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### Trolley Wire Specifications

A criticism of the specifications for trolley wire, suggested by Committee W of the American Society for Testing Materials and printed in the columns of this paper for July 31, appears elsewhere in this issue. The author, Mr. Woods, believes that the tests for trolley wire recommended by Committee W, are not sufficient to disclose all of the possible defects, because no provision is made for a torsion test. This test, Mr. Woods believes, is not only essential to determine the absence in the sample of oxide seams as well as its ability to withstand bending stresses, but is also most desirable because it will indicate the presence of impure copper, excessive hardening or insufficient

annealing. In fact, Mr. Woods makes out a strong case for the retention of the torsion test, and it would seem that material which has to withstand such constant flexure and pounding as that required of trolley wire should be examined most critically so far as this kind of wear is concerned. The subject is one which could be well considered by the Engineering Association through its committee on power distribution.

### Long-Distance Interurban Traffic

The diary of a traveler by trolley from Hudson, N. Y., to Chicago, Ill., which was published in the ELECTRIC RAILWAY JOURNAL last week is convincing evidence of the possibilities of long-distance interurban travel. With one short gap between Peru and Warsaw, Ind., the connecting electric lines span the entire distance of nearly 1000 miles. Mile by mile the many breaks of a few years ago have been filled in and within a few weeks the last link will be completed. Throughout Indiana, Ohio and Michigan and in Central New York the interurban network has spread until now it is possible to travel from almost any city to any other city, sometimes over a roundabout route, by electric railways. The day of the isolated interurban line starting from nowhere and ending nowhere is fast passing. Most of the new construction in this territory during the past two or three years has been extensions of existing lines or building of connecting lines between two or more centers of electric railway development. The era of consolidation into large systems, building of cut-off lines, improvement of city entrances and terminals and general interchange of traffic has already begun. These tendencies mark an epoch in the history of interurban railways.

Long-distance passenger and freight traffic is now a reality and the field of future conquests. As Mr. Norviel pointed out in a paper read last week before the Central Electric Railway Association and printed elsewhere in this issue, the interurban railways have about reached the limit of development of strictly local traffic. Not much more revenue can be expected from this source except as the communities served grow in population and industry. They must look to the profits on long-haul freight and passengers for distances exceeding, say, 100 miles, for future large increases in their earnings. On some of the longer runs, for example between Indianapolis and Fort Wayne and between Dayton and Toledo, through cars are now being operated over several independent lines. Some of the larger systems are running through cars over connecting divisions for long distances. Interline freight and passenger tariffs are now in effect throughout the Central Electric Railway Association territory and most of the larger companies are working in close harmony to encourage through business by the publication of joint timetables and other

similar efforts. How successful this new invasion of the steam railroad field will be depends on the foresight and energy of the electric railway managements. They cannot expect to get any large share of the long-haul business without fighting for it, nor can they expect to hold what they get unless they are prepared to maintain a high standard of comfort, regularity and speed in the service which they offer.

### Through Routes and Joint Rates with Steam Lines

Complaint of discrimination by various steam railroads has been made to the Interstate Commerce Commission by the Southern California Sugar Company, which has a factory on the line of the Pacific Electric Railway. The complaint is really based on the refusal of the steam roads to make through routes and joint rates with the electric railway on shipments to the Missouri River and other eastern points. This company, which manufactures sugar from sugar beets, states in its formal complaint filed with the Interstate Commission that its freight shipments of sugar will amount annually to 10,000 tons. Based on the through rates granted to other sugar factories, the company would pay freight charges in excess of \$100,000, which amount would be increased \$20,000 to \$25,000 if two freights should be required. It appears from the complaint that the Pacific Electric Railway has side tracks in the yards of the sugar company and is equipped with freight cars to transport the freight and the manufactured products and by-products to any points on the line of the electric railway and the junctions with the San Pedro, Los Angeles & Salt Lake Railroad, the Atchison, Topeka & Santa Fé Railroad and the Southern Pacific Company. The Pacific Electric Railway is declared to be ready and willing to make through joint freight rates with each or all of these roads from Delhi, Cal., where the factory is located, to any points outside of the State of California which the steam railroads enter. Some of the steam railroads with which a similar question has been raised have been able to postpone action from time to time or, taking an arbitrary position, have refused directly to enter into any arrangement for through routes and joint rates in which an electric railway was involved. The Interstate Commission, however, will reach a decision in course of time and its construction of the law will be of great importance to all electric railways which have facilities for the transportation of freight and desire to interchange with steam lines, but have found it impossible to do so thus far because of the arbitrary refusal of the steam railroads to enter into the necessary arrangements.

### Michigan Decision on Routing Cars

The Detroit United Railway Company recently won an important decision in the Supreme Court of Michigan, which involved the right of the city authorities to dictate to the company in regard to routing cars. The decision related to but two lines, one a crosstown line, the other a longitudinal line, at whose intersection transfers were given. The ordinance under which these lines were operated provided that the rates of fare were not to be reduced without the consent of the grantees, that the powers conferred and the obligations imposed were to be "deemed

a contract," but that the City Council reserved the right "to make by ordinance such reasonable rules as may from time to time be deemed necessary to protect the interests, safety, welfare or accommodation and running of cars for the public in relation to said railways."

A few years ago the Council passed an ordinance of 20 sections, entitled "An ordinance to regulate the running and operation of street cars on streets within the corporate limits of the city of Detroit, to promote the public safety, and to repeal all ordinances or parts of ordinances inconsistent herewith," and sought, among other things, to establish a new continuous route, and prescribed a penalty for non-compliance. The opinion of the court rather severely condemned the ordinance. The judge said:

The defendant secured contracts right under the ordinance of 1891 to run two lines of street railway, one a crosstown line, and another running at right angles therewith, agreeing to give transfers at intersecting points. Now it is proposed to compel them to do more than this. They are asked to establish an additional route by putting on cars whose route shall be a combination of portions of both of said original routes. The effect would be to compel an unnecessarily frequent schedule on parts of the lines, or an infrequency of cars upon other parts, which would be likely to result in a greater inconvenience than the present method of transferring passengers. Furthermore, it would deprive defendant of its right to collect a second fare from passengers who should transfer to other lines intersecting Fourteenth street. The claim that the ordinance, in section 17, reserved power to the council to regulate the running of cars, is not overlooked. It would be an extraordinary stretch of judicial legislation to hold that either party supposed or intended that the council should have power to impose such duties and obligations on the company, which still has, and until the expiration of its 30-year franchise, will have, the right to run a cross-town line with transfers at Fourteenth street, and the duty of running cars upon the proposed route will have to be deferred until such time as the city may be able to make a contract for such service. The ordinance is an infringement of the constitutional provision regarding the impairment of contracts.

Not only were the judgments of conviction reversed, but the highest court of Michigan expressly ordered that no new trial be held and that the company should have costs of both courts.

### Providing a Vault for Storing Records

A detail to which attention may properly be directed is the importance of having on every electric railway property a place, preferably a commodious vault, in which can be stored for safekeeping all the important records, papers, drawings and books that accumulate—everybody knows how rapidly—in the several departments. The laxity of some companies in this regard is well-nigh appalling even to the managements themselves when the matter has been brought to their attention. A favorite place for "storing" all papers and records and the accumulated mass of "dead" stuff that is of no current value, and yet which nobody wants to take the responsibility of destroying, appears to be the loft in some old car house. It is not uncommon to see piles of old papers and books heaped indiscriminately in out-of-the-way corners, subject to the ravages of mice and damage from dust and fire, and, in truth, offering in themselves the makings of an incipient conflagration. If by chance any record or book is wanted, the seeker after the information takes one look at the heap and usually decides forthwith the particular thing he wants is not there.

Such records as non-current vouchers, conductors' trip cards, account books of underlying companies, and even old files of the claim department and engineering drawings of existing buildings and other property, are all too often handled in this haphazard way, simply because no definite place had been provided for their orderly keeping or the vault intended for that purpose had been outgrown. Later, if the room is needed for some other purpose, or in the event of a general moving, the usual course is for the accumulation to be dumped out as so much rubbish. The chances are then that papers which should be preserved will be destroyed with those which are worthless. Again, this carelessness with regard to old documents always presents the possibility that old books and records, loosely guarded as they are, may come into the possession of unscrupulous persons, or those who have no right to them, and be used with unfair motives to cause the company trouble and annoyance. All of this points to the desirability of making provision for a definite place where can be stored, under lock and key, properly indexed and protected against fire and theft, everything of this nature, from vouchers to blueprints, that can be of any possible value to the company or its successors. We have already, in several recent issues, described the storage vaults erected to take care of this situation by the Brooklyn Rapid Transit Company, and in this issue an account is given of another, built by the Utica & Mohawk Valley Railway Company, large enough to hold for many years to come all the live and "dead" records, books and papers of the various departments of that company. The total expense of providing this latter vault was approximately \$5,000; but it is not difficult to imagine a condition in which one set of papers in an accident case, or one map in a right-of-way controversy, or one set of account books in a physical valuation investigation, available because properly stored and indexed, might very easily save the company in actual cash more than the entire cost of the vault.

### The Adoption of Standards

But little progress seems to have been made in the general adoption by electric railways of the standard details of rolling-stock equipment recommended by the American Street & Interurban Railway Engineering Association. These standards of wheels, axles, journal boxes, brake shoes, couplers and other parts were decided upon only after many conferences between the railway engineers composing the committee on standards and the manufacturers. They were indorsed by the association as a whole and earnestly advocated for use by many individual members. Yet in spite of this effort to agree on one design, and thus obtain the benefits of quick delivery, lower prices, interchangeability and an open market, a wide diversity of patterns and dimensions still prevails.

Standardization of the equipment of any road may be brought about by discarding all the old parts at one time, regardless of their capacity for future service, and replacing them by new standard designs. Few companies, however, could afford to make such a radical change for the sake of benefits ultimately to be derived, no matter how great they might be. The logical method of introducing standards is to adopt them gradually for all new equip-

ment and replacements. This involves no extra expense and accomplishes the desired end in an astonishingly short time. That it is not being generally done, however, is shown by the recent statement of a large car-building company that less than 10 per cent of the rolled steel wheels bought for cars built by it were ordered by the railway companies to be of the standard designs of the Engineering Association. The fault lies directly with the purchaser and not with the manufacturer, who has nothing to gain and often much to lose by departure from stock patterns. It is expensive and takes time to make a set of dies and rolls to forge and finish a few hundred wheels, varying only in some slight degree from a standard in general use. Needless to say, the consumer pays for the extra labor in the end and gains nothing material for the outlay. The manufacturers, we believe, stand ready to furnish the standards promptly if they are asked for, but they cannot be expected to insist on furnishing them if their customers demand special patterns. When the demand for the standards reaches a point where they constitute the largest part of any manufacturer's output, price concessions can be expected over orders for the same parts made to special designs. The saving in time due to prompt delivery can often be measured in terms of dollars and cents on rush orders, and to large buyers the maintenance of an open market is of great importance. A greater appreciation of the aggregate saving resulting from the general use of the association standards would do much to promote their wide adoption.

### Steam vs. Electric Transportation Methods

According to the English papers the reports of the British steam railroad companies for the last half year indicate that the tramway and omnibus competition for suburban traffic is less acute than for several years past, although it is still serious, especially in some parts of London. The result is that the railroad managers are uncertain whether it is advisable to spend money to regain their suburban business or boldly to make no efforts to secure it and confine their energies to developing their long-haul traffic. The London, Brighton & South Coast Railway has adopted the former alternative and hopes by the electrification of its South London line to compete on more even terms with the tramway and buses. Other steam railroad companies have inaugurated a system of low fares. In the meantime the traffic on the District Railway and on most of the tubes shows a gratifying increase. The District Railway particularly, owing to the adoption of improved methods of popularizing its service, has an especially good record of gross receipts for the past half year.

In many respects the situation in London differs radically from that in any American city. Owing to the large amount of underground electric railway construction which has been undertaken during the past five years, the city is intersected in almost every direction by rapid transit lines with frequent stations and a fairly general transfer system. When to this service is added that of the many motor bus lines on the street, with their low fares, it is not surprising that many travelers prefer to utilize these means rather than the more rapid, though less convenient, suburban service of the trunk line railways.

It is evident from the reports of their meetings that the latter, like many of the American steam railroads, have yet to learn the secret of conducting a successful suburban business in competition with frequent electric trains or cars. Elaborate terminal stations in which one has to walk through long waiting rooms and the length of a station platform before he reaches his train do not appeal to the short-distance traveler who can make as quick or quicker time by taking a slower moving car or subway train at a short distance from his residence or office. Nor is the suburban resident filled with delight if when he reaches his railroad station a few minutes late he finds that he must wait half an hour before the next train leaves for his destination. A frequent schedule may be impossible under the steam railroad operating conditions. In this respect the steam railroad will always be handicapped as compared with the line operating a multiplicity of small units, and it may be equally impossible with steam service to make the trains much more accessible than at present. But there seems little excuse for many of the designs of railroad stations which one sees in America, in which the train, the objective point, is reached only by a long walk over the marble floors and past the rows of benches with which the waiting-room is fitted.

### Some Aspects of Piece Work

The possibilities of reducing the cost of maintenance of rolling stock by the introduction of piecework into the repair shop are now attracting attention in many shops. There is no question that in many cases where the subject has been given careful study and tests have been made of the average and minimum times which different jobs may be expected to take, some excellent economies in shop operation have been attained. Frequently the cost of a given operation has been cut down 20 or 30 per cent by this means. It is still uncertain, however, as to the place where piecework should stop and hourly or weekly wages begin. The general purposes of piecework are reasonably familiar to motive power officers, but there is at times a need of keeping more clearly in mind the fundamental advantages of such a method and the lines of work to which it is especially applicable.

In any consideration of piecework it is important to remember that the company usually desires to obtain as large a volume of work in a given time as possible, in order that the unit cost may be reduced. The shop employee, on his part, desires to earn as high a wage as possible. These two requirements meet on common ground in a well-designed piecework system, and they come together because of the value of time to both parties. There are still many public utility companies doing business without keen appreciation of the importance of having every man waste as little time as possible in non-productive work. Every man who works for himself in this world, as the saying goes, knows that each hour must be turned to fullest account if the results which he desires are to be obtained. Piecework tends to put each man employed under such an arrangement on the basis of being his own master so far as each particular job is concerned; it destroys the temptation to idle away any time, and if properly safeguarded, gives the company the maximum return in work done for

a given expenditure of time. Efficiency is encouraged by the most potent of all rewards in business—a fatter pay envelope.

It is surprising how far the piecework system can be carried, even in a repair shop. In a large railroad shop recently visited, even the men who pushed handcar loads of timber from the cutting-up shop to the assembly shop were paid by the piece. The company manufactured many of its cars, and so it was on a par with the class of industrial establishments where piecework fits best, namely, those where the product is repeated over and over again—where the work of each department is to a large degree the same from one week to the next. In the street railway shop the work is generally of both kinds as regards repetition. Certain operations, like the painting of closed cars in summer and the refurbishing of open ones in the winter, the relining of bearings, undercutting of commutators, rewinding of armatures completely, changing of wheels, turning down of trolley wheels and other tasks of a standard character lend themselves particularly to piecework. Other work, such as the repairing of burned-out electrical equipment, which is only partially spoiled for service, the replacement of vestibules and rebuilding of panels crushed in a collision, the renovation of motor brushes and the repairing of fused or broken leads is apt to be of such an irregular type that the institution of unit remuneration is difficult, if not impracticable. The most careful analysis of each job is therefore necessary before a company can fairly decide whether its character is sufficiently repetitive to warrant piecework payments, and closely associated with this is the important problem of determining the maximum amount of work which an unusually able man can accomplish in a specified repetitive task. The company must obtain a fair idea of the physical limits of each job; in other words, it must know how much any man can force the organization to pay him by accelerating his working pace. Only with actual local figures covering a wide range of service can the company proceed on a firm foundation for changes in its method of payment.

### The Brooklyn Rapid Transit Report

The most notable electric railway annual report of the year is that of the Brooklyn Rapid Transit Company. It includes not only statistical tables and other information of the greatest interest to the traveling public and to the security holders of the company, but also a discussion by President E. W. Winter of the most important events of the year affecting the property. In the current report, relating to the year ended June 30, 1909, even fuller information is presented respecting some features of the operations than has been given previously.

In the general comparative statement of results of operations for the last two years many changes are indicated. Total gross earnings from operation were \$19,694,462, a decrease of less than 1 per cent from the record of the preceding year. This reflects the business depression, the effect of which continued to be felt during the first six months of the fiscal year; gross passenger earnings in this half-year were \$358,479 less than in the corresponding period of 1907, but subsequent improvement in the general

business situation affecting street railway traffic overcame this decline, and the result was an increase in passenger earnings for the entire year of \$128,529. Of this total increase the surface division, which furnished nearly 60 per cent of the total passenger earnings, contributed almost four-fifths.

In other departments contributing revenue material changes from the previous year have taken place. As the contract of the American Railway Traffic Company with the city, which expired near the close of 1908, was not renewed, that company experienced a decrease of \$244,233 in its gross earnings. Freight earnings were lighter, due also to business depression, and express earnings were affected by the expiration without renewal of a contract with the American Express Company, which was terminated with the close of 1908. While the earnings from these sources constituted a relatively small proportion of the total revenue, the decreases were sufficiently large to overcome the effect of the small gain in passenger earnings and produce the net decline indicated in gross earnings from operation.

The net earnings remaining from operation were helped in comparison with the previous year by a substantial reduction in operating expenses. The volume of business was handled with an expenditure charged against revenue of \$11,394,655, a decrease of \$544,924, or 4.56 per cent from the total outlay for operating expenses during the previous year. Analysis of the operating expenses shows that the saving was not made by reduction in the expenditures for maintenance of the property. Total expenditures for maintenance of way and structure and equipment in the last year aggregated \$2,884,930, as compared with \$2,857,654 in the preceding year. The division of these expenditures as between way and structure and equipment was somewhat different in 1909 from 1908. The maintenance of equipment expenditures were decreased 8 per cent. Mr. Winter states that this reduction was made possible by the centralization of the power production and the practical completion of standardization of the equipment—a standardization which has been described in recent issues of this paper. The maintenance of way and structures expenditures were increased 17 per cent. The aggregate of the expenditures for maintenance equalled 14.7 per cent of the total gross earnings. Because of the decline in business of the American Railway Traffic Company and the elimination of part of the express arrangements there was a reduction of \$260,062 in the expense charged against the revenue of the traffic company and that apportioned in the accounts to "freight, mail and express."

General expenses were larger by 3.84 per cent than in the previous year, but in the operation of both power plant and cars and in the cost of "damages and legal expenses" there were important savings. Operation of the power plant cost \$1,596,759, or 3.44 per cent less than in 1908; this expenditure amounted to 8.1 per cent of the total earnings from operation. Operation of the cars cost \$4,812,556, a decrease of 6.07 per cent. This, it should be noted, was effected notwithstanding an increase of a little under 1 per cent in the revenue mileage. A reduction of 9 per cent in the cost of damages and legal expenses indi-

cates a tendency toward improvement in a feature of the operation which is so serious, still, however, as to lead President Winter to call further attention to it in his remarks to stockholders. He states that the item of damages is still a burdensome feature of operation, but that there was a marked decrease in the number of both serious and minor accidents and a material reduction in number and gross amount involved in both outstanding claims and pending suits. Mr. Winter thinks it is reasonable to expect that through steady improvement in physical operating conditions, exercise of care in detecting fraudulent claims and readiness to settle fairly just claims, the companies in the system will be called into court less frequently and the industry of "ambulance chasers" will continue to decline.

Reduction in operating expenses thus indicated made possible a gain of 4.65 per cent in net earnings from operation. Income from other sources, while relatively small, decreased. A heavy increase was made in the appropriation for taxes and a slightly larger outlay in the net expenditures for interest and rentals.

The seriousness of the tax situation is discussed at length by Mr. Winter, as the appropriation for taxes was 43.8 per cent greater than in the preceding year. The charge as made by the company covers the full liability in all cases except the special franchise tax, which has been charged at "somewhat more than the admitted liability, although not the full amount assessed." Mr. Winter believes that the interests of both the State and the corporations imperatively require a modification of the special franchise tax law that its application may be more just and its operation more direct and certain.

The report also takes up the question of official impositions and public benefits which affect the earnings of the company. It is estimated that not less than \$200,000 annually is expended in relieving the city of the cost of maintaining certain pavements, shifting tracks for sewers, water mains, etc., and this estimate is made without the inclusion of interest on over \$4,000,000 "invested by the company in paving in various streets which the city would have had to pave had tracks not been there." The Federal corporation tax will cost the system about \$50,000 on the basis of the net income during the calendar year 1908.

In connection with this recital of facts Mr. Winter observes that the State cannot consistently expect railroad corporations to meet requirements as to rates and services and to cripple their power to discharge their duty by imposition of unreasonable financial burdens. Statistics are given to show that the contribution of the company in transportation for the members of the city police and fire departments during the year was \$319,096, based on the ticket returns from these sources as applied to the average rates of fare for passenger traffic. The vitality of the transfer evil, Mr. Winter declares, is worthy of a better cause; and to add emphasis to his remarks on this subject he presents figures showing the increasing disproportion between the increase in pay and transfer passengers.

The report justly invites attention to the disquieting features of the situation, which are felt, to some extent, on all electric railways in large cities, but are not appreciated as they should be by the general public.

**EXPRESS DEPOT, VAULT AND STABLES AT UTICA, N. Y.**

The Utica & Mohawk Valley Railway Company maintains at Utica an express and freight terminal building which has a number of unusual and interesting features. It was designed to take care of the express and freight service of the Utica & Mohawk Valley Railway, which has now reached large proportions, as well as to handle the express and freight business of the Oneida Railway (West Shore electrification between Syracuse and Utica) and the Oneonta & Mohawk Valley Railway.

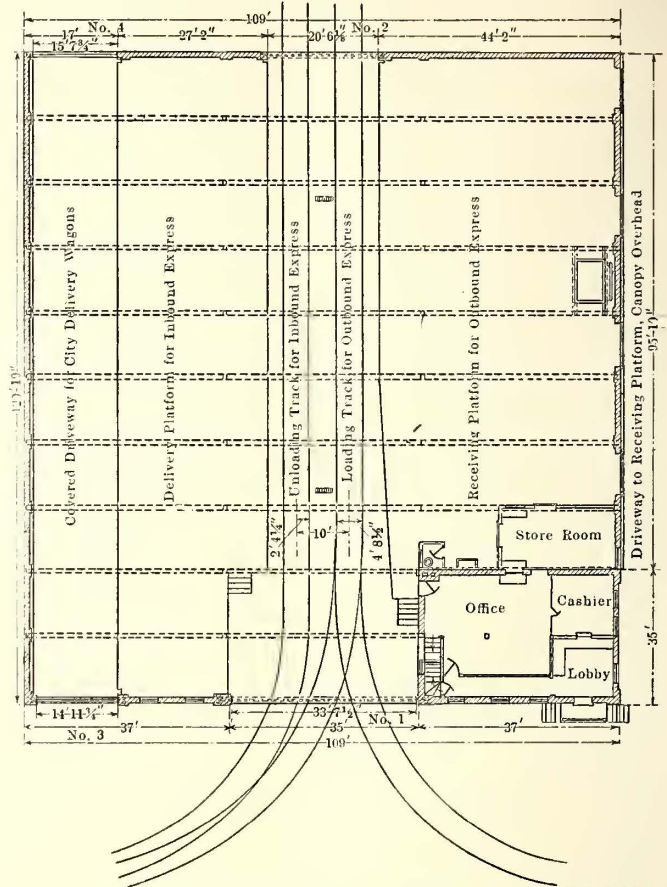
As showing the capacity of the station, it may be said that during the six months ending June 30, 1909, approximately 18,330,000 lb. of express and freight were handled and passed through the building. It will also interest other companies who have terminal problems to know that the total cost of handling this business at the terminal was \$4,717, giving a terminal cost of \$0.0257, or approximately 2½ cents per hundred pounds handled. This includes interest and depreciation on land and building, warehousemen and terminal employees and a proper pro rata charge of other expenses.

Through the courtesy of the management of the Utica & Mohawk Valley Railway the following article is published, describing and illustrating the express and freight station, a novel and fireproof vault for storing tickets and records, which is a part of the station, and the model stables erected at the rear of the depot for housing the horses and wagons attached to the express department. The items showing the cost of the terminal given at the end of this article will also be found valuable for comparison and reference use. The terminal was designed and built under the supervision of C. Loomis Allen, vice-president and general manager. Albert Eastman is general express and passenger agent, and M. J. French was the engineer in charge.

The express and freight depot is located at the corner of Lafayette Street and Broadway, about two blocks west from the business center of Utica, and convenient to the shipping and warehouse districts.

The entire building is approximately 120 ft. long by

prises the warehouse proper for the handling of express matter. Running through the center of the building from front to rear are two tracks, with right and left curve connections to the tracks at the front of the depot on La-



Utica Express and Freight Terminal—Plan

fayette Street. Each of the warehouse tracks will accommodate two 56-ft. express cars at a time, or four in all, two loading and two unloading.

