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Of this issue of the ELECTRIC RAILWAY JOURNAL 9000 *copies are printed.*

Advertising for Permanent Traffic

The summer season is always marked by the issue of handsome circulars intended to attract the attention of the pleasure-seeking tourist. The number of such circulars published this year by the electric lines is far greater than ever before, and undoubtedly in many, if not most, of the cases is money well spent, but the practice suggests the thought that if so much attention can profitably be given to increasing the riding during a few months of every year, is it not worth while to pay equal attention to advertising for permanent traffic. This need not necessarily take the form of the usual elaborate circular. Timetables, small folders, and even photographs of interesting points along the line, framed and hung in hotels and elsewhere, where they can be seen by strangers, can be, and have been, of great advantage. The practice in cities which are visited by many tourists often offers good suggestions. In one, posters are mounted in bulletin boards at the railroad station descriptive of the points which can be reached by trolley. In another, a small guide book is sold by conductors at a nominal price. The success of sight-seeing cars in many cities of the country indicates that people will pay well for a sight-seeing tour in a strange city, and patronize an electric railway car for this purpose if it offers the desired facilities.

City Planning and Congestion

The committee on congestion of population in New York has been actively endeavoring to secure a change in the building laws of the city, and thus to reduce the congestion of population not only in the lower east side, but in other parts of the city. A close relation has been found to exist between the population per acre and the death rate, as well as the morality and general welfare of the section concerned, as was shown by the exhibit made by the committee at the Twenty-second Regiment Armory last spring, and also in pamphlets published since that time under its auspices. The subject of city design is very closely allied with that of transportation, because one of the chief means of reducing congestion is the provision of cheap and adequate means of transit, and its problems are by no means confined to New York City. According to a report on the subject recently published by the secretary of the committee, scientific methods of city planning have been actively taken up in many American cities, including Boston, Philadelphia, St. Louis, Cleveland, Grand Rapids, Harrisburg, Hartford, as well as others. None, however, has gone into the subject as fully as most of the larger cities abroad, not only in England, but on the Continent. The modern reconstruction of Paris dates from the comprehensive plans executed by Napoleon III, but in practically all of the European municipalities there are provisions so that the city shall expand horizontally as well as vertically, and that sites for parks, playgrounds and school houses shall be reserved. Some of the other principal features guaranteed by their system of design are a proper supply of water and drainage, the suitable position and arrangement of the buildings so as to secure an adequate amount of sunshine in the rooms occupied, regulation of the width of the streets and sidewalks so as to be in accordance with the amount of traffic upon them, the use of the buildings in different sections of the city, limitation of the heights of the buildings to accord with the width of the streets, etc.

It is not claimed that good rapid transit facilities alone will insure the distribution of the population, because of the desire to secure the greatest return from land, but without them the other reforms would be hardly possible.

Inspecting Foreign Cars

The increasing number of through cars which are run over local systems from outside points requires that special attention shall be accorded to the inspection of the foreign rolling stock while it is in the hands of other companies than its owner. An obstacle to such inspection is the short time available for it, but it would seem that at least an effective external examination could be made by the receiving crew with the object of heading off the more patent causes of breakdowns and delays to traffic on the home system. Where a company maintains a starter at a system terminus that official may properly be charged with a cursory but skilful inventory of the condition of the arriving car, and much may be done to prevent the slight but trying failures which often tie up the service as badly as defects which are very expensive to repair. The kind of inspection which can be made in the few moments available must cover such points as the condition of air and hand brakes, the position and tightness of fenders, condition of the trolley and circuit breaker, readiness of the sand box for service, presence of any apparently loose brake shoes, condition of grab handles, steps, car floor and seats. These points can be ascertained very quickly by the crew of the home system, and the electrical tests can be omitted, unless some special reason leads the receiving crew and starter to believe that something is wrong. The point is that the more easily detected troubles should not be overlooked, since they may cause accidents or other casualties if neglected, and a suitable record should be kept and turned in by the men making the inspection, so that whenever a foreign car is received in poor condition the responsibility for the occurrence can be properly assigned, and any expenses for repairs paid for by the company to which they should belong.

Changing the Gear Ratio

The subject of gear ratio in relation to speed, acceleration and power consumption is a most important one, but usually it receives attention when some new motors are installed for the first time. The gear ratio then selected represents the balancing of a set of factors any one of which is liable to change within a few years after the decision has been made. In almost every case, whether city or interurban, the traffic grows and the number of stops increases accordingly. In consequence, acceleration tends to become more important than maximum speed. Finally a point is attained where an increase in the gear ratio would produce a considerable saving in power because the same schedule could be maintained by the increase in acceleration. The Brooklyn Rapid Transit Company is one of the railways which has undertaken to increase its gear ratios to meet changed conditions. In Brooklyn nearly all the lines converge toward either the Brooklyn or East River bridges so that a good part of every run is over crowded thoroughfares on which the original maximum speed is seldom attainable. The extension of the New York subway to the heart of Brooklyn's shopping center also introduces a large number of short-trip runs on which high schedule speeds are not essential. Further than this, the suburban territory, particularly that on the way to Coney Island, is being built up rapidly. It is clear that all of these conditions favored a decrease in maximum speed and an increase in acceleration. As the result of various increases in gear ratios, the company will secure an average saving of over 7.2 per cent in power consumption. This economy will not be offset by the cost of the change, as most of the alterations will be made on a maintenance basis. The action of the Brooklyn Rapid Transit Company is not necessarily an absolute criterion for others, but it emphasizes the wisdom of analyzing whether some departures from original practice would not be justifiable.

Boarding Cars with Platform Gates

An interesting decision was rendered early this summer by the New York Court of Appeals on the criminal effect of boarding a moving train of electric cars. The circumstances out of which the case arose were these: The plaintiff, a lawyer, intending to return from Coney Island on one of the defendant company's trains, boarded one of the cars while the train was moving slowly. Although the platform gate was closed, a guard opened it and allowed him to enter, after which he was arrested for getting on the train while in motion. He was taken to the station house, released on bail and, after a subsequent examination, discharged. He thereupon brought his action for false arrest and malicious prosecution. The judgment of the trial court, dismissing his complaint and declaring that he had no cause of action, was affirmed by the intermediate Appellate Court, whereupon the plaintiff appealed to the highest court in the State, by whom a decision has just been rendered.

The railway company claimed that under a section of the Penal Code his act was a crime. The section in point has the caption, "Riding on Freight Trains," and provides, among other things, that one "who gets on any car or train while in motion, for the purpose of obtaining transportation thereon as a passenger * * * is guilty of a misdemeanor." It was observed at the outset that if this contention was correct, then an act of such common occurrence as to be almost a characteristic trait of our human nature, without distinction of class or calling, is stamped with criminality. But the court took the position that the statute has no such meaning, that although the caption of the section is certainly not appropriate to all its subdivisions, the Legislature did not intend to change and to add to the law with a view to preventing accidents by making the common practice of getting on a train or car while in motion a misdemeanor. The argument of the court can hardly fail of conviction:

"Had the Legislature been moved to this enactment by the occurrence of accidents to the traveling public, its purpose would have been better and more completely expressed in prohibiting persons from getting off, as well as from getting on, a car while in motion."

In the unanimous opinion of the court the section should be construed as applicable to unauthorized and mischievous acts, such as stealing or getting a free ride by getting and standing upon some part of the train, and not to the inno-

cently impulsive acts of persons intending, in good faith, to become passengers. It was thought strange by the judges that if the section was entitled to the construction urged by the railway company's attorney, that he was unable to cite any case in which the courts have so held in the 30 years during which the law had been in effect. And, finally, the court was of the opinion that if the plaintiff, though intending to be a passenger upon the train, was defiant of the rules, or was disorderly or gave any justification for the treatment he received from the guard of the train, that those were matters for an affirmative defense by the company on the new trial which was ordered.

Of course, the court limited its duty to interpreting the existing law, and properly did not attempt additional legislation. It may be that the line of defense recommended by the court is sufficient, but if not, the statutes are clearly defective. To attempt to force one's way through the closed gate of an elevated or surface car is a very dangerous practice, and should be made a more serious offence than merely disorderly conduct.

The New Interurban Rules

The revisions of the new code of interurban rules prepared by the committee of the Transportation & Traffic Association, which were printed in tentative form in the Electric Railway Journal last week, should be carefully studied by the managements of all interurban electric railways before the Denver convention. We believe that the code, as it now stands, provides for safe, expeditious and altogether satisfactory operation of high-speed interurban electric cars on single-track roads, but, no doubt, the committee would be glad to receive from any one interested in the subject, criticisms and suggestions which might in any way improve the rules. The committee has given wide publicity to all of its deliberations in formulating the new code, and has urgently invited discussion. When the report is presented at Denver with any changes which the committee may decide to make in the meantime, sufficient study should have been given the rules that there will be little delay in adopting them in the form presented or in modifying them in any particular to meet the views of the majority of the members of the association present at the convention. It is quite probable that there are a few details in which the code might be improved, and, no doubt, there will be presented for consideration, either to the committee prior to the convention or on the floor of the convention, a number of suggestions for changes. The adoption of the code as a whole will necessarily require a compromise of opinion. The best recommendation of the new code is that it represents the consensus of experience and ideas of a number of conservative electric railway operating officers, and that, furthermore, in most of its essential details, it follows closely the procedure of the American Railway Association standard code, which is in general use by the steam railroads throughout the United States.

A casual study of the tentative revisions as printed last week reveals one or two points to which attention might be called. Rule 258, which outlines the procedure of delivering a train order to an agent or operator at a station, assumes that only a "19" order is to be delivered in this manner. This rule might be made to specifically cover the procedure for delivering a "19" train order and also a "31" order just as the procedure is specifically laid down in revised Rule 256. There is a conflict between Rule 104 in the interurban code and the corresponding rule in the tentative code of city rules to be presented to the convention at the same time. These rules relate to audible signals and in the interurban code, two bells from the motorman to the conductor is an emergency signal to pull down the trolley to the roof while five bells is a signal to watch the trolley. In the city rules these indications are reversed, and two bells indicate watch the trolley, while five bells indicate pull down the trolley. The conditions of interurban service are such that when a motorman desires the trolley to be pulled down it is usually in an emergency, and the signal must be given with the least possible delay, whereas the signal to watch the trolley usually permits of giving a longer time in its transmission. In this particular case the conflict might perhaps be overcome by changing the code of city rules rather than the code of interurban rules, for in city service the speeds are not so high and the emergencies requiring the trolley to be pulled down are not so frequent.

The new code is designed essentially for single-track operation. When the committee was appointed, more than a year ago, it took up the fundamental problem of formulating rules for single-track roads, not only because such a code of rules is the foundation on which rules for double-track roads could be framed, but also because the number of double-track interurban roads in operation is small compared with the mileage of single-track roads. The American Railway Association began in the same way many years ago by preparing a code of rules for single-track roads, and as the increased mileage of single-track was added, a separate code, based on that adopted for single-track operation, was formulated to cover the different situations encountered. Supplementary codes for three and four-track roads were subsequently adopted by that association and are in use to-day. The Transportation & Traffic Association might well assign to a committee next year the task of drawing up a companion code to cover the conditions on double-track interurban roads, following whenever possible the procedure of the single-track code prepared by this year's committee. This would be a much less difficult task than that which has devolved upon this year's committee. It would require the omission of such rules as Nos. 206 and 207, which are not applicable to double-track operation, and either the omission or modification of such rules as the revised rules 203A and 230, which might involve delays on a double-track road which are not called for by considerations of safety. The wording of a comparatively small number of the other rules would have to be changed somewhat, but for the most part the single-track rules could be adopted entire. For example, no change would be required in the rules covering the transmission of train orders nor in the general rules. With the formulation of these two codes the interurban electric railways, both single and double-track, would have for their guidance uniform and safe rules covering all general conditions of operation. The double-track code will, in the future, be a necessary supplement to the single-track code.

ROLLING STOCK STANDARDIZATION IN BROOKLYN—ORGANIZATION AND PRACTICE OF THE MECHANICAL DEPARTMENT

In recent issues of the Electric Railway Journal seven articles have been published on the rolling stock standardization of the Brooklyn Rapid Transit System. In this, the concluding article of the series, some particulars will be given of the organization and office practice of the mechanical department, which is directly responsible for the results obtained and the methods by which they are accomplished.

This standardization of equipment, or it might be termed rehabilitation work, was started on a well-defined basis in January, 1904, and has therefore covered a period of five and one-half years, having been completed July 31, 1909. In round figures the total cost of this standardization and reconstruction work has been $4,000,000 and the total number of cars on which equipment was standardized was 3423. Of this number 627 were elevated cars and the remainder were surface cars.

ORGANIZATION OF MECHANICAL DEPARTMENT

From time to time some necessary changes have been made in the organization of the mechanical department for the purpose of increasing its efficiency. A diagram of the present organization is shown in Fig. 1.

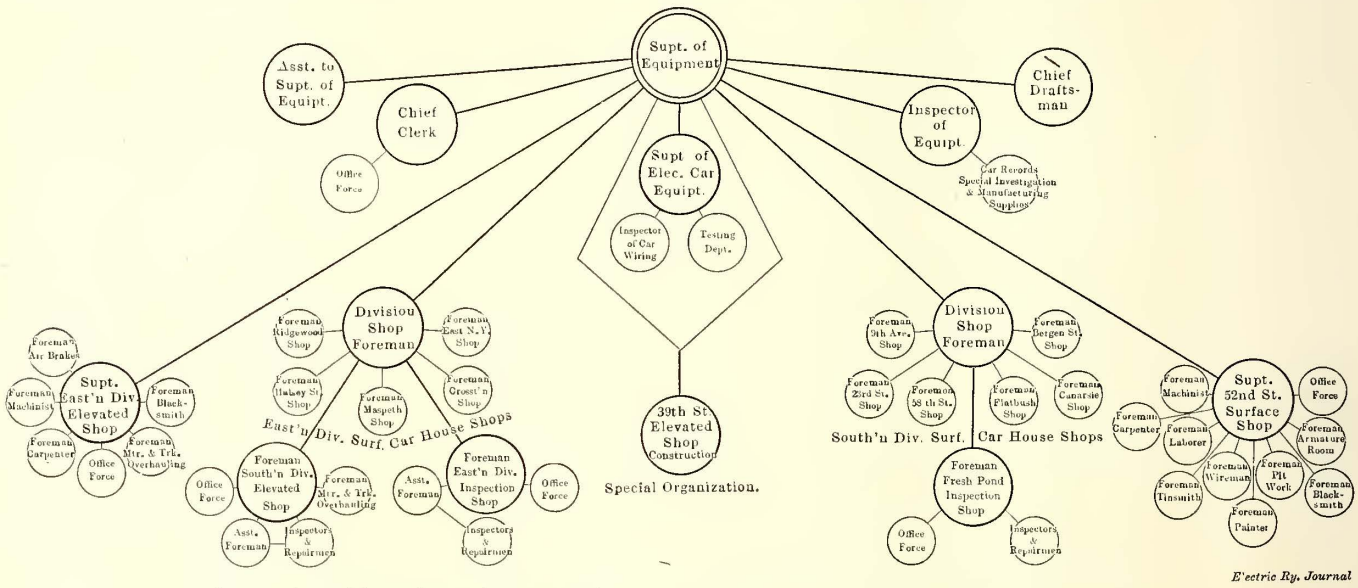


Fig. 1—Brooklyn Organization—Diagram of Organization of Mechanical Department

The office of the superintendent of equipment, who is the head of the mechanical department, is in the general office building of the Rapid Transit Company at 85 Clinton Street and all of the department work is supervised from that place. The superintendent of electric car equipment, chief draftsman, inspector of equipment and other assistants are also located in the same offices, so that all records and statistics necessary for use in connection with the proper maintenance of the equipment are readily obtainable. All work of a special maintenance character, as well as that relating to the reconstruction and standardization of the rolling stock, is planned and definite instructions forwarded from that office.

METHODS OF FILING DRAWINGS

When work of an extraordinary character is contemplated, such as special maintenance, reconstruction, construction of new cars, trucks or other equipment by builders and manufacturers, complete drawings are prepared in detail in the drafting room under the supervision of the chief draftsman and as directed by the superintendent of equipment. The tracings of such drawings are indexed and filed in a specially constructed cabinet, an illustration of which is shown in Fig. 2. It will be noticed that the cabinet is so arranged as to provide for the filing of all the various sizes of tracings and also has drawers for filing the card records of tracings, blue prints, pattern records and other details pertaining to the drafting room. In addition provisions are made to care for filing catalogs and storing various sample articles of which drawings are to be prepared.

In addition to the filing cabinet for tracings, which is located in the drafting room at the general office and is shown in Fig. 2, there is a filing cabinet consisting of drawers only at the Eastern Division Elevated shop. On the completion of each tracing a blue print is taken from it and is filed in the cabinet at East New York, where it is kept under bar and lock at all times purely for reproduction purposes in case of emergency. In this way the whole set of the tracings belonging to the mechanical department could be replaced from these prints should a fire or an accident occur to the tracings.

SHOP MANAGEMENT AND DATA

To properly maintain the cars on both the surface and elevated divisions in practically the same condition as when turned out of the construction shops as new or reconstructed, the Brooklyn Rapid Transit System has expended large amounts of money in building new shops and in reconstructing and re-equipping old ones; many of these shops have been described in articles of the Electric Railway Journal at various times in the past. There are four maintenance shops for the use of cars on the elevated division and 11 maintenance shops for use of the cars on the surface division which are equipped with tools. The shops used for inspection work only are supplied with a drill press, lathe, grindstone and emery wheel and a blacksmith's forge. The maintenance shops, however, at which overhauling work is done, are also equipped with cranes, some traveling and some jib, and other tools necessary for overhauling work.

On account of the large number of cars on the system, the extent of the territory over which they operate and large quantities and many types of equipment used, it was necessary to organize an elaborate system of records for following up the life and service of the equipment in a

thoroughly accurate manner. The work of caring for these detailed records comes under the charge of the inspector of equipment, and the detailed routine followed

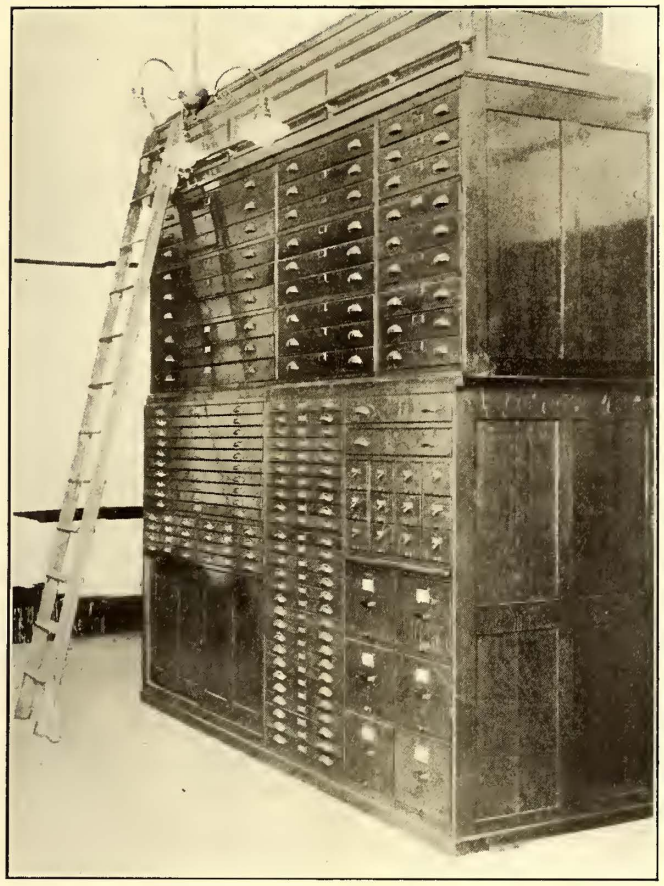


Fig. 2—Brooklyn Organization—Filing Case for Mechanical Department for Tracings, Records, Etc., in Drafting Room of Superintendent of Equipment's Office

was described in a recent issue of the ELECTRIC RAILWAY JOURNAL. An illustration of the cabinet, however, in which these records are kept is shown in Fig. 3. In connection

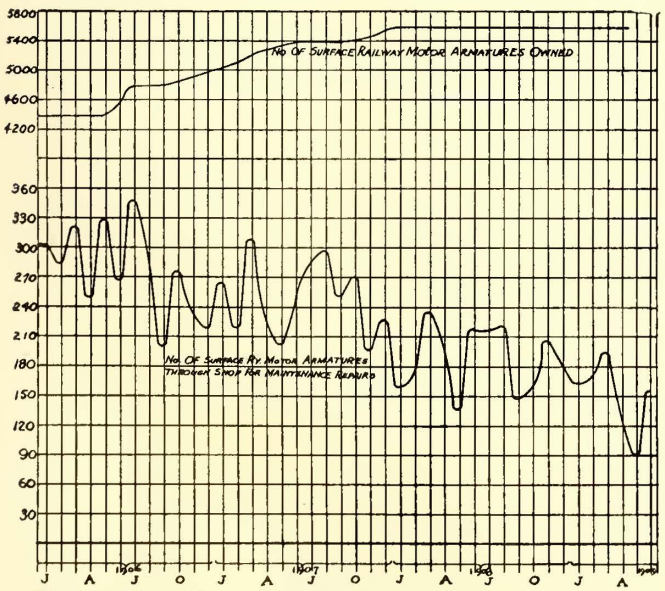


Fig. 5—Brooklyn Organization—Record of Surface Armature Repairs

with this system of records it should be stated that at the present time there are a number of owning companies in the Brooklyn Rapid Transit System and it is necessary to follow the records of all of the detailed equipment of each of these owning companies. This includes car-bodies, trucks, motors, controllers and other parts of the car equipment as well as the individual machine tools which form

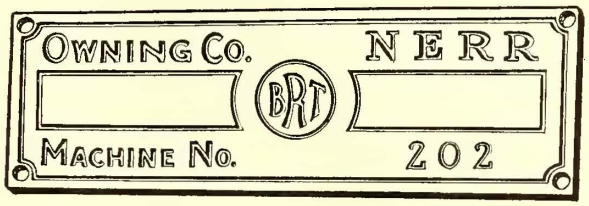


Fig. 4—Brooklyn Organization—Identification Plate

the tool equipment of each shop. The record of car equipment is handled by card record and by numbering the various parts in serial form. The machine-tool records are also kept on cards, but an identification plate, shown in Fig. 4, is attached by screws to each machine. This plate

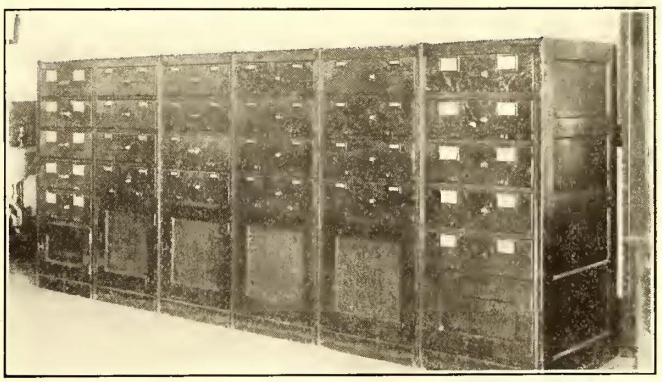


Fig. 3—Brooklyn Organization—Filing Cabinet for Card Records of Car Equipment in Superintendent of Equipment's Office

shows the serial number of that machine as well as the name of the owning company.

OPERATING RECORDS

It is the policy of the mechanical department management to keep each of the shops supplied with all the de-

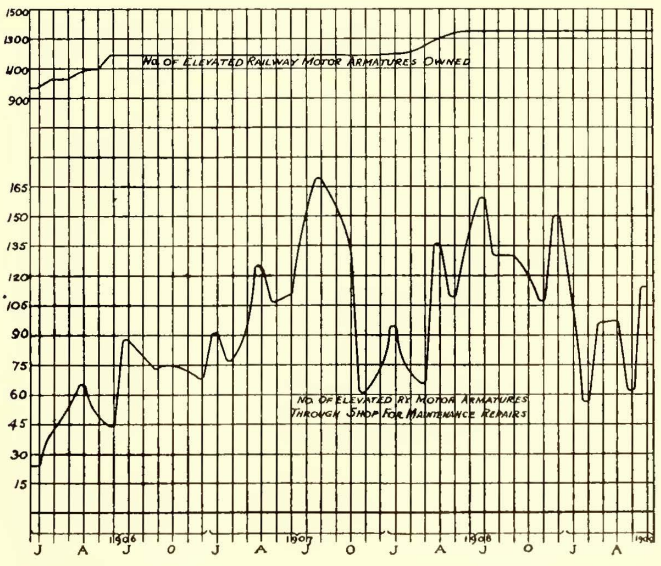


Fig. 6—Brooklyn Organization—Elevated Armature Repairs

tailed information possible concerning the equipment under their charge, as it is felt that they will be better able to get the best results out of the equipment if they have been acquainted with all the details connected with its con-

struction and performance. Consequently a series of monthly bulletins and curve sheets are issued to all the shops showing:

"Run-ins," i.e., cars removed from service.

Material costs on mileage basis for such material as brake shoes, babbitt, lubricants, trolley wheels, etc.

Troubles occurring in service, with particular reference to bridge operation and defects, even though they are not sufficient to cause cars to be removed from service.

Number of cars maintained and percentage of defects occurring as compared with cars maintained and operated.

Motor flashes, controller flashes, drawbar troubles, and other details which will give the local points information with which to measure their standing and condition.

The efficiency of the equipment is forcibly evinced in the curve sheet showing the number of armatures repaired each month together with the total number of armatures in service. The curve for surface armatures is shown in Fig. 5 and the curve for elevated armatures is shown in Fig. 6. A copy of one of the monthly comparative statements is given in Fig. 7.

Uniform practices and methods of maintaining the different types of equipment are used in all of the 11 surface maintenance shops as well as the four elevated maintenance shops. The methods to be employed are decided upon in the office of the superintendent of equipment and all instructions are issued in bulletin form from that office. All instructions and bulletin notices sent to the shops are printed on a multigraph machine and such bulletins as are of direct interest to shop employees are sent to the shops in sufficient quantities so that they can be posted on standard bulletin boards provided for that purpose. Suggestions and discussions as to improved methods or practices as well as improvement in design and method of care for equipment parts are encouraged and weekly meetings of all of the shop foremen are held in the office of the superintendent of equipment on alternate Thursdays for the surface and elevated foremen for the purpose of discussion and instruction. It is found that these meetings are productive of great good in the way of benefiting the various foremen in the handling of their work.

BROOKLYN RAPID TRANSIT SYSTEM—MECHANICAL DEPARTMENT.

STATEMENT SHOWING NUMBER OF PASSENGER CARS REMOVED FROM SERVICE (TERMED RUN-INS) ON ACCOUNT OF DEFECTS DURING THE MONTH OF JUNE, 1909, SURFACE AND ELEVATED DIVISIONS.

Bulletin No. 1058–*A*.

Definition of the Term "Run-In":—When it becomes necessary for any reason to replace any car in service, the car replaced shall be considered a "Run-in."

For the information and guidance of the Heads of Mechanical Departments of other Electric Railway Companies who may desire to compare their figures with those of the Brooklyn Rapid Transit System, it should be noted that on the Surface Division it is necessary to run-in practically all of the cars developing defects. This is due to the fact that there are no Mechanical Inspectors or Repair-men located outside of the Car House Maintenance Shops. On the Elevated Division, however, there are some Mechanical Inspectors located at or near the Brooklyn Bridge, and there is one inspector located at the terminal of each Elevated Line. These men care for minor defects, adjustments of control switches, etc. This point enables some Elevated Cars to remain in service which it might otherwise be necessary to run-in on account of slight disarrangements in adjustments.

The basis of regular thorough, general inspection on the Surface Division is mileage—600 miles for Hand Brake Cars and 800 miles for Air Brake Cars. The basis of general inspection on Elevated Equipment is time—twice each week.

Shop	Average number of cars maintained per day	Total number of cars maintained per month	Average number of cars operated per day	Total number of cars operated for month	Revenue mileage for the month	Average miles per car per day of cars maintained	Number of Cars Run-In and Result of Examination: Found defective mechanically or electrically	Found O. K. on examination	Due to causes not attributable to condition of equipment	Total all causes	Mileage Basis, Total Number of Revenue Miles Made per Car Run-In: Found defective mechanically or electrically	Found O. K. on examination	Due to causes not attributable to condition of equipment	Total all Run-Ins	Percentage Basis No. of Cars Run-In Defective Mechanically or Electrically, Compared With: Total cars maintained	Total cars operated
Surface—East Div.:																
Ridgewood	300	9,000	225	6,733	630,272	70	37	12	16	65	17,034	52,523	39,392	9,696	.4	.5
Halsey Street	64	1,920	57	1,715	142,216	74	15	3	2	20	9,481	47,405	71,108	7,111	.7	.8
Maspeth	99	2,970	70	2,108	228,134	77	14	1	1	16	16,295	228,134	228,134	14,258	.5	.7
Crosstown	165	4,950	151	4,529	367,540	74	31	5	11	47	11,856	73,508	33,413	7,820	.6	.7
East New York	308	9,240	210	6,299	622,296	67	69	10	12	91	9,019	62,229	51,858	6,838	.7	1.1
Total	936	28,080	713	21,384	1,990,458	71	166	31	42	239	11,991	64,208	47,392	8,328	.6	.8
South Division:																
Ninth Avenue	222	6,660	165	4,940	449,601	67	37	38	20	95	12,151	11,832	22,480	4,733	.6	.7
58th Street	205	6,150	171	5,132	495,024	80	32	17	16	65	15,407	29,119	30,939	7,616	.5	.6
Flatbush	192	5,760	124	3,725	386,648	67	20	5	7	32	19,332	77,330	55,235	12,083	.3	.5
Canarsie	121	3,630	106	3,191	307,558	85	46	11	10	67	6,686	27,960	30,756	4,590	1.3	1.4
Bergen Street	144	4,320	112	3,366	303,414	70	50	13	11	74	6,068	23,339	27,583	4,100	1.2	1.5
Total	884	26,520	678	20,354	1,942,245	73	185	84	64	333	10,499	21,931	30,348	5,833	.6	.9
Surface total	1,820	54,600	1,391	41,738	3,932,703	72	351	115	106	572	11,204	34,197	37,101	6,875	.6	.8
Elevated:																
Eastern	465	13,950	419	12,569	1,300,443	93	155	19	1	175	8,389	68,444	1,300,443	7,431	1.1	1.2
Southern	351	10,530	332	9,975	1,430,790	136	113	18	3	134	12,662	79,488	476,930	10,678	1.1	1.1
Fresh Pond	112	3,360	106	3,175	287,985	86	10	0	0	10	28,798	287,985	287,985	28,798	.3	.3
Elevated total	928	27,840	857	25,719	3,019,218	108	278	37	4	319	10,860	81,600	754,805	9,465	1.0	1.1

WM. G. GOVE, *Supt. of Equipment.*

Fig. 7—Brooklyn Organization—Monthly Comparative Statement of "Run-Ins"

ACCOUNTS

The accounting system prescribed by the Public Service Commission for the First District, State of New York, and subdivided as shown in schedule of operating expenses, Fig. 8, is strictly adhered to, and so that all who have anything to do with the entry of charge account numbers on time cards and storeroom orders may understand the

SCHEDULE OF OPERATING EXPENSES, BROOKLYN RAPID TRANSIT SYSTEM, EFFECTIVE JULY 1, 1909.

	Schedule No. Surf.	Elev.	Frt. Mail.	MAINTENANCE OF WAY AND STRUCTURE
				Superintendence of way and structure:
L. M.	201	501	1101	Track.
L. M.	202	502	1102	Electric line.
M.	203	503	1103	Ballast.
M.	204	504	1104	Ties.
M.	205	505	1105	Rails.
M.	206	506	1106	Rail fastenings and joints.
M	207	507	1107	Special work.
M.	208			Underground construction (cable-way)
L.	209	509	1109	Roadway and track labor.
L. M.	210	510	1110	Paving.
L. M.	211	511	1111	Misc. roadway and track expenses.
L. M.	212	512	1112	Cleaning and sanding track.
L. M.	213	513	1113	Removal of snow, ice and sand.
L. M.	214	514		Repairs of tunnels.
L. M.		515		Repairs of elevated structures and foundations.
L. M.	216	516	1116	Repairs of bridges, trestles and culverts.
L. M.	217	517	1117	Repairs of crossings, fences and signs.
L. M.	218	518	1118	Repairs of signal and interlocking systems.
L. M.	219	519	1119	Telephone and telegraph repairs.
L. M.	220	520	1120	Other miscellaneous way expenses.
L. M.	221	521	1121	Pole and fixture repairs.
L. M.	222	522	1122	Underground conduit repairs.
L. M.	223	523	1123	Transmission system repairs.
				Distribution system repairs:
L. M.	224	524	1124	Overhead feeders.
L. M.	225	525	1125	Underground feeders.
L. M.	226	526	1126	Track bonding.
L. M.	227	527	1127	Overhead trolley, etc.
L. M.		528	1128	Third rail.
				Miscellaneous electric line expenses:
L. M.	229	529	1129	Emergency crews.
L. M.	230	530	1130	Other expenses.
				Repairs of buildings and structures:
L. M.	231			Power plants.
L. M.	232			Sub-stations.
L. M.	233	533	1133	Car houses.
L. M.	234	534	1134	Shops.
L. M.	235	535	1135	General office buildings.
L. M.	236	536	1136	Stations, waiting rms and platforms
L. M.	237		1137	Docks and wharves.
L. M.	238	538	1138	Misc. buildings and structures
L. M.	239	539	1139	Other bldg. and struct. maint.
	240	540	1140	Joint way and structures—Dr.
	241	541	1141	Joint way and structures—Cr.
	242	542	1142	Depreciation of way and structures.
				MAINTENANCE OF EQUIPMENT
L. M.	243	543	1143	Superintendence of equipment.
				Repairs of furnaces, boilers and accessories:
L. M.	244			Boilers, furnaces, flues, etc.
L. M.	245			Piping, inc. feed pumps, heaters.
L. M.	246			Economizers.
L. M.	247			Stokers.
L. M.	248			Forced draught apparatus, air duct engines and blowers.
L. M.	249			Coal and ash handling machinery.
L. M.	250			Miscellaneous.
				Repairs of steam engines:
L. M.	251			Engines and turbines.
L. M.	252			Condensers, including circulating, dry pumps, etc.
L. M.	253			Miscellaneous.
				Repairs of power plant electric equip.:
L. M.	254			H. T. generators and exciters.
L. M.	255			Low tension generators.
L. M.	256			H. T. switchboards and cables.

	Schedule No. Surf.	Elev	Frt. Mail.	MAINTENANCE OF EQUIPMENT, (Continued)
				Repairs of power plant electric equipment, (continued):
L. M.	257			L. T. switchboards and cables.
L. M.	258			Boosters.
L. M.	259			Storage batteries.
L. M.	260			Miscellaneous.
L. M.	261			Repairs of misc. power plant equip.
				Repairs of cable plant equipment:
L. M.	262			Engines, boilers, shafting, etc.
L. M.	263			Leading wheels and bearings.
L. M.	264			Cables.
				Repairs of sub-station equipment:
L. M.	265			Rotary transformers.
L. M.	266			Static transformers and blowers.
L. M.	267			H. T. switchboards and cables.
L. M.	268			L. T. switchboards and cables.
				Repairs of pass. and comb. cars:
L. M.	269	569		Bodies.
L. M.	270	570		Painting and varnishing.
L. M.	271	571		Trucks, hand brakes and brake rig.
L. M.	272	572		Wheels and axles.
L. M.	273	573		Journal brasses.
L. M.	274	574		Brake shoes.
L.	275	575		Transfer of trucks for purposes other than repairs.
L. M.	276	576		Fenders.
L. M.	277	577		Fare registers.
L. M.	278			Grips and grip fixtures.
L.	279	579		Transferring cars for repairs.
				Repairs of freight, express and mail cars:
L. M.			1180	Bodies.
L. M.			1181	Painting and varnishing.
L. M.			1182	Trucks, hand brakes and brake rig.
L. M.			1183	Wheels and axles.
L. M.			1184	Journal brasses.
L. M.			1185	Brake shoes.
L.			1186	Transfer of trucks for purposes other than repairs.
L. M.			1187	Fenders.
L.			1188	Transferring cars for repairs.
				Repairs of locomotives:
L. M.		589	1189	Bodies.
L. M.		590	1190	Trucks.
				Repairs of service cars:
L. M.	291	591	1191	Plow, sweeper, sprinkler, brine cars.
L. M.	292	592	1192	Coal, supply and work cars.
				Repairs of electrical equipment of cars:
L. M.	293	593		Trolley stands, poles, contact shoes and beams.
L. M.	294	594		Car heaters, lights, switches, fuse blocks, wiring fuses and lightning arresters.
L. M.	295	595		Armatures.
L. M.	296	596		Commutators.
L. M.	297	597		Fields.
L. M.	298	598		Electrical car control.
L. M.	299	599		Gears, pinions and gear cases.
L. M.	300	600		Motor bearings.
L M	301	601		Brush holders.
L. M.	302	602		Motors, miscellaneous.
L.	303	603	1203	Transfer of motors and equipment for purposes other than repairs.
L. M.	304	604	1204	Air brakes, including pumps and governors.
L. M.			1205	Electrical equipment of freight, mail and express cars.
L. M.	306	606	1206	Electrical equipment of service cars and plows.
L. M.		607	1207	Repairs of electrical equipment of locomotives.
L. M.	308	608	1208	Repairs of shop machinery and tools.

	Schedule No. Surf.	Elev.	Frt. Mail.	MAINTENANCE OF EQUIPMENT (Continued)
L.	309	609	1209	Shop expenses: Foremen and clerks.
L. M.	310	610	1210	Fuel and light.
M.	311	611	1211	Supplies.
L.	312	612	1212	Stationary engineers, watchmen and other labor.
L.	313	613	1213	Labor handl'g and deliver'g supplies
L. M.	314	614	1214	Miscellaneous.
				Repairs of vehicles:
L. M.	315	615	1215	Automobiles.
L. M.	316	616	1216	Trucks, emergency, repair, tower and other service wagons.
L. M.	317	617	1217	Other misc. equipment expenses.
	318	618	1218	Maintaining joint equipment—Dr.
	319	619	1219	Maintaining joint equipment—Cr.
	320	620	1220	Depreciation of equipment.
				TRAFFIC
L. M.	321	621	1221	Traffic expenses: Superintendence and solicitation.
L. M.	322	622		Advertising.
L. M.	323	623		Park and other attractions.
L. M.	324	624	1224	Miscellaneous traffic expenses.
				TRANSPORTATION EXPENSES.
L.	325	625	1225	Superintendence of transportation: Superintendence and clerks.
L.	326	626	1226	Depotmasters, trainmasters, train dispatchers and car starters.
L.	327	627	1227	Inspectors.
L. M.	328	628	1228	Other expenses.
				GROUP 1—POWER SUPPLY.
L.	329			Power plant labor: Power plant superint'd'ce and care.
L.	330			Boiler room labor.
L.	331			Engine labor.
L.	332			Electric labor.
L.	333			Cable power plant labor.
L.	334			Substation labor.
M.	335			Fuel for power.
M.	336			Water for power.
M.	337			Lubricants for power.
L. M.	338			Misc. pwr. plant supplies and expenses
L. M.	339			Substation supplies and expenses.
M.	340	640	1240	Power purchased.
	341	641	1241	Jointly produced power—Dr.
	342	642	1242	Power exchanged—Balance.
	343	643	1243	Jointly produced power—Cr.
				GROUP 2—OPERATION OF CARS.
L.	344	644		Passenger motormen.
L.		645		Elevated conductors and guards.
L.	346			Passenger conductors (surface).
				Other passenger trainmen:
L.	347	647		Student motormen.
L.	348	648		Other trainmen.
L.			1249	Freight, mail and express motormen and trainmen.
		650	1250	Miscellaneous car serv. employees: Couplers.
L.	351	651	1251	Switchmen.
L.	352	652	1252	Flagmen.
L.	353	653		Register takers.
L.	354	654		Transfer agents.
L.	355	655	1255	Miscellaneous.

	Schedule No. Surf.	Elev	Frt. Mail.	TRANSPORTATION EXPENSES, (Continued)
				Miscellaneous car service expenses:
M.	356	656	1256	Car supplies.
				Station employees:
L.	357	657		Ticket agents.
L.	358	658		Gatemen and platform men.
L.	359	659	1259	Station porters and watchmen.
L.			1260	Freight foremen, agents, etc.
L.			1261	Other freight employees.
				Station expenses:
L. M.	362	662		Pass. station supplies and expenses.
L. M.			1263	Frt. station supplies and expenses.
				Car house employees:
L.	364	664	1264	Foremen.
L.	365	665	1265	Car cleaners.
L.	366	666		Heater tenders.
L.	367	667	1267	Watchmen.
L.	368	668	1268	Yardmen.
L.	369	669	1269	Lampmen.
L.	370	670	1270	Car house men.
L.	371	671	1271	Other labor.
				Car house expenses:
L. M.	372	672	1272	Fuel, light, water, ice, etc.
				Operat'n, Sig. and Interlock. Systems:
L.	373	673		Tower, signal, lever and lampmen.
M.	374	674		Fuel, water, light, supplies, etc.
				Operation telephone and telegraph:
L.	375	675	1275	Telephone operators.
L.	376	676	1276	Telegraph operators.
M.	377	677	1277	Supplies and chemicals.
				Loss and damage:
L. M.			1278	Loss, damage, and destruction of frt.
				Other transportation expenses:
L. M.	379	679	1279	Wrecking expenses.
L. M.	380	680	1280	Other expenses.
	381	681		Joint operation of cars—Dr.
	382	682		Joint operation of cars—Cr.
	General.			GENERAL & MISCELLANEOUS
	2001			Salaries and expenses, gen'l officers.
	2002			Salaries and expenses general office clerks.
	2003			General office supplies and expenses.
	2004			General law expenses.
	2005			Insurance.
	2006			Relief Department, pensions.
	2007			Miscellaneous general expenses.
	2008			General amortization.
	2009			Joint general expense—Dr.
	2010			Joint general expense—Cr.
				Accidents and damages:
	2011			Claim department expense.
	2012			Medical expenses.
	2013			Claims for injuries to employees.
	2014			Other injuries and damages.
	2015			Other expenses.
				Law expenses connection damages:
	2016			Salaries and expenses of attorneys.
	2017			Court costs and expenses.
	2018			Law printing.
	2019			General stationery and printing.
	2020			Store expenses.
	2021			Stable expenses.
	2022			Undistributed adjustments—Balance.

L = Labor. M = Material.

Approved: *HOWARD ABEL*, Comptroller

Fig. 8—Brooklyn Organization—Schedule of Operating Expense Accounts of Brooklyn Rapid Transit Company, Given to Each Department

TRANSIT DEVELOPMENT COMPANY.
MECHANICAL DEPARTMENT.

Shop. Date:

Mr. Wm. G. Gove,
Supt. of Equipment.

Dear Sir: The following cars have, this day, been received from the Maintenance Shop, as indicated, for repairs amounting to less than $25.00 in each instance. We estimate the cost to be as follows:

Car No.	From	Description of Damage, or Rprs Reqrd	Estmtd Cost

Superintendent.

Authority is hereby given to make repairs as above required and charge cost to Straight Maintenance Accounts.

Yours truly,

.....
Supt. of Equipment.

DIRECTIONS: This form is to be issued each day when one or more damaged cars are received for repairs, and two copies should be sent to the Supt. of Equipment, who, after approval, will return the carbon copy to the Shop as authority to proceed with the work, and retain the original.

Fig. 9—Brooklyn Organization—Form MD, A. Authority to Repair Slight Damage. Original, 8½ in. x 11 in.

BROOKLYN RAPID TRANSIT SYSTEM
Mechanical Department
ORIGINAL
Shop Material Order No. .....
..... Shop .....190..

DESCRIPTION	CHARGE AUTH. NO.	CHARGE ACCT. NO.

Signed

..... To be done at .....Shop

Approved

..... Order sent to Shop.....
Sup't of Equipment.

DIRECTIONS

This order is to cover repairs or renewals of material required for Maintenance of Equipment or authorized work other than standard material carried in stock, and for repairs to Shop Machinery and Tools.

A brief description of the work desired with sufficient information to enable one to promptly and properly fill the order should be given. All three copies are to be sent to the Superintendent of Equipment and, when approved by the Sup't of Equipment, the Triplicate will be returned with No. of Order thereon and Original sent to shop where work is to be done.

Fig. 10—Brooklyn Organization—Form NS, 834. Shop Material Order. Original Size, 8½ in. x 11 in.

TRIPLICATE

AUTHORIZATION TO PROCEED WITH WORK

This form to be made out to cover any work to be done of an extraordinary repair character or for additions or betterments, changes in Equipment, Track, Line, Buildings, etc., and for all new work of any description.

Dept. No..... Auth. No..... Appropriation No.....

Date, ..., 190

This request will be charged to Signed:

.....

.....

.....

Recommended:

Comptroller.

.....

Approved .....
Vice-Pres't and Gen'l Mgr.

.....

President. .....

Fig. 12—Brooklyn Organization—Form NS, 202. Vice-President and General Manager's Authorization. Original, 8½ in. x 11 in.

system thoroughly, copies of the schedule of operating expenses in lithographed form are framed and hung in the office of each shop foreman. A bulletin has also been issued containing a reproduction of the schedule of operating expenses, together with detailed instructions covering specific work to be charged to the accounts in which the mechanical department is directly interested.

All of the work in all of the shops of this department is on a day basis, with the exception of the electrical department of the Fifty-second Street surface shop, where the piecework system is in vogue with very good results.

MAINTENANCE OF ESPRIT DE CORPS

With the new and re-equipped shops not only has the standard of rolling stock maintenance been brought to a higher plane, but that of the shop equipment and the cleanliness and appearance of the shops themselves has been greatly improved, and, as an illustration of the policy of the management to improve the appearance of the shops

BROOKLYN RAPID TRANSIT SYSTEM
ORIGINAL
MACHINE SHOP ORDER NO. ....

.....19

This work should be completed by.....19

New Material
Repair At an estimated cost of $.....

.....

.....

.....

Signed: Charge to.....
....
Approved: Approved:
....
Head of Dept. Requiring Work Done. *Assistant General Manager*

Foregoing described work to be done at.....Shop
(Do not write in this space)
Order sent to Shop.....
Superintendent of Equipment
Sent to V. P. and G. M. for Approval.....
Sent to Comptroller for Approval.....

DIRECTIONS

This order must state whether New Material or Repairs are desired (mark out the wording not used) and should give sufficient description of the work to enable Shop to properly and promptly furnish what is required.

Order should be made in Quadruplicate and all four copies sent to Supt. of Equipment after approval of Head of Department requiring the work.

The Quadruplicate copy (pink) will be returned to the Department interested after the number and Shop to which work is assigned are noted thereon.

Material to be repaired should then be properly marked with order number on tag and sent to the Shop designated.

Fig. 11—Brooklyn Organization—Form NS, 188. Machine Shop Order. Original, 5¾ in. x 9 in.

and surroundings as much as possible, lawns and flower beds have been laid out and are maintained by the company in the immediate surroundings of the shops. It is plainly noticeable that this cleanliness and improvement in the appearance of the shops has had the desired effect of increasing the interest of the employees and making them feel proud of their work. This, in turn, has benefited the equipment through the closer and more interested attention which it has received.

REGULAR AND SPECIAL ORDERS

No work is done at any of the shops other than the regular maintenance work at the maintenance shops without specific instructions from the superintendent of equipment. All work of any character whatsoever, other than the straight maintenance work at the maintenance shops, is authorized on forms provided for the purpose, these forms being:

Form MD, A—Authority to repair slight damage.

Form NS 834—Shop material order.

Form NS 188—Machine shop order.
Form NS 202—Vice-president and general manager's authorization.

Copies of these forms are shown in Figs. 9, 10, 11 and 12, and proper accounts to be charged for doing the work as shown on these forms appear on them in each case.

The system for keeping all persons in the mechanical department fully informed as to all business transacted in which they are directly interested is accomplished by the superintendent of equipment referring all correspondence to them, with instructions as to the action which he desires should be taken.

INSPECTION AND OVERHAULING ON MILEAGE BASIS

All surface cars are being regularly inspected and overhauled on a mileage basis, and all elevated cars will be overhauled on a mileage basis, commencing Sept. 1, 1909. The inspection of the elevated equipment, however, is still continued on a time basis, but it is expected to be placed on a mileage basis on Jan. 1, 1910.

Under the methods outlined above the rolling stock equipment of the Brooklyn Rapid Transit system is beyond doubt now being maintained at a very high state of efficiency, as will be noted by the comparative statement of defects during the fiscal years of 1906-07, 1907-08 and 1908-09. These figures are given in bulletin No. 1080, of Aug. 9, 1909, shown in Fig. 13. After all that has been said the statement contained in bulletin No. 1080 shows most plainly to what extent the work of the past 5½ years in standardizing, systematizing, etc., has increased the efficiency of the equipment.

TRANSIT DEVELOPMENT COMPANY.
MECHANICAL DEPARTMENT.

Bulletin No. 1080. Aug. 9, 1909.

NOTICE TO:
SUPT. 52D ST. SURFACE SHOP.
SUPT. 39TH ST. ELEVATED SHOP.
FOREMAN SO. DIV. ELEVATED SHOP.
FOREMAN EA. DIV. ELEVATED SHOP.
FOREMAN EA. DIV. INSPECTN. SHOP.
FOREMAN FRSH. PD. INSPECTN. SHOP.
FOREMEN SURFACE CAR HOUSE SHOPS.

Gentlemen:

I wish to call your particular attention to the figures shown in the statement below as a striking example of the excellent results obtained in the past three years in reducing the number of "Run ins" and increasing the milcage made per defect; due to the STANDARDIZATION work recently completed and to more efficient maintenance of the cars at the various shops on the system:

COMPARISON OF EQUIPMENT DEFECTS, AS REPORTED IN OPERATION, ON MILEAGE BASIS.
For Fiscal Years, 1906-07, 1907-08, 1908-09.

	Defects			Total Mileage			Miles Made pr Defect			% of
Elev. Div.	1906-7	1907-8	1908-9	1906-07	1907-08	1908-9	1906-7	1907-8	1908-9	Incr. in
Car Body	8540	6128	4960				3295	5033	6389	Mileage
Truck	1199	1017	1462				23469	30324	21674	per
Control	4216	6060	5228				6675	5089	6061	Defect
Motor	2131	3896	3650	28139687.	30840295.	31687142.	13205	7911	8681	1908-09
Brakes, Air	4832	3737	3915				5824	8226	8093	over
Trly & C. Sh	4761	3441	1946				5910	8963	16286	1906-07.
Totals	25679	24279	21161				1096	1270	1497	37
Surf. Div										
Car Body	21933	17350	12598				1990	2645	3612	..
Truck	11329	6933	6445				3853	6619	7060	..
Control	4858	4555	3784				8982	10074	12026	..
Motor	6407	5549	4854				6813	8270	9375	..
Brakes, Air	1919	1315	941	43652964.	45888166.	45504794.	22747	34896	48358	..
Trolley	5945	4104	2978				7343	11181	15281	..
Totals	52391	39806	31600				833	1153	1440	73

The above must not be interpreted to indicate the mileage possible between defects causing interruptions to service, as this latter is clearly shown in the statement of "Run ins" sent you, reduced to a mileage basis, and which mileage is many times greater than shown in this statement. The above mileage figures simply illustrate the percentage of increase in the efficiency of the equipment.

Yours truly,
WILLIAM G. GOVE,
Supt. of Equipment.

Fig. 13—Brooklyn Organization—Bulletin No. 1080, Showing Comparison of Equipment Defects on Mileage Basis.

The electric tramway system of Adelaide, South Australia, was put in operation Sept. 29. This line has recently been equipped and there are 16 cars. The engineer and manager of the line is W. G. T. Goodman.

TRACKLESS TROLLEY CARS IN EUROPE

A short account was published in the ELECTRIC RAILWAY JOURNAL for May 29 of the report of a special committee from the city of Sheffield, England, on the subject of trackless trolley cars in Europe. According to W. C. Hamm, consul at Hull, the Leeds Council also sent a committee to the Continent recently to study this subject. The result of their observations is summarized as follows:

The three systems considered were the Mercedes-Stoll, which is in operation in various parts of Austria and was seen in Vienna; the Filovia, used on six or seven routes in north Italy and seen in Milan; and the Max Schiemann, which is employed in Germany, especially in the Rhine Valley.

The vehicles operated under each of these systems in general appearance do not differ greatly from the familiar single-deck motor omnibus, except that they have some means of collecting current and returning it to the two overhead lines. The principal difference among the various systems occurs in regard to the arrangement for keeping the two collectors on the two cables.

THE MERCEDES-STOLL SYSTEM

The length of the route inspected in Vienna is about 1½ miles, where the road—of a switch-back character, having at one stretch of about 100 yd. a gradient of 1 in 10—is macadamized. On this route there are two pairs of cables, one for going and one for returning cars, though elsewhere one pair is made to suffice, so that when two cars meet one has to stop and remove its connection with the wires until the other has passed. The vehicles carry 12 passengers seated, though when required an additional 12 are allowed to stand, even on the platforms, both front and back. The entrance is at the driver's end, and he attends to all the duties of a conductor as well as driver.

