 100-kw, 250-volt, direct-current generator; a Crocker-Wheeler form W motor, having a capacity of 200 hp built for 230 volts, for the Hunt Engineering Company, Des Moines, Ia.; two 100-hp, 3-phase, 60-cycle induction motors of the wound-rotor type, rated at 100 hp each, for the Boston & Corbin Copper & Silver Mining Company, Boston.

Allis-Chalmers Company, Milwaukee, Wis., during March and April received a large number of contracts for plants averaging 400 hp, the aggregate of apparatus representing the large capacity of 61,985 hp, in the power and electrical field. One of the orders which the company received was from the Milwaukee Electric Railway & Light Company for two 1500-kw motor generator sets, one 500-kw balancer, six 2000-kw transformers, two 300-kw transformers, two 300-kw motor generator sets and a 300-kw generator of the water-wheel type, much of this apparatus constituting a "repeat" order. Other purchasers are: Utah Light & Railway Company, Salt Lake, Utah; Detroit United Railways, Detroit, Mich.; Intercolonial Railway of Canada, Moncton, N. B.; Milwaukee & Fox River Valley Railway, Elkhart Lake, Wis.; Pacific Gas & Electric Company, San Francisco, Cal.; Northern Idaho & Montana Power Company, Sand Point, Idaho; Michigan Power Company, Lansing, Mich.; La Porte Electric Company, La Porte, Ind.; Oak Park Power Company, Flint, Mich.; Maumee Electric Company, Maumee, Ohio, and Murphysboro Water Works, Electric & Gas Light Company, Murphysboro, Ill. During the past 90 days this company has also taken contracts for more than 30 steam turbines and generators, aggregating in capacity nearly 50,000 kw and is negotiating for the sale of more than double that number of units. Among the orders recently placed is one for a unit of 2000 kw for the Public Service Corporation of New Jersey, to be installed at Camden, another of 2000 kw purchased by the Stone & Webster Engineering Corporation for the El Paso (Tex.) Electric Company and a 2000-kw machine to be placed on a "repeat" order in the public service station of the city of Columbus, Ohio.

Pullman Company, Pullman, Ill., has awarded contracts for the construction of new buildings at its plant at Pullman, which will increase the capacity of the shops to 30,000 cars a year, or about one-third, and which will involve an expenditure, including the equipment for the shops, of about $3,000,000. The new plant will be devoted to the construction of all-steel freight and passenger cars, and will have a capacity of three all-steel passenger cars a day, increasing the passenger capacity to 175 a month, and 1500 steel freight cars a month. In a general way, the plans for new shops were outlined about two years ago, but were abandoned temporarily on account of the business depression, and the almost total cessation of car building which followed. Work has already been started on two erecting shops for passengers cars, each 420 ft. x 220 ft., with a transfer table between them for handling the car bodies. These are located to the east of the present buildings and are of steel construction. They will cost $400,000 and will be completed in 90 days. All of the new buildings planned are expected to be finished by Sept. 1, 1909. Next to the passenger shops will be an 8000-hp electric plant 200 ft. x 150 ft. which will furnish power for the passenger shops. The steel cabinet shop for finishing the interiors of the steel passenger cars will be connected with the present wood-finishing shop. It will be of the same dimensions as the power house. North of the cabinet shop will be the new brass foundry and finishing shop, 160 ft. x 80 ft.

ADVERTISING LITERATURE

Crocker-Wheeler Company, Ampere, N. J., announces bulletin No. 114 on coupled type a.c. generators.

Walter A. Zelnicker Supply Company, St. Louis, Mo., has mailed its Bulletin No. 84 listing the electric railway material it has for sale.

Stromberg-Carlson Telephone Manufacturing Company, Rochester, N. Y., is sending out folders describing a new compact magneto wall telephone and its oak, locust and "Krecose" (preserved hard maple) pins.

Okonite Company, New York, N. Y., has issued a folder explaining its use of the inspection stamp of the National Board of Fire Underwriters. Insulated wires which do not bear this official stamp are subject to rejection by the underwriters having jurisdiction.

J. G. Brill Company, Philadelphia, Pa., has issued the May number of *Brill's Magazine*. The principal features are descriptions of Baltimore traffic conditions, the convertible pay-as-you-enter cars for the Third Avenue Railroad, New York, N. Y., and the rolling stock for La Paz, Bolivia.

H. W. Johns-Manville Company, New York, N. Y., has issued a booklet on "Permanite" sheet packing for steam machinery and a pamphlet on its combination asbestos-asphalt J.-M. roofing. This publication includes an illustrated description of a successful blow-torch test on this roofing.

Buckeye Jack Manufacturing Company, Louisville, Ohio, has printed a catalog describing "Buckeye" compound lever track and automatic lowering jacks. The 10-ton automatic lowering jack has found particular favor with electric railways. Each type is illustrated and described in detail.

Western Electric Company, New York, N. Y., has issued a detailed description of the first Rateau regenerator installed in America. This regenerator is used with Western Electric equipment at the Chicago works of the International Harvester Company. The present bulletin is a reprint of a description originally published in *Power*.

Westinghouse Electric & Manufacturing Company, Pittsburg, Pa., has just issued Circular 1502, entitled Westinghouse Distributing Transformers, 5 to 50 Kw. In discussing this subject the circular contains much valuable information on alternating-current distribution, covering transformers, lightning arresters, insulators, cross-arms, etc. Considerable space is also devoted to underground and overhead construction applicable to congested and scattered districts. Information on potential regulating systems is also given. The circular contains 52 pages.

Lord Electric Company, New York, N. Y., announces the following bulletins: "F," the Con-Tro-La-Tor, which is a controller regulator with or without the reverse feature; "I," Garton's Multi-Vapo-Gap Lightning Arrester for line and car service; "J," Garton's Multi-Vapo-Gap Signal Lightning Arrester for the protection of all signal circuits. It has also issued Bulletin D, relating to laminated soldered rail bonds. The last publication contains 24 pages, and is profusely illustrated with views of the different types of soldered bonds manufactured by the company, of the methods of applying the bonds and of the apparatus required. There is also a price list of the materials and tools used in the work.