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Evils of Congestion

The committee on congestion of population in New York has just issued a bulletin which is one of the strongest arguments possible for the extension of rapid-transit facilities. After reciting some of the well-recognized evils of tenement life on the east side of New York, as well as some of those which are not so well known, the committee points out the fact that a large part—36 per cent—of the working population residing in these districts is employed in the manufacture of clothing and millinery and in laun-

dries. Most of the clothing is made in sweat shops, and those who use it run a serious risk from contagious diseases. Such a condition is almost inseparable from tenement life where sweat shops abound, and it is safe to say that the conditions found in New York are duplicated, though they may not exist to the same extent, in other large cities. Legislation can do little in cases of this kind. The only effective way of dealing with this problem is to eliminate the cause, and of all the remedies that of good transit facilities is the only one which strikes at the root of the evil.

Data on Freight and Express Traffic

Data sheet No. 40, designed by the committee on freight and express traffic of the American Street & Interurban Railway Transportation & Traffic Association to produce statistical information bearing on revenues and expenses, which shall be used without disclosure of the names of companies giving the information, should result in a compilation that will be of great value. The responses of the companies will not, of course, be complete, because many of the companies make no attempt whatever to separate their operating expenses as between freight and passenger service. Where efforts are made to segregate the expenses chargeable to freight service alone, the equity and reliability of the arbitrary bases of division are sometimes open to question. However, whatever information is obtained bearing on this important subject will represent the foundation on which the judgment of the management of each property providing freight and express service rests in determining the profitableness of the business, and it will help some puzzled managers in reaching a conclusion as to whether the territory which their lines traverse is likely to yield sufficient traffic to justify experiments.

Street Railway Facilities at Railroad Terminals

A suggestive letter from Samuel Rea, second vice-president of the Pennsylvania Railroad, to the Public Service Commission of New York, First District, urging the necessity of a subway on the west side of Manhattan Island, was published in the last issue of this paper. Mr. Rea evidently appreciates fully that the great throngs of passengers which his system expects to land in its new terminal at Thirty-third Street and Seventh Avenue, Manhattan, after completion of this costly improvement next year, will be virtually dependent upon new subway transit facilities, and he therefore urges that all proper steps possible be taken to meet the necessities of the situation. The subject of adequate street railway facilities at a large railroad terminal is one whose importance cannot, in the interest of the traveling public or the community, be overestimated; it is more serious in degree, but not in character, in New

York than in other cities, because of the greater congestion of population and density of traffic which exist here. Several parties are concerned in the provision of good street railway facilities at a steam railroad terminal, and it is difficult to say which one is most interested or affected if those facilities do not meet a fair standard of public convenience. An accessible railroad terminal is one of the most encouraging aids in the development of long-distance traffic; an inaccessible terminal is a constant detriment. The traveling public prefers to patronize, other things being equal, the roads with terminals that may be reached with convenience and without much expenditure of time, and any added facilities for this traffic are for the direct benefit of the citizens.

If the street railway company considers the standpoint of revenue only, it may be calculated that a large proportion of the railroad terminal business would be short-haul; but the broader point of view to take is that the station traffic includes a large number of visitors from other cities, who form their impression of the street railway, and therefore in part of the city which it serves, from the facilities they find. Differing from these standpoints is that of the community which, if progressive, wants visitors to leave with a favorable opinion; and if the volume of business does not afford sufficient revenue to justify the street railway in maintaining a desirable quality of service, it would be in the interest of the community to grant concessions in other directions that would equalize the loss. The unquestioned benefits that may be secured from the best street railway service possible between railroad terminals and business, residence or hotel districts have failed to receive proper consideration at a critical time in the history of some of these improvements.

Paint Specifications

Specifications in general are intended to outline for the benefit of the manufacturer the requirements of the purchaser and to serve as a basis for estimating the prices named in an accompanying contract. They may be divided into two classes: first, those which state in a general way the purchaser's requirements as to quality and quantity of material and such other details as are necessary to guide the maker in selecting his own methods of manufacture best suited for producing the desired result; and, second, those which add to the general requirements precise instructions as to composition of materials, methods of manufacture, tests to determine acceptance and other restrictions of a similar nature. It is only to be expected that the more rigid the specifications are made under which material is purchased, the higher the price will be. Under some circumstances, however, rigid specifications, resulting in higher prices, may be economical in the end, but in other instances a rigid specification not only causes higher prices, but may result in the delivery of material actually inferior to that which could have been supplied at a less cost under less severe restrictions. In the purchase of transmission wire, for example, tensile strength, ductility and electrical conductivity are the essential requirements. It will pay the purchaser to insist on a given minimum standard for all of these characteristics and to test each reel or shipment, subject to rejection if it fails to meet the requirements. In

the purchase of paints, however, a rigid specification is detrimental to the best results in the end.

The value of any specification lies chiefly in the ability to check each requirement and insist on its fulfillment. It is useless to specify exact methods of manufacture unless the raw materials are also specified, and both are useless if the purchaser has no means of checking up either one. Paints are complex mixtures of widely different elements, and their exact analysis is an extremely difficult task for the most experienced chemists. Even when the chemistry is known the variations in the methods of manufacture may have a decided effect on the resistive properties of the paint, and this feature can only be followed up by an inspector at the factory. This would be feasible, perhaps, if very large quantities were purchased at one time, but few railways buy enough paint in a whole year to warrant the expense of this kind of inspection for a single order. Furthermore, if a chemical analysis is made, it should be done only by an experienced paint chemist who knows how to interpret his results. If water is found it does not necessarily follow that water has been added to the paint as an adulterant. Some of the pigments commonly used contain water of combination which cannot be driven out during the process of grinding and mixing, but which shows up at once in a chemical analysis.

So difficult is paint analysis recognized to be that one large steam railroad company which has adopted a policy of purchasing all supplies under rigid specifications and maintains for its exclusive use an elaborately equipped testing laboratory, has prepared its paint and varnish specifications in such a way that a really inferior product is furnished under them, simply because the better grades contain so many elements that an accurate analysis cannot be made of them. This railroad, in following out the plan of purchasing everything on a strictly competitive basis, is straining a point in the matter of quality of paint and varnish for the sake of absolute uniformity and the maintenance of an open market. The average street railway cannot afford to do this. The honesty and repute of the paint maker from which it buys is sufficient guarantee of results, provided always that good paints of established merit are bought. It will not pay to haggle over a few dollars' difference in the price of unknown brands and reputable brands. Buy the best, even if the price is somewhat higher, for the chances are all in favor of the higher-priced paint being the better paint.

A Weak Spot in Interurban Service

The maintenance of a fast schedule is one of the prerequisites of success in operating an interurban line in competition with other transportation agencies. Such a statement would be a truism were it not for the fact that the difference between a high schedule speed from terminus to terminus and very fast running on the private right-of-way is sometimes overlooked. The latter is no doubt necessary in many cases to overcome the handicap of terminal difficulties, but the investment in power station, distribution system and car motors, and the structural strength required in rolling stock for really high speed running, are much greater than many promoters of interurban railways appreciate. As a financial proposition, the high-powered road

which can use its full resources over only a short portion of its total running time is clearly handicapped over a somewhat slower line in point of maximum speed, but one which manages to maintain good running time from end to end on account of wise and progressive arrangements for its service in and out of terminal cities.

There is nothing new in this problem of the speed of interurban cars in city terminals, but its neglect in practice justifies renewed reference to it. Something is plainly wrong when it takes the cars of a fast line as long to run through 7 or 8 miles of urban territory as it does to traverse 30 or 40 miles of intermediate country. Perhaps there is no remedy for such a condition in many instances, but the manager who is keen to secure every possible passenger will not settle back contented until he has made certain that improvements cannot be effected. The obstacles to even a fair rate of speed into and out of terminal cities are well known to be the obstruction of regular and special cars of the local system, circuitous routes, vehicle traffic on the highways, inadequate feeder capacity for the needs of the heavier through cars, waits for crews to be changed, delays in taking register readings when system boundaries are reached, etc. In general, they can usually be summed up as being caused by a disposition on the part of the city system to treat the interurban cars as a part of its own local service, according them neither special rights nor extra care in the maintenance of the fastest local running time consistent with safe operation.

The interurban manager may readily plead that he is without control of the local situation, but as the stress of competition becomes keener the only way out of the problem is to have a conference with the local management and try to root out some of the more glaring difficulties which hold down the movement of the through cars. If an expenditure of money is required for some of the improvements necessary, it may be a better investment for the interurban road to share the cost of bettering that part of the local system over which its cars run than to spend the same amount in doubling the motive power of its rolling stock. What is needed is not the speed of a limited express train through the outlying streets of the terminal city, but the maintenance of a good average rate of movement with the fewest possible number of stops and slow-downs that will take care of the reasonable demands of the through travel. It might cost less to permit the interurban crews to run through to the city terminus, with an extra conductor or inspector of registers from the local system, than to adhere so generally to the present system of changing crews at system limits.

The Cost of Accidents

At the convention of the International Association of Accident Underwriters, held last week at Niagara Falls, attention was attracted to the tremendous aggregate expense of casualties and to the large proportion of them which could be prevented by care. According to Dr. W. H. Tolman, a conservative estimate of the number of accidents which in this country result fatally or in partial or total incapacity for work, is 500,000 each year. If we assume an average disability for each victim of one year and an average earning capacity annually of only \$500, the casual-

ties cause in loss of services an economic drain on the country of \$250,000,000 a year. This is considerably more than the amount paid annually in pensions by the United States, but by no means constitutes all of the expense. If to this should be added the value of the labor of the higher-priced men and the cost of the courts in considering accident cases, the aggregate is very much larger. Thus in New York City alone, 60 per cent of the time of the jury trial and first appeal courts is occupied by the consideration of accident cases, and the salaries of the judges and the wages of the court attendants, exclusive of administrative expenses and supplies, cost the taxpayers of the city in 1908 \$4,000,000. Of course, no part of this sum is any direct aid or compensation to the victim of the accident.

Strictly speaking, every accident could be avoided by care on the part of somebody, but eliminating those accidents which are sometimes called unavoidable because they are not caused by what is termed gross negligence, there is no doubt that a very large percentage of the injuries which are now a drain upon the earning capacity of the country could be greatly reduced. The only way in which this can be accomplished is to inculcate so generally the idea of the necessity for caution that the public, as well as those engaged in the direction of the different industries, may take all precautionary steps possible. Many employers of labor have already shown that they realize the importance of action of this kind. Thus the United States Steel Corporation has for some years had a central committee of safety, whose duty it is not only to insure the introduction of the best methods of preventing accidents and safeguarding employees, but also to obtain and disseminate among the employees of the company information and suggestions in regard to protecting themselves and those who might be injured by the machinery. The New York Edison Company has a somewhat similar organization, as well as elaborate emergency staff, with a complete system of first aid to the injured. Among the railway companies this same plan has also been followed to a large extent by issuing instructions to employees regarding the prevention of accidents and the care of the injured. In some cases, like Milwaukee, an ambulance car has been equipped and a complete hospital outfit has been provided with attendant physicians and nurses, for the use of employees or others who may be injured on the premises or lines of the company and can be taken to the company's hospital more quickly than to any others in the city.

While great progress has been made in this direction by railway companies so far as their own forces are concerned, it seems as if still more could be done in instructing the general public regarding the necessity of precautionary measures. The railway companies can do something along these lines by posting in their stations and other public places notices like those used by the Red Cross Society and published in a recent issue of this paper. But other factors like the daily newspapers and the municipalities must assist if much is to be accomplished. Every accident means an injury not only to the victim, but to the community, which always has to bear a part of the expense. So long as human judgment is fallible accidents cannot be entirely eliminated, but it would seem as if they might be reduced in amount over those which now occur.

**ROLLING STOCK STANDARDIZATION IN BROOKLYN—
SPECIFICATIONS FOR CASTINGS, FORGINGS AND
COMPOSITIONS, INCLUDING THE DETAILS OF
STANDARD TRUCKS AND FITTINGS**

One of the later phases of the standardization work of the Brooklyn Rapid Transit Company is represented by the series of metal specifications prepared with the view of securing the safest and most suitable equipment. The subject has not been treated from the mere cents per pound standpoint, but with due regard for the engineering requirements of each class of service. For this reason the specifications are worthy of the earnest study of all railroads which have not had the means or opportunity to give this matter the thorough treatment which it deserves. The materials for which individual specifications have been prepared in the order given are the following: Steel tires; steel castings; wrought iron; steel forgings for driving axles, trailer truck axles and armature shafts; composition castings; cast-steel gears; steel pinions; elliptic and semi-elliptic springs; and drop-forged steel coupling links and pins. In addition to the foregoing, special forms are prepared for complete trucks and other equipment when bids are called for on new rolling stock.

STEEL TIRES

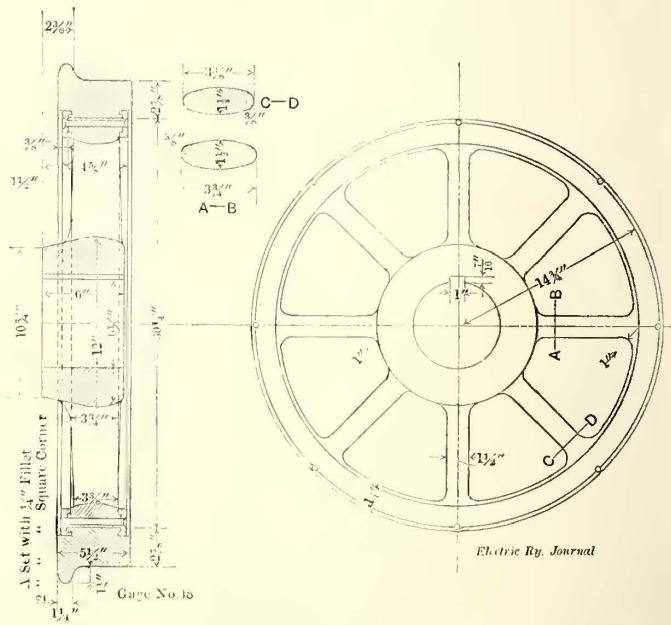
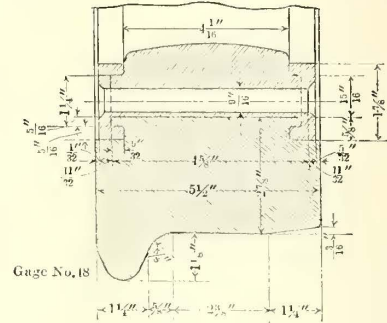
The steel tires are of open-hearth or crucible steel and in general conform to the standards outlined in Bulletin No. 14 of the American Society for Testing Materials. The chemical composition is limited as follows: Manganese, not to exceed 0.80 per cent; silicon, not less than 0.25 per cent; phosphorus, not to exceed 0.05 per cent, and sulphur, not to exceed 0.05 per cent. All tires must have a tensile strength of not less than 110,000 lb. per square inch and their elongation in 2 in. must not be less than 10 per cent. One test per melt is required to be cut cold from the tire or test ingot which must receive approximately the same working and heat treatment as the tire. The tires must be stamped with the maker's brand and serial number; the railroad company's order number and the material number marked in white. All tires must be free from cracks, flaws or other injurious defects and conform to dimensions ordered. Where tires are not inspected at the mills the manufacturer must send a certified report of the physical and chemical tests to the superintendent of equipment when each shipment is made.

The steel tires covered by the foregoing are 27/8 in. thick and are used on 38 Baldwin trucks installed under some elevated cars of the 900 type and under electric locomotive No. 4. The wheels used under the elevated cars are 36 in. diameter and carry 9000 lb. when the car is light. The elevated cars are operated up to a maximum speed of 40 m.p.h. The wheels used for the electric locomotive are 37 in. diameter, carry 14,250 lb. and are run at speeds up to 40 m.p.h.

STEEL CASTINGS

The open-hearth or crucible-steel castings to be specified for future rolling stock conform in general to the standards laid down in Bulletin No. 16, American Society for Testing Materials. In their chemical composition these castings must not have over 0.05 per cent of phosphorus or over 0.05 per cent of sulphur. Such castings must have a tensile strength of not less than 60,000 lb. per square inch, an elastic limit of not less than 27,000 lb. per square inch, an elongation of not less than 22 per cent in 2 in. and a reduction in area of not less than 30 per cent. It is required that coupons for the tests shall be cast on at least two

castings from each heat and that the tests shall be made from a 3/4-in. round cut from the coupon. Each casting must have the melt number plainly stamped with sunk figures and the railroad company's pattern number cast with raised figures. Each test piece must have the melt and order number stamped on it. All castings must be annealed by heating uniformly to about 850 deg. C., or 1560 deg. Fahr. No castings must be shipped until it is certain that the proper crystallization has been obtained. This is characterized by a fine granular section, a sample of which must be furnished upon request. Castings must be true to patterns and free from slag, blow-holes, shrinkage cracks and sand. Bearing surfaces must be solid, and no porosity is allowed in positions where the resistance and value of the casting for the purpose intended will be seriously affected. Defective castings are returned at the



Brooklyn Specifications—Steel-Tired Spoke Center Motor Truck Wheel

expense of the manufacturer. Tests, when required, are made at the foundry and no charge for such tests is allowed.

WROUGHT IRON

The wrought iron to be specified in the future is known as Burden's Best, and must be free from steel scrap. The physical requirements for both rectangular and round sections are given herewith: Tensile strength per square inch, not less than 48,000 lb., rectangular, or 50,000 lb., round; elastic limit per square inch, not less than 25,000 lb., rectangular, or 25,000 lb., round; elongation in 8 in., not less than 20 per cent, rectangular, or 25 per cent, round. A reduction of 1000 lb. per square inch in tensile strength is allowed below the above figures when it is necessary to machine test pieces. Bars are required to bend cold, with-

out signs of fracture or cracking, through 90 deg. to a curve whose radius equals the thickness of the piece. At least one sample in three must bend through 180 deg. without cracking. Bars when nicked evenly and bent back by light blows must show a generally fibrous fracture, free from steel or coarse crystalline spots. Not over 15 per cent of the fractured surface must be granular. Two test pieces, 20 in. long, are taken for test from each 200 bars or less. The bars must be marked in white lead with the railroad company's order number and the specified mark given on the order. All bars must be practically straight, smooth, free from cinder spots, blisters, cracks, slivers, injurious flaws and imperfect edges. Round iron must conform to the limit gages adopted by the Master Mechanics' Association and rectangular iron must not vary more than .03 in. from the size ordered. Bar iron which fails to meet the above requirements is subject to return at the manufacturer's expense.

STEEL FORGINGS FOR DRIVING AND TRAILER TRUCK AXLES AND ARMATURE SHAFTS

The specifications for steel forgings for truck axles and armature shafts conform to those of the American Railway Master Mechanics' Association and the American Society for Testing Materials. The material is open-hearth steel with the following chemical limitations: Phosphorus, not to exceed 0.05 per cent; sulphur, not to exceed 0.05 per cent, and manganese, not to exceed 0.60 per cent. The tensile strength must not be less than 80,000 lb. per square inch, the elongation not less than 20 per cent in 2 in., and the reduction in area not less than 25 per cent. One test per melt is required. This is taken from the forging or from a full-size prolongation of the same, halfway between the center and the outside, parallel to the axis of the forging. The standard turned test specimen, 1/2 in. in diameter and 2 in. gage length, must be used to determine the physical properties. Coupons for test must be left attached to the forging, but so nearly cut through that they may be detached with hammer and cold chisel on the arrival of the railroad company's inspector. The superintendent of equipment of the railroad company must be notified in advance when forgings will be ready for inspection, and no shipment must be made before tests have been completed and the inspector advises that the forgings are satisfactory. Drillings or turnings from the tensile specimens are used to determine the chemical properties where check analysis is necessary.

Each forging must be plainly stamped on one end with the melt number and with the name or initials of the manufacturer, with stamps not less than 3/8 in., and must have the order number plainly marked with white lead. All forgings must be free from seams, cracks or other defects and must conform to sizes ordered. When called for forgings must be rough-turned all over with a flat-nosed tool, cut to exact length and centered for a lathe with 60-deg. centers. Forgings, when specified to be either rough-turned or hammered to shape, must be made with sufficient accuracy to allow for finishing all over at 1/8 in. less than specified rough diameter. Forgings failing to meet the above requirements, or which prove defective on machining, will be rejected and returned at manufacturer's expense for replacement free of cost to the railroad company.

COMPOSITION CASTINGS

Five different alloys are used for composition castings, as follows: Journal bearings, check plates and various other bearings are of bearing metal, No. 1 composition; car trimmings, trolley wheels and various power-house cast-

ings are of bronze, No. 2 composition; signal bells are of bell metal, No. 3 composition; steam fittings, valves and cocks are of steam metal, No. 4 composition, and miscellaneous castings, motor and control parts are of yellow brass, No. 5 composition.

The analyses of the five compositions are given in Table I:

Composition	Copper	Tin	Lead	Zinc	Maximum impurities
	Per cent	Per cent	Per cent	Per cent	Per cent
No. 1, Bearing metal.	77.00	8.00	15.00	....	1.0
No. 2, Bronze	88.40	5.50	2.80	3.30	1.5
No. 3, Bell metal.	82.00	18.00	....	....	1.5
No. 4, Steam metal.	85.00	5.00	5.00	5.00	1.0
No. 5, Common brass.	67.00	....	....	33.00	1.5

NOTE: A variation of 10 per cent is allowed from the specified amounts of tin, lead and zinc.

Mixtures with scrap of the percentages indicated are permitted as shown in Table II:

Composition	Copper	Tin	Lead	Zinc	Maximum scrap
	Per cent	Per cent	Per cent	Per cent	Per cent
No. 1, Bearing metal.	38.50	4.00	7.50	....	50
No. 2, Bronze	62.00	3.80	1.90	2.30	30
No. 3, Bell metal.	82.00	18.00	....	....	..
No. 4, Steam metal.	59.50	3.50	3.50	3.50	30
No. 5, Common brass. . . . .	....	....	....	....	100

NOTE: All scrap must be of the same composition as the metal for which it is used, and where the amount of scrap, as shown above, cannot be obtained, new metals must be used in proportion.

Inspection must show that the castings are free from segregation, oxidation, dirt, sand, cavities and any other injurious defects. All castings that do not meet the requirements of these specifications are returned at the manufacturer's expense. Any labor performed on castings found defective after machining or finishing is charged to the manufacturer.

CAST-STEEL GEARS

Cast-steel gears are of open-hearth or crucible steel and must not contain more than 0.05 per cent of phosphorus or more than 0.05 per cent of sulphur. The tensile strength must be not less than 70,000 lb. per square inch, the elastic limit not less than 35,000 lb., the elongation in 2 in. not less than 16 per cent and the reduction in area not less than 25 per cent. Coupons for test must be cast on at least two castings from each heat and tests must be made from a standard 1/2-in. x 2-in. test piece. The test piece must be removed from the casting and tested in the presence of the railroad company's inspector. Each gear casting must have the melt number stamped thereon with steel figures, and the finished gear must have the railroad company's order number stamped with steel figures on the side of the rim. All gear castings must be annealed by heating uniformly to about 850 deg. C., or 1560 deg. Fahr. No castings must be shipped until it is certain that the proper crystallization has been obtained, this being characterized by a fine grain. The gears must be true to patterns and free from slag, blow-holes or shrinkage cracks. The finished surfaces must be solid and no porosity will be allowed in the teeth. The face of hub and rim must be finished; bore must be "rough-bored" unless otherwise specified. The gear teeth must be Brown & Sharpe standard involute, made with special cutters for the number of teeth and degree of pitch shown on the plans accompanying the order. Gears that are found defective upon re-

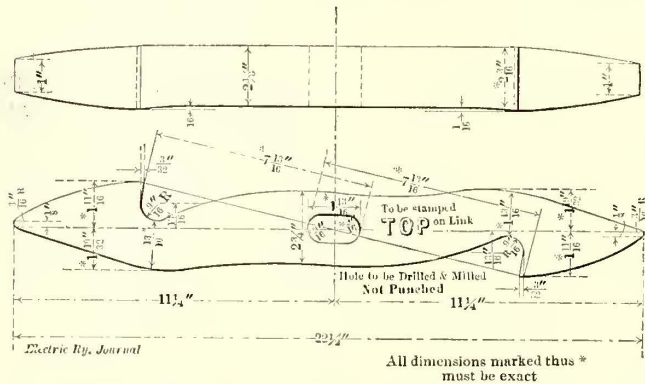
ceipt or those that fail in service, due to imperfect material or workmanship, are returned to the manufacturer, who must give full credit for the original value of the same.

STEEL PINIONS

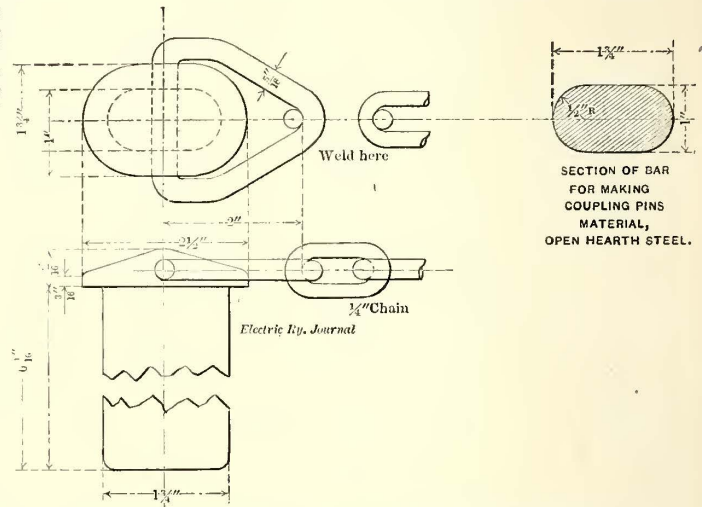
All steel pinions are of open-hearth steel of individual billets hammered to size for each pinion. The principal difference from the gear metal is in the use of manganese, which must not exceed 0.6 per cent; phosphorus and sulphur, must not exceed 0.04 per cent each. The tensile strength of the pinion material must be not less than 80,000 lb. per square inch, the elastic limit per square inch not less than 40,000 lb. per square inch, the elongation in 2 in. not less than 22 per cent and the reduction in area not less than 35 per cent.

One test per melt is required. This is taken from the forging, halfway between center and outside and parallel to the axis of the forging. The standard turned test piece, 1/2 in. in diameter and 2 in. gage length, must be used to determine the physical properties. Coupons for test must be left attached to the forging, but so nearly cut through that they may be easily detached upon the arrival of the railroad company's inspector. The purchasing agent of the railroad company must be notified in advance when forgings will be ready for inspection and the cutting of

exceed 0.05 per cent, and sulphur, not to exceed 0.05 per cent. At least 25 per cent of each lot of springs is subject to test. The trial consists in applying one and one-half times the maximum specified load with the ends of the semi-elliptic springs supported on swinging or roller bearings. When released from one and one-half times the maximum specified load, the springs must not be more than 3/16 in. higher nor more than 3/16 in. lower than the specified height, and must not take a permanent set when free. The plates must fit closely together at all times and deflect uniformly under the test loads. Each spring must be stamped on one side with the maker's mark and date made (month and year) and the railroad company's order number. The plate must be free from lamination and other defects and must not vary more than .03 in. in width nor more than .02 in. in thickness. The bands must not vary more than 1/4 in. in length, 1/16 in. in width or 1/32 in. in thickness. The distance, center to center, must not vary more than 1/4 in. from drawings. When so desired the springs may be tested at the mills free of cost to the railroad company. When springs purchased to



Brooklyn Specifications—Standard Coupling Link for Van Dorn No. 4A and No. 18 Drawheads



Brooklyn Specifications—Coupling Pin and Links for Van Dorn 4A and No. 18 Drawheads

the pinions must not commence before the inspector advises that the forgings are satisfactory. Drillings or turnings from the tensile specimens are used to determine the chemical properties where check analysis is required. Each forging must be plainly stamped on one end with the melt number and finished pinions must have the railroad company's order number and the initials of the manufacturer stamped on one end.

All pinions must be free from seams, cracks or other defects and must be finished to the exact sizes shown on the plans accompanying the order. The bore must be accurately and smoothly reamed. The teeth are Brown & Sharpe standard, involute, made with special cutters for the number of teeth and pitch shown on the plans accompanying the order. Pinions that are found to be defective upon receipt or those that should fail in service, due to imperfect material or poor workmanship, are returned to the manufacturer, who must give full credit for the original cost of the material.

ELLIPTIC AND SEMI-ELLIPTIC SPRINGS

Car springs, whether of the elliptic and semi-elliptic type as now ordered on requisitions, are of crucible or open-hearth steel containing the following ingredients: Carbon, 0.90 to 1.10 per cent; manganese, 0.25 to 0.50 per cent; silicon, 0.15 to 0.25 per cent; phosphorus, not to

these specifications are shipped without inspection by the railroad company's representative the manufacturer must make specified tests and report the results to the superintendent of equipment, Brooklyn Rapid Transit Company.

The manufacturer must furnish the railroad company with a certified report of the analysis of the steel used in each lot of springs. When springs are ordered in pairs the variation in height under specified loads must not exceed 1/16 in. in the same pair. Springs that fail to meet the requirements specified above are returned at the manufacturer's expense.

OIL-TREATED, DROP-FORGED STEEL COUPLING PINS AND LINKS

The drop-forged steel coupling pins and links are of open-hearth steel, containing: Phosphorus, not to exceed 0.04 per cent; sulphur, not to exceed 0.04 per cent; manganese, 0.50 to 0.60 per cent, and carbon, 0.35 to 0.45 per cent. The link must be heat treated to bring the tensile strength up to approximately 100,000 lb. per square inch and the elastic limit to approximately 60,000 lb. per square inch. The oil tempering and annealing must be done as follows, after the links have been machined and milled: Heat links to about 800 deg. C., plunge in oil and reheat to about 500 deg. C. All pins and links must be free from seams, cracks or other defects and must conform to sizes given on the railroad company's plans.

The forging must be performed by alternately striking on opposite sides so as to produce smooth and true forgings and eliminating die seams as far as practicable. The slotted hole in the coupling links must be accurately located and drilled and milled, not punched. Each link or pin must be plainly stamped with steel dies with the manufacturer's initials and each lot shipped must be tagged with the railroad company's order number. The links must have the word "TOP" stamped on the top side, as indicated on plan. The inspection is made before the heat treatment is applied either at the manufacturer's works or at the railroad company's shops, as advised by the railroad company. This inspection is made from one sample selected from each heat. If tests are carried out at the manufacturer's works no charges are made for cutting test pieces or the use of testing machines and the railroad company's inspector must have free access to all parts of the shops where the links or pins are being made.

TRUCK SPECIFICATIONS AND JOURNAL WEIGHTS

In addition to the forgoing individual specifications general specifications are prepared from time to time covering complete trucks except wheels and axles. Those which are reproduced relate to the following trucks: Surface passenger motor, maximum traction, elevated motor and elevated trailer. The accompanying table of the weights

WEIGHTS OF JOURNALS.

Truck.	Size of journal.	Weight on journal car light, lb.	Weight on journal with full load, lb.	Weight per sq. in. of journal bearing car loaded, lb.
Surface passenger, short wheel base, double.....	3¾ in. x 7 in. M. C. B.	5,025	6,900	292
Surface passenger, maximum traction driver....	3½ in. x 7 15/16 in.	4,412.5	5,950	192
Surface passenger, maximum traction, pony....	3 in. x 7 15/16 in.	2,562.5	4,100	226
Surface service, diamond frame, double.....	4¼ in. x 8 in. M. C. B.	4,267.5	9,267.5	299
Elevated passenger, '07 type, motor.....	5 in. x 9 in. M. C. B.	7,829	10,435	251
Elevated passenger, trail truck on motor cars....	4¼ in. x 8 in. M. C. B.	6,357	8,794	283
Elevated passenger, all other motor trucks, excepting '07 type.....	4¼ in. x 8 in. M. C. B.	6,580	9,017	290
Elevated passenger, trail car truck.....	3¾ in. x 6½ in.	3,350	6,106	362

NOTE.—The heaviest equipment is used in each case for computing weight for journal.

on the journals of these and other trucks will be found of interest in connection with the specifications for the truck parts and the bearings. The minimum weight per square inch when the car is carrying its maximum load varies from 192 lb. on the driver journal of the surface passenger short wheel-base trucks to 362 lb. on the journals of elevated passenger trucks.

SURFACE PASSENGER CAR MOTOR TRUCK SPECIFICATIONS

The following details will give briefly the size and grades of metals specified for motor trucks ordered during 1906 for surface passenger cars of the Class 4100-4300-4500 types. The trucks were of the M. C. B. swing-bolster type, with inside-hung shoes, side bearings and rigid nose suspension, as shown in the accompanying engraving. The car body weighed when fully equipped about 23,000 lb. The weight of the maximum passenger load was assumed at 17,000 lb. and the trucks were to be built so that under these loads the difference in the height of the empty and loaded car should not exceed 2 in. The total weight of car and trucks is 52,000 lb. The general dimensions of this truck were: Wheel base, 4 ft. 10 in.; height

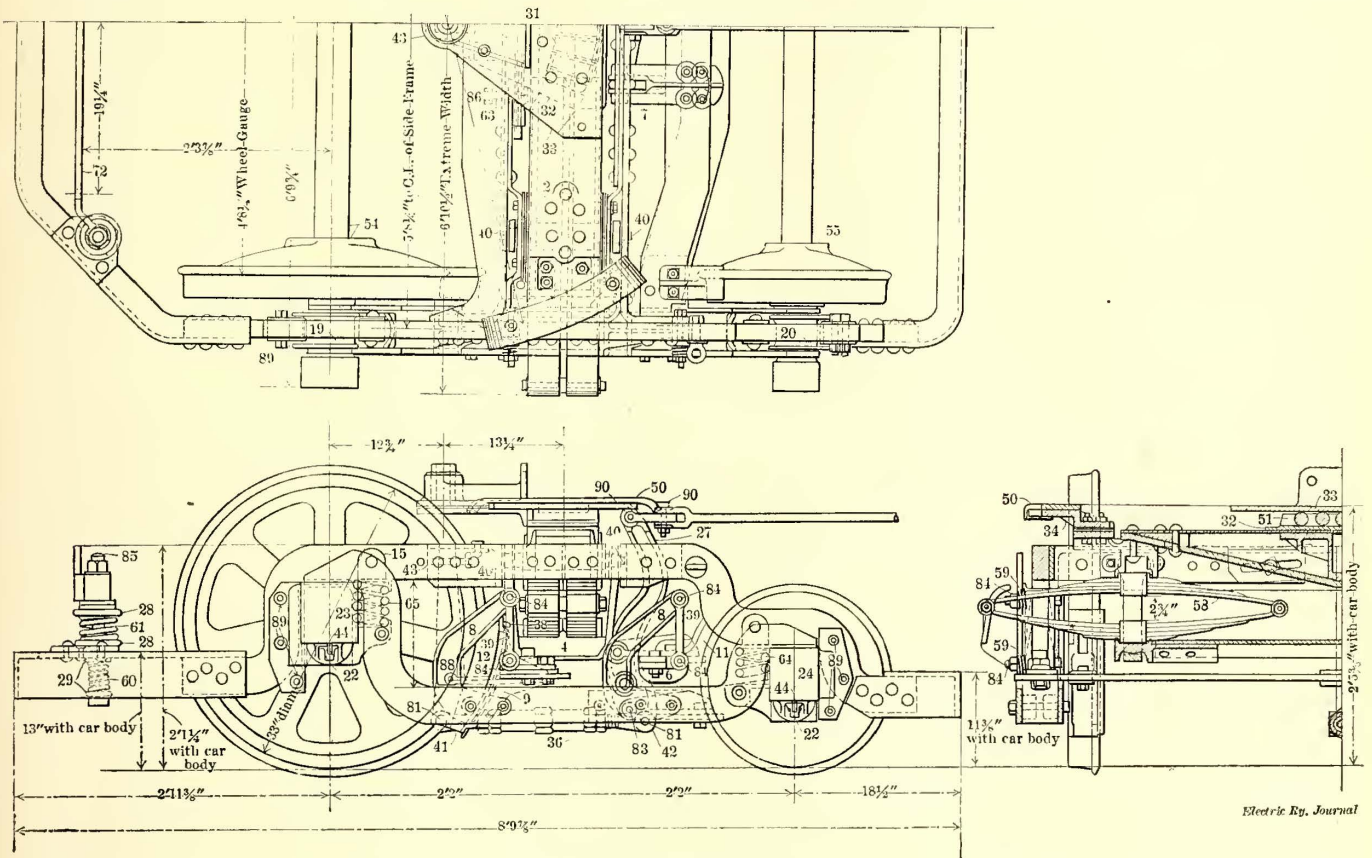
from rail to top of car body centerplate with weight of empty car body, 29¾ in.; height from rail to top of side bearings, 31¾ in.; gage of track, 4 ft. 8½ in., and diameter of wheel, 33 in. The contractor guaranteed to replace without cost to the railroad company any parts which might become worn out or broken because of faulty design, material or construction, within one year from the date the truck was put into service, excepting wheels, axles, journal brasses and brake shoes.

The wrought iron furnished under this specification was to have been made originally by the puddling process, and as furnished might consist of new muck bar iron or of a mixture of muck bar iron scrap, but free from a mixture of steel scrap. The bar iron was to be smoothly and truly rolled to the ordered dimensions and free from slivers, depressions, cracks and burned edges. The bar iron had to conform to the following tensile, nicking and bending tests: Rectangular iron less than 3 in. wide and having less than 1½-in. cross-sectional area to be tested in full size as rolled. Iron more than 3 in. wide or having a cross-section of more than 1½ in. was to be reduced to that width or area by turning or by planing, but when practicable, tested in full thickness. Round iron having a diameter of 1¾ in. or less was to be tested as rolled and that measuring more than 1¾ in. was to be reduced to that dimension. All other shapes were to be reduced to the most convenient size up to 1½ in. in area. The testing of very irregular shapes and very small rods was optional. The length of the test section was 9 in. and the elongation was measured between marks originally 8 in. apart. All of the iron of one size in the shipment was subject to rejection if the average tensile strength of the specimens representing it fell below 47,000 lb. or exceeded 53,000 lb. per square inch, or if any single specimen showed less than 45,000 lb. per square inch. In the case of flat bars, which had to be reduced in width, an allowance of 1000 lb. was made in the tensile strength, making the rejection limit 46,000 lb. per square inch. All of the iron of one size was to be rejected if the average elongation in 8 in. fell below the limit given: Rounds ½ in. and over, 20 per cent; rounds less than ½ in., 16 per cent; flats, pulled as rolled, 20 per cent, and flats, reduced, 16 per cent. In the nicking and bending tests the iron was held firmly in a vise, nicked lightly on one side and then broken by a succession of light blows on the nicked side. When broken it had to show a general fibrous structure with not more than 25 per cent crystalline and free from steel admixture. If more than one bar in five thus tested showed steels in whole or in part, all of that size were to be rejected.

Steel bars were specified to be of soft, open-hearth steel, tensile strength 55,000 lb. to 60,000 lb. per square inch, elastic limit of not less than one-half the ultimate strength, elongation 27 per cent cold, or quench bends 180 deg. flat on themselves without fracture of outside of bend. Gray iron castings were to be made of clear tough gray iron exhibiting a uniform and closely grained fracture, free from any white, mottled or vitreous appearance. They were to be soft enough readily to be cut, drilled or chipped, and when struck on a corner or edge with a hammer the metal was to indent and not break off. Malleable iron castings were to be made of clean high-grade metal, evenly annealed throughout. Coupons for tests were to show an ultimate strength of 40,000 lb., an elastic limit of 20,000 lb. per square inch, an elongation of at least 2½ per cent and a reduction area of not less than 6 per cent. They were to be capable of bending to an angle of 90 deg. without

even shoe wear and to keep the shoes on the same point of the wheel, irrespective of the weight on the truck. The car body swivel plates have conical rollers, which allow the truck to take curves easily and with less friction on wheel flanges.

the American Locomotive Company. Many details were changed, however, in conformity with Brooklyn Rapid Transit practice. Important features are the cast-steel gussets which tie the side frames and transoms and embrace in one casting the swing-link bearings, brake hanger



BILL OF MATERIAL.

Mark	Description	Material	No. per Truck	Mark	Description	Material	No. per Truck
1	Bolster Center Filler	Mal. iron	1	38	Brake Shoe Key	Wrought iron	2
2	Bolster Filler	Mal. iron	2	39	Brake Hanger	O. H. steel	8
3	Bolster Spring Cap	Mal. iron	2	40	Bolster Hanger Pin	O. H. steel	4
4	Bolster Spring Seat	Cast steel	2	41	Bottom Brake Rod—L. H.	Wrought iron	1
5	Brake Beam Bracket—Driver	Cast steel	2	42	Bottom Brake Rod—R. H.	Wrought iron	1
6	Brake Beam Bracket—Pony	Cast steel	2	43	Dead Lever Guide	O. H. steel	1
7	Brake Beam Fulcrum	Cast steel	4	44	Journal Box Lid Bolt	Wrought iron	4
8	Brake Hanger Bracket	Cast steel	4	45	Release Spring Bolt	Wrought iron	1
9	Brake Head	Mal. iron	2	46	Release Spring Hook Bolt	O. H. steel	1
10	Brake Shoe, 20"—R. H.	Cast iron	1	49	Damper Washer	O. H. steel	2
11	Brake Shoe, 20"—L. H.	Cast iron	1	50	Side Bearing Wear Plate	O. H. steel	2
12	Brake Shoe, 33"	Cast iron	2	51	Roller	O. H. steel	5
13	Car-Body Side Bearing—R. H.	Cast steel	1	54	Driver Wheel and Axle		1
14	Car-Body Side Bearing—L. H.	Cast steel	1	55	Pony Wheel and Axle		1
15	Equalizer Spring—Cap	Mal. iron	4	58	Double Elliptic Spring		2
16	Journal Bearing—Driver	Brass	2	59	Brake Hanger Spring		3
17	Journal Bearing—Pony	Brass	2	60	Bottom Motor Spring		2
18	Journal Box—Driver—R. H.	Cast iron	1	61	Top Motor Spring		2
19	Journal Box—Driver—L. H.	Cast iron	1	62	Brake Release Spring		1
20	Journal Box—Pony—R. H.	Cast iron	1	63	Damper Spring		2
21	Journal Box—Pony—L. H.	Cast iron	1	64	Equalizer Spring—Pony		2
22	Journal Box Bolt Lever	Mal. iron	4	65	Equalizer Spring—Driver		2
23	Journal Box Lid—Driver	Mal. iron	2	66	Journal Box Spring		4
24	Journal Box Lid—Pony	Mal. iron	2	69	Dust Guards—Driver	White wood	2
25	Journal Check Plate—Driver	Brass	2	70	Dust Guards—Pony	White wood	2
26	Journal Check Plate—Pony	Brass	2	72	Motor Suspension Bar		2
27	Live Lever	Cast steel	1	80	Live Lever Top Brake Pin		2
28	Motor Spring Cap	Mal. iron	4	81	Live and Dead Lever Bottom Brake Pin		2
29	Motor Spring Seat	Mal. iron	4	82	Live and Floating Lever Fulcrum Brake Pin		1
30	Release Spring Worm	Mal. iron	2	83	Floating Lever Top and Bottom Brake Pin		4
31	Solder	Mal. iron	1	84	Brake Hanger Pins		8
32	Swivel Plate—Bottom	Cast steel	1	85	Motor Suspension Bolt		2
33	Swivel Plate—Top	Cast steel	1	8	Bolster Damper Spring Bolt		1
34	Truck Side Bearing—R. H.	Cast steel	1	87	Bolster Damper Spring Bolt		1
35	Truck Side Bearing—L. H.	Cast steel	1	88	Dead Lever Fulcrum Bolt		1
36	Turnbuckle	Mal. iron	2	89	Side Frame Wearing Piece Bolt		12

Brooklyn Specifications—Maximum Traction Truck, Type O-45

SPECIFICATIONS FOR ELEVATED PASSENGER MOTOR TRUCKS
 The latest type of motor truck used by the Brooklyn Rapid Transit Company, as applied under class 1400 semi-convertible elevated cars, was briefly described and illustrated in the STREET RAILWAY JOURNAL of Nov. 9, 1907. The truck follows the intrurban standards of the builder,

brackets or lugs and the brake release-spring brackets. This feature eliminates several small castings, with the attendant bolts and rivets. One change required by the clearance conditions was the dropping of one end of the top frame to clear the car body's platform. The trucks are of the two-bar equalizer and swinging bolster design, with inside-hung

shoes, roller side bearings and inside nose suspension without springs for Westinghouse No. 300 motors. Two of these trucks carry an elevated car 48 ft. 11 in. over all, with a load of 28,465 lb. at the center plate. The weight of each truck is 12,000 lb. The weight of the car body equipped is 37,730 lb., and the motor end alone 18,190 lb. The car seats 53 passengers, and is figured for a maximum of 139 passengers averaging 150 lb. each.

The general dimensions and clearances are: Length, 10 ft. 9 in.; wheel base, 6 ft. 8 in.; center to center of side frames, 6 ft. 4 in.; center to center of car body side bearings, 5 ft.; top of rail to top of car body center plate, 34 $\frac{3}{4}$ in. (car light); top of rail to top of truck side bearings, 34 $\frac{3}{4}$ in. (car light). The wheels are of the Schoen solid steel type, 34 in. diameter, 4 $\frac{1}{8}$ in. width of tread; 1 $\frac{1}{8}$ in. height of flange; 2 in. thickness of rim at thinnest point; 1 $\frac{3}{8}$ in. thickness of flange from back to gage line. The axle diameters are as follows: Gear seat, 7 $\frac{13}{16}$ in.; wheel seat, 7 $\frac{3}{4}$ in.; motor bearings, 6 $\frac{1}{2}$ in. The journals are 5 in. x 9 in.

The truck framing includes the following list of parts, made mostly according to the specifications of the builder:

PARTS OF MOTOR TRUCK FOR CLASS 1400 ELEVATED CARS	
Top side frames.....	4 in. x 1 $\frac{1}{2}$ in., soft steel.
Side frame truss.....	4 in. x $\frac{3}{4}$ in., soft steel.
Pedestal tie bars.....	4 in. x 1 in., soft steel.
End braces.....	4 in. x 1 in., soft steel.
Bolster plates.....	8 in. x $\frac{3}{4}$ in., soft steel.
Equalizers.....	5 in. x 1 in., soft steel.
Pedestals.....	4 in. x 1 $\frac{3}{8}$ in., wrought iron.
Center braces.....	4 in. x 1 $\frac{3}{8}$ in., wrought iron.
Transoms.....	9 in. x 25 lb., channel.
End frames.....	4 in. x 4 in. x $\frac{5}{8}$ in., angle.
End frame gussets.....	$\frac{1}{2}$ in., steel plate.
Spring plank.....	4 in. x 5.25 lb., channel.
Transom gussets.....	Cast steel.
Elliptic spring caps.....	Malleable iron.
Bolster fillers.....	Malleable iron.
Bolster wear pieces.....	Malleable iron.
Side bearings.....	Malleable iron.
Side bearings fillers.....	Malleable iron.
Brake heads.....	Malleable iron.
Center plates.....	Cast steel.
Swing link rockers.....	Cast steel.
Brake shoes.....	Steel back.
Journal boxes.....	Symington.
Journal brasses.....	B. R. T. specification.
Springs, elliptic.....	34-in. centers.
Springs, coil.....	7 $\frac{1}{4}$ in., O. D.

The specifications for wrought-iron and steel castings do not differ materially from those of the Brooklyn Rapid Transit Company except as to test conditions. The other specifications may be summarized as follows:

Soft Steel: To be open hearth manufacture, to contain not over 0.06 per cent of either phosphorus or sulphur; tensile strength per square inch, 52,000 lb. to 62,000 lb.; elastic limit per square inch, not less than one-half tensile strength; elongation in 8 in. not less than 25 per cent; test pieces to bend 180 deg. flat without fracture on outside of the bent portion, either hot, cold or cherry red.

Spring Steel: To be crucible or open-hearth manufacture, to contain 0.90 to 1.10 per cent carbon, 0.25 to 0.50 per cent manganese, 0.15 to 0.25 per cent silicon; phosphorus, not more than 0.05 per cent; sulphur, not more than 0.05 per cent; copper, not more than 0.05 per cent. Bars must not vary more than 0.01 in. in thickness and 0.02 in. in width, and be free from seams, hollow spots, cracks on edges and laminations.

Elliptic and Semi-Elliptic Springs: The chemical specifications for this purpose are the same as for spring steel, but no reference is made to copper. The springs are tested

by applying one and one-half times the specified load, with the ends of semi-elliptic springs supported on swinging or roller bearings. When released, the springs must not be higher nor more than $\frac{3}{8}$ in. lower than the height specified, and must not take a permanent set when free. Plates must be free from laminations and other defects, and must not vary more than 0.03 in. in width nor more than 0.02 in. in thickness. The bands must not vary more than $\frac{1}{4}$ in. in length, 1/16 in. in width or 1/32 in. in thickness.

SPECIFICATIONS FOR ELEVATED PASSENGER CAR STANDARD TRAILER TRUCKS

The following paragraphs cover the metal requirements of the elevated trailer trucks ordered in 1907 for the class 1400 cars:

The trucks built under these specifications were of the M. C. B. swing bolster type, with inside-hung brake shoes, with the frame suspended on double equalizing bars. The weight on the truck center plate with the car body light was given as 17,600 lb., and with maximum passenger load 27,900 lb. The total deflection of both elliptic and helical springs from height with car body empty to height with full passenger load was not to exceed 2 in. The general dimensions were as follows: Wheel base, 5 ft. 6 in.; height from rail to top of car body center plate, with car body light, 34 $\frac{3}{4}$ in.; height from rail to top of side bearings, with car body light, 34 $\frac{3}{4}$ in.; gage of track, 4 ft. 8 $\frac{1}{2}$ in. and diameter of wheels, 31 in. The contractor guaranteed to replace without cost any part which might become worn out or broken because of faulty design, material or construction, within one year from the date the truck was put into service, excepting wheels, axles, journal brasses and brake shoes.

The frame was put together with 0.875 in. diameter turned bolts driven into 0.870 in. diameter reamed holes. The top chord was 4-in. x 1-in. soft steel; bottom chord, 4-in. x $\frac{3}{4}$ -in. soft steel; side frame truss, 4-in. x $\frac{3}{4}$ -in. soft steel; pedestal tie, 4-in. x $\frac{3}{4}$ -in. soft steel; end brace, 4-in. x $\frac{1}{2}$ -in. soft steel, and end frame, 4-in. x 4-in. x $\frac{1}{2}$ -in. angle, 12.8-lb. Carnegie A-23; transom, 9 in., 20-lb. channel Carnegie C-4; gussets, $\frac{3}{8}$ -in. soft steel boiler plate; pedestal, cast steel; pedestal cap, 4-in. x $\frac{5}{8}$ -in. soft steel. The bolster top and bottom plates were both 8-in. x $\frac{3}{4}$ -in. soft steel, secured at the ends with an accurate joint. All holes for rivets were reamed the exact size of rivet, and at the center of the bolster two malleable iron filler castings, machined top, bottom and sides, were fitted between both plates and fastened with four $\frac{7}{8}$ -in. turned bolts driven into reamed holes. The spring plank consisted of a 4-in. channel, 5.25 lb. per foot, and a bottom bar of $\frac{7}{8}$ -in. x 3-in. soft steel. The links supporting the spring plank were made in one piece, without welding, and the square holes in the top of the links were not punched, but drilled and slotted. The elliptic spring seat was of malleable iron, elliptic spring cap of gray iron, bolster fillers of malleable iron, bolster link rocker of cast steel and the swing hanger pin fulcrum of cast steel.

The truck center plate and body center plate were of cast steel, turned on the working surface and planed. The body center plate was furnished planed, turned and drilled ready for attachment to the car. The truck center plate was flanged over the sides of top member of bolster $\frac{5}{8}$ in. in depth and planed to fit the bolster. The brakes were inside hung, with a steel brake beam of B-17, 17.5-lb. Carnegie type. The springs comprised double elliptic bolster springs and single-coil equalizing springs designed for the loads and limiting deflections previously given.

CO-OPERATION BETWEEN THE OPERATING AND THE CLAIM DEPARTMENTS

BY R. H. SMITH, GENERAL MANAGER, ALBANY & HUDSON RAILROAD

The prevention of accidents is just as important in the economical management of railway properties as the reduction of cost per thousand car miles in the mechanical department. To this axiom every progressive railway manager who has followed the work of F. W. Johnson, superintendent of the Bureau of Accident Prevention of the Philadelphia Rapid Transit Company, the pioneer in this line, must agree. The only excuse the writer has for taking up this subject at this time is that he is keenly alive to the value of accident prevention work, and for several years was fortunate enough to be connected in an operating capacity with the system on which Mr. Johnson first stepped outside of the routine of the claim department, and began his successful crusade against accidents. The plan of applying the machinery of the claim department to the problem of anticipating and preventing accidents should need no defense, and the efforts expended in drilling employees into a more perfect state of efficiency by means of bulletins and lectures have already shown results sufficiently gratifying to attract the attention and receive the approbation of the most conservative officials. That more railways have not already taken up this work is due, in the opinion of the writer, to the fact that the average manager is too busy with his multifarious duties to keep in touch with this and similar topics which have been discussed in the technical journals. The alert claim agent who is anxious to take up prevention work, however, should fortify himself with all the available ammunition in the shape of facts and figures showing the value of the system, and start out first of all to reform his general manager.

The old-fashioned claim adjuster who placidly salved the pains and bruises of the unfortunate with amounts representing herculean efforts in reducing operating cost, and then lapsed into a state of coma until the next call, is doomed to become extinct. With him will go the old theory of the claim department: "The transportation department did it; why should we care?" and the companion reflection, "The more money we must spend, the more valuable and indispensable we are."

The claim agent of to-day, when not actually investigating claims or attending court cases, is actively at work devising means for preventing accidents. He makes a careful study into the causes of these accidents, analyzes in a most thorough manner the avenues through which the larger portion of his damage payments are made, and tries to apply a remedy. The average transportation official, whose duties are mostly of a purely operating character, does not have the time to conduct a course in accident prevention and, in the writer's opinion, for many other reasons, is not the proper person to have charge of such work. To require the superintendent to assume the burden of this work would be somewhat like adding the proverbial "last straw." The claim agent is a specialist in this line. The duty of preventing accidents seems to logically fall to this expert, who has before him the accident data necessary to uncover the weak points, and he is undoubtedly best qualified to suggest corrective measures and shape the general policy of the campaign against accidents. He may discover that a considerable number of accidents have been due to lack of proper training of employees, or he may ascertain that the accidents have been occurring on

one particular line where the speed of the ears may be greater than on other lines. His obvious duty in such cases is to bring these matters to the attention of the superintendent for such action as the importance of the case demands. In doing this, however, he must not lose sight of the fact that the superintendent is human, and in all cases where the question of authority might be raised all possibility of unpleasantness should be dissipated by frank and friendly discussion.

This brings us to a consideration of the matter of co-operation between the transportation and the claim departments, and raises several questions as to where the authority of the claim department should begin and end. Instruction of employees by the claim department, together with the posting of bulletins and the promulgation of various other schemes devised for the purpose of reducing accident expenses produces a situation which, for the best interests of the company as a whole, demands that the line of demarkation between departments be made more flexible than is usually considered wise. By this it is not meant that either department shall ruthlessly encroach upon the obvious duties of the other, but rather that a feeling of good fellowship should exist between the two departments which will make either head yield to the reasonable desires of the other.

It is safe to say that the average superintendent, being an advocate of strict discipline, is jealous of his rights and looks with disapproval upon the proposition of turning his employees over to another department for instruction, and is equally disinclined to allow any overlapping of authority. This is the situation which confronts the claim agent after he has had his successful interview with the general manager. After winning one, he must do likewise with the other. The general manager is too busy to straighten out such matters, and the situation is one which can be best handled by the claim agent, who must stand behind his own arguments. To be most successful in his work, he must first enlist the support of the superintendent. This is the starting point where he must bring his personality into play and instill into his fellow worker the belief that he has no desire to usurp the powers of the other, but merely seeks the co-operation which is absolutely essential to success.

Some transportation officers have been known to take the attitude that they will not tolerate the claim department interfering with discipline by dealing direct with the men. The apprehension thus displayed seems to be due to a misunderstanding as to just what "interference" consists of. Certainly, if the claim department can show that by its proposed system of education the company will derive substantial benefits, and the superintendent cannot or will not find time to do this work, the claim department should be given the necessary authority to proceed. The claim agent is vitally interested in the instruction and conduct of ear crews inasmuch as the financial expense of his department is large or small according to the efficiency of the crews. Looked at from this standpoint, the dreaded "interference" seems to be more a matter of right than of unwarranted meddling. The claim agent does not ask the superintendent to relinquish any of his functions or responsibilities; neither does he desire to uproot discipline, deprive any fellow worker of prestige, or belittle him in the eyes of his men.

Another bone of contention may be found in the hesitancy of the superintendent to allow the claim agent to post notices of caution and instruction signed by him as claim

agent. As a general proposition and for disciplinary reasons all notices of any character should be signed by the superintendent; but the writer, while looking with disapproval on any practice tending to lower the standard of discipline, believes that the sole signature of the claim agent proves in practice to be too small a matter to cause dissension, and that the best solution of the difficulty is to have the signature of both officials affixed. This will indicate to the men that both departments are working in harmony and that the notices are sanctioned and will be enforced by their immediate employer. The signature of the superintendent or general manager alongside of that of the claim agent cannot help but have a salutary effect, which will be shown by a more general compliance with the instructions. The superintendent who insists that his signature alone shall appear upon these notices which are edited and printed solely by the claim department fails to offer his full share of co-operation.

The operating questions involved in this educational work, and the handling of operating subjects as between the instructor and the employees, is a matter which should be worked out amicably between the superintendent and the claim agent. It is at this point that co-operation is absolutely essential, and it is the writer's belief that the superintendent should wave aside his fears, link arms with the man who should be one of his strongest allies, and work with him to eliminate from the company's expense account a large proportion of the money spent annually in the settlement of accident claims. Those who are doubtful concerning the advisability of allowing prevention work to overlap the authority of the superintendent in a few minor respects should broaden out and remember that the inevitable benefits to be derived will be for the good of both departments and the company from whom all are earning a livelihood. If the number and severity of the accidents are substantially reduced, the transportation department, through its co-operation in the work, will get proper credit for the results obtained.

Does accident prevention work conducted by the claim department tend to upset discipline by placing the employees under the jurisdiction of two departments? This question is raised by the superintendent, who sees danger in allowing any one not connected with his department to deal directly with the men. He fears that the discipline of his organization will be disrupted, and that the men will chafe under the idea of having two "bosses." Furthermore, the employees may feel that the claim agent has a voice in the handling of operating matters, with the result that the superintendent finds his authority less strong over the men under him.

Strict discipline, tempered with a generous amount of sound judgment, is absolutely essential in the successful handling of railroad employees. An arrangement which makes employees responsible to any but the person who is instrumental in their employment would be ruinous to discipline. This should not be lost sight of in the consideration of this subject. All controversy on this point is at once eliminated, however, when it is mutually agreed that the claim department shall have no hand in the disciplining of employees, but that its recommendations along these lines will receive careful consideration by the immediate superior of the offending parties, usually the superintendent. The claim agent, in conducting his educational work, should exercise great care to avoid creating the impression that the men are responsible to any person but the superintendent, and should not attempt disciplinary methods, as this lies solely within the jurisdiction of the superintendent.

If both officials are pulling together in the proper spirit no results injurious to discipline will be experienced.

Acquaintanceship among employees formed by the claim agent in conducting the educational work is undoubtedly productive of good. The men see the man and become acquainted with the mind and personality back of the bulletins of instruction. What is still more important, by being placed in actual contact with the claim agent, the car crews become imbued with the enthusiasm of the instructor, and are left with a more lasting impression of the importance of the topics presented to them for consideration.

The claim agent, following out his plan of prevention work, is a stimulus and spur to the superintendent, who, with the knowledge that every condition or practice which might bring about an accident will be called to his attention by a letter from the claim department, begins to make better use of his eyes in this particular direction and arouses his street inspectors into a condition of greater activity. He receives a letter from the claim agent that a certain crew "laid over" at the end of the line 10 minutes, another to the effect that Conductor Jones was operating his car with the platform chains unhooked, a certain motorman was making it a practice to engage in unnecessary conversation, and that Conductor Brown had left the car just before it came to a standstill, etc. It might seem that the claim agent who reports such occurrences is taking upon himself responsibilities not connected with his department, but it is very apparent that the acts complained of are conducive to accidents in one form or another, and therefore the claim agent's reports are entirely within the scope of his department. It is impossible for street inspectors to notice all such infractions of the company's rules; therefore the superintendent should accept this information without offense, discipline the careless employees, and stimulate his street force. These reports from the claim department to the superintendent bring about a healthy condition of alertness on the part of all concerned.

The methods of breaking in and examining new men vary greatly according to the size of the road and the ideas of the operating officers. It is safe to say that in a great many instances, on small roads in particular, new employees are placed upon the cars with but brief instruction by some member of the operating staff on the subject of the proper handling of accident cases. The examining officer is an operating man, and naturally touches only the high spots connected with accident work. An accident occurs, and the novice in charge of the car comes out of the fray suffering from nervous exhaustion. He has forgotten his witnesses and knows nothing about the injured party other than that he was taken away in a carriage by a man wearing a brown hat. The modern claim agent, with his characteristic energy, takes hold of such a situation as this and, with the assistance of the superintendent, works out a plan of instruction which results in good accident reports and ultimately a great financial saving. It is difficult to see how any operating man can take serious exception to this progressive work now being undertaken by the claim departments everywhere, and it is undoubtedly due to a misconception of the plan in general that operating officials have stood upon their dignity and placed themselves on the defensive against accident prevention work.

A great deal depends upon the tact and judgment exercised by the claim agent in his relations with the superintendent and in his dealings with the men. It is a somewhat delicate situation, but it is safe to say that efficient

claim agents, who are students of human nature as well as of accident work, will not be found wanting when it comes to meeting the superintendent half way on matters of disagreement. Let the operating men discard the idea that the claim agent is "knocking" his department and assist the work in every way possible.

DISCUSSION OF HEIGHT OF CAR STEPS IN TORONTO

It will be remembered that, following the report of the committee on standards at the meeting at Atlantic City of the American Street & Interurban Railway Engineering Association, there was a long discussion on the height of car steps. In this discussion J. F. A. Wyse, engineer of Ontario Railway & Municipal Board, made a protest against the use of a 17-in. step. He said that a number of prominent physicians in Toronto had decided that the high steps used on the cars of that city were injurious, if not dangerous, to passengers.

On Sept. 10 last the subject was brought officially before the Ontario Railway & Municipal Board through the application of Dr. H. McMurchy, who requested the board to pass an order fixing the height of the first step on all cars at from 9 in. to 12 in., and the heights of all others at from 7 in. to 9 in. Notice of this application was sent to all electric railway companies under the jurisdiction of the board and to the clerks of the different municipalities. The only municipalities who took an active interest in the matter were the city of Toronto and the then city of West Toronto. The board then ordered a hearing, at which a number of physicians, including several representatives of the faculty of medicine at Toronto University, advocated steps not to exceed 12 in. in height. The testimony of officers of the Toronto Railway Company was also taken.

Walter McRea, mechanical superintendent, Toronto Railway Company, testified that it was impossible with the limitations in Toronto as to width of tracks and devil strip to radiate all curves and bring the car floor any lower than at present. The clearance between the motor and the car floor is now 5 in. and the company employs 33-in. wheels. These wheels had been adopted because a 30-in. wheel would not allow sufficient clearance for the motors; in fact, even with a 33-in. wheel the motors become polished at the bottom from rubbing on the pavement. The 33-in. wheel is also much more desirable in winter for keeping the rails clear of snow than a wheel of smaller diameter.

Michael Powers, master car builder, Toronto Railway Company, stated that the company had many curves of a 35-ft. radius. At present the first step on the company's cars was from 15 to 16 in. above the top of the rail, the second step 15 in. and the third step 11 in. The car steps now project 24 in. beyond the track. The gage is 4 ft. 11 in. On the closed cars there is one more step, that from the platform into the car, than on the open cars, but this is not possible with the open cars because the step would project so far into the street that it would be a serious obstacle to vehicles and the general public.

Donald Campbell, manager, Preston Car & Coach Company, made the following statement as to standard dimensions of the Toronto cars: Wheels, 33 in.; flange, $\frac{5}{8}$ in.; floor, 1 in.; minimum clearance above motors, $2\frac{3}{4}$ in.; total without cross framing, $37\frac{3}{8}$ in. The minimum thickness of cross-framing used has been $1\frac{1}{4}$ in., enforced with angle iron, making a total of $38\frac{5}{8}$ in. as the minimum height with no margin for safety. If 1 in. is allowed for safety the height of $39\frac{5}{8}$ in. is obtained. Mr. Campbell recommended

a height for the two upper steps of 14 and 11 in. with an average height for the middle step of 15 in., but stated that a variation of at least $2\frac{3}{4}$ in. should be allowed for the lower step on account of the settling of the springs.

At the request of the board the Toronto Railway Company equipped a double-truck open car with an additional step to test the feasibility of having the first step no higher than 12 in. from the ground, but the steps projected so far into the street as to be dangerous and it was found that the adoption of this additional step would also involve a reconstruction of the car houses and repair pits. The company also equipped as an experiment a car in which the floor was brought to within 38 in. from the ground, but the board reached the conclusion that this allowed no margin of safety for the operation of the brake rods and the compressed-air piping.

In conclusion, the board passed on June 25 the following regulations regarding new cars, but not applying to the cars at present in use:

The steps on all cars hereafter constructed and used by the Toronto Railway Company and all other street and electric railways under the jurisdiction of this board shall have steps conforming to the following regulations:

On closed single-truck cars the height of the first step above the ground shall be not less than 12 in. nor more than 15 in.

On closed double-truck cars the height of the first step above the ground shall be not less than 14 in. nor more than 16 in.

On open single-truck cars the height of the first step above the ground shall be not less than 12 in. nor more than 15 in., and the distance between the first and second steps and the second step and the floor of the car shall measure 12 in. and 9 in. respectively.

On open double-truck cars the height of the first step above the ground shall be not less than 14 in. nor more than 16 in., and the distance between the first and second steps and the second step and the floor of the car shall measure 12 in. and 14 in., respectively.

OPENING OF THE DOWNTOWN TUNNELS OF THE HUDSON & MANHATTAN RAILROAD

On July 19, at 10:25 a. m., the first official train, carrying about 2000 invited guests, was operated through the downtown tunnel of the Hudson & Manhattan Railroad from the terminal station at Cortlandt and Church Streets, Manhattan, to the Pennsylvania Railroad station in Jersey City. The tunnels were thrown open to the public at 3 p. m. The invited guests on the official trip were carried on three trains of seven cars each and a fourth of five cars. They were officially sections of one train and sent out at three-minute intervals. The first car carried Governor Fort, of New Jersey, and his staff; acting Mayor Patrick F. McGowan, of New York; Attorney-General Edward R. O'Malley, of New York State, and James W. Wadsworth, Speaker of the New York Assembly; William G. McAdoo, president, and Charles M. Jacobs, chief engineer of the Hudson & Manhattan Railroad, together with other officials of the railway company and construction company.

The running time of the first train was 2 minutes and 40 seconds. In Jersey City the party was carried to the City Hall in automobiles. Here Otto Wittpen, Mayor of Jersey City, Governor Fort and Charles M. Jacobs made addresses and Wm. G. McAdoo read a message from President Taft, in which the President expressed regret that he could not be present. At 11:30 a. m. a reception was held in the Aldermanic chamber of the City Hall.

The City Hall, plaza and other buildings in Jersey City were decorated with flags and bunting.

INTERLINE TICKETS AND JOINT BAGGAGE CHECKS OF THE CENTRAL ELECTRIC TRAFFIC ASSOCIATION

The new joint passenger tariff, No. 2 of the Central Electric Traffic Association, which was referred to in the ELECTRIC RAILWAY JOURNAL of July 17, page 124, will be put into effect on Aug. 2. This tariff covers the new interchangeable mileage ticket and also the sale of single and

regards the conditions named in the contracts attached at the top and in the methods of cancellation and indicating destination. The one-way first-class tickets are printed on green paper; the round-trip first-class single tickets are printed on gray paper; the one-way coupon party tickets are printed on light blue paper, and the round-trip coupon party tickets are printed on pink paper.

The one-way and round-trip single tickets are of three different forms. The first form, which is shown herewith, is printed with the name of the railroad company issuing the ticket at the top, and also the junction points. The destination is written on the margin of each of the coupons which are good for passage between junction points printed thereon, and is also written at the top of the ticket. This ticket is issued only for journeys by routes over which there is enough traffic to justify the printing of separate lots of tickets. The second form is a skeleton interline ticket containing two or more skeleton coupons to be filled in with the name of the issuing road, the name of the road honoring the coupons, the starting point of the journey and destination. The third form of ticket is a skeleton form for use on branch lines connecting with certain trunk lines of heavy traffic within the Central Electric Traffic Association territory. The name of the issuing road and the starting point is left blank, but the names of the junctions on the trunk line roads are printed on the ticket and the destination is indicated by a punch mark on each coupon.

Each interline ticket has attached to it an agent's stub on which the price of the ticket is indicated, and also the destination, as well as the route.

These tickets will be used by all members of the Central Electric Traffic Association for interline traffic after Aug. 2, 1909, replacing the present diversified forms of tickets in use.

The full text of the new regulations covering the checking of baggage was printed in the ELECTRIC RAILWAY JOURNAL of July 17, page 124. Two of the cuts on page 146 show two of the forms of baggage checks which will be used. For baggage which is checked free, a plain duplex form is used consisting of the string coupon and duplicate coupon printed on a manila card. When excess baggage charges are paid in advance, the check used is printed on a red card consisting of three coupons. The face of each coupon contains blank lines for entering the point from which baggage is checked, the point to which baggage is checked, route, free baggage check numbers, number of passengers, excess weight and amount of excess baggage charges collected. On the back of the coupons are printed instructions to baggage agents, and both the string check and the duplicate check contain the following release of liability for any errors arising in the delivery of the baggage to its destination:

RELEASE.

I hereby agree that in consideration of its carrying my baggage the _____ Co. is released from any responsibility regarding delivery of said baggage. I agree to call for said baggage at the baggage car door immediately on its arrival at destination, and I further agree should I fail to call for baggage as agreed, the _____ Co. is authorized to carry it to the next station beyond, where it has proper storage facilities, and that I will pay the charge for such carriage, service and storage.

(To be signed in ink.)

OWNER.

The company shall in no case be liable for the loss of or damage to baggage to exceed the sum of \$100 for a full-fare passenger or \$50 for a half fare or child passenger.

On the back of the string check are printed the following instructions to baggage agents: "Please send this string check to the general office of your line as soon as released from the baggage." Additional instructions are printed on the back of the duplicate check as follows:

ISSUED BY: EAST & WEST TRACTION CO. VOIO AFTER 1915 1914 1913 1912 1911 1910 1909

GOOD FOR ONE FIRST CLASS PASSAGE -TO- DESTINATION AND RETURN.

When stamped by Company's Agent and presented with coupons attached, in accordance with the following conditions:

1st. That in selling this Ticket for passage over other lines and checking baggage on it the EAST & WEST TRACTION COMPANY acts only as Agent and is not responsible beyond its own line.

2nd. This ticket is VOID for passage if any alterations or erasures are made hereon, or if more than one date is cancelled.

3rd. THIS TICKET IS LIMITED AS REGARDS TIME AND MUST BE USED TO DESTINATION BEFORE MIDNIGHT OF THE DATE CANCELLED IN THE CONTRACT.

4th. Baggage liability is limited to wearing apparel not to exceed One Hundred (\$100) dollars in value for a whole ticket, and fifty (\$50) dollars for a half or Child's ticket.

5th. THIS TICKET IS GOOD ONLY ON TRAINS SCHEDULED TO STOP AT BOTH STATIONS DESIGNATED IN THE CONTRACT.

6th. It is subject to the stop-over regulations of the lines over which it reads and also to the regulations of the various lines over which it reads.

7th. This ticket is sold subject to an extra fare charged on limited trains, according to the rates of the various lines over which it reads.

NO AGENT OR EMPLOYEE HAS POWER TO MODIFY THIS CONTRACT IN ANY PARTICULAR.

General Manager.

ISSUED BY: EAST & WEST TRACTION CO. Acct of EAST & WEST TRACTION CO. EASTON, O. STATION STAMPED ON BACK On Conditions named in Contract. Form C. E. T. A. 2 R ONE PASSAGE NOT GOOD IF DETACHED Via E. & W. GN.

ISSUED BY: EAST & WEST TRACTION CO. Acct of GREAT NORTHERN TRACTION CO. STATION WRITTEN IN MARGIN -TO- EASTON, O. On Conditions named in Contract. Form C. E. T. A. 2 R ONE PASSAGE NOT GOOD IF DETACHED Via E. & W. GN.

ISSUED BY: EAST & WEST TRACTION CO. Acct of GREAT NORTHERN TRACTION CO. STATION WRITTEN IN MARGIN -TO- EASTON, O. On Conditions named in Contract. Form C. E. T. A. 2 R ONE PASSAGE NOT GOOD IF DETACHED Via E. & W. GN.

ISSUED BY: EAST & WEST TRACTION CO. Acct of EAST & WEST TRACTION CO. STATION STAMPED ON BACK -TO- EASTON, O. On Conditions named in Contract. Form C. E. T. A. 2 R ONE PASSAGE NOT GOOD IF DETACHED Via E. & W. GN.

Change back of Stub, Contract and each coupon with ticket stamp. Via same Route Returning. Via E. & W. TR CO. to EASTON, O. TO EASTON, O. FROM

INSTRUCTIONS TO AGENTS. Fill in the destination and starting points with the name of the station and State. Contract and Ticket. If printed, cancel with ticket punch, the date of expiration in the contract.

Form C.E.T.A.2 R Agent's Stub NOT GOOD FOR PASSAGE.

ISSUED BY: EAST & WEST TRACTION CO. VOIO AFTER 1915 1914 1913 1912 1911 1910 1909

GOOD FOR ONE FIRST CLASS PASSAGE -TO- POINT BETWEEN PUNCH MARKS AND RETURN.

When stamped by Company's Agent and presented with coupons attached, in accordance with the following conditions:

1st. That in selling this Ticket for passage over other lines and checking baggage on it the EAST & WEST TRACTION COMPANY acts only as Agent and is not responsible beyond its own line.

2nd. This ticket is VOID for passage if any alterations or erasures are made hereon, or if more than one date is cancelled.

3rd. THIS TICKET IS LIMITED AS REGARDS TIME AND MUST BE USED TO DESTINATION BEFORE MIDNIGHT OF THE DATE CANCELLED IN THE CONTRACT.

4th. Baggage liability is limited to wearing apparel not to exceed One Hundred (\$100) dollars in value for a whole ticket, and fifty (\$50) dollars for a half or Child's ticket.

5th. THIS TICKET IS GOOD ONLY ON TRAINS SCHEDULED TO STOP AT BOTH STATIONS DESIGNATED IN THE CONTRACT.

6th. It is subject to the stop-over regulations of the lines over which it reads and also to the regulations of the various lines over which it reads.

7th. This ticket is sold subject to an extra fare charged on limited trains, according to the rates of the various lines over which it reads.

NO AGENT OR EMPLOYEE HAS POWER TO MODIFY THIS CONTRACT IN ANY PARTICULAR.

General Manager.

ISSUED BY: RICHMOND to Station Stamped on Back. Via RICHMOND to Station Stamped on Back. Form C.E.T.A.3 R NOT GOOD IF DETACHED Via

ISSUED BY: POINT BETWEEN PUNCH MARKS to RICHMOND. Via POINT BETWEEN PUNCH MARKS to RICHMOND. Form C.E.T.A.3 R NOT GOOD IF DETACHED Via

ISSUED BY: RICHMOND to POINT BETWEEN PUNCH MARKS. Via RICHMOND to POINT BETWEEN PUNCH MARKS. Form C.E.T.A.3 R NOT GOOD IF DETACHED Via

ISSUED BY: STATION STAMPED ON BACK to RICHMOND. Via STATION STAMPED ON BACK to RICHMOND. Form C.E.T.A.3 R NOT GOOD IF DETACHED Via

ISSUED BY: RICHMOND to POINT BETWEEN PUNCH MARKS. Via RICHMOND to POINT BETWEEN PUNCH MARKS. Form C.E.T.A.3 R NOT GOOD FOR PASSAGE \$

Samples of Interline Ticket Forms

round-trip interline tickets. The association has adopted for this purpose eight standard forms of interline tickets, two of which are shown in the accompanying engravings. The other six forms are quite similar to the two shown as

This is a duplicate check and also a receipt for excess charges paid for baggage bearing number of checks as shown on face of string check of corresponding number.

Receiving agent will forward this duplicate and receipt to general office of his company.

Receiving agents will certify to the total weight of the baggage as covered by the check numbers shown on the face of string check of corresponding number.

On the back of the agent's stub are the following instructions:

Agents will be held strictly accountable for the proper filing out of these cards with INK.

The route and destination in each coupon must exactly correspond with the route and destination of the passage ticket on which the baggage is checked.

After being properly filled out, detach the next coupon (or duplicate check) and hand it to the owner of the baggage, and attach the string check to the baggage.

One of these excess baggage checks only will be used as a check on any one lot of excess baggage.

Regular checks will be used for the other pieces. Agents must keep these stub cards in a safe place for immediate reference, if necessary, and send them to the general office with report of excess baggage collections. These cards must be used in consecutive order.

TO AGENTS:

Agents will use great care in filling out these cards, so they will be fully understood by all concerned.

The route and destination on each coupon must exactly correspond with the route and destination of the passage ticket on which the baggage is checked.

In cases where passenger is ahead of baggage, or the checks are issued by a transfer company, agents will detach one of the string checks and use instead a C. O. D. check, enclosing the duplicate C. O. D. check to the agent at destination, and send the string check, which has been detached from the baggage, to the general office with a letter of advice.

Carefully note in the space provided on the string check the kind and number of the check or checks held by the passenger.

Forwarding agents will send this stub to the auditor as soon as issued.

(Signed) General Manager.

When storage charges are collected on baggage, a storage receipt is issued to the passenger of the form shown in the engraving. This receipt is printed in such a way that both the passenger's receipt and the agent's stub may be punched simultaneously when the two coupons are folded over each other. The punch marks indicate the number of days on which storage charges have been made and also the gross amount of the storage charge.

MEETING OF THE EXECUTIVE COMMITTEE OF THE TRANSPORTATION & TRAFFIC ASSOCIATION

A meeting of the executive committee of the American Street & Interurban Railway Transportation & Traffic Association was held July 19 at the headquarters of the association, 29 West Thirty-ninth Street, New York. There were present President C. Loomis Allen, of Utica; R. I. Todd, of Indianapolis; G. L. Radcliffe, of Schenectady; G. W. Parker, of Detroit; Henry C. Page, of Springfield, Mass., and Secretary B. V. Swenson. The meeting was for the purpose of deciding upon the program to be followed at the convention of the association at Denver.

The program of the Transportation & Traffic Association this year will be made up entirely of the reports of the standing committees of the association and the discussions arranged by them. There are six of the committees, as follows: (1) Committee on passenger traffic, (2) committee on interurban rules, (3) committee on express and freight traffic, (4) committee on city rules, (5) committee on transfers and transfer information, (6) committee on the training of transportation employees. It was tentatively decided to take these up in the order named, and the following program was decided upon:

First session, Monday, Oct. 4, from 2 to 5 p. m. Address of president, report of the executive committee, report of secretary and treasurer, report of the committee on passenger traffic.

Tuesday, 9:30 a. m. to 12:30 p. m. Report of the committee on interurban rules, report of the committee on express and freight traffic.

Wednesday, 9:30 a. m. to 12:30 p. m. Appointment of the committee on nominations, report of the committee on city rules, report of the committee on transfers and transfer information.

Thursday, 9:30 a. m. to 12:30 p. m. Report of the committee on nominations, report of the committee on the training of transportation employees, general business, election of officers, installation of officers, adjournment.

The reports of the different committees promise this year to be unusually interesting and instructive. The committee on passenger traffic, in addition to its report, will make an exhibit of different circulars used by railway companies to stimulate traffic, timetables, maps and other company publications. A great many companies have gone extensively into the publication of these circulars, and it is thought that this symposium will be a surprise to many

Co. _____

STORAGE STUB
STATION _____

INITIAL OF BAGGAGE CHECK _____

NUMBER OF BAGGAGE CHECKS _____

Storage use as above from _____

Check No. _____

1033

Co. _____

STORAGE CHECK
Porter _____ STATION _____

DATE _____

AT _____

DAYS	AMT.	DATE	AMT.	DATE	AMT.
23	\$1.45	12	\$1.75	1	\$ 2.25
24	2.50	13	1.45	2	3.35
25	2.85	14	1.50	3	4.35
26	2.75	15	1.65	4	5.35
27	2.85	16	1.75	5	6.35
28	2.95	17	1.85	6	7.35
29	3.05	18	1.95	7	8.35
30	3.15	19	2.05	8	9.35
31	3.25	20	2.15	9	10.35
32	3.35	21	2.25	10	11.35
33	3.45	22	2.35	11	12.35

DATE DELIVERED _____ A.M. _____ P.M. _____

1033

Co. _____

PASSENGER'S RECEIPT
FOR AMOUNT PAID FOR
STORAGE OF BAGGAGE

BEARING CHECK No. _____

INITIALS _____

The date on this form of this receipt shows when Storage Charges commenced and the punch marks indicate the number of days charged for and amount paid.

General Manager _____

Front and Back of Storage Receipt

Agents will, each day attach this form to all "Storage" stubs from on hand twenty-four hours or over, not counting Sundays or Legal Holidays.

First enter the date on all items previous to the initial and numbered baggage check on the Receipt and Stub portion.

The date and hour entered must show the date on which storage commenced.

Detach this stub and send as soon to the Auditor.

Find the Receipt over the check portion at the perforated line and, without separating them, attach to the baggage by passing the baggage check strap through both slots.

When baggage is checked compute the number of days storage from date above on receipt and check and punch the hole between the number of days and amount collected.

Also punch out the "opposite" "A. M." or "P. M." showing whether delivered on afternoon or afternoon, and hour, and enter time delivered.

Give receipt to party paying storage and also take a record for reporting with the check portion at once to the Auditor.

General Manager _____

Co. _____

1033

Co. _____

STORAGE CHECK

Front of C. O. D. Baggage Check

Co. _____

C. O. D. STRING CHECK.
\$ _____ on baggage bearing Check

No. _____

FROM _____

TO _____

Deliver to connection at Station No. _____

ROUTED

Via _____

COD No. 1032

Co. _____

C. O. D. DUPLICATE CHECK.

Date _____ on baggage bearing 19...

Check No. _____

FROM _____

TO _____

ROUTED

Via _____

SEE OTHER SIDE

COD No. 1032

Co. _____

C. O. D. AUDITOR'S STUB.

Date _____ 19...

FROM _____

TO _____

ROUTED

Via _____

\$ _____ for Storage for _____ lbs. Excess Weight

\$ _____ Transfer for _____

\$ _____ Account _____

Number of Passengers _____

Check No. _____

Member and kind of Check detached, if any.

SEE OTHER SIDE

COD No. 1032

When any amount is to be collected on baggage before delivery a blue C. O. D. check is used, the face of which is reproduced in one of the engravings. The back contains the following information and instructions to agents:

Number of pieces covered by this check. _____

Bearing Check Nos. _____

This card is a duplicate check for piece of baggage bearing correspond ing string check and a notification of the amount of charges that must be paid at destination before baggage will be delivered. The amount should be credited as follows:

\$ _____ for _____ lbs. excess weight.

\$ _____ Storage for _____

\$ _____ Transfer for _____

\$ _____ Account _____

The receiving agent will remit the amount collected to his company and report the collection to his auditor, who will include the same in monthly report of excess baggage to the auditor of the issuing company giving the number of C. O. D. check.

(Signed) General Manager.

who have not followed out the recent developments in this direction.

The committee on interurban rules has held two meetings, the last one at Washington, at which time the existing code of rules for interurban railways was very carefully considered in detail. The final rules will now be printed in pamphlet form and will be sent to the members of the association at an early date, with requests for further suggestions and final criticisms. The committee will hold another meeting to consider these suggestions, and its report will summarize its final conclusions.

The committee on express and freight traffic held a meeting at Chicago on July 13, and hopes to be able to present at the convention a tabulated statement of existing conditions and methods of conducting the electric freight and express business in different parts of the country. The data sheets sent out by the committee are being returned rather slowly, but it is hoped that a sufficient number will come in to enable the committee to present suggestions and make recommendations which will be of value. In addition, the committee is planning to have two papers on the subject of the transportation of express and freight, presented by member companies whose experience and recommendations should be very valuable to the association. These papers will not only describe the conditions existing on the properties with which the speakers are connected, but in the territory immediately surrounding them. One paper will also make recommendations in regard to tariffs, accounting methods, forms, etc. The other will pay particular attention to methods of solicitation and handling of claims.

The plan of the committee on city rules is very similar to that of the committee on interurban rules. It has held two meetings, one on March 27, the other on June 7, and at the latter meeting a proposed code of rules was tentatively decided upon. This code, which contains a few modifications from that published in the *ELECTRIC RAILWAY JOURNAL* for June 12, is now being printed, and will be mailed to member companies of the association, who will be asked for suggestions and criticisms. The committee will hold a meeting to consider these suggestions, and expects to be able to present at Denver a final code of rules for adoption. It is also proposed to have at least three papers discussing this code of rules.

The committee on transfers and transfer information is giving its attention to the best form of transfer law. One of the large member companies of the association has been paying a great deal of attention recently to the legal aspect of transfers, and has been successfully prosecuting a number of persons for the wrongful use of transfers. This campaign has led to a study of the transfer laws of the State in which the company is situated, as well as to some interesting legal decisions, and it is believed that the information thus secured will be of a great deal of benefit to other member companies, especially if it points the way to framing a law which will prevent the abuse of transfers.

The report of the committee on the training of transportation employees will be based largely upon data sheet No. 39, which asked the member companies to indicate to what extent their current practice coincides with the recommendations of the committee as set forth in the 1908 report, and if they found it impossible to follow the committee's recommendations to give their reasons. About 100 replies to this data sheet had been received up to July 1. These replies, with those which have been received since July 1, are being tabulated. From the information

thus obtained the committee expects to make a series of recommendations. In addition, one of the members of the committee will present a discussion on the various forms of discipline, giving the advantages and disadvantages of suspension and of the merit and demerit system, and also the value of heart-to-heart talks, etc. It is expected that another member of the committee will discuss the subject of relief and pension work as helping to raise the standards of the men. A third paper will discuss the question of the selection of employees. A fourth paper will be devoted to the training of the men, the value of written and oral examinations and the development of the moral, mental and physical standard of the men.

MEETING OF THE WAY COMMITTEE

A meeting of the committee on way matters of the American Street & Interurban Railway Engineering Association was held July 14 in the board room of the Pittsburgh Railways, 435 Sixth Avenue, Pittsburgh. Those present were E. O. Ackerman, chairman, engineer of maintenance of way, Columbus, Ohio; J. H. Hanna, chief engineer, Washington, D. C.; M. J. French, engineer of maintenance of way, Utica, N. Y.; J. M. Larned, engineer of maintenance of way, Pittsburgh, Pa.; Martin Schreiber, engineer of maintenance of way, Newark, N. J. A communication was received from G. L. Wilson, engineer of maintenance of way, Minneapolis, Minn., who was not able to attend.

The committee held a closed session in the morning and an open session in the afternoon at 2 o'clock. The latter was attended by F. Uhlenhaut, Jr., chief engineer, Pittsburgh Railways, and the following representatives of manufacturers: F. J. Drake and E. B. Entwistle, of the Lorain Steel Company; V. Angerer and William McClain, of William Wharton, Jr., & Company; Charles A. Alden and J. T. Hill, of the Pennsylvania Steel Company, and E. A. Condit, Jr., of the Rail Joint Company. These gentlemen addressed the committee on the specifications of open-hearth rail, gage of curves and the present status of the use of manganese rail. The data will be embodied in the committee's report at Denver. A vote of thanks was extended to the visitors for their interest and kindness in assisting the way committee in their work.

The committee continued its deliberations on Thursday at 9 a. m., and adjourned at noon. In the afternoon, by the kindness of the officers of the Pittsburgh Railways Company, an inspection tour was made over the local company's property.

NEW YORK TRANSPORTATION COMMITTEES COMPLETED

At a joint meeting in New York of the two committees having charge of the special trains to Denver from New York City, held July 20, the complete committees were announced by the chairmen.

C. Loomis Allen, chairman of the committee in charge of the New York Central trains, stated that that committee now consists of: C. Loomis Allen, Utica & Mohawk Valley Railway, chairman; J. H. Pardee, J. G. White & Co.; J. H. McGraw, *ELECTRIC RAILWAY JOURNAL*; E. F. Peck, Schenectady Railway Company; H. C. Page, Springfield (Mass.) Street Railway Company; J. M. Wakeman, *ELECTRIC RAILWAY JOURNAL*; J. A. Kucera, *ELECTRIC RAILWAY JOURNAL*; J. J. Mahoney, General Electric Company; H. S. Bradfield, New York Car Wheel Company; Bertram

Berry, Heywood Brothers & Wakefield Company; J. V. Meek, H. W. Johns-Manville Company; Joseph Cunningham, Allis-Chalmers Company; Elmer P. Morris, E. P. Morris & Company.

The complete committee in charge of the special train from New York over the Pennsylvania Railroad consists of: W. L. Conwell, Westinghouse Electric & Manufacturing Company, chairman; Gen. George H. Harries, Washington Railway & Electric Company; Thomas N. McCarter, Public Service Railway Company, Newark; William A. House, United Railways & Electric Company, Baltimore; Charles O. Kruger, Philadelphia Rapid Transit Company; George Keegan, Interborough Rapid Transit Company, New York; W. K. Beard, *ELECTRIC RAILWAY JOURNAL*; J. S. Doyle, Interborough Rapid Transit Company, New York; W. G. Gove, Brooklyn Rapid Transit Company; H. C. Evans, Lorain Steel Company; Cornell S. Hawley, Consolidated Car Heating Company; William Wampler, American Locomotive Company.

Secretary Swenson, of the American Street & Interurban Railway Association, has announced the appointment of an additional committee to organize a party from the Central West. This committee consists of Robert I. Todd, president, Indianapolis & Northwestern Traction Company, and C. D. Emmons, general manager, Fort Wayne & Wabash Valley Traction Company.

MEETING OF COMMITTEE ON POWER GENERATION

The committee on power generation of the American Street & Interurban Railway Engineering Association held a meeting at the Engineers' Club, Philadelphia, on July 19 and 20, to formulate the scope and arrangement of their forthcoming report to the convention in October. Those present were G. H. Kelsay, superintendent of power, Indiana Union Traction Company, Anderson, Ind., chairman; William Roberts, superintendent of motive power, Northern Ohio Traction & Light Company, Akron, Ohio; James D. Andrew, superintendent of power stations, Boston Elevated Railway Company; William S. Twining, chief engineer, Philadelphia Rapid Transit Company; Fred Heckler, superintendent of motive power, Lake Shore Electric Railway Company, Fremont, Ohio; Charles Hewitt, superintendent of motive power, Philadelphia Rapid Transit Company, and E. D. Dreyfus, representing the Westinghouse Machine Company. The only absent member of the committee was A. S. Byrd, superintendent of power plants, Montreal Street Railway Company, Montreal, Canada.

The committee report this year will cover three subjects: low-pressure turbines, flue gas analysis and steam meters. The subject of low-pressure turbines was considered first by the committee. The chairman reported that he had received operating data relative to nine installations of low-pressure turbines throughout the United States. Not all of these installations are in electric railway power houses. The replies to the questions contained in the circular letter have been tabulated, and will be included in full as part of the committee report. The committee asked Mr. Dreyfus, of the Westinghouse Machine Company, to compile a brief introduction to this part of the report, setting forth the claims made by the manufacturers regarding the performance of low-pressure turbines in general and outlining the field of their application. This introduction will not be a theoretical discussion of the design and operation of low-pressure turbines, but will be a simple exposition of the manufacturers' claims of what can be accomplished in the way of increased economy and output by

installing them in combination with existing reciprocating engine plants. The second part of this section of the committee report will consist of a tabulation of the operating data received in response to the circular letter sent out by the chairman, and the conclusions of the committee, based on the operating data secured, as to whether or not low-pressure turbines in general have fulfilled the claims of efficiency and capacity made for them by the manufacturers. The work of analyzing the operating data and formulating conclusions has been assigned to Mr. Twining, who has had personal experience in the operation of two low-pressure turbines at the Thirteenth Street power house of the Philadelphia Rapid Transit Company.

The second part of the committee report will take up the question of the value of making flue gas analyses and the results obtained with CO₂ recorders. The committee has obtained considerable information on this subject.

The subject of steam meters will be rather briefly treated in the report, because the investigations of the committee have shown that there are only a few steam meters in use in railway power houses, and that so far the development of the steam meter has been rather unsatisfactory.

On Monday the committee were the guests at luncheon of William S. Twining, and after luncheon were taken to the Thirteenth Street power station of the Philadelphia Rapid Transit Company to inspect the two 800-kw Curtis exhaust steam turbines which have been in operation at that plant for some time.

ACCIDENT CLAIM FROM PASS-HOLDER

BY HOWARD C. LAKE, OF THE NEW YORK BAR

The right of an employee of an electric railway company to recover for injuries sustained while riding on a pass has lately been decided by the Supreme Court of the State of Washington in three very interesting companion cases which arose out of the same accident. In the opinions reference is made to the conflicting views in the various States named and the general conclusion reached that where the pass was given, not as a gratuity, but as part consideration for the employee's wages, he was a passenger for hire so that the provisions of the pass waiving his right of protection as such were void as against public policy.

A man named Harris, employed as a foreman of a bonding gang, was injured while riding on one of the passenger trains running between Seattle and Tacoma. He was accompanied by his son Otto, a minor. Harris lived midway between the two cities and was required in the performance of his duties to travel over the line with his crew. The railway company furnished him with a pass which he and his gang were accustomed to use in going from place to place. This pass read as follows:

"Puget Sound Electric Railway. Quarterly ticket. 1906. Pass W. L. Harris and five men, bonders. Void after Dec. 31, 1906. No. 641. W. S. Dimmock, manager." Upon the back of the pass was printed the following:

Conditions. This free ticket is not transferable, and if presented by any other person than the individual in whose name it is issued, if altered by erasures, additions or interlineations, or in case any questions arise between the conductor and the holder as to its validity or the right of the bearer to use it, the conductor will take up this ticket, collect fare, and report the case to the superintendent. The signature of the holder of any pass presented and not taken up must be written upon the blank (Form A-001) provided for that purpose when presented by the conductor with the spacings properly filled in, when the conductor will take up the blank and ring for it upon the register as a ticket. The person accepting this free ticket agrees that the Puget Sound Electric Railway shall not be liable under any circumstances, whether of negligence by its agents or otherwise, for any injury to the person or for any loss or damage to the property of the passenger using the same. I accept the above conditions. W. L. Harris. This pass will not be honored unless signed in ink by the person for whom issued.

The son, Otto, was a member of his father's gang. The

accident was a head-on collision and occurred through the negligence of a flagman. The father, Harris, died of the effects soon after. At the time of the accident he did not have his pass with him, but he had signed the form A-901 referred to in the pass. The conductor was also killed. There was evidence that the conductor had not punched the blank form No. A-901 as was his custom, but it appeared to be reasonably certain that Harris was riding by virtue of his pass. The widow had a judgment against the railway company, which was affirmed on appeal. The manager of the company, Mr. Dimmock, was also sued as a party defendant, upon what theory it does not appear, but the judgment recovered was against the company only.

An appeal was entered by the company because of the clause on the pass exempting the company from liability. The jury decided that the pass was not a gratuity, but was a part consideration for the wages of the deceased, and this finding of fact the Appellate Court naturally declined to disturb.

The following rule from a leading work was cited in the opinion: "The decisions are not in harmony as to the effect to be given to a provision in a free pass exempting the carrier from liability for injuries caused by its negligence or that of its servants. According to one view such an exemption is contrary to public policy and not enforceable." As sustaining this view a number of cases are cited, among them Alabama, Iowa and Minnesota authorities. The rule then continues: "In other jurisdictions the view is taken that there is no violation of law or public policy by an agreement on the part of the passholder that the carrier shall not be liable for injuries caused to him by its negligence or that of its servants" and this holding is said to have been followed in the United States Supreme Court and in Indiana, Maine and elsewhere.

The State of Washington held to the last-named rule some years ago where the pass was a mere gratuity, but in a case decided thereafter had expressly stated that if the employee's transportation constituted a portion of the consideration for his services he became a passenger for hire "just the same as anybody else who parts with anything of value for transportation." In accordance with its previous decision the court held that the transportation of Harris was not a gratuity, but constituted a part consideration for his services; that he was a passenger for hire and entitled to protection as such passenger, a protection which public policy does not permit him to waive. There was evidence that after Harris boarded the train he was traveling upon the time of the company. Many authorities hold that employees carried free under such circumstances are not to be considered as passengers. But the Washington court held that this made no difference if he had paid his fare and it was reasonably certain that he did.

Finally, the court held that the verdict of \$15,000 while large, was not excessive, the deceased being at the time of his death 41 years of age, earning on an average \$115 a month, and being bright, active, industrious and of good habits.

The son's verdict was for \$2,000 and the same points were presented as in the father's case, the decision in which was controlling. The boy was held to be rightfully on the train as a passenger and was entitled to be carried as such unless it was shown by the company that he had waived his rights as a passenger. This was not proved to be the case.

A third case was brought by the widow for expenses and loss of earning capacity of her minor son Otto during

infancy, for which it was held that she could recover. This case, unlike the other two, was tried by the court without a jury and was based on the facts found in the other cases.

GRAND RAPIDS RAILWAY DESIGNS PRIZE FLOAT

A gold cup for the most artistic float in the civic pageant held in Grand Rapids on June 10 was awarded to the Grand Rapids Railway Company. Hundreds of floats were in line, most of them being advertisements for some local concern. The float which won first prize for the railway company was one typifying the Japanese nights which are regu-



Prize Float in Grand Rapids

lar features of the Ramona resort at Reed's Lake in summer. The float represents a large gondola drawn by four white swans. In the rear, attached with flowered ropes, are two small canoes containing small girls dressed in white. White was the color scheme, thousands of paper flowers being used. The float was drawn by six milk-white horses.

SHELTER STATION OF EVANSVILLE SUBURBAN & NEWBURGH RAILWAY

The Evansville Suburban & Newburgh Railway, operating lines from Evansville to Newburgh and Evansville to



Concrete Block Shelter Station

Boonville, has constructed 18 hollow block concrete shelter stations. One of these stations is located at each cross road on the line. The station is built of hollow concrete

blocks, 8 in. x 8 in. x 16 in., outside measurements, each block being faced with a waterproof facer. The designs of the blocks are different in each station. The stations are 10 ft. 8 in. wide and 8 ft. deep, with cement floor. The inside walls are finished with a smooth floating coat of cement, the top being ceiled with 3/4-in. ceiling, painted a light blue.

The roof is made of 7/8-in. flooring, which is covered with one layer of roofing paper and finished with imitation tile metal shingles painted terra cotta red. The roof extends over the front of the building 3 ft., and at the front edge a boxed gutter leads into a down spout at one side.

The opening in front of the building is 5 ft. 4 in. wide, without a door. One opening on each side, for a window, is glazed with a 4-light glass. Each station contains a seat around the inside wall.

In front of each of the stations is a cinder platform 5 ft. wide and 20 ft. long, the curbing of which is of concrete.

With one exception, the stations are located on the north side of the track, giving a southern exposure to the fronts of the buildings.

The Railroad Commission of Indiana, in its annual report, published recently, referred to these sheds as creditable to the company and useful to its patrons.

The foregoing description and the accompanying illustration were received from Gus Muhlhausen, manager of the company.

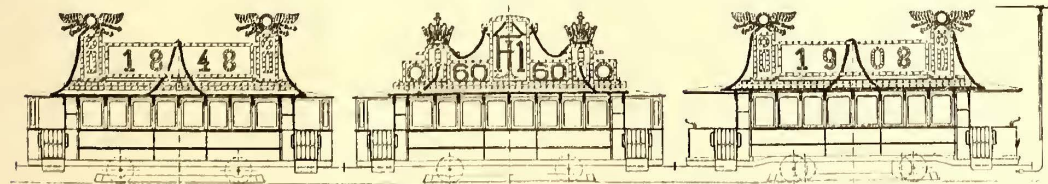
DECORATIVE ILLUMINATION IN VIENNA

The Vienna Municipal Tramways took an active part in the jubilee which was held in Vienna last December to celebrate the sixtieth anniversary of the accession to the throne of Emperor Francis Joseph I. Through the courtesy of L. Spängler, manager of the Vienna tramways system, views are published of the illuminated train of



Illumination of Car House

cars which traversed the lines of the company on the evening of Dec. 1, and also the exterior view of one of the principal car houses of the company, showing the artistic arrangement of lamps. The train of cars was made

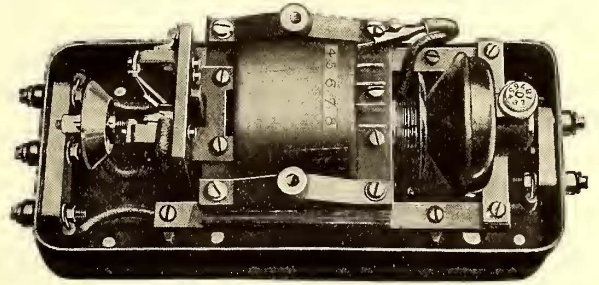


Illuminated Floats in Three-Car Train

up of three cars, a motor car at each end and a trail car between them. Each motor car was equipped with 575 10-cp lamps arranged in circuits of five lamps each, and the trail car had 750 lamps of the same size.

AN OVERLOAD INVERSE TIME-LIMIT RELAY

From the standpoint of uninterrupted service the ideal protection against overload on a heavily loaded power or lighting circuit is one that opens the circuit only after the overload has continued long enough to approach more or less nearly to the danger point. A new relay having several novel features and offering this protection has been designed by the Westinghouse Electric & Manufacturing Company and is known as the Type B. This relay with the cover removed is shown in an accompanying cut. The stationary parts consist of a current coil mounted in a laminated iron shell and a needle valve in the metal framework of the bellows. The moving part consists of a brass rod on which are mounted an iron core inside the coil, a contact cone below, and the bellows above the coil. The relay is inclosed in a dustproof case. The current settings are for 4, 5, 6, 7 and 8 amp. The number of turns de-



Overload Inverse Time-Limit Relay

creases in proportion as the current rating increases, so that the ampere-turns are the same for any current setting. The size of wire is larger for the larger current capacities, making the loss in watts at full load due to resistance approximately the same for any capacity. This is 7 watts in case of the 4-amp setting and 11 watts with the 8-amp setting. This watt loss is exceptionally low for an instrument of this kind.

The laminated iron shell around the coil has an ample sectional area and forms a good magnetic circuit with the core. The shell supports the coil firmly and is mounted on the base of the relay. The core is very light, but so constructed magnetically that it exerts an ample force for drawing up the moving parts and making the contact. The bellows leather consists of two thicknesses of light-weight leather treated to render it impervious to air and to make it flexible and durable. The escape valve of the bellows is a needle valve. Each needle is specially ground to allow the right escapement of air. A numbered dial is mounted on the needle so as to indicate accurately the setting of the valve.

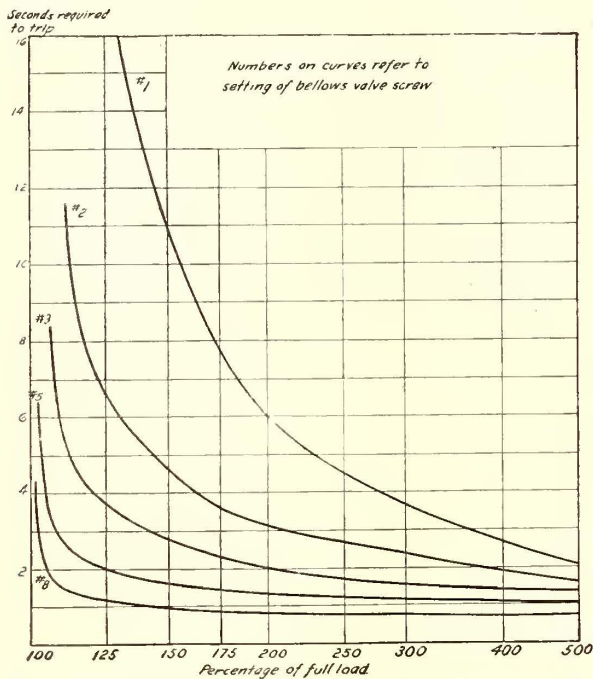
This instrument is adjusted at the time of calibration so that the iron core just strikes the iron shell when the moving element is in its highest position, thereby preventing violent vibration of the moving element. It would be impossible to use this method of damping out the violent vibrations if the various current settings were obtained by moving the iron core,

but inasmuch as the core is in the same position for all settings of the relay its behavior is very satisfactory.

The weight of the moving element is counterbalanced by a spring, so that only a slight magnetic pull is required to

make it operate. For this reason, and on account of the small weight of the core and the good magnetic circuit, it is possible to have the resistance and inductance of the relay very low. This presents the advantage of having the relay run cool under all conditions as any load heavy enough to heat the relay to 40 deg. C. will open the circuit. Another advantage is the low voltage drop, because these relays are ordinarily used with series transformers, and unless the voltage drop is low the accuracy of the transformer ratio is affected.

This relay is capable of a very wide range of adjustments, as illustrated by the accompanying set of curves. The number on each curve corresponds to a number on the needle valve dial. All the curves except No. 1 are the same for all relays. There is a small variation of No. 1 on different relays. Variations may be made in the time setting without affecting the normal full-load rating, and varia-



Adjustment Curves of Overload Inverse Time-Limit Relay

tions may be made in the normal full-load setting without affecting the time of operation at a given percentage in excess of full load. The curves drawn show the operation on a basis of percentage overload, assuming that the overload begins as soon as the current exceeds the normal rating, which may be anything from 4 amp to 8 amp. Without changing the current setting the time required for operation at 50 per cent overload may be varied from 1 second to 11 seconds. This range may be still further increased by varying the current settings. The scale divisions indicating the horizontal distances are not uniform, but are made on a logarithmic scale because the curve is more compact when drawn in this way. It is thus possible to show clearly the operation of the relay on any load up to 500 per cent of full load.

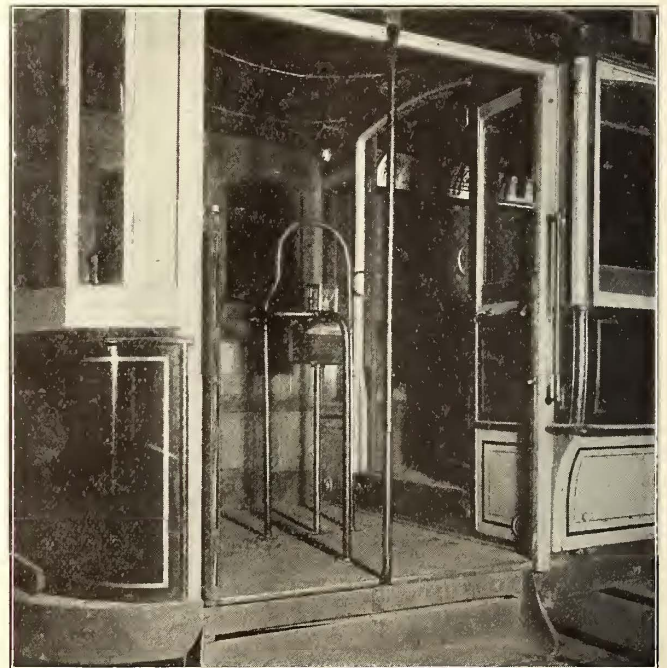
In some cases two relays are affected by the same overload. For example, one may be on a main feeder and one on a branch; or one may be at the generator end and the other at the load end of the same feeder. In either case it is essential that if possible only the relay nearer the load end shall operate when the overload occurs. The other relay serves as a protection in case of ground on the line between the generator and the second relay. This selective action may be secured either by adjusting the relay nearer the generator for a longer time element or by setting it for

a larger current. By referring to the time-load curves it will be seen that this setting may be easily made because there are wide spaces between the curves and because the relation between time element and percentage overload is absolutely independent of the current setting on which the rated full load is based.

Another point of this relay is its "resetting," or returning to its position of rest. This relay resets in the same time as it takes to operate at 20 per cent to 50 per cent overload, and it begins to reset as soon as the load drops to 60 per cent of the load that would make the relay operative. This time for resetting is so short that if the circuit-breaker is opened the relay resets before the circuit-breaker is closed, but it is not so short as to interfere with the normal operation of the relay.

REBUILDING CARS IN NEW YORK FOR PREPAYMENT SERVICE

The Third Avenue Railroad Company has had in operation for about a month a double-truck car which has been converted for prepayment service by lengthening the platform from 4 ft. to 6 ft. New hoods and knee-braces were required for this purpose, but the old vestibules and dashers have been retained. A special feature of the rebuilt car is the absence of any bulkhead or post between the body doors. The latter are of the double sliding type and when pushed back leave a 36-in. opening which may be used alike by entering or leaving passengers. As shown in the ac-



Platform Rebuilt for Prepayment Service

companying illustration, the platform dividing rail ends at such a distance from the car body that a space of practically 24 in. is allowed for exit and entrance. The operation of the first car has proved so satisfactory that the company is seriously considering rebuilding over 200 cars for prepayment service on this plan. These cars will be operated in addition to the new pay-as-you-enter cars which have been in service for some months.

Two citizens of Vladivostok have offered to advance to the city two-thirds of the capital necessary to build a system of tramways estimated to cost \$695,000.

News of Electric Railways

Reply of Philadelphia Rapid Transit Company to Councils on Fares

The Philadelphia Rapid Transit Company has replied to the City Councils in accordance with the resolution of those bodies adopted on June 17, 1909, asking the company to reconsider and readjust the fare question so that the sale of strip tickets might be restored. The company reviews its present obligations and the obligations which are accumulating, and presents a statement showing that its business has fallen off considerably during the last year. The statement of the company in full follows:

"Replying to the joint resolution of your honorable bodies passed June 17, 1909, in which you express the hope that this company would reconsider and readjust the fare question, so that the sale of strip tickets might be restored, we beg to lay before you the following facts:

"For the current year, beginning July 1, 1909, the interest, rental and sinking fund charges of the Philadelphia Rapid Transit Company (including the interest on the whole of the \$5,000,000 of bonds recently issued with the consent of Councils) will amount to \$8,416,056.30. (These charges will be increased beginning in 1912 by sinking fund payments for the benefit of the city, as well as sinking fund payments under the said issue of bonds, the city sinking fund being so arranged as to produce \$30,000,000 in the following 45 years.)

"These payments are the binding and legal obligation of the company, and must be met. They are due to over 25,000 different stockholders and bondholders, most of whom are citizens of Philadelphia. In addition, they are an obligation, both of the company and Philadelphia, for they were recognized and confirmed by the contract of July 1, 1907, and all talk about a reduction or readjustment of these charges is mere agitation, which cannot possibly have any practical effect.

"In addition to these fixed charges, the company's taxes for the year ended June 30, 1909, amounted to:

State	\$796,611.14
Local	177,597.16
Payment to Philadelphia under contract.....	499,785.07
Total taxes	\$1,473,993.37

"In addition to these direct payments, the company, as part of the fixed charges above mentioned, is paying out each year in interest \$1,200,000 upon that portion of its capital which was spent in laying improved pavements in the city at the time the trolley system was installed, so that the company is paying each year out of its receipts for the benefit of the public upward of \$2,500,000, or more than one-half a cent for every passenger carried, including those carried on transfers.

"If, therefore, there is no change in the taxes for the coming year, the company will stand obligated to pay out of its receipts from passengers by way of fixed charges, licenses and taxes \$9,890,048.67. (As already stated, upward of \$2,500,000 of this amount is paid out for the public benefit.)

"The figures for operation for the year 1909 are not yet made up. Taking the year 1908 as a basis, we find that the company's expenses were:

Maintenance of way and buildings.....	\$1,060,424.66
Maintenance of equipment.....	915,287.31
Transportation	4,822,471.68
Power	1,280,213.44
General expenses (including 6 per cent for accidents).....	1,716,110.78
Total	\$9,794,507.87

"As is known, the increase in the wages of motormen and conductors will add approximately \$280,000 to the expenses during the coming year, so that the company must take in during the year ending June 30, 1910:

For taxes, licenses and fixed charges.....	\$9,890,048.67
For operation (based on expenses of 1908).....	9,794,507.87
Add increase in wages.....	280,000.00

Or a total of.....\$19,964,557.54

"To estimate the receipts, there are two factors to be determined, viz., the number of passengers carried, and the average amount received per passenger. The record of former years shows the number of passengers carried to have been: Year ended June 30, 1906, 448,576,785; June 30, 1907, 492,137,038; June 30, 1908, 512,869,023; June 30, 1909, 464,364,636.

"An estimate of the number of passengers to be carried during the current year at 500,000,000 seems to be fair.

"Now as to the rate per passenger. For the nine months ending April 1, 1909, which included a period when the new transfer order was in effect, and before strip tickets

were withdrawn from sale, the average fare per passenger was 3.90. If strip tickets were restored, as requested by Councils, and if the estimate of 500,000,000 should prove correct, the receipts of the company for the current year would be: 500,000,000 passengers carried at 3.90 per passenger, \$19,500,000, or nearly \$500,000 less than the absolute requirements of the company.

"On the other hand, the average fare now being received per passenger is about 4.18. (This is less than estimated, due to the greater use of exchanges and transfers). Again, assuming that the company will carry 500,000,000 passengers, and applying the present average per passenger, we get estimated receipts for the current year of 500,000,000 passengers carried at 4.18 per passenger, \$20,900,000, or a surplus of about \$900,000. If this estimate proves correct, it will leave about 3 per cent on the \$30,000,000 cash capital of the company.

"All of these figures for the current year, except the fixed charges, are necessarily estimates, and the results are subject to change if the taxes or expenses should be increased or reduced, or the number of passengers should vary. The actual figures, however, for the past years, on which these estimates are based, have been given, and we submit conclusively to every fair-minded person that the company is not in a position to restore strip tickets."

Question Box of the A. S. & I. R. Engineering Association

The American Street & Interurban Railway Engineering Association, through its secretary-treasurer, John W. Corning, is sending to member companies and associate members for consideration and replies a set of questions submitted by the membership, which, with the answers received, will constitute the question box for the 1909 convention. It is requested that replies be forwarded to Mr. Corning at 552 Harrison Avenue, Boston, Mass., as early as possible. The questions follow:

POWER HOUSES

1. What experience has been had in the use of hot-water meters in power plants?
2. What have been the actual results of purchasing coal under contracts which specify a standard quality and price, with a sliding scale of prices covering variations in quality?
3. Give an exact definition and basis on which power station load factors are worked out, especially in combined railway and lighting stations.

TRACKS

4. How does the cost of steel ties in concrete compare with that of wooden ties laid in concrete, and what life is expected for steel ties?
5. Does the gage line of both rails on straight track wear equally, and, if not, what causes one rail to wear more than the other?
6. Does such unequal wear occur on high-speed lines only?
7. On what foundation is the track? What kind of ballast? What rail section?
8. Are both rails bonded, and if only one is bonded, which rail wears most?
9. What kind of trucks?
10. What is the most satisfactory manner of testing for defective bonds in pavement?
11. What is the average cost of creosote block pavement, laid in concrete foundation?
12. What is the average life of creosote block pavement?
13. Do physical and chemical tests show any difference between rolled manganese steel rails and cast manganese steel rails? Give details and recommendations.
14. Is it practical and advisable to adopt a standard set of track maintenance rules for city and also for interurban lines, including both streets and private right of way?
15. Have electrically brazed or soldered bonds placed on outside of rail head in paved streets, or in streets graded to top of rail, proved satisfactory? Give some figures.
16. What is the life of cast weld joints on new rail laid with good foundation in paved street?
17. How close should ties be spaced in track laid with 6 inches of crushed stone underneath the ties and 4 inches of concrete between the ties; ties 8 x 6 x 8 inches?
18. What is the best method of getting good fitting combination joint plates, whether from the manufacturers of special work, or if made in home shop?
19. What is the life of one of the best mechanical joints put on new rail laid with good foundation in paved street?
20. What is the life of electric welded joints put on new rail laid with good foundation?
21. How long should concrete be allowed to set, under and between rails, before allowing cars to run over same?
22. Is the use of soapy water in place of oil in general use as a lubricant for drills used in boring holes for copper rail bonding to improve conductivity of contact?

CAR-HOUSE CONSTRUCTION

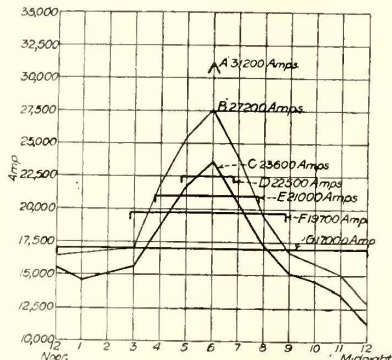
23. What percentage of the length of a car storage house should be of open pit construction?
24. What is the opinion of the association as regards the necessity of aisle sprinklers when the ceiling sprinklers are not more than 18 feet above the top of the rail?

LINES—OVERHEAD AND UNDERGROUND

25. Given a net work of street railway lines fed from several 600-volt direct-current stations and substations: a. Would you install trunk

line feeders to tie the stations together, so that they may help each other out in case of trouble? b. Or would you extend and connect the ends of certain feeders so that, in addition to feeding a section, they may serve as tie lines? c. What proportion of station or substation capacity would you provide in the capacity of such trunk lines or tie lines?

26. Given a net work of street railway lines fed from several 600-volt direct-current stations: If the system load curves are similar to accompanying diagram, and if the morning and afternoon peaks are approximately the same, assuming underground distribution, by using paper-insulated copper cables, would you calculate your feeders on the basis of the loads, as per values A, B or C in accompanying diagram, or would you use say the 2-hour or 4-hour value D and E and allow the overload capacity of the feeder cables to take care of the system through the peak period?



A—Momentary Max. Observed. D—2 Hour Average of C.
 B—Aver. Max. Heaviest Month. E—4 Hour Average of C.
 C—Aver. Max. Heaviest 3 Months. F—6 Hour Average of C.
 G—12 Hour Average of C.

27. Can the life of cedar poles be prolonged by treatment? If so, to what extent and by what method?
 28. What is the best method of testing underground power cables? Interval between inspections and interval between tests?
 29. Is the use of galvanized Siemens-Martin steel strand for overhead supports found as satisfactory, both from a lineman's point of view as regards ease of manipulation and from a general manager's point of view as regards reduced maintenance charges, as the use of ordinary galvanized steel cable?
 30. Is the San Francisco practice of putting out fires on wooden poles and crossarms of 13,000-volt alternating-current lines by portable extinguishers while the conductors are kept in service in general use?
 31. a. Is the leading of the feed-in tap from the underground feeder cable up through the inside of the iron side pole in successful, satisfactory use anywhere in this country? If so, where? b. In case this is done, what is the B & S size of the conductor, and what is the preferred insulation of that part of the feed-in tap that passes up the interior of the pole—giving all layers outside of the conductor? c. In this particular case is the conductor stranded or solid? d. In this same case is a cut-out installed in each feed-in tap, and if so, where is it located?

CAR BODIES

32. Is it better practice to use electric markers in connection with storage batteries on interurban cars than to use regular oil markers?
 33. What is the most satisfactory position of the truck centers in relation to the "Over All" length of car?
 34. Are the ventilating devices on cars more efficient with or without the monitor or upper decks?
 35. What is altogether the most satisfactory disinfectant to be regularly used on the interior of closed city cars? Interurban cars?
 36. In your particular locality, approximately, what actual saving in cost for power can be effected on one car for one year, or for 100 miles run, by reducing the dead weight of an average city car by 100 lb.
 37. What is the best method of car washing with special reference to the preservation of outside varnish?
 38. What is the cost of changing double-end, single-truck cars to single-end, pay-as-you-enter type?
 39. What is the average life of a closed passenger car, an open car, and a service car?
 40. What percentage of the original cost each year should be deducted for depreciation?
 41. What value is placed on car after it has outlived its usefulness?

CAR EQUIPMENT

42. Which is preferable on strapwound armatures, one or two part coils?
 43. From experience of the past year with vacuum process of coil impregnation, is such treatment considered more or less valuable than it was a year ago?
 44. For motors of 50 hp or under, are commutating fields desirable?
 45. Does it pay to furnish the depot repairsmen small tools, such as hammers, monkey-wrenches, pliers, screwdrivers, etc.?
 46. What results have been obtained from the use of automatic slack adjusters, and what has been the saving of labor by use of same?
 47. Why does the insulation on the long field leads of the General Electric 80 motors catch fire inside of motor shell, and what can be done to prevent it?
 48. What is the average life of a car body?
 49. What is the average life of equipment?
 50. Which is the best policy: viz., to continue using an expensive tin base babbitt metal as used with grease lubrication after your motors are converted to oil lubrication, or to use a cheap lead base metal?
 51. Do you use either ball-bearing or rolling center plates or side bearings; and if so, what effect have you noted on wheel flange wear, power consumption and saving in center plate lubrication?
 52. Have you ever tried the use of a recording meter under the car for car-mileage records?
 53. How many motors should one armature winder take care of—average conditions on a road having say 25—4 motor equipments and 75 double motors, city and suburban traffic?
 54. What should determine the minimum diameter of a railway motor commutator, that is, when should it be scrapped on account of being too small?
 55. What has been your experience with motor field and armature coils wound with asbestos-covered wire? Do you think impregnation of such coils is necessary in addition to being wound with asbestos wire?
 56. Is not the use of asbestos-covered wire for motor and car wiring sufficiently important to justify the manufacturers of asbestos wire to so

perfect their product as to enable it to stand the necessary insulation test required of wire used for such purposes?

57. What are the advantages, if any, of asbestos wire-wound field and armature coils over those wound with cotton-covered wire? Do you think there is anything harmful in such construction due to liability of overloading of motors?
 58. What have been the results of using babbitt-lined journal brasses on heavy high-speed interurban equipment?
 59. What is the best brake shoe for steel wheels?
 60. What is the best method of boring armature bearings true, or any other treatment of them to increase life?
 61. What is considered good mileage for cast-iron brake shoes?
 62. What is considered good mileage for trolley wheels?
 63. How much of the wear on the truck brake rigging and the resulting brake trouble and the wear on the wheel flanges when in contact with the shoes is due to the lost end motion of the axle in its M. C. B. bearings?
 64. Will a car ride better if the excessive end motion of the axle in its M. C. B. bearings is eliminated?
 65. What is the best method of preventing rapid wear on the bolts and other moving parts of the truck brake rigging?
 66. What methods should be used to prevent excessive wear on the ends of M. C. B. journal bearings and the resulting excessive side motion of the truck frame with reference to the axles and wheels?
 67. What is a quicker (and fairly reliable) method of periodically calibrating car circuit-breakers by car equipment inspectors than the use of water rheostat and an ammeter?
 68. Has the intelligent use of a spring balance, in opposition to the calibrating spring, been passed on by the association, and if so, what was the decision? (This practice was pronounced impracticable by the manufacturing company, but has been found of much value by the interrogator for approximate calibration, detection of faults in adjustment, incorrect springs, etc.)

WHEELS AND AXLES

69. Limit gages and average mileage between turning steel wheels on city service?
 70. In using steel wheels, what mileage should be had between turnings, what wear from service, and how much turned off?
 71. What is considered good mileage for solid steel wheels, steel-tired wheels and cast-iron wheels, allowing three turnings for steel?

PURCHASING AGENTS

72. Should there not be a separate section in the convention for the deliberations and decisions of the purchasing agents' division of the American Street & Interurban Railway Association?
 73. Should the storekeeper be under the supervision of, and responsible to, the purchasing agent or the engineer?
 74. To avoid the heavy loss by dead stock in storeroom, how often should the purchasing agent and engineer fix arbitrary standards of material?
 75. How long should the agreement last?

Cleveland Traction Situation

An ordinance was introduced and passed to its second reading in the City Council of Cleveland, July 12, giving Herman J. Schmidt an extension from the proposed Payne Avenue road on Wade Park Avenue, East Sixty-fifth Street, East Sixty-sixth Street and West Sixty-fifth Street.

As an indication that promises made at the tent meetings by Mayor Tom L. Johnson will be carried out, the Cleveland Traction Company has been incorporated with a capital stock of \$10,000 by H. Schmidt, A. F. May, O. F. Leisey, T. G. Fitzsimmons and J. Lawrence. Mr. Schmidt expects to transfer his grants to this company.

Harry Decker, a west side dry goods merchant, has resigned as a member of the committee of 100. Mr. Decker says that he is as much in favor of defeating the Schmidt franchise as ever, but that he has not the time to devote to the work of the organization. He is one of the merchants named in the Mayor's famous circular, but he states that his business has not suffered as a result of the effort of the Mayor to misrepresent him in public.

At a meeting of the local branch of the Amalgamated Association of Street & Electric Railway Employees held on July 16 it was decided to oppose the Schmidt franchise. Members were instructed to bring every influence to bear against the adoption of the grant by the people. This organization had much to do with the defeat of the security franchise granted to the Cleveland Electric Railway when the property of that company was leased to the Municipal Traction Company.

F. W. Walz, a Councilman who deserted the Mayor as an ally some time ago, held a second tent meeting at Superior Street and Eighty-sixth Street on the evening of July 17. Mr. Walz was not interrupted in making his address, but questioners persisted in having him explain various matters to which he referred. A. L. Behner, vice-president of the International Organization of Street Railway Employees, secured the consent of the chairman of the meeting to reply to an attack the Mayor made upon him. He said the Mayor had called him a dynamiter, and defied the Mayor to prove the statement.

Mayor Johnson has had hundreds of small billboards erected between the sidewalks and the curbs along the streets on which the proposed 3-cent lines are to be built, and upon them are pasted posters advising people to vote for the Schmidt grant and instructing them how to cast their votes at the election. As special permits must be obtained for putting billboards on the streets, the department of public safety decided to allow any persons who wish to do so to erect such boards for a limited time.

The report of the receiver of the Municipal Traction

Company for June, made public through the Federal Court on July 17, follows:

Gross earnings	\$561,587
Operating expenses:	
Maintenance	\$107,330
Transportation	174,257
General	38,970
Total	\$320,557
Net earnings	241,030
Neutral street railway, rental	936
Taxes	24,644
Interest rental	38,589
Dividend rental	73,378
Total	\$137,538
Surplus	103,482

Transit Affairs in New York

The Appellate Division of the Supreme Court has overruled the Public Service Commission in its refusal to approve the franchise granted by the Board of Estimate to the South Shore Traction Company to operate cars over the Queensboro Bridge, and has ordered the commission to grant the application of the company and pay it \$50 in costs. The opinion was written by Justice Ingraham, Justices Laughlin, Clarke, and Houghton assenting. The latter, however, wrote a separate opinion, in which he differed with his colleagues on several of their findings with regard to the powers of the commission. The commission refused to grant the franchise purely on its terms, admitting the necessity for the immediate operation of cars across the bridge. In its decision on the matter the commission declared that under the franchise the company was given the right for 50 years to one of the most important thoroughfares between Jamaica and Long Island City, and that future extensions were not sufficiently provided for.

In its decision the court holds:

"Necessity or convenience for the public service was the single question the commission was authorized to determine, and upon the determination of that question depended the permission of approval.

"The Public Service Commission had no right to arbitrarily reject an application because of the action of the local authorities in granting or refusing their consent.

"If a railroad over the proposed route was required by the public, was necessary or convenient for the public service, then it was the duty of the commission to grant the application, and as I understand from the return that they have determined that the proposed railroad was required, the denial of the application was error."

It is announced that the commission will carry the case at once to the Court of Appeals.

The Public Service Commission has modified the plan of construction for the Broadway-Lexington Avenue subway, according to the wishes of property owners in Lexington Avenue, so as to make the subway structure a double instead of a single deck tunnel. The original plan adopted by the commission contemplated four tracks on one level, but the property owners have objected to this plan on account of the narrowness of the avenue and the interference with abutting property which would result. On the receipt of these objections the commission instructed its engineers to devise a better plan, if possible, and the result is the development of the double deck form of construction from Houston Street to 103d Street, and from 113th Street to the Harlem River, the lower tracks varying from 25 ft. to 70 ft. below the upper tracks. The modified plan has been approved both by the commission and the Board of Estimate and Apportionment.

Enlargement of the Chambers Street station of the Brooklyn loop section of the subway to accommodate six instead of four tracks, at a cost of \$875,000, as recommended by the Public Service Commission has been approved by the Board of Estimate and Apportionment. It is understood that this will also involve the taking of additional property estimated to cost about \$1,000,000. The board has also granted the request of the commission for leave to advertise for bids for the construction of the Lexington Avenue and the Brooklyn subways.

The Public Service Commission has made public a provisional list of stations for the Broadway-Lexington Avenue subway, on which the Bradley-Gaffney-Steers Company is a bidder according to the route which the commission has approved. The list as now given out is tentative only, and the commission is anxious that citizens interested in the matter shall all get the information at the same time. The permanent list of stations will not be definitely determined until several engineering problems have been settled. As now laid out the new line starts with a terminal at Battery Park. The commission apparently has decided that ex-

press trains in the new subway shall be operated primarily for the benefit of the residents of Harlem and the Bronx. Express trains will stop at Canal Street and Murray Street and Warren Street and at the terminal at the Battery. There will be no express stop between Canal Street and Eighty-sixth Street, and the only other one in Manhattan will be at 125th Street. In the Bronx the express stops will be more frequent.

Advertising Campaign in Philadelphia

The Philadelphia Rapid Transit Company has begun the publication in the daily papers of Philadelphia of a series of transit talks designed to acquaint the public better with the problems which beset the management of a large corporation such as the Philadelphia Rapid Transit Company, in the hope that the advertisements may prove mutually helpful to the company and its patrons. The first talk was entitled "Why Street Car Operation Is Especially Difficult and Costly." It occupied approximately 38 square inches of space. The announcement of the company follows:

Next to the streets, there is no more important factor in the comfort and well-being of city dwellers than the street car.

You realize this when trolley transportation is interrupted for even a few hours.

The Philadelphia Rapid Transit Company also realizes this fact, and the consequent responsibility resting upon it to give satisfactory service to the public.

But the transit company and the 1,350,000 people who ride on its cars every day come in contact so often that some friction and misunderstanding seem to be unavoidable.

We believe, however, that this misunderstanding can be lessened by increasing the public's knowledge of the company's affairs. We are convinced that a better understanding can be brought about by informing you of our efforts, difficulties, accomplishments—and failures.

Acting on this belief, it is our intention to publish in the newspapers regular bulletins that will deal with all aspects of the company's affairs and service, its relation with the public and the city.

Look for these "trolley facts." They will be interesting, as well as informing.

Every citizen of Philadelphia, under the contract between the city and the company, is a future part owner of the street car system—another reason why you ought to know more about it.

If there is anything you want especially to hear about, write to the Publicity Bureau, 228 Land Title Building, and if the subject is of general interest, it will be taken up in its turn.

The first talk of the company follows:

Philadelphia has come to be known as the City of Homes, because it is the best city in the country to live in. But it presents more difficulties for the transportation company than any other city on earth.

The streets are narrow and the blocks are short, with the result that about every 400 ft. there is a grade crossing.

It costs more to install a crossing and keep it in repair than it costs for the 400 ft. of straight track between crossings. It is more wearing on the electrical equipment and the car trucks to go over a crossing than it is to run a quarter of a mile on the straight track.

Then there are the additional chances of accident at crossings—chances not encountered on straight track. In this city a car must be started and brought to a stop nearly every 450 ft.; it cannot run its full speed more than half that distance.

These are the reasons why trolley service costs more and is necessarily slower here than in cities where there are broad avenues of travel and few intersecting streets.

But even under the hampering circumstances described, our cars make an average speed of 8½ miles an hour—not bad when you consider the frequent crossings and the fact that the cars share the tracks with hundreds of vehicles whose drivers seem to think that they have as much right as anybody to the use of the rails.

Much has been done toward bettering the service by the traffic regulations of the police department. Much more could be done if drivers and teamsters would clear the track *before* the motorman is obliged to slacken speed and wear out the gong behind some obstinate driver.

Railway Office Robbed.—The office of the Los Angeles-Pacific Company, Los Angeles, Cal., was entered by burglars on July 4, and the safe rifled of \$3,700 in cash. According to the latest reports the robbers have not yet been apprehended.

Outing of the New England Street Railway Club.—The August outing of the New England Street Railway Club will be a ladies' day, and will be held on Aug. 12, at Canobie Lake Park, Salem, N. H. The program will be announced later.

Hearing on Application of the Boston, Lowell & Lawrence Electric Railroad.—Another hearing on the petition of the Boston, Lowell & Lawrence Electric Railroad, Boston, Mass., for a certificate of exigency, was held before the Massachusetts Railroad Commissioners on July 9. Prominent business men and public officials were present to favor the building of the new line. The hearing will be continued on Sept. 20.

Plan for Report on Subways in Pittsburgh.—At a conference on July 13 between Mayor Magee, of Pittsburgh; Morris Einstein, chairman of the corporation committee of the City Council, and Dr. H. B. Burns, chairman of the sub-committee on subways of the City Council, plans were discussed for employing an expert to study the subject of underground railways in Pittsburgh and report to the Council in the fall.

Circular on Taxes and Other Requirements.—The secretary of the American Street & Interurban Railway Asso-

ciation has issued Bulletin No. 107 giving information in regard to taxes and other city and municipal requirements of city lines. The bulletin contains a number of tables showing the basis of the tax requirements, as well as the free transportation for municipal employees, removal of snow and ice, etc., required of the different companies. The bulletin is sent only to member companies of the association.

New York Tunnel of the Pennsylvania Railroad Ready for Equipment.—The twin tunnels of the Pennsylvania Railroad under the Hudson River between Hackensack N. J., and Seventh Avenue and Thirty-third Street, New York, where the immense terminal of the company is being built, have been completed, and the work of track laying, placing the third rail and installing the signal system will now be pushed. The first excavation was begun on May 12, 1905. The north tunnel was joined on Sept. 12, 1906, and the south tunnel on Oct. 9, 1906. The tunnels under Bergen Hill, New Jersey, were connected on May 7, 1908, and on April 11, 1908, respectively.

Progress in Detroit Investigation.—The fifth meeting of the committee of fifty which is investigating the street railway situation in Detroit was held in the common council chamber in Detroit on June 7. Reports of progress and the results accomplished were received from the committee on franchises. This committee has examined all the franchises under which the Detroit United Railways and its constituents operate and all the amendments to grants for street railways made by the city from the ordinance dated Nov. 24, 1862, to the present time, and it has reviewed the history of every street railway that has owned or operated a line in Detroit. This review has been published as part of the record of the meeting on June 7.

Columbus Terminal Ordinance Signed.—Mayor Bond, of Columbus, has signed the ordinance granting the Ohio Electric Railway, Columbus, Ohio, permission to erect its proposed union station. The measure provides that an interurban station to cost \$175,000 shall be erected at Third Street and Town Street by Jan. 1, 1913; that what is known as the loop be abandoned; that 7 tickets be sold for 25 cents within the city and that the franchise of the company to operate in Columbus be extended for eight years. The new terminal for the present will probably be only two stories high, but it will be so constructed as to permit of the addition of floors as the business demands. The first floor will be used for the ticket offices and as a waiting room. The second floor will be fitted up for the use of the office force by the company in Columbus.

Colorado State Convention.—The Colorado Electric Light, Power & Railway Association, which usually holds its conventions in September, has arranged this year to hold its meetings as opportunity may offer at Denver during Thursday, Oct. 7, Friday, Oct. 8 and Saturday, Oct. 9, of the week of the convention of the American Street & Interurban Railway Association, the officers of the association deciding that this is better than to ask members to convene during some other week, especially as it is expected that there will be a full attendance of members of the Colorado Electric Light, Power & Railway Association at the national convention. The program of the meeting of the Colorado Electric Light, Power & Railway Association has not yet been fully arranged. J. F. Dostal, of the Denver Gas & Electric Company, is president of the association, and J. C. Lawler, of the Colorado Springs Electric Company, is secretary and treasurer.

Public Utility Matters in Abeyance in Maryland.—Consideration by the cabinet of Governor Crowthers of Maryland of the question of creating a public service commission has been postponed until S. Davies Warfield, chairman of the executive committee of the Consolidated Gas, Electric Light & Power Company, Baltimore, Md., submits to the cabinet his plan for bringing natural gas into Baltimore from Virginia. The first meeting of the cabinet of the Governor to consider this matter was called for June 17. Mr. Warfield then said that his company desired to enter into an agreement with the City of Baltimore by which the city would become a partner in the company, and be represented on the board of directors, but that under these circumstances he felt the company should not be subject to the orders of a commission. He has not said when he expects formally to outline his plans to the Governor.

Electrical Engineering at the Massachusetts Institute of Technology.—Late last month announcement was made of the appointment at the Massachusetts Institute of Technology of Dr. Harold Pender as professor of theoretical and applied electricity. Dr. Pender is a graduate of Johns Hopkins University and took the degree of Ph.D. at that university in 1901. Later he joined the engineering department of the Westinghouse Electric & Manufacturing Company

and is recognized as notable in his work in mathematical and experimental physics. His teaching at the Institute of Technology will consist of a course for third-year undergraduate students and courses for graduate students in the more advanced theories of electric current flow and the electric transmission of power, in addition to the direction of experimental research by advanced students. The advanced lectures on the organization and administration of public service companies, on the design of power stations and systems, and on electrical measurements heretofore carried on by Professor Jackson, Professor Shaad and Professor Laws will be continued by the same professors. As indicating the trend of electrical engineering study at the present time, it is notable that 40 per cent of the students just graduated from the electrical engineering course at the Massachusetts Institute of Technology already bore degrees of Bachelor of Arts or Bachelor of Science, conferred, as a rule, in classical or literary courses.

Active Construction Begun on Cambridge Subway.—Active construction work upon the new subway to be built in Cambridge, Mass., by the Boston (Mass.) Elevated Railway has been begun by Contractor Hugh Nawn at the intersection of Bay Street and Massachusetts Avenue, near the Harvard Square district. A shaft has been excavated to facilitate removing the material from underneath Massachusetts Avenue, and a system of narrow-gage car tracks has been built on a lot at the south to enable the material raised from the tunnel section of the subway to be hauled away from the route and dumped into wagons for transfer away from the city. It is expected that the method of removing the material from beneath the avenue at this section of the work will eliminate very largely the inconvenience which has sometimes attended subway construction in trunk thoroughfares. G. A. Kimball, chief engineer, is in charge of the subway work. The Railroad Commission has approved the plans of the company for stations at Harvard, Central and Kendall Squares. At present the question is before the Supreme Court of Massachusetts of allowing the Boston Transit Commission to construct the Boston end of the Cambridge subway under Boston Common, citizens having appealed to this tribunal in favor of the Scollay Square terminus. The Transit Commission and the Boston Elevated Railway are convinced that the Park Street terminus, or its equivalent, will meet the needs of the greater number of patrons, and full preparations were being made to construct it when an injunction was demanded by the complainants. It is not expected that there will be any considerable delay in reaching the decision.

LEGISLATION AFFECTING ELECTRIC RAILWAYS

Connecticut.—The special committee of the Legislature which has had under consideration the question of recommending for passage a public utilities measure has adopted a bill to create a board of telephone, lighting and water commissioners. The measure is designed to deal exclusively with telephone, lighting and water companies, and provides that there shall be three commissioners at salaries of \$3,000 each, the same as that paid to the railroad commissioners. Before the close of the present session of the Assembly the Governor is to nominate one commissioner to hold office until July 1, 1911; one commissioner to hold office until July 1, 1913, and one commissioner to hold office until July 1, 1915. Sixty days after the organization of the General Assembly of 1911 and biennially thereafter the Governor is to nominate one commissioner to hold office for a term of six years from July 1. The commissioners are authorized to employ such clerks, accountants, engineers, inspectors, experts and others as may be necessary to conduct the work of the commission properly. Reports of the operation of companies subject to the jurisdiction are to be made to the commission for the year ended June 30 on blanks specially prepared by the commission and furnished to the companies. The act will become effective on its passage. The Connecticut Railway & Light Company, operated under lease by the Connecticut Company, has been granted a charter amendment to permit it to extend its lines in Bridgeport and Stratford. The New York, New Haven & Hartford Railroad has been given the right to extend its Middletown-Middlefield electric line to Durham if the Meriden, Middletown & Guilford Street Railway, incorporated two years ago, does not build within the next two years. The Senate has reversed the action of the House and rejected the bill which provides for two 5-cent fares between Hartford and Manchester on the line of the Connecticut Company, instead of three. This session has been prolific of attempts to reduce fares on electric railways. In all upward of 20 measures seeking reductions have been introduced, but not one has been favorably acted upon in committee. Of this number, however, three or four have passed the House.

Financial and Corporate

New York Stock and Money Market

July 23, 1909.

The market last week was sluggish, but preserved a strong undertone, based very largely on the ease in money, the excellent outlook for crops and the continued revival in business. Speculative interest centered largely in Steel common, and on Saturday the market showed a decided upward tendency. The movement was concentrated, however, and for a time there was a reaction due to profit taking, but the list recovered rapidly. Naturally the traction stocks followed the trend of the market and slight advances were recorded for nearly all their securities.

Quotations for money were raised, but are still low for this period of the year. Rates to-day were: Call, 1½ to 2 per cent; time, 2 per cent for 60 days; 2¼ to 2½ per cent for 90 days; ¾ per cent for five months, and ¾ to ¾ per cent for six months.

Other Markets

In Philadelphia an effort was made to force Philadelphia Rapid Transit to higher levels, but at 28½ on Friday considerable was offered. On Tuesday, however, the stock recovered to 29½ on better demand.

In Chicago, Kansas City Railway & Light common and preferred advanced slightly. The elevated stocks were weak, however, Metropolitan West Side common and preferred falling off fractions.

On Tuesday, on light transactions, Massachusetts Electric Companies preferred advanced to 75, its highest price in three years. Boston Suburban Electric common recorded a slight gain. Boston Elevated moved upward more than half a point.

In Baltimore, United Railways securities were quite active and strong. The first mortgage bonds were in demand at 87¾ and 88, the funding 5s from 85 to 86, and the incomes from 57¾ to 58¾. Maryland Electric first mortgage 5s were quoted at 95 to 95¾.

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

	July 13.	July 20.
American Railways Company.....	45	44 3/4
Aurora, Elgin & Chicago Railroad (common).....	39 3/8	44 1/4
Aurora, Elgin & Chicago Railroad (preferred).....	a87	a86 1/2
Boston Elevated Railway.....	129	a130
Boston & Suburban Electric Companies.....	*15 1/2	*16
Boston & Suburban Electric Companies (preferred).....	*71	*71
Boston & Worcester Electric Companies (common).....	10	10
Boston & Worcester Electric Companies (preferred).....	a56	a56
Brooklyn Rapid Transit Company.....	77 3/4	78 1/2
Brooklyn Rapid Transit Company, 1st ref. conv. 4s.....	86	85 3/8
Capital Traction Company, Washington.....	a138	a137 1/2
Chicago City Railway.....	a190	a190
Chicago & Oak Park Elevated Railroad (common).....	*2 1/2	*2 1/2
Chicago & Oak Park Elevated Railroad (preferred).....	*10	*10
Chicago Railways, ptcptg. ctf. 1.....	a112 3/4	a114
Chicago Railways, ptcptg. ctf. 2.....	a30 1/2	a38 3/4
Chicago Railways, ptcptg. ctf. 3.....	a20 1/4	a26 1/2
Chicago Railways, ptcptg. ctf. 4s.....	a10 1/2	a10 1/2
Cleveland Electric Railway.....	*78	*78
Consolidated Traction Company of New Jersey.....	a76 1/2	a77
Consolidated Traction of N. J. 5 per cent bonds.....	a106 1/2	a106
Detroit United Railway.....	a63 1/2	63
General Electric Company.....	164	168
Georgia Railway & Electric Company (common).....	a92 3/4	a93
Georgia Railway & Electric Company (preferred).....	89	a87
Interborough-Metropolitan Company (common).....	15 1/2	15 3/4
Interborough-Metropolitan Company (preferred).....	a7 3/4	a8
Interborough-Metropolitan Company (4 1/8s).....	80 3/4	80 1/2
Kansas City Railway & Light Company (common).....	a50	50
Kansas City Railway & Light Company (preferred).....	a84 3/4	a84 1/2
Manhattan Railway.....	a146	146
Massachusetts Electric Companies (common).....	13 1/2	a14
Massachusetts Electric Companies (preferred).....	71 1/4	a75
Metropolitan West Side, Chicago (common).....	a16 1/2	16 1/2
Metropolitan West Side, Chicago (preferred).....	a48	48
Metropolitan Street Railway.....	a20	a20
Milwaukee Electric Railway & Light (preferred).....	*110	*110
North American Company.....	82	84
Northwestern Elevated Railroad (common).....	a22	a22
Northwestern Elevated Railroad (preferred).....	a69	a71
Philadelphia Company, Pittsburg (common).....	a42	a42
Philadelphia Company, Pittsburg (preferred).....	43	a43
Philadelphia Rapid Transit Company.....	a28 5/8	29 1/4
Philadelphia Traction Company.....	91	a91
Public Service Corporation, 5 per cent col. notes.....	a100 1/2	a100 1/2
Public Service Corporation, cfs.....	a89	a89
Seattle Electric Company (common).....	*102	*105 1/4
Seattle Electric Company (preferred).....	103 1/8	*103
South Side Elevated Railroad, Chicago.....	a55	a56
Toledo Railways & Light Company.....	a9 1/2	a10
Third Avenue Railroad, New York.....	17	18 1/2
Twin City Rapid Transit, Minneapolis (common).....	103 1/4	106
Union Traction Company, Philadelphia.....	53	53 1/2
United Railways & Electric Company, Baltimore.....	12	a12 1/2
United Railways Inv. Co., San Francisco (common).....	a38	37
United Railways Inv. Co., San Francisco (preferred).....	a55 1/2	53 3/4
Washington Railway & Electric Company (common).....	a42 1/2	a46
Washington Railway & Electric Company (preferred).....	a99 7/8	a93
West End Street Railway, Boston (common).....	92 1/2	93
West End Street Railway, Boston (preferred).....	104 1/2	a104 1/2
Westinghouse Electric & Manufacturing Company.....	a84 1/4	85 1/2
Westinghouse Elec. & Mfg. Company (1st pref.).....	a124 1/2	a124 1/2

aAsked.

*Last sale.

First Annual Report of the Chicago Railways Company

The first annual report of the Chicago Railways Company for the year ended Jan. 31, 1909, has been made public. The income statement shows the results from the operation of the property for the joint account of the company and the City of Chicago under the terms of the ordinance of Feb. 11, 1907.

This income statement follows:

Income from:	
Passengers.....	\$10,773,914.50
Chartered cars.....	4,619.00
Mail.....	31,812.60
Advertising.....	44,333.34
Rent of land and buildings.....	14,632.77
Rent of equipment.....	33,973.50
Sale of power.....	17,925.30
Interest on deposits.....	41,711.13
Miscellaneous income.....	74,149.02
Gross income.....	\$11,937,071.16
Expenses:	
Maintenance of way and structures.....	\$544,763.11
Maintenance equipment.....	844,711.68
Renewals.....	171,201.44
Operation power plants.....	1,000,148.87
Operation cars.....	3,618,693.64
General expenses.....	1,119,638.69
Expense account investment real estate.....	54,837.22
Taxes.....	371,955.16
Total expenses.....	\$7,725,949.81
Balance.....	\$3,311,121.35
Deduct interest at 5 per cent on valuation.....	1,739,684.39
Net income.....	\$1,571,436.96
Division of net income:	
City of Chicago, 55 per cent.....	\$864,290.33
Chicago Railways Company, 45 per cent.....	707,146.63

The traffic statistics for the year ended Jan. 31, 1909, follow:

Car mileage:	
Passenger cars, miles.....	43,857,066
Mail cars, miles.....	164,388
Total.....	44,021,454

		Per cent of total.
Passengers carried:		
Revenue.....	217,400,335	58.18
Free.....	2,947,287	00.79
Transfer.....	153,295,766	41.03
Total.....	373,643,388	100.00
Percentage of revenue and free passengers using transfers.....		69.57
Percentage of operating expenses to gross income.....		65.06
Percentage of renewals to gross income.....		1.57
Percentage of taxes to gross income.....		3.37
Total.....		70.00
Percentage of interest on plant value to gross income.....		15.76
Percentage of net divisible income to gross income.....		14.24
Total.....		100.00

The income statement of the company for the year ended Jan. 31, 1909 (non-partnership account), follows:

Items of income:	
The company's proportion of income from joint operation.....	\$707,146.63
Interest allowance on valuation of property.....	1,739,684.39
Interest on bank balances.....	99,872.75
Interest on treasury securities.....	38,933.03
Interest on bonds and collateral notes not issued.....	153,664.78
Gross income from all sources.....	\$2,739,301.58
Deductions:	
Interest accrued on—	
First mortgage bonds.....	\$400,000.00
Consolidated mortgage bonds.....	1,213,015.58
Collateral and funding notes.....	414,613.26
Underlying securities.....	29,986.54
Miscellaneous items.....	1,571.98
Sinking fund reserve accrued.....	250,000.00
Corporate expenses and adjustments.....	124,139.64
Total deductions.....	2,433,327.00
*Net income available for dividends.....	\$305,974.58

*NOTE.—From this amount a payment was made to the depositaries, who disbursed from same an equivalent to 4 per cent to the holders of Participation Certificates, Series 1, Chicago Railways Company.

Decision Against Metropolitan Securities Company Affirmed

The judgment of the United States Circuit Court, awarding William W. Ladd, receiver of the New York City Railway, plaintiff in a suit against the Metropolitan Securities Company, \$5,271,582.54, has been affirmed in a decision rendered by the United States Circuit Court of

Appeals. The amount awarded Mr. Ladd is the balance of \$8,000,000 that the Metropolitan Securities Company agreed to advance to the New York City Railway to enable the latter to carry out its agreement with the Metropolitan Street Railway, whereby it was to furnish money for improvements. The principal point of contention at the trial last fall was whether the money to be advanced by the Metropolitan Securities Company was a loan or a purchase of the \$8,000,000 in improvement notes, issued by the Metropolitan Street Railway. The Court of Appeals, among other things, says:

"But whatever would be an accurate description of the strict legal nature of the obligation between the Metropolitan Securities Company and the New York City Railway, one thing seems absolutely clear, and that is, it was not a contract of loan. Nothing in the case indicates that the Metropolitan Securities Company was loaning the money to the New York City Railway. No promise to repay was executed, no evidence of the loan was delivered, no time for the repayment was fixed, no rate of interest was agreed upon, and none of the ordinary indications of a loan, particularly a loan of such magnitude as \$8,000,000, exists. But much weightier than the fact that all ordinary evidences of a loan are wanting is the fact shown by all the evidence and all the circumstances of the case, that nobody imagined at the time that the transaction was a loan or had any analogy to a loan. The Metropolitan Street Railway had furnished the securities upon which the money was to be raised.

"They were in the shape of negotiable securities. They had been transferred for value before maturity to innocent purchasers in good faith, and no defense could be interposed to them. The money had been raised and deposited with the Metropolitan Securities Company, subject to the call of the New York City Railway. It was just as though that amount had been deposited in a bank subject to the checks of the New York City Railway. It was intended to be expended in permanent betterments of the property of the street railway, to provide for which the railway had parted with its securities for a like amount. The suggestion made now that this was a loan, that the New York City Railway supposed or that any of the parties concerned imagined that the New York City Railway, after it expended that \$8,000,000, was at some future time to repay it in cash to the Metropolitan Securities Company, seems to us absolutely untenable."

Report of the Vienna Tramway System

The report of the Vienna municipal tramways for 1908 has just been made public and shows an increase in passenger receipts on the electric lines of 9.7 per cent. Part of this was due to the crowds attracted to Vienna during the Imperial jubilee, part to extensions of the system. The gross receipts from passengers last year amounted to Kr. 33,868,992 (\$6,773,800). The day of lightest traffic was Aug. 9; of heaviest traffic Nov 1. The average single fare paid was 14.38 heller (2.876 cents).

The system comprises 458.169 km (286.36 miles) of track, of which about 90 per cent is electric, the rest steam, and possesses 1056 motor cars, 998 trail cars, 153 snow plows and 64 work cars. Of the snow plows 122 are operated by horses, 8 by electric motors and 23 are attached to motor cars. In addition the system includes three automobile bus lines, one of which is a trackless trolley line with 4 cars. These cars are equipped with two 20-hp motors each and accommodate 14 seated and 10 standing passengers each. The street is equipped with four overhead wires so that the line is practically a double-track road. There are also 14 gasoline automobiles and two storage battery automobiles. The trackless trolley line was in operation only during the last two and a half months of 1908.

In the electric service there were 91 serious and 10 fatal accidents, 29 of these serious casualties, and 1 fatal accident occurred to persons boarding or leaving cars in motion.

Some statistics follow:

Average length of route in km.....	1908. 198.3	1907. 187.9
Car kilometers, in thousands.....	69,098	62,430
Passengers carried, in thousands.....	238,050	216,901
Receipts in thousands of kroner.....	33,868	30,885
Average per km. of track per day:		
(a) car kilometers.....	997	911
(b) passengers carried.....	3,435	3,163
(c) receipts in kroner.....	488.73	459.44
Average per car kilometer:		
(a) passengers carried.....	3.4	3.5
(b) receipts in kroner.....	0.49	0.495
Average cash fare in kroner.....	0.1438	0.1429

The Copenhagen Tramways

The tramway system of Copenhagen, Denmark, is supplied by three tramway companies which in the order of

their size are the Copenhagen Tramway Company, the Fredericksborg Tramway Company and the Suburban Tramway Company. The latter is largely an excursion line. The gross receipts for 1908 in American currency were:

Name of Company.....	Receipts. 1907.	Per Cent Increase Over 1907.
Copenhagen Tramway Company.....	\$1,720,654	3.4
Fredericksborg Tramway Company.....	319,059	3.5
Suburban Tramway Company.....	82,077	3.0

Statistics of last year's operation follow:

Tramways.	Copen- hagen.	Fredericks-Suburban borg. Comp.
Length of line, km.....	59	12.2 6.28
Length of electric line, km.....	56.5	11.0 6.28
Population served.....	471,661	92,500
Population per km.....	8,188	8,409
Passengers per km.....	1,187,879	1,098,173
Passengers (electric).....	1,208,355	1,044,005 328,253
No. of tons per km. (El. lines).....	84,585	73,080 22,978
Rides per inhabitant per year.....	149	143.7
Rides (electric lines).....	144.7	124
Motor car km., per km.....	222,547	178,481 95,007
Trailer km., per km.....	92,370	38,564 33,610
Horse car km., per km.....	159,621	238,860
Load factor of traffic.....	0.85	0.66
Capital stock, per km.....	\$44,603	..... \$62,832
Gross receipts per km.....	29,164	26,155 13,670
Passenger receipts (electric) per km.....	29,475	24,304 11,422
Passenger receipts (horse) per km.....	14,900	21,036
Pas. receipts per train or motor c. km....	13	13.0 12
Gross receipts per calc. car kh.....	3.11	12.5 11.2
Gross receipts per inhab. per year.....	3.63	3.47
Pass. receipts per inhab. per year.....	3.5	2.6
Receipts per passenger.....	2.4	2.36 4
Total exp. per km. (electric).....	20,700	17,870 7,062
Total exp. per km. (horse).....	19,350	41,367
Watt-consumption per tr. km.....	673	679 453.6
Franchise charges per km.....	1,800	1,304 147
Exp. in per cent of receipts.....	20.4	22 54

¹ Passengers estimated at 70 Kg. each, ² including omnibuses. ³ In obtaining this figure one-half of the trailer mileage is added to the motor car mileage.

Interborough Rapid Transit Report for Year

The Interborough Rapid Transit Company has issued a statement of income for the year ended May 31, 1909, as follows:

Gross earnings.....	\$25,594,439
Operating expenses.....	10,799,650
Net earnings.....	\$14,794,789
Other income.....	1,404,769
Gross income.....	\$16,199,558
Rentals of Subway and Manhattan Railway.....	8,021,281
Taxes.....	1,786,520
Total rental and taxes.....	\$9,807,801
Balance.....	6,391,757
Interest charges, Interurban Rapid Transit Company.....	1,996,370
Balance.....	\$4,395,387
Discount, etc.....	19,185
Surplus for dividends.....	\$4,376,202

Report of Chicago Railways Company for May

The Chicago (Ill.) Railways Company has reported its earnings for May, 1909. A comparative statement of the earnings follows:

May.	1909.	1908.
Gross earnings.....	\$1,055,160	\$902,482
Expenses:		
Maintenance way and structures.....	55,180	41,015
Maintenance equipment.....	59,501	67,678
Operation power plants.....	110,832	78,073
Operation cars.....	325,010	290,220
General expenses.....	124,619	103,960
Expense investment real estate.....	3,446	2,798
Taxes (estimated).....	31,156	16,608
Total.....	\$709,744	\$600,352
Balance (actual).....	345,416	302,129
Balance based 70 per cent operating.....	316,548	270,744
Deduct interest 5 per cent on valuation.....	176,437	137,625
Net income.....	\$140,110	\$133,118
City of Chicago, 55 per cent.....	77,060	73,215
Chicago Railways Company, 45 per cent.....	63,049	59,903

Carlisle & Mount Holly Railway, Carlisle, Pa.—The property of the Carlisle & Mount Holly Railway has been sold to the Cumberland Railway, recently organized. The officers of the Cumberland Railway are: John Graham, Newville, Pa., president; Walter Stuart, Carlisle, Pa., secretary and treasurer; W. F. Pascoe, Carlisle, Pa., general manager.

Dallas (Tex.) Electric Corporation.—Stone & Webster, Boston, Mass., offer, subject to previous sale, 6 per cent cumulative stock and common stock of the Dallas Electric

Corporation, consisting of 10 shares of first preferred stock and four shares of common stock at \$925. A circular gives the gross earnings of the company for the year ended May 31, 1909, as \$1,230,639 and the balance as \$68,843, and estimates the earnings of the company for the year ending Dec. 31, 1909, to be \$1,303,303 and the balance for the same period to be \$117,664.

Eastern Pennsylvania Railway, Pottsville, Pa.—Julius Christensen, Philadelphia, Pa., offers at 93 and interest to yield 5½ per cent the unsold portion of a block of \$100,000 of first mortgage 5 per cent gold bonds of the Eastern Pennsylvania Railway, dated 1906 and due July, 1936, but subject to call at 110 and interest. The bonds are of the par value of \$500 and \$1,000, and interest is payable in New York in January and July. They are part of an authorized issue of \$6,000,000, of which \$3,002,500 are outstanding. The Central Trust Company, New York, is trustee of the mortgage under which the bonds are secured.

Illinois Traction System, Champaign, Ill.—William B. McKinley and his associates in the Illinois Traction System are understood to have concluded negotiations for the purchase of the property of the Des Moines Electric Company as a nucleus for a system of interurban electric railways to extend from Des Moines.

Indianapolis & Cincinnati Traction Company, Indianapolis, Ind.—Charles L. Henry, president and receiver of the Indianapolis & Cincinnati Traction Company, has requested the court to extend the receiver's certificates so they will not become due until Aug. 1, 1910. Mr. Henry says that he proposes to extend the road from Connersville to Hamilton, Ohio, so as to secure an entrance to Cincinnati.

Iowa Light & Traction Company, Boone, Ia.—E. E. Hughes, Boone, Ia., J. H. McBride, Philadelphia, Pa., and Andrew Stevenson, Chicago, Ill., have purchased from the estate of L. W. Reynolds, the property of the Boone Electric Company and the Boone Suburban Railway, which includes all the public utilities in Boone, and after Sept. 1, 1909, will operate the properties under the name of the Iowa Light & Traction Company under a new franchise for the city for 25 years. It is proposed thoroughly to rehabilitate the different systems and to extend the Boone Suburban Railway from its present terminus on the Des Moines River to Ogdan, 3½ miles distant. The officers of the Iowa Light & Traction Company follow: Henry S. Osborne, chairman of the board of directors, Chicago, Ill.; Andrew Stevenson, president and general manager, 153 La Salle Street, Chicago, Ill.; E. E. Hughes, vice-president and treasurer, Boone, Ia.; J. H. McBride, second vice-president, Philadelphia, Pa., and J. F. Hardin, secretary, Eldora, Ia.

Public Service Investment Company, Boston, Mass.—An initial quarterly dividend of 1½ per cent has been declared on the preferred stock of the Public Service Investment Company, payable on Aug. 2, 1909, to stock of record on July 19, 1909.

Second Avenue Railroad, New York, N. Y.—Judge Lacombe of the United States Circuit Court has signed an order extending the time for all parties to take testimony in the foreclosure proceedings instituted by the Guaranty Trust Company against the Second Avenue Railroad until Oct. 9, 1909. Under this order the complainant has until Aug. 9 and the defendant until Sept. 9 for the taking of testimony, and from that date until Oct. 9 the complainant is allowed to take testimony in rebuttal.

Virginia Railway & Power Company, Richmond, Va.—The distribution of the securities of the new Virginia Railway & Power Company, common and preferred stock and bonds, is expected to be made by the Equitable Trust Company, of New York, on July 25. Registrar and transfer agents have been appointed as follows: For Philadelphia, Guarantee Trust & Safe Deposit Company, registrar, Trust Company of North America, transfer agent; for New York, Equitable Trust Company, registrar, D. J. Gallagher, transfer agent; for Baltimore, Baltimore Trust & Guarantee Company, registrar, Fidelity Trust Company, transfer agent; for Richmond, Virginia Trust Company, registrar, Bank of Richmond, transfer agent.

Winchester & Washington Railway, Winchester, Va.—At the annual meeting of the Winchester & Washington Railway on July 6 the following officers were elected: Lewis F. Cooper, Winchester, president, to succeed the late Scott H. Hansbrough; Charles Mullikin, Boyce, vice-president; Shirley Carter, secretary-treasurer, and the following directors: Lewis F. Cooper, C. Mullikin, E. V. Weems, W. H. Baker, A. Moore, Harry Warden, S. L. Hoover, R. H. Chew and R. Cray Williams. A dividend of 3 per cent was declared for the six months.

Traffic and Transportation

Rules for City Car Inspectors in Cincinnati

The following rules have been adopted by the Board of Public Service of Cincinnati for the guidance of the chief car inspector and his five assistants appointed in accordance with the provisions of an ordinance passed recently by the Council of Cincinnati as noted on page 1100 of the *ELECTRIC RAILWAY JOURNAL* of June 12, 1909:

"1. All inspectors will be required while on duty to wear the official badge, bearing the words 'Street Car Inspector' and showing the city seal; the badge of the chief inspector is to bear the additional word 'Chief.' Inspectors will, when necessity arises, exhibit their badges as their authority for acting in their line of duty. No inspector will be allowed to ride on the front end of any car or converse with the motorman while the car is in motion and all must studiously avoid any arguments with motormen, conductors, or other employees of any street car company with which they have dealings.

"2. Inspectors shall make daily reports to the chief inspector on forms provided for the same, and the chief inspector shall make reports to the Board of Public Service at least once a week, and at any other time as ordered or as necessity may require.

"3. It shall be the duty of inspectors to inspect all street cars operated in Cincinnati as frequently as possible, by examining the condition of the safety brakes, service brakes, wheels, gears, sand boxes, fenders and all other equipment, and noting the condition of the cleanliness and sanitation.

"4. By ordinance of Council the chief inspector and inspectors have the right to enter any barn belonging to any company operating street cars in Cincinnati, for the purpose of making inspections. Inspectors must not hold any car at the end of the line after schedule time is up to leave unless found defective.

"5. Regular inspections shall be made in the barn before the cars are run out, and at the further end of routes, except in cases of companies having lay-over terminals in the city, and in such cases inspection may be made in or at such terminals.

"6. Inspectors shall forbid the use of cars which are found by them to be in an unsafe condition, and any cars so found will be reported to the barn foreman or man in charge of the barn at once, such report being made in writing on a form prepared for that purpose as provided for in Rule No. 8. When cars so reported are repaired and put into a safe condition they will be re-inspected as promptly as possible by the inspector, and if found to be in good condition, written release will be given by the inspector, allowing the car to be put back into service, but in all cases inspectors shall so arrange as to re-inspect cars within 12 hours after they are notified that they are ready for such re-inspection.

"7. While all regular inspections must be made as provided for in Rule 5, inspectors have the authority to stop any street car at any point on the streets of Cincinnati, in case they have good and sufficient reason to believe that such car has need of immediate inspection. Inspectors are specifically directed, however, to refrain from stopping cars while in operation on the streets except in cases of emergency, it being necessary to bear in mind that the safety and convenience of the traveling public are to be considered, and traffic is not to be delayed except in extreme cases. Cars on the street must not be turned into the barn unless absolutely necessary by reason of unsafe condition, and all such cars will be treated in the same way, in so far as reports and inspection are concerned, as those inspected in the barn under Rule No. 6.

"8. Blank forms will be provided upon which inspectors shall report every car found to be in unsafe condition, which form shall provide space for indicating the place where the inspection is made, the line on which the car is operated, the car number, the number of the conductor and motorman, and the direction in which the car is going (if the car is in operation on the streets), together with all details as to the condition discovered.

"9. If, in case of an emergency inspection on the streets, a car is found unsafe and is turned in, the inspector must accompany the car to the barn and see that his order is complied with and make proper report to the barn foreman.

"10. Inspectors will give no orders to any employee of any company except when emergency inspection shows that safety requires the car to be turned in, when the motorman and conductor will be so instructed.

"11. Inspectors will not make known the result of their inspection except to barn foreman or other officials of any traction company authorized to receive such report, as

provided in Rule No. 6, to the motorman or conductor in charge of car turned in from emergency inspection, and to the chief inspector, in their daily reports. Under no circumstances shall inspectors give any information or make any statement whatsoever to any other persons regarding conditions of cars inspected.

"12. Inspectors must not forbid cars to be run out of barns nor order cars turned in upon any statement or complaint whatsoever, whether it be made by an employee of any company or any other person. In every case inspectors must make their own examinations.

"13. Inspectors shall not have anything to say concerning the ordinary running or operation of cars, and will refrain from assisting in relieving blockades, settling disputes between passengers and employees, or taking part in any affairs of a similar nature.

"14. Inspectors will arrange so as to go over the tracks of every street railway operating in Cincinnati as frequently as possible, paying especial attention to all tracks on grade; and they shall report all unsafe conditions that may be found, including such report in their daily report to the chief inspector, and giving the exact location and conditions as found.

"15. In fair weather, when tracks on grades do not require the attention of inspectors, they shall endeavor, as far as possible, without interfering with the inspection of cars, to watch the schedule of the various lines as to the headway and number of cars operated so as to be able to furnish the chief inspector with such information as will make it possible for him to at all times give the Board of Public Service all information with reference to car schedules."

Arbitrators Decide in Favor of Pittsburgh Railways Company

In the settlement of the differences between the employees of the Pittsburgh Railways Company and the company recently only one subject was left over for final adjustment. This was the question of whether a motorman discharged for drinking while in uniform should be reinstated, the company's rule covering this point making discharge the punishment on the first offense. D. B. Oliver and W. J. Brennan acted as arbitrators, and they sustained the company in declaring rigid enforcement of the rule "necessary for the good of the service," but expressed the opinion that in the case under review discharge was too drastic a punishment, this being the first offence. The decision of the arbitrators follows:

"In pursuance of our appointment as arbitrators in the dispute between the Pittsburgh Railways Company and its employees, we met and considered the questions involved and the subjects submitted to arbitration and agreement. The question at issue is the summary discharge of James Ashford, a motorman in the company's service. The company claims Ashford violated one of its rules by entering a tavern and taking a drink of liquor while wearing the company's uniform. Ashford admits the truth of the charge.

"After considering the matters submitted to arbitration and agreement, we came to the conclusion that we could agree without the selection of a third arbitrator, as the matters in controversy were not of such character as required the taking of testimony, as the facts and questions involved were not disputed by either side of the parties to the controversy.

"Owing to the weighty responsibility lying on the company in case of accidents involving loss of life or limb, or damage to property, the interest of the general public, the company and its operating force require that the company shall have a free hand in the matter of hiring and discharging its employees. Under existing conditions we regard this as imperative; at the same time due discretion is to be used by the company in exercising these powers so as to induce and promote faithful and efficient service on the part of its employees, and just and generous treatment of them by the company; they must be exercised in good conscience and no snap judgment must be taken, and care must be had that they do not at any time become the means of carrying out the dislikes that sometimes arise in the minds of the sub-bosses.

"In Ashford's case we find that he was, in the language of the rule, 'sober and temperate,' that he had been an acceptable employee of the company for 12 years; that on the occasion in question he had finished his run and had worked some over-time and was on his way home; that it took place in a saloon on a street on which there is no car line, to which he was followed by the inspector who reported him. The rule, dated April 20, 1907, is as follows:

"For the betterment of the service and the safety of the public, it will from this date be the policy of this company not to retain in its employ men who use intoxicating liquors or cigarettes or are in the habit of gambling.

While it is the privilege of each individual to eat, drink and smoke what he pleases, it becomes the duty of this management to have in the service only men of sober and temperate habits, physically and mentally able to perform the duties to which they may be assigned. For employees discharged for violation of any of the provisions of this rule there is no appeal."

"Another rule found in a book issued to the employees relates to drinking intoxicating liquors and makes discharge the penalty for infraction. It says:

"Entering, while in uniform or while on duty any place where the same is sold or dispensed, except in case of necessity."

"The main object of this rule is to provide that the men shall be 'sober and temperate;' that is its primary consideration, all else is secondary. The rule is good and necessary, but a method of its enforcement which, for a first violation of one of its provisions summarily compels the loss to the company of the services of a capable employee and to that employee his means of support for himself and family, cannot be regarded as a just and generous enforcement or of a kind to win faithful and efficient service on the part of its employees.

"In view, therefore, of these conditions, our finding is that James Ashford be reinstated in the company's employment and that he be allowed 20 days' pay for the time he was off duty."

Finding of Massachusetts Commission in Methuen Fare Case

On June 25 the Massachusetts Railroad Commission gave a hearing on the petition of the Selectmen of Methuen for a reduction of the fare from 10 cents to 5 cents on the Lawrence-High Dracut line of the Boston & Northern Street Railway between the Broadway and Essex Street transfer station in Lawrence and the Methuen-Dracut town line, as mentioned on page 54 of the *ELECTRIC RAILWAY JOURNAL* for July 3, 1909. The opinion of the commission, rendered on July 9, follows:

"The application, briefly stated, requests the board to recommend to the Boston & Northern Street Railway Company an extension of its fare zone in the town of Methuen to the Dracut line. The present fare limit is at a point known as 'Private Lands,' where the line of the company leaves the highway and for something over a mile runs over private lands to the Dracut line. The existing fare zone is one of three covering the route from Lowell to Lawrence, and the established fare between these cities is 15 cents, with transfer privileges.

"Any readjustment of the fares in Methuen as petitioned for would have an important if not a controlling effect upon the through fare from Lowell to Lawrence, and might have a serious effect upon existing privileges of free transfer. The sole question before the board is the reasonableness of the rate. Having in view the present fares of the company, and the free transfer privileges, it does not appear that the fare complained of is unreasonable or excessive, and we do not therefore recommend the extension of the fare limit.

"During the hearing it appeared that conductors of cars over this route are accustomed to make collection of fares before reaching the zones for which the fare is payable, resulting, in some instances, in overcharge for patrons not intending to make the through trip between Lowell and Lawrence. The attention of the company is specifically directed to this condition, and the board recommends that clear and specific instructions be given by the management with respect to the established fare zones and points of collection."

Letter to Springfield (Ill.) Consolidated Railway Employees on Conduct

C. S. Goodwill, superintendent of transportation of the Springfield (Ill.) Consolidated Railway, recently addressed the following letter to the employees of the company:

"This letter is addressed to you, and I hope will appeal to you in what it contains. Your hearty co-operation cannot help but get good results for yourself and the company for which you are working.

"Remember that a company is judged by the public through the appearance and gentlemanly conduct of its employees. Be neat and clean at all times. Don't forget to blacken your shoes once in a while. Be courteous in answering questions. Don't carry on unnecessary conversation with passengers.

"Motormen should not talk to passengers while cars are in motion. Motormen should ring their gong at all cross-streets and when passing vehicles in the street. Your at-

tion is especially called to the ringing of gongs. In the future this will be watched closely, and I hope it will not be necessary to cause any one any inconvenience for not obeying this rule.

"Motormen should not run with vestibule gates open at any time.

"When carrying large loads, motormen, help your conductor all you can.

"Don't 'yell' at the crews on passing cars. Don't run by another car that is standing still, or running, at a reckless rate of speed.

"Conductors now have open cars to work, on most lines, and should be careful about people getting on or off while the cars are in motion. Don't be afraid to 'yell' at them 'Wait until the car stops.' Let them know that you are alive; it may save you writing out an accident report.

"Your attention is called to the careful operation of your car at all times. It is not necessary to run like mad from one end of the line to the other and abuse the car equipment. Take your time feeding the power by your controller.

"Don't be taking in all the sights through the city while your car is in motion.

"Don't forget to make your safety stops or slow-downs. Be careful at railroads. Look back before starting your car at railroads to see that no one is getting on or off.

"If you should have an accident, don't forget to make a full report at once, and be sure to get plenty of witnesses. All serious accidents report to the inspector, or direct to the office by telephone. Look—and be sure at railroad crossings. Don't take any chances.

"When you have read this, sign your name and give it to the inspector in charge."

Tacoma Company Experimenting with New Safety Car Gates.—The Tacoma Railway & Power Company, Tacoma, Wash., is experimenting with a new safety car gate with a view of adopting it for use on all its cars.

Bonuses for Employees in Washington, D. C.—Through a typographical error in the *ELECTRIC RAILWAY JOURNAL* of July 17, 1909, it was stated that the Capital Traction Company, Washington, D. C., distributed \$1,600 in bonuses to 226 of its motormen and conductors for efficient service during the year. The amount distributed by the company was \$16,000.

Extension of Pay-as-You-Enter System in Columbus, Ohio.—The Columbus Railway & Light Company has extended the use of pay-as-you-enter cars to its Main Street line. Cars of this type were first placed in operation on the Oak Street line of the company, and it is said that not a single serious accident has been reported on this line during the four months that the pay-as-you-enter cars have been in service.

Additional Transfer Points in Philadelphia.—Twenty-eight additional transfer points have been established by the Philadelphia Rapid Transit Company for the convenience of the residents of South Philadelphia. The company has also decided to inaugurate a double-loop system between Arch Street and Catharine Street and Second Street and Eighteenth Street. The purpose of this loop is to enable patrons to reach the central section of the city from points downtown, and vice versa, for one fare.

New Trolley Express Service Between Boston and Worcester.—A two-car express passenger service was inaugurated by the Boston & Worcester Street Railway, Boston, Mass., between Boston and Worcester on July 12. The express cars leave Worcester at 8:05 a. m. and 9:05 a. m. and arrive at Park Square, Boston, at 9:50 a. m. and 10:50 a. m., respectively, and leave Park Square at 4 p. m. and 5 p. m., and arrive at the City Hall, Worcester, at 5:45 p. m. and 6:45 p. m., respectively. Only two stops are made between Boston and Worcester.

Traffic Records Broken in Portland, Ore.—B. S. Josselyn, president of the Portland Railway, Light & Power Company, Portland, Ore., has compiled a record of passenger business handled by the company during the Rose Festival week. During the six days of the festival the various divisions of the service carried the unprecedented total of 1,751,745 passengers, an average of 291,957 for each day. During the celebration last year the company carried 1,564,145, the increase this year over last being 187,600, or 12 per cent. Not an accident or a mishap of consequence occurred during the week.

Employees' Benefit Association of the Fort Wayne & Wabash Valley Traction Company.—The report of Chas. W. Guild, treasurer of the Fort Wayne & Wabash Valley Traction Company Employees' Mutual Benefit Association, which is composed of employees of the Fort Wayne &

Wabash Valley Traction Company, Fort Wayne, Ind., shows that the association has paid out \$2,712.19 since Oct. 1, 1907, of which amount \$2,100 was distributed in death claims. The secretary of the association reports that the association has a total membership of 673. This is 90 per cent of the entire number of men employed by the company.

Warning Signs in Chicago.—The Chicago (Ill.) City Railway has posted signs in all of its cars which call attention to the dangers of crossing tracks in front of moving cars and of getting caught between cars running in opposite directions. The text of the poster is: "Be careful. Take no chances when crossing tracks. To be run down by or caught between cars means serious injury. Vigilance is the price of safety." The posting of these signs is part of a general campaign by the company to warn people of the dangers of getting caught between cars operating over the reconstructed lines in Chicago which have a standard distance between track centers of 9 ft. 8½ in.

Trolley Trips in the Hudson-Mohawk Valleys.—This is the title of a very interesting folder issued by the Schenectady (N. Y.) Railway, describing the many historic places along its lines in the Hudson and the Mohawk Valleys. The Schenectady Railway operates three separate lines: from Saratoga Springs to Schenectady, from Schenectady to Albany, and from Schenectady to Troy. The folder opens with a paragraph on the early history of transportation between Schenectady and Albany, and illustrates, in colors, the first steam locomotive to operate between the two cities on Sept. 24, 1831. It also contains an illustrated description of the encounters between the Indians and the early settlers in the region traversed by the Schenectady Railway. There are two maps, which show the lines of the Schenectady Railway and its connections, and one of Lake George. The publication is concluded with the rates of fare and a list of connections made with other transportation lines in the territory served by the company. The covers are printed in colors and are illustrated with scenes in the principal streets in Saratoga, Schenectady, Troy and a picture of the State Capitol at Albany.

Interchange Order in Indiana.—Mention was made on page 93 of the *ELECTRIC RAILWAY JOURNAL* of July 10, 1909, of the order issued by the Indiana Railroad Commission directing that on or before Aug. 15, 1909, the Evansville, Suburban & Newburg Railway and the Evansville Terminal Railway establish a connection and interchange freight after that date. The order of the commission follows: "It is now ordered that the said respondents on and after Aug. 15, 1909, shall interchange with each other all business in carload lots moving from one line to another, from one point to another point in this State. It is further ordered, that on or before Aug. 15, 1909, the said respondents, Evansville, Suburban & Newburg Railway and Evansville Terminal Railway, shall construct on the north side of their said railroads at the point of intersection near Newburg, Ind., a track of railway to be used by said companies as a transfer track between their said lines, the cost of constructing and maintaining said track to be borne equally by said respondents. It is further ordered that a copy of this order duly certified shall be forwarded by the secretary to the general managers or superintendents of said companies by registered mail."

Awards for Suggestions in Philadelphia.—The Philadelphia (Pa.) Rapid Transit Company has awarded cash prizes to motormen and conductors who have submitted suggestions of value to the management. Ten men received \$10 each and 56 men received \$2 each. The prizes of \$10 each were awarded for suggestions covering a variety of subjects. One first-prize winner suggested a change in route to avoid two crossings, another made a suggestion for the use of the back of transfers, another suggested means for the co-operation of employees in accident work, another suggested improvements in witness blanks, another suggested means for preventing boarding and alighting accidents. The company has issued the first of a series of cards commenting on the suggestions received. This card says: "A considerable number of letters submitted by conductors and motormen in connection with our recent 'suggestion' contest touched upon the fact that some few motormen still persist in the needlessly dangerous practice of starting their cars upon receipt of but one bell. The regulations covering the matter of signals are very clearly set forth. Failure to observe them can be attributed only to indifference. If your signal bell does not work properly report the matter at once. Motormen are herewith cautioned against putting their cars in motion until they first shall have received the full signal of two bells."

Personal Mention

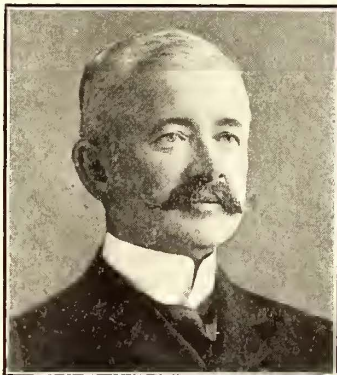
Mr. Walter S. Heaton has been appointed claim agent of the Los Angeles-Pacific Company, Los Angeles, Cal. Mr. Heaton was formerly general Western agent of the Ohmer Fare Register Company.

Mr. Francis A. Stratton, president of the Northern Westchester Lighting Company and the Peekskill Lighting & Railroad Company, Peekskill, N. Y., has been elected president of the Westchester Lighting Company.

Mr. J. Brodie Smith, vice-president and general manager of the Manchester Traction, Light & Power Company, Manchester, N. H., was married on July 14 to Miss Charlotte Dodd Stewartson by the Rev. Thomas Chalmers. Miss Stewartson is a graduate of the medical department of Tufts College, class of 1900, and is a member of the Massachusetts and New Hampshire Medical Societies and since 1902 has practised in Manchester. Mr. Smith, besides being vice-president and general manager of the Manchester Traction, Light & Power Company, is treasurer of the Brodie Electric Company and is a trustee of the Manchester Savings Bank. He is also an associate member of the American Institute of Electrical Engineers.

Mr. W. A. Gibbs, whose resignation as district manager of the Ohio Electric Railway, with headquarters at Springfield, Ohio, was announced in the *ELECTRIC RAILWAY JOURNAL* of July 17, 1909, has become associated with an organization which is interested in the purchase and development of public utility properties. Mr. Gibbs and his associates have already purchased a street railway and electric lighting plant in Cambridge, Ohio, and as soon as he severs his connection with the Ohio Electric Railway Mr. Gibbs will devote his attention to the improvement and extension of the properties at Cambridge. After the rehabilitation of these utilities has been accomplished, Mr. Gibbs will assist his associates in managing other railway and light companies which they control.

Mr. H. C. Patterson, whose appointment as mechanical and electrical engineer of the Illinois Traction System, Peoria, Ill., to succeed Mr. H. C. Hoagland, was noted in the *ELECTRIC RAILWAY JOURNAL* of July 10, 1909, has had an experience of more than 30 years, covering the mechanical, electrical and hydraulic branches of engineering, being especially wide along the lines of cost of construction and maintenance of public utility properties. Previous to 1880 Mr. Patterson was engaged in construction and design of engines, boilers, tools etc. In 1880 he became connected with the engineering department of the New York Edison Company and assisted in the construction of the first station in New York. In 1882 Mr. Patterson was sent to Europe by the Edison interests to assist in constructing the first lighting stations there. From 1883 to 1886 he was connected with the sales department of the Brush Electric Company, Cleveland, Ohio. In 1885 he entered the employ of the Thomson-Houston Company, Boston, organized the engineering department and subsequently was appointed chief engineer of the company. When the Thomson-Houston Company was succeeded by the General Electric Company Mr. Patterson continued with the General Electric Company, for which he designed and constructed more than 75 railway and lighting plants. During this time he also acted as an independent consulting engineer, in which capacity he selected for the West End Street Railway, Boston, the location of its plant and was more or less closely identified with its construction. For many years Mr. Patterson was a member of the committee which managed local light and power companies in which the General Electric Company was financially interested. About 1895 Mr. Patterson was appointed receiver of the Consolidated Lighting Company, Dover, N. H., and for a year managed the railway, lighting and gas interests there. Between 1896 and 1902 Mr. Patterson was manager of the municipal lighting and water plant of Austin, Tex. Since 1902 he has engaged as an independent consulting engineer, with offices in Boston. As electrical and mechanical engineer of the Illinois Traction System Mr. Patterson will design, construct and supervise the operation of stations on



H. C. Patterson

the system. He is at present at work on a 20,000-hp plant for Venice, Ill., and another for Wichita, Kan.

Mr. F. L. Richards has been appointed trainmaster of the Illinois Traction System, with headquarters at Springfield, Ill. This is Mr. Richards' first experience in electric railway work. He has, however, had more than 20 years' experience in steam railroading. He entered railroad work in 1882 with the Erie Railroad as a telegraph operator and subsequently became a train dispatcher. In 1888 Mr. Richards became chief dispatcher for the Buffalo, Rochester & Pittsburg Railroad, and in 1890 he entered the employ of the Chicago, Milwaukee & St. Paul Railway, with which he served as dispatcher, chief dispatcher and trainmaster of various divisions. In 1903 he was appointed assistant superintendent of the Chicago, Rock Island & Pacific Railroad between Albert Lea and Minneapolis and the terminals. In 1904 Mr. Richards entered the employ of the Chicago & Alton Railroad, and remained with it until June, 1909, when he resigned to become connected with the Illinois Traction System. During his connection with the Chicago & Alton Railroad Mr. Richards acted as passenger trainmaster, trainmaster and assistant superintendent.

NEW PUBLICATIONS

Poor's Manual for 1909. New York: Poor's Railroad Manual Company; 2362 pages. Price, \$10.

This publication is now in its 42d year and its value is generally recognized. The data in the present volume are divided into three main groups: the steam railroad section, the street railway section and the industrial section, the latter including manufacturing, water, gas, electric light and other companies. In addition there are lists giving data of annual meetings, addresses of transfer agencies, dividend tables, etc. In the street railway section the roads are grouped by States except in the case of the roads controlled by Stone & Webster, which are published together, and of some holding companies which appear in the industrial section.

Grounded Electric Transmission and Electrolytic Corrosion. By J. Stanley Richmond, Consulting Engineer. Toronto, 1909: The *Canadian Engineer*. Paper, 70 pages. Price, 50 cents.

This is a reprint from the *Canadian Engineer* of a series of articles by an engineer who has made a specialty of studying the effects of electrolytic action on buried pipes and means for preventing such action. The author briefly outlines the history of the use of the earth as a return conductor in the development of various applications of electricity and gives a short bibliography of the subject. He then discusses methods of measurement for the detection of stray current, track drops, voltage contour lines, rail bonding and transverse stray transmission. The author's general conclusions on the prevention of electrolytic action are interesting and are reprinted below:

"Do everything possible to prevent assisting earthed conductors to collect stray transmission. Do everything possible to collect all stray transmission in earthed conductors at a lower voltage than the voltage of contiguous rails. Do everything possible to keep each and every portion of the return in a first-class condition—a bad return system costs considerable money every year in the form of wasted power. In any centralized system of electric traction, such as that of a city, plenty of insulated return copper is a good investment for the traction company.

"Electrolytic corrosion of pipes due to grounded transmission mediums can be made a negligible factor by:

- "(1) Good condition of bonding.
- "(2) Special long bonding at all special track work.
- "(3) Insulation of generators from ground in power house—this includes the connections between the generators and the switchboard.
- "(4) Insulation of all auxiliary return copper between switchboard and equi-voltage points—this includes pipe drainage copper.
- "(5) Removal of all bond connections between rails and other earthed conductors, such as pipes, cable sheaths, etc.; the only connections permissible being those to pipe drainage and insulated return cables.
- "(6) Treatment of bad local conditions at outlying dangerous points.

"Don't bond cable sheaths to the track rails. Run an insulated 'stray transmission cable' in a duct by itself. To this cable should be bonded at each manhole all the cable sheaths, the connection between the bonded sheaths and the insulated 'stray transmission cable' to be by means of insulated jumpers. To drain the 'stray transmission cable' it should be connected to the low voltage side of the generators in the power house, but not to the pipe drainage cable."

Construction News

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

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

RECENT INCORPORATIONS

Monterey & Del Monte Heights Railway, Monterey, Cal.—Incorporated to construct a street railway from Monterey to Seaside, a distance of 5 miles. Capital stock, \$100,000. Officers: H. R. O'Bryan, president; Geo. W. Phelps, vice-president; A. G. Metz, secretary and treasurer, and F. M. Fairchild, 1707½ Oak Street, San Francisco, general manager. [E. R. J., July 3, '09.]

***Detroit, Lansing & Grand Rapids Railway, Lansing, Mich.**—Incorporated to build an electric railway to connect the cities named in the title. Capital stock, \$25,000. Incorporators: Oliver H. Lau and Henry M. Wallace, Detroit.

***Cedar Point (Ohio) Railway.**—Incorporated to build an electric railway along the lake shore to connect the Cedar Point resort with the Lake Shore Electric Railway at Sandusky. Capital stock, \$10,000. Incorporators: W. C. Phelps and others.

***Northwestern Traction Company, Columbus, Ohio.**—Chartered to build an electric railway from Newark via Fallsburg, West Carlisle, Cooperdale and Wakatomika to Coshocton and New Philadelphia. Capital stock, \$25,000. Incorporators: G. W. Oxley, E. S. Crawford, T. S. Sharpless, S. H. Miller and J. M. Magruder.

***Interstate Interurban Railway, Waynesburg, Pa.**—Chartered to build electric railways in West Virginia and Pennsylvania. Capital stock, \$8,400. Incorporators: W. J. Sheldon, McKeesport, Pa.; J. C. Sheldon, Buffalo, N. Y.; T. H. Shannon, R. B. Blair and R. B. Chaleroi, Waynesburg.

Marshall (Tex.) Traction Company.—Incorporated to build an electric railway within the corporate limits of Marshall. Capital stock, \$25,000. Incorporators: Marvin Turney, F. H. Prendergast, John Copeland and others. [E. R. J., Jan. 16, '09.]

***Helper Western Electric Railway, Helper, Utah.**—Incorporated in Utah to build an electric railway from the Denver & Rio Grande Railroad at a point 2 miles southeast of Helper, through Carbon County. Capital stock, \$15,000. Incorporators: J. F. Williamson, Salt Lake City, president; C. L. Crandall, vice-president; H. B. Tyrrell, Provo, secretary and treasurer; G. W. Higgins, Clinton, Ind., and J. A. Thorne, Springfield, Ill.

***Clark County Railway, Vancouver, Wash.**—Incorporated to build electric railways in Clark County. Headquarters, Vancouver. Capital stock, \$150,000. Incorporators: Bert Yates, J. W. Sifton and O. C. Spencer. Directors: Jas. G. Kidwell, Walla Walla; J. H. Murphy, A. Welch, C. E. Moulton and O. C. Spencer.

FRANCHISES

***Escondido, Cal.**—G. W. Pursell, San Diego, has applied to the City Council for a franchise for an electric railway to be built from San Diego to Escondido.

Ocean View, Cal.—The Board of Trustees has granted to the Southern Pacific Railroad a franchise for the construction of an electric railway, that company being the only bidder. The franchise provides that the company may enter and leave the city via Shattuck Avenue and California Street.

***Yuma, Col.**—Messrs. Karr, Kester & Speese have applied to the City Council for a 25-year franchise over the streets of Yuma for an electric railway to be operated in connection with the Colorado River Railroad, which they propose to build.

Galesburg, Ill.—S. F. Atwood, secretary of the Peoria & Galesburg Railway, has applied to the City Council for a 35-year franchise to operate a street railway in Galesburg. [E. R. J., May 15, '09.]

Hampton, Ill.—A 20-year franchise has been granted to the Tri-City & Northeastern Interurban Railway, Port Byron, by the Town Board. J. W. Simonson, Port Byron, president. [E. R. J., June 19, '09.]

Paxton, Ill.—The Chicago, Kankakee & Champaign Electric Railway has been granted a 50-year franchise by the Board of Trustees to construct an electric railway through Paxton. [E. R. J., July 10, '09.]

Chanute, Kan.—The City Council has granted the Chanute Electric Railway a year's extension of its franchise, until July 10, 1910, in which to begin work on its railway. [E. R. J., July 18, '08.]

Worcester, Mass.—The Board of Aldermen has granted to the Worcester Consolidated Street Railway a franchise

to lay tracks in Hamilton Street from the terminus of the present route to Lake Park.

Butte, Mont.—The Board of County Commissioners has granted to the Butte Electric Railway a franchise to build an electric railway in the McQueen addition. The new railway will connect with its Garden Street tracks and will extend northerly for 1 mile. J. R. Wharton, manager.

Missoula, Mont.—A 50-year franchise has been granted to the Missoula Street Railway by the County Commissioners to build an electric railway within a radius of 4 miles outside the city limits from the south end of the Higgins Avenue bridge. W. A. Clark, Butte, is interested. [E. R. J., March 13, '09.]

Bryan, Ohio.—Application to the City Council has been made by the Fort Wayne & Toledo Electric Railway, Harlan, Ind., for a franchise. The company proposes to build an electric railway from Fort Wayne, Ind., to Bryan, Ohio, 55 miles. R. T. Bastress, Harlan, general manager. [E. R. J., March 27, '09.]

New Albany, Ohio.—The Columbus, New Albany & Johnstown Traction Company has applied to the City Council for a franchise to build a street railway through Main Street, New Albany.

Plymouth, Wis.—A franchise has been granted to the Milwaukee & Fox River Valley Railway to build a street railway in Plymouth. [E. R. J., May 16, '08.]

TRACK AND ROADWAY

Edmonton (Alta) Radial Railway.—A company represented by R. Brutinelle is said to be negotiating with the City Council for the purchase of the interurban franchise of the street railway. If an agreement is effected, the company will build as far as the White Star coal mines, 7 miles distant, during the summer. Among other things the company agrees to purchase the charter now owned by Edmonton, which was purchased last year from the Strathcona Radial Tramway Company and which grants to the company the right to construct radial lines within a radius of 80 miles from the center of Strathcona.

Suburban Railway, Phoenix, Ariz.—C. B. King advises that this company has secured franchises for its proposed street and suburban railway and has not as yet done anything toward construction. [E. R. J., July 3, '09.]

Fort Smith, Subiaco & Eastern Railroad, Paris, Ark.—This company has filed a certificate to extend its proposed electric railway from Subiaco to Scranton, 8 miles. The present railway is from Paris to a point near Subiaco, a distance of 7 miles. The company has changed its name to the Subiaco Traction Company. [E. R. J., July 18, '08.]

Grand Junction Electric Railway, Colorado Springs, Col.—It is officially announced that work will be started soon on the interurban railway between Grand Junction and Palisades, a distance of 17 miles. It will be extended to Fruita. The railway is expected to be completed next April. E. A. Sunderlin, general manager. [E. R. J., Dec. 5, '08.]

Denver (Col.) Interurban Railroad.—It is stated that this company will extend its railway from Louisville to Lafayette and from there to Longmont, building 12 miles of double track, one track to be used for freight and the other for passenger service.

Chicago, Kankakee & Champaign Electric Railway, Champaign, Ill.—It is stated that this company has secured the principal franchises along the route and most of the right-of-way. It is probable that a new company will be incorporated to take over the holdings and rights of the Chicago, Kankakee & Champaign Electric Railway so as to secure funds for carrying out the plans of the old company and to provide for future extensions. Upton Schaub, vice-president. [E. R. J., July 10, '09.]

Iowa Railroad, Chicago, Ill.—The ELECTRIC RAILWAY JOURNAL is officially advised that this company, which proposes to build an electric railway between Waterloo and Des Moines, has purchased from the estate of L. W. Reynolds all of the public utilities in Boone, Ia., and vicinity heretofore controlled by that estate. These consist of the Boone Electric Railway & Light Company, the Boone Suburban Railway and the Central Heating plant. The Iowa Railroad will begin operating these properties on Sept. 1, under the name of the Iowa Light & Traction Company. The entire systems will be rehabilitated, and it is probable that the Boone Suburban Railway will be extended from its present terminus on the Des Moines River to Ogden, a distance of 3½ miles. The City Council of Boone has granted 25-year franchises covering all the utilities which the Iowa Light & Traction Company will operate. The officers of the new company are as follows: Henry S. Osborne, Chicago, chairman of board; Andrew Stevenson, 153 La Salle Street, Chicago, president and general manager; E. E. Hughes, Boone, Ia., vice-president and treasurer; J.

H. McBride, Philadelphia, Pa., second vice-president; J. F. Hardin, Eldora, Ia., secretary. The Iowa Railroad is also negotiating for the purchase of the public utilities in Marshalltown, Ia., and the properties of the Tama & Toledo Electric Railway & Light Company. These systems will be operated under one management if satisfactory terms are reached. [E. R. J., Jan. 9, '09.]

***Cornell, Ill.**—H. W. Knight is said to be promoting a plan to build an electric railway which is to extend from Peoria and Bloomington to Eureka, then to El Paso, Gridley, Flanagan, Cornell, Blackstone, Ransom, Seneca and Chicago.

East St. Louis, Caseyville & Eastern Railway, East St. Louis, Ill.—Grading has been started by this company on its proposed railway from East Lansdowne to Caseyville. F. G. Harding and Joseph Harding are interested. [E. R. J., Jan. 16, '09.]

Manhattan City & Interurban Railway, Manhattan, Kan.—It is announced that this company, which has only been in operation since June 1, will make extensions to its electric railway in Manhattan. It is the intention to establish a park on College Heights and extend the line to this point, a distance of about 1 mile. Jos. T. West, Manhattan, secretary and general manager.

Kentucky Electric Railway, Providence, Ky.—It is stated that this company has made surveys for its proposed electric railway from Providence to Dawson Springs, 20 miles, which will eventually extend east to Madisonville. J. T. Edwards, president. [E. R. J., July 3, '09.]

***Cumberland, Md.**—It is stated that the Marion Railroad has sold all its rights, titles, interests and franchises to Clement L. Shaver, Fairmont, W. Va. A new company to be known as the Fairmont & Northern Traction Company will be incorporated and the holdings of Mr. Shaver will be turned over to the new company, which will construct an electric railway from Fairmont to Fairview and Blacks-ville.

***Detroit, Lansing & Grand Rapids Railway, Lansing, Mich.**—It is stated that this company, which is to build an electric railway from Detroit to Grand Rapids via Lansing, has let the contract for building the railway to the St. Johns Construction Company, Chicago, Ill. Oliver H. Lau, Detroit, interested.

***Manistee, Mich.**—It is stated that the R. G. Peters Lumber Company will electrify the railway from its timber land on Lake Mitchell to Manistee, about 7 miles distant.

Missouri River, Carrollton & Northwestern Railroad, Carrollton, Mo.—This company advises that it is now making its preliminary survey for its proposed electric railway from Carrollton to the boat line on the Missouri River and to Northwest Carroll. Herndon Ely, president. [E. R. J., July 10, '09.]

North Missouri Central Railway, Mexico, Mo.—This company has been organized for the purpose of building an electric railway from Columbia to Jefferson City and Mexico, 63 miles. It will connect with the Missouri Pacific Railway at Jefferson City and the Chicago & Alton Railroad at Mexico. The contract for the building of this proposed railway has been let to the Franklin Construction Company, St. Louis, Mo. Officers: O. F. Spaete, St. Louis, president; H. C. Hoagland, Decatur, Ill., vice-president and general manager; A. J. Estes, Columbia, secretary and treasurer. Directors: F. W. Niedermeyer, C. B. Rollins, T. S. Gordon, L. F. Conley, L. B. Bass, E. C. Clinkscales, all of Columbia, and G. T. Odell, Chicago, Ill., and V. H. Roberts, St. Louis. [E. R. J., July 10, '09.]

Brooklyn (N. Y.) Rapid Transit Company.—Application has been made to the Public Service Commission of the First District by the Brooklyn Rapid Transit Company for permission to substitute for the cable power of its Montague Street line the overhead trolley system. W. S. Menden, chief engineer of the company, told the commission that by means of the change the Montague Street cars, instead of stopping at Court Street, would run through Fulton Street to Fulton ferry, and that transfers would be given to the lines on Sands Street. As the necessary consents have been obtained, it is understood that the commission will grant the application. [E. R. J., July 17, '09.]

New York, Westchester & Boston Railway, New York, N. Y.—It is stated that the grading of this railway, which is to be a double-track electric system, connecting New York and Portchester, a distance of 65 miles, has started in New Rochelle. The expense of this project will be \$21,000,000 for road and equipment. The railway will be controlled by interests which obtained possession of the New York, Westchester & Boston Railway and the New York & Portchester Railway franchises. The contract for the work on the railway between the Bronx and Portchester

has been let to the Ferguson Contracting Company, New York and Pittsburgh.

Putnam & Westchester Traction Company, Peekskill, N. Y.—This company advises that its railway now extends from Peekskill to Oregon, which previously extended only to Varian's Mills. The new extension is about 1½ miles long.

***Minot, N. D.**—It is reported that H. F. Bartling is interested in a plan to construct an electric railway from Minot to the Canadian boundary.

***Cleveland, Ohio.**—It is reported that Charles Phelps is securing the rights of way for an electric railway to extend between Cedar Point and Rye Beach, near Huron, which will connect with the main line of the Lake Shore Electric Railway.

Hocking-Sunday Creek Traction Company, Nelsonville, Ohio.—C. W. Juniper, secretary of the Nelsonville, Athens & Gloucester Traction Company, writes that this company has been recently sold and transferred its rights of franchises, etc., over to the Hocking-Sunday Creek Traction Company, which proposes to construct a gasoline motor system over the same route of the old company. It is probable that construction work will be started within a few days. The proposed railway will connect Nelsonville, Gloucester and Athens. Capital stock authorized, \$300,000. Officers: E. B. Young, president; Charles A. Vorhes, vice-president; Charles Tutt, Nelsonville, general manager; Warren H. Badger, chief engineer, all of Nelsonville. [E. R. J., June 26, '09.]

Ohio Central Electric Railway, Uhrichsville, Ohio.—Carl C. Conkle, president, advises that the engineering preliminaries have been completed and that the company is now ready to begin grading the proposed electric railway. Construction work is scheduled to begin Aug. 1. The proposed line will connect Wheeling, W. Va., Bridgeport, Cadiz, Uhrichsville and Dennison, a distance of 52 miles. It is proposed to install the overhead trolley system. Capital stock authorized and issued, \$500,000; bonds authorized, \$1,250,000. Offices, Uhrichsville and 1306 Machesney Building, Pittsburgh, Pa. Officers: Carl C. Conkle, Pittsburgh, Pa., president; Wylie N. Taylor, Wellsburg, W. Va., vice-president; C. U. Patterson, Uhrichsville, secretary; H. L. Thompson, Uhrichsville, treasurer; A. Evans Townsend, Cadiz, general manager. [E. R. J., June 19, '09.]

Berlin & Waterloo Street Railway, Berlin, Ont.—The ratepayers have approved a by-law to raise \$19,000 for double tracking a section of the street railway track between Berlin and Waterloo. [E. R. J., June 26, '09.]

Windsor, Essex & Lake Shore Rapid Railway, Windsor, Ont.—It is reported that this company will extend its railway to Chatham and London from its present eastern terminus at Leamington. Spur lines will also be constructed on this new route.

Pittsburgh, Monongahela & Washington Railways Company, Pittsburgh, Pa.—Surveys are being made by this company, under the direction of J. A. Morrow, for a route for the proposed electric railway from Monongahela to Washington, 32 miles. At a recent stockholders' meeting the name of the company was changed from Monongahela & Carrol Street Railway to Pittsburgh, Monongahela & Washington Railways Company. About 1700 ft. of track has been laid in Monongahela. The contractors are Phil & Miller, Pittsburgh. J. W. Bridge, general manager.

Holmesburg, Tacony & Frankford Electric Railway, Tacony, Philadelphia, Pa.—This company has placed orders for 2400 ft. of Lorain 95-lb. girder rails, ties, joints, etc., for reconstruction work.

San Angelo, Tex.—J. J. Lanin advises that no company has yet been organized to build the proposed railway from San Angelo to Carlsbad and Sterling City. An organization will be effected at once. It is the intention of the promoters to begin construction work on Aug. 15. The officers of the preliminary organization are: W. H. Shaffer, president; A. H. Shaffer, vice-president; J. J. Lanin, New Hampton, Ia., manager, to whom all communications should be addressed. [E. R. J., July 10, '09.]

Ogden (Utah) Rapid Transit Company.—This company has opened its electric railway for traffic up through Ogden Canyon as far as Perry. A half-hour schedule will be maintained on the line during the summer. Work is still progressing on the extension, which has already reached the Hermitage.

Utah Light & Railway Company, Salt Lake City, Utah.—W. H. Bancroft, president of this company, has approved of the plans for the proposed Ninth Avenue and Eighth West Street extensions of the street railway, which have been prepared by Chief Engineer L. L. Dagon. The Ninth Avenue extension will be a continuation of the line north

on B Street from Sixth Avenue to Ninth Avenue, and thence east to K Street. Standard 65-lb. steel rails and the 80-lb. high T-rails will be used. The estimated cost of the improvements is \$56,000.

Everett & Cherry Valley Traction Company, Everett, Wash.—It is stated that construction work is to be started at once on an electric railway from Monroe up the Snoqualmie Valley. The contract is said to have been let to Coughren, Winter, Smith & Company, Seattle, for grading and bridge work on the first 30 miles. J. T. McChesney, president. [E. R. J., Dec. 5, '08.]

Kennewick, Wash.—C. A. Lundy, Kennewick, writes that the proposed electric railway in Kennewick will extend from the wharf on Columbia River through Kennewick, connecting with the Northern Pacific Railroad, the North Coast & Spokane Railroad and the Portland & Seattle Railroad, and then into the wheat country a distance of 20 miles. The main business will be freight. The company has not as yet incorporated and is not connected with any other system. The proposed railway will be standard gage and equipped with overhead trolley and a 3-phase system. Power will be purchased from the Yakima Valley Power Company. [E. R. J., July 3, '09.]

SHOPS AND BUILDINGS

Louisville & Eastern Railroad, Louisville, Ky.—This company will soon award contracts for the erection of three frame depot buildings and 40 shelter houses. Henry Glover, Louisville, receiver.

Maryland Electric Railways, Baltimore, Md.—This company has awarded to J. Henry Miller, 110 Dover Street, Baltimore, the contract for the building of a car house and terminal station at Druid Hill and Fulton Avenue. Plans for the new structure, which will be 191 ft. x 472 ft., were made by Baldwin & Pennington, 330 N. Charles Street. The building will cost about \$250,000. It will be two stories high, of fireproof construction, with red pressed brick outside walls. [E. R. J., June 12, '09.]

Ohio Electric Railway, Cincinnati, Ohio.—The Columbus City Council has passed a franchise measure which requires this company to construct a union station at Third and Rich Streets, Columbus. The building will cost, it is estimated, \$175,000. [E. R. J., June 12, '09.]

Ohio Central Electric Railway, Uhrichsville, Ohio.—This company, which proposes to build an electric railway between Wheeling, W. Va., and Uhrichsville, announces that it will erect its repair shops at Cadiz.

POWER HOUSES AND SUBSTATIONS

Denver City Tramway, Denver, Col.—This company has just placed in commission a new fireproof rotary converter substation to maintain the voltage in the northeastern part of Denver. There are two 500-kw General Electric rotary converters supplied by two banks of transformers. The primary voltage is 11,000, protected by aluminum cell arresters.

Illinois Traction System, Peoria, Ill.—It is stated that this company has purchased the property of the Des Moines (Ia.) Electric Company and that it plans to build an interurban system radiating from Des Moines, with the power system of the property just taken over as a nucleus.

Louisville & Eastern Railroad, Louisville, Ky.—This company expects to award contracts soon for the building of two brick substations.

Binghamton (N. Y.) Railway.—Construction is now under way on the addition to the power station of the Binghamton Railway. The improvements to be made will cost, it is estimated, \$50,000, and will include the installation of a new turbine, new boilers and a new condensing plant. Foundations for the turbine are now being laid and it is expected the new plant will be in operation by Oct. 1.

Ohio Central Electric Railway, Uhrichsville, Ohio.—This company expects to build a power plant at Cadiz to furnish power for the operation of its proposed electric railway in Wheeling, W. Va., and Uhrichsville.

Toledo, Bowling Green & Southern Traction Company, Findlay, Ohio.—This company has placed a contract with the General Electric Company for a portable sub-station.

Hanover & McSherrystown Street Railway, Hanover, Pa.—This company announces that it has placed contracts with the General Electric Company for a 300-kw motor generator set, consisting of a 325-kw, 220-volt, 60-cycle, two-phase a.c. motor and a 300-kw, 600-volt, d.c. interpole generator; and for a switchboard with 6 panels to control both the a.c. and d.c. current.

Union Traction Company, Philadelphia, Pa.—This company has awarded to George W. Beard & Company, Reading, the contract to build its substations at Mount Penn, Mohnton, Robesonia and Sanatoga, which will cost about \$30,000.

Manufactures & Supplies

ROLLING STOCK

Chicago & Oak Park Elevated Railroad, Chicago, Ill., is planning to purchase 20 cars.

Peoria (Ill.) Railway, it is reported, is in the market for 10 cars of the pay-as-you-enter type.

Connecticut Valley Street Railway, Greenfield, Mass., is in the market for two double-truck closed cars.

Durham (N. C.) Traction Company has just ordered two sets of Brill E-39 double trucks for replacement.

Edmonton (Alberta) Radial Railway expects to place an order for six additional cars in the course of a week.

Illinois Traction System, Peoria, Ill., has ordered two sleeping cars from the American Car & Foundry Company.

Union Street Railway, New Bedford, Mass., expects to buy 15 open double-truck cars and 12 double-truck closed cars.

Easton (Pa.) Transit Company will purchase two (and probably four) second-hand, 20-ft. closed car bodies without trucks or equipment.

Pittsburgh, Harmony, Butler & New Castle Railway, Pittsburgh, Pa., expect to purchase one new express car complete within a week.

Milford & Uxbridge Street Railway, Milford, Mass., has just received a 2400-gal., single-truck sprinkler car from The J. G. Brill Company.

Columbus, Delaware & Marion Railway, Columbus, Ohio, has ordered one freight and express car from the Jewett Car Company, Newark, Ohio.

Exeter, Hampton & Amesbury Street Railway, Hampton, N. H., has purchased a second-hand, 10-bench open car from the Public Service Railway, of Newark, N. J.

Chippewa Valley Railway, Light & Power Company, Eau Claire, Wis., contemplate buying one or two single-truck closed cars for city service, either new or second-hand.

Pittsburgh (Pa.) Railways has purchased 20 interurbans from the G. C. Kuhlman Car Company. Mention of the contemplated purchase of these cars was made in the ELECTRIC RAILWAY JOURNAL of June 19, 1909.

Fort Wayne & Wabash Valley Traction Company, Fort Wayne, Ind., has placed an order with the Curtis Motor Truck Company, Decatur, Ill., for six sets of interurban trucks and 20 single trucks for city cars. The car bodies to be mounted on these trucks are being built by the Cincinnati Car Company.

Michigan United Railways, Lansing, Mich., has ordered two combination baggage and express cars from the St. Louis Car Company, St. Louis. The car bodies will weigh 23,800 lbs. and the distance between bolster will be 35 ft. The bodies will be 48 ft. long; length over vestibules, 50 ft.; width over sills, 8 ft. 8 in. The bodies and underframes will be of wood and the interior trim of yellow pine. With the exception of Peckham No. 14-A trucks, and Ohio Brass Company's couplers, the St. Louis Car Company will furnish all the remaining special equipment.

Sapulpa (Okla.) Interurban Railway, mentioned in the ELECTRIC RAILWAY JOURNAL of June 5, 1909, as having purchased four cars from the St. Louis Car Company, has drawn up the following specifications:

Seating capacity	38	Interior trim	white oak
Weight (car body only)		Underframe	wood
	23,000 lb.	Air brakes	Westinghouse
Bolster centers, length		Couplers	St. Louis
	22 ft. 6 in.	Curtain fixtures	
Length of body	34 ft.	Curtain Supply Company	
Length over vestibule, 46 ft.		Curtain material	Hartshorn
Width over sills	8 ft. 8 in.	Heating system, Consolidated	
Sill to trolley base	9 ft. 3 in.	Roofs	steam coach type
Height top of rail to sills		Seats	St. Louis
	30 in.	Trucks	St. Louis No. 23-A
Body	wood		

TRADE NOTES

Sterling Varnish Company, Pittsburgh, Pa., has removed its main offices from 325 Water Street to 908 Fulton Building, Pittsburgh.

General Fire Extinguisher Company, Providence, R. I., has removed its St. Louis office from the Lincoln Trust Building to 1621 Picree Building.

Westinghouse Electric & Manufacturing Company, Pittsburg, Pa., has removed the sales office formerly located at Tucson, Ariz., to 173 San Francisco Street, El Paso, Tex., where it will be continued as a branch of the Los Angeles office.

Liberty Manufacturing Company, Pittsburgh, Pa., announces that Glen M. Porter has succeeded W. M. Owen as manager of its New York office at 90 West Street. Mr. Porter will give the New York district his entire attention, assisted by C. S. Roosa.

Crocker-Wheeler Company, Ampere, N. J., announces that at the last directors' meeting the following were elected officers of the company: President, Dr. S. S. Wheeler; vice-president, Gano S. Dunn; second vice-president, A. L. Doremus; chief engineer, Gano S. Dunn; secretary, Rodman Gilder; treasurer, W. L. Brownell; assistant treasurer, G. W. Bower.

H. G. Nicholls, Toronto, Ont., who has for several years been assistant general manager of the Canadian General Electric Company and the Canada Foundry Company, has resigned to go into business for himself. He has organized a company under the name of Factory Products, Limited, with offices in the Confederation Life Building, Toronto, for the purpose of acting as Canadian selling agents for representative manufacturers.

M. L. Newman & Company, New York, N. Y., have opened an office at 26 Broad Street for the practice of industrial engineering in a consulting capacity. M. L. Newman, the senior member of the firm, is perhaps best known by his long experience in the employ of the Government at the Brooklyn Navy Yard. Alfonso Kaufman, who recently severed his connection as manager of the Alaska Chemical Company, has become actively engaged with the new firm.

Warren Bicknell Company, Cleveland, Ohio, was organized recently in the interest of the Cleveland Construction Company, the charter of which does not give it authority to operate railroads. No definite plans have been made for the operation of any railroad, but the company will be fully organized and prepared to act in an operating capacity. After a new road has been completed, it is sometime necessary to operate it for a time, and the Warren Bicknell Company will be prepared to relieve the construction company in such cases.

Forsyth Steel Tie Company, Pittsburgh, Pa., has purchased the plant and business of the Pittsburgh Pole & Forge Company and will continue to manufacture all of the devices formerly made by that company, including trolley poles, span wire poles, rail benders and miscellaneous railroad equipment. It has also acquired the rights to manufacture the Forsyth steel tie, Forsyth fastening device for steel ties and improved brake-shoe keys, brake levers, tie plates, etc. The company's offices are in the Curry Building, Fourth Avenue and Ross Street, Pittsburgh, Pa.

W. T. Van Dorn Company, Chicago, Ill., reports a number of contracts for couplers received during the past few months. Among them may be mentioned the following: For the Seattle Electric Company, 140 couplers; Hudson & Manhattan Railroad, 184 couplers; United Railways & Electric Company, Baltimore, 160 couplers; Pittsburgh Railways Company, 200 couplers; Philadelphia Rapid Transit Company, 80 couplers; Interborough Rapid Transit Company, Elevated Division, 200 couplers; Interborough Rapid Transit Company, Subway Division, 500 couplers; Aurora, Elgin & Chicago Railway, 20 couplers; Denver City Tramway, 20 couplers. Mr. Van Dorn has been working on some important improvements in couplers of the M. C. B. type and on some heavy couplers of his standard type and an announcement of the results secured may be expected at an early date.

Cooper Heater Company, Dayton, Ohio, which for the last year and a half has been operating under a receiver, has been successfully reorganized. The announcement was made this week that some of Dayton's leading business men are now interested in the company and that they will give it strong financial backing. Since the organization of the company, three years ago, it has been under the management of W. L. Blackwell, who retains his interest under the new corporation. The company has also been fortunate in obtaining the services of W. E. Hinmon as traveling representative. Mr. Hinmon was for three years superintendent of operation of the Dayton & Western Traction Company, and for seven years was connected with the Ohmer Fare Register Company as sales agent. He has many friends in the electric railway world, who wish him every success in his new departure. The Cooper Heater Company manufactures hot water heaters for city and interurban cars, and has succeeded in placing them on 50 important electric railway lines throughout the country. The chief claims made for the heater by its manufacturers are its economy in fuel and the small amount of floor space it occupies. It is interesting to learn that the company has

brought out a number of valuable improvements on its heater and that they are to be introduced the coming season.

ADVERTISING LITERATURE

Electric Storage Battery Company, Philadelphia, Pa., sketches the development of "Exide" and "Hycap-Exide" storage batteries in a small illustrated booklet just published.

Scully Steel & Iron Company, Chicago, Ill., has just issued its July stock list of iron-working machines, tools and appliances for immediate delivery to electric railway companies.

Buda Foundry & Manufacturing Company, Chicago, Ill., is distributing a calendar 9 in. x 15 in. for the last half of 1909, illustrated with a city view on which a Buda handcar is shown floating in space.

Wickes Brothers, Saginaw, Mich., show in their July stock list a large variety of steam boilers, engines, heating apparatus, electrical machinery, feed-water heaters, condensers and contractors' material.

Arthur S. Partridge, St. Louis, Mo., in Schedule No. 30, dated July 15, 1909, lists for sale a number of street and interurban railway cars, controllers, motors and power house equipment of all sizes and types.

Walter A. Zelnicker Supply Company, St. Louis, Mo., has issued Bulletin No. 89, listing all kinds of new and second-hand rails, cars, locomotives and miscellaneous steam and electric railway equipment and supplies.

Pettingill-Andrews Company, Boston, Mass., has issued the July number of *Juice*. It contains notes on regenerative flame lamps, Pittsburgh transformers, concrete conduits, woven-wire dynamo brushes, luxometers, lighting reflectors and Tungsten miniature and candelabra lamps.

Packard Electric Company, Warren, Ohio, has issued a folder describing the features of its tungsten sign lamp transformers. The folder also contains the specifications for these transformers, giving their kilowatt capacity, efficiency, net weights, shipping weights and price.

Allis-Chalmers Company, Milwaukee, Wis., has issued Bulletin No. 1519, dated July, which has for its subject Tomlinson barometric condensers, Type A N. The front cover contains an interior view of the Thirty-ninth Street pumping station, Chicago, Ill., showing the Tomlinson Type A N condensers and pumps, which were installed by the Allis-Chalmers Company.

Westinghouse Electric & Manufacturing Company, Pittsburgh, Pa., has issued a booklet describing the application of its line of small motors to office, store and shop services. The numerous illustrations scattered through the pages suggest many time and labor saving uses for these efficient little power devices; among these are the motor-driven adding machine, mailing machine, eraser, graphophone, envelope sealer, vacuum cleaner, etc.—applications selected at random from the large number of uses where the electric motor provides the ideal power.

General Electric Company, Schenectady, N. Y., has issued the following bulletins: No. 4674, illustrating and describing polyphase induction motors and controlling apparatus; No. 4672, with the title "Electric Drive for Large Printing Presses"; No. 4679, which describes a new line of commutating pole constant speed motors, made for both slow and moderate speed in sizes from 20 hp to 350 hp; No. 4673, which is a reprint from the *ELECTRIC RAILWAY JOURNAL* of Jan. 16, 1909, of an article by J. R. Hewitt, describing the 1200-volt direct-current installation of the Pittsburg, Harmony, Butler & Newcastle Railway; No. 4678, which describes type MS-8 hood switches for railway service.

Pennsylvania Metal Culvert Company, Warren, Pa., has issued a pamphlet devoted to its product. The use of its culverts by steam railroads, electric railways, State highway departments, etc., is shown. Accompanying the pamphlet is a print recording the result of a comparative corrosion test of samples of steel, charcoal iron and American ingot iron which had been immersed in 25 per cent sulphuric acid for 1½ hours. This showed the original thickness of metals before the test and the thickness after the test, the result showing the percentage of loss of the steel to be 88.7, the percentage of loss of the charcoal iron to be 69.6, and the percentage of loss of the American ingot iron to be only 1.14.