The committee was particularly struck with the smoothness and comfort of riding, the spring base of the truck being very well arranged. The brakes are ample, and spraggs are fitted to prevent running backward if the car is stopped on a hill. Satisfactory assurances were received as to the operation of the cars under the severest

winter conditions, though it is noticed that on this particular route the cars have been running only since last October. The motors, which are each 20 hp, form the hubs of the back wheels, and the current is collected from the supply cable by means of a pair of wheels running on the top of the wire—a similar pair of wheels transferring the current to the return. A weighted pendulum slung from a frame carrying these two pairs of wheels keeps them well pressed upon the wires, and the current is conveyed to the motors not by a trolley pole, but by a pair of cables which allow the car to pass to any part of the road in the avoidance of other traffic. The empty car weighs 2½ tons.

The cost of the chassis of the Mercedes-Stoll is about $2,750, without body. The cost of the overhead construction is about $8,500 per mile, and the working expenses per car-mile, the committee was informed, are: Current, $0.80; tires (total load, 4.2 tons), $2.66; wages (driver only employed), $2.40; depot expenses, $0.52; taxes, management, insurance, $1.60; repairs, renewals, painting cars and equipment, $1.06; total, $9.04.

THE FILOVIA SYSTEM IN NORTH ITALY

On the Filovia system the car will take 30 passengers. A framework carrying two pairs of wheels, one pair in contact with each overhead cable, is employed to maintain the circuit. It is very similar to that used in the Mercedes-Stoll system, except that it is pressed by a pole against the undersides of the cables. There are two direct-current motors of 10 to 12 hp each, and figures supplied by a route similar to that inspected show a working cost per car-mile as follows: Cost of energy used, $0.83; general expenses, $1.188; rubber tires, renewal, $4.32; wages and salaries, $2.80; maintenance of vehicles and line, $1.24; repairs of vehicles, $0.912; total, $11.29.

The route inspected, owned by a private company, is 4½ miles long, and the fare charged is 8 cents. The committee found the vehicles well able to reverse, turn around and maneuver without the trolley being removed, and to take heavy gradients over bad and muddy roads without difficulty, vibration or noise. The practicability of this type of railless traction considerably impressed the committee. The cost of overhead construction is estimated at only $3,756 per mile, but only wooden poles were used.

THE MAX SCHIEMANN SYSTEM

The Max Schiemann system was seen working at Mulhausen. Here the contact with the pair of cables is maintained by means of a pole carrying at its extremity a pair of sliding shoes. The overhead construction is similar to that of the systems previously described. The vehicle carries about 15 passengers seated, and only the front wheels have rubber tires, so that there is considerable vibration and noise. The single motor drives onto the front axle, so that the steering is comparatively heavy. The design of this type, however, is stated to be undergoing radical modification. The weight of the present empty car is 6280 lb.

It is stated concerning all of the three systems that very few hitches have been reported, and owing to the comparative lightness of the vehicle the surface of the road suffers less than in the case of a service of cars carrying their own petrol or other engines.

The committee was much impressed with the practicability of each of the various schemes, and considers that by avoiding the heavy expenditure required in the installation of ordinary tramway traction this method of conveyance offers considerable possibilities as general feeders in suburban and interurban districts to tramway systems, and is quite capable of supplying a sufficient service for thinly populated districts on a reasonably economic basis.

The Grosse Berliner Strassenbahn has an arrangement with the Berlin municipality whereby very liberal rates are made for the transportation of public school children to the city playgrounds in the suburbs. The company furnishes for 22.5 M. ($5.62) a motor car and two trailers for a round trip from any part of the city. These trains seat about 240 children. The excursions are given during the summer vacation season and at times when plenty of rolling stock is available.

BEARING FRICTION AND POWER CONSUMPTION

BY M. V. AYRES, ELECTRICAL ENGINEER, BOSTON & WORCESTER STREET RAILWAY

In an article published in the Electric Railway Journal Aug. 1, 1908, on the "Need for Lighter Cars," the present writer expressed the opinion that only slight improvements are possible in the following four directions:

1. Improving efficiency of motors, including starting device.
2. Reduction of bearing friction.
3. Reduction of track friction.
4. Reduction of wind friction.

Immediately after this was published I received some letters protesting against the conclusion that only slight savings can be effected by reduction of bearing friction. Since then there have been brought to my attention somewhat frequently claims of very large savings made by the use of ball or roller bearings.

The evidence in support of some of these claims seemed so circumstantial that I have been led to make a study of the question from theoretical grounds with a view to ascertaining the possibilities in this direction and have as a consequence considerably modified my opinion. I believe the results are sufficiently new and of enough interest to warrant consideration by the engineering world.

My opinion, as given in the former article, was intended to apply only to that class of traffic in which electric motive power is generally used; that is to say, "frequent-stop service." I never doubted that the elimination of bearing friction, if attainable, would result in great power saving in long-haul service.

In frequent-stop service the greater part of the power supplied to a car is used in acceleration and later dissipated in braking, and my idea was that the power used in overcoming bearing friction was so small a part of the whole as to be comparatively insignificant.

My first attempt to make a complete analysis of the power distribution in a typical run seemed to completely justify that idea. This will be clearly shown by a consideration of Fig. 1, which also serves well to illustrate the method pursued.

These curves are calculated from assumed data as follows:

Car weight, loaded, = 82,000 lb.
Equipment, four GE-73 motors.
Gear ratio, 19-56.
Wheels, 33 in. diameter.
Line voltage, 500.
Train resistance, that given by Mr. Armstrong's formula:

$$F = \frac{50}{\sqrt{W}} + .03S + \frac{.002aS^2}{W}$$

Where F = the resistance in pounds per ton, W = weight in tons, S = speed in miles per hour, a = area of car end in square feet. The first two terms of this formula are together supposed to represent bearing and track friction and the third term wind friction.

The straight-line acceleration is taken at the rate given by 163 amp per motor. This is a rate of acceleration of about 2.1 m.p.h.p.s. at 25 per cent above the rating of the motor. The power required for acceleration is assumed 7 per cent greater than indicated by the weight of the car to allow for the effect of revolving parts.

The heavy solid line is the speed-time curve, showing acceleration to 30 m.p.h. in 36 seconds, coasting to 65 sec-

onds and braking to standstill at 80 seconds. Braking is at a rate of 1.75 m.p.h.p.s. The area of the speed-time curve is, of course, proportional to the distance run, and in this curve represents a run of exactly one-half of a mile in 80 seconds. Allowing for a 10-second stop, this would represent a schedule speed of 20 m.p.h., with two stops per mile.

The cross-hatched areas represent power supplied and consumed, the vertical distances being proportional to the kilowatts, and the areas proportional to the watt-hours. Current is supplied at the rate of 163 kw for three seconds during series operation, followed by 326 kw for 4.7 seconds to the motor curve at full-speed position of the controller. The power then drops off rapidly to 90 kw at the end of 36 seconds, when coasting commences.

The energy thus supplied is used in various ways, as indicated by the cross-hatched areas:

Areas *A* show energy lost in rheostats.
Area *B* shows energy used in acceleration.
Area *C* shows energy lost in motors.
Area *D* shows energy lost in wind friction.

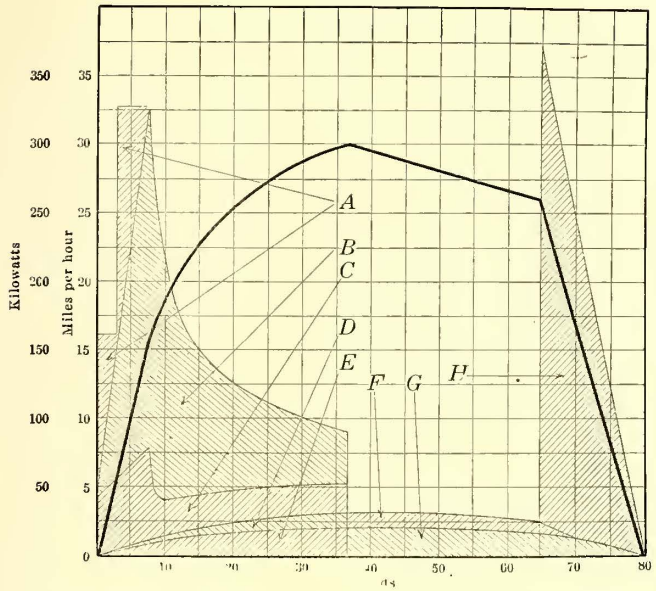


Fig. 1—Energy Consumption of 41-Ton Car, Including Track and Bearing Friction

Area *E* shows energy lost in track and bearing friction.

The values of these areas in watt-hours are given in Table I:

TABLE I.

	Watt-hours.	Per cent.
Rheostat losses	157	9.52
Motor losses	285	17.28
Track and bearing friction	158	9.55
Windage	57	3.45
Acceleration	993	60.20
	1,650	100.00

This shows that in the case assumed, track and bearing friction consume only 9.55 per cent of the power supplied. At first glance it would seem that any economies to be effected by reducing these losses would be limited to about 9.5 per cent as a maximum possible saving.

In order to test this supposition I worked out the corresponding curves for the same equipment, omitting the first two terms of the train resistance formula; that is to say, assuming wind friction to be the only resistance to the motion of the car.

The results are shown in Fig. 2. At starting current is supplied at the same rate, but acceleration is somewhat more rapid during the straight-line portion and considerably more rapid during the motor-curve portion of the run. The car reaches a speed of 27.5 m.p.h. at the end of 22.5 seconds; coasts to 64.5 seconds and brakes to standstill at 80 seconds. The time of coasting is so chosen that the distance traveled and time consumed are the same as in Fig. 1. The broken lines in Fig. 2 show the outlines of the principal curves of Fig. 1, and it is at once evident that the power consumption has been greatly reduced.

The track and bearing friction area has, of course, been eliminated, rheostat losses are slightly reduced due to quicker acceleration; motor losses and windage are both materially reduced on account of the shorter time which power is supplied at high speed, and power for acceleration is reduced most of all on account of the lower speed reached. This latter quantity is reduced as the square of the speed. The results are given in Table II, compared with the results from Fig. 1:

TABLE II.

	Watt-hours. Fig. 1.	Watt-hours. Fig. 2.	Reduction. Per cent.
Rheostat losses	157	136	13.3
Motor losses	285	195	31.6
Track and bearing friction	158	0	100.0
Windage	57	29	54.4
Acceleration	993	835	16.0
	1,650	1,195	27.6

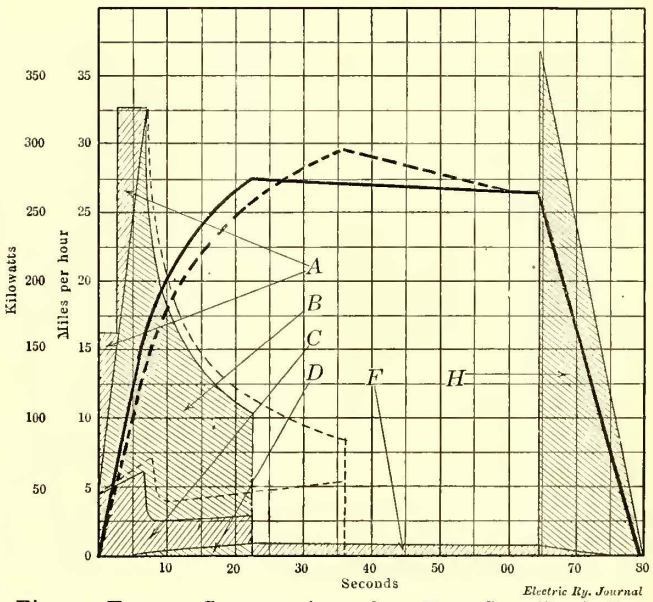


Fig. 2—Energy Consumption of 41-Ton Car, Excluding Track and Bearing Friction

It thus appears that by eliminating a friction consuming only 9.55 per cent of the power supplied we can effect a saving of 27.6 per cent in power required. This result is obtained in a case which was purposely chosen as representing an extreme case of frequent-stop service, in which the possible saving due to reducing bearing friction is the least.

A further study of the curves of Figs. 1 and 2 will explain the above apparently anomalous result.

In Fig. 1 the areas *F* and *G* show the energy expended in windage and track and bearing friction after power is shut off, and area *H* shows the energy dissipated in braking. It is interesting to observe that this latter reaches the formidable figure of 370 kw. The energy represented by the curves *F* and *G* has to be supplied from that stored up in the car during acceleration. This causes the slope of the speed-time curve during the coasting periods and the elimination of the track and bearing friction is responsible for the much less slope of the coasting part of the speed-time curve of Fig. 2.

In other words, windage and track and bearing friction are really a draught upon the power supply during the

whole of the run, and not merely during the time power is being used. The track and bearing friction resistance by the Armstrong formula for 25 m.p.h. is 350 lb., or 8.54 lb. per ton. To push 350 lb. 2640 ft. requires 924,000 ft.-lb., or 348 watt-hours.

Assuming that this was supplied to the car at a motor efficiency of 76.5 per cent, the power supplied for this purpose would be exactly 455 watt-hours, which is just the difference in power consumption indicated by the power curves of Figs. 1 and 2.

Of course, this is not an exact method of computing, because, first, the motor efficiency varies from 74.5 per cent to 86 per cent and must average higher than 76.5 per cent, and, second, that part of curve under the braking line is not saved by eliminating friction, as a correspondingly greater amount of power has to be absorbed by the brakes. That is, the saving effected, as shown by a comparison of the curves of Figs. 1 and 2, is slightly greater than would be expected even after we realize that we have to supply power to overcome the friction encountered during the whole run with the exception of the braking period, instead of only during the time power is supplied. This discrepancy is explained by the fact that the average efficiency of the motors throughout Fig. 2 is considerably higher than in Fig. 1 on account of the greater average load in the former case.

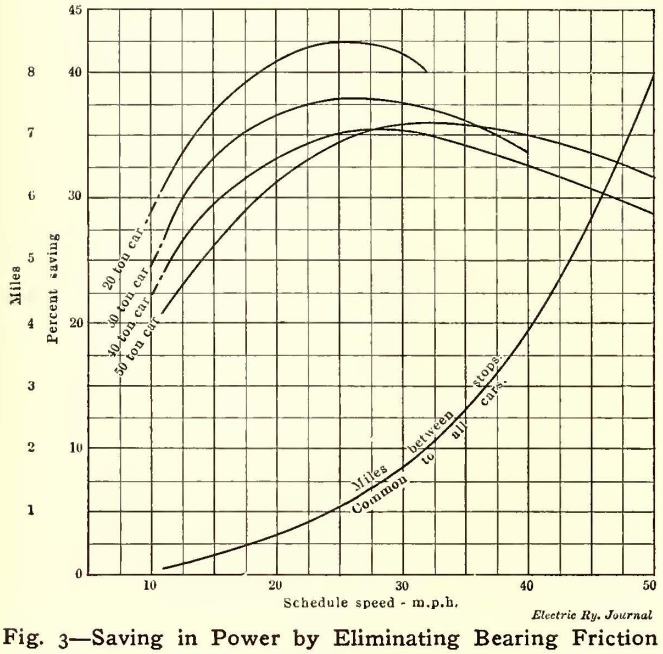


Fig. 3—Saving in Power by Eliminating Bearing Friction

I believe that a very close approximation to the actual saving that may be accomplished in any case by reducing bearing friction would be given by the following formula, obviously derived from the above results:

$$E = f \times \frac{5280}{2655} \times \frac{1}{.77} = 2.6f, \text{ nearly.}$$

When E = watt hours saved per ton mile, and f = pounds per ton reduction in train resistance effected by reducing friction.

This formula should hold approximately true, no matter what the rate of acceleration, frequency of stops or amount of coasting. It gives, however, only the absolute saving, not the percentage saving. The latter will increase as the total watt-hours per ton-mile become less.

It is unfortunate that we have no formula differentiating bearing friction from track friction. If we knew how much of the first two terms of the train resistance formula were due to bearing friction, and how much to track friction, we could tell more nearly how much saving to hope for in the use of roller or ball bearings. I believe track friction is but a small factor in the formula, and bearing friction about the whole of the first two terms. If so, nearly the whole of the saving indicated could be realized by the use of a ball or roller bearing, because such a bearing would undoubtedly almost eliminate bearing friction.

In order to get some idea of the variation of the power saving possible by eliminating friction I have calculated the percentage saving for some of the cars and schedules given in Chap. 13, Par. 126, of the Standard Handbook. These are cars of 20, 30, 40 and 60 tons, operating on schedules of ⅛, ¼, ½, 1, 2, 3, 4, 5, 6 and 7 stops per mile, and accelerating at .8, .9, 1.0, 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.7 miles per hour. The results are given in the curves of Fig. 3. The least saving indicated is 20.5 per cent and the greatest 42.5 per cent. These are all for conditions of frequent stop service, the speed being increased as the stops are less frequent, so that the power used in acceleration and braking is great in all cases.

For long runs at low speeds the saving due to eliminating bearing friction would approach 100 per cent of the power ordinarily required. For instance, if the 82,000-lb. car were to be run for a long distance over straight, level track, coasting from 30 m.p.h. to 25 m.p.h., then accelerating to 30 m.p.h., and coasting again, and so on, the power required by the full train resistance formula, including motor losses, would be 30 watt-hours per ton-mile. Omitting the first two terms of the formula, the power required would be 8.5 watt-hours per ton-mile, or a saving by eliminating friction of 72 per cent.

Of course, there are certain unavoidable sources of error in my calculations, of which the principal ones are the following:

Empirical nature of the train resistance formula.

Inability to separate track friction from bearing friction.

Assumption that gear losses and motor bearing losses are eliminated with other friction.

If it is possible to reduce bearing friction by means of ball bearings by an amount sufficient to reduce train resistance 8 lb. per ton, and I believe that this is a safe assumption for rapid transit work, this would produce a saving of 20.8 watt-hours per ton-mile. For a 25-ton car, running 200 miles per day, this would amount to 38,000 kw-hours per year, worth, at 1.5 cents per kw-hour, $570 per year.

I will not attempt to say much in this place as to the possibility of producing ball or roller bearings capable of standing up under conditions of railway service, beyond remarking that several manufacturers now claim to be ready to do it, and expressing the opinion that if such bearings are demanded they will shortly be supplied, even if not now on the market.

As stated above, I developed the method of analysis illustrated in Figs. 1 and 2 in the attempt to demonstrate whether or not the savings claimed to be made by the use of anti-friction bearings were theoretically possible. I have found the method, however, very useful in studying other problems in electric train performance. There have already been published two papers from my pen in which I made use of this form of diagram, calculated, however, in both cases from different data, and primarily intended to illustrate different concepts.

The first was a talk on "Transportation Efficiency," delivered before the Worcester branch of the A.I.E.E., and published in the *Election Traction Weekly* of May 22, 1909. The diagram used in that case was intended to furnish a visual representation of the fact that all the power supplied to an electric car from the power station is ultimately dissipated in heat, none of it being required for permanent conversion into any form of stored energy.

The second was a paper read before the Massachusetts Street Railway Association last June, on "Car Weights, as Affecting Operating Costs," and published in the Electric Railway Journal of June 19, 1909. The same general form of diagram was used, calculated for cars of different weights, to show how closely power consumption is proportional to car weights. At the latter meeting there was considerable discussion, not reported, on the question of bearing friction, which happened to be a matter of especial interest to some of those present.

Since that time several people have mentioned to me their desire for more information as to the importance of bearing friction, which leads me to hope that the present article may prove of interest as a contribution to that subject.

GASOLINE-ELECTRIC CAR IN CHICAGO

Considerable attention was attracted among railroad and electrical men in Chicago recently by a gasoline-electric passenger car of the latest type developed by the General Electric Company. This car was on exhibition at the passenger station of the Chicago, Rock Island & Pacific Railway Company in Chicago, where it was an object of much interest. It is 50 ft. long over all and is divided into four compartments—the main salon for passengers, a smoking room, a small baggage compartment and the engine room. The engine room is, of course, at the forward end of the car, which is wedge-shaped to lessen wind pressure. It contains a 125-hp, eight-cylinder gas engine, water-cooled, with radiators on top of the roof of the car and forming a rather conspicuous feature of the exterior. Direct connected to the gas engine is a d.c. 600-volt generator, which supplies electricity to two 100-hp standard railway motors mounted on the forward truck of the car. The control of the car is entirely electrical, the motorman using a controller similar to that used on ordinary electric cars. The car weighs, complete, 35 tons, and has seating capacity for 45 passengers. The entrance doors are at the side. The car is of steel construction.

This gasoline-electric car is supplied with a small storage battery for lighting and has an electric headlight and all the usual accessories. The maximum speed is from 45 to 50 m.p.h. The car on view in Chicago has seen actual service on the Southern Railway between Manassas and Strasburg, Va. These places are 63 miles apart, and for 20 days the car made a round trip daily. It is probable that the principal use of this type of car will be on branch lines of steam railroads where the service is infrequent. The car is entirely self-contained, and is operated by two men, so that it shows a great economy, even in comparison with a steam railroad train with an engine, baggage car and passenger coach. On the other hand, the overhead electrical construction of the electric railway is not needed.

The University of Illinois, Urbana, Ill., has published a circular of information of the College of Engineering which contains a description of the equipment and an announcement of courses for 1909 and 1910.

COMMUNICATIONS

THE NEW CORPORATION TAX

Milwaukee, Wis., Aug. 12, 1909.

To the Editors:

Attorney-General Wickersham, answering the criticisms of 12 certified public accountants of New York, as embodied in their letter, copy of which was sent to each member of Congress, under date of July 8, 1909, says, among other things, in his letter of July 17, 1909, to the accountants, as published in the Milwaukee *Sentinel* of July 18, 1909, the following:

The bill was purposely framed to deal with receipts and disbursements made within the year for which the tax was to be imposed. The theory of the framers of the bill in this respect differs from that which you advocate, that the proposed law does not impose a tax on "profits," but on "the entire net income" over and above $5,000 received from all sources during such year [meaning calendar year ending Dec. 31].

"The theory of the framers of the bill differs" not only from what is advocated by the 12 certified public accountants of New York, but from all accepted principles of sound accounting, with respect to determining what is either "net income" or "profits," and also differs in theory and practice from the accounting systems prescribed by the Interstate Commerce Commission, the American Street & Interurban Railway Association, the National Electric Light Association, American Gas Institute, Wisconsin Railroad Commission and New York Public Service Commissions, Districts Nos. One and Two, and in this respect the provisions of the bill are "absolutely impossible of application" for any corporation "which keeps just and true books of account."

A mercantile corporation, in determining its "net income received" for a given year, ending Dec. 31, based on "actual receipts and payments," would presumably treat as one of the sources of "actual receipts" payments received for account of sales of merchandise, which probably would be, and usually are, less than the sales of merchandise amount to during the year; therefore "net income received" could not be correctly determined on this basis.

A corporation in determining its "net income received" for a given year, ending Dec. 31, based on "actual receipts and payments," would presumably treat as one of the items of "actual payments," payments made for account of merchandise purchased and carried in stock, which probably would not be all sold; therefore "net income received" would not be correctly determined on this basis, nor could it be, without taking an inventory as of Dec. 31. This, outside of the question of the fiscal year not ending Dec. 31, would be absolutely impossible to do in the case of a corporation conducting a large department store, that month of the year (December) covering the Christmas shopping season, requiring the services of all of its employees and the use of all of its facilities to attend to the wants of its customers.

"Losses actually sustained," for example, uncollectible accounts written off the books, would not be "an actual payment" nor "an actual disbursement," therefore, presumably, would not be included as such in determining "net income received" of a corporation for a given year.

"Interest actually paid" in the case of a corporation issuing bonds dated Jan. 1, coupons payable July 1 and Jan. 1, in determining its "net income received," as per provisions of the corporation tax bill, would charge against its "actual receipts" the "payment" or "disbursement" of six

months' interest during its first year of business, namely, the coupons due and payable July 1, assuming they were all paid within six months, which is usually not the case.

C. N. Duffy.

NEW MOTOR CARS FOR THE NORTH EASTERN RAILWAY OF ENGLAND

The British Thomson-Houston Company, Ltd., of Rugby, England, has recently completed equipping six new passenger coaches for the North Eastern Railway for use on its Newcastle electrified division. The car bodies and trucks were built by the North Eastern Railway in its own shops situated at York, where the complete electrical equipment was installed by the British Thomson-Houston Company, Ltd.

These cars are similar to the original cars built for this line, but various improvements in details have been made by the railway company, and the installation of the electrical equipment is in accordance with the latest British Thomson-Houston practice.

The following table gives the leading dimensions of these cars:

Length over all	56 ft. 6¾ in.
Length over end sills	55 ft.
Center of trucks	40 ft.
Wheel base of each truck	7 ft.
Width over all	9 ft. 2½ in.
Height from rail to top of roof	12 ft. 5½ in.
Diameter of wheels (motor truck)	36 in.
Diameter of wheels (trailer truck)	35 in.
Diameter of motor journals	5½ in.
Passenger capacity (seated)	64

Each car is equipped with two GE-211 railway motors on the leading truck, the control being of the Sprague-Thomson-Houston multiple-unit type. A driving equipment is located at each end of the coach in the motorman's cab, consisting of a master controller with the necessary auxiliary switches, brake-valve instruments, etc. There is also a switchboard in each cab, accessible from the back, and

Motor Car for Electrified Newcastle Division of North Eastern Railway of England

the car body in the region of the switchboard is lined with Uralite as a protection from fire.

The motors are of the interpole type, and their armatures are so constructed that if the armature shaft at any time should become damaged it can be pressed out and replaced with a new one without disturbing or disconnecting in any way either the commutator or armature windings. These motors are also interchangeable as a whole with those on the original equipments. The master controllers are the same as on the original equipments. They are fitted with a "deadman's handle," and acceleration can be effected either automatically or by hand, as desired.

The contactors and reversers are attached to the underframe below the car floor, and are arranged in metal cases specially designed for easily examining the apparatus. The resistances are also attached to the underframe under the floor, and are of the grid type, and entirely insulated with mica.

Each end of the coach is fitted with couplers for control, main and pump-line circuits, and all cables are covered with fire-resisting material. The power and heater cables are laid in solid drawn steel conduit, all junctions being

Interior of Motor Car for North Eastern Railway of England

made in metal-connection boxes with special terminals; there are no joints in the cables.

A supply of air for the brakes is furnished by an electrically driven (type CP-22) air compressor. This compressor is hung from the underframe in a cradle, rubber blocks being inserted between the feet of the compressor and the supporting frame so as to minimize the vibration on the coach.

Both motor and trailer trucks of these new passenger cars are equipped with collector shoes for collecting current from the third-rail.

The lighting of the cars is effected by six circuits of six lights each in series, each lamp being of 32 cp at 100 volts.

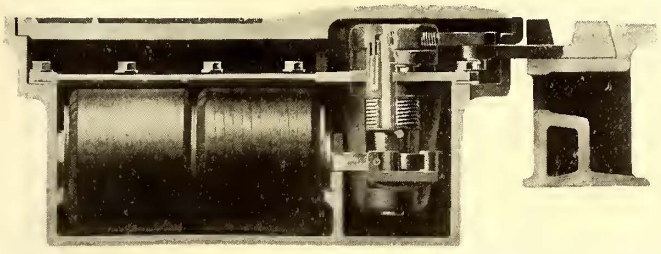
Four of these circuits are employed for lighting the passenger compartments. The lamps are wired on alternate circuits, so that in case of any circuit failing there will still be a light in each cluster, the clusters each having three lights. The clusters in the passenger compartments are arranged down the center of the upper deck, and the fittings are of heavy ornamental brass design, having circular globes of cut glass.

One circuit at each end is used for lighting the destination and signal lights, each of these circuits being in duplicate and governed by a two-way switch, so that there may always be a light in the destination indicator and signal lamps in the case of failure of one circuit. The cars are heated by electric heaters, there being 16 distributed throughout the car, all connected in series. Two heaters at each end are situated in the driver's cab.

The proportion of motor cars to trailers in trains is one to one. The weight of these motor cars in running order, but without passenger load, is 33¾ tons.

AUTOMATIC ELECTRIC SWITCH-THROWING MACHINE

The American Automatic Switch Company, New York, has recently developed a new and improved type of electric switch-throwing apparatus, the details of which are shown in the accompanying engravings. It is designed to overcome trouble from water getting into the switch box, wear on the moving parts due to the presence of dirt and grit and general wear and tear on the trolley contactor.



Electric Switch-Throwing Mechanism, Showing Mercury Stuffing Box

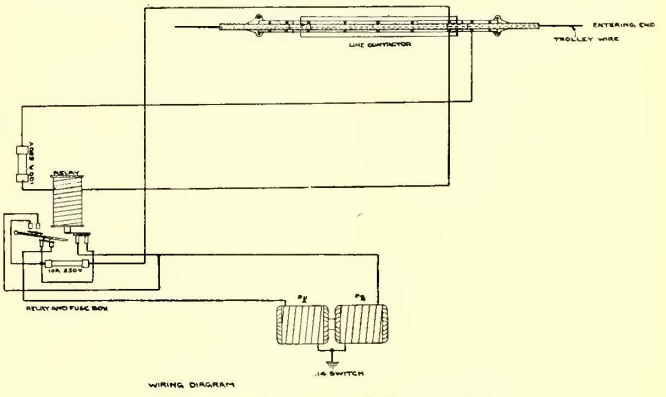
The switch-throwing mechanism consists of two powerful solenoids having a common plunger, a rotating vertical shaft, to which the solenoid plunger is attached at the lower end, and an adjustable link connecting the crank arm formed on the upper end of the rotating shaft with a lug cast or welded on the switch tongue. A semi-locking device is attached to the mechanism to prevent the switch from moving after it has been thrown. The coils and plunger are enclosed in an iron box having an inner cover put on with bolts and a gasket to make it watertight. The box is set in the street alongside the switch, with the outer cover flush with the surface of the paving. The rotating shaft projects through the inner cover and turns in a unique water and dust-proof stuffing box. This stuffing box consists essentially of a mercury seal, and the construction is clearly shown in the sectional engraving. It is impossible for dirt or water to pass through the mercury cellar and into the inner box, as to do so it would have to sink through the mercury seal and rise on the inside of the dividing wall. Mercury has a specific gravity of 14 as compared to water. As an additional precaution the coils are impregnated, and they can be entirely immersed in water without affecting their operation. The joints of the wires leading into the box and connecting to the solenoid leads are made water-tight.

The switch-throwing machine is spiked to two ties alongside of the switch. The box itself need never be dug up or removed from the street, as all of the interior parts can be inspected by lifting the outer cover and removing the bolted-on inner cover. The magnets, mercury stuffing box and all the moving parts can be taken out for repairs or replacements without difficulty. All the moving parts have case-hardened pins and bushings which can be removed and replaced easily and at small cost. The bearings are all separate from the box and therefore the box is not subject to wear and does not have to be dug up and replaced at intervals.

The controlling relay and fuses are mounted in a small waterproof cast-iron box fastened on the trolley pole nearest to the switch. The line contactor is simple, light and strong. In designing it care has been taken to keep the arc very small to prevent carbonizing of the wood insulating pieces. At the gap the metal contact pieces overhang the wood, and the wood is cut away for a distance of 1½ in. above the gap. The arc, which is broken when the trolley leaves the contactor, is less than 2 amp.

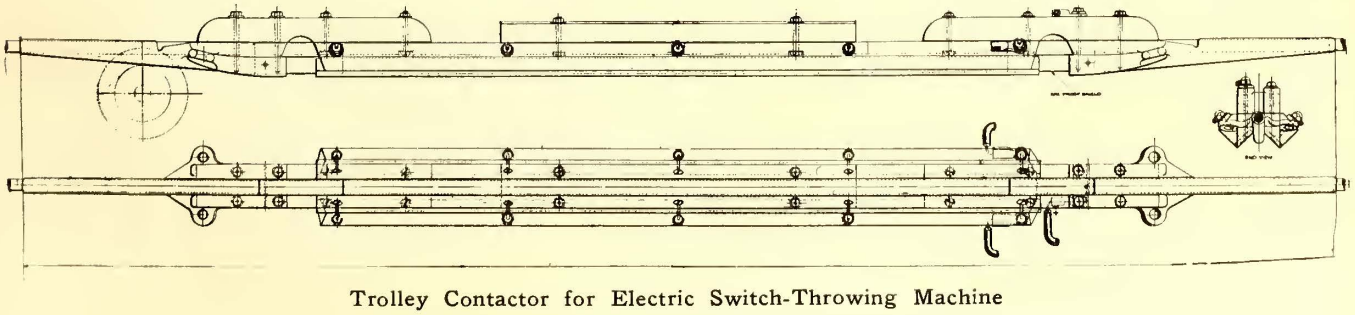
The operation of the device is illustrated by the wiring diagram. If the car is going to the left the motorman runs under the trolley contactor with the current off, and the switch will be thrown to the left if not already set in that position. If the car is going to the right the motorman runs under the contactor with the current on, which throws the switch to the right. It is not necessary for the motorman to see the switch point in order to know whether to keep the current on or off. The reverse result can be accomplished if desired by reversing the magnet connections in the relay.

The contactor is placed on the trolley wire so that the trolley wheel of a car passes under it when the front end



Wiring Diagram of Connections

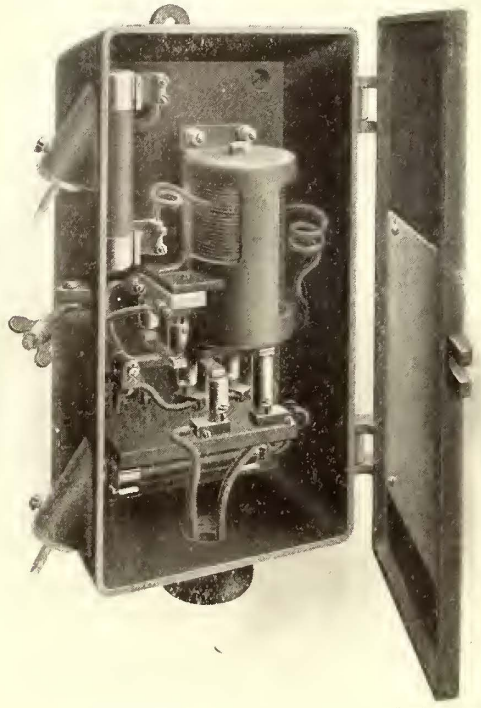
of the car is about 8 ft. from the switch point. If the current through the motors of the car is off while the wheel is passing under the contactor, a small amount of current will flow from the trolley wire through the large fuse, through the relay coil to one of the side strips of the contactor, through the trolley wheel to the other side strip (the side strips being insulated from the trolley wire and from each other), down through the small fuse, from which it passes momentarily through both magnet coils of the switch-throwing machine to the ground. The current flowing through the relay coil causes the armature to lift and break the contacts shown to the right in the wiring diagram. This cuts out the right-hand switch-throwing solenoid, but leaves the left-hand solenoid energized, thus causing the plunger to move to the left and throw the switch to the left. The small amount of current flowing



Trolley Contactor for Electric Switch-Throwing Machine

in the relay magnet coil is sufficient to break the right-hand contacts, but is not sufficient to lift the long latch shown to the left.

If current is on when the trolley wheel passes under the contactor, the same preliminary circuit is set up, but as all the current going through the car must also pass through the relay, both the long and the short latches are lifted. This breaks the bottom contact on the long latch and establishes a top contact which energizes the right-hand solenoid and cuts out the left-hand coil. The plunger then moves to the right and throws the switch point to the right. By adjusting the contacts which support the long latch either up or down the relay can be adjusted to care for any amount of current consumed by the heaters, lights or air compressors on the cars when running under the contactor with the motors cut off. No external resistances are used, and a car standing with the trolley wheel in contact with the contactor cannot injure any parts of the apparatus.



Relay and Fuses in Box on Pole

HEAVY ELECTRIC LOCOMOTIVES FOR SWITZERLAND

The Berner Alpenbahn Gesellschaft has placed an order with two German firms and the Oerlikon Company for three large motor cars and two large locomotives, to be employed on the new Spiez-Frutigen 15,000-volt single-phase line. A water-power plant near Spiez will furnish the current at 15 cycles. Catenary overhead construction and bow collectors are to be used. The motor cars will be equipped with four single-phase motors of a total capacity of 880 hp, will weigh (including passengers) 55 tons each, and each will be capable of hauling a trailing load of 250 tons over a grade of 1½ per cent at a speed of 45 km per hour.

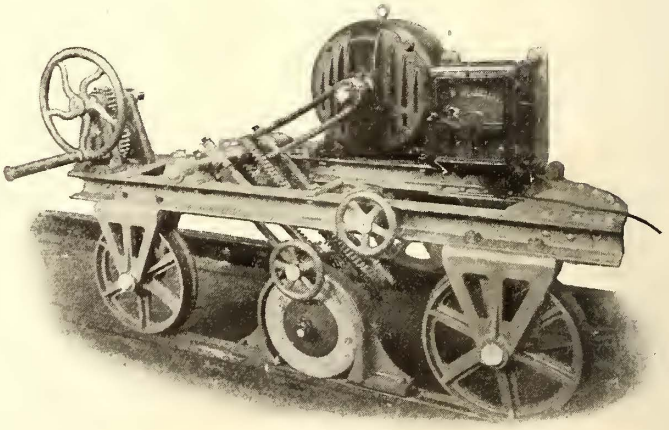
The locomotive of the Oerlikon Company will be one of the heaviest ever built, and will be equipped with two 1000-hp motors, said to be the largest single-phase motors in the world. The specifications of this locomotive required it to be capable of hauling a 420-ton train over a 1½ per cent grade at a speed of 42 km per hour. The cab rests on two six-wheel trucks, each carrying a motor. The total weight of the locomotive is estimated at 86 tons, all of which can be utilized for adhesion. The locomotive of the Allgemeine Elektricitäts Gesellschaft is similar to that of the Oerlikon Company, but the motors will be of slightly less capacity. Both motor cars and locomotives will carry transformers and be equipped with multiple control system. The maximal schedule speed will be 70 km per hour.

RAIL-GRINDING MACHINE FOR REMOVING CORRUGATIONS

The accompanying engraving, reproduced from *The Electrician*, London, shows a new type of machine for grinding corrugated rails, which has been designed and patented by Frank Ayton, chief engineer and manager of the Ipswich Corporation electric supply and tramways departments, and L. Crosta, managing director of the Railway & General Engineering Company, of Nottingham, England. It is made by the latter company. The new feature embodied in this machine lies in fixing the grinding wheel in a "skate" which is attached to the truck by two radius arms. The skate is able to move vertically, and also to some extent in a lateral direction, independently of the movement of the truck carrying the driving motor. A screw adjustment and guide are provided for feeding the grinding wheel down in the skate. As the skate slides along the rail on two perfectly flat faces, it is obvious that the crests of the corrugation waves will be ground off, and finally a perfectly flat and smooth surface reproduced on the rail head. The effect is really the same as that obtained by a carpenter truing up the wavy edge of a board with a plane.

The machine is also arranged so that it may be used to grind out the small grooves worn by the wheel flanges at the bottom of the grooves of switch point mates. These grooves cause bumping of the cars, and are also, no doubt, the cause of many broken axles. For this purpose the machine is provided with a second set of skate faces and a narrow grinding wheel is used.

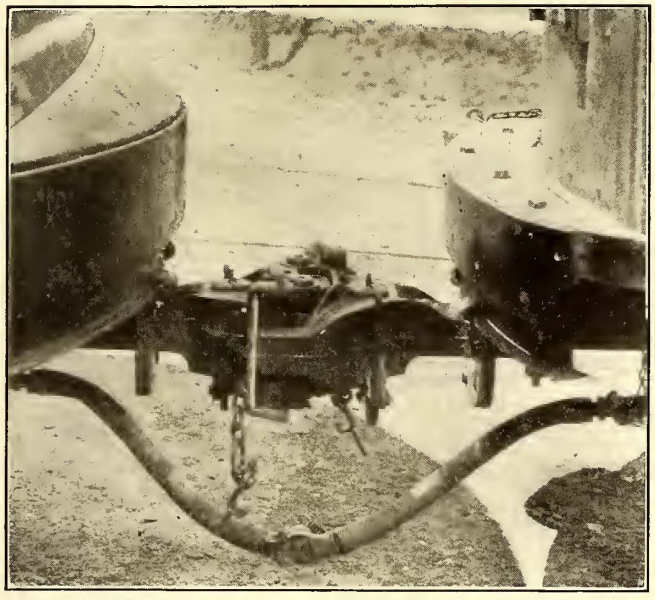
The power required is small. When the machine is running light—that is to say, with the grinding wheel not touching the rail—the motor of the machine shown in the engraving takes 1½ kw. When grinding corrugations, the average input is 3.75 kw, and the maximum about 5 kw. The motor is rated at 5 hp, and the drive is to a countershaft, and thence to the skate by means of two Renolds chain belts. Power is taken from the trolley. The slow traverse along the track of about 5 ft. to 8 ft. per minute is obtained by winding up a small steel rope on the winch seen at the left end of the machine. The other end of the rope is fixed to a stake driven between the paving blocks.



Rail Grinder for Removing Corrugations

AUTOMATIC COUPLERS FOR ELECTRIC CARS

The W. T. Van Dorn Company, Chicago, Ill., has recently perfected and placed on the market several new types of drawbars for electric railway cars, which are designed to meet the special conditions encountered and to perform extraordinary service. All of these new types are built along the same substantial lines as the older designs of couplers made by this company, which are the

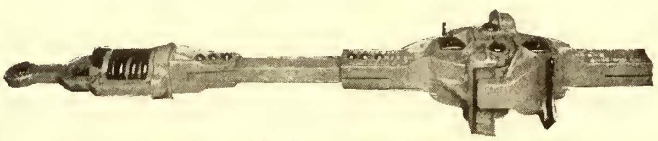


No. 31 Couplers on Chicago & Southern Traction Company's Cars

standard on more than 400 street and interurban railways throughout the world and on practically all of the elevated and subway systems of the United States.

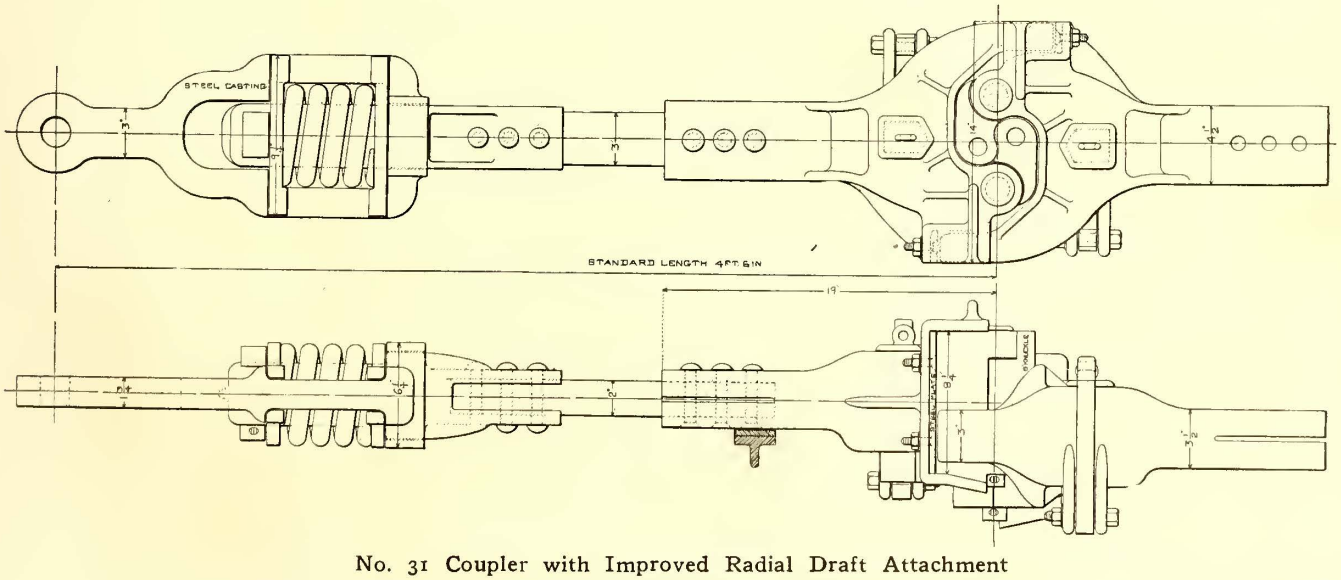
One of the illustrations is of the company's new No. 31 drawbar as installed on the cars of the Chicago & Southern Traction Company. The engraving shows two of these cars coupled together for train operation. The drawbars are built with heads about three-fourths the size of standard M.C.B. heads, but the manufacturer is in position to furnish drawbars of the same general design conforming to M.C.B. specifications if desired. This coupler is recommended by the company for use on city and interurban cars. The knuckles and face of the coupler are modified from the standard M.C.B. contour lines to furnish a more rigid coupling, and it is not intended to couple with M.C.B. standard types. It is built on lines which eliminate lost motion between the knuckles and give longer life to the parts.

The coupler attachment is of the radial type and the head was especially designed to overcome the buckling forces which had to be contended with in other types of couplers. On one side of each head a pocket or recess is cast. This pocket is formed back of the knuckle far enough to allow the guard arm that is cast on the opposite side of the head to slide around the knuckle and slip back into the pocket. The arm is of sufficient length to butt up against the steel wearing plate in the pocket when the two couplers are locked. This gives the couplers a butting surface not only against the knuckles, but also on each side of the head, thus giving a three-point contact and preventing the couplers from buckling. The steel wearing plate, which



No 31 Coupler with Improved Draft Attachment

is riveted or bolted to the back part of the pocket, is so constructed that after a long period of service all the lost motion can be taken up by a fillet plate inserted between the wall of the coupler and the wearing plate. One feature of this construction is that the guard arm that slides into the pocket when the couplers are brought together brings the heads of the two couplers into alignment and locks the knuckles for their entire width. By this arrangement a wearing surface which extends the full width and depth of the knuckle is provided. The knuckles are 8 in. deep. This drawbar is fitted with a very strong but simple automatic unlocking device. The pivot pins on which the knuckles turn are the same size as those used on standard M.C.B. couplers.

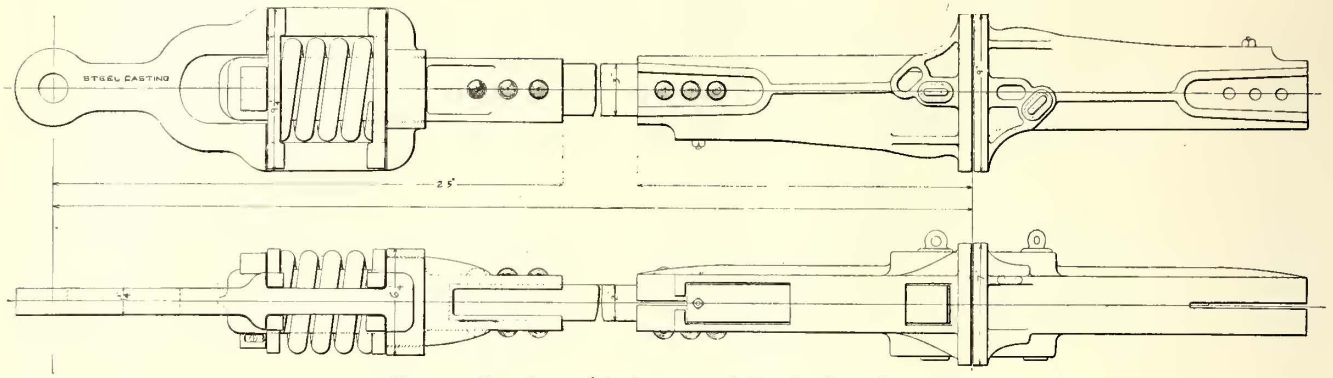


No. 31 Coupler with Improved Radial Draft Attachment

A new form of radial draft attachment, which was designed especially for this type of coupler, but it may be used on any of the various types of couplers made by the company. The attachment is composed of two steel castings which, when fitted together, form a strong straight-line draft rigging. They also form a substantial casing in which the draft spring is enclosed. This casing serves as

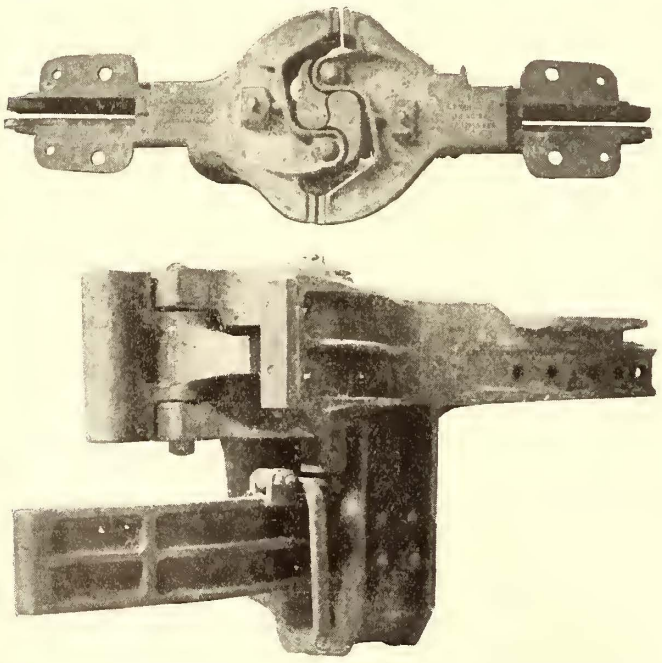
a guide for the spring, and, because of its simplicity, eliminates the necessity of having more than two supporting points for the drawbar. The standard drawbar of this type is 4 ft. 6 in. long, but this length can be changed to meet any special condition.

The Van Dorn No. 27 drawbar, which is also illustrated, is shown fitted with the company's new draft rigging. This type of coupler is built in sizes between the Van Dorn No. 5 and the Van Dorn No. 11 couplers, and couples automatically with either one of these types. It is built so substantially that it may be used for as heavy cars as the No. 11 or interurban type of coupler. This coupler will also couple automatically with the company's No. 5¾, No. 11½ and No. 21½ types, and is equipped with the same sized link and pin as these other couplers.



No. 27 Coupler with Improved Draft Attachment

All of the Hudson & Manhattan Railroad subway cars have been equipped with Van Dorn No. 20½ heavy type couplers, which are shown in the engravings. These couplers have the same form of pocket and extension guard arm as the No. 31 coupler described above, and in addition are fitted with an automatic unlocking device, by means of which the knuckles may be uncoupled without going between the cars. It also has the same form of double combination pin to couple and uncouple as is used in the company's older types.



No. 20 1/2 Couplers as Applied to Hudson Tunnel Cars

The W. T. Van Dorn Company will exhibit at the Denver convention in October samples of all of the new couplers which it has recently perfected.

WOODPECKERS ATTACK CEDAR POLES

Considerable damage is being reported to telephone, telegraph, electric light and electric railway poles by members of the woodpecker family. These birds originally built their homes in the dead or dying trunks or limbs of trees, but for some reason best known to themselves have come to the conclusion that the peeled pole offers better conditions for a home. Their activities spread over a wide portion of the United States, notably in the South, Southwest and Central West. Cedar poles seem to be the ones most frequently attacked. The birds bore into them at any height from the ground, and the holes which they make are often 2 or 3 in. in diameter and 4 or 5 in. deep. Such an amount of wood drilled from a stick of timber which is carrying a load of wires naturally weakens the strength of the line.

It would, of course, not be a difficult matter to exterminate these birds. However, this is not desirable, as they are among the most beneficial forms of bird life native to this country, and destroy large numbers of insects which are injurious to vegetation. It seems, therefore, that methods should be undertaken to compel the birds to revert to their former habit of boring rather than to exterminate them.

Frequent inquiries have been made by the Forest Service in this connection, but the only information to date which the Government has been able to obtain is that on a casual inspection of treated and untreated pole lines in Louisiana. In that region it was found that poles which had been impregnated with creosote oil were not attacked by the birds, whereas untreated poles under the same conditions were very severely injured. Whether or not creosote will prevent such attack is not definitely known, but the Service is investigating this problem, and should this oil prove a preventive, it will fulfill a twofold purpose—it will protect the poles from decay and from destruction from animal life. Employees of one of the electric railway companies in southern Indiana recently attempted to prevent further destruction of the poles on that line by filling the holes in the wood with stones. The birds, however, simply drilled around the stones and made the conditions much worse. This apparently does not seem to be a means of preventing their depredations.

TRAIL CARS FOR PHILADELPHIA

The Philadelphia Rapid Transit Company is now equipping at its shops 60 motor cars for operation with trailers, and they will be placed in service this fall. The lines on which these trains will be placed have not yet been determined.

ELECTRIC RAILWAY LEGAL DECISIONS

EJECTMENTS, ASSAULTS, ETC.

Maryland.—Carriers—Injuries to Passengers—Actions—Evidence — Instructions — "Passengers" — Licensees —Trespassers—Burden of Proof—Instructions.

Where, in an action against a carrier, the gist of the action was that plaintiff, while a passenger on a street car, had been assaulted by the conductor and ejected therefrom, and that if not a passenger he was entitled to protection from the violence of the employes of the company, and the theory of the company was that plaintiff boarded the car to sell newspapers, and that the conductor did not assault him, but that plaintiff contributed to his own injury by jumping from the car while in motion, an instruction that if the jury believed that plaintiff boarded the car for the purpose of riding as a passenger, and tendered his fare which the conductor without reason refused to receive, and forcibly and wantonly ejected him from the car, the verdict should be for plaintiff, while if he boarded the car to sell papers, the verdict should be for defendant, unless the injury was caused by the conductor wantonly ejecting him from the car, properly submitted the issue.

A street railway company is liable for an assault on a passenger committed by its conductor while executing the contract of transportation.

A newsboy, entering a street car for the purpose of selling papers, and without paying fare, is not a "passenger" but a mere licensee or trespasser, and the company owes him no duty, except to use ordinary care for his preservation after discovering his peril, and to refrain from inflicting willful, reckless, and wanton injury.

One suing a street railway company for injuries received while a passenger, in consequence of being assaulted by the conductor, has the burden of showing, by the weight of the evidence, that the injury was caused by the wrongful act of the conductor, or the verdict must be for the company.

Where, in an action for injuries to a passenger ejected from a street car, the court charged that if plaintiff boarded the car for the purpose of riding as a passenger, and tendered his fare, which the conductor, without excuse, refused to receive, and wantonly ejected plaintiff from the car, the verdict should be for him, and that if he was on the car for the purpose of selling newspapers, the verdict should be for defendant, unless the injury was caused wantonly, etc., an oral instruction that the court had refused instructions prepared by plaintiff, and had given, in lieu of them, its own instructions, which were read, and stating that at the instance of the parties it had granted prayers, which were read; that the object of the instructions was to present the theories of the case; that if the story told by plaintiff was believed, a verdict was authorized in his favor, while if defendant's story was believed the verdict should be for it, was erroneous as misleading the jury to the prejudice of plaintiff. (Rosenkovitz vs. United Railways & Electric Co. of Baltimore City, 70 Atl. Rep., 108.)

New Hampshire.—Carriers—Carriage of Passengers—Ejection of Person at Place Other Than Station—Action—Nature.

A carrier which ejected a person from a train for nonpayment of fare at a place other than a passenger station, in violation of Pub. St. 1901, c. 160, sec. 6, is not necessarily liable for the resulting damage, but it must appear that it occurred through its failure to perform the duty imposed by statute; and, to recover, the ejected person must prove the insufficiency of the station at the place of expulsion, his own care, and that the injury resulted from defendant's fault.

Where a person was ejected from a train five miles from his home, where there was no passenger station, and was in such good health and so well clothed that he could properly go home afoot, and there was no train that he could wait for, and it appeared that he would have walked home even if there had been a station, an illness contracted by him from the walk had no connection with his ejection, and he could not recover therefor. (Caher vs. Grand Trunk Ry. Co., 71 Atl. Rep., 225.)

New York.—Master and Servant—Injuries to Third Persons—Exemplary Damages—Liability of Employer—Grounds—Employer's Liability—Instructions—Damages.

In order to justify an award of punitive damages against an employer for a tort committed by his employee, the act of the servant must be wanton or malicious, and the employer must have participated in the act, or expressly or impliedly authorized or ratified it.

In an action against a master for false imprisonment by a servant an instruction that the right of freedom of the person is inviolate, and, if infringed, should be punished in an exemplary manner, and, if plaintiff was falsely imprisoned, the jury could award punitive damages in such degree as, in its discretion, was proper, was erroneous as omitting the requirement that the tort must have been wanton or malicious and participated in by the master, and as tending to require the award of punitive damages. (Lewine vs. Interborough Rapid Transit Co., 113 N. Y. Sup., 15.)

New York.—Master and Servant—Injuries to Third Persons—Punitive Damages—Damages—Grounds—Malice —Question for Jury.

In an action against a street railroad for an arrest by its employee, plaintiff could not recover punitive damages, unless the employee acted through malice in which defendant shared, and an instruction permitting the award of punitive damages if defendant ratified its employee's act and the jury thought it necessary to add something by way of punishment, was improper.

Malice may be proved, so as to justify the award of punitive damages against an employer for the act of his servant, by showing that the tort was committed to gratify some actual grudge or ill will, or that it was committed recklessly or wantonly, without regard to the rights of others.

In an action against an employer for the tort of a servant, whether malice existed, so as to justify the award of punitive damages, is for the jury, and, even if they find malice, the award of punitive damages is discretionary with them. (Magagnos vs. Brooklyn Heights R. Co., 112 N. Y. Sup., 637.)

New York.—Carriers—Carriage of Passengers—Actions—Admissibility of Evidence—Courts—Municipal Court—Jurisdiction—Malicious Prosecution.

In an action for breach of a carrier's contract to carry a passenger safely, testimony tending to show an assault and slanderous abuse of plaintiff while in the car was admissible in support of the action for breach of contract.

Under the direct provisions of Municipal Court Act, sec. 1, subd. 14 (Laws 1902, p. 1489, c. 580), that court has no jurisdiction of actions for malicious prosecution, so that it was error to admit evidence to support such an action which was joined with another action of which it had jurisdiction. (Telzer vs. Brooklyn Union Elevated R. Co., 113 N. Y. Sup., 18.)

New York.—Carriers—Stations—Swinging Doors—Personal Injury—Burden of Proof.

In a suit for injury to a passenger while necessarily passing through a corridor to his train caused by glass in a swinging door breaking when he pushed against it to open the door, which was locked, the burden was on the company to explain why the door was locked, where the passenger used no more force than he had previously used in passing through the doors, and where there was nothing to indicate that they would not easily respond to ordinary pressure. (McCormack vs. Interborough Rapid Transit Co., 113 N. Y. Sup., 1006.)

Rhode Island.—Carriers—Passengers—Personal Injuries—Actions—Sufficiency of Evidence—Damages—Excessive Damages—Personal Injuries.

In trespass for assault and battery by employees of a carrier upon one about to take passage on its car, evidence held to sustain a verdict for plaintiff.

In an action against a carrier for injuries caused by an assault of employees, resulting in contusions and bruises on the knee joint, which caused plaintiff's knee to be permanently stiff, a verdict for $2,000 was not excessive. (Wilcox vs. Rhode Island Co., 70 Atl. Rep., 913.)

LIABILITY FOR NEGLIGENCE

Texas.—Carriers—Street Railroads—Injuries to Passenger Alighting from Car—Contributory Negligence—Instructions—On Rehearing—Actions—Pleading—Trial—Assumption of Facts.

Where, in an action against a street railroad for injuries to a passenger while alighting from a moving car, defendant alleged that plaintiff alighted in a negligent manner, and there was evidence that plaintiff stepped off with her back the way the car was going, it was error to refuse an instruction that if plaintiff in alighting "did not follow the motion of the car" but stepped therefrom in a negligent manner, and that, if a person of ordinary care would not have so acted under similar circumstances, this would constitute contributory negligence.

In an action against a street railroad for injuries to a passenger alighting from a moving car, a plea that plaintiff was

negligent in the "manner" in which she alighted from the car was a specific allegation of negligence, and, in the absence of a special exception, was sufficient to admit evidence as to plaintiff's manner of alighting.

In an action against a street railroad for injuries to a passenger alighting from a moving car, an instruction that if plaintiff in alighting did not follow the motion of the car, but stepped therefrom in a negligent manner, and that if a person of ordinary care would not have so acted under similar circumstances, this would constitute contributory negligence, was not objectionable as assuming that, if plaintiff failed to step with the motion of the car, in alighting therefrom, she was guilty of negligence as a matter of law. (Dallas Consol. Electric St. Ry. Co. vs. Barnes, 119 S. W. Rep., 122.)

Texas.—Carriers—Injuries to Passengers—Actions—Evidence—Contributory Negligence—Intoxication.

Where, in an action by a passenger, the evidence was conflicting as to whether he was intoxicated when injured, he testifying that he had not been drunk for two years prior thereto, testimony was admissible that plaintiff had been intoxicated many times previous to the injury. (Lewis v. Houston Electric Co., 112 S. W. Rep., 593.)

Virginia.—Evidence—Res Gestæ—Declarations of Employe After the Event—Appeal and Error—Harmless Error—Non-expert Opinions — Trial — Instructions—Assumption of Fact—Injury to Passenger Boarding Car—Question for Jury.

Conversation between the motorman and a third person after a passenger, who, while attempting to board a street car, had been injured, by being thrown to the ground by the starting of the car, had arisen and got on the car, is no part of the res gestæ.

The declaration of the motorman, after a passenger had been injured while attempting to board the car, that he had no right to stop on the railroad track, and his failure to reply, when thereupon he was asked, "What did you stop for, then?" are inadmissible against the carrier; he not being in the performance of any duty within his employment in what he said or in his silence.

It being a material issue as to whether a street car was still or moving when a passenger attempted to board it with the result of being thrown by the car moving, and the evidence thereon being conflicting, the majority of witnesses testifying it was standing still, it was not harmless to admit evidence that, after the accident, the motorman said he had no right to stop on the railroad track, and made no reply when, thereupon he was asked, "What did you stop for, then?"

Non-experts, who were frequently with plaintiff after her alleged injury, and in a situation to know and speak of her condition as lay witnesses could speak, could testify that she did not appear to have such use of her shoulder as enabled her to work as seamstress, and that since the accident she had not been able to do anything with her arm.

The instruction that if the jury believe defendant, at the time of the alleged injury, was engaged in running street cars, it was bound to use the utmost care and diligence for the safety of its passengers, and is liable for injuries to its passengers occasioned by the slightest neglect against which human prudence and foresight might have guarded, has for its object merely the statement of the degree of care defendant owed to its passengers; and does not assume plaintiff was a passenger—a question submitted to the jury by other instructions.

Evidence in an action for injury to a person while attempting to board a street car held sufficient to authorize submission to the jury of the question of the car having been stopped at the point for the purpose of receiving passengers, and of its having been started suddenly and without notice while she was boarding it. (Blue Ridge Light & Power Co. vs. Price, 62 S. E. Rep., 938.)

Washington.— Carriers — Alighting Passengers — Carrier's Duty — Negligence — Contributory Negligence — Questions for Jury—Damages—Personal Injuries—Recovery Not Excessive.

A carrier must provide a safe place for its passengers to alight.

Though a street car passenger knew the unsafe condition of the street in which she was injured while alighting from a car at night, she had the right to expect that the company having the same knowledge, would perform its duty in so stopping the car as to provide her with a safe place for alighting.

In an action against a street car company for injury to a passenger, who stepped into an excavation while alighting, whether the company was negligent, and whether the passenger was guilty of contributory negligence, held, under the evidence, for the jury.

A personal injury verdict for $2,000 was not so excessive as to justify interference, where plaintiff incurred $150 medical expenses, sustained bruises on her right arm from the elbow to the shoulder, and also her right side, and had a severe pain in her head for almost a year. (Murray et ux. vs. Seattle Electric Co. et al., 97 Pac. Rep., 458.)

Washington.—Carriers—Passengers—Actions for Injuries—Question for Jury—Defect in Step—Instructions—Contributory Negligence—Care Required of Passengers.

In an action by a passenger for injuries received in alighting from a street car, where there was evidence to show that the car step sagged, permitting the heel of the person using it to be caught and held while she attempted to alight, the question of whether the step was defective was properly submitted to the jury.

In an action by a street car passenger for injuries while alighting, an instruction that the law does not require plaintiff in an action for personal injuries to be absolutely free from any neglect whatever, as such a requirement would impose on him the duty of exercising extraordinary care, while the law only required that plaintiff exercise ordinary care under the circumstances, which he may do, though guilty of some slight neglect, was proper, and made the exercise of ordinary care the measure of plaintiff's conduct. (McCormick vs. Seattle Electric Co., 96 Pac., Rep., 220.)

Wisconsin. — Carriers — Negligence — Starting Street Car While Passenger Is Alighting—Injury to Alighting Passenger—Sufficiency of Special Verdict—Trial—Instructions—Credibility of Witnesses—Instructions Not Applicable to Evidence.

A street car conductor, who starts his car at a time when he knows a passenger is alighting, is negligent as matter of law.

In an action against a street car company for injuries to an alighting passenger, where it was undisputed that the conductor was on the rear platform as plaintiff was alighting, and saw him in the act, and that the conductor rang the bell to start the car, a special verdict in favor of plaintiff, finding that he was injured while alighting from the car, that the car started while he was alighting, causing him to fall to the pavement, that the starting of the car was the proximate cause of his injury, and that he was not negligent, was sufficient, though it did not specifically find that defendant was negligent.

In an action against a carrier for injuries to an alighting passenger, where the conductor of the car had been examined before trial under St. 1898, Sec. 4096, providing for examination of parties before trial, and was cross-examined on the trial in relation thereto and forced to admit that he had made statements contradictory to those made on the trial, a charge that the jury should not consider the conductor's evidence given prior to the trial in so far only as to determine the credibility of his evidence given on the trial and the weight to be given to it, though inaccurately worded, sufficiently informed the jury that they could consider the conductor's prior testimony only on the question of credibility of and weight to be given his testimony on the trial.

In an action against a carrier for injuries to an alighting passenger, where the only contributory negligence claimed was that plaintiff attempted to alight while the car was in motion, and the court fully charged that if he did so, and by reason thereof he fell or was thrown from the car, he was negligent, it was not error to refuse a request that a slight want of ordinary care by plaintiff contributing to his injury would render him negligent.

In an action against a street car company for injuries to an alighting passenger, where undisputed evidence showed that the conductor was on the rear platform, and saw or should have seen, plaintiff when he was alighting, requests to charge that if the car was stopped for a period reasonably sufficient for plaintiff in the exercise of ordinary care to alight, and the car was then started by defendant's servants without their knowing or having reason to believe that plaintiff desired to alight or was in the act of alighting, then the starting of the car was not the proximate cause of the injury, and that if, when the car started, plaintiff was not in a position reasonably calculated to inform defendant's servants, had they exercised due care, that plaintiff would probably be injured by starting the car, then the starting of the car was not the proximate cause of the injury, were properly refused as not applicable to the evidence. (Jirachek vs. Milwaukee Electric Ry. & Light Co., 121 N. W., Rep., 326.)

CHARTERS, FRANCHISES AND ORDINANCES

New York.—Eminent Domain—Condemnation Proceedings—Orders—Appealability—Compensation — Deduction for Benefits—Intangible Property—Easements—Evidence—Value—Similarly Situated Property.

Under the condemnation provisions of the Code of Civil Procedure, an appeal lies from an order denying a motion to confirm the report of commissioners awarding damages for property taken and remitting the matter to new commissioners to assess damages.

Code Civ. Proc. § 3370, General Railway Law, Laws 1850, c. 140, p. 211, and Rapid Transit Act, Laws 1875, § 20, c. 606, p. 745, providing that in fixing the amount of compensation to be paid by the condemnor the commissioners shall not make "any allowance or deduction on account of any real or supposed benefits which the owners may derive from the public use for which the property is to be taken or the construction of any proposed improvement connected with such public use," apply to the taking of actual tangible property, and not to intangible property. Hence, where easements appurtenant to real property are condemned, benefits may be allowed as a set-off, as, the damages being consequential, the benefits are an element of the right taken.

In condemnation proceedings, it is a general rule that a party may not establish the value of his land by showing what was paid for another parcel similarly situated, subject to the exception that where the difficulty of otherwise proving value is very great, and the other property is so similar in kind and character to that to be acquired that the evidence is reasonably satisfactory, it may be admitted.

In proceedings by a railway company to condemn easements appurtenant to real property on the question of the damage to the owner of a particular estate in the property by the loss in value of such estate from deprivation of the easement, evidence of what the company paid to owners of other interests in the property to secure releases of their rights in the easements is inadmissible, where the estates affected are so dissimilar as not to afford a proper basis of comparison.—(Manhattan Ry. Company v. Stuyvesant et al., 111 N. Y. Sup., 222.)

Texas.—Mandamus—Street Railroads—Streets—Duty to Pave—Evidence.

Where a street railroad's franchise required it to pave the street between its rails and one foot on the outside thereof in the same manner and at the same time as the streets through which the track was laid should be paved by the city, a judgment in mandamus commanding the railway company to forthwith proceed to pave that portion of M. street occupied by its tracks and one foot outside the rails with the same kind of material and at the same time that the city does its part of the work was not objectionable for failure to sufficiently describe the material with which the work was to be done, or the manner and time of doing it.

Where a street railway's franchise required the railway to pave its portion of the street and one foot outside the rails in the same manner and at the same time the streets should be paved by the city, proof that the city was actually engaged in paving a street on which defendant's tracks were laid, and that defendant had refused to pave its portion of the street, not because of financial inability, warranted mandamus compelling the railway company to forthwith comply with its franchise obligation.—(Denison & S. Ry. Co. v. City of Denison, 112 S. W. Rep., 780.)

Virginia.—Street Railroads—Location—Power of City Council—Municipal Corporations—Discretion of City Council—Review—Eminent Domain—Additional Servitude—Streets—Abutting Owners—Rights of Abutting Property Owner—Damage to Abutting Property.

The power conferred by Bristol city charter on the city council to permit street car lines to be built, and to designate the route and grade thereof, is not limited by the present Const. 1902, art. 4, § 58, (Code 1904, p. ccxxii), providing that the Legislature shall not enact any law whereby private property shall be taken or damaged for public uses without just compensation, nor by Code 1904, § 1294i, authorizing the construction of street railroads, and providing that the tracks shall not unnecessarily interfere with the use of the street or public travel over the same, or damage property without compensation, so as to deprive the city council of the right to determine the location of such railroad within a street.

The city council of a city having charter authority to permit street railway lines to be built and to designate the route and grade thereof, the exercise of judgment by the council in directing that a street railway line should be laid east of the center of a street could not be interfered with by the courts, in the absence of a showing of a fraudulent or manifest abuse or oppressive exercise of power.

The rule that the location of a street railway line does not impose an additional servitude on the land occupied by the street so as to constitute an invasion of the property rights of abutting owners is not changed by Const. 1902, art. 4, § 58 (Code 1904, p. ccxxii), prohibiting the passage of any law whereby private property shall be taken or damaged for public uses without just compensation.

Where a city acquires title to the fee of a street by conveyance or condemnation, the abutting owner is presumed to have been compensated for all the servitudes to which the street was liable when the city acquired the land.

A city council, pursuant to charter authority, directed that a street railway company should lay its tracks east of the center of a certain street, on the east side of which complainant owned certain property. The track was to be located six feet from the east curb flush with the surface of the street, and maintained so as not to unreasonably impede travel or the passage of vehicles. Held, that such location did not impair any of complainant's rights in the street; and this, though a vehicle could not stand between the track and the curb while a car was passing.

Where by reason of the location of street railway tracks, east of the center of a street, there was not sufficient room for a vehicle to stand opposite the complainant's property between the track and the curb while a car was passing, complainant was entitled to occupy the street in front of his property for a reasonable time to take away or deliver persons or goods, as against the rights of the street railway company to use the street for passage.

An abutting property owner is not entitled to damages because the proposed location of a street railway track in the street in front of his property as authorized nearer to his property than the center of the street would make such property less desirable and less comfortable as a residence.—(Wagner v. Bristol Belt Line Ry. Co. et al., 62 S. E. Rep., 391.)

Washington.—Eminent Domain—Right of Way—Value of Property.

Under Const. art. 1, § 16, providing that no right of way shall be appropriated until full compensation thereof be made or ascertained, irrespective of any benefit from the improvement proposed, the value of the property taken for a right of way should be fixed as at the time of trial, rather than at the commencement of condemnation proceedings.—(Gray's Harbor & Puget Sound Ry. Co. v. Kauppinen et al., 101 Pac. Rep., 835.)

West Virginia.—Eminent Domain—Property Subject to Appropriation—Railroad Right of Way—Use by Another Company—Railroads—Right of Crossing Road of Another Company—West Virginia Statute.

Under the law of West Virginia, the right of way of a railroad company is its private property; the rights of the public therein being only in its use. After it has acquired and is using such right of way for its road, it cannot be wholly deprived thereof for any other public use, nor can it be subjected to the burden of a further easement thereon without compensation.

Code W. Va. 1906, § 2343, cl. 7, authorizes a railroad company "to cross at grade or to cross over or under * * * any other railroad * * * at any point on its route," and provides that, if the two corporations cannot agree upon the amount of compensation or the points and manner of such crossing and connections, the same shall be ascertained and determined by condemnation proceedings. Section 2216 provides that any railroad, canal, or pipe line company, etc., may cross any other railroad, canal, or pipe line at grade, "provided its work be so constructed as not to impede the passage or transportation of persons or property along the same;" that, "in case the parties interested fail to agree upon such crossing, * * * the company desiring it may bring its suit in equity, and in such suit the court may in a proper case decree that such or any proper crossing * * * may be made upon payment of damages," to be ascertained by proceedings under the condemnation statute. Held that, construing such provisions together and in the light of other provisions, a railroad company has not the absolute right to cross the road of another company at grade at any point it might select, but that, if the parties could not agree on the same, the point and manner of the crossing must first be determined by the court in a suit in equity, after which the crossing may be made on payment of compensation to be determined in condemnation proceedings.—(Elkins Electric Ry. Co. v. Western Maryland R. Co. et al., 163 Fed. Rep., 724.)

News of Electric Railways

Power of Ontario Board to Award Damages to be Decided by Courts

The city of Hamilton applied to the Ontario Railway & Municipal Board recently to recover $2,418.45 from the Hamilton (Ont.) Street Railway for repairs to the asphalt pavement on certain streets and for 2 ft. outside of the rails of the company's lines, claiming this amount in the nature of damages for breach by the company of its obligation to repair the streets named in the petition. The question arose as to whether or not the city could recover for damages through the intervention of the Railway & Municipal Board, involving the subject of the jurisdiction of the commission, a jurisdiction which, in this particular instance, the board did not want to assume unless it was clearly its duty to do so, as it might mean inroads by the board on the jurisdiction of the courts. The board finally decided to adjourn the hearing until after the Court of Appeals has determined the question of its jurisdiction. In filing its opinion the board quoted extensively from the act creating it, and concluded as follows:

"It is clear that this legislation gives the board jurisdiction where the company has violated or committed a breach of such agreement or where the municipality has violated or committed a breach of the agrecment to compel the company or the municipality or both specifically to perform the agreement. To enable the board to enforce its order against a company it has power to enter upon, seize and take possession of the whole or part of the railway and its real and personal property. In case of default of a municipal corporation in obeying the order of the board, the board may direct the work to be done by some other person and the expense incurred may be recovered by such person from the municipal corporation in default as money paid and the certificate of the board shall be conclusive evidence.

"In all this legislation there is no inroad made upon the jurisdiction of the courts. The jurisdiction that the courts had before the creation of the board they have still. The jurisdiction conferred upon the board was entirely new and original. The board was established for the purpose of enforcing statutory enactments and agreements made by virtue of statutory power. It does not follow that because the board has power to hear and determine any application and to specifically enforce a statutory enactment or an agreement made by virtue of statutory power, that it has jurisdiction to award damages for their violation. The board has power to prevent their violation, but if either party permits the other to violate the statute or agreement without asking the intervention of the board, and damages accrue, we are of opinion that these damages must be recovered in the courts, which always were and still are wide open.

"The board has responsible and drastic powers delegated to it by the creative act. It will readily occur upon reflection that if the board were compelled to undertake to try the actions for damages, which will accrue to individuals throughout Ontario, based upon breaches of the Railway Act and on the contracts between the thirty odd railways under its jurisdiction and three times that number of municipalities, the board must soon, from mere accumulation of cases, find itself paralyzed and incapable of performing the prompt, direct and effective work contemplated by the act, which the public interest requires at its hands. It is the opinion of the board that the Legislature was fully sensible of this and intentionally omitted to give the board express jurisdiction to award damages.

"By subsection 3 of section 17 of the act creating the board, it is provided that the board shall have exclusive jurisdiction in all cases and in respect of all matters in which jurisdiction is conferred on it by that act or by the special act or by the Railway Act. If this board has jurisdiction, the courts have not, and the result will be that trial by jury in all cases arising out of the Railway Act will be abolished. It never could have been the intention of the Legislature to deprive the individual litigant againt the companies of the palladium of his rights. There should be no straining by the board for jurisdiction; neither does the board want to shirk its duty. Fortunately we are not the sole judges of our jurisdiction. It is not what we say but what the Court of Appeal determines that fixes our jurisdiction.

"During the argument we were asked by the city to construe sections 5 and 11 of By-Laws 624, for the reason that these sections were now being violated. It would be impossible to construe these sections without evidence of the nature and character of the alleged breaches. Before the board can say whether or not its powers can be invoked, it must hear the evidence. We therefore give the city leave to amend and give particulars and adjourn the further hearing of this application until after the determination of the question of the board's jurisdiction by the Court of Appeal."

Cleveland Traction Situation

After the defeat of the Schmidt ordinance, negotiations were reopened for a settlement of the street railway matter and at a special meeting called by Mayor Johnson the Council as a committee of the whole voted unanimously to use the Baker ordinance as a basis for negotiations with the Cleveland Railway. Horace E. Andrews, president of the Cleveland Railway, announced his willingness to negotiate with the Baker ordinance as a basis. The Baker ordinance and the Tayler plan are approximately the same, except for the maximum rate of fare and the length of time within which the city may nominate a purchaser of the lines. According to the Baker ordinance, should any clause in the franchise be found to be illegal the entire grant is invalidated.

Mayor Johnson announced that he desired Mr. Andrews to record his opinion at the next meeting of the Council regarding control of interurban service within the city, the method for fixing the valuation, whether the valuation should be fixed before or after passage of the ordinance, the allowance for payment valuations in case of purchase by the city, and the subject of the failure of the entire ordinance in case any of the clauses are found invalid. Councilman Haserodt desires to know whether Mr. Andrews will insist on a maximum fare of seven tickets for a quarter, a penny charge for a transfer and a five-cent cash fare, or whether he will accept the Baker maximum fare of four cents cash and seven tickets for a quarter without any transfer charge.

Receiver Warren Bicknell, of the Cleveland Railway, has issued a statement of earnings of the company for July. Gross receipts were $574,223; operating expenses, $333,395; dividend, rental, interest and taxes, $137,722; surplus, $103,-105.

After a series of meetings of the Council the minor questions relating to a new franchise have been temporarily smoothed out. The only questions remaining to be settled are the two concerning public safeguards and the renewal of the Euclid Avenue franchise.

During a meeting of the Council on Aug. 13 it was suggested that the validity clauses be framed so as to effect an increase in fare only and not the life of the grant.

Under such an arrangement it was argued that the bondholders would be protected, because a grant would still belong to the company, worth more than enough to retire all the bondholders under any circumstances.

President Andrews, in stating his opinion of the matter, said that it was his belief that the safeguards must be protected and stated the difficulties facing the company when it came to disposing of bonds and selling stock. Unless bonds could be marketed, he explained, it would be impossible for the company to build a single foot of track or buy any more rolling stock or in any way better the road.

Mr. Andrews said that he had submitted to an expert the Baker ordinance, particularly the clause stating that if any safeguard was declared invalid the entire grant must fail. The report of the expert was to the effect that not one dollar's worth of bonds could be sold dependent upon such an uncertain contract.

An effort will be made by the lawyers on both sides to reduce the section enumerating the public safeguards to general terms. This will be done in the hope that a way may be discovered of lessening the chances of a successful attack on the ordinance with a view to making it an easier problem all around.

Federal Judge Tayler has been chosen to act as final arbitrator on the question of valuation, and when it was suggested that he also arbitrate the dispute over the maximum rate of fare Mayor Johnson declared that he would not agree to any arbitration on the fare question, and that in case of a dispute over the fare question it would be settled by the people at a referendum election.

There are now nine principal questions to be disposed of definitely, some having been temporarily settled. Seven of these are: The legal safeguards, suburban contracts, East

Cleveland contention, the licensee provision, passes for employees, the selection of arbitrators and the value of the pavements at the end of the grant.

After the determination of these questions the remaining two, namely, valuation and rate of fare, can be determined, valuation by immediate arbitration and the rate of fare by agreement after the determination of value.

John J. Stanley, vice-president of the Cleveland Railway, in an interview published in the Cleveland *Leader* of Aug. 16, said:

"From $3,000,000 to $4,000,000 should be spent at once upon extensions and betterments. New cars should be bought and a new powerhouse constructed.

"A crosstown line on the West Side should be built at once. It would run on W. Sixty-fifth Street, from Clark Avenue S. W. to Detroit Avenue N. W. A line should be built from Harvard Avenue S. E. and E. Seventy-first Street to the new Newburg plant of the American Steel & Wire Company, and that line might run through to Brooklyn. The Perkins Avenue line should be built up again. That was the route over which the Wade Park cars ran when they used to come down town on Prospect. And Euclid Avenue ought to have a car line from E Twenty-second Street to E. Fortieth Street."

Transit Affairs in New York

The Public Service Commission, First District, has issued a statement giving a summary of its plans for subway extension and of the proposals of the Interborough Rapid Transit Company and the Bradley-Gaffney-Steers syndicate. The engineers of the commission are now at work preparing the specifications for all the plans and the members of the legal staff are drawing up the forms of contract which must be advertised when bids are requested.

Commissioner Maltbie, of the Public Service Commission, First District, is investigating the operation of cars on the Williamsburg bridge. The subject came up on the application of the receivers of the Metropolitan Street Railway to purchase 500 shares of the Bridge Operating Company from the New York City Railway. The United States Circuit Court has already authorized the purchase, but in view of possible applications for authority to issue bonds in the future, the receivers wish to have the approval of the commission also. The Bridge Operating Company was incorporated in 1904 to undertake the operation of all trolley cars over the Williamsburg bridge. It has 1,000 shares (par $100) fully paid in, which were divided equally between the New York and Brooklyn companies. The New York City Railway, as the operating company in Manhattan, took 500 shares and the other 500 went to the Brooklyn Heights Railroad, the Brooklyn Rapid Transit Company and the Coney Island & Brooklyn Railroad. Subsequently the operation of all local cars over the bridge was turned over to the Brooklyn Heights company, which guaranteed a 6 per cent dividend. The dividend has been paid by the Bridge Operating Company and there has been a surplus, also, which has been divided among the companies owning the stock. The terms agreed on between the receivers of the Metropolitan and the New York city companies provide for the payment of $150,000 for the $50,000 stock, par value.

William M. Coleman, counsel for the Metropolitan receivers, informed Mr. Maltbie that he regarded this price as fair, owing to the profit that had been made and notwithstanding the fact that the companies' agreement with the city was for 10 years from Sept. 1, 1904. After that date it can be terminated at any time on one year's notice by the Bridge Commissioners. The operating company has never filed reports with the commission because it is a business corporation and not a railroad corporation. Commissioner Maltbie ordered that reports be filed. Under the agreement with the city, the Bridge Operating Company paid $10,000 a year and also 5 cents for each and every round trip of a car running over the bridge. The New York City Railway, having ceased to be an operating company, its only interest in the stock of the operating company is what it may derive from its sale for the benefit of its creditors, and hence the present application was made. The local service over the Williamsburg bridge is furnished on a fare of 3 cents, or two tickets for a nickel. The company owns its cars but has no power plant.

At a hearing before Commissioner Maltbie on Aug. 16 William M. Coleman, counsel for the Bridge Operating Company, asked to be relieved from showing the financial results of operation of the property. Mr. Coleman said: "Those figures would seem to show that the Bridge Operating Company is able to show large profits because it is able to purchase power at a low cost, and because its administration expenses are small. It is apparent to the officials of the Brooklyn and Manhattan companies that a great deal of money is being lost in the operation of through cars over the bridge. The Metropolitan receivers have gravely considered, on account of this expense, taking off the through cars now operated on the north tracks of the Williamsburg bridge. It is a question if the whole bridge operation does not mean that more money is being lost in the operation of the through cars than is being made by the local car service. Now, if the figures showing the profit on the local cars are made public, it will be half the truth at best."

The Interborough Rapid Transit Company announces its compliance with the order of the Public Service Commission instructing it to have six six-car, side-door express trains in operation in the subway by Aug. 15. The last of the trains was put into commission on Aug. 14. They will be run from West Farms to Atlantic Avenue, Brooklyn, with the side doors in operation during the rush hours and closed during the rest of the day. It was also announced that this equipment will be installed on the express service of the subway as rapidly as feasible.

Philadelphia Transit Talks

Transit Talk No. 7 of the Philadelphia (Pa.) Rapid Transit Company was dated Aug. 4, 1909. The subject was "Our Men." The talk follows:

Street railway companies expect a large proportion of their motormen and conductors to be "floaters." On most systems the average term of employment is less than two years.

We have more changes than we like, but less than most systems. Every year there are about 2000 changes; that is, one-third, approximately, of our total roster of motormen and conductors change every 12 months.

We get a lot of satisfaction, however, out of the fact that *we have 782 men who have been in our employ 10 years or more.* There are 337 conductors and 445 motormen on the 10-year roll.

So far as we have been able to find out, no other system can make such a showing as this.

Any corporation is fortunate that has 782 employees each with a record of 10 years' loyal service. Faithful and experienced workers spell EFFICIENCY in large letters.

Yes, we know there are others; some of our men don't satisfy us any better than they satisfy you. *But do you know of any body of 6425 public servants with whom you have so little trouble?*

The duties of motormen and conductors are very trying. Please remember this the next time one of them gives offense. And it is only fair to remember also the 99 rides when nothing unpleasant happened as well as the one ride when you were annoyed.

The company's bureau for the prevention of accidents is really a school. It endeavors not merely to teach the men how to do their work well; it also tries to instil a sense of responsibility toward the public and the company.

The success of this bureau (as well as what the men can do when they try) may be judged from the record of a number of barns against which not one collision was charged for several months.

With the co-operation in this work that we have the right to expect from employees, not only will accidents continue to decrease; service will be improved all 'round. That is what we are working for all the time and by all means available.

Transit Talk No. 8 was dated Aug. 10, 1909. The subject was "Trolley Riders Each Day Equal Whole Population of City." The talk follows:

Did it ever occur to you that day in and day out, taking the whole year through, *the average number of passengers daily transported by the Rapid Transit Company is equivalent to the entire population of the city of Philadelphia?* Such is the fact.

During the year ended June 30, 464,364,656 passengers were carried. That figures out nearly 1,275,000 a day. Take the previous year, which was one of more normal conditions, and the average number of riders on street cars in Philadelphia exceeded 1,400,000 a day.

Think what it means to transport that many people. Broad Street Station is a very busy place, yet only about 70,000 people a day are handled there. The Philadelphia Rapid Transit Company under ordinary conditions accommodates in one day about as many people as use the Pennsylvania's big terminal in three weeks.

It is no small task to transport each day as many people as live in Philadelphia—spread over an area of 129 square miles. But that is what the Rapid Transit Company is doing. And this work, *considering its magnitude,* is being accomplished with regularity, and, we think, with the minimum of discomfort and danger to the public.

Of course, there is crowding of cars at rush hours, but so there is everywhere that travel is dense. This is an unavoidable condition.

At the "high-load line" morning and evening we put on 475 *more cars* —seating 18,840 passengers—than we run at noon. This fact may surprise the editorial critic who said recently that the company made no effort to increase its facilities during the rush hours. That statement had no foundation; there may be as little ground for the next criticism you may happen to read.

Transit Talk No. 10, dated Aug. 17, 1909, was entitled "Twelve Riders for Six Car Lines," and said in part:

It is because we want the public to know the problems and perplexities of street transportation in this city that these Transit Talks are published.

Here is a phase of one problem that few people have ever thought of:

The territory west of Fifty-second Street furnishes only 6 per cent of all the Transit Company's passengers, yet this portion of the city gets exactly the same car service as the central portion. In other words, a part of the city furnishing six passengers gets as many cars per hour as the part that supplies a hundred riders.

This means that the Philadelphia Rapid Transit Company is operating at a loss in the new parts of the city.

Why, then, does the company not reduce the number of cars in these less populous districts and save money?

Because, for one out of many reasons, the Rapid Transit Company has incurred an obligation in opening up and developing these new districts, and in spite of loss must carry out an implied contract with dwellers in outlying sections.

Insurance Company Investments in Electric Railway Bonds

In a letter addressed to Charles C. Lemert, Superintendent of Insurance of Ohio, the following opinion is expressed by Attorney-General Denman of Ohio concerning investments in first mortgage bonds of electric railroads by insurance companies:

"Your communication is received in which you call attention to the following quotation from Section 3637 R. S.:

"'First mortgage bonds of railroads within this State upon which default in the payment of interest coupons has not been made within three years previous to the purchase thereof.'

"You inquire whether or not the word 'railroads' as above used may be so construed as to include first mortgage bonds of electric railroads.

"In reply I beg to say the courts of this State have held that the statutes governing and regulating the operation of railroads apply only to steam railroads. These decisions are based upon the fact, however, that legislation affecting steam railways and electric railways has been kept separate by the Legislature.

"Section 3637 Revised Statutes, however, refers to the manner in which the capital of insurance companies may be invested, and in the sixth item authorizes 'first mortgage bonds of railroads within this State upon which default in the payment of interest coupons has not been made within three years previous to the purchase thereof.' It is my judgment, in a proper construction of the word 'railroads' as here used, no distinction is required as between steam and electric railroads. It is only required that they be first mortgage bonds, that the railroads be within this State, and that default in the payment of the interest has not been made within three years previous to the purchase thereof.

"I am, therefore, of the opinion that insurance companies are authorized to invest their capital in first mortgage bonds of electric railroads, provided the other requirements of item six of said section are complied with."

Progress Toward Settlement of Wage Question by Chicago Surface Lines

During the week ending Aug. 14, the controversy between the street railway companies of Chicago and their employees was lessened materially. Conferences were held daily during the week between the presidents of the railway companies and the committees named by the employees. On Aug. 12, John M. Roach, president of the Chicago Railways, presented a scale of wages for consideration which at once appealed to the employees and furnished what it is said will prove to be the foundation for a definite agreement between his company and its employees. On the following day Thomas E. Mitten, president of the Chicago City Railway, presented a proposition amending that submitted by Mr. Roach to his employees. The amended proposition was of such a nature that the committee of employees, representing motormen and conductors, announced that the plan as outlined would be satisfactory with a few minor exceptions. Mr. Roach later endorsed the wage scale as amended.

The proposition as it now stands provides that the Chicago City Railway and the Chicago Railways and all of their subsidiary companies enter into an agreement with their trainmen whereby the labor question will be settled for the next three and a half years, or until Feb. 1, 1913, on the followig basis:

Men who have been receiving the old maximum wage of 27 cents an hour during the last year will receive salary per hour as follows:

	Hourly Wage
From Aug. 1, 1909, to Aug. 1, 1910	28 cents
From Aug. 2, 1910, to Aug. 1, 1911	29 cents
From Aug. 2, 1911, to Feb. 1, 1913	30 cents

For present employees who have served less than one year:

First six months of service	23 cents
Second six months of service	25 cents
Second year of service	27 cents
Remaining eighteen months of contract	30 cents

For men entering service following signing of proposed contract:

First six months	23 cents
Second six months	24 cents
Second year	25 cents
Third year	26 cents
Last six months of contract	27 cents

During the present week the employees' committees waited upon the presidents of the two railway companies in Chicago and negotiated for an increase in wages for the shop men and the attaches of the car houses. While there were still a few minor details to agree upon before final agreements are signed and the negotiations completed, the officers of the railway companies and the committees representing the employees have issued statements that the entire wage question will be settled amicably in a few days.

Syracuse Agreement Approved.—The New York Public Service Commission, Second District, has approved an agreement between the Syracuse Rapid Transit Railway and the Syracuse & Suburban Railway for the use of a portion of each other's lines in the city of Syracuse.

Opening of New Line Advertised in Boston.—The Boston Elevated Railway advertises in the daily newspapers of Boston that its new line to Middlesex Fells is now in use and is accessible by the cars of the company in the 12 cities and towns in which the company operates.

Seven-Car Train Operated Between South Bend and Michigan City, Ind.—The Chicago, Lake Shore & South Bend Railway operated a seven-car train between South Bend and Michigan City, Ind., on Aug. 9. The train was made up in South Bend in two sections, and after passing the city limits the sections were coupled together.

Three-Car Trains for Lake Shore Electric Railway.—Beginning with the summer season next year, the Lake Shore Electric Railway will operate three-car trains between Cleveland and Toledo, according to the statement of F. W. Coen, general manager. The decision was made after a test with a two-car train between Cleveland and Sandusky on Aug. 8, which gave satisfaction to the passengers and the officials. A chair car and a buffet car will also be added.

Legislative Committee Considers Extension of Public Service Commissions' Powers.—The committee of the New York Legislature appointed at the last session to consider whether the Public Service Commissions law should be amended so as to give the commissioners jurisdiction over telephone and telegraph companies began its work at the Murray Hill Hotel, New York, on Aug. 17. The members of the committee are Senator George A. Davis of Buffalo, chairman; Senators John Kissel of Kings, and J. J. Frawley of New York, Assemblyman Edwin A. Merritt, Jr., of St. Lawrence, who framed the Public Service Commission law, and Assemblymen John Yale of Putnam, Artemus Ward, Jr., of New York, J. H. Walters of Onondaga, and Thomas J. Geoghegan of Kings. Ephriam J. Page, of King, Walters & Page, of Syracuse, was selected as counsel for the committee. An adjournment was ten taken until Sept. 6. After the meeting Senator Davis declared that the reports printed in up-State newspapers and elsewhere, in which it had been declared the committee would enter upon an investigation of the Public Service Commissions was erroneous. "This committee has no such authority under the resolution which created it," said Senator Davis. "We can investigate the Public Service Commissons only to an extent sufficient to determine whether those bodies should be burdened with the supervision of telephone and telegraph companies in addition to their present duties."

Announcement of Alabama Light & Traction Association Convention.—Lloyd Lyon, secretary of the Alabama Light & Traction Association, has issued the following announcement of the 1909 convention: "The annual convention of the Alabama Light & Traction Association will be held at Birmingham on Monday and Tuesday, Nov. 15 and 16, 1909. President Ford, without nominating his home city, found that the members of the executive committee were unanimously in favor of Birmingham. The dates have been made to follow those set for the convention of the American Street & Interurban Railway Association, so that those who contemplate attending the national association's convention can do so and return in time for this meeting the following month. Montgomery and Mobile have entertained your association, and the third meeting will be held in the 'Magic City,' whose growth and development have given high rank to Alabama in recent business and industrial progress. As a convention city for this association Birmingham is ideal. President Ford's company, the Birmingham Railway, Light & Power Company, operates in gas, electric lighting and power, steam heating, and is also one of the leading city and interurban railways of the entire South. There will be opportunities offered, during the convention, of inspecting this property's plants and equipment, which should benefit every member in attendance. At a later date the program for the convention will be arranged, and as soon as this has been completed it will be published and distributed to the members. The first meeting at Montgomery surprised all by the enthusiasm and interest shown. Later at Mobile the convention meeting made even a deeper impression on those in attendance. So there is every reason to assume, and none to doubt, that the Birmingham convention will be the most successful of all."

Financial and Corporate

New York Stock and Money Market

August 17, 1909.

Within the last few days a slight pause has occurred in the persistent upward trend of the Wall Street market. It is hardly more than that, for even during the periods when stocks were selling off the sentiment in the market was bullish and traders were enthusiastic over prospects. It is but natural that under conditions when such a large portion of the trading is that of professionals profit-taking should succeed each sharp advance. The upward movement has been led by Union Pacific, which reached 219 during the week, with Reading and Steel common almost equally prominent. Traction stocks have been less active.

Bonds continue to be in good demand, and the money market is beginning to show the effect of trade expansion. More loans are being made, and rates have advanced. Quotations to-day for money were: Call, 2¼ to 2½ per cent; 90 days, 3½ per cent.

Other Markets

Rapid Transit has continued to be the traction feature of the Philadelphia market. Even this has not been as active as a few weeks ago. Price changes have been unimportant. There has been but little trading in Union Traction and Philadelphia Traction.

Within the last few days Massachusetts Electric has developed considerable activity in the Boston market. Both the preferred and common have been bought in considerable quantities and prices have advanced about 2 points.

There has been practically no dealing in traction stocks in the Chicago market within the week. A few odd lots of Chicago Railways, Series 2, have been sold, but there was no interest in the market. Subway has been less active and declined several points.

In Baltimore, United Railways bonds continue to be active, with fractional price changes. There has also been some trading in the stock at about 14⅜.

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

	Aug. 10.	Aug. 17.
American Railways Company	40	a46½
Aurora, Elgin & Chicago Railroad (common)	*41½	a49¾
Aurora, Elgin & Chicago Railroad (preferred)	*86½	a95
Boston Elevated Railway	127⅜	128⅜
Boston & Suburban Electric Companies	*17½	*17
Boston & Suburban Electric Companies (preferred)	*70	*17
Boston & Worcester Electric Companies (common)	a13	10
Boston & Worcester Electric Companies (preferred)	54½	52½
Brooklyn Rapid Transit Company	80⅜	79½
Brooklyn Rapid Transit Company, 1st pref., conv. 4s	87½	86½
Capital Traction Company, Washington	a142	141
Chicago City Railway	a190	a190
Chicago & Oak Park Elevated Railroad (common)	*3	*3
Chicago & Oak Park Elevated Railroad (preferred)	*12	*12
Chicago Railways, ptcptg, ctf. 1	a112	a112
Chicago Railways, ptcptg, ctf. 2	a39	a38
Chicago Railways, ptcptg, ctf. 3	a25	a24½
Chicago Railways, ptcptg, ctf. 4s	a10	*10
Cleveland Railway	*78	*78
Consolidated Traction Company of New ersey	a78	a77½
Consolidated Traction of N. J., 5 per cent bonds	a106½	a106½
Detroit United Railway	a70	71
General Electric Company	171⅜	169½
Georgia Railway & Electric Company (common)	*94	a93
Georgia Railway & Electric Company (preferred)	*88	a87
Interborough-Metropolitan Company (common)	12½	14½
Interborough-Metropolitan Company (preferred)	48⅛	47½
Interborough-Metropolitan Company (4½s)	83¼	82¾
Kansas City Railway & Light Company (common)	a50	a50
Kansas City Railway & Light Company (preferred)	83⅜	*89⅜
Manhattan Railway	144½	a145
Massachusetts Electric Companies (common)	12⅞	14½
Massachusetts Electric Companies (preferred)	73½	75
Metropolitan West Side, Chicago (common)	15⅛	a18
Metropolitan West Side, Chicago (preferred)	48½	a50
Metropolitan Street Railway	a23	a23
Milwaukee Electric Railway & Light (preferred)	*110	*110
North American Company	85	83¼
Northwestern Elevated Railroad (common)	a21	a20
Northwestern Elevated Railroad (preferred)	a70	a70
Philadelphia Company, Pittsburg (common)	44	48
Philadelphia Company, Pittsburg (preferred)	44½	45
Philadelphia Rapid Transit Company	31	31⅛
Philadelphia Traction Company	a91¼	91
Public Service Corporation, 5 per cent col. notes	a100½	a100¼
Public Service Corporation, ctfs	a92½	a93½
Seattle Electric Company (common)	112½	116
Seattle Electric Company (preferred)	*105	*106
South Side Elevated Railroad, Chicago	a58	a56
Toledo Railways & Light Company	10½	10
Third Avenue Railroad, New York	19¼	18¾
Twin City Rapid Transit, Minneapolis (common)	103¾	110
Union Traction Company, Philadelphia	55¼	55
United Railways & Electric Company, Baltimore	14	14⅜
United Railways Inv. Co., San Francisco (common)	a38½	37⅛
United Railways Inv. Co., San Francisco (preferred)	54	a56¼
Washington Railway & Electric Company (common)	a47	47½
Washington Railway & Electric Company (preferred)	a92½	92
West End Street Railway, Boston (common)	96½	95½
West End Street Railway, Boston (preferred)	*105	106½
Westinghouse Electric & Manufacturing Company	88	85⅞
Westinghouse Elec. & Mfg. Company, (1st pref.)	120	125

aAsked. *Last sale.

Asheville (N. C.) Electric Company.—This company has filed a mortgage to the Old Colony Trust Company, Boston, as trustee, to secure not exceeding $3,500,000 of 5 per cent bonds, due July 1, 1939. Of this issue, $750,000 bonds will be reserved to retire an equal amount of first mortgage 5s, due in 1941.

Berkshire (Mass.) Street Railway.—The Board of Railroad Commissioners of Massachusetts has authorized this company to issue not exceeding $190,000 of 20-year 5 per cent debenture bonds.

Columbia Power, Light & Railway Company, Bloomsburg, Pa.—This company, incorporated in Delaware with $1,250,000 capital stock, has purchased the stock of the Danville & Bloomsburg Street Railway and of companies owning the electric lighting and gas properties of Danville, Bloomsburg and Berwick, Pa.

Columbus, Delaware & Marion Railway, Columbus, Ohio.—With the appointment of Eli M. West, Columbus, as receiver of the Columbus, Delaware & Marion Railway, by Judge E. B. Kinkead, of the Franklin County Common Pleas Court, the company passed into the control of two receivers, Judge B. S. Young, Marion, having previously appointed George W. Whysall, general manager of the company, receiver. The appointment of the first receiver was made on the application of N. J. Catrow, Miamisburg, who is treasurer of the company, because notes held by him for $372,381.81 remain unpaid. Immediately upon the appointment of Mr. Whysall the question of court jurisdiction arose and it was insisted that the receivership should have been granted in Franklin County. It finally was agreed that the receivers should work jointly.

Des Moines (Ia.) Railway & Light Company.—This company has been incorporated in Maine with $100,000 capital stock.

Gainesville Railway & Power Company, Gainesville, Ga.—The Gainesville Railway & Power Company, which was formed recently to acquire the property of the Gainesville Electric Railway, which was sold under foreclosure, has been permanently organized with the following officers and directors: A. G. Sharp, Atlanta, president; W. A. Carlisle, vice-president; W. H. Slack, secretary-treasurer; C. M. Merrick, W. R. Pomerene, F. M. Marriott and J. E. Redwine, Jr.

General Electric Railway, Dover, Del.—The property and franchise of the Delaware General Electric Railway, which proposed to build an electric railway in Kent County, were offered for sale recently. R. R. Kenney, attorney for the receiver, offered the property as a whole and it was finally sold to James Lord, Dover, Del., with the exception of portion of land containing five acres 2½ miles from Dover, which had been purchased for the purpose of building a power house. This was sold for $170. It was generally understood that Mr. Lord represented Leo Belmont, Philadelphia, who was interested in the original proposal to build the electric railway.

Georgia Railway & Electric Company, Atlanta.—Of the $20,000,000 authorized "refunding and improvement mortgage bonds," dated Jan. 1, 1909, and due Jan. 1, 1949, but subject to prior redemption at 105 and interest, $1,250,000 are issuable forthwith, including the $1,000,000 sold recently, and $11,230,000 are reserved to retire underlying liens. The remainder may be issued from time to time to an amount not exceeding 75 per cent of the actual and fair cost of extensions, improvements and additions (including bonds and shares of stock of other corporations), provided that no bonds shall be issued unless the net earnings after operating expenses and taxes for the 12 months next preceding shall have been equal to at least 1½ times the interest on all outstanding bonded debt, including the bonds proposed to be issued.

New Orleans Railway & Light Company.—Bertron, Griscom & Jenks, of New York and Philadelphia, have purchased $2,580,900 of 40-year 5 per cent bonds, dated Nov. 1, 1909, and have also acquired an interest in both the preferred and the common stocks. This firm will have two representatives on the board of directors. The bankers have sold this block of bonds to a French syndicate headed by the French Finance Corporation. The new mortgage will secure an authorized issue of $50,000,000 of 5 per cent 40-year bonds, of which $30,000,000 will be reserved to retire the general mortgage 4½ per cent bonds now outstanding. The new issue will be a first lien on all property now owned or hereafter acquired, subject to the existing general mortgage 4½ per cent issue. Of the balance, $1,580,900 will be used to retire on Nov. 1, 1909, an issue of outstanding 6 per cent notes. The remaining bonds can be issued: (1) For improvements and betterments to the properties of the railway company at 75 per cent of the cost thereof; (2) for the acquisition, dollar for dollar, of additional shares of stocks, bonds and obligations of subsidiary companies now

owned or controlled or hereafter acquired or controlled by the railway company and which shall have been issued by such companies for betterments and improvements, not in excess of 75 per cent of the cost thereof; and (3) for the acquisition of additional shares of stock, bonds and obligations of the subsidiary companies now owned or controlled or hereafter acquired or controlled by the railway company at 75 per cent of the par value thereof, such shares of stock, bonds or obligations to be paid for at par by the railway company.

New York, New Haven & Hartford Railroad.—The New York Public Service Commission, Second District, has denied the application of the Central New England Railway for consent to execute a mortgage for $20,000,000 upon its property and for authorization to issue bonds upon the security thereof to the amount of $12,910,000. The application submitted was the financial organization plan of the New York, New Haven & Hartford Railroad for this property.

Northern Texas Electric Company, Ft. Worth, Tex.—An initial dividend of 2 per cent has been declared on the $2,500,000 common stock, payable on Sept. 1.

Oneonta & Mohawk Valley Railroad.—The receivership has been terminated and the company reorganized under the title of the Otsego & Herkimer Railroad. W. Boardman Reed is president; Herbert T. Jennings, vice-president and general counsel; Miss L. M. Wilson, treasurer; Joseph K. Choate, general manager, Hartwick, N. Y.

Philadelphia Rapid Transit Company.—During the first 12 days in August the gross earnings of the company increased $33,000, as compared with the corresponding period of the previous year. The increase in gross revenue in July, as compared with July, 1908, was $139,000.

Seattle (Wash.) Electric Company.—A quarterly dividend of 1¾ per cent has been declared on the common stock, payable on Oct. 15.

Toledo, Bowling Green & Southern Traction Company, Toledo, Ohio.—In the Electric Railway Journal of July 10, 1909, page 91, it was announced that a meeting of the stockholders of the company would be held on Aug. 6, 1909, to ratify an increase of $750,000 in the capital stock of the company to provide funds for lifting the receivership of the Toledo Urban & Interurban Railway and taking over the property of that company. The plan was approved at the meeting and the Toledo, Bowling Green & Southern Traction Company will take over the Toledo Urban & Interurban Railway just as soon as the formalities can be arranged.

United Railways Investment Company, New York.—The Railroads & Power Development Company, incorporated recently in Maine, is designed to be the holding company for the Stanislaus Power Development Company and the San Francisco Electric Railways and will own $10,000,000 out of $18,800,000 common stock of the United Railroads of San Francisco.

York (Pa.) Railways.—This company has had listed on the Philadelphia Stock Exchange $3,400,000 of first mortgage bonds, $1,600,000 of preferred stock and $2,500,000 of common stock.

Samuel B. McLenegan, general manager of the Central California Traction Company, Stockton, Cal., has submitted a letter to the newspapers of Stockton in relation to the settlement of the differences between the company and its motormen and conductors. Mr. McLenegan says in part: "As we have already stated, there were no serious differences between the company and its employees which could not be adjusted by cool-headed men. The signed agreements cover one for the Stockton city lines and one for the interurban division, to fit the working conditions of each, but seniority from the former to the latter was not considered. The company insists upon careful and competent men on each, but it is wholly immaterial what politics, religion or other beliefs our men adhere to, and has absolutely no interest in any other consideration. To obtain promotion a man must be thoroughly competent to do the work entrusted to him, and there is no reason why the conductor or motorman of to-day may not become the dispatcher, trainmaster or superintendent of to-morrow, if he will but demonstrate his ability, his honesty of purpose and trustworthiness to fill the higher position. To consider for a moment the question of placing the sloven, the shiftless workman, on a par with his fellow man who is active, energetic and full of ambition, and to determine their promotion by seniority of service is contrary to every sense of right and justice. The conclusions reached and precedents established by this agreement are not of local interest only, but are far reaching in effect, being of vital interest wherever electric railways are in operation."

Traffic and Transportation

Ruling by Washington Commission on Request for Modification of Its Orders

Four requests of the Washington Railway & Electric Company, Washington, D. C., to the Interstate Commerce Commission for a modification of certain regulations recently adopted, together with the action taken by the District Electric Railway Commission upon them at its last meeting, have been made public by the District Electric Railway Commission and follow:

To the request that the headway required on all east and northbound cars operated between Fifteenth and G Streets northwest and North Capitol Street and T Street be increased to 3 minutes instead of 3¾ minutes, as required by the regulation and 2½ minutes as now operated by the company, the District Commission recommends that a 2½ minute headway be required.

In this connection Secretary Eddy stated that if the patrons of that line would patronize the small cars instead of crowding as a rule into the large Brookland cars the service would be materially improved.

As to a request for a modification of the regulation requiring fuse boxes and circuit breakers with covers, the commission recommends that the railway company be informed that any "inclosed" type of circuit breaker will be considered as complying with the regulation, and that its request for a modification of the regulations that covers be required only "where live contacts are in reach of passengers or pedestrians" shall not be adopted.

The request of the company that the regulation as to pickup fenders and wheelguards be made to apply to those cars only which are acquired after July 1 was denied, Secretary Eddy, after investigation, reporting that it is generally accepted among street railway men that a properly operated fender which can be dropped to the pavement is much more likely to prevent fatal or serious injury than one maintained in a fixed position several inches above the track.

The request for a modification of the headway schedules for the Anacostia and the Eleventh Street lines has been granted until Oct. 1, as follows: Between Ninth and F and Eleventh and Monroe Streets, between the hours of 4:40 p. m. and 5:20 p. m., the headway shall be 2½ minutes instead of three minutes; between Anacostia and Ninth and G Streets northwest, between 7:30 a. m. and 8 a. m., the headway shall be four minutes instead of 3¾ minutes, and between Ninth and F Streets and the Anacostia bridge, between 6 p. m. and 6:30 p. m., the headway shall be three minutes instead of four minutes. This concession is made because of the falling off in the traffic during the months of July, August and September.

The request for the revocation of the regulation requiring an additional safety hanger for brake beams was denied for the reason that the device is believed to be a safety precaution and a large number of the cars are already supplied with them, while all the new cars have them.

Hearing on Coney Island Fares

A hearing on the application of Jonas Monheimer to compel the Coney Island & Brooklyn Railroad, Brooklyn, N. Y., to charge a 5-cent fare to Coney Island on weekdays was held before the Public Service Commission of the First District of New York on Aug. 11. Mr. Monheimer originally complained against the company for charging a 10-cent fare to Coney Island on Saturdays, Sundays and holidays, but the commission, after carefully considering the evidence, sustained the company in exacting this rate of fare, as stated in the Electric Railway Journal of July 10, 1909, page 75. When Mr. Monheimer's first case was begun the company was charging only 5 cents on weekdays, but it subsequently made the rate a flat one of 10 cents for every day. The decision of the commission, in the original complaint, covered, of course, only the Saturday, Sunday and holiday rate. Mr. Monheimer then filed a complaint against the 10-cent charge on weekdays.

Owen J. Finnerty appeared as counsel for Mr. Monheimer, and O. F. Kuhn appeared as counsel for the Coney Island & Brooklyn Railroad. S. W. Huff, president of the Coney Island & Brooklyn Railroad, was also in attendance at the hearing. Mr. Finnerty's witnesses were introduced to show that the low fare adopted by the company on weekdays had induced people to move to Coney Island, but that many of these people had found the double fare burdensome and had left Coney Island to reside within the 5-cent zone. As a result small tradepeople had suffered

considerable financial loss and the owners of flats and dwellings had recently been compelled materially to reduce rents in order to retain their tenants.

Henry Floy, a consulting engineer in the employ of the commission, introduced as evidence a summary of the property of the company. He did not submit any figures as to value, however, it being stated that these figures would not be ready for several weeks. A. H. Walker, as counsel for the commission, introduced considerable documentary evidence bearing upon the history, franchise rights, operating expenses, indebtedness and ability of the company to carry passengers for the 5-cent fare, which had been put in evidence in the former proceedings.

Mr. Kuhn, for the company, asserted that the complainants had failed to make out a case against the company and moved the complaint be dismissed. He contended that the company is empowered to charge a 5-cent fare to Prospect Park, and that at the rate of 3 cents a mile for the remaining six miles to Coney Island the 10-cent fare is neither excessive nor illegal. Commissioner Bassett, before whom the hearing was held, adjourned the hearing until Aug. 25.

Service on Surface Lines in New York

The Public Service Commission of the First District of New York has issued the following table, which, it says, shows the effect of orders issued by it regarding service on the surface lines in New York:

Line.	Direction.	Before: Average seats per car.	Before: Average passengers per car.	Before: Average loading (per cent).	After: Average seats per car.	After: Average passengers per car.	After: Average loading (per cent).	Per cent of improvement.
Fourth & Madison Avenue	North	36	59	163	36	41	113	31
	South	36	45.5	126	36	40	112	11
Grand Street Crosstown	West	28	52	185	31	36	116	37
	East	28	43	153	30	34	114	25
Third and Amsterdam Avenue	North	35	57	163	53	44	82	50
	South	35	36	103	54.5	33	61	41
Lexington Avenue	South	32	39	121	47	48	102	16
	North	33	40	122	45	42	94	23
Kingsbridge Line	North	28	27	97	28	29	103	6
	South	28	16	56	28	12	44	22
Eighth Street Crosstown to Brooklyn	West	28	46	164	28	29	103	37
	East	28	57	203	28	24	87	57
Christopher & East Tenth Street Ferry	East	28	35	124	28	19	66	47
	West	28	34	121	28	24	87	28
Fourteenth Street Crosstown to Brooklyn	East	35	69	198	36	41	113	43
	West	34.4	54	157	36	47	130	17

Additional Transfer Points in Philadelphia.—The Philadelphia Rapid Transit Company will grant 36 additional transfer points to South Philadelphia.

Wages Increased by Chicago, Lake Shore & South Bend Railway.—The Chicago, Lake Shore & South Bend Railway Company, South Bend, Ind., has increased the wages of its motormen and conductors from 23½ to 27 cents an hour.

Council of Marquette, Mich., Grants Fare Increase.—The Common Council of Marquette, Mich., has amended the franchise of the Marquette City & Presque Isle Railway, so as to permit a straight 5-cent fare to be charged in lieu of six tickets for 25 cents. The company showed that the property was operated at a loss.

Increase in Wages in Portland, Ore.—The Portland (Ore.) Electric Railway has increased the wages of its motormen and conductors from 30 cents to 33 cents. For the first year, however, the men will continue to get 30 cents. The Oregon Electric Railway is a high-speed line, and its employees make from 156 to 200 miles per day, that is 10 to 11½ hours, according to layovers. The increase went into effect on July 18.

Complaint Against Excess Fare on New York Line.—The New York Public Service Commission, Second District, has received a complaint from James Morris, of Albion, against the Buffalo, Lockport & Rochester Railway, asking the commission to order the company not to charge the excess fare of 5 cents between any of its stations on this line where the fare is paid on the car instead of procuring a ticket at the station.

Smoking on Rear Seats in Rochester.—The New York State Railways, Rochester lines, has returned to the practice of permitting passengers who occupy the three rear seats of open cars to smoke. Some time ago the company changed its original order to this effect so as to make it apply only to passengers standing on the back platform, but there were so many who desired to smoke that entrance to the cars was made very difficult at times.

Interurban Competition Causes Changes in Steam Road Schedule.—The Lake Erie & Western Railroad, a steam line, will make the third attempt to overcome interurban competition by running five trains into Indianapolis every morning and evening, beginning on Aug. 16. The round-trip fare will be identical with that charged by the interurban lines between Peru and Indianapolis and Portland and Indianapolis. The trains will consist of two and three coaches and will make many stops. The tariff sheets have been filed with the Railroad Commission.

Appeal to Interstate Commerce Commission.—A complaint of discrimination was filed with the Interstate Commerce Commission at Washington, D. C., on Aug. 16, based on the refusal of the San Pedro, Los Angeles & Salt Lake Railroad to make through routes and joint rates with the Pacific Electric Railway of Los Angeles, Cal. The complaint was made by the Southern California Sugar Company. By reason of the defendants' refusal to make such routes and rates the sugar company alleges it is forced to pay excessive rates for the transportation of its products.

Selectmen Petition for Lower Fare.—The Selectmen of Westwood, Mass., have filed a petition in the Supreme Judicial Court for Norfolk County in equity asking that the Dedham & Franklin Street Railway be forced to comply with the terms of its location and the rights of fare. The issuance of a mandatory order or injunction is asked that the rate of fare shall not exceed 5 cents for any distance in one continuous trip within the town limits or for a continuous trip from any point along the line of the road in Westwood to its respective termini in Medfield and Dedham. The petitioners in their bill allege that the Dedham & Franklin Street Railway compels the payment of 10 cents for continuous trips from points in Westwood to the termini mentioned.

Lehigh Valley Transit Advertises Attractions.—The Lehigh Valley Transit Company, Allentown, Pa., is advertising its Liberty Bell route in the daily papers. The company carried in a recent Sunday issue of the Philadelphia *Ledger* an advertisement 15½ in. wide by 11 in. long, telling about the unique trip and giving the time of starting cars. The route is from Chestnut Hill, Philadelphia, to Allentown, Bethlehem and Nazareth, and thence over connecting roads to Mauch Chunk or Portland, which is within a few miles of the Delaware Water Gap. The trips are personally conducted, a competent tourist agent and lecturer accompanying each car. The fare to the Water Gap is $1.32, to Allentown 60 cents and to Bethlehem 70 cents. The company has also recently carried in the Philadelphia daily papers an advertisement about this service 6½ in. wide by 2½ in. long.

Twin City Company Burns Boat and Increases Business.—The Twin City Rapid Transit Company, Minneapolis, Minn., on Aug. 12 burned the *Excelsior*, one of the oldest boats, off Big Island Park on Lake Minnetonka. The boat was formerly used by the company as a part of the system of express boats running on the lake. The event was advertised in the newspapers and special cars were brought into service to accommodate the people from Minneapolis who went to see the spectacle. The spectators were first treated to a display of fireworks from the boat, after which the boat was burned. The *Excelsior* was recently condemned so that the company decided to burn it in order to attract some additional business for Lake Minnetonka. It is said that the result was perfectly satisfactory, and it proved to be one of the gala evenings of the summer at Lake Minnetonka.

South Shore Route Folder.—The Chicago, Lake Shore & South Bend Railway, Michigan City, Ind., has issued through A. F. Faber, traffic manager, a traffic circular illustrating and describing its line between Chicago and South Bend, skirting Lake Michigan. Hudson Lake, one of the principal pleasure resorts along the line, receives considerable attention. The location of the resort and the amusements there are described and information is given regarding the hotels and the camping grounds. The general information contained in the circular covers such subjects as how to reach Chicago, how to travel from Chicago, tickets, special cars, baggage, lost articles and the arrangement that can be made with the Wells-Fargo Express Company for handling express matter. A double page of the circular is devoted to time tables of week-day trains westbound between South Bend and Chicago and eastbound trains between Chicago and South Bend, and a double page is also devoted to a similar summary of trains for Sundays. A map of Chicago shows the Randolph and the Van Buren Street stations and the principal business houses in the loop district of Chicago.

Personal Mention

Mr. W. Scott Libbey, Lewiston, Maine, has been elected treasurer of the Portland, Gray & Lewiston Electric Railroad, with headquarters at Lewiston.

Mr. Matthew C. Brush has resigned as vice-president and general manager of the Boston Suburban Electric Companies to become general manager of the Buffalo & Lake Erie Traction Company.

Mr. William N. Patten, engineering manager of the Stone & Webster Engineering Corporation, has become associated with the construction department of the company and Mr. Frederic N. Bushnell has succeeded him as engineering manager.

Mr. Herbert S. Whiton has resigned as local manager of the Ponce Railway & Light Company, Ponce, P. R., to become superintendent of power of the Minneapolis General Electric Company, Minneapolis, Minn. Mr. Whiton was succeeded by Mr. Edward T. Steel.

Mr. A. G. Jillson, formerly connected with the Houston (Tex.) Electric Company and with the Boston office of Stone & Webster, has been appointed assistant treasurer of the Pensacola (Fla.) Electric Company to succeed Mr. R. G. Carroll, who has been transferred to the Boston office of Stone & Webster.

Mr. T. B. Gay has resigned his position as secretary and purchasing agent of the Norfolk & Portsmouth Traction Company, Norfolk, Va., effective Aug. 15. He will enter the law firm of Messrs. Munford, Hunton, Williams & Anderson, Richmond, on Oct. 1, as an associate member. Mr. Gray was graduated from the Law School of the University of Virginia and was admitted to the Virginia bar several years ago.

Mr. W. S. Dimmock has been elected general manager of the Pacific Traction Company, Tacoma, Wash., the property of which has been purchased by the Stone & Webster interests. The personnel of the newly elected officers is as follows: Mr. F. A. Boutelle, superintendent; Mr. A. W. I. Birtwell, assistant treasurer; Col. W. R. Woodward, superintendent of construction; Mr. W. F. Bosworth, chief engineer; Mr. D. G. Dewey, master mechanic; Mr. G. O. Snyder, purchasing agent; Mr. K. C. Schluss, superintendent of power, and Mr. A. H. McMay, traffic agent.

Mr. R. D. Miller, who was recently appointed general manager of the Sapulpa & Interurban Railway Company, Sapulpa, Okla., has heretofore been connected with steam railroads. Mr. Miller spent over 15 years in steam railroad work as trainmaster, superintendent of terminals and division superintendent on the Kansas City, Memphis & Birmingham Railroad and the St. Louis & San Francisco Railroad. He was connected with the latter road as division superintendent, with headquarters at Sapulpa, until July 1, 1907, when he resigned his position to engage in the oil business.

Mr. Frederic N. Bushnell, who has been appointed engineering manager of the Stone & Webster Engineering Corporation to succeed Mr. William N. Patten, joined the staff of Stone & Webster in February, 1907, taking charge of the construction of the Lincoln, Harvard and Charlestown power stations of the Boston Elevated Railway. This work consisted in substantially enlarging the structures of the three original stations and installing 20,000 hp of new generating capacity with boilers and all other auxiliaries. It was carried out in the exceptionally short period of 10 months. Previously Mr. Bushnell was chief engineer of the Rhode Island Company, in charge of design and construction of power stations, substations, car houses, bridges, tracks, and also of operation of power stations. In connection with a large station designed and built under his supervision at Providence, there was conducted a service test which lasted an entire year and established a record for economical operation that has rarely, if ever, been equalled in this country. In the engineering field Mr. Bushnell is regarded as an authority on the design and operation of power stations.

OBITUARY

Howard F. Grant, who has been prominently identified for some years with the Stone & Webster interests of Boston, died at the home of his sister, Mrs. John G. Parsons, Portsmouth, N. H., on Aug. 15. Mr. Grant was born on Oct. 24, 1858. His first railroad connection was as watchman for the Eastern Railroad at Portsmouth, N. H., when he was 19 years of age. Later he was placed in charge of the kyanizing plant of the company at Portsmouth. One year later he was made a clerk in the maintenance of way department and afterward promoted to the position of chief clerk. After the consolidation of the Eastern Railroad with the Boston & Maine Railroad, Mr. Grant became chief clerk in the department of engineering and maintenance of way for the system. Mr. Grant resigned from the Boston & Maine road in 1893 to become secretary to Charles S. Sergeant, vice-president and general manager of the West End Street Railway, Boston. He remained in this position for 10 years, extending into the period of the operation of the West End Street Railway by the Boston Elevated Railway. Mr. Grant resigned this position on Jan. 10, 1903, to accept the office of general manager of the Seattle (Wash.) Electric Company. Three years later there were added to his duties in this position those of district manager for all the Stone & Webster properties in the Puget Sound territory. Later Mr. Grant withdrew from the office of general manager of the Seattle Electric Company and devoted his time entirely to the work of district manager. About a year ago Mr. Grant left Seattle and returned to the Boston office of Stone & Webster.

Howard F. Grant

A Suggestive Time Table

The time table of local and limited trains on the Pittsburgh, Butler, Harmony & New Castle Railway, Pittsburgh, Pa., between Evans City, Butler, Harmony, Zelanople, Ellwood City and New Castle contains advice and instructions to patrons that may prove of value as suggestions for officers of the traffic transportation departments of other railways to whom is entrusted the work of preparing time tables and traffic circulars. The Pittsburgh, Harmony, Butler & New Castle Railway is a 1200-volt d. c. road and consists of 75 miles of line built according to the latest interurban standards. A complete time table is given between Pittsburgh and New Castle and between New Castle and Pittsburgh; also between Pittsburgh and Butler and Butler & Pittsburgh, and New Castle and Butler and Butler and New Castle. The tables are so divided that limited and local trains are entirely separate. Among other things the circular says:

"Ordinary, every day trolleying has its advantages, but the 'trolley traveler' who uses this service in an intelligent manner reaps the greatest harvest. Tired nature demands relaxation from the daily grind and nothing so fully meets this demand as a change of scene. Of course, everyone uses the electric cars for what might be termed business purposes. It's a convenient, quick way for reaching places of business, for shopping or calls, or for reaching any point where there is some special reason for making the trip—but that isn't 'trolleying.'

"What we want to get at is this. Intelligent trolley riding will furnish more real, genuine pleasure than any similar investment. Coupled with the pleasure, there is health and the added educational advantages to be derived from seeing the historic points of interest that surround the vicinity in which one lives; seeing the bounteous gifts of nature along the route; seeing the many manufacturing and other industrial enterprises; and how other people live and work.

"Special effort is made by the company to select tried and true men who know their business; men who can be trusted not only to operate cars, but who will do their utmost to care for the comfort of passengers. It is the only way to travel in parties.

"The Pittsburgh, Harmony, Butler & New Castle Railway through its realty department is prepared to give valuable and timely information to those seeking residential, manufacturing, farming, outing resort and bungalow sites, along its route, that will enable them to avoid possible error and costly mistakes. The policy of the company is to work for the upbuilding of its territory.

"It is the desire of the company that all patrons receive courteous and intelligent attention at the hands of their employees, and prompt investigation will follow any complaints received for such violation or neglect. At the same time the public is requested to make its wants known to the conductor in a clear and explicit manner and to kindly bear in mind that the demands upon his time are invariably pressing and often of a nature calculated to irritate the most affable."

Construction News

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

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

RECENT INCORPORATIONS

Iowa Light & Traction Company, Eldora, Ia.—Incorporated in South Dakota to build an electric railway from Boone to Ogden, Ia., with branches to Ames, Story City, Eldora, Des Moines, Webster City and Perry, Ia. Capital stock, $500,000. Headquarters, 153 LaSalle Street, Chicago, Ill., and Eldora, Ia. Incorporators and officers: Henry S. Osborne, chairman of board; Andrew Stevenson, president and general manager, Chicago; E. E. Hughes, Boone, Ia., vice-president and treasurer; J. H. McBride, Philadelphia, Pa., second vice-president, and J. F. Hardin, Eldora, Ia., secretary. [E. R. J., July 24, '09.]

***Oklahoma City & Suburban Railway, Oklahoma City, Okla.**—Incorporated for the purpose of constructing four interurban railways, the main route to extend from Britton to Edmond and Oklahoma City to Moore, 32 miles in length. The main terminus will be at Thirteenth Street and Santa Fé Avenue, Oklahoma City. From this point one branch will extend east 2 miles and northwesterly 2 miles; another branch will extend from Main and Pennsylvania Avenues northwesterly for 3 miles. Branch offices will be located at Pittsburgh, Pa., and New York, N. Y. Capital stock, $250,000. Incorporators: Charles W. Ford, superintendent of the Oklahoma Railway; J. J. Johnson, Fred S. Combs, W. A. Haller and Richard Durrett, all of Oklahoma City.

Baker Interurban Railway, Baker City, Ore.—Incorporated to build electric railways in the vicinity of Baker City. Capital stock, $50,000. Incorporators: Thos. B. Neuhausen, Anthony Mohr and A. K. Bentley. [E. R. J., July 31, '09.]

***Utah & Idaho Railroad, Salt Lake City, Utah.**—Incorporated in Utah to construct a railway, to be operated either by steam or electricity, from a point on the Ogden & Lucin Railroad at or near Salina, northerly through Kelton Pass to the State line and then to connect with the Minidoka & Southwestern Railroad near Burley, Idaho, a total distance of 150 miles. Surveys are being made so that construction can begin within six months. Capital stock, $160,000. Headquarters, Salt Lake City. Officers: W. H. Bancroft, president; D. E. Burley, vice-president; C. H. Jenkinson, treasurer, and G. K. Smith, secretary. Incorporators: W. H. Bancroft, J. M. Davis, P. S. Williams and F. H. Knickerbocker.

FRANCHISES

Selma, Ala.—The Selma Street & Suburban Railway has been granted a franchise by the City Council to extend its street railway on Water Street.

Vacaville, Cal.—T. T. C. Gregory, president of the Vallejo & Northern Electric Railway, has applied to the Board of Trustees for a renewal of a franchise granted to the railway, and which expired about a year ago. [E. R. J., Oct., 31, '08.]

Wilmington, Del.—The People's Railway has applied for a franchise to the Street and Sewer Directors to extend its tracks on King Street from Front Street to the terminal of the New Jersey & Wilmington Ferry Company.

Kokomo, Ind.—The County Commissioners have granted a franchise to C. C. McFann, president and general manager of the Kokomo Western Traction Company, to construct a railway from Kokomo west to Young America. The railway will extend later to Burlington and Flora, a total distance of 15½ miles. The company expects to handle passengers and freight. It is stated that gasoline is being considered as motive power. [E. R. J. Dec. 19, '08.]

Michigan City, Ind.—The City Council has granted to the Chicago, Lake Shore & South Bend Railway an extension of its franchise until September, 1910, in which to complete its proposed branch into Michigan City.

Edna, Kan.—The City Council has granted a franchise to the Kansas Union Traction Company to build its proposed electric railway through Edna. The company expects to begin construction on the two routes this fall, connecting Cherryvale and Columbus, and Parsons and Coffeyville, all in Kansas. Barney McDaniel, Altamont, secretary, and Archer & Rollins, Kansas City, Mo., contractors. [E. R. J., April 10, '09.]

Juarez, Mexico.—H. S. Potter, general manager of the El Paso (Tex.) Electric Railway, has applied to the State government for a concession to extend the electric railway in Juarez to the racetrack projected by Col. M. J. Winn. Louisville, Ky.

***Sidney, N. Y.**—E. C. Bennett, Pulaski, N. Y., a contractor, has applied to the Board of Trustees for a franchise to build an electric railway from Sidney to Treadwell. The proposed railway is to connect Sidney and Franklin.

Utica, N. Y.—The Public Service Commission of the Second District has granted its approval and given permission to the Utica & Mohawk Valley Railway to exercise franchises granted it by the City Council on Whitesboro Street in Utica.

Portland, Ore.—The Oregon Electric Railway has applied to the County Court for a 50-year franchise to use parts of certain county highways, over which it is operating its interurban electric railway.

Bentleyville, Pa.—The Bentleyville Council has granted a franchise to the Pittsburgh, Monongahela & Washington Railways to build a street railway in that town. The railway is to connect Monongahela and Washington, 32 miles. Phil & Miller, Pittsburgh, contractors, and J. W. Bridge, general manager. [E. R. J., July 24, '09.]

Humboldt, Tenn.—The Missouri, Tennessee & Georgia Railroad has applied for a 45-year franchise to the Board of Aldermen to operate its proposed electric railway over Main, Osborne, Mitchell, Stillwell, Webster, Dickson, Shane, Summie and Green Streets. The company proposes to build the railway from Humboldt to Dyersburg via Crockett Mills, Friendship and Bonicord, 35 miles distant. I. H. Dungan, president and general manager. [E. R. J., April 17, '09.]

***Greenville, Tex.**—J. W. Crotty and L. A. Miller, Dallas, have applied to the City Council for a franchise to build an electric railway in Greenville.

Monroe, Wash.—The Everett & Cherry Valley Traction Company has applied to the Town Council for permission to build a temporary track over certain streets of Monroe to connect the Snoqualmie Valley Railway with the main line of the Great Northern Railroad.

Wheeling, W. Va.—The Pan Handle Traction Company has applied to the Board of County Commissioners of Ohio County for a franchise granting the right to double-track about 4 miles of its electric railway. G. O. Nagle, general manager.

Waukesha, Wis.—The City Council has granted a franchise to the Milwaukee Western Electric Railway to extend its railway into Waukesha via North Street. [E. R. J., Aug. 7, '09.]

TRACK AND ROADWAY

Northern Electric Railway, Chico, Cal.—This company has opened its street railway extension in Yuba City, which is operated in conjunction with its Marysville line and its interurban system. [E. R. J., July 10, '09.]

Oakland & Antioch Railway, Oakland, Cal.—The surveys of this electric railway, which is to connect Oakland and Bay Point, in Contra Costa County, a distance of 30 miles, are being made on each side of the Contra Costa County range. A. W. Maltby and Joseph Napthaly are interested. [E. R. J., June 19, '09.]

Visalia (Cal.) Electric Railroad.—The grading on the extension of the Visalia Electric Railroad, from Lemon Cove to Woodlake, a distance of 12 miles, is practically completed. The company, it is said, has plans for another extension from Exeter to Lindsay and Portersville. [E. R. J., May 1, '09.]

Tampa-Sulphur Springs Traction Company, Tampa, Fla.—It is reported that this company will extend its street railway along Eighth Avenue to Thirty-sixth Street and on Fifth Avenue to Thirty-second Street. L. Brill, general manager.

Dublin, Ga.—P. L. Wade, Dublin, advises that a company has not yet been organized to build the proposed street railway in Dublin. It is the intention to operate gasoline motor cars. [E. R. J., Aug. 14, '09.]

Danville, Kankakee & Crescent Traction Company, Crescent City, Ill.—This company has completed the survey of its interurban railway, which will be operated by gasoline motor cars, and is securing right of way between Kankakee, Danville and Crescent City. J. P. Sterrenberg, Crescent City, is interested. [E. R. J., July 31, '09.]

Elgin & Sycamore Railway, Elgin, Ill.—It is stated that surveys for this electric railway between Elgin and Sycamore have been completed. Capital stock, $100,000. Directors: B. C. Payne, F. N. Rogers, E. S. Bailey, F. J. Hohling and F. W. Merrick, all of Elgin. [E. R. J., April 10, '09.]

Indiana Union Traction Company, Anderson, Ind.—It is reported that this company will build new steel bridges

over the White River at Anderson, and over Buck Creek at Yorktown, on the Indianapolis-Muncie division of its system.

Covington & Southwestern Railway, Kingman, Ind.—M. A. Peoples, secretary and general superintendent of J. J. Burns & Company, Chicago, Ill., who have the contract to build the first 50 miles for the Covington & Southwestern Railway, advises that a few miles of the track are already laid, and that it is expected to build 25 miles this year. The railway will have two routes, one being from Kingman to Crawfordsville and the other from Kingman to Covington. Officers: William C. Ruhl, president; B. E. Jones, secretary, and Harmon W. Campbell, treasurer. [E. R. J., July 10, '09.]

Southern Traction Company of Illinois, East St. Louis, Ill.—This company has recently filed a mortgage to the Union Trust & Savings Bank of East St. Louis, as trustee, to secure an issue of $1,500,000 bonds. The company proposes to build an electric railway from East St. Louis via Centerville to Belleville and Murphysboro, and possibly to Cairo, Ill. F. P. Ernest, East St. Louis, president.

Old Colony Street Railway, Boston, Mass.—It is stated that this company has begun relaying the tracks on Main Street, Brockton, with new rails, which will involve an expenditure of $40,000.

***St. Louis & Kansas City Electric Railway, St. Louis, Mo.**—Announcement is made of the organization of this company, which plans to build a double-track, high-speed electric railway from St. Louis to Kansas City, a distance of 250 miles. Articles of incorporation will be filed within a few days. According to plans under consideration the grade will be less than one-tenth of 1 per cent over 80 per cent of the distance, and less than 1 per cent over the remaining 20 per cent of the proposed line. It is the intention to install the multi-phase system. Among those said to be interested in the project are W. D. Nevin, Denver, Col.; W. H. Chase, B. F. Gray, Edgar R. Talton, St. Louis, and Daniel F. Miller. Capital stock will be $15,000.000.

Bozeman (Mont.) Street Railway.—It is reported that this company will extend its railway to the Inter-State fair grounds.

New York, Westchester & Boston Railway, New York, N. Y.—At a hearing in New York on Aug. 16 before the Public Service Commission of the Second District, the New York, Westchester & Boston Railway asked permission to make an increase of $20,000,000 in its capital stock. The company's present capital is $4,000,000. It recently acquired all the property of the New York & Port Chester Railroad, and asked for permission to consolidate the two properties, the same to be operated under the name of the New York, Westchester & Boston Railway, which is building a four-track electric railway from the Lenox Avenue terminal of the subway to Port Chester, with a double-track branch running from Mount Vernon to White Plains. With the consolidation of the two companies, the New York, Westchester & Boston Railway will ask permission to abandon portions of the respective routes, using only those parts which are advantageous to a direct line. The company also asks permission to abandon that part of its proposed route running from White Plains to Elmsford. L. S. Miller, president of the company, stated that so far the right of way had cost the company about $240,000 a mile, and that the prospective business did not warrant a 3-mile extension from White Plains to Elmsford. A decision will be rendered by the commission at a later date. [E. R. J., July 24, '09.]

Third Avenue Bridge Company, New York, N. Y.—This company, which is a subsidiary company to the Third Avenue Railroad, has applied to the Public Service Commission for a certificate of public convenience and necessity to cross the Queensboro Bridge with a line into Queens. The company desires to build a line from Fifty-seventh Street and Third Avenue east to Second Avenue and thence north to the bridge and over it to Jackson Avenue, Queens. [E. R. J., June 12, '09.]

Lebanon & Franklin Traction Company, Lebanon, Ohio.—It is reported that this company is planning to extend its railway to Springboro, a distance of 4 miles. Two surveys have been made, one following Clearcreek from Franklin directly to Springboro, and the other along the Upper Springboro Highway. Robert E. Kline, Callahan Bank Building, Dayton, general manager.

Woodward (Okla.) Interurban Railway.—It is reported that the survey for this proposed electric railway, 140 miles in length, connecting Mutual, Richmond, Canton, Okla., with Buffalo and Englewood, Kan., has been started under the direction of A. J. Innis. Among those interested are Homer Wilcox and Frank Tucker, Woodward. [E. R. J., Feb. 13, '09.]

Berlin & Waterloo Street Railway, Berlin, Ont.—The ratepayers have approved a by-law to raise $19,000 for double-tracking a section of this street railway between Berlin and Waterloo.

***Hartland, Ont.**—It is reported that an electric railway will be constructed to connect Hartland, Foreston, Rockland, Windsor and Knowlesville. John E. Stewart and A. B. Downworth are interested.

Farmers' Railway & Navigation Company, Pendleton, Ore.—Chas. A. Hill, president, announces that construction on this proposed railway will begin about Nov. 15. The motive power has not yet been decided upon. The route will be from Umatilla, through Holdman, Helix, Hermiston, Echo and into Pendleton. Headquarters, Pendleton. Officers: Chas. A. Hill, president; A. A. Cole, secretary, treasurer, and purchasing agent, Pendleton, and E. T. Erickson, Hermiston, chief engineer. [E. R. J., Aug. 14, '09.]

Umatilla Railway & Electric Power Company, Pendleton, Ore.—A. R. Turner, secretary, writes that the purpose of this company is to build an electric railway with the Columbia River as its northern terminus and with Grant County as its southern terminus. The railway, which is to be approximately 100 miles in length, will extend from Pendleton south through Pilot Rock, Nye, Alba, Ukiah and into Dale. The company proposes to erect a hydro-electric plant on the John Day's River. Capital stock, $100,000. Officers and directors: Hon. Douglas Belts, Pilot Rock, president; Geo. A. Brown, vice-president and general manager; A. R. Turner, secretary and treasurer; C. J. Smith and Hon. Stephen A. Lowell. [E. R. J., July 31, '09.]

Central Pennsylvania Traction Company, Harrisburg, Pa.—The board of directors of this company has determined to build extensions to the following routes: Double-track Second Street route from Moclay Street to Division Street; the Third Street and Fourth Street tracks from Moclay Street to Seneca Street with an extension on Seneca Street. The company will also rebuild the Third Street track from North Avenue to Delaware Avenue and the Fourth Street and Sixth Street tracks from Market Street to Reily Street, using the 92-lb girder rails.

***Scotland, S. D.**—It is stated that L. F. Phillips is making surveys between Scotland, Olivet and Wittenberg for the construction of an electric railway.

San Antonio & Vernon Railway, Amarillo, Tex.—R. O. Whyman of the Whyman Construction Company, Amarillo, writes that this railway, in which his company is interested, is to be a steam road and not an electric railway, as reported in a recent issue. [E. R. J., Aug. 7, '09.]

El Paso & Fort Hancock Railway, El Paso, Tex.—Thomas O'Keeffe, El Paso, secretary, advises that this company expects to begin construction on its electric railway from El Paso to Ysleta, a distance of 10 miles, in October. Bids for the ties and rails for the 10 miles of track have been received and will be opened Sept. 1. The repair shops will probably be located at Ysleta. It is probable that McKeen motor cars will be installed. Capital stock, authorized, $100,000; subscribed, $70,000. Officers: C. N. Bassett, president; Felix Martinez, vice-president, and W. Cooley, treasurer, all of El Paso. [E. R. J., Aug. 7, '09.]

Port Arthur (Tex.) Street Railway.—H. J. Myers advises that the contract for the construction of this new 6-mile electric railway in Port Arthur has been let to H. E. Talbott & Company, Reibold Building, Dayton, Ohio. Financial arrangements have been completed and surveys will be started at once. The line will be owned and operated by Dayton, Ohio, capitalists. The company expects to apply for a charter within a few days and the title will be changed to the Port Arthur Traction Company. The present headquarters will be 503 Reibold Building, Dayton, Ohio, where all communications should be addressed. [E. R. J., April 3, '09.]

San Angelo (Tex.) Street Railway.—This company has been organized to build an electric railway from San Angelo to Carlsbad and Sterling City. Capital stock authorized, $100,000. Directors: W. H. Shaffer, A. H. Shaffer, and J. J. Lanin, New Hampton, Ia., manager, to whom all communications should be addressed. [E. R. J., July 24, '09.]

Salt Lake & Ogden Railroad, Salt Lake City, Utah.—This company has completed the design of three large bridges and is now calling for bids for the fabrication and delivery of the required steel for these structures. The bridges were designed by the Falkenau Electrical Construction Company, Chicago, Ill., which company will also erect the bridges, which are to be of the following types: One double-track through girder type of bridge, for overhead crossing for Wall Avenue, in Ogden; one double-track composite bridge, consisting of a combination of pony truss, steel tower and deck girder; one double-track concrete bridge, consisting of two spans of 80 ft. each with a rise

of 26 ft. These bridges are each to be of the heaviest type of construction and designed on the basis of Cooper E-45 rating, to carry 100,000-lb. cars.

Everett & Cherry Valley Traction Company, Everett, Wash.—Work on this electric railway has commenced at several different points between Monroe and Tolt, the general contractors, Caughren, Winters, Smith & Company, having sublet contracts for the grading and bridge and trestle building. [E. R. J., July 24, '09.]

Clarke County Suburban Railway, Vancouver, Wash.—It is reported that grading on this proposed electric railway to extend from Vancouver to a point two miles east of Orchards has been started. Plans and specifications for the bridge across Burnt Bridge Creek have been completed, and bids are now being advertised for its erection. It will be a piling bridge, 800 ft. in length and 600 ft. to the cutoff. This company is said to be a subsidiary company of the Vancouver Traction Company, which operates the street railway in Vancouver. Bert Yates, J. W. Sifton and O. C. Spencer are the incorporators. [E. R. J., July 24, '09.]

Cincinnati Construction Company, Janesville, Wis.—It is stated that this company has completed all surveys and financial arrangements on the electric railway which it proposes to build from Janesville to Madison. Howard H. Ziegler, Columbus, Ohio, president. [E. R. J., Jan. 9, '09.]

SHOPS AND BUILDINGS

Pacific Electric Railway, Los Angeles, Cal.—This company expects to erect a station in Pasadena at the corner of Mission Street and Fair Oaks Avenue.

San Diego (Cal.) Electric Railway.—This company is having plans and specifications prepared by Andrew Evast, engineer, for a car house to be erected on the site which was recently purchased on M Street, Fifteenth Street and L Street. The property is 195 ft. x 300 ft. and the car house will be 195 ft. x 270 ft.. The building will be constructed of reinforced concrete, and it will be equipped with an automatic sprinkler system. All tracks will run into the building from M Street. There will be 15 tracks in the building, having a storage capacity of approximately 100 cars. Two tracks will be used for wash pits. A space 12 ft. x 100 ft. along the Fifteenth Street wall will be utilized for work benches and other equipment. Locker rooms will also be provided for the employees. The structure, it is estimated, will cost $100,000. [E. R. J., June 19, '09.]

Tri-City Railway, Davenport, Ia.—This company expects to erect a new car house on East River Street, to cost $5,000.

Central Pennsylvania Traction Company, Harrisburg, Pa.—This company is building a car house at Cameron and Forster Streets which is to be 75 ft. x 360 ft. with six tracks, capable of accommodating 60 cars. The building will be of reinforced concrete, one story high, and will have 12 windows and 35 skylights, each 10 ft. x 12 ft. The cost of the car house will approximate $35,000. Mason D. Pratt is the designer.

POWER HOUSES AND SUBSTATIONS

British Columbia Electric Railway, Vancouver, B. C.—This company is reported to have awarded to Malcolm & Dinsdale the contract for an addition to its power plant on Store Street, Victoria. The cost of the work is estimated at $50,000.

Covington & Southwestern Railway, Kingman, Ind.—This company, which is building an electric railway from Kingman to Crawfordsville and Covington, has completed its power station, and has equipped it with the following apparatus: a 500-hp Bates-Corliss engine, a 300-kw Ridgway generator and boilers from the Springfield (Ill.) Boiler & Manufacturing Company. B. E. Jones, secretary. [E. R. J., July 10, '09.]

Hagerstown (Md.) Railway.—This company expects to purchase immediately a 1000-hp condenser for its power house at Hagerstown. H. C. Alvey, chief engineer.

Toledo & Indiana Railway, Toledo, Ohio.—This company has purchased from the Allis-Chalmers Company, Milwaukee, Wis., a 400-kw rotary converter, 500-r.p.m., 25-cycle, 3-phase, 600-volts d.c., with three 150 kva. O. F. S. C. transformers, 3200 volt to 375 volt, with switchboard.

Portland Railway, Light & Power Company, Portland, Ore.—This company has purchased from the Allis-Chalmers Company, Milwaukee, Wis., a 500-kw vertical direct-current, 600-v generator with switchboard.

Milwaukee & Fox River Valley Railway, Fond Du Lac, Wis.—This company has purchased from the Allis-Chalmers Company, Milwaukee, a 200 kw, 2300-v. 60-cycle synchronous motor. W. H. Phillips, vice-president. [E. R. J., July 24, '09.]

Manufactures & Supplies

ROLLING STOCK

Peoria (Ill.) Railway Terminal Company is in the market for five interurban cars.

Adrian (Mich.) Street Railway has purchased two 28-ft. closed city cars from W. R. Kerschner, Allentown, Pa.

Toledo & Western Railroad, Sylvania, Ohio, is in the market for one second-hand combination steam coach.

Chicago (Ill.) City Railway has placed an order for two funeral cars with the G. C. Kuhlman Car Company, Cleveland.

Toledo Railway & Light Company, Toledo, Ohio, is asking for bids on 10 city cars, through Ford, Bacon & Davis, New York.

British Columbia Electric Railway, Vancouver, B. C., is reported to be planning to build 25 cars of the pay-as-you-enter type in its own shops at Vancouver.

Interborough Rapid Transit Company, New York, N. Y., placed an order with the American Locomotive Company, New York, for 100 trailer trucks for subway service.

Public Service Railway, Newark, N. J., is building eight cars of the pay-as-you-enter type in its own shops and is having 228 cars remodeled for pay-as-you-enter service by the John Stephenson Company.

Kansas City Railway & Light Company, Kansas City, Mo., has placed an order for 25 closed single-truck trail cars 26 ft. long with the McGuire-Cummings Mfg. Company, Chicago. Mention of this contemplated purchase was made in the ELECTRIC RAILWAY JOURNAL of July 31, 1909.

Vincennes Traction & Light Company, Vincennes, Ind., has purchased one 20-ft. motor car mounted on Brill 21-E trucks and equipped with Westinghouse 12-A motors, from the Dorner Railway Equipment Company.

Illinois Traction System, Champaign, Ill., has drawn the following specifications for the 10 pay-as-you-enter cars ordered for Peoria (Ill.) city lines and three of the cars ordered for the Champaign (Ill.) city lines:

Length of body.....22 ft.	Curtain fix....Curtain S. Co.
Length over vestibule..32 ft.	Curtain material...Pantasote
Width over sills..... 7 ft.	Curtain rollers....Hartshorn
Width over posts at belt .....7 ft. 8 in.	Fare boxes.....Brill
	Hand brakes....Brill ratchet
Sill to top of roof.9 ft. 5/8 in.	Registers ...Sterling-Meaker
Body .....Wood	Sanders .....Brill
Interior trim.....Cherry	Seating material.....Plush
Underframe .....Composite	Trucks, type..Brill No. 21-E

Chicago & Oak Park Elevated Railroad, Chicago, Ill., has decided on the following details for the 20 combination motor and trail cars ordered from The J. G. Brill Company, as mentioned in the ELECTRIC RAILWAY JOURNAL of Aug. 7, 1909: Body length over end plates, 47 ft. 4¾ in.; width over sills, 8 ft. 6 in.; over posts at belt, 8 ft. 8¼ in. The interior trim will be of Mexican mahogany and the headlinings will either be of Agosote or three-ply maple veneer, steel underframes. Other details are:

Air brakes.....West. A. M.	Heaters .....Consolidated
Curtain fix....Curtain S. Co.	Seats...Walkover No. 199A
Curtain material...Pantasote	Slack adjuster.Am. Brake Co.
Destination signs.....Hunter	Step treads....Carborundum
Door hangers, McCabe ball-bearing	Varnish. Murphy No. 127 body

Northern Texas Traction Company, Fort Worth, Tex., has specified the following details for the 12 double-truck cars recently ordered from the Cincinnati Car Company through Stone & Webster:

Length of body.....28 ft.	Destination signs....Hunter
Length over vestibule..41 ft.	Hand brakes.....Sterling
Width over sills....8 ft. 6 in.	Heating system.Consolidated
Sill to trolley base..9 ft. 6 in.	Headlights ...Crouse-Hinds
Body .....Composite	Motors.....Four GE-81
Interior.Honduras mahogany	Registers .....International
Underframe .....Composite	Roofs .....Monitor
Air brakes.West. Straight-Air	Seats, style.Heywood 54-AC
Control system.....K-28-B	Seating material.....Rattan
Couplers.....C. C. Co.	Step treads.....Universal
Curtain fix....Curtain S. Co.	Trucks, type..Standard 0-50
Curtain material...Pantasote	

The cars will be constructed under the license of the Pay-As-You-Enter Car Corporation.

The one vestibuled semi-convertible car ordered from the Cincinnati Car Company at the same time will be of the pay-as-you-enter type also, differing only in details as follows: Length of body, 21 ft.; over vestibule, 33 ft.; width over sills, 8 ft., and being 9 ft. 4 in. from sill to trolley base. K-10 controllers, two GE-54 motors, Brill 21-E trucks with

7 ft. 6 in. wheel base, and Agosote ceilings being ordered. No destination signs to be used. This company has ordered heaters from the Consolidated Car Heating Company for 58 cars.

Houston (Tex.) Electric Company, mentioned in the Electric Railway Journal of June 19, 1909, as having purchased 15 single-end and five double-end single-truck cars from the Cincinnati Car Company through Stone & Webster, has ordered these to be of the pay-as-you-enter type with the following details:

Length of body.....21 ft.	Headlinings .....Agosote
Length over vestibule..31 ft.	Headlights ....Crouse-Hinds
Width over sills..... 8 ft.	Journal boxes....Symington
Sill to trolley base..9 ft. 4 in.	Motors.....Two GE-80
Body .....Composite	Registers .....International
Interior trim.....Mahogany	Sash fixtures.....Dayton
Underframe .....Composite	Seats.....Heywood 11-S-C
Couplers .....Cincinnati	Step treads.....Universal
Curtain fix....Curtain S. Co.	Trolley retrievers....Wilson
Curtain material...Pantasote	Trolley base.....U. S. No. 6
Destination signs....Hunter	Trolley wheels.....Standard
Hand brakes.....Sterling	Trucks .....Standard

Dallas (Tex.) Consolidated Electric Railway has drawn the following details for the two double-truck cars reported in the Electric Railway Journal of June 19, 1909, as being built by the Cincinnati Car Company. The cars will be of the pay-as-you-enter type.

Length of body.....28 ft.	Destination signs....Hunter
Length over vestibule..41 ft.	Fenders ..... Parmenter
Length over all....42 ft. 6 in.	Gongs
Sill to trolley base..9 ft. 6 in.	One 14-in. on each platform
Body ..... Composite	Hand brakes..Sterling Giant
Underframe ..... Composite	Heaters
Air brakes....West. straight	Consolidated Electric
Axles 4½ in.	Headlights....United States
Hammered steel	Journal boxes
Bolsters, body, built-up steel	A. S. & I. R. Standard
Brakes	Registers .... International
A. S. & I. R. Standard	Roofs....Monitor deck type
Brakeshoes	Sash Fixtures
A. S. & I. R. Standard	Dayton Mfg. Co.
Car trimmings..Solid bronze	Seats.....Heywood 54-AC
Center bearings..Symington	Step treads.....Universal
Couplers...Cincinnati Radial	Trolley retrievers
Curtain fixtures	Wilson No. 2
Curtain S. Co.	Trucks ..... Brill
Curtain material...Pantasote	

TRADE NOTES

Pullman Company, Chicago, Ill., announces that Ralph W. Benson, who was heretofore employed as an engineer at the Pullman car works, has been appointed assistant manager of sales, vice A. Twyman, retired.

H. W. Johns-Manville Company, New York, N. Y., has removed its Cleveland office from 1525 Columbus Road to 813 Superior Avenue, N. W., and its Los Angeles office from 203 E. Fifth Street to 224 North Los Angeles Street.

Stromberg-Carlson Telephone Manufacturing Company, Rochester, New York, closed its shops for Saturday, Aug. 14, in order to allow all of its employees to attend the company's fourth annual picnic, which was held at Manitou Beach on Lake Ontario.

Walpole Rubber Company of Canada, Ltd., Granby, Quebec, has been formed to produce in Canada the same materials as the Massachusetts Chemical Company produces at Walpole, Mass., under whose management the company is being conducted.

Grip Nut Company, Chicago, Ill., has received orders for universal window fixtures and universal deck sash ratchets to be used on the 50 new passenger cars to be built by the American Car & Foundry Company and the Barney & Smith Car Company for the Baltimore & Ohio Railroad.

McGuire-Cummings Manufacturing Company, Chicago, Ill., announces that Wendell MacDuffie Company, 50 Church Street, New York, have been appointed its general Eastern agents and will handle its general line of steam and electric cars, trucks, sweepers, sprinklers and snow plows.

Standard Steel Works Company, Philadelphia, Pa., announces that it has established a branch office in Pittsburgh.

Westinghouse Machine Company, Pittsburgh, Pa., announces that F. C. Armstead, who has been supervising engineer of the stoker department of the company for a number of years with offices at East Pittsburgh, Pa., has moved his headquarters to the Westinghouse Works, Attica, N. Y., where the stokers are manufactured.

Engineering & Electrical Securities Corporation, New York, N. Y., has changed its name to the Engineering Securities Corporation. Through a typographical error by which the two first words of the company's former title were omitted, it was erroneously stated in this column last week that the Electrical Securities Corporation had changed its title to the Engineering Securities Corporation. The two corporations are separate and distinct organizations, with no connection whatever.

Ball & Wood Company, Elizabethport, N. J., has received an order from the United Electric Company, Chambersburg, Pa., for two 750-kw Rateau-Smoot high-pressure turbines and 60-cycle three-phase generators, to be installed in its plant at Lemoyne. The United Electric Company is owned by the Cumberland Valley Railroad and the latter is, in turn, controlled by the Pennsylvania Railroad. The specifications for the units just contracted for were issued by the motive power department of the Pennsylvania Railroad.

Crocker-Wheeler Company, Ampere, N. J., has recently booked several large orders for direct-current apparatus. One of these from the Indiana Steel Company calls for 70 mill motors, totaling about 2400 hp. This order is an addition to the 11,000 hp of Crocker-Wheeler motors employed at the present time by this company. The King Bridge Company, Cleveland, Ohio, has recently placed an order for one 150-kw, compound wound, 250-volt generator, to be used for supplying light and power. The Bethlehem Steel Company has recently added to its 8800 hp of Crocker-Wheeler motors by an order for a 225-hp, compound wound motor, to be installed at its Saucon plant.

Manufacturers' Publicity Corporation, New York, has been organized by Benjamin R. Western and W. Hull Western, formerly proprietor and manager, respectively, of the Manufacturers' Advertising Bureau, 237 Broadway, New York, and Walter Mueller and W. H. Denney, formerly president and treasurer of the Banning Company, 225 Fifth avenue, New York. The officers of the corporation are Benjamin R. Western, president; Walter Mueller, vice-president and general manager; W. H. Denney, treasurer, and W. Hull Western, secretary. The offices are located at the Hudson Terminal Building, 30 Church Street, New York. The advertising interests of the clients of both the merged companies will be handled by the new company.

Westinghouse Storage Battery Company, Boonton, N. J., which was incorporated on July 12, 1909, has acquired all of the plant, patents and equipment of the storage battery department of the Westinghouse Machine Company and of the General Storage Battery Company, and will manufacture, at Boonton, N. J., both the Westinghouse and Bijur types of storage battery for those classes of service in which each has proved superior. The Westinghouse Storage Battery Company enters the field with greatly increased manufacturing facilities, and will maintain thoroughly equipped testing and commercial laboratories, insuring uniformity of both materials and product. The general offices of the company will be located at Boonton, with sales offices in the principal cities of the country.

Wheeler Condenser & Engineering Company, Carteret, N. J., at a recent meeting of the stockholders elected J. J. Brown vice-president and general manager. In 1894 Mr. Brown was appointed as Southwestern manager for the Henry R. Worthington Company, and later became general sales manager for that company. After the formation of the International Steam Pump Company he became its general Western sales manager, with headquarters at Chicago, and resigned that position to take up his present work. The company's plant at Carteret, N. J., is being enlarged and improved. Among these improvements is a new power house, which will be equipped with several different systems of condensers for exhibition purposes, as well as for supplying the electrical energy which will be used throughout the shops.

ADVERTISING LITERATURE

Niagara Forged Steel Company, Buffalo, N. Y., has issued an illustrated leaflet describing the merits of its Niagara forged steel rail braces, Niagara combination tie plate and rail brace, Niagara base joint plate and the Niagara forged steel tie plate.

United Electric Car Company, Ltd., Preston, Lancashire, Eng., has issued a booklet in which its new Preston semi-convertible car is described. The company has just received an order from the West Ham Corporation for six top-bench cars, with lower windows, on the principle of the Preston car.

Electrical Alloy Company, Morristown, N. J., has issued a 34-page pamphlet setting forth the merits and variety of its goods, which shows the company is manufacturing resistance materials in every variety of wire, sheet and ribbon, including nickel steel alloys, nickel copper alloys, ferro-nickel alloys, nickel chromium alloys and german silver alloys.