The theory of the design to facilitate the movement of goods through the station will be understood from the



Utica Express and Freight Terminal—Entrance to Warehouse, Tracks in Front, Office at Corner and Wagon Receiving and Delivery Platform at Side

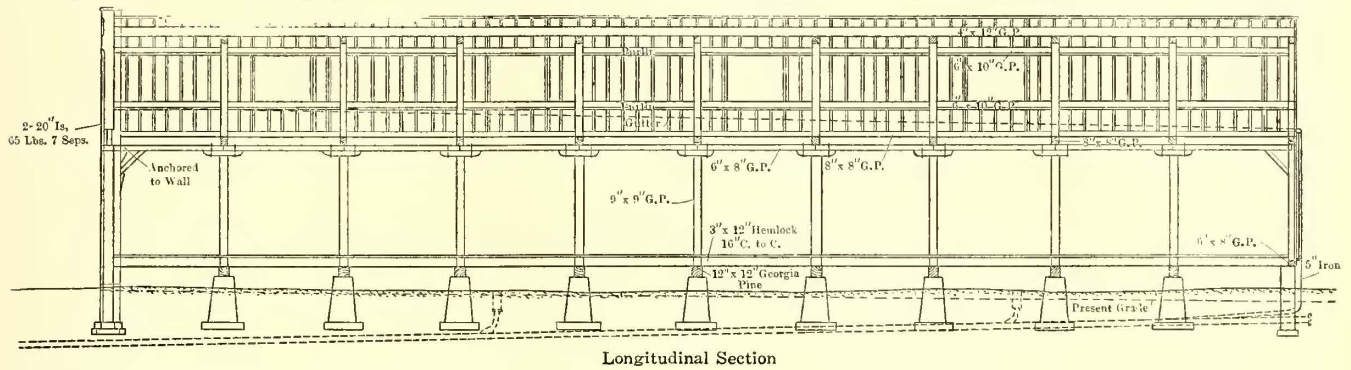
109 ft. wide, and is laid out in three bays, each bay being 36 ft. wide by 120 ft. long. The front portion of one bay is divided to give a two-story office section 36 ft. wide by 25 ft. long. The remaining portion of the structure com-

plan. Along the Broadway side of the building is a driveway protected by an overhanging canopy. Here the wagons deliver shipments to the receiving platform. The shipments are weighed on Fairbanks scales, conveniently

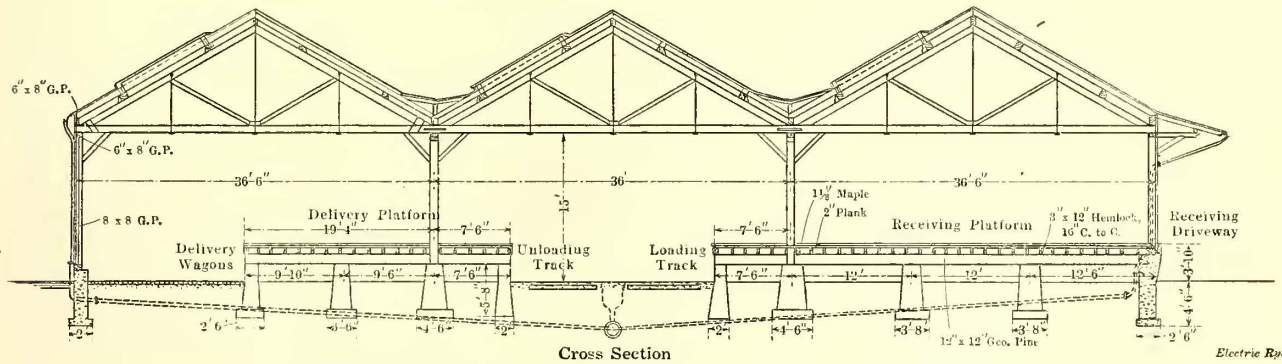
located, and are then handled across the receiving platform into the outgoing express cars. The incoming cars use the other track, and the inbound express matter is unloaded directly onto the delivering platform, where it is sorted

ing and unloading tracks so they are practically on a level with the floors of the cars and wagons, thus avoiding unnecessary lifting of goods.

Structurally the depot is a substantial, well-designed build-



Longitudinal Section



Cross Section

Electric Ry. Journal

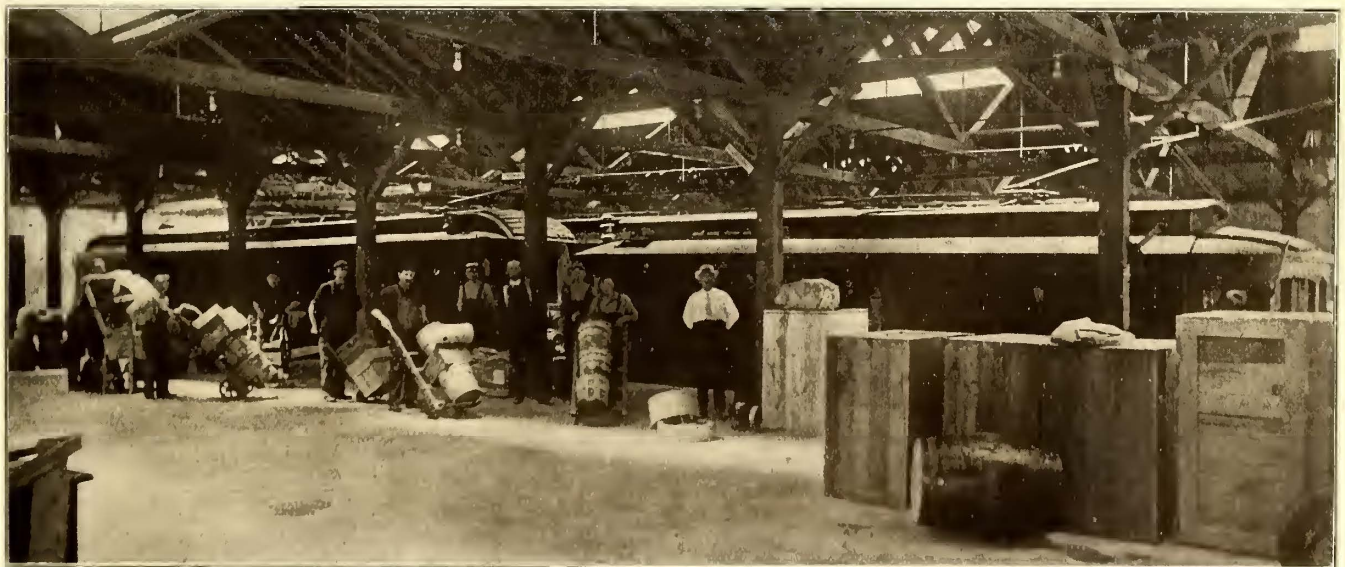
Utica Express and Freight Terminal—Longitudinal and Cross Sections

and loaded into the delivery wagons, which use a covered driveway on the far side of the delivering platform. It will be noted, therefore, that the design of the depot provides for the progressive movement of goods across the warehouse from east to west, and there is no conflict between inbound and outbound express. This is an important feature.

The receiving platform is 44 ft. wide, giving about 4000

ing, attractive in appearance and admirably suited to the requirements.

The main walls are red burned brick laid in concrete foundations and footings. The walls are 12 in. thick and the brickwork is well bedded, flushed up and tied in every sixth course and worked in regular bond. The brick were laid with flush solid joints, with mortar composed of one part Portland cement, two parts best quality lime and four



Utica Express and Freight Terminal—Loading Cars on Receiving Platform

sq. ft. of clear space for handling and routing shipments. The delivery platform is 27 ft. wide, giving approximately 3240 sq. ft. of clear area. The platforms are 3 ft. 10 in. above the finished grade of the driveways and of the load-

parts clean, sharp sand. All brick on facing or exterior walls and chimney tops are assorted hard burned Syracuse common pressed bricks, joints neatly laid up and struck and cleaned down with aqua fortis at completion. All of

the stone trimming, including window sills and water table, corbels, coping, etc., is litholite, except the front door sill and pilaster caps, which are Ononadaga gray limestone, axe-hammered to smooth surface.

The Portland cement concrete for piers, walls and footings was made of one part cement, three parts sand, six parts stone from  $\frac{1}{4}$  in. to 2 in. in size. The car shed floor and cellar floor are of the same proportions, with 1 in. wearing surface of one part cement to two parts sand, floated and troweled to a smooth surface. The car shed floor is laid to grade of rails and is blocked off in flags about 6 ft. square.

The roof of the warehouse consists of  $\frac{7}{8}$ -in. matched boards and is supported on timber joist trusses, giving practically slow-burning mill construction. The entire warehouse is lighted from 27 skylights in the roof each 6 ft. x 10 ft., and glazed with wire glass in metal frames. At night ample lighting is secured from 70 drop incandescent lamps distributed over the warehouse platforms and taking current from the trolley circuit, the wires being placed in standard conduit. The office section and vault are lighted from the local city a.c. lighting service.

heavy ball-bearing freight-house door hangers, supported on steel tracks, with guides at the bottom of doorways.

The two-story office section of the warehouse gives accommodations for the executive and clerical forces of the express and passenger departments. There is also a store-room, heated by separate radiators for keeping perishable goods. The office building is trimmed with Georgia pine with sand-finished walls of hard wall plaster, painted with light shades of oil paint.

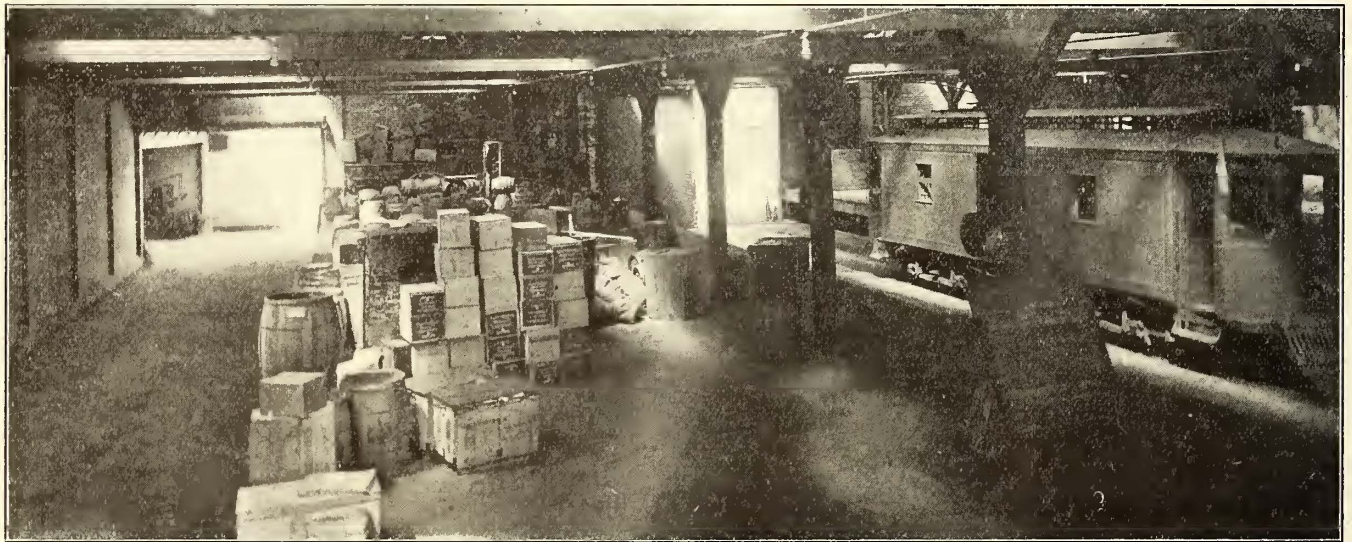
The office section is heated by a hot water heater of ample capacity to maintain a temperature of 75 deg. Fahr. in zero weather. The warehouse proper is not heated.

A separate toilet room for the warehouse men is provided at one end of the receiving platform.

#### Vault for Records

Finding itself in need of a place in which to store tickets and records for safe-keeping, the company, after the express depot had been in use for some time, decided to take advantage of the location to build an extensive fire-proof vault.

Accordingly, a section of the bay under the receiving platform was excavated and a vault with reinforced con-



Utica Express and Freight Terminal—Delivery Platform, Showing Typical Collection of Shipments

The floor of the receiving platform is concrete and this serves as the roof of the vault beneath, to be referred to later. The delivering platform is floored with maple which affords a very smooth and durable trucking surface. Although a hardwood flooring seems somewhat expensive for a warehouse platform, it is believed that the life of the maple under the constant trucking will be so much longer than a softer wood as fully to justify the higher first cost.

The receiving driveway on the Broadway side is paved throughout with sandstone blocks on Portland cement concrete. The delivery driveway and the driveway in the rear of the building, including the entrance to stables, are paved throughout with standard vitrified paving blocks supplied by the Mack Manufacturing Company.

The entrances to driveways and trackways in the front and rear of the warehouse are closed with hand-operated Kinnear steel rolling doors. The warehouse doors under the canopy on the Broadway side where express is received from the wagons are made of two layers of  $\frac{7}{8}$ -in. x 3-in. matched pine flooring of good quality, laid crosswise and covered on all sides and edges with Merchants I. C. old-method tin plate, soldered and painted on inside with red lead before nailing to the doors. The doors are hung on

crete roof, sides and floor and steel, combination-lock safe door, was built. The vault gives ample room for storing and safe-keeping the entire supply of unused tickets and transfers comprising over 500 different forms and aggregating upward of a million dollars in potential value, as well as records, maps, books, vouchers and accumulated papers of the auditor's, engineer's and cashier's departments of the Utica & Mohawk Valley and associated companies.

The vault proper measures 95 ft. long by 32 ft. wide by 7 ft. 10 in. high, inside measurements. The details of the construction merit description.

The walls of the vault are concrete, the outer walls of the freight station, which are 16 in. thick, forming the walls of the vault except on one side, where a new 8-in. wall was built. The floor consists of 3 in. of concrete laid on a 4-in. bed of cinders. On the inside of the walls commencing at a point 1 ft. above the ground line and extending down the walls and under the floor was placed waterproofing consisting of three-ply felt and tar. The vault walls proper consist of one course of  $4\frac{1}{2}$ -in. hollow brick laid next to the felt waterproofing and plastered on the inside with hard wall plaster made by the American Hard Wall Plaster Company, of Utica, N. Y. The floor was com-



pleted by laying directly on the waterproofing a 2½-in. bed of Portland cement flooring with a ½-in. wearing surface on top, consisting of cement mixed in equal proportions of cement and sand.

The vault roof, which also forms the floor of the warehouse receiving platform, consists of 7 in. of reinforced Portland cement concrete supported by cross-beams spaced 12 ft. on centers. Each beam consists of two 9-in. girder rails 12 ft. long surrounded with Portland cement concrete to form a beam 12 in. wide by 15 in. deep. These beams are supported by concrete posts on 12-ft. centers, each reinforced with two 9-in. girder rails, the posts being 15 in. square and carried on footing piers which are 36 in. square and 36 in. deep.

The entire inside of the vault is painted with two coats of white cold water paint and lighted by clusters of incandescent lamps, giving a bright, cheerful effect, in sharp contrast with the common impression of an underground vault.

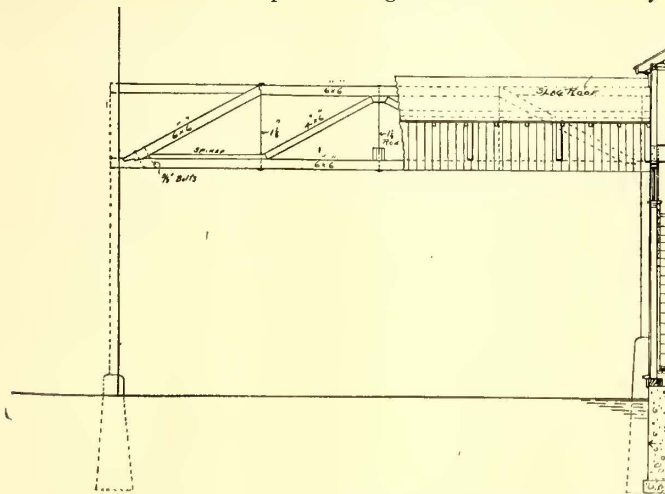
The interior of the vault is divided by wire partitions into three large compartments. The section used by the passenger department for the storage of unissued tickets and transfers is about 42 ft. long by 21 ft. 9 in. wide. The various forms of tickets are kept in a metal rack along one wall. This rack contains 340 pigeon holes each 12 in. by 8 in. by 12 in. deep.

The other two compartments are provided with metal racks and filing cases for storing vouchers, maps, drawings, records and papers of other departments. There is no wood in or near the vault. The steel racks and filing cases were furnished by the General Fireproofing Company, of Youngstown, Ohio, and the Lyons Metallic Manufacturing Company, of Aurora, Ill.

STABLES

Companies that are contemplating remodeling old stables or building new ones may find something of interest and value in the plans here reproduced showing the model stables provided for housing the horses and wagons used by the express department of the Utica & Mohawk Valley Railway.

The stables and an open carriage shed for the delivery



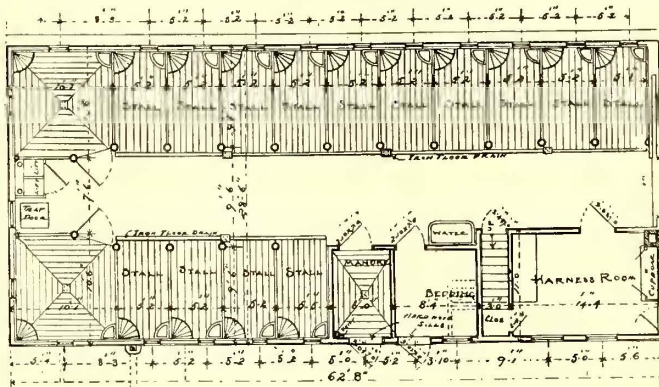
Utica Express and Freight Terminal—Section of Stable and Wagon Shed

wagons are in the rear of the express depot. These buildings are of wood on concrete foundations. The sides of the stable proper are covered with 5-in. white pine siding with one thickness of three-ply "Neponsit" building paper placed under the siding up to the second floor. The roof is shingled.

The floor plan of the stable gives accommodations for

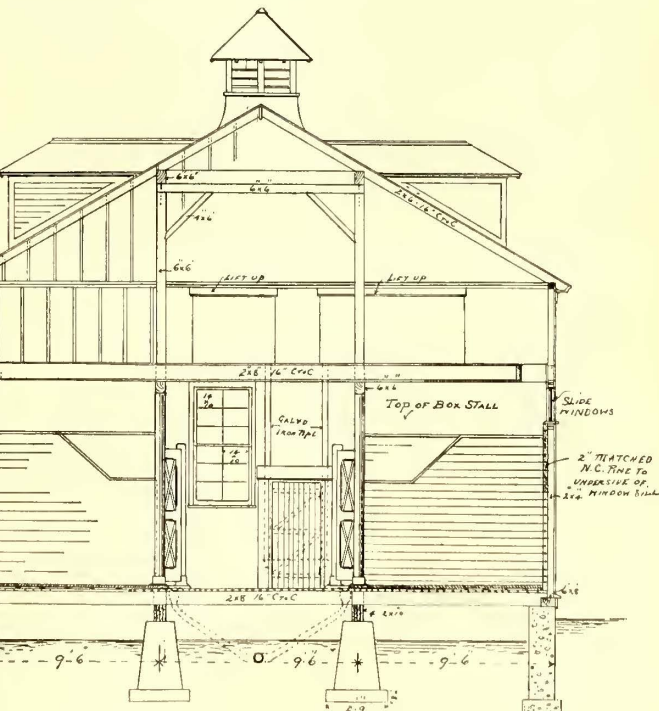
14 single stalls, two box stalls, a commodious harness room, manure and bedding compartments and a wide aisle between the ends of the stalls. In the second story are the haylofts and feed bins. In addition to the doors, ample ventilation is received by sliding windows over each stall.

Particular attention was paid to the drainage. Running along each side of the aisle, just back of the rows of stalls,



Utica Express and Freight Terminal—Plan of Stable

is a trough let into the stable floor for collecting liquid matter and permitting thorough flushing of the floor and stalls. At each stall is a cast-iron drain, connected by a 4-in. cast-iron pipe to a sewer drain pipe laid under the center line of the building and consisting of a 5-in. cast-iron sewer pipe to a point 3 ft. outside of wall, where it is continued by 6-in. vitrified pipe to the main sewer. The stalls and manure bins are graded at the rate of ¼ in. to 1 ft. and 3-in. by 3-in. chamfered strips are placed around partitions and walls of stalls.



One essential of a sanitary stable is a thoroughly watertight floor and interior finish that can be kept clean and sweet. Throughout the entire stable was first laid a good 2-in. matched hemlock underflooring, laid across the joists and double-spiked at each joist. Upon this floor was placed a good quality 2-in. matched spruce floor tightly driven up, butted and blind nailed. The doors to the bedding and

manure compartments are of two thicknesses of 1-in. by 3-in. matched pine laid diagonally of half-door type, made in upper and lower sections and tight fitting to the casings.

The stalls are built of sound 2-in. matched North Carolina pine, posts of stalls and girders turned of the same material, posts set in cast-iron floor sockets. The sides and ceiling of stable are ceiled with 7/8-in. beaded North Carolina pine placed vertically. All angles are filled with quarter-round molding.

The harness room contains a harness closet with suitable hooks for the orderly keeping of harness. A seat runs across one end of the harness room made of 7/8-in. by 2-in. slats on forms to conform to the body and open underneath. At the left of the inside door is placed a blanket rack with three turned bars, 2 in. in diameter, with a distance of each from the floor varying by 6 in. and distance from the wall varying by 4 in.

The feed bins in the loft are lined with tin, have counter-weighted covers and connect with 5-in. galvanized iron pipes with slides to feed bins in a closet on the first floor. Openings with trap doors and hay chutes to stalls facilitate the handling of hay. For watering the horses there is a 24-in. by 48-in. cast-iron roll-rim enameled water trough 16 in. deep, placed on heavy cast-steel brackets and



Utica Express and Freight Terminal—Interior of Vault, Showing Racks for Holding Unused Tickets

provided with plug and chain for waste, also overflow pipe, all connected with sewer lead trapped pipe and 3-in. iron pipe. Each stall has a cast-iron corner manger.

It is the practice at these stables to place the hay for feeding in the corner of the stalls on the floor, as it has been found that the horses will not paw the hay under foot when it is placed on the floor, as they will do when they have to pull the hay from a rack overhead. Another humane feature is the placing in each stall of a salt brick holder in which is provided at all times a brick of salt, and the horse can reach up and lick the salt whenever he feels so inclined.

COST DATA

The following is the actual cost of constructing the express terminal, excluding the vault and stables:

Mason and carpenter work.....	\$17,652
Plumbing .....	329
Heating for office building.....	376
Electric wiring .....	342
Steel rolling doors.....	1,128
Designing, superintendence and inspection.....	400

Total cost of terminal building, exclusive of real estate ..... \$20,227

Cost per cubic foot of entire station, approximately .....	6.83 cents
Cost per square foot of entire station, approximately .....	\$1.55
Cost of vault complete, including heating, plumbing and electric lights.....	5,550.00
Cost of stables and carriage shed, complete.....	4,922.00

TRAINING MOTORMEN IN BERLIN

The motormen's instruction system of the Grosse Berliner Strassenbahn, while thorough, is interesting for its absence of the use of printed diagrams. The student is brought immediately into direct contact with the realities and each day must come into the classroom prepared to answer verbally any query relating to the previous lessons. The instruction course is so arranged that theory and practice alternate throughout the day. Thus every week of schooling comprises 60 hours, of which 20 are spent in the classroom and 40 on the cars. The course covers from 14 days to 21 days, according to the intelligence of the student. There are two instruction rooms, both of which have practically the same equipment. Each contains the usual dummy platform with its outfit of controller and braking handles, current meter, circuit breaker, fender, switch rods, bells, etc. This is supplemented by loose individual specimens of each important electrical part in car equipment, so that in making out a trouble report there will be no excuse for using incorrect or indefinite terms. Every motorman must also know enough of track and overhead construction to describe observed defects intelligently. For this reason each instruction room contains the principal types of overhead equipment as installed complete at crossings, on tangents, at feeder points, etc., together with specimens of rails in section. A complete telephone equipment is also installed to teach the recruits how to describe an accident and call for an emergency wagon in the clearest and quickest manner. This telephone lesson is particularly valuable in Berlin, partly because the men are often unfamiliar or clumsy with the apparatus and partly because an arrangement exists whereby the company's central operator immediately notifies the nearest emergency station upon receipt of an accident call. In general, all the schoolroom instruction is given by experienced motormen, but is supplemented by occasional talks by the engineer of car equipment on how to make repairs, use the least current, make out reports, etc.

After the recruit has completed the regular instruction course he must pass separate examinations by the car engineer and traffic inspector of the district to which he is assigned. He is then given charge of a car for about two weeks under the observation of a roadmaster and is finally accepted only upon the recommendation of this instructor. Should the new man cause an accident through serious negligence on his part the roadmaster is warned not to pass men of this type in future on penalty of reduction to the ranks. Applicants for the position of motormen are paid from 50 cents to 75 cents a day during the instruction period, but as the cost of teaching is considerable, they must deposit \$16 to \$18 to save the company from loss. This money is returned in full after one year's employment, or in part if the applicant failed to pass the final test.

British Parliamentary returns just issued show that at the end of 1908 the miles of electrified steam railroad track in Great Britain worked solely by electricity was 204 1/2, and partly by electricity 200 1/2. The kilowatt-hour consumption by these lines in 1908 was 249,287,308.

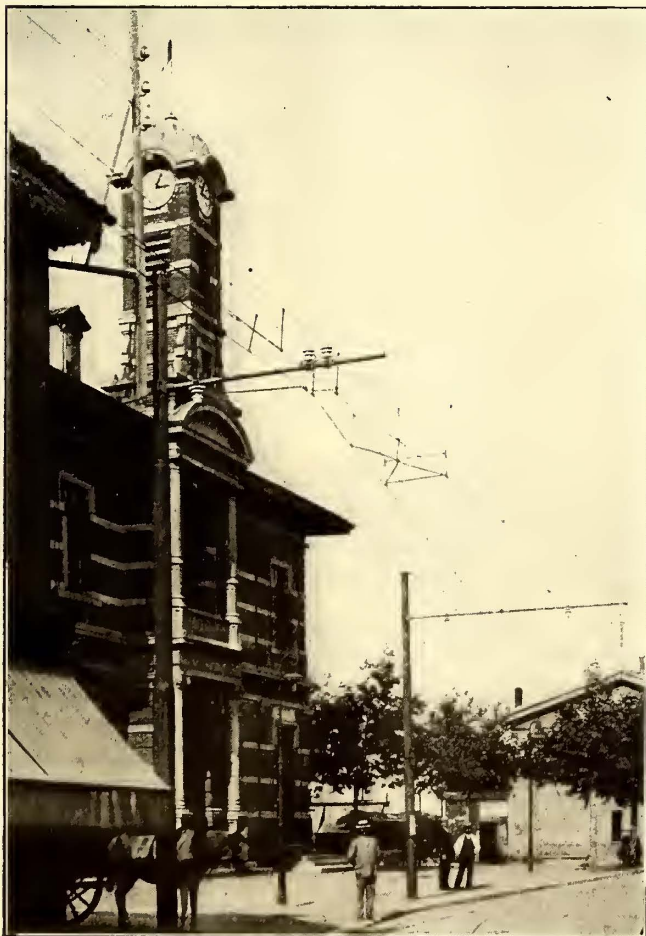
**SINGLE-PHASE EXTENSIONS OF THE LYONS (FRANCE) CITY LINES**

The two 6000-volt single-phase catenary lines which have recently been completed for the Lyons (France) electric railway system are of particular interest, inasmuch as they are practically suburban a.c. extensions of old d.c. lines operated from the heart of the city. Previous to the commercial development of single-phase traction, the Lyons company had extended its suburban lines to the point where the d.c. substation and feeder losses had become so large that further growth would have been unprofitable. It may be said, therefore, that the adoption of a high-tension alternating-current trolley has been the direct cause for the increase of electric railway facilities in this important manufacturing city.

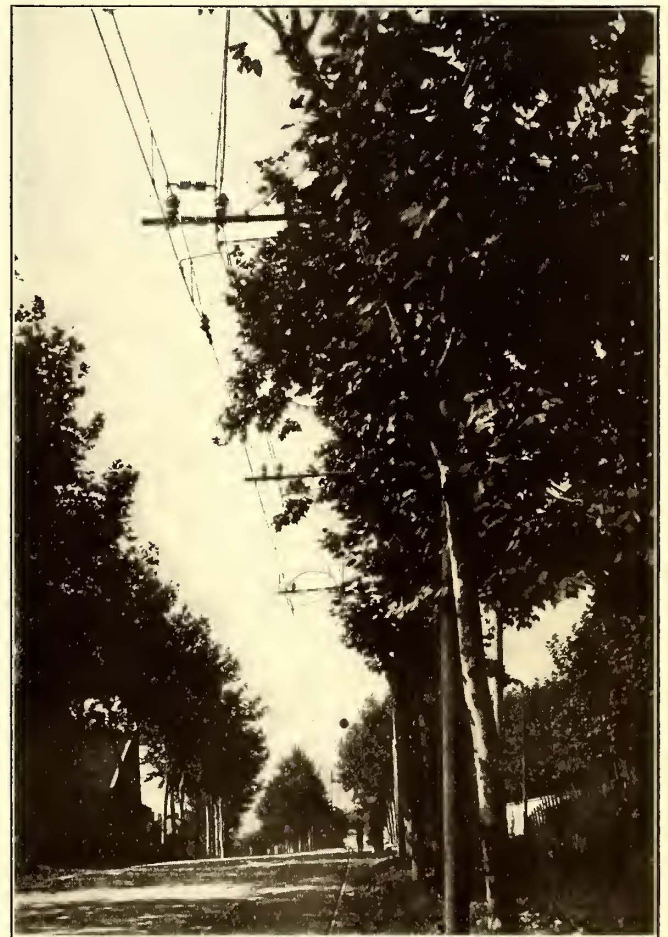
The first two a.c. extensions installed are those to Miri-

steel poles. Throughout the city, villages and at turnouts the poles are of the Mannesmann tubular design, capable of supporting a load of 800 kg. (1760 lb) at the summit. Elsewhere, and particularly on short curves, a double T-beam 160 mm (6.3 in.) wide is employed. The results given by the latter type of pole have been very satisfactory. The pole spacing on tangents varies from 35 m to 54 m (115 ft. to 177 ft.). All poles are set in concrete and have a ground connection to the rails. In general, the line construction is of the bracket design, with the bracket tubing interchangeable with the topmost member of the Mannesmann poles. Span wires are used at stations and sidings, but in a few cases the catenary is carried from light steel channels, as illustrated.

The messenger insulators are triple-petticoat porcelain, and before installation were subjected to a test with 50,000



**Lyons Single-Phase Tramways—Separator Construction at Siding**



**Lyons Single-Phase Tramways—Passing from A.C. to D.C. Sections**

bel and Jons, and as the cars are operated through the city, the equipment had to be designed for d.c. operation at 600 volts as well as for the a.c. potential of 6000 volts. The Miribel line is 12 km (7.4 miles) long, of which 5 km (3.1 miles) are operated with direct current. It will be extended eventually to Montluel, which will give a total length of 20 km (13.4 miles), all on the highway. The Jons line is 21 km (13 miles) long, of which 6 km (3.6 miles) are operated with direct current. This road is to be extended to Saint-Brémaz, a town 60 km (37.2 miles) from Lyons. Both of these lines are standard gage, single track and bonded with Chicago bonds of 50 sq. mm section.

**LINE CONSTRUCTION**

The overhead construction is carried from two types of

volts. The messenger cable is of steel and the trolley of figure 8 copper of 50 sq. mm (100,000 circ. mils) section. The hangers have a closed loop over the messenger, and are clipped to the trolley. The messenger and trolley are maintained in a vertical plane at curves, and even on tangents, by steady strains. As shown in the illustrations, these steady strains are made either of wood and are rigid or are made of wire and are flexible, in accordance with the conditions. The strain insulators are similar to those carrying the messengers.

The lines are electrically divided into sections of 3 km (1.86 miles) each. The steel cabinets, placed at the inter-sections of two such divisions, are provided with an oil switch section breaker and lightning protection.

The more distant portions of the single-phase divisions

are supplied by 6000-volt feeders, one being 6.5 km (3.8 miles) and the other 4.5 km (2.8 miles) long. The passage from the a.c. to the d.c. sections is made simply through the interposition of a neutral zone of dead wire. The construction at one of these neutral points is shown in one of

are set about 19 ft. center to center and have driver wheels of 850 mm (33 in.) diameter. The truck axles are 1.21 m (3 ft. 11 in.) apart.

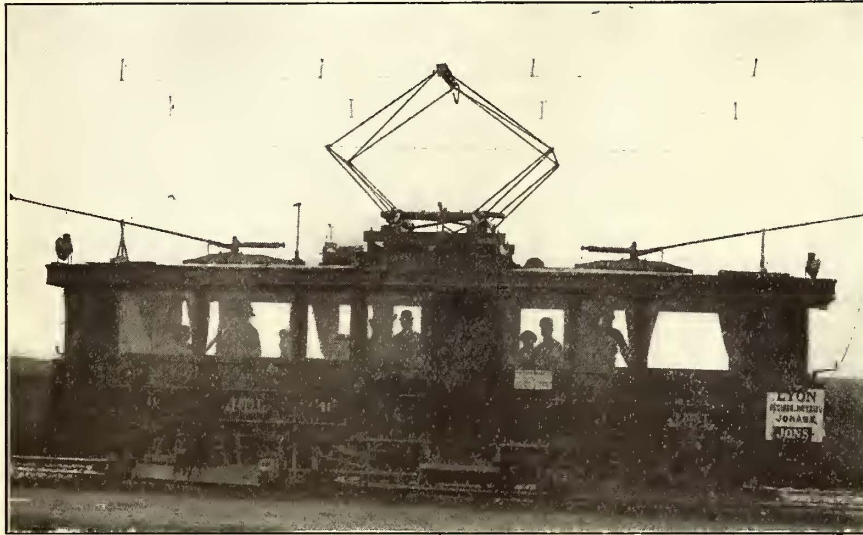
The electrical equipment per car, furnished by the French Westinghouse Company, comprises the following: Two

No. 1180 motors, two No. 225 controllers, one auto-transformer, one reverser, d.c. resistances, high and low-tension lightning arresters, disconnecting switches, fuses and air-braking equipment. It will also be noted that the motor car carries both a pneumatic pantograph and two trolley poles. The latter are necessary, as the old city overhead work is not suitable for the pantograph. The latter is carried on a wooden framing and four carefully grounded insulators.

When a car is leaving the d.c. zone to enter the a.c. section it passes a special pole arm, which strikes an upright lever of the car reverser. This shock has the effect of turning the reverser to such an angle that the a.c. circuit becomes operative. When the car is returning the lever, of course, is thrown to its original position, and the d.c. circuit becomes operative. The alternating current must

pass through the reverser, the high-tension fuses, and thence to the transformer under the car. This circuit is carried in grounded metal conduits.

The transformer is of the oil-cooled type made for 55 kva, 15 cycles, and is grounded. It takes current at 6000



Lyons Single-Phase Tramways—Car with Pantograph Raised on A.C. Section

the accompanying views. The d.c. sections in the city are of the ordinary, single-trolley construction.

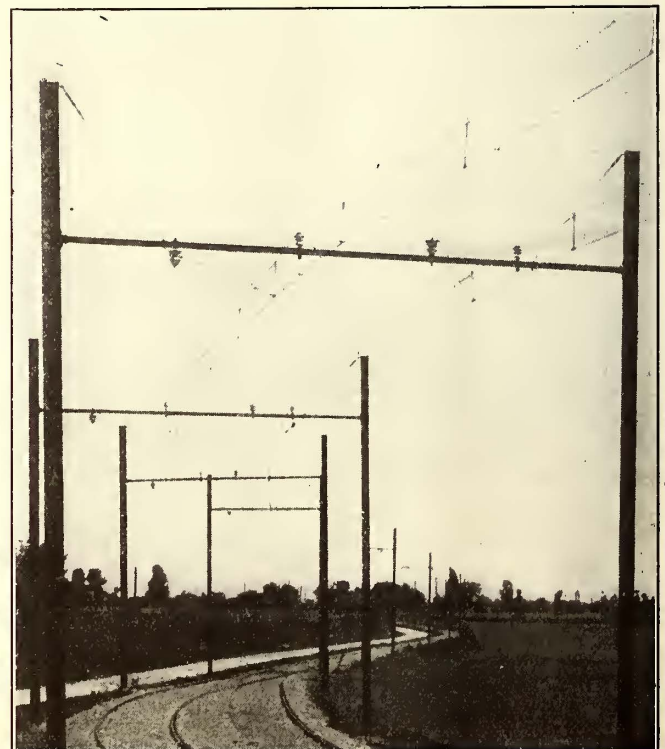
ROLLING STOCK

The motor cars used on both lines will number 15 in all. They are about 33 ft. long over all and about 6 ft. wide. They are divided into first and second-class compartments, with a total of 50 seats. Standing room is there-



Lyons Single-Phase Tramways—Catenary Construction in the Country

fore furnished by a central instead of end platform. There is a motorman's cab at each end of the car. As is customary in European cities, the motor cars are frequently operated with trailers. The motor trucks are of the Brill maximum traction type, and were made in America. They



Lyons Single-Phase Tramways—Span Construction, with Channel Poles and Carriers

to 6600 volts and transforms it to any desired potential between 100 and 315 volts. The controllers are furnished with three drums, two of which correspond to the running and reverser cylinders of the d.c. types, while the third regulates the speed when the motors are working with

alternating current. There is only one main controller handle, and in passing from one current to another the motorman shifts his handle.

Both motors of the equipment are mounted on one truck,

a half-hourly service on week days, and six motor cars for a 20-minute service on Sundays and holidays from 5 a. m. to 11 p. m. The Jons line has three motor cars for an hourly week-day service and six cars for a half-hourly



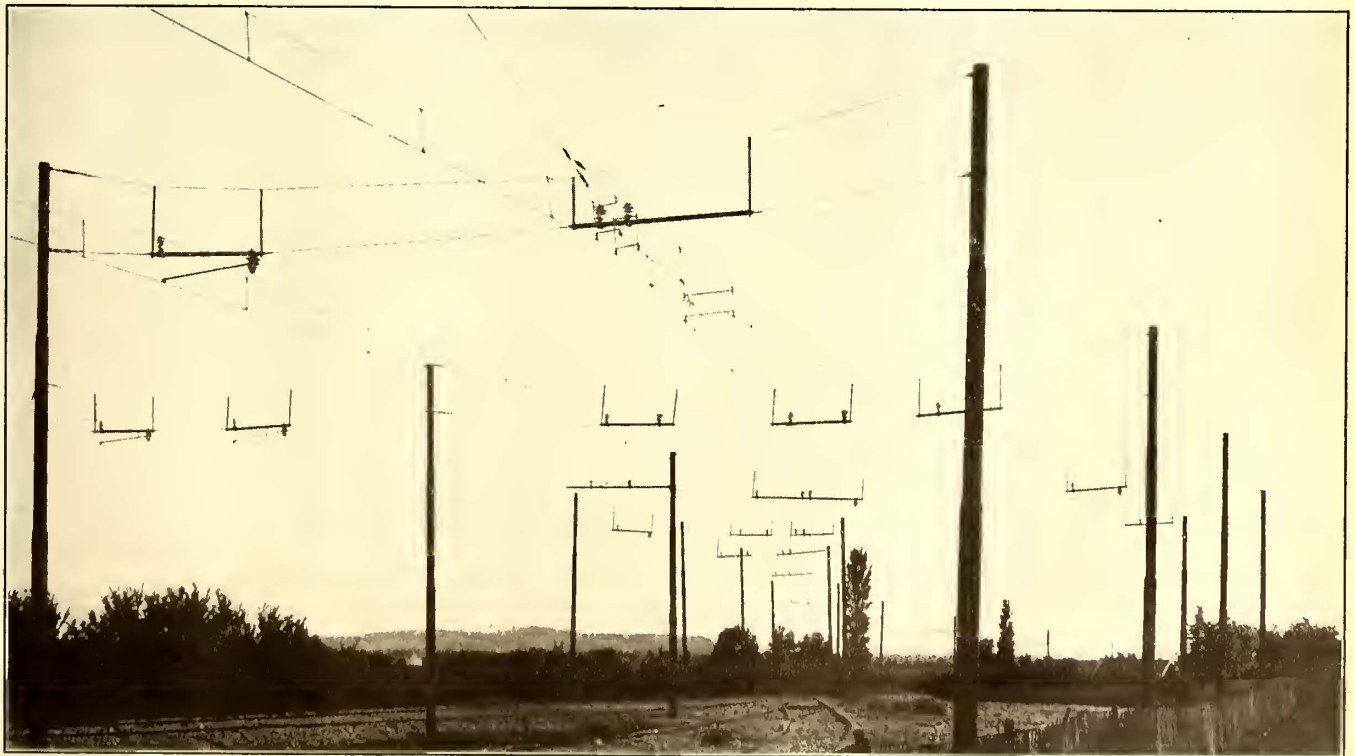
Lyons Single-Phase Tramways—Rectangular Separators at a Siding



Lyons Single-Phase Tramways—Plain Catenary Brackets on Channel and Tubular Poles

and they are rated at 45 hp each when taking 275 volts a.c. or 575 volts d.c. As a.c. motors, they are operated in parallel and as d.c. motors in series. Electrically considered, the motors are of the compensated type. The air

Sunday and holiday service from 5 a. m. to 11:30 p. m. When the traffic is heavy each car takes one or two trailers. The maximum trial speed of the motor cars was 50 km an hour (31 m.p.h.), and an average speed of 24-25 km an



Lyons Single-Phase Tramways—Catenary Construction in the Yard

compressor is of 5-hp capacity, and is also designed for a.c. and d.c. service.

GENERAL

Operation of the lines described was begun in March, 1909. The Miribel line has three motor cars, which give

hour (14-15 m.p.h) is obtained between the stations. The schedule speeds mentioned are considered to be remarkably good for routes where stops and slow-downs are necessarily frequent. It has been observed that the pantograph requires very little attention or maintenance expense.

## REPORT ON ACCOUNTS OF CHICAGO RAILWAYS COMPANY

Price, Waterhouse & Company, chartered accountants, made an examination of the books and accounts of the Chicago Railways Company recently at the request of Mayor Busse, of Chicago. A short notice concerning this examination was published in a previous issue of the *ELECTRIC RAILWAY JOURNAL*, but the full report contains discussion and information on several topics which have a bearing on the relations between the city of Chicago and the surface lines and an abstract of the principal points is therefore presented herewith. The investigation of the accountants concerning this company follows similar reports regarding the books and accounts of the Board of Supervising Engineers, Chicago Traction and of the Chicago City Railway. Abstracts of these reports were published in the issue of the *ELECTRIC RAILWAY JOURNAL* for April 24, 1909, page 788.

The accountants examined the accounts of the Chicago Railways Company for the two years ended Jan. 31, 1909, being the first two years of the partnership arrangements under the ordinance of Feb. 11, 1907. Owing to the delay in the consummation of the reorganization, the Chicago Railways Company was not in a position to accept the ordinance within the term of 210 days allowed therein. This term was extended, however, to Feb. 1, 1908, and the ordinance was finally accepted on Jan. 29, 1908, and went into effect as of Feb. 1, 1907. During this interval the property was operated by the receivers of the Chicago Union Traction Company, and the accounts were kept without regard to the probable future relationship with the city. The report states:

It became necessary, therefore, to rewrite the earnings and expense accounts, and they were rewritten on the theory that, if only there were excluded therefrom the expenses pertaining to the period prior to Jan. 31, 1907, the balance of the receivers' expenses must represent the expense chargeable to the partnership, and through a misunderstanding it was believed that the city comptroller concurred in this view. It happened, however, that the receivers' expenses of this first year (in addition to expenses dating from prior to the period of the partnership) included also numerous charges incidental to the reorganization of the company and otherwise, which were not properly expenses of operation, and the comptroller took exception to certain of these charges amounting to \$119,000, but not until the accounts of the first year were practically closed.

It was thereupon mutually agreed that the matter should be adjusted by charging a corresponding amount of strictly partnership expenses of the following year to the individual company instead of to the partnership account. Accordingly there was charged to the individual account a proportion (\$119,000) of certain legal fees and expenses paid in the year 1908, but these, being subsequently found to have been incurred chiefly in connection with or in effectuating the plan of reorganization, were objected to by the board of supervising engineers in the course of an investigation which the board undertook to make of the company's accounts in the latter part of 1908, and the objection was very properly sustained by the city's special traction counsel. In addition to the charges of \$119,000 in question, and on the ground that the expenses of the receivership were not *per se* expenses of the partnership, the board decided to exclude further charges amounting to \$93,076 while a special claim of \$42,411 was made against the receivers of the Chicago Union Traction Company or of the Chicago Consolidated Traction Company for their proportion of the cost of the trial department of the Railways Company for the two years, with the result that the partnership account was relieved of expenses theretofore charged against it up to Jan. 31, 1909, amounting in all to \$254,487.

In issuing its certificate of expenditures up to the end of January, 1909, the board reserved the right to make such

further audit and adjustment of the accounts as it considered necessary, and this further audit was made concurrently with our own and the adjustments found to be necessary as a result of both audits were compared, and, so far as they were agreed to by the company's auditor and the auditor for the board, correcting entries were to be made in the books of the partnership forthwith.

The most important of the adjustments agreed upon related to the treatment of the "income miscellaneous account." For the year ended Jan. 31, 1908, the net income derived from property owned or in use in the operation of the railway, remaining after deducting the expenses, was added to the gross operating receipts for the purpose of the settlement with the city, whereas in the following year the gross income was included in the gross receipts of the railway, the expense of upkeep and maintenance being included in the gross operating expenses of the railway. The report adds:

We find on investigation that both operated and non-operated property were included in the original appraised value of \$29,000,000 as of June 30, 1906, and we conclude that so far as the city is concerned, the non-operated property is, to all intents and purposes, the same as the operated property. We reach the conclusion, therefore, that the treatment adopted by the Railways Company in the first year was erroneous and that that adopted in the second year was the correct one, and the accounts of the first year should now be readjusted in accordance therewith.

There were other adjustments relating to various discrepancies which, though numerous, did not involve any items of any magnitude. The corrections of all of these items will result in an increase of the divisible profits by \$14,197 (of which the city's 55 per cent share amounts to \$7,808), but inasmuch as the corrections will involve also an addition of \$35,106 to the capital account, they are, in the whole, in favor of the company.

A somewhat similar question arose regarding the manner in which the sale of power should be treated in the partnership accounts. The report states:

The practice of the Railways Company has been to apply the cost of the power sold in reduction of the proceeds of sale and only the net profit on the sale has been carried to the credit of earnings. While this practice is in accordance with sound accounting, in that it enables the company to ascertain and state separately not only the profit on the sale of power to outside interests, but also the cost of power actually consumed in the operation of the railway, it is perhaps not in strict conformity with the requirements of the ordinance in regard to the manner in which a settlement is to be effected with the city, namely, by deduction of 70 per cent from the gross receipts from all sources and of every kind. It seems to us that the gross receipts from the sales of power should have been credited as gross receipts from operation, and the result would have been to increase the profit available for division with the city by \$17,190. On the other hand, the elimination of certain purely bookkeeping entries on both sides of the account (which add to the apparent expense as well as the apparent credits for power) would serve to reduce the divisible profits by \$4,368, making a net increase of \$12,821 by reason of the readjustment of the power account, of which amount the city would be entitled to 55 per cent, or \$7,052 on a revision of the accounts.

Some confusion had arisen as between the receivers and the new corporation in regard to the treatment of the reserve for accidents and injuries. The property was sold subject to the condition that the purchasers gave security for the payment of all liabilities of the receivers arising out of the operation of the street railways by the receivers which might not be met out of the cash funds remaining in the hands of the receivers after execution of the decree of sale. The Railways Company was to deposit with the court \$750,000 of 5-year, 6-per cent collateral bonds of the

Chicago Railways Company as a complete release and bar to any and all other liabilities in respect to these matters. From the sale of these notes there was realized \$697,500. Out of these funds the receiver continued to pay claims originating during the receivership and paid not only claims which dated from prior to Feb. 1, 1907, but also such as originated subsequent to that date and up to the time of the sale of the property in January, 1908. The claims originating in the last-mentioned interval and so paid by the receiver have amounted to approximately \$163,000.

The accountants say they are informed that it has now been decided that the payment by the receiver of claims pertaining to the year ending Jan. 31, 1908, was erroneous, or was at least founded on a misapprehension of the question of accounting involved, and accordingly the receiver will be reimbursed for these payments of \$163,000 approximately, the reimbursement being charged against the partnership reserve and so shifting the payment of the claims on to the partnership books where they properly belong.

The capital account was scrutinized carefully, and the only items as to which any question arose outside of those in the adjustment of which the company's auditor and the auditor for the board had already acquiesced were the addition of the commission and brokerage charge of 15 per cent on the final payment of \$9,297 in February, 1907, for a converter, amounting to \$1,394, and the duplication of certain charges to capital account amounting to \$1,843, a total of \$3,237.

It was held by the accountants that the final payment of \$9,297 was merely a payment in discharge of an obligation of the company outstanding on Jan. 31, 1907. It had no place on the books as an actual physical addition to the property subsequent to the date when the ordinance went into effect. Exception was taken to the second item of \$1,843 as being, in effect, a duplicate charge to capital account, inasmuch as the labor and material, or the property represented thereby, would have been covered in the supplementary appraisal which the board of engineers made of the property as of Jan. 31, 1908.

A question having been raised as to what proportion, if any, of the salaries of general officers and maintenance and other expenses was transferred from operating to construction, or charged direct to construction in the first instance, as being that proportion of the expenses of the character above described which the management of the company may have regarded as fairly applicable to the cost of the rehabilitation work over and above the labor and other direct charges entering therein, it was ascertained that the only charges of this nature which the company had made to capital account related to the use of teams and work cars and to the salaries of some additional clerks employed in the engineering department, and that these charges had amounted in all to not exceeding \$9,200 for the two years.

Careful inquiries were made as to rebates, but no evidence was found of the existence of any rebate agreements except one with a varnish company. Under an arrangement of long standing with that company, an allowance of 50 cents per gallon is received. The allowances amounted to \$568 in the two years, and in every case the credit was found to have been deducted from the gross amount of the purchase before recording in the books.

A question had arisen in regard to the allowances to the city for interest on its share of the annual earnings for the interval between Jan. 21 and the time allowed for the final accounting and settlement up to April 10, following. It was the view of the board of supervising engineers that some reasonable time was necessary after the compilation

of the accounts to ascertain the earnings and the city's share thereof, and that the intention of the ordinance was doubtless to allow such time after Jan. 31 and up to April 10 as the company may require for the purpose stated without any question of interest for this brief interval. As a difference of opinion existed on this point, the accountants suggested that it be referred to the special traction counsel of the city for a ruling and agreement. The present practice is to credit the partnership account with interest at the rate of 2 per cent per annum on 30 per cent of the monthly traffic receipts as they are deposited in bank from day to day. The accountants expressed the following conclusions on this point:

It would seem, therefore, that if the company continued to credit the city with interest calculated at some reasonable rate on the undistributed profits for the time elapsing between the close of the year and the date of final payment over of these profits (during which time the company has the use and benefit of the funds representing the profits) this course would be merely an extension of the same principle to its logical conclusion.

A statement of the various errors and discrepancies disclosed by the audit and which appeared to the accountants to call for an adjustment of the accounting with the city has been appended to the report. So far as the city is more directly concerned, the net effect of the adjustment is to add the sum of \$46,337 to the capital investment and of \$14,860 to the share of earnings accruing to the city. The accounts are still, however, subject to adjustment of interest on all the items enumerated in this schedule as well as of interest on the expenditures excluded by the board in its first audit of the accounts. The report continues:

There would then remain open for settlement, according as the legal advisers of the city may determine, the question of (1) the proportion, if any, of the maintenance and general expenses, which may be charged either to capital account as being fairly applicable to the cost of the rehabilitation work over and above the direct charges entering therein, or to the individual account as being that proportion of these expenses which was intended to be borne by the individual company in view of the requirements of Section 7 of the ordinance (the determination of which question would necessarily also control the adjustment of interest), and (2) the interest, if any, which it may be proper to allow on the city's share of the profits in respect of the interval elapsing between the close of the fiscal year on Jan. 31 and the date of final payment over of these profits to the city.

In conclusion we would report that, in addition to embracing the books of the partnership proper, our examination was extended to the so-called individual or private books of the corporation, which were thrown open to our inspection as accredited representatives of the city and without any reservation on the part of the management, and that every facility was afforded us for the purpose of this examination.

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The recent strike of the street railway employees of Stockholm, Sweden, resulted in a complete failure, and has been declared off. The few strikers who have been reinstated have been compelled to sign a contract and give a bond to insure their future loyalty to the company.

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On Sunday, July 25, the first section of the Mont Blanc electric railway was opened to the public, and passengers were carried up to a point 5,495 ft. above Le Fayet, the starting place of the railway. The total altitude of Mont Blanc, 15,781 ft. above sea level. The second section, upon which work is now under way, will reach a height of 10,800 ft. The two lower sections will run, without tunnel, in the open for 5 miles. The gradients will be never less than 1 in 12, and in places will be as steep as 1 in 5.

## CONCRETE POLES

The Oklahoma Gas & Electric Company, Oklahoma City, Okla., during the past year has experimented with reinforced concrete poles on a large scale. At a recent meeting of the Oklahoma Electric Light, Railway & Gas Association, J. M. Brown, superintendent of the company, read a paper in which he described the methods of molding and setting the poles and gave some figures of cost.

The poles are made hexagonal in shape and hollow in the center. A 35-ft. pole is 7 in. across the corners at the top and 16 in. across at the butt. The forms are arranged so that by adding sections 5 ft. long to either end poles of any length can be molded. The forms are made of heavy timber to avoid warping and are built in two halves which are clamped together and accurately lined up to insure the pole being straight. The 1 $\frac{1}{4}$ -in. high-carbon-steel, deformed-section reinforcing rods are then put in place symmetrically about the central axis. At the top of the pole



Setting Reinforced Concrete Pole

the rods are secured by passing them about 2 in. through holes in a steel plate, bending over the ends and then bolting down a second plate on the bent-over ends with four small bolts. The rods are then stretched and anchored in the butt by an ingenious method. The ends of the rods project about 6 in. through holes in a steel plate fastened in the form. Pieces of  $\frac{1}{2}$ -in. steel rod 10 in. long with an eye formed in one end and threads on the other end are used for stretching. The ends of the reinforcing rods are bent over and hooked into the eyes of the stretchers and short pieces of pipe are passed over the stretchers butting against the steel plate. A nut and washer bearing on the outer end of the piece of pipe is screwed down on the threaded end of the stretcher giving any desired tension to the rods. The form is then ready for placing the core, which is made in two sections, telescoping with each other. The core is wrapped with one thickness of building paper

and is hung in the center of the mold by suspension wires placed at intervals along the length of the form.

The concrete used consists of a mixture of one part cement, two parts sand and three parts chats or zinc tailings, which can be obtained in large quantities from the zinc mines of southwestern Missouri. With cement costing \$1.50 per barrel, sand at \$2 per cubic yard, chats at \$2 per cubic yard and labor at \$2 per day of eight hours, the cost of manufacturing a 35-ft. pole, 7 in. across at the top, averages \$10. Three men can make three poles per day. Poles have been molded, hauled 3 $\frac{1}{2}$  miles and set in five days' time, but this requires very careful handling and a longer time should be allowed for the concrete to set thoroughly. A 35-ft. pole molded, hauled to place and set, with steel cross-arms and pins mounted ready for stringing wires, costs \$18.

The advantages claimed for concrete poles are numerous. They are more rigid than wooden poles and wires do not swing as much as when mounted on wooden poles. The maintenance cost is practically negligible and the depreciation far less than for wooden or steel pole lines, as they do not rot or rust. They resist lightning discharges and accidental grounds, can be erected with no more trouble than wooden or steel poles and can be climbed for inspection or repairs as easily as a steel pole.

## CAPITALIZATION, CARS AND MILEAGE OF ELECTRIC RAILWAY COMPANIES IN THE UNITED STATES

The accompanying table shows the mileage, number of cars and capitalization of the street, elevated and electric interurban railway companies in the United States and its insular possessions, including Porto Rico, Hawaii and the Philippines; also in Canada (including Newfoundland) and Cuba. The figures are given for the last two years, and are compiled from the last two editions of the Red Book of American Street Railway Investments.

The decreases noted in the columns of capital stock and funded debt require some explanation, as they are more apparent than real. That in Massachusetts was caused principally by the decision to omit the capitalization of two or three of the underlying companies because the securities are also included in that of the holding company. The Massachusetts figures are now on the same basis as that of the other States. The other small decreases are due to consolidation, mergers, etc., or from estimating 1908 capital when for 1909 actual amounts were available. As in last year's table, the statistics of the electrified trunk lines are omitted.

The dates of the reports from different companies as given in the Red Book vary, but practically all of those in the 1909 edition are within the limits of June 30, 1908, and May 1, 1909. The average is believed to be not far from Dec. 31, 1908. For this reason the figures given in the table for 1908 may be considered as fairly representing the conditions at the close of that year.

Where reliable reports could not be obtained of the capital stock and funded debt of the companies, estimates have been made based upon the known physical property of the separate companies. As the roads not thus reporting were very small, however, both in number and importance, these estimates do not vitally affect the accuracy of the table. More important estimates had to be made of the outstanding stock and funded debt in cases where holding or leased companies owned a portion of the outstanding obligations or capital of sub-operating companies. These estimates were required, as some holding companies do not report the capitalization of sub-companies controlled by them.



# STREET AND CANADA

STATES	LIABILITIES.	
	1908	INCREASE FOR YEAR.
<b>New England States</b>		
Maine.....		
New Hampshire.....	2,872,213	\$ 75,532
Vermont.....	0,994,200	*505,800
Massachusetts.....	7,295,500	200,990
Rhode Island.....	1,814,800	*3,794,850
Connecticut.....	3,646,200	4,520,800
Total.....	3,869,478	*586,700
<b>Eastern States</b>		
New York.....		
New Jersey.....	1,143,125	141,328,032
Pennsylvania.....	1,408,480	17,306,140
Delaware.....	4,559,918	71,760,003
District of Columbia.....	9,679,000	*100,000
Maryland.....	3,853,187	16,992,578
Virginia.....	9,758,050	19,405,000
West Virginia.....	7,627,700	5,931,250
Total.....	6,227,900	6,966,900
<b>Central States</b>		
Michigan.....		
Ohio.....	9,896,800	9,843,100
Indiana.....	69,108,973	22,649,000
Kentucky.....	33,374,400	11,285,280
Wisconsin.....	78,091,010	6,997,400
Illinois.....	43,351,900	14,924,400
Minnesota.....	70,303,340	25,104,040
Iowa.....	56,370,000	1,985,000
Missouri.....	61,492,700	2,689,000
Total.....	37,164,700	*796,300
<b>Southern States</b>		
North Carolina.....		
South Carolina.....	12,313,000	5,473,100
Georgia.....	9,789,280	6,280
Florida.....	46,235,794	2,366,300
Alabama.....	8,171,000	1,257,000
Mississippi.....	33,259,000	5,262,000
Tennessee.....	7,417,870	*353,030
Louisiana.....	42,155,600	186,900
Arkansas.....	84,896,900	697,100
Total.....	10,089,800	308,000
<b>Western States</b>		
North Dakota.....		
South Dakota.....	660,000	*3,000
Nebraska.....	150,000	
Nevada.....	24,614,400	1,809,800
Kansas.....	1,230,000	730,000
Oklahoma.....	15,406,000	980,000
Texas.....	8,325,000	781,200
Colorado.....	44,036,000	938,400
Montana.....	43,752,200	4,624,200
New Mexico.....	4,409,615	*40,000
Idaho.....	700,000	
Utah.....	4,199,400	900,000
Washington.....	16,097,500	*950,000
Oregon.....	77,706,810	6,912,900
California.....	46,184,000	5,791,000
Arizona.....	260,398,400	21,267,400
Wyoming.....	960,000	100,000
Total.....	75,000	75,000
<b>United States</b>		
Hawaii, Porto Rico and Philip pine Islands & West Indies.....	548,904,325	43,917,300
Canada and Newfoundland.....	557,136,143	433,301,745
Cuba.....	26,011,500	11,256,500
	104,437,074	18,831,578
	40,785,681	*1,476,819

\* indicates a decrease



# STREET AND ELEVATED RAILWAY MILEAGE, CARS AND CAPITALIZATION IN UNITED STATES AND CANADA

COMPILED FROM THE STATISTICS OF THE VARIOUS PROPERTIES CONTAINED IN "AMERICAN STREET RAILWAY INVESTMENTS," EDITION OF 1909

STATES	No. of Ry. Cos.	ELECTRIC RAILWAYS.								CAPITAL STOCK.			FUNDED DEBT.			CAPITAL LIABILITIES.			
		TRACK MILEAGE.		ELECTRICALLY EQUIPPED CARS, SWEEPERS AND LOCOMOTIVES.		ALL OTHER CARS.		TOTAL CARS.		TOTAL.		INCREASE FOR YEAR.	TOTAL.		INCREASE FOR YEAR.	TOTAL.		INCREASE FOR YEAR.	
		1907	1908	1907	1908	1907	1908	1907	1908	1907	1908		1907	1908		1907	1908		
<b>New England States</b>																			
Maine.....	16	446	495	502	530	245	225	747	755	\$ 10,904,681	\$10,904,713	\$ 32	\$11,892,000	\$11,967,500	\$ 75,500	\$ 22,796,681	\$ 22,872,213	\$ 75,532	
New Hampshire.....	20	292	295	355	450	69	45	424	493	6,446,000	6,570,200	124,200	5,034,000	4,424,000	*630,000	11,500,000	10,994,200	*505,800	
Vermont.....	11	123	125	122	130	20	20	142	150	3,721,510	3,970,000	248,490	3,373,000	3,325,500	*47,500	7,094,510	7,293,500	200,990	
Massachusetts.....	69	2,949	2,980	8,136	8,260	2,455	2,250	10,591	10,510	107,169,650	99,074,450	*8,095,200	68,440,000	72,740,350	4,300,350	175,609,650	171,814,800	*3,794,850	
Rhode Island.....	10	459	460	1,009	1,000	224	200	1,233	1,200	21,992,000	26,192,700	4,200,700	17,133,400	17,453,500	320,100	39,125,400	43,646,200	4,520,800	
Connecticut.....	14	855	1,035	1,690	1,930	350	170	2,040	2,100	36,691,100	36,524,100	*167,000	37,765,078	37,345,378	*419,700	74,456,178	73,869,478	*586,700	
<b>Total.....</b>	<b>140</b>	<b>5,124</b>	<b>5,390</b>	<b>11,814</b>	<b>12,300</b>	<b>3,363</b>	<b>2,910</b>	<b>15,177</b>	<b>15,210</b>	<b>186,924,941</b>	<b>183,236,163</b>	<b>*3,688,778</b>	<b>143,657,478</b>	<b>147,256,228</b>	<b>3,598,750</b>	<b>330,582,419</b>	<b>330,492,391</b>	<b>*90,028</b>	
<b>Eastern States</b>																			
New York.....	168	3,950	4,720	13,011	13,700	4,232	4,290	17,243	17,990	437,269,849	495,714,675	58,444,826	372,545,244	455,428,450	82,883,206	809,815,093	951,143,125	141,328,032	
New Jersey.....	48	1,215	1,285	2,590	2,825	330	365	2,920	3,190	95,873,590	105,549,980	9,676,390	108,228,750	115,858,500	7,629,750	204,102,340	221,408,480	17,306,140	
Pennsylvania.....	170	3,950	4,210	8,333	8,475	1,178	1,150	9,511	9,625	264,516,930	302,411,687	37,894,757	178,282,985	212,148,231	33,865,246	442,799,915	514,559,918	71,760,003	
Delaware.....	4	85	75	170	155	5	16	175	171	4,450,000	4,350,000	*100,000	5,329,000	5,329,000	0	9,679,000	9,679,000	*100,000	
District of Columbia.....	8	340	393	1,000	1,015	470	435	1,470	1,450	34,964,800	42,048,100	7,083,300	31,895,809	41,805,087	9,909,278	66,860,609	83,853,187	16,992,578	
Maryland.....	14	528	560	1,960	1,990	179	185	2,139	2,175	20,243,050	26,808,050	6,565,000	60,110,000	72,950,000	12,840,000	99,758,050	109,405,000	9,646,950	
Virginia.....	24	543	470	666	670	190	210	856	880	29,682,600	32,796,600	3,114,000	32,013,800	34,861,100	2,847,300	61,696,450	67,627,700	5,931,250	
West Virginia.....	24	349	350	421	435	38	35	459	470	10,844,000	14,217,900	3,373,900	8,417,000	12,010,000	3,593,000	19,261,000	26,227,900	6,966,900	
<b>Total.....</b>	<b>460</b>	<b>10,960</b>	<b>12,063</b>	<b>28,151</b>	<b>29,265</b>	<b>6,622</b>	<b>6,686</b>	<b>34,773</b>	<b>35,951</b>	<b>897,844,869</b>	<b>1,023,866,992</b>	<b>126,022,123</b>	<b>796,822,588</b>	<b>950,390,368</b>	<b>153,567,780</b>	<b>1,694,667,457</b>	<b>1,974,257,360</b>	<b>279,589,903</b>	
<b>Central States</b>																			
Michigan.....	28	1,700	1,355	2,011	1,915	492	500	2,503	2,415	42,538,200	42,666,800	128,600	47,515,500	57,230,000	9,714,500	90,053,700	99,896,800	9,843,100	
Ohio.....	105	4,450	4,455	4,948	5,100	698	620	5,646	5,720	219,018,473	234,240,973	15,222,500	127,441,500	134,868,000	7,426,500	346,459,973	369,108,973	22,649,000	
Indiana.....	53	2,281	2,320	1,840	2,000	400	440	2,240	2,440	96,214,980	102,297,260	6,082,280	70,590,750	75,793,750	5,203,000	166,805,730	183,374,400	11,285,280	
Kentucky.....	13	349	380	599	625	303	300	902	925	20,924,200	23,620,900	2,696,700	15,430,300	17,731,000	2,300,700	36,354,500	38,091,010	1,736,510	
Wisconsin.....	23	785	790	831	835	110	115	941	950	34,091,000	38,477,000	4,386,000	34,359,000	44,897,400	10,538,400	68,450,000	43,351,900	14,924,400	
Illinois.....	65	2,821	3,015	5,096	5,100	2,184	2,260	7,280	7,360	168,465,800	172,956,500	4,490,700	176,733,500	197,346,840	20,613,340	345,199,300	370,303,340	25,104,040	
Minnesota.....	10	546	560	782	790	78	50	860	840	32,565,000	32,912,000	347,000	21,820,000	23,458,000	1,638,000	54,385,000	56,370,000	1,985,000	
Iowa.....	30	756	760	896	860	140	130	1,036	990	36,653,200	36,588,200	*65,000	22,150,500	24,904,500	2,754,000	58,803,700	61,492,700	2,689,000	
Missouri.....	27	1,172	1,088	2,254	2,320	372	390	2,626	2,710	88,262,000	87,975,700	*286,300	99,699,000	99,189,000	*510,000	187,961,000	187,164,700	*796,300	
<b>Total.....</b>	<b>354</b>	<b>14,860</b>	<b>14,723</b>	<b>19,257</b>	<b>19,545</b>	<b>4,777</b>	<b>4,805</b>	<b>24,034</b>	<b>24,350</b>	<b>738,732,853</b>	<b>771,735,333</b>	<b>33,002,480</b>	<b>615,740,050</b>	<b>677,418,490</b>	<b>61,678,440</b>	<b>1,354,472,903</b>	<b>1,449,153,823</b>	<b>94,680,920</b>	
<b>Southern States</b>																			
North Carolina.....	14	115	150	180	185	39	40	219	225	3,592,100	6,842,000	3,249,900	3,247,800	5,471,000	2,223,200	6,839,900	12,313,000	5,473,100	
South Carolina.....	7	139	140	138	160	26	30	164	190	4,283,000	4,369,280	86,280	5,500,000	5,420,000	*80,000	9,783,000	9,789,280	6,280	
Georgia.....	13	386	395	557	570	108	105	665	675	23,269,394	24,378,294	1,108,900	20,600,100	21,857,500	1,257,400	43,869,494	46,235,794	2,366,300	
Florida.....	10	151	150	175	175	39	60	214	235	4,666,000	5,074,000	408,000	2,248,000	3,097,000	849,000	6,997,000	8,171,000	1,257,000	
Alabama.....	11	302	302	484	410	173	190	657	600	15,467,000	18,475,000	3,008,000	12,530,000	14,784,000	2,254,000	27,917,000	33,259,000	5,262,000	
Mississippi.....	10	92	96	122	155	10	20	132	175	4,122,400	3,421,370	*701,300	3,648,500	3,996,500	348,000	7,770,900	7,417,870	*353,030	
Tennessee.....	11	352	360	650	680	92	65	742	745	19,354,700	19,346,600	*8,100	22,614,000	22,809,000	195,000	41,968,700	42,155,600	186,900	
Louisiana.....	8	252	250	590	640	59	60	649	700	52,257,800	53,395,900	1,138,100	31,942,000	31,501,000	*441,000	84,199,800	84,896,900	697,100	
Arkansas.....	9	128	132	192	193	35	35	227	228	5,461,800	5,491,800	30,000	4,320,000	4,598,000	278,000	9,781,800	10,089,800	308,000	
<b>Total.....</b>	<b>93</b>	<b>1,917</b>	<b>1,975</b>	<b>3,088</b>	<b>3,168</b>	<b>581</b>	<b>605</b>	<b>3,669</b>	<b>3,773</b>	<b>132,474,194</b>	<b>140,794,244</b>	<b>8,320,050</b>	<b>106,650,400</b>	<b>113,534,000</b>	<b>6,883,600</b>	<b>239,124,594</b>	<b>254,328,244</b>	<b>15,203,650</b>	
<b>Western States</b>																			
North Dakota.....	3	18	18	45	45	5	5	50	50	360,000	360,000	.....	303,000	300,000	*3,000	663,000	660,000	*3,000	
South Dakota.....	4	25	30	6	8	2	2	8	10	100,000	100,000	.....	50,000	50,000	.....	150,000	150,000	.....	
Nebraska.....	10	280	240	450	460	53	60	503	520	14,329,600	14,587,400	257,800	8,475,000	10,027,000	1,552,000	22,804,600	24,614,400	1,809,800	
Nevada.....	2	10	11	10	10	.....	2	10	12	200,000	1,100,000	900,000	300,000	130,000	*170,000	500,000	1,230,000	730,000	
Kansas.....	17	279	295	230	235	80	95	310	330	7,826,000	8,751,000	925,000	6,600,000	6,655,000	55,000	14,426,000	15,406,000	980,000	
Oklahoma.....	15	213	215	120	140	24	30	144	170	5,345,800	5,604,000	258,200	2,198,000	2,721,000	523,000	7,543,800	8,325,000	781,200	
Texas.....	29	541	550	720	735	143	130	863	865	26,980,600	26,770,000	*210,600	16,117,000	17,266,000	1,149,000	43,097,600	44,036,000	938,400	
Colorado.....	17	457	472	474	445	225	480	699	925	20,191,000	24,192,200	4,001,200	18,937,000	19,560,000	623,000	39,128,000	43,752,200	4,624,200	
Montana.....	6	81	81	106	117	24	20	130	137	2,799,615	2,759,615	*40,000	1,650,000	1,650,000	.....	4,409,615	4,409,615	*40,000	
New Mexico.....	2	11	11	14	10	3	1	17	11	350,000	350,000	.....	350,000	350,000	.....	700,000	700,000	.....	
Idaho.....	7	138	145	57	65	70													



**FINAL REVISION OF CITY RULES**

A final meeting of the committee on city rules of the American Street & Interurban Railway Association was held Aug. 27 at the headquarters of the association, 29 West Thirty-ninth Street, New York. There were present R. E. Danforth, general manager, Public Service Railway Company, Newark, N. J.; L. H. Palmer, assistant to manager, Metropolitan Street Railway Company, New York; H. H. Hunt, district manager, Stone & Webster Managers' Organization, Boston, and N. W. Bolen, superintendent of transportation, Public Service Railway Company, Newark.

At the last meeting of the city rules committee, held June 7 and 8, and reported in the ELECTRIC RAILWAY JOURNAL for June 12, a number of revisions in the Standard Code of Rules were made. The rules as thus revised were printed in bulletin form and, as members of the association know, a copy was mailed to all the members, with the request that any criticism of the rules be sent to the committee in time to permit a final revision before the Denver convention. In response to this circular a number of letters were received by the chairman, some containing suggestions for additional changes. All of these suggestions were considered at the meeting Aug. 27, and a number of them were adopted.

The new rules, as revised by the committee at the meeting last week, are printed below, and it is expected that this is the form in which they will be presented to the association, accompanied by a report which will describe the work of the committee this year, and possibly outline that suggested for the coming year.

Very few of the rules have been changed in intent, as compared with the tentative list published in the ELECTRIC RAILWAY JOURNAL for June 12, but the captions have been altered in a number of cases to make them indicate more clearly the purpose of the rule. The most important changes in the text of the rules themselves are as follows: In Rule 10, on bell signals, the five-bell signal from the motorman to the conductor has been omitted. Rule 20, on warning passengers, has been entirely rewritten. Rule 103, on route signs, has been changed, so that the conductor is required to change the route signs on each half-trip, but by an addition to the rule on responsibility (Rule 2), both conductor and motorman are held responsible for seeing that this is done. Rule 107, on inspection of cars, has been elaborated. A new rule on destination signs (206) has been added, and the rules following this new rule have been advanced one number. Former rule 224, regarding pedestrians between tracks, has been omitted.

**RULES FOR CITY OPERATION**

**GENERAL NOTICE.**

To enter or remain in the service is an assurance of willingness to obey the rules.

Obedience to the rules is essential to the safety of passengers and employees, and to the protection of property.

The service demands the faithful, intelligent and courteous discharge of duty.

To obtain promotion, capacity must be shown for greater responsibility.

Employees, in accepting employment, assume its risks.

In all cases of doubt, take the safe side.

The rules herein set forth are for the government of the employees of the.....Company, and become effective....., superseding all previous rules and instructions where they conflict with the same.

Special instructions may be issued from time to time by proper authority.

**GENERAL RULES.**

**KNOWLEDGE OF RULES.**

**Knowledge of Rules.**

1. All employees whose duties are prescribed by these rules will be furnished with a copy, for which they will sign receipt, and will be required to have the same in their possession at all times while on duty.

Conductors and motormen are required to be familiar with the rules, and with every special order issued. The bulletin

board must be examined daily for special orders. Employment by the company binds the employee to comply with the rules and regulations, and ignorance thereof will not be accepted as an excuse for negligence or omission of duty. If in doubt as to the exact meaning of any rule or special order, application must be made to the proper authority for information and instruction.

In addition to these rules, special orders will be issued from time to time; such orders, when issued by proper authority, whether in conflict with these rules or not, must be obeyed while in force.

**RESPONSIBILITY.**

**Responsibility.**

2. The motorman is held responsible

(a) For the safe running of the car.

(b) For the proper operation of the machinery of the car.

(c) For running car according to schedule.

The conductor is in charge of the passengers on the car and is held responsible

(d) For the safety and convenience of the passengers.

(e) For the collection and proper accounting of fares.

Conductors and motormen will see that route and destination signs are properly displayed and will be held jointly responsible therefor.

All employees whose duties are prescribed by these rules will be furnished with a copy, for which they will sign receipt, and will be required to have the same in their possession at all times while on duty.

**PERSONAL CONDUCT.**

**Personal Appearance.**

3. Conductors and motormen must report for duty clothed in full regulation uniform, and must be clean and neat in appearance.

**Poiteness.**

4. Conductors and motormen must treat all passengers with poiteness, avoid difficulty, and exercise patience, forbearance and self-control under all conditions. They must not make threatening gestures or use loud, uncivil, indecent or profane language, even under the greatest provocation. Badge number of conductor and motorman must be given on request of a passenger at any time.

**Habits.**

5. The following acts are prohibited:

(a) Drinking intoxicating liquors of any kind while on duty.

(b) Entering any place where the same is sold as a beverage while in uniform or while on duty, except in case of necessity.

(c) Constant frequenting of drinking places.

(d) Carrying intoxicating drinks about the person while on duty.

(e) Carrying intoxicating drinks on the company's premises at any time.

(f) Indulging to excess in intoxicating liquors at any time.

(g) Gambling in any form, including the laying of bets (and playing raffles) while upon the premises of the company.

(h) Smoking tobacco while on duty.

(i) Smoking tobacco while off duty in any part of the company's buildings, except in the conductors' or motormen's room.

(j) Reading books or newspapers while on duty.

**Conversation.**

6. Motormen while operating cars are permitted to answer questions of superior officers, and to give proper instructions to students only. All other conversation with motormen while car is in motion is forbidden.

**Run on Time.**

7. Cars must never be run ahead of schedule time, but must pass time points and leave terminals promptly on time, unless unavoidably delayed. Should a motorman be unavoidably detained he must not attempt to make up time by reckless running.

Conductors and motormen must carry reliable watches which must show correct time and be compared daily with the standard station clock.

**Starting.**

8. Motorman must never move car (whether stopped on signal or for any other reason) without signal from conductor, and then only when assured that no one is getting on or off front platform.

Conductor must never give signal to start when passengers are getting on or off.

Conductor must not put his hand on bell cord until passengers have boarded or left car; bell cord must not be touched until it is time to signal motorman to go ahead.

Conductor must never give signal to back a car unless he is on rear platform and sees that track is clear behind the car.

**Starting Cars After Blockade.**

9. In the event of a blockade of cars from any cause, the cars in such blockade must not all be started at one time, but singly, and at such intervals as will not burden the feeder line.

**Bell Signals.**

10. From conductor to motorman, to be given on motorman's signal bell:

1 bell—"Stop at next crossing or station."

2 bells—"Go ahead."

3 bells—"Stop immediately."

4 bells—"given when car is standing"—"Back car slowly."

From motorman to conductor, to be given on conductor's signal bell:

1 bell—"Come forward."

2 bells—"Watch the trolley" and danger signal to the conductor.

3 bells—"Set rear brake."

4 bells—Signal to conductor that motorman desires to back the car.

Whenever a car in service is stopped, for any cause except to take on or let off passengers, the motorman will, as soon as he is ready to go forward, give two taps of the gong; after which, if the conductor is ready to proceed, he will give the "Go ahead" signal.

The motorman will answer the signal to stop from conductor by one loud tap of gong; and two loud taps of gong after receiving the signal to go ahead. If unable to proceed immediately upon receipt of signal, motorman will wait for another "Go ahead" signal before starting the car.

When the car is standing, and motorman desires to back, for any reason, he will give the conductor four bells, but must not move the car until the conductor has answered with four bells to signify "All is clear behind." However, when it is necessary to back for any distance, or whenever any danger would be likely to result from backing, motorman must always change ends.

When two or more cars are coupled together, "Go ahead" signal must first be given by conductor of rear car and be repeated by each conductor in succession on his signal bell, when he is ready to start.

#### Obstructions Near Track.

11. Before passing any vehicle or obstruction close to the track, where passengers or conductor are liable to be injured while standing on the step of an open car, motorman must give two taps on conductor's signal bell as a warning, and must bring his car to a full stop before passing vehicle or obstruction unless he has received GO AHEAD signal from the conductor, indicating that all is clear. Great care must be exercised in passing over all excavations; workmen should be warned of the approach of car by sounding the gong repeatedly, and the car should be kept under full control. Where excavations are near regular stopping place, car should be run clear thereof before stopped.

#### Danger Signals.

12. Red lights or flags indicate danger, and when placed on the track cars must come to a full stop until such signal is removed.

#### Report Defects.

13. Conductors and motormen will report to superintendent, inspector, starter or foreman any defect in car, track or wire, and fill out blank provided for that purpose.

#### Disabled Cars.

14. The motorman or conductor of any disabled car, withdrawn from the main track, must remain with the car until relieved by proper authority. When a disabled car is being pushed or pulled, the signal for starting must first be given by conductor on rear car, and repeated by conductor on forward car, each conductor being careful not to give the signal when passengers are boarding or leaving car.

#### Leaving Car.

15. When necessary for conductor to leave his car he must notify the motorman to protect passengers and car. Should passengers board car during absence of conductor, motorman will notify conductor of the number and location of such passengers upon his return.

Cars in commission must not be left unprotected; either conductor or motorman always remaining in charge.

#### Responsibility for Damages.

16. Employees will be held responsible for any damages caused by their neglect or carelessness or by disobedience of rules.

#### Transfer Point Meetings.

17. Motormen and conductors will be held equally responsible for leaving a transfer point so quickly as to prevent the transfer of passengers from an approaching car on a connecting line.

#### Steam Railroad Crossings.

18. Car must be brought to a full stop at a safe distance approaching steam railroad crossings at grade, and motorman must not proceed until conductor has gone ahead to the center of crossing, looked both ways, and given the COME AHEAD signal. Before starting, the motorman will look back to see that no passengers are getting on or off; and in no case proceed, even after conductor's signal, until he has also examined the crossing and satisfied himself that steam cars are not approaching.

When there is more than one track the conductor must remain in advance of the car until the last track is reached.

After boarding car, conductor will give GO AHEAD signal to notify motorman that he is aboard. Motorman is forbidden to proceed without this signal.

Where crossing is protected by derail, interlocking plant, or flagman (employed by the company) this rule does not apply, special instructions being issued to govern in such cases.

### SAFETY OF PASSENGERS.

#### Safety.

19. The safety of passengers is the first consideration. All employees are required to exercise constant care to prevent injury to persons or property, and in all cases of doubt take the safe side.

#### Warning to Passengers.

20. While persons assuming positions of danger, such as boarding or leaving moving cars, walking behind a moving car when another car is approaching, etc., do so at their own risk. Conductors and motormen should call the attention of such persons to the danger of so doing. Conductors on moving cars must give the danger signal (three bells) if an accident appears imminent.

#### Standing on Steps.

21. Permit no person to stand on the steps or buffers. Passengers should be fully inside of the car or safely landed on the platform before the signal is given to start.

#### Stealing Rides.

22. Any person caught stealing a ride on a car must never be driven therefrom while it is in motion, but car must be stopped at next street or station and such person put off.

### ACCIDENTS.

#### Assistance.

23. In case of accident, however slight, to persons or property, in connection with or near any car, the motorman and conductor in charge of the same will render all assistance necessary and practicable. In no case will they leave injured persons without first having seen that they are cared for.

#### Medical Attendance.

24. Motormen and conductors are directed not to employ medical attendance to injured persons, except for the first visit, in cases of personal injury; nor will they visit such persons at any other time afterward unless specially instructed so to do by an officer of the company.

#### Fire in Car.

25. When there is evidence of car being on fire, motorman will immediately throw overhead switch to OFF and conductor pull down trolley, both motorman and conductor using every effort to prevent passengers becoming panic-stricken or leaving car before it is brought to a stop.

#### Written Reports.

26. A full and complete written report of every accident, no matter how trivial, and whether occurring on or near the car, must be made by the conductor. Accidents sometimes considered as not worth reporting are often the most serious, troublesome and expensive.

The conductor will obtain the name and residence in full of all witnesses on or near the car, including badge number of any policeman, fireman, private officer, postman or uniformed employee of the company.

The motorman will assist the conductor in securing the names of witnesses whenever practicable, and will be held responsible for any neglect to render assistance.

In all cases full facts must be obtained and stated in the report, as follows:

The date, exact time, exact place, run and car number, and the direction in which the car was moving, the nature of the accident or collision, and the cause of its occurrence.

The full name and address of the person injured, or whose vehicle was in collision (giving the name of both the driver and the owner of the vehicle).

Ascertain the extent of injuries or damage, if any, before leaving the spot.

In case there has been an accident on the car, and the crews change ahead, the conductor taking car on which the accident happened must secure the names of witnesses as above.

In case a person is struck by a car after passing around the rear of a passing or standing car, the numbers of both cars must be obtained, and both crews must report the accident.

If an accident is caused by any defect or damaged condition of car, conductor must report the same and its cause.

Accidents to employees will be reported the same as accidents to passengers.

Any trouble or disturbance of a boisterous or quarrelsome character which occurs on a car, or the ejection of a person from a car, will be reported as an accident.

#### Report Accidents to Inspectors.

27. Conductors and motormen will make a verbal report to the first inspector or official of the company they meet of any accident, blockade or mishap of any kind. The depot starter or dispatcher must also be notified.

#### Information to Proper Persons Only.

28. No employee shall, under any circumstances, give any information whatever concerning any accident, delay, blockade or mishap of any kind to any person, except to a properly authorized representative of the company.

#### Information by Telephone.

29. In case of accident involving personal injury or serious damage to property, conductor, after attending to the case and getting witnesses, will telephone at once to headquarters, giving notice and particulars of accident.

In case of a blockade, where assistance is required to get cars moving, conductor of car first in block must summon assistance. Conductor of the second car, however, will also be held responsible for being sure that assistance has been summoned. Expense of telephone message will be refunded upon application at office.

### EJECTMENTS.

#### Ejectments.

30. Ejectments shall be made by the conductor with the assistance of the motorman after the car has been brought to a stop, using "only such force as is sufficient to expel the offending passenger with a reasonable regard for his personal safety." No passenger shall be forcibly ejected from the car for any cause whatever without order from an inspector, starter or official of the company, unless the conduct of the passenger is dangerous or grossly offensive.

#### Where to Eject.

31. Any person ejected from a car must be put off at a regular stopping place. No passenger will be put off at a point where likely to be exposed to danger.

Particular attention must be paid to this rule during bad and inclement weather, late at night, or when a passenger is intoxicated.

#### Intoxicated Persons.

32. No passenger will be ejected from a car for mere intoxication, unless said passenger becomes dangerous or offensive; such passenger must then be ejected with great care and must be guided until free from probable injury.

### CAR-HOUSE RULES.

#### Report for Duty.

33. Regular conductors and motormen must report for duty ten minutes before leaving time for their first trip, or, if for any good reason unable to so report, must give notice at least ten minutes before such leaving time.

Extra men must report at such time as ordered, or must give notice at least ten minutes before such time. They must not absent themselves after answering roll-call without permission.

### HEARING BY SUPERINTENDENT.

#### Hearing by Superintendent.

34. A hearing will be given by the superintendent to every employee who desires to complain. Reports or suggestions for the betterment of the service will always receive consideration.

### RULES FOR CONDUCTORS.

#### OPERATING RULES.

#### Position on Car.

101. Remain on rear platform when not collecting fares, keeping a lookout for persons desiring to board car. Keep careful watch of passengers to observe requests to stop car. When stops are made at principal streets, places of amusement, churches, or at any point where a considerable number of passengers enter or leave the car, conductor should be on rear platform until such point is passed. When descending steep grades conductor will remain on rear platform.

#### Announcements.

102. Announce distinctly the names of streets, public places and transfer points when approaching the same.

#### Route Signs.

103. Properly display route signs on each half trip.

#### Trolley.

104. Trolley rope must be held when passing over switches, crossings, or going around curves. Should the trolley leave the wire, the conductor must at once pull down the trolley and signal the motorman to stop. After the car has stopped, replace the trolley on the wire, look around and through the car and see if any persons are boarding or leaving same before giving motorman signal to start. See that passengers keep their hands off the trolley rope. Do not remove trolley from wire at end of run, or elsewhere at night, until passengers have alighted from car.

#### Gates.

105. Front and rear gates on closed cars on the side between the tracks must always be kept closed and securely fastened. On open cars the guard chains must be kept fastened and guard rail lowered on the side between the tracks. When gates or chains or their fastenings are broken or out of order, prompt report must be made to superintendent, inspector, starter or foreman.

#### Disabled Motorman.

106. In case motorman is disabled from any cause while car is in motion, conductor must stop the car as promptly as possible.

**Inspection of Car.**

107. Conductors will see that cars are clean, and will carefully inspect floor, windows, grab-handles, steps, signs and all others parts of car which passengers may use to see that same are in proper condition before car is taken out on the road.

**HANDLING PASSENGERS.**

**Moving Forward.**

108. On closed cars when standing passengers crowd the rear door, request them to PLEASE STEP FORWARD.

**Seating Passengers.**

109. Standing passengers should be directed to vacant seats, and an effort made to provide them with seats where possible.

**Assisting Passengers.**

110. Elderly and feeble persons, women and children, should be given assistance getting on and off car, when possible. Crippled, blind or badly intoxicated persons should be assisted to sidewalk if necessary.

**Information to Passengers.**

111. Conductors are expected to be familiar with principal points along their route, so as to be able to give information to passengers about streets, parks, connecting or intersecting railway lines, depots, ferries, public buildings, large stores, hospitals, theaters, etc.

When on the stand at terminals, and when approaching passengers, conductors must announce the route and destination of car.

**Spitting on Floor.**

112. No passenger will be ejected from a car for spitting on the floor. If a passenger violates the rule or law prohibiting spitting, the conductor will call the attention of the passenger to the law prohibiting such conduct and endeavor to persuade the passenger to desist.

**Carrying Packages.**

113. Passengers must not be allowed to carry bulky or dangerous packages aboard cars.

Employees must not carry packages, letters or newspapers without an order from the proper authority, and must not assume responsibility for any package which a passenger may bring upon the car, excepting such articles as are to be turned into the Lost Article Department.

They must not hang nor allow articles to be hung on the brake handles.

**Lost Articles.**

114. Any article left in the car must be turned in promptly at office. Concerning articles found, conductors must not give information to any person, but must refer such person to the proper office. The names and addresses of parties giving lost property to conductors must be obtained.

**Dogs In Cars.**

115. Dogs will not be carried on any car.

**FARES AND TRANSFERS.**

**Collection of Fares.**

116. Fares must be collected promptly after passenger has boarded car and immediately registered. When more than one person boards car at a time, the fares must be registered immediately in the presence of the passenger who paid them before any more fares are collected. Fares should be collected separately and not in bunches.

Should a conductor for any reason return a fare to a passenger, or by error register more fares than he collected, he must not attempt to recover same by omitting to register fares subsequently collected, but should make report of such fact.

**Change.**

117. When necessary to give change, first register fare, and immediately thereafter give change, stating the amount received and amount returned.

Should a conductor have any dispute with a passenger in regard to change, he must make a report in writing to the superintendent.

Conductors will make change for passengers to the amount of two dollars.

**Register Bell.**

118. Be careful to see that register rings each fare.

**Register Out of Order.**

119. In case the register gets out of order, stop using it, make report of fares on back of trip report or on blanks supplied for that purpose, and report the fact to the first inspector, or starter, met on the road, and subsequently report to superintendent.

**Transfers in Blockades.**

120. In case any line is blocked it is the desire of the company to carry passengers to their destinations on other lines. Under such circumstances conductors of parallel or intersecting lines will accept transfer tickets accordingly and will issue a transfer on a transfer if necessary. They will also accept transfer passengers without tickets on orders from any inspector or authorized representative of the company, making report of same on back of trip report.

**Issuance of Transfers.**

121. Correctly punched transfers will be issued only on request made at time fare is paid.

**Acceptance of Transfers.**

122. Transfers will be accepted only when properly punched and offered for ride at designated transfer point within the time limit punched on transfer.

**Refusal to Pay Fare—Transfers.**

123. When a passenger refuses to pay fare or presents a defective transfer or ticket, upon which, in the judgment of the conductor, the passenger is not entitled to ride, the conductor must secure the names of as many witnesses to the facts as is possible, whereupon the car must be stopped and the passenger requested to leave.

If the passenger fails to comply with such request, the facts of the case must be brought to the attention of the first inspector, starter or official of the company who is met, and the conductor must act according to instructions received from such inspector, starter or official. In all cases the passenger must be given the benefit of any doubt.

When a passenger who refuses to pay fare requests to be allowed to leave the car, the car must be stopped and the person permitted to alight.

**RULES FOR MOTORMEN.**

**HANDLING CARS.**

**Stopping for Passengers.**

201. Keep a careful lookout on both sides of the street and bring the car to a full stop for every person who signals, except that when a car has considerable headway, is overcrowded, and another car of the same line follows within 500 feet passengers should be requested to take the following car.

Cars will stop on signal only at farther corners, at car stations, transfer points, and at points as provided in special orders.

Do not stop cars so as to block cross-streets or cross-walks. Churches, Hospitals and Schools.

202. When passing a church during the hours of service, and at all times when passing a hospital, run slowly and do not ring the gong unless necessary.

Cars must be run slowly and with great care, and gong sounded, in the vicinity of schools when there are children on the street.

**Run Slowly.**

203. When passing standing or slowly moving cars, gong must be rung and car brought to slow speed.

Run slowly over special work, especially over all facing switch points, and if there is another car moving in the opposite direction on the other track, allow that car to pass before striking the switch point.

Motormen must see that all switches are properly set before passing over them, coming to a full stop if necessary.

**Looking Back While Car Is Moving.**

204. Motorman must not look back, either through or around car, while it is in motion.

**Changing Ends.**

205. When changing ends at terminals motormen must not pass through car.

**Destination Signs.**

206. Properly display destination signs on each half trip.

**Entering Terminals.**

207. Motormen must reduce speed when running into terminals to a rate just sufficient to carry the car into terminal.

**Persons Authorized to Run Car.**

208. Motormen must not allow any person to run their car except men placed there for instruction or some inspector or duly authorized officer of the company known to the motorman to be such. Conductors must not be allowed to run cars. A motorman who has a student "breaking in" in his charge must, under no circumstances, allow the student to handle the car unless he (regular motorman) is at his side, ready to take the brake or controller immediately if necessary.

**Inspection of Car and Equipment.**

209. Motormen must test brakes, switches, controller, lights and other apparatus and examine sand boxes to insure himself that car is in proper running order before taking it out on the road.

**Emergency Stop.**

210. Motormen must not use the reverse to stop car except to avoid accident or when the brake rigging is disabled.

Do not reverse when the brake is set, but release the brake and throw the reverse handle simultaneously, and, when the reverse handle is thrown in position, apply the current one point at a time; otherwise the fuse will melt or the breaker will release. Sand should be used when making an emergency stop.

**Runaway Car.**

211. While descending a grade, should it not be possible to stop a car equipped with two motors by means of brake, the motorman must immediately turn off hood switch, reverse and advance controller cylinder to last position. In the event of car being equipped with four motors, simply reverse to stop.

Should a car equipped with two motors start to roll backward while ascending a grade and the brakes be unable to hold it, the hood switch must be immediately turned off and the controller cylinder advanced to last position. Should the car be equipped with four motors, if the reverse is set in forward position the car will stop.

**Leaving Car.**

212. Never leave platform of car without taking controller and reverse handles, throwing off the overhead switch and applying brake. Always remove reverse handle first.

Before leaving car at any point set hand brake sufficiently to prevent car from drifting.

**Overhead Switch.**

213. An overhead switch must never be thrown until power is turned entirely off, except in case controller cylinder fails to turn when power is on. It must be thrown by hand only.

**Power Off Line.**

214. When the power leaves the line the controller must be shut off, the overhead switch thrown and the car brought to a stop; the light switch must then be turned on and the car started only when the lights burn brightly.

**Economical Use of Current.**

215. In order to effect an economical use of the electric current it is necessary that the continuous movements of starting and increasing speed should be made gradually. In starting a car let it run until the maximum speed of each notch has been attained before moving handle to the next notch.

Rapid feeding of controller is injurious to the equipment of the car and causes discomfort to passengers. Controller must never be thrown on last point if car does not start from preceding points. The controller must never be thrown from a higher to a lower notch. Controller must not be held for any length of time on any one point except the first and second running positions. If necessary to run slower than the first running position speed, power must be thrown on and off, and not be taken continuously from a lower notch than that of the first running position.

Do not apply brakes when the current is on.

Do not apply current when brakes are applied.

Do not allow the current to remain on when car is going down grade or when passing over section breakers. Endeavor to run car with the least amount of current, allowing the car to drift without the use of current when it can be done without falling behind time.

A great amount of power can be saved by using judgment and discretion in approaching stopping places and switches by shutting off the power, so as to allow the car to drift to the stopping place or switch without a too vigorous use of the brake.

**Release of Brakes Before Stop.**

216. When brakes are set to make a stop they should always be released or nearly so just before the car comes to a stand-still.

**Water on Track.**

217. When there is water on the track run the car very slowly, drifting without the use of power whenever possible.

**Sanded Rails.**

218. Never run on freshly sanded rails with brakes full on except to prevent an accident. On cars provided with sand boxes, in case of slippery rail, always sand the track for a short distance before applying the brakes.

**Spinning of Wheels.**

219. Care must be taken particularly during snowstorms to avoid spinning of the wheels with no forward or backward movement of the car.

**Slippery Rail.**

220. On a slippery rail do not allow the wheels to skid; as soon as wheels commence to skid the brake must be released and reset.

Extreme caution must be used to keep car under full control approaching all intersections, junctions, railroad crossings and prominent driveways, being very careful when approaching wagons and other cars, disregarding schedule if necessary.

**Do Not Oil Car.**

221. Do not oil or grease any part of a car.

**VEHICLES.****Passing Vehicles.**

222. Motormen are cautioned to exercise great care when a vehicle is passing alongside of track ahead of car. Ring the gong vigorously to attract the attention of the person driving, as a warning not to pull in ahead of car; and run cautiously until the vehicle is passed in safety.

**Fire Apparatus.**

223. When any fire department vehicles are observed approaching from any direction, cars must be stopped until such vehicles have passed.

**Ambulances, Patrol and Emergency Wagons.**

224. Ambulances, police patrol and the emergency wagons of the company must be allowed the right of way, and when approaching or passing, cars must be kept under control to avoid collision.

## DETROIT MEETING OF CENTRAL ELECTRIC RAILWAY ASSOCIATION

The first fall meeting of the Central Electric Railway Association was held at the Cadillac Hotel, Detroit, Mich., Thursday, Aug. 26, 1909. The meeting was attended by a large number of railway men, principally from Ohio and Indiana, many of whom made the trip from their home cities by special cars. The longest run was that of car No. 72, belonging to the Terre Haute, Indianapolis & Eastern Traction Company. This car left Indianapolis at 6 a. m., Aug. 25, and ran on a schedule which enabled it to cover the entire distance of 326½ miles in 12 hours.

Only one session of the convention was held, beginning at 11 a. m. and adjourning at 2 p. m. In the afternoon many in attendance made a trip down the Detroit River in the steamer *Pleasure*. In the evening a dinner was served at Belle Isle Park, after which another boat trip was enjoyed. The entertainment features were provided by the Detroit United Railway.

**EXPRESS AND FREIGHT BUSINESS**

The technical proceedings of the convention began with the presentation by J. H. Crall, general freight and passenger agent, Terre Haute, Indianapolis & Eastern Traction Company, of a paper on "The Growth and Development of Express Business on Interurban Lines." This paper was published in the *ELECTRIC RAILWAY JOURNAL* for last week, page 326.

A. A. Anderson, general manager, Indianapolis, Columbus & Southern, said his company is now negotiating with two old-line express companies with a view to making contracts whereby all the express business on his lines will be handled by these companies. He stated he believed many railway companies do not keep close enough account of the cost of handling freight to know what the business really is worth, nor what it costs to handle.

G. W. Parker, general freight agent, Detroit United Railway, stated that his company handles its own express business in a manner similar to that of steam railroads. The company also has a satisfactory arrangement with the old-line express companies, which affords its patrons facilities for making foreign shipments. Under the contract entered into with the old-line companies and renewed each year, the Detroit United Railway does not have to give up any of its local express business. No interchange arrangements are made with steam railroads for the handling of freight.

C. N. Wilcoxon, general manager, Cleveland, Southwestern & Columbus Railway Company, briefly reviewed the plans that were made a few years ago which resulted in

the formation of the Electric Package Company at Cleveland. He thought this express company has succeeded in building up a business which surpasses in extent that of other companies catering only to electric railways. This company furnishes an express service that is as reliable as the service furnished by the old-line companies. It has its own collection and delivery wagon service and its own regularly appointed agents. The cars employed in regular express service furnish greater earnings with two exceptions than passenger cars operating on the same lines.

J. H. Pardee, operating manager, J. G. White & Co., thought the success of handling express on electric lines depends to a great extent on local operating conditions. Past experience lead him to believe that the handling of freight and express on a large scale is not as profitable as is the business when made supplementary to the passenger business. He said that electric railways of the State of New York are trying to raise the rates for carrying express, which have heretofore been very low.

E. H. Hyman, representing the Electric Package Company, Cleveland, said the essential conditions necessary for building up a lucrative electric express business are obtained where large manufacturing plants are located in many small towns within a radius of 60 miles of a large central city. With these advantageous conditions and unsurpassed express service, good rates can be charged and a large business done. The company with which Mr. Hyman is associated, being engaged only in the express business, necessarily charges the complete cost of operation direct to the earnings derived from the handling of this class of traffic. He stated that he believes any electric railway can, by furnishing unsurpassed service, secure a large percentage of the local business that is now handled by the old-line companies. His company has an agreement with three old-line express companies for the handling of foreign shipments on a tonnage basis. The messengers on express cars operated by the company are paid jointly by the Electric Package Company and the old-line companies.

F. Hardy, superintendent interurban division, Ft. Wayne & Wabash Valley Traction Company, said that the freight and express business on his company's lines has been made self-sustaining. The company handles all the local express business, but has arrangements with an old-line company for handling the through business. About 75 per cent of the business originated by this company is sent to foreign points. The agreement does not conflict with the railway company's local traffic. A very low rate is made on carload shipments, as this class of business can be handled by freight cars attached to regular passenger trains without interfering with them.

**FILING SYSTEMS**

S. D. Hutchins, chairman of the committee on loose leaf filing systems for trade papers, reported that no definite progress had been made toward interesting publishers in the loose leaf system, which was proposed some time ago by R. N. Hemming, Ohio & Southern Traction Company. On motion of C. D. Emmons, the report was accepted and the committee was instructed to confer further with the publishers of trade papers and ascertain what plans can be made for facilitating the filing of articles published in the papers from time to time.

**WATTMETERS ON CARS**

Thomas J. Henkle, Electric Service Supplies Company, then read a paper on "The Application of Recording Wattmeters on Electric Cars," which was published last week on page 325. In the discussion of this subject the arti-



cle on "Reducing Power Consumption on Trains of the Metropolitan West Side Elevated, Chicago," which was published on page 1127 of the *ELECTRIC RAILWAY JOURNAL*, of June 19, 1909, was read. This article gave the results of tests conducted by B. I. Budd, general manager of the company, to determine the amount of current which could be saved by a careful manipulation of the controller, and elicited an interesting discussion as regards what may be accomplished by taking car readings of the current consumed during operation.

H. A. Nicholl, general manager, Indiana Union Traction Company, said his company has had some difficulty in getting satisfactory readings from meters placed on cars.

F. W. Coen, vice-president, Lake Shore Electric Railway, stated that tests have been made in Cleveland to ascertain the relative consumption of current by city and interurban cars. Tests were run on 14 city and 14 interurban cars representing the different classes of equipment operated in that city. The results of these tests showed that while the interurban cars each weighed practically 50 per cent more than the city cars, the current consumed was 3 per cent less per car-mile. It was said this showing was partially due to the fact that the interurban cars made approximately 15 stops, while the city cars made 65 stops. In answer to a question, Mr. Coen stated that he believed the current consumption of interurban and city cars would be directly proportional to the tonnage of these cars if they were operated under identical conditions.

W. H. Evans, formerly master mechanic, International Railway, Buffalo, N. Y., said that the Denver City Tramway Company has developed a thorough system for keeping records of the current consumed by its cars. He recalled instances where the rivalry created among motormen as the result of carefully compiled readings resulted in greatly reduced current consumption.

#### LONG DISTANCE PASSENGER AND FREIGHT BUSINESS

F. D. Norveil, general freight and passenger agent, Indiana Union Traction Company, then read a paper on "Development of Long Distance Passenger and Freight Business," which is printed in the next column. Mr. Norveil supplemented his paper with sample copies of the company's magazine, and with maps, folders, etc., all of which are used in a general scheme to attract new traffic.

A. A. Anderson, president, thought every railway man should lend his support to a plan to develop long distance travel. Inasmuch as special cars can be successfully run from Indianapolis to Detroit, he knew of no reason why passengers should not be carried an equal distance.

A representative of the Ohio Electric Railway said that there is a big future for electric railways which start right in the development of freight and express business. As an indication of the revenue derived from freight traffic he called attention to the fact that steam railroads in Ohio earn \$3 from freight handling to every \$1 earned from passenger traffic. He urged systematization in the soliciting and handling of freight.

F. Hardy said some companies who have not found freight and express business profitable have tried to give express service at freight rates. He thought that any company can increase its revenue in a large way by properly classifying freight and express and by providing a good, reliable service.

In response to a question asked by F. W. Coen, Mr. Anderson stated that his company has had satisfactory results from charging excess fare for passage on limited trains. This plan encourages long distance travel by providing

better accommodations. The excess fare on six limited trains operated both ways daily on the Indianapolis, Columbus & Southern aggregates from \$28 to \$30 a day. This more than offsets the increased cost of operating the cars.

H. A. Nicholl stated that the Indiana Union Traction Company abandoned the excess fare rate for the reason that its regular rate of fare is practically 2 cents a mile, which is the maximum rate that can be charged in Indiana.

The next meeting of the association will be held at the Claypool Hotel, Indianapolis, Ind., on Nov. 18, 1909.

### THE DEVELOPMENT OF LONG-DISTANCE FREIGHT AND PASSENGER BUSINESS\*

BY F. D. NORVIEL, GENERAL FREIGHT AND PASSENGER AGENT,  
INDIANA UNION TRACTION COMPANY

The growth of long-distance freight and passenger business of electric railways is of such recent origin that facts and figures are lacking. To get useful statistics would be a very hard matter, and to treat the subject from the standpoint of one road would be of small interest to the members of this association. This paper is intended to take up the subject in a broad way, defining the ideal conditions under which the traction lines may enjoy a much larger proportion of this traffic than is now being handled by them. The business is here and needs no creation, but does need intelligent cultivation. Information regarding rates and schedules should be distinctly and plainly set forth in circulars or instructions to agents, trainmen and others interested, so that the passenger need not ask in vain at any point of the journey.

We know that a fair proportion of the strictly local business along our respective lines comes to use at rates as high as those of the steam lines, if we only give adequate service and accommodations. The writer believes that we ask more of the public than we should in the matter of congested loading of cars, especially at times of peak travel. Our trains are late probably more often than they should be, but the principal causes of complaints are lack of comfort, not watching the water can, and congested cars. In our efforts to make large earnings per car-mile we overlook the fact that the traveler's comfort is to be considered or we may lose the very means of getting this revenue. We know that we are handling our share of local travel, but this "pot" has been scraped nearly clean. We cannot expect much more from this source, except as the population increases through the upgrowth of commercial and industrial enterprises, in which every traction line should take an active and substantial interest. Take care of the local business properly and it will remain yours, without question.

But to get the long-distance passenger travel, as well as the freight business, requires something more:

First, tariffs naming rates should be prepared in as clear and distinct but plain a way as is possible, stating in positive language what an agent may do and what he may not do.

Second, arrange for a plan of division of interline revenue just as plain and positive as your tariffs, so that there may be no need of useless correspondence between the accounting departments of connecting roads. (We are woefully lacking in this respect now, and it should be given immediate attention.) Let all lines adopt for their interline accounting some standard system, probably the one to be recommended at the next meeting of the American Street & Interurban Railway Accountants' Association, at Denver in October. Let the division of every rate and route be agreed to by the traffic departments before the rates are put into effect, and let this information be in the hands of the accountants.

Third, have maps and through timetables arranged in such a manner as to enable agents to give information about junction points and connections to the passenger at the time he buys his ticket; arrange for the transfer of baggage at junctions and for carriage transfer of pas-

\*Abstract of a paper read before the Central Electric Railway Association, Aug. 26, 1909, at Detroit, Mich.

sengers, where necessary, so that the passenger is put to the minimum of trouble.

Fourth, instil courtesy into your agents and trainmen. If they cannot acquire it, do not keep them, but insist on this one thing above all else. It is your best stock in trade.

Fifth, the things absolutely essential to secure and hold long-distance travel, which must be provided, are good cars, through service, reliability of schedules, proper inspection, sanitary care of toilet rooms, proper icing and watering of cars and careful cleaning of cars. On long runs this cleaning should be done en route by men with proper appliances. Buffet arrangements for meals should be provided also, if possible. If this is not practicable, stated stops for meals should be made at some hotel, where patrons can secure something to eat at prices to suit the individual purse. This service should be advertised, and conductors should arrange in advance for passengers wishing meals.

Allow sufficient room so that each passenger may ride in comfort. An average of 25 to 30 passengers to a car, on a basis of 2 cents per mile per passenger, is good earnings for a passenger car, either motor or trailer. Do not expect to retain business and annoy long-distance passengers with stops at every hamlet. They no sooner arrange themselves and their luggage so as to take a moment's rest and enjoy the scenery you have advertised, when you require them to move and make room for some roughly dressed man, possibly a farm laborer or mechanic, all right in himself, but not in apparel suitable for sitting beside some one in good dress. We are too prone in our democratic fashion to say, "That's all right—it won't hurt 'em," but it does hurt your business. Have we not now reached the stage where, except in emergencies, we should furnish more seating space for our patrons?

Some measure of attention as to ventilation in winter, as well as in summer, and a proper regard for general comfort, with, perhaps, a little luxury, will have great weight in coaxing business to the electric lines. When you get it, take measures to hold it, for patronage is fickle.

A through car between Indianapolis, Ind., and Toledo, Ohio, Detroit, Mich., or Cleveland, Ohio, the writer feels sure, would get its share of business at an equal rate of fare with the steam lines, even though it ran on a longer schedule, if properly advertised and the goods delivered. There are many runs of more than 100 miles now being operated successfully. However, for these longer hauls it will require better and more commodious equipment and more regard to the privacy and dressing accommodations of lady passengers. This means work for the car builders and designers, but it also means additional earnings to the railway companies.

These are some of the possibilities in long-distance passenger travel. The same rules apply to the development of freight traffic as well. We have to-day no switches, no cars and no warehouses worth mentioning for handling through freight. Not one traction line in Indiana or Ohio has sufficient equipment to offer the public a bid for their freight traffic, yet it continually knocks at our doors, asking for help which we cannot now give them. While it is true that we do get some of the local freight traffic it is only a small part of the business that we might get.

The advantage of time of handling (especially the handling of carloads) is in favor of the traction lines, at least for distances up to 150 or 200 miles. With necessary equipment and prompt movement there is no reason why we should not get this traffic. The amount of freight business, both local and interline, handled by traction lines varies from 5 to possibly 20 per cent of the gross earnings. From 60 to 80 per cent of the gross earnings of a steam road comes from its freight business. This gives some idea of the immensely increased earning power of the electric lines, provided they have facilities to care for this kind of business. Some attention must be paid to the standardization of equipment; easier curves and grades must be provided; freight houses and storage tracks must be built.

That there is money in through freight and passenger business is beyond question, but there is a long lane of improvements which must be made in every branch of electric railway equipment before we can say we are prepared for this traffic. When you design your next cars

don't design them simply for the service of to-day or tomorrow, but for the future. Do not see how light and cheap they can be built, but how large and how many luxuries may be added. Build big, heavy motor cars complete in themselves and capable of handling one, two or three trailers, each as complete and just as comfortable as the motor car.

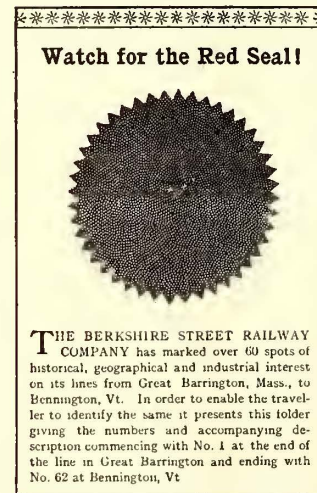
The schedule of all through trains should be the outcome of a joint conference between the traffic department, the operating department, the mechanical department and the electrical department with the general manager as referee. The traffic department, in order to offer inducements to the public, sometimes wants more than it is possible or practicable to give it. The operating department, on the other hand, may expect something from the equipment, either the cars or power, which it would not be possible to obtain. However, a joint conference with a disposition to give or take according to the best judgment of the majority, should result in something practicable and fair to all.

Trains should start from terminals and be split up at junctions, giving practically through service to such points as business will justify. All of the features of the through service must then be put before the public in as alluring shape as is possible and constantly be kept before them until the success of these runs has advertised them for themselves. Then by attractive literature constantly keep your service in the limelight. Show comprehensive through schedules, transfer arrangements and through tariffs; in fact, go into every and all details, even to the smallest.

## HISTORICAL POINTS MARKED BY BERKSHIRE STREET RAILWAY

A folder issued by the Berkshire Street Railway, Pittsfield, Mass., calls attention to the fact that it has marked

over 60 points of historical, geographical and industrial interest on its lines between Great Barrington, Mass., and Bennington, Vt. The Berkshire Street Railway and connecting lines reach Great Barrington, Stockbridge, Lee, Lenox, Pittsfield, Cheshire, Adams, North Adams and Williamstown in Massachusetts; Pownal and Bennington in Vermont, and Hoosick Falls, N. Y. A typical description of the 62 contained in the folder is the following: "24.—This point gives the best far view of Greylock Range, being about 16 miles distant. The central mountain in the group is Mount Greylock, whose summit, 3505 ft. above sea level, is the highest point in Massachusetts."



### Folder Calling Attention to Points on Berkshire Line

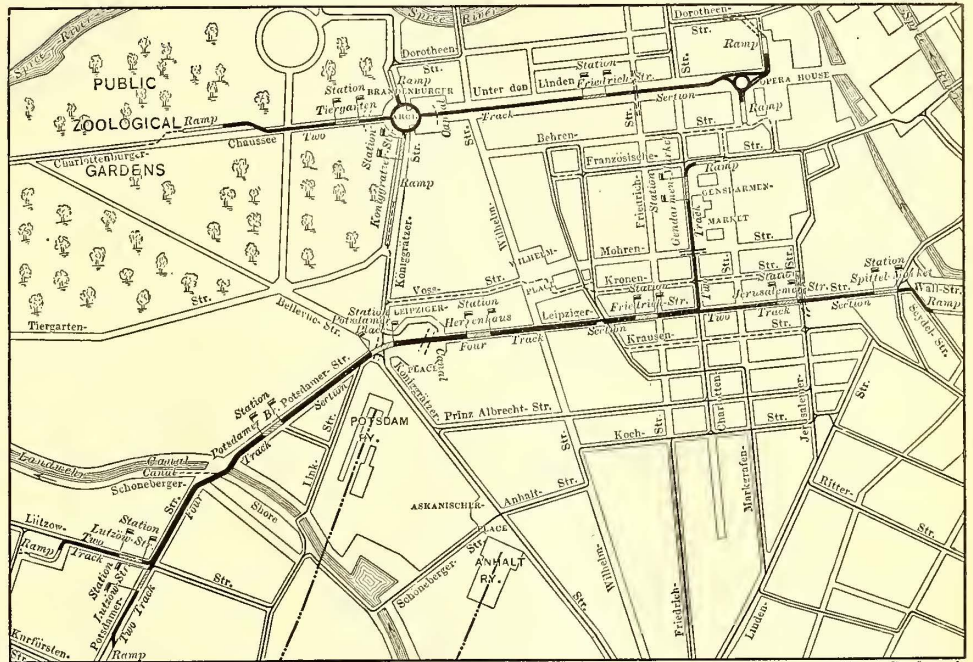
The University of Michigan has arranged a special course in railway administration which will be started with the fall term. The course is divided for four classes of students. First, those who desire to enter any of the business or administrative branches of railway service. Second, those who desire to enter the service of State or Federal commissions as statisticians or economic investigators. Third, those who wish to undertake statistical or appraisal work for bankers and brokers. Fourth, those who wish to make a study of transportation problems as part of a general education. The general academic, law, engineering and economics departments will all be utilized for special courses.

**PROPOSED SURFACE CAR SUBWAYS IN BERLIN**

The Grosse Berliner Strassenbahn now has pending before the franchise authorities of Berlin a proposition to build two subways for the use of its surface cars. As shown in the accompanying map, one of these tunnels is to be built under Potsdamer and Leipziger Streets and the other under the Unter den Linden Boulevard. The principal object of the first or southern tunnel is to relieve Leipziger Street of the greater part of its surface car traffic, which includes almost every line in Berlin. The second or northern tunnel is intended to improve the through service between outlying sections, and not primarily to serve local travel. Different station spacing is proposed to accord with the different purposes for which the two subways are to be used. The Leipziger Street subway is to be 3.5 km (2.2 miles) long, with an average distance of 385 m (1255 ft.) between the stations, whereas the Unter den Linden subway, which will be about 1.85 km (1.15 miles) long, will have only a west and south station at the Brandenburger loop and a second station about 1.3 km

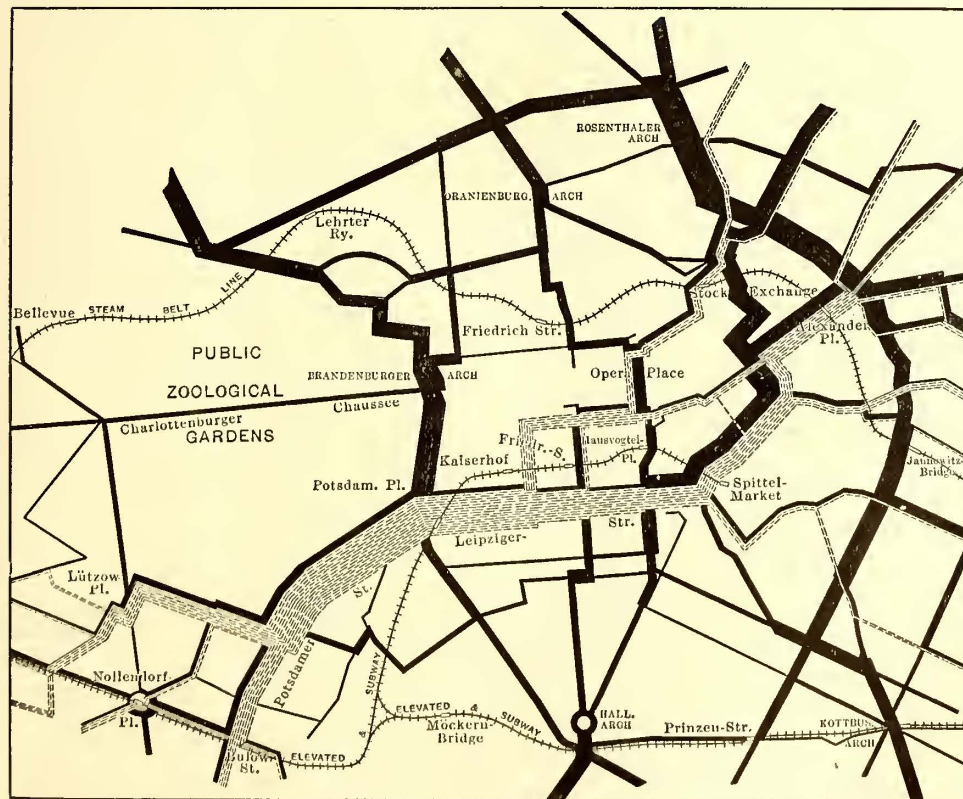
two-car trains at a time. Portions of this tunnel are to have four tracks.

The company does not propose to make any changes in routing or maximum speed in the Leipziger Street sub-



Solid line shows proposed subway; thin lines, existing routes; dotted lines new routing required by subway.

**Map of Berlin, Showing Proposed Route of Subway**



Width of dotted lines indicates proportion of traffic to be taken by subway; width of solid lines that remaining on street.

**Traffic Map of Berlin, Showing the Estimated Relief Afforded by Proposed Subway**

(0.81 mile) distant at the important business thoroughfare, Friedrich Street. The stations on the Leipziger Street subway will be 220 ft. to 250 ft. long, to accommodate three

way, but has calculated that the tunnel distance will be traversed in 13 minutes, as against the present periods of 19 minutes and 23 minutes for the run on the street. It is customary in Berlin to run single trailers with motor cars, and the spacing between the rear ends of such 62-ft. trains is to be 110 m (361 ft.), so that at a speed of 25 km (15.5 miles) an hour the headway will be 15.8 seconds. This headway is regarded as ample, since the average stop, according to surface experience, does not exceed 10 seconds.

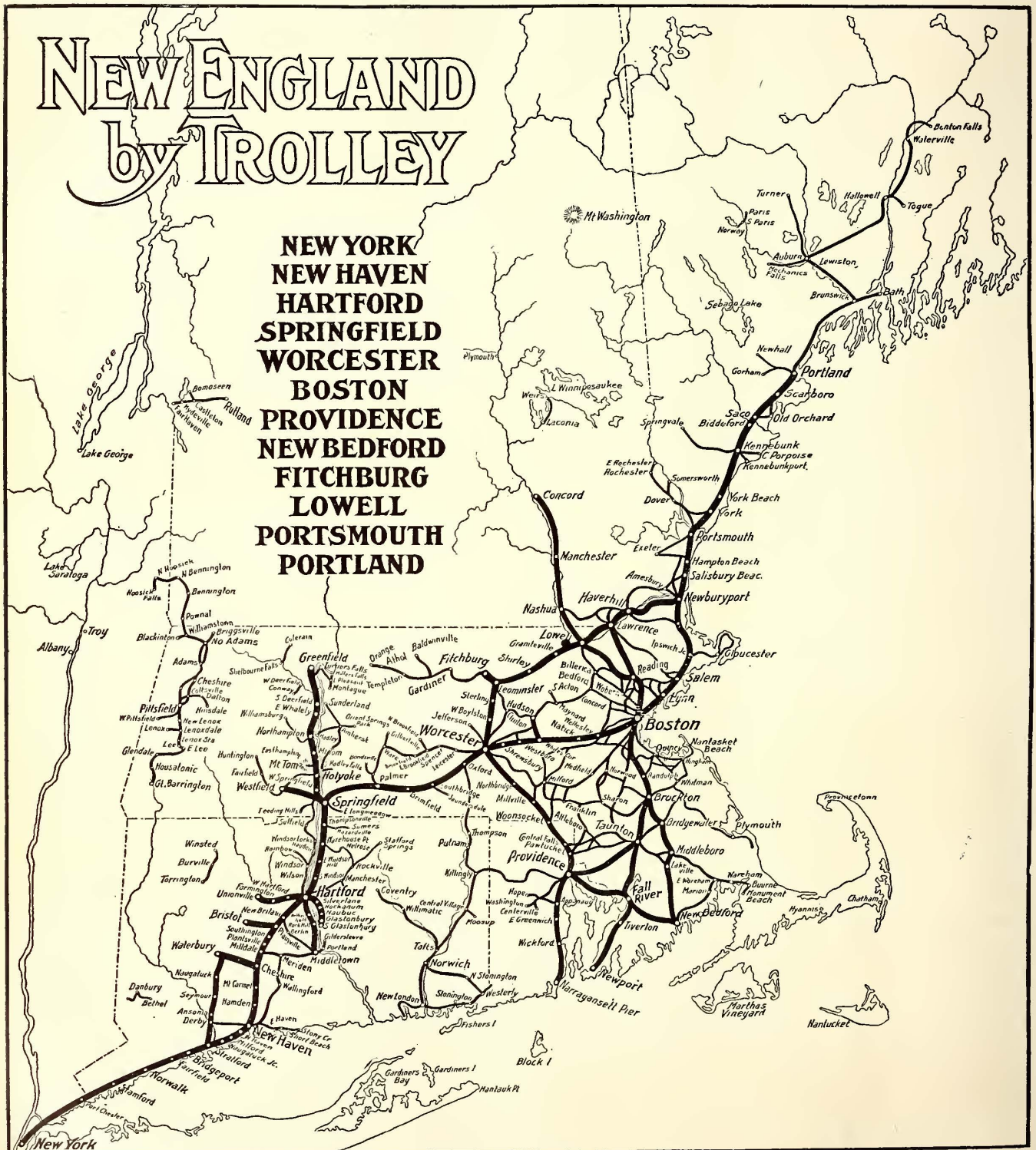
The station will load and unload passengers practically as on the street. There will be no ticket booths, turnstiles or other impediments to rapid movement, and no special form of rolling stock.

The importance of the proposed Leipziger Street subway is shown in the accompanying travel density map, which illustrates the effect the subway would have in relieving the present surface lines. The map is drawn upon the basis of a count of passengers taken Nov. 9, 1907. The width of the lines is proportional to the number of passengers traveling over each route on that day, the scale being approximately 1/4 in. to every 150,000 passengers per day. As explained, the dotted lines indicate the proportion of traffic which will be

taken by the Leipziger Street subway and the width of the solid lines the proportion of remaining surface car traffic after the subway is built. About 70 per cent of the present traffic goes to Leipziger Street, while the remaining 30 per cent is through travel. The average daily number of cars, with or without trailers, passing Potsdamer Place between 6 a. m. and 10 p. m varies between 4800 and 4900,

### NEW ENGLAND BY TROLLEY

The Hartford & Springfield Street Railway has issued a large map in three colors entitled "New England by Trolley" and is circulating also for advertising purposes a folder on which this map is reproduced in smaller size. The accompanying illustration shows the map as circulated



Map of Trolley Lines in New England States

to which must be added some 4500 omnibuses and heavy trucks and 20,000 cabs and other light vehicles.

The Unter den Linden tunnel is to have two tracks throughout. It will not only serve to facilitate through service between the eastern and western portions of Berlin, but may also act as a relief to the other tunnel should two tracks eventually be used for through service.

by the company. It is believed that it will be effective as an advertisement to induce long-distance trips by electric railways in New England. Thomas C. Perkins, vice-president of the company, has been active in a movement designed to arouse interest in long-distance trolley trips.

In the folder, photographs of various scenes in the places reached are reproduced. The approximate running

time and fares by trolley between New York and Portland, Maine, and intermediate points are given as follows:

	Fare.	Time, hrs. min.
New York City Hall to:		
Stamford .....	\$0.35	3 45
South Norwalk .....	.50	5 00
Bridgeport .....	.75	6 30
New Haven.....	.95	8 30
New Britain.....	1.30	10 52
Waterbury .....	1.20	9 15
Meriden .....	1.30	10 15
Middletown .....	1.45	10 58
Hartford .....	1.40	11 37
Warehouse Point.....	1.55	12 25
Thompsonville .....	1.60	12 50
Springfield .....	1.70	13 27
Westfield .....	1.75	14 17
Holyoke .....	1.75	14 17
Mt. Tom .....	1.80	15 07
Northampton .....	1.85	15 02
Greenfield .....	2.20	16 32
Palmer .....	1.80	14 27
Southbridge .....	2.15	15 39
Worcester .....	2.45	16 57
Boston .....	3.04	19 12
Salem .....	3.24	20 47
Portsmouth .....	3.99	25 07
Portland .....	5.04	29 17
Fitchburg .....	2.70	18 27
Lowell .....	3.15	20 27
Lawrence .....	3.30	21 17
Concord, N. H.....	3.85	24 02
Woonsocket .....	2.90	19 37
Providence .....	3.10	21 02
Brockton .....	3.29	20 47

These fares and running times are stated to be approximately correct, but to vary somewhat according to the connections made.

**SPECIMENS OF RAIL CORRUGATION IN EUROPE**

Since the publication of the abstract of Mr. Peterson's study of rail corrugation this paper has received from Arthur Busse, chief engineer of way and construction, Grosse Berliner Strassenbahn, photographs of a number of specimens of rail corrugation on the surface, elevated and

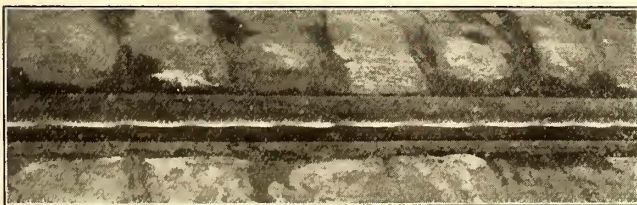


Fig. 1—Rail on Tangent in Paved Street in Berlin, Showing Slanting Corrugations

steam railroad lines in that city. These photographs accompanied the paper on rail corrugation presented by Mr. Busse at the Munich convention of the International Street & Interurban Railway Association last year, published in abstract on page 1323 of the ELECTRIC RAILWAY JOURNAL,



Fig. 2—Corrugated Rail Laid on Concrete Foundation

Nov. 7, 1908, and several of the most interesting are reproduced herewith. At that time Mr. Busse enunciated the theory, which he still holds, that a predisposition to cor-

rugation is given in the rail mill and that corrugation is then developed by rapid braking, quick acceleration, high speeds which cause hammer blows, lurching due to defects in truck construction, large radius curves where a tendency exists for the outer wheels to slide in jerks on the longer



Fig. 3—Badly Corrugated Rail on Triangular Curve of Berlin Elevated Railway

outer rail, rigid roadbeds which fail to take up the blows like an elastic substructure, etc.

Fig. 1 shows a section of a tangent track with slanting corrugations in paved streets in Berlin. Fig. 2 shows a section of corrugated rail laid on a concrete foundation. On this rail waves had developed to such a degree that the

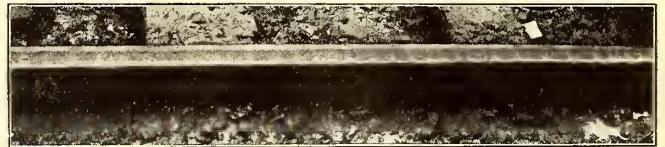


Fig. 4—Corrugated Rail Near Station on Berlin Steam Belt Railway

passing cars loosened the whole structure. Similarly embedded rails on the same section with little or no corrugation are still as secure as ever. Fig. 3 illustrates very badly worn rail on the triangular curve of the Berlin elevated system, where the corrugations are of a depth of 0.97 in. Fig. 4 illustrates a corrugated rail near a station on the

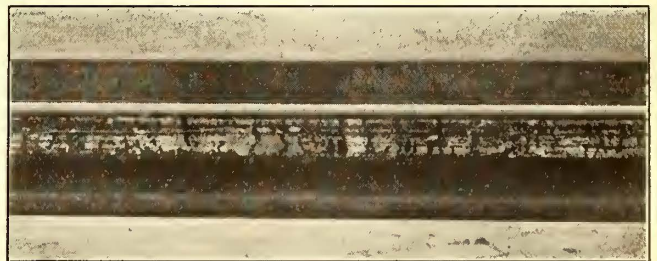


Fig. 5—New Rail, Filed to Show Incipient Corrugations

Berlin steam belt railway. The deepest corrugations on this line occur, however, on the free-running sections, in switches and opposite crossings. Fig. 5 illustrates an unused rail received from the mills, but with the tread filed and showing, Mr. Busse thinks, corrugations which will develop in service. Mr. Busse approves of the plan to use softer rails to secure more uniform wear.

The negotiations for the purchase of the tramway and electric lighting system of St. Petersburg, Russia, are still pending. The purchasing syndicate is said to include the German General Electric Company, Siemens & Halske and the British Westinghouse Company. The price is 20,000,000 rubles, and an additional sum of 30,000,000 rubles is to be reserved for immediate extensions and improvements to the system.

## WISCONSIN CLASSIFICATION OF ACCOUNTS

Copies of the classification of accounts for street and interurban railways as finally adopted by the Railroad Commission of Wisconsin have been issued, with an introductory letter, dated July 1, 1909.

Some slight changes have been made since the preparation of the titles of the accounts as published in the *ELECTRIC RAILWAY JOURNAL* of June 12, 1909, page 1076. The power accounts, as finally prescribed for street and interurban railways, are identical with those prescribed for electric utilities. William J. Hagenah, statistician of the commission, from whom a copy of the classification has been received, writes: "Several of the operating expense accounts which appear in the classification of the Interstate Commerce Commission were excluded from our classification because they had no application to Wisconsin railways." In its introductory letter the commission says:

It will be observed that this classification in many respects conforms quite closely to that prescribed for electric railways by the Interstate Commerce Commission. A special effort was made to secure similarity wherever possible, but in a number of instances it was found that changes were necessary to secure greater detail in expenditures or to combine or eliminate accounts which had no application to Wisconsin electric railways. The greatest departure from the classification of the Interstate Commerce Commission is in the power accounts, those herein prescribed being identical with the power accounts prescribed for electric utilities. Where corporations are engaged in only a railway service, greater detail of the cost of power generation was deemed desirable. Where, however, corporations are engaged in both railway and electric light and power service, the change in question will result in greater simplicity, since but one group of power accounts will be required, the total cost of power being apportioned over the several departments on the basis of benefits received.

In the preparation of this classification conferences were had with the accounting committee of the Wisconsin Street & Interurban Railway Association and with officers of the association and of individual railway systems. Co-operation and assistance were afforded by representatives of the electric utilities.

Owing to the great difference in size of the railways, it was found necessary to prepare three separate schedules which would recognize these conditions, and by each following the same general principles would permit comparison of the operating results between the smallest and the largest companies. Class C schedule is the basis upon which class B and class A schedules have been founded, the latter two being an unfolding and refinement of the smallest classification. The basis of the classification is as follows:

**Class A companies**—Those having gross earnings in excess of \$500,000.

**Class B companies**—Those having gross earnings less than \$500,000 but in excess of \$80,000.

**Class C companies**—Those having gross earnings less than \$80,000 per year.

Any railway in class C or class B desiring a more detailed classification than that prescribed for its class should open the accounts prescribed for the next highest class, and any railway in class A requiring a more detailed system may go into as much subdivision and refinement of each of the submitted accounts as its interest requires, but must not rearrange or combine any two or more of the accounts in such a manner as to interfere with the integrity of the scheme and thus destroy the possibility for comparison. A copy of all additional accounts and the desired subdivisions of the prescribed accounts must be filed with the Railroad Commission before such accounts are opened. All records and accounts, including those which are an enlargement, subdivision or refinement of the prescribed accounts are to be open at all times to the examination of this commission.

Provision is made for changes into operating expenses to cover depreciation and extraordinary contingencies. The text covering these accounts is as follows:

**Depreciation.**—Every electric railway shall carry a proper and adequate depreciation reserve to cover the full replacement of all tangible capital in service. There shall be opened a depreciation account, to which shall be charged monthly, crediting the depreciation reserve, an amount equal to one-twelfth of the estimated annual depreciation of the tangible capital in service of the railway, or as near that amount as the finances of the property will permit. Tangible capital comprises all land and its improvements and all interest in land the term of enjoyment of which is one year or more from the date of grant, buildings and structures and all equipment, facilities and apparatus used and useful in the operation of the railway and having an expectation of life in service of more than one year. Hand and other small portable tools, because of their liability to loss and theft, are to be treated as part of the operating expenses of the year in which they were purchased. The estimate here required shall be made upon a rule designed to effect by its uniform application during the life of the tangible capital in service, a charge into operating expenses of the total original cost of such capital, less its salvage or scrap value upon retirement. When any building, structure, machine, facility or unit of equipment which at the time of its construction or installation was classified as tangible capital becomes through wear and tear economically irreparable, the substitute therefor having substantially no greater capacity than the unit for which it was substituted, shall be charged against the depreciation reserve. When, however, the building, structure, machine, facility or unit substituted has a substantially greater capacity than that for which it was substituted, the cost of the substitution of one of the same capacity as the unit replaced, shall be charged to the depreciation reserve, and the remaining cost of the actual substitution shall be charged to the appropriate construction and equipment account. The details of the deduction on account of depreciation and the basis thereof will be called for in the annual report to the Railroad Commission.

**Contingencies (extraordinary).**—When the property of the carrier is visited by an extraordinary casualty of such a nature as to be beyond anticipation through the exercise of ordinary and reasonable prudence, and of such a nature as not to be contained in the provision for depreciation, as earthquakes, floods, cyclones, etc., resulting in irreparable damage, there may be charged to this account the original cash cost of such irreparably damaged property, less the salvage or scrap value and irreparable wear and tear from use accrued thereto. When the amount of such damage or loss is considerable, there may be set up an extraordinary casualties suspense account, to which shall be credited monthly the amount charged to the account contingencies (extraordinary) until the total loss or damage caused by such casualty shall be wiped out through operating expenses. All ordinary casualties, that is, those which occur with such uniformity and frequency that the principles of insurance are applicable thereto, must be provided for by suitable charges to the insurance reserve, set up and maintained for such losses, or are considered as included in the provision for depreciation, or constitute an item of current maintenance.

The required reserves are three in number, covering depreciation, sinking fund and amortization. The text of these accounts is as follows:

**Depreciation reserve.**—To this account shall be credited monthly, or as they are made, all charges to the depreciation account (hereinbefore described), the income from the investment of any money or from any security belonging to the depreciation reserve, and any other appropriations which may have been made to it. When, through wear and tear in service, casualty, inadequacy, supersession or obsolescence, any building, structure, facility or unit of equipment originally charged to capital is no longer economically repairable, and in order to keep the capacity of the railway system up to its original or equivalent state of efficiency it is necessary to make a complete replacement of such building, structure or unit of equipment, the money cost of the original unit replaced and charged to capital (estimated if not known, and if estimated, the basis thereof shall be shown in the record entry) shall be charged to the depreciation reserve, and the excess cost of the substituted unit

over such original unit shall be charged to the appropriate capital account. When any building, structure, facility or unit of equipment originally charged to capital is retired from service and not replaced by any other unit of similar nature or equivalent thereto, the original money cost thereof (estimated if not known, and if estimated the basis thereof shall be shown in the record entry) shall be charged to this account and such amount originally entered or contained in the charges to capital in respect to such unit so being retired shall be credited to the capital account to which it was originally charged, and any adjustments necessary made through the surplus account. The salvage or scrap value of any unit of equipment retired from service or replaced by any other unit will be credited to this account. An analysis of the charges and credits to this reserve will be called for in the annual report to the Railroad Commission.

**Sinking fund reserves.**—Sinking fund reserves shall be maintained whenever they are required in pursuance of the provisions of mortgage deeds, deeds of trust, contracts or provisions of the law. A separate sinking fund reserve shall be maintained for each contractual requirement, to which reserve shall be credited any appropriation made in pursuance of the terms of the respective mortgage and trust deeds, contracts, etc., and charged to the account contractual sinking fund requirements, and also accumulations resulting from any security belonging to such particular reserve. The title of each reserve shall clearly indicate the purpose for which it is being maintained. An analysis of the charges and credits to this reserve will be called for in the annual report to the Railroad Commission.

**Amortization reserve.**—This account shall be raised to provide for the amortization of intangible capital in service. To it shall be credited monthly, or as they are made, all the amounts charged from time to time through operating expenses to the account amortization reserve requirements, which account is to be set up where the nature of the capital occasions the setting up of this reserve. Such reserve shall also be credited with all accumulations resulting from the investment of any moneys or the interest or dividends from any securities belonging to it. For example, a corporation pays \$100,000 for a 20-year franchise to operate an electric railway. In order that this amount shall be set aside out of revenue and the actual capital of the corporation not impaired by dividends paid, there shall be charged monthly to the account amortization reserve requirements, crediting the amortization reserve an amount which, invested at current rates of interest, will at the end of the franchise term have created an amount equivalent to the cost of the franchise. An analysis of the charges and credits to this reserve will be called for in the annual report to the Railroad Commission.

The optional reserves are as follows:

**Maintenance reserve.**—This reserve may be raised by those electric railways which operate equipment, the repairs to which are occasioned only at remote intervals, and are then so considerable in amount as to cause wide fluctuations in the operating expenses for the division of operation or group of expenses of which the maintenance account in question is a part. This reserve must not be charged with renewals and replacements of property and equipment which, from their nature, are chargeable against the depreciation reserve.

**Injuries and damages reserve.**—Railways may open an injuries and damages reserve, to which will be credited monthly any amounts which may be charged to the proper operating expenses or other expense accounts. The amounts so charged and credited shall be such as are estimated to meet the admitted liability against it for injuries to persons and damages to property other than that of the railway, insofar as such claims can be anticipated by the exercise of reasonable judgment. All such claims, when paid to satisfy admitted liability and judgments obtained in the courts of law, shall be charged to this account.

**Insurance reserve.**—Railways may set up this reserve, to which shall be credited monthly the charges made in operating expenses to the insurance account to cover self-carrying risks. When any irreparable damage to the property of the railway occurs, and the nature of such damage is such as to be covered by the provisions of self-insurance, the cost of repairing the property damaged, or the cost of its replacement, shall be charged to this reserve.

## ELECTRIC LOCOMOTIVE BUILT BY THE INDIANAPOLIS COLUMBUS & SOUTHERN TRACTION COMPANY

The accompanying illustration shows an electric locomotive which was built at the Greenwood shops of the Indianapolis, Columbus & Southern Traction Company, Indiana. The car is short, being only 16 ft. in length, but is strong and compact. The body is mounted on an old style Brill single truck, which has been remodeled, and carries two GE-57, 50-hp motors geared 16.69. The locomotive is 10 ft. above the rail, and was built for handling coal cars about the power house and yards.

The bottom framing consists of four 5 in. x 7 in. oak sills with one 5 in. x 7 in. needle beam. There are four 1¼ in. truss rods bolted through the end sills which support the needle beam at the center. There are also filling blocks placed between the sills, mortised into the sills and held together by ¾ in. rods. The end sills and intermediate sills have ¾ in. x 7 in. corner irons on the inside corners, and are bolted through the sill, and a ½ in. x 7 in. plate, which runs the entire length and also across the ends of the car. The draw bars are the standard M. C. B., and



Indianapolis, Columbus & Southern Traction Company's Electric Locomotive

are hung 34½ in. above the rail. There are two 1½ in. rods that connect the two draw bars together in such a way as to take a part of the load from the opposite end of the car. The top framing is 3 in. x 3 in. oak for posts placed 2 ft. apart except in the cab. This framing is securely bolted and held in place with angle irons. The inside of the body is lined with 1 in. lumber, and the outside covered with No. 16 iron riveted and screwed to the posts. The cab is 4 ft. x 6 ft. 4 in., and is finished in wood.

The locomotive is fully equipped with air, sand, classification markers, electric headlight, etc. The ends are filled with scrap iron to give the car sufficient weight. The total weight of the locomotive is 25 tons, and it is capable of hauling three 50-ton coal cars up a 2 per cent. grade into the boiler house.

In a paper on steam turbines read last month before the Incorporated Municipal Association, at Manchester, by Alfred S. Blackman, borough electrical engineer and manager at Sunderland, the author estimated that the maintenance of a steam turbine plant, consisting of turbine, alternator and condensing plant, should not exceed \$500 per year per 10,000,000 generated, and in many cases would be less than this. He quoted some figures on the consumption of his 2000-kw turbine, as follows: Steam with 27½-in. vacuum, 17.07 lb. per kw-hour on one test and 17.1 lb. on another. The cost of oil per turbine, generating 9,000,000 kw-hours during the year, was \$64, and for the auxiliaries \$88.12 for the year.

## COMMUNICATIONS

### TROLLEY WIRE SPECIFICATIONS

ARTHUR D. LITTLE, INC., LABORATORY OF ENGINEERING  
CHEMISTRY

BOSTON, Aug. 24, 1909.

To the Editors:

In the issue of the *ELECTRIC RAILWAY JOURNAL* for July 31 there appeared the report of committee W of the American Society for Testing Materials on proposed "Standard Specifications for Hard Drawn Copper Wire." A long-felt want has existed for copper wire specifications which would enable intelligent purchase, and also establish a reasonable manufacturing standard. Specifications issued by the American Society for Testing Materials justly attract widespread attention and respect, but before their adoption by electric railway companies a careful consideration of the requirements of such users is desirable. The proposed specifications cover all sizes and kinds of hard drawn copper wire, but the principal interest to electric railroads lies in their application to trolley wire.

During the past three years the company with which the writer is connected has tested all of the trolley wire purchased by the Boston & Northern and Old Colony Street Railway companies, of Boston, Mass., under specifications which clearly defined the quality of wire desired. Every reel has been tested before purchase, and the specifications have been rigidly adhered to. The results have been so satisfactory that a criticism of the proposed specifications seems justified.

The determination of the characteristics of high-grade trolley wire and the selection of necessary tests must be preceded by a knowledge of the service demands and the possible defects incident to manufacture. Trolley wire in service is subjected to the tension of the span, to the stresses of ice, wind and snow, and to the severe pounding and wear of trolley wheels. The passage of the wheel produces a wave motion on the wire which proceeds until a fixed support checks the wave and produces a sharp upward bend of the wire. A daily record of the breaks at or near a fixed support proves the seriousness of this factor. Efficient trolley wire must therefore possess the following characteristics to a marked degree:

- (1) Conductivity, for economical power transmission.
- (2) Tensile strength, to withstand abnormal stresses.
- (3) Flexibility, to enable stranding and to allow adjustment of the wire under stress.
- (4) Homogeneity, to distribute stresses uniformly.
- (5) Toughness, to withstand kinking, wrenching and slow distortion.

Each of these qualities is essential, but all of them are interdependent, so that marked increase in one produces a proportionate reduction in one or more of the others. Specifications must therefore require that the wire possess each of the maximum amount consistent with the others.

A study of manufacturing conditions reveals the following main causes for inferior wire:

- (1) Impure copper, resulting either in diminished conductivity or lack of toughness.
- (2) Insufficient drawing, producing low tensile strength and high ductility.
- (3) Lack of or insufficient annealing, causing high tensile strength but lack of ductility.
- (4) Accidents of manufacture, oxide seams, flaws and uneven drawing, which increase wear and accelerate fracture under repeated stress.

The first defect lies in the quality of copper in the bar. If the impurities are in the metallic state, the electrical resistance is raised, while if over oxidized in refining, the excess copper oxide produces brittleness, or "shortness."

The fundamental principle of hard drawn wire is the production of a hard, dense surface by drawing the wire through steel dies. Other things being equal, the tensile strength of wire varies directly with the amount of reduction produced by drawing, and is, therefore, a function of the cross-sectional area and the amount of work expended upon the surface. The ductility of the wire, however, varies inversely with the tensile strength. As the toughness is improved by drawing, high-grade trolley wire is annealed after a part of the drawing, to prevent excessive hardness and low ductility, and the partially annealed wire is then drawn through two or more "holes."

The fourth defect, that of accidents in manufacture, is most common because most difficult to avoid. Copper bars are covered with a layer of oxide, and frequently exhibit a concave upper surface due to shrinkage in casting. On entering the rolls the edges of such a bar are lapped over, enclosing the oxide, and the subsequent passes and drawing cover this flaw, which may extend through many feet of finished wire. Carelessness, changes in temperature, accidents to dies, produce wire of uneven hardness throughout its length.

The proposed specifications include three tests, by means of which these defects are to be detected. These tests are: Tensile strength, elongation and conductivity.

The committee states that "it is impracticable to so define the conditions of the test that a twist test can be made definite and reliable," and, further, that "wire which will meet the physical tests included in the proposed specifications will meet any properly made twist or wrap test that would reasonably be required."

The conductivity determination will detect metallic impurities; the elongation measurement will prevent over-oxidized copper, excessive hardness or insufficient annealing. The tensile strength test will detect "short" copper or insufficient drawing, and with the elongation may show non-homogeneity. But none of these tests reveals oxide seams or is sure to indicate variations in hardness. Tensile strength, as stated before, is dependent upon the area of cross-section and surface hardness. A flaw extending through many feet of wire may not have a cross-section at any point sufficient to affect the total area of the wire nor to reduce the ductility, but this same flaw, under the bending stresses of service, will open and offer added chance for wear and fracture. Further, a wire may be non-homogeneous, and yet sufficiently strong and ductile at all points to meet the specifications, which in service would fail because bending stresses would concentrate on the softer portions, and thereby subject the wire at such points to abnormal conditions.

These two defects can be detected with certainty only by a twisting test. Under such a test the seams open up as in service, and cause the wire to break after a comparatively few turns. Non-homogeneous wire exhibits concentration of twists in the soft portion, and consequent low number of turns before fracture. In addition, this test detects impure copper, excessive hardness or insufficient annealing as surely as an elongation measurement. It can be safely stated that to an experienced inspector this test affords more information on the quality of wire than any other test. It is therefore the writer's contention that, while an elongation measurement affords desirable data, a



specification omitting a torsion test fails to protect the purchaser of trolley wire.

The procedure followed in making this test for the Boston & Northern and Old Colony Street Railway companies affords an accurate method, the conditions of which are capable of exact repetition on different specimens. The machine employed for test is composed of two jaws attached to a rigid base in such a manner that the specimen lies in a horizontal plane and is subjected only to torsional stress. One jaw is free to slide horizontally to allow for elongation under stress, but is prevented from revolving by means of lugs. The other jaw revolves by machinery at a fixed speed of four turns per minute. Both jaws consist of two corrugated grips, which are clamped to the wire with sufficient force to prevent slipping. Little trouble is experienced by breaking of the specimen in the jaws, but if this occurs a retest is made. The test is carried out in the same room as the tensile test, so that temperature changes are alike for both. The details of such a machine may be varied, the essential requirements being to apply the torsional stress slowly and uniformly and to avoid any other stresses, such as bending or compression. Three specimens are carefully straightened and subjected to test, the operator noting the number of turns before fracture and the behavior of the wire under torsion. The specifications require the average number of turns of the three specimens to pass a certain figure, and provide a minimum below which no one of them shall fall. It is further specified that the wire shall show no slivering or splintering under torsion, and the twists shall be evenly and uniformly distributed. Inferior wire is invariably detected, and the wire which meets the requirements is admittedly of the highest grade.

The experience of the above mentioned railway companies has shown that certain defects of wire are detected only by the torsion test, and has established a reliable method of testing which affords consistent results. It is hoped that all consumers will consider this point carefully in preparing specifications, and that the American Society for Testing Materials will not adopt as standard, specifications which in any respect fail to protect the consumers' interest.

CARL F. WOODS.

### ALTERNATING VS. DIRECT CURRENT

LONDON, Aug. 18, 1909.

To the Editors:

I have read the communication of Dr. Frederick Eichburg in your issue of Aug. 7. As the part inventor of a particular arrangement of coils on a particular kind of single-phase motor, he is entitled to such consideration as may be accorded him by those engineers who have pinned their faith to single-phase systems. My particular reason for taking notice of Dr. Eichburg's communication is on account of the statements he makes in connection with the Central London Railway—statements wholly inaccurate and sufficiently illustrative of Dr. Eichburg's method of dealing with facts.

I was not responsible for the form of locomotives on the Central London Railway nor for the type of motor specified. What I did recommend need not be discussed. The fact is, however, the locomotives were a mechanical and electrical success, with the exception of two equipped with motors made in Germany. These burned out with great promptitude and had to be rewound. The balance were made at Schenectady, U. S. A. The sole reason for re-

placing these locomotives was on account of surface vibration due to the concentrated weight on the locomotive drivers.

I note Dr. Eichberg's satisfaction with his Hamburg cars. I confess I have not seen them. But, having seen some of his motors after a few months' work, I trust there is more reason for self-glorification in this than in the former instance.

H. F. PARSHALL.

### DISTORTED RAILS AND CORRUGATIONS

NEW YORK, Aug. 30, 1909.

To the Editors:

I have read with interest the resumé which you published last week of the report on rail corrugation by Mr. Peterson, manager of the municipal railways of Dortmund, Germany. While I am not in a position nor do I desire to dispute any of the facts presented, but regard them as a valuable contribution to the subject, it does not seem that they warrant the conclusions that are drawn. While it may not be that the investigator entered upon his work with any preconceived bias or ideas on the subject, the whole tone of facts set forth show that apparently the lack of homogeneity of the rail was the sole cause of the trouble that was looked for. It only needs a most casual reference to the pages of your journal to see that there has been from time to time other marshaling of facts to prove other plausible theories, that any one of a hundred things might cause corrugations—and still we are in doubt.

Taking up the matter of Mr. Peterson's hard and soft and indented surface of rails, I beg to call attention to the casual investigation along these lines that I made a few years ago and which was published on page 506 of your issue of Oct. 5, 1907. In this it appeared that the crown and hollow of the corrugations were both hard and soft indiscriminately and that by a judicious selection of locations or rails it would be possible to prove that there was no difference or that there was a wide difference, just as the mental bias might be inclined. Then, even granting that the crests or crowns of corrugations are hard and the valleys soft, it remains to be proved that this condition is not the result rather than the cause of the corrugations.

Great emphasis is laid, too, on the fact of the peculiar treatment in rolling to which street railway rails are subjected as the primal cause. This may be quite true, but it does not explain why some of the worst cases of corrugation occur with the ordinary T, or Vignole, rail that has not been subjected to this peculiar action of the rolls. Nor does it or the theory of varying homogeneity seem to have any bearing upon the fact that corrugations sometimes develop in rails that have been moved from a location of no corrugations to one where they are always found.

As a matter of fact, corrugations seem to be as illusive as the will-o'-the-wisp and have not as yet been tied down to any set of conditions which other conditions do not seem to disprove and this because of the limitation that has hedged in all observations thus far made. So, while the theory of non-homogeneity may be made to fit and explain the conditions set forth in this article, they fall short of explaining many others with which every one is familiar.

Finally, though the Dortmund investigations are of great value, it seems fair to ask for more and to consider that it is quite proper to render a Scotch verdict of "not proven" in the case.

The subject is a puzzling one, and its numerous anomalies and seeming inconsistencies are so difficult to unravel that no one has yet accomplished it. And this very fact leads me to the formulation of a theory.

When a result is brought about by any one cause that cause is usually easy to discover. But when a result is the product of two or more causes that must occur together and yet whose immediate manifestations are different and elusive, it becomes a matter of difficulty to detect, collect and connect them as productive of some resultant that may be of a totally different character from the separated results of the individual causes. And this difficulty increases with the variation in the character of the causes. It, therefore, seems quite probable that instead of rail corrugation being due to any one cause, it may be the result of a combination of causes, which impossible of detection up to the present time, can be caught, analyzed and remedied by a determined and systematic hunt.

GEO. L. FOWLER.

### THE "FILOVIA" TRACKLESS TROLLEY IN ITALY

On June 20 the Società Trazione Elettrica, of Milan, has recently put in operation a trackless trolley line, or "Filo-via," as it is called in Italy, from Argegno, on the Lake of Como, to San Fedele. The line contains many interesting features, including the surmounting of very heavy grades. It is the eighth that has been installed in Italy by the

The overhead equipment includes the use of two copper trolley wires of 105,000 circ. mil section, suspended about 18 ft. above the road surface and carried in the same horizontal plane, 350 mm (25 in.) apart. One wire, of course, is positive and the other negative. The negative wire is earthed at intervals of about 1 mile, and the line is divided into three sections, with appropriate section insulators and switches. The trolley wire hangers, insulators and fittings are practically identical with those used on double trolley street railway lines. The only difference is in the hangers, which are of special design, consisting of a yoke of special paraffined wood, to which are fixed two ordinary overhead insulators. This standardization permits the use, later, of the overhead system for a regular trolley line, if the traffic increases sufficiently to warrant the installation of rails. The overhead line is supported in the ordinary way, on wooden poles with steel brackets, except that steel poles are used wherever there are curves. One feeder is run to the end of the first section, the drop of voltage being from 8 to 9 per cent. In one of the other trackless trolley lines built by the same company, and 18 miles long, there is no feeder, the current being supplied to the line at 650 volts directly from the power station, which is half-way between the two termini.

The current in this case is supplied from the San Fedele end of the line by the Volta Electric Supply Company, and reaches the transformer house at 25,000 volts, three-



Views of Trackless Trolley Car in Italy

Società Trazione Elettrica. The total length of these lines is slightly more than 60 miles, and for the most part they are over country roads.

The Argegno line has a total length of 9.3 km (5.81 miles), of which about 500 m (1640 ft.) are in the town of Argegno. There are many very sharp curves, and the grades are as high as 12.9 per cent. The average grade, including the practically level section at each end, is more than 5.7 per cent. The owners contemplate extending the line ultimately to Santa Margherita, on the Lake of Lugano, so that when completed it will have a length of about 14 miles, and will link together the Lake of Como and the Lake of Lugano.

phase, 42 cycles. It is transformed down to 3600 volts, and actuates a motor generator set composed of a 75-hp synchronous motor directly coupled to a 50-kw, 600-volt d.c. generator. A storage battery of 75 amp-hours is connected in parallel with the generator. The car house adjoins the power station, with room for about 10 cars, a repair shop and the company's offices.

The motor cars employed do not differ greatly in general appearance from a single-deck motor omnibus, except that each is provided with a trolley pole. The chassis frame is of pressed steel and the side members are bent in toward the front to allow of a wide turn to the front wheels, which is necessary because some of the curves are

only 20 ft. radius. The wheels are of cast steel and fitted with ball bearings and solid rubber tires. The diameter of the front wheels is 850 mm (33½ in.) and that of the back driving wheels 950 mm (37½ in.). The wheelbase is 8 ft. 6 in. and has had to be kept short on account of the sharp curves of the road. Special attention has been paid to the brakes on account of the heavy grades. There are three mechanical brakes, each independent of the other. One is a band brake working on the chain sprocket drum; a second one is a band brake working on the back wheels, and a third consists of two shoes which expand in the interior of a drum fitted to the back wheels. All these mechanical brakes are water cooled, and each is sufficient alone for holding the car on any of the grades. Spraggs are fitted to prevent the car from running backward if stopped on a hill.

The electrical equipment of each car consists of two 15-hp, 500-volt railway motors, which are spring suspended from the chassis and transmit their power to the driving wheels by means of a flexible coupling, spur reduction gear, sprocket and chain. The gear ratio from the motors to the road driving wheels is 1 to 13, but this ratio can be altered if desired. Each motor drives one wheel independently of the other. A series parallel controller is used. The method adopted of suspending the motors and the gears to the chassis is claimed to give a much longer life to the motors and also to the rubber tires. Each car is provided with a circuit breaker, a canopy switch and a lightning arrester of the ordinary type.

The current collecting apparatus deserves special attention. It consists of a tubular pole carrying at its top a little four-wheeled truck and mounted on a base very similar to that usually used. The connection of the current collecting truck to the trolley pole is made with a special joint, which allows the collector to move easily and to adapt itself to the oscillations of the car and of the overhead line. The pressure of the collector wheels on the wires is about 10 lb. The collector will allow the car to become displaced about 7 ft. either side of the trolley wire even when running full speed, and to take very sharp curves without the poles leaving the wires. The car is even able to turn completely round without removing the collector.

The cars have a seating capacity of 20 passengers and accommodation on the roof for parcels and luggage. The weight of a car complete in running order is about 3 tons.

The schedule of the new line is 10 trips each way, and the fares charged are 30 cents for the up trip and 20 cents for the down trip. The run is made between termini, with three intermediate stops, in 50 minutes. There are three passenger cars, one of which is held in reserve, and one freight car. The kilowatts required on the up trip with a full car of 20 passengers are from 12 to 18, when the trip is made in 50 minutes, and from 17 to 24 when the trip is made in 35 minutes. For the down trip practically no current is used.

The following operating expenses per car-mile are taken from a similar line installed in 1905 by the Società per la Trazione Elettrica from Spezia to Fezzano (Portovenere) with a length of about 9 miles:

Cost of energy .....	0.83	cents per car-mile
General expenses .....	1.188	" "
Rubber tires renewal.....	4.320	" "
Wages of conductors and motor-		
men .....	2.800	" "
Maintenance of car and line.....	1.240	" "
Repairs of cars.....	0.912	" "
Total cost .....	11.290	" "

The cost of tire renewal looks, of course, high, but in all trackless trolley systems this is the serious question. It is stated, however, that the cost of tires varies greatly with the character of the roadway, and that the roads of Spezia are not very good. It is said that one of the trackless trolley lines in Italy has made a contract with rubber tire manufacturers for the maintenance of its tires at a rate of about 3.24 cents per car-mile. The Italian Government allows the company about \$290 a year for the haulage of the mails.

Dr. A. M. Zani, of Milan, who has been actively associated with the development of this system in Italy, is now introducing it into England.

### TELEPHONES ON AN AKRON ROAD

The Cleveland, Akron & Columbus Railroad Company has recently installed a composite telephone circuit on its lines between Akron and Columbus, Ohio, a distance of 130 miles. The line is constructed of No. 9 copper and has three intermediate telegraph offices between the terminal telephones. There are also three intermediate telephone stations connected to the line. The company has also equipped its wrecking train with a portable composite telephone, which may be connected to the line at any point along the road. An extra portable composite telephone is kept at the division headquarters, to be used on inspection trips or in cases of emergency. The Western Electric Company's instruments are used.

### CONVENTION NOTES

The secretary's office mailed on Sept. 1 to members and associate members of the various associations the first installment of papers to be presented at the Denver meeting. Those sent out included all of the reports for the Engineering Association, all but one of the Accountants' Association and all but one of the Transportation & Traffic Association. These papers comprise all that will be distributed in advance. It is also understood that all of the papers of the Claim Agents' Association have been received, but will be distributed only at the convention. The secretary's office and the presidents of the various associations are to be complimented on their successful efforts in bringing about this early completion of papers.

The transportation committee in charge of the New York-Denver special train over the New York Central Railroad has issued a very attractively printed pamphlet descriptive of the train. It gives the schedule from the time of leaving New York, Sept. 30, at 3:30 p. m., until the arrival in Denver on Oct. 2, at 4 p. m., and gives particulars of the methods of securing accommodations on the train. An account is also given of Denver, and of some of the side trips which can be made from that city and from Colorado Springs. The pamphlet is well illustrated and has an attractive cover design.

K. D. Hequembourg has issued a circular to manufacturers in regard to the consolidation into carload lots of the exhibits which they expect to ship to Denver. The freight rate to Denver is high for small shipments, but reasonable for carload lots, and manufacturers who wish to take advantage of a consolidation of this kind should notify Mr. Hequembourg promptly. It might be said that recent inquiry at the offices of the railroad freight agents brought out the fact that the average time for a freight shipment at present from New York to Denver is two

weeks. The time required for freight from Cleveland to Denver is about 12 days and from Chicago to Denver 10 days.

Mr. Hequembourg also wishes to call attention to the importance of manufacturers ordering promptly such furniture as they will require for their booths. The contract for this furniture has been let to the Spangle House Furnishing Company, of Denver, on account of the low rate which this company quoted.

Following is a list of the manufacturers who have applied for space at Denver since the publication of the first list in the *ELECTRIC RAILWAY JOURNAL* for Aug. 14:

D & W Fuse Company, Providence, R. I.  
 Guy M. Gest, New York City.  
 Kerite Insulated Wire & Cable Company, New York City.  
 Massachusetts Chemical Company, Boston, Mass.  
 Rubberset Company, Newark, N. J.  
 Standard Paint Company, New York City.  
 United States Wood Preserving Company, New York City.  
 Pantasote Company, New York City.  
 Aluminum Company of America, Pittsburgh, Pa.  
 Hale & Kilburn Manufacturing Company, Philadelphia, Pa.  
 Jones & Laughlin Steel Company, Pittsburgh, Pa.  
 Nachod Signal Company, Philadelphia, Pa.  
 Sterling Varnish Company, Pittsburgh, Pa.  
 Standard Steel Works, Philadelphia, Pa.  
 American Railway Guide Company, Chicago, Ill.  
 Atlas Railway Supply Company, Chicago, Ill.  
 Colorado Cement Products Company, Denver, Colo.  
 Duntley Manufacturing Company, Chicago, Ill.  
 Electric Traction Company, St. Louis, Mo.  
 Forsyth Brothers Company, Chicago, Ill.  
 Handlan Buck Manufacturing Company, St. Louis, Mo.  
 National Brake & Electric Company, Milwaukee, Wis.  
 Peter Smith Heater Company, Detroit, Mich.  
 Buckeye Electric Company, Cleveland, Ohio.  
 Standard Brake Shoe Company, Chicago, Ill.

### TESTS WITH FRICTION DRIVE IN EAST ST. LOUIS

Some interesting tests of an electrical locomotive equipped with friction drive instead of geared motors have been conducted during the past few weeks at East St.

tween the 48-in. wheels of the locomotive truck, and is arranged to be raised or lowered by pneumatic power, so that a 12-in. friction wheel on the end of its shaft is thrown in and out of engagement with the treads of the driving wheels. The motor operates continuously.

Tests were conducted last week with the completed car and with an ordinary geared locomotive equipped with two 35-hp motors. In each case a load of 10 empty coal cars, weighing altogether 308,500 lb., were drawn. The results were as follows:

No. of Runs.....	Friction Drive Car.				Geared Car.			
	1	2	3	4	1	2	3	4
Distance, feet.....	9340	9340	2310	2310	9340	9340	2310	2310
Time, seconds.....	625	520	200	225	440	350	160	160
Amperes, avge.....	65	60	71.1	70.1	168	145	209	175
Horse power.....	46.79	40.14	52.89	48.88	109	95	140.6	113
Saving of friction drive, per cent....	57	58	62	57	....	....	....	....

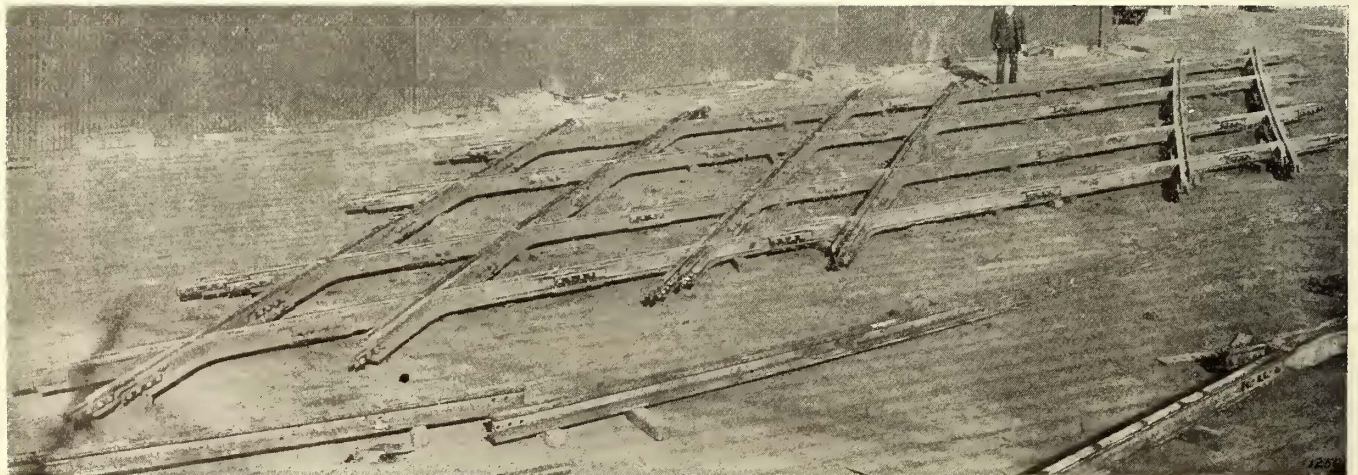
It is believed by the inventors that the application will find a wide field in electric railway service, particularly with alternating-current motors.

### SPECIAL WORK FOR TRUNK LINE OPERATION

During the last convention of the British Railway Permanent Way Institution held at Sheffield, England, July 16-23, the members were invited by the Hadfield Steel Foundry Company to visit its East Hecla Works, whose special work for electric railways is well known in England.

Hitherto it has been the practice on most British railroads to have their switches and crossings made from rails, so that steel foundries have had little or no interest for railroad engineers responsible for the maintenance of the permanent way. But the severe working conditions prevailing on railroads now, due to the greatly increased weights of the locomotives, the increased carrying capacity of the rolling stock, the vastly higher speeds of the trains and the introduction of electricity have shown that corresponding improvements in the stability of the track and the quality of the switches and crossings are necessary.

At the time of the visit the Hadfield company had on its lay-out floor, said to be the largest in the world, several important pieces of special work of Era steel for the North



Large Piece of Special Work for North Eastern Railway, England

Louis, on the lines of the East St. Louis & Suburban Railway. The application is the invention of J. V. Heverling, of St. Louis, and among those associated with him in the development of the device are Geo. W. Baumhoff and Edwards Whittaker.

As used on the locomotive of the East St. Louis & Suburban Company, one 75-hp electric motor is mounted be-

Eastern Railway, which has a section of electrified lines. One of these crossings is illustrated in the accompanying engraving and attracted great attention. Afterward the party was shown the works. The various departments visited included the pattern shop, foundry, grinding shops, erecting shops for track work for the electric conduit system and its vast machine shops.

## LONDON LETTER

*(From Our Regular Correspondent)*

The annual conference of the Municipal Tramways Association will be held in London on Sept. 22, 23 and 24. Arrangements are to be made for the inspection by the delegates of the metropolitan system of tramways, and free passes will be issued enabling them to travel all over the Council's tramways, the manager of which, Mr. Fell, is the president of the Municipal Tramways Association.

A useful guide book to places of interest on the South Lancashire Tramways route has just been issued. By means of this system the smaller towns and villages of Lancashire are brought in direct communication not only with each other, but with the great cities of Liverpool, St. Helens, Wigan, Bolton and Manchester. The book shows how to travel by tram from Manchester to Bolton, Bolton to Liverpool, Wigan to Manchester, as well as containing descriptions and views of places of interest on the route.

The electrified section of the London, Brighton & South Coast Railway between Peckham Rye and Victoria is now in working order and a service of 12 trains daily has been started to familiarize the public with the new system. The full service of 77 trains daily between London Bridge and Victoria will come into operation on Oct. 1, and a revised table of fares, involving considerable reductions for South London traffic, is under consideration. On the results of the working of this single-phase overhead system a great deal will depend. If satisfactory the system will probably be extended not only to the other suburban lines of the Brighton Company, but to those of other companies, which are watching the outcome of the experiment with great interest.

The last steam tramway in England has now been electrified and is in service in its new form. This event took place in August, when the Bacup Electric Tramways were officially thrown open to the public. The Rossendale Valley Tramways are now completed, the contracts for the Bacup line amounting to £36,000, and for the Rawtenstall sections £145,000. Rawtenstall Corporation will work the Bacup tramways for 30 years, taking the profits, and then handing the line over free as a going concern to the Bacup Corporation.

It seems that the traffic returns of the Liverpool Tramways Committee show that the modification of the first-class car system to "first-class inside only" has increased the car mile earnings to 10.40d. This compares favorably with other routes and the committee has decided to continue the first-class service.

The probable use of trackless trolley cars in British cities has not been forwarded by the decision of a Parliamentary committee. Recently the Gateshead and District Tramways Bill was before the committee on unopposed bills in the House of Commons. In the bill was a clause which would empower the running of trackless trolley cars with overhead electric equipment, but the committee has ordered that this clause should be omitted.

At the Johnson-Lundell Works of the J. L. Manufacturing Co., Ltd., Southall, a demonstration was given recently of a new surface contact or "stud" system, known as the "S. P." or "Simplex." The patents for this system are by a Russian named D. Suchostawer, and are owned by the S. P. Syndicate, Ltd., London. The demonstration was entirely successful, and showed a very simple system in operation, whereby overhead construction on tram lines can be entirely obviated, as the cost of this surface contact system is less.

The Observatory Department of the National Physical Laboratory, which had to be removed from Kew owing to the disturbing effect of the West London electric trams on the delicate magnetic instruments, is now installed in its new quarters in Dumfriesshire, and the report for the first year has just been published. Electric trams and trains are unlikely to trouble the staff for many years to come, for the new observatory at Eskdalemuir is in the midst of a wide-spreading pastoral district and nearly 20 miles from the nearest railway station. A room has been specially constructed underground in which seismographs will record the most minute earth movements. Little actual work has yet been undertaken, but the situation has proved ideal for the purpose.

The bill promoted by the Torquay Tramways Company, which proposes to authorize the construction of an additional line of tramways, commencing by a junction with the existing tramways in the Torbay Road opposite the Torquay station, and proceeding along that road to Paignton, and terminating close to Paignton station, has been allowed to proceed. The object of this line of tramway is to afford much-needed facilities of locomotion between

the borough of Torquay and the urban district of Paignton.

An important point affecting the introduction of trackless trams in this country was mentioned recently at Leeds City Council, which a few weeks ago passed a resolution to make a trial of the trackless system in Farnley, a suburb of the city. It appears, however, that as the trackless tram has not yet been introduced in England, the Board of Trade has not decided whether local authorities must promote a Parliamentary bill for powers to adopt the system. The attitude of the Board of Trade indicated that at present it thought it would be necessary to ask for powers for trackless trams, but there was a chance that the Council's powers already obtained for electric traction might be sufficient, and that the fact of there being no rails in the trackless system would not be regarded as important. In any case, a resolution is to be proposed at the September meeting of the Leeds Council providing for an application for the necessary powers to introduce the trackless system in accordance with the resolution which has already been passed.

On the recommendation of the highways committee the London County Council has agreed to seek Parliamentary powers in the next session for the construction of about 24 miles of new electric tramways within the county. With the exception of about 4 miles in the neighborhood of Brixton and Wandsworth, the whole of the new track will be laid down in North London, one of the most important leading from the Marble Arch to Cricklewood. With the opening of the extension of the tramway service from Streatham to Norbury it is now possible to travel by tramcar from Barnet, on the heights of Hertfordshire, through London to Purley, at the foot of the Surrey Hills. The distance is 20 miles, and the journey can be done with only three changes.

General interest attaches to the annual reports of the working of the Wolverhampton Tramways, because it is there that the sole British installation of the Lorain surface contact system is working. The report shows the substantial decrease in the working costs as compared with last year of 0.135d. per car-mile, being 6.374d. against 6.509d. This figure of 6.374d. is below the average of other municipal tramway undertakings in this country, and Wolverhampton is one of the few towns where the working costs show a decrease per mile over the previous year. The result of the year's working is a gross profit of £17,048, and, after meeting standing charges, there remains a net balance of £746. The renewals fund was credited with £4,505, and it now stands at £26,590.

The report of the highways committee of the London County Council states that up to the date mentioned the capital expenditure on the tramways undertaking amounted to £9,483,561 18s. 1d., of which £1,068,971 2s. 2d. represents expenditure during the year 1908-1909. The total debt repaid up to the same date amounted to £1,074,345 4s. 11d. out of revenue, and £282,519 12s. 8d. from the proceeds of sales of horses and old materials, etc. The debt outstanding on March 31, 1909, was £8,126,697 0s. 6d., or deducting £83,558 for the value of surplus land, £8,043,139 0s. 6d. The Council decided on June 23, 1908, subject to the approval of the Treasury, to repay the debt (estimated at about £960,000) on the capital, which will be obsolete by March 31, 1914, owing to the electrification of horse tramways, within 15 years from that date. The present position with regard to this obsolete capital expenditure has accordingly been shown in the accounts for 1908-1909, where it is shown that the amount of obsolete capital, less proceeds of sales, on March 31, 1909, was £1,344,093 17s. 3d. Deducting the debt in respect of such capital repaid out of revenue, viz., £302,637 13s. 5d., the outstanding debt is £1,041,456 3s. 10d. The total receipts from the undertaking during the year and the working expenses were as follows: Electric traction—Total receipts, £1,572,251 8s. 7d.; working expenses, £896,286 4s. 7d.; surplus on working, £675,965 4s. Horse traction—Total receipts, £275,199 1s. 7d.; working expenses, £305,402 0s. 2d.; deficiency, £30,202 18s. 7d. Thus there is a total surplus of £645,762 5s. 5d.

Royal assent has just been given to the bill of the Central London Railway for an extension of its tube from the Bank to Liverpool Street, which, when completed, ought to add greatly to the value of the original twopenny tube. Liverpool Street being the logical terminus, and not the Bank, where it connected with nothing. The company is also to construct a moving platform between its British Museum station and the Holborn station of the Piccadilly tube. The depths of the two stations show a difference of a number of feet, and the platform will have to be made on an inclined plane. When it is finished passengers will be able to step out of the trains at either the Museum or Holborn, and they will be at once transported to the other line.

A. C. S.

# News of Electric Railways

## Cleveland Traction Situation

The week ended Aug. 28 was taken up by the City Council and the Cleveland Railway in considering a series of propositions and counter propositions.

Horace E. Andrews, president of the Cleveland Railway, has not yet yielded to the demand that the city be permitted to name a purchaser for the company's property within 10 years from the date of the granting of the franchise, and has also refused to yield to the proposal that the Cleveland Railway shall not have the right to retain its property after 10 years if it is willing to accept terms as liberal as offered by any other bidder. Mr. Andrews says that the company should not be deprived of the property if, after bids have been received, it should decide that it will operate under the terms offered by the most favorable bidder. He submitted a communication to the City Council on Aug. 23 embodying the views of the company on this phase of the question.

The same communication touched upon the acceptance of Judge R. W. Tayler of an appointment as a member of the legal committee that is to decide upon an invalidity clause for the proposed franchise. The company insists that Judge Tayler be a member of the committee. On Aug. 25 the Council replied that Judge Tayler would be accepted as a member of the committee provided City Solicitor Baker also act as a member of the committee with Judges Lawrence and Tolles as the other members. In this communication the Council also stated that its position fixing Jan. 1, 1917, as the date when the city might nominate a purchaser is unchanged. The company holds to the suggestion of Judge Tayler that the date shall be Jan. 1, 1919.

On the evening of Aug. 19 another communication was filed by the Cleveland Railway, in which it was suggested that Messrs. Tayler, Tolles and Lawrence act upon the local committee, with the city solicitor as an adviser of the Council and not as a member of the committee. It was also stated that the company is unwilling to agree to a board of arbitration composed of men interested on either side. The company would prefer to have disinterested experts thoroughly qualified by previous experience to decide the questions which may be submitted to them.

The reply of the Council, delivered on the evening of Aug. 20, contained a refusal to fix a date of limitation for a longer period than to Jan. 1, 1917, and a refusal to agree that the members of the board of arbitration shall be disinterested. The third man chosen will be the umpire, the reply states, and he should be chosen with special regard to his fitness and disinterestedness.

## Transit Affairs in New York

William R. Willcox, chairman of the Public Service Commission of the First District of New York, sent a letter on Aug. 27 to Theodore P. Shonts, president of the Interborough Rapid Transit Company, in which the company's offer to build a subway north on Lexington Avenue from the Grand Central Station, and another south on Seventh Avenue, connecting with the present system at Forty-second Street and Broadway, is practically declined by the commission. The letter points out that the route proposed by Mr. Shonts is only an extension of the present underground, and that it would interfere with the construction of additional lines. While the action of the commission does not finally dispose of the bid made by the Interborough Rapid Transit Company, it is expected that Mr. Shonts will adhere to the position he resumed when the new roads were first proposed and decline to offer bids on any other subway construction.

The construction of the two-track line on Lexington Avenue, with a third track on Third Avenue, the letter says, would render impracticable, and perhaps impossible forever, the construction of a complete route from the Bronx to lower Manhattan. It suggested that plans might be prepared for the building of an underground line on Madison Avenue north from Forty-second Street, connecting with the West Farms branch of the present road at 110th Street, with a crosstown section on that street to bring the East and West side divisions of the road together. The provision for entering a new section of the Bronx also was spoken of in this regard, but nothing definite mentioned about the location of the spur.

It is made plain throughout the letter that the plan sent to the commission by the Bradley-Gaffney-Steers Company, which included the construction of an underground road from the Battery north on Broadway to Ninth Street and

thence up Lexington Avenue to the Bronx, meets with favor at the hands of the commission. While the Bradley-Gaffney-Steers Company is not mentioned, it is pointed out that the construction of the new road under the route planned by the commission was most desirable. The plan of the Bradley-Gaffney-Steers Company includes all of the routes laid out by the commission with additions that are agreeable to that body.

The letter in conclusion requests that conferences be arranged between Mr. Shonts and the members of the commission, before the board finally disposes of the matter. The letter says in part:

"The commission considers it essential that the needs of the city a decade hence shall be considered and not merely those of to-morrow, and that the development of all rapid transit lines shall proceed in a logical, practical and systematic form, and not in a haphazard, disjointed and temporizing manner. The two two-track lines proposed by your company for Lexington and Third Avenue do not meet these requirements.

"The laying out of routes in no proper way interferes with the legitimate use of development or the present subway; neither is it an attempt to hamper the Interborough Rapid Transit Company. Assuming that the various routes proposed are advertised for bidders, such action will merely place every other bidder upon an equality with the Interborough Rapid Transit Company so far as the commission can do so. If the commission were to lay out routes upon which no one could bid but the Interborough Rapid Transit Company, it would be giving that company an unfair advantage, which could not be justified.

"It is realized that the Interborough Rapid Transit Company in some ways has an advantage over every other bidder, for it can offer transfers between future subways and the present subway and the elevated roads, which no other company is now in position to do. Consequently, the addition of independent routes in no way deprives the Interborough Rapid Transit Company of any privileges or rights which it has, but merely places, so far as it is possible and desirable to do so, other companies upon the same basis as the Interborough Rapid Transit Company. This is giving equal treatment to all, and any other course would involve discrimination and favoritism."

## Wage Controversy in Chicago

The wage controversy between the street railway companies of Chicago and their employees is practically at a deadlock. Conferences have been held daily, but no proposition has been presented that, as a whole, was favorably received by both sides. It is now stated that the only hope for peaceable settlement lies in a board of arbitration.

Walter L. Fisher, traction attorney representing the city of Chicago, presented a plan on Aug. 27 advocating a graded scale of wages which provided for a maximum wage of 30 cents an hour. The agreement as proposed by Mr. Fisher was to be effective for five years from Aug. 1, 1909. It was founded on the basis of seniority and gave the employees who have been in the service of the railway company for more than nine years a wage of 30 cents per hour, and younger employees a wage of proportionately 1 cent per hour less for each year that they have been in the companies employ less than nine years. Under the suggested plan, new men would receive 23 cents per hour for the first three months' service, 25 cents per hour for the next nine months' service, 27 cents per hour for the second year's service, and an increase of 1 cent an hour each year until the expiration of the agreement. This plan was rejected by the employees.

An amended counterwage scale, relating to that part of the proposed agreement which fixes the wage scale of the new men in the service, was presented on Aug. 30 by the representatives of the employees. It was as follows:

First three months' service.....	23 cents
Next nine months' service.....	25 cents
Second year.....	27 cents
Third year.....	28 cents
Fourth year.....	29 cents
Fifth year.....	30 cents

At conferences held on Aug. 30, 1909, the employers stated that in the proposition presented on Aug. 13 they had consented to grant concessions which would represent an increase of practically \$300,000 annually over existing wages. Mr. Fisher's plan would entail the payment of practically \$420,000 a year in excess of existing wages. It was stated that the railway companies could not afford to grant more concessions and that further negotiations would be

useless. President John M. Roach, of the Chicago Railways Company, and President Thomas E. Mitten, of the Chicago City Railway Company, announced that they are now ready to arbitrate the entire wage question. It seems probable that the several plans which have been suggested for settlement of the pending difficulties will be acted upon by a referendum vote of the employees at an early date.

On Aug. 25 President Mitten issued a statement to the committee of employees of the Chicago City Railway Company, in which he said in part:

"Your communication of Aug. 23 is on its face a most unfair attempt to take advantage of concessions made by me as the representative of the Chicago City Railway Company and at the same time to ignore the considerations offered by you, which my concessions were based upon. It is a repudiation of the agreement embodying these mutual concessions which you promised not only to report to the men, but to recommend for adoption.

"This company has insisted and now insists that its trainmen should be graded and paid according to their length of service and efficiency resulting therefrom. The professed reason for the opposition to the graded scale has been that the company might show favoritism by dismissing the older and higher-priced men to make room for the newer men at a lesser rate. The company denies that this would be the case, and it is now taking this stand for a graded scale in favor of the old men in the service, first for the very selfish reason that the older men are a better investment at a higher wage, due to their having fewer accidents than the men less experienced in the service, the records of the company showing that during the month of July 732 men over nine years in the service performed 26.33 per cent of the actual work and had only 12.78 per cent of the accidents; 2041 men, including all men nine years and under in the service, performed 73.67 per cent of the actual work and had 87.22 per cent of the accidents; new men under one year in the service performed 8.41 per cent of the actual work, but had 29.62 per cent of the accidents; the percentage of accidents compared to the work performed growing less as the length of service and experience of the men increase. As a single accident often costs the company more than the entire wage which a trainman would receive during the entire period of his contract, it is to the advantage of the company to retain its older employees.

"Second, much expense and trouble is caused to the company by the constant changes in the force found necessary in weeding out the undesirable element among the new men; the company's record covering a period of three years shows that the changes have been less than 6 per cent in men over nine years in the service; changes in men nine years and under in the service being 94 per cent; changes in men from one to three years in the service being 77 per cent, the changes growing gradually less in number as the men are longer in the service of the company.

"In addition to the above, there remains the moral obligation of the company to see that its older men receive the maximum wage possible, in order that they may be able to lay aside something against the time when they are no longer able to perform their present duties.

"Your committee conceded that the gradual scale was correct in principle, but objected to its application to the men that had already entered the service on a different basis of pay. It was, therefore, agreed that the system should be started with the new men hereafter to be employed, and that a graded increase to 30 cents should be given to the present trainmen during the life of a contract to run three and a half years. You now state the discrimination between the new men and the old men is the chief cause of dissatisfaction with the settlement which you definitely agreed to advocate and support. Your proposal of Aug. 23, however, not only continues this discrimination, but would give the new men higher wages than the old men are to receive for the very same length of service.

"The company is entirely willing to wipe out all discrimination between new and old men, and to pay both alike the same pay for the same length of service, under a wage scale to go into effect at once, which shall give new men when they start 23 cents, and 30 cents to all men now or hereafter over nine years in the service, with corresponding wages to the men of less years in the service.

"The period of the contract to be three and a half years from Aug. 1, 1909, with the same working conditions as are contained in the contract which expired Aug. 1, 1909. It is my belief that this plan is fair and just and will serve to insure co-operation by recognition of efficient service.

"This company is prepared to discuss a contract upon the above terms or to submit all of the terms of a contract between us to any fair board of arbitration upon which we can agree."

On the same date President Roach issued a statement as follows to the committee of employees of the Chicago Railways Company:

"In the negotiations in reference to wages that have been conducted for the last few weeks, the Chicago Railways Company has never lost sight of the fact that it is a quasi-public institution and that it is under obligations to the general public, to the business interests of the community and to its employees, and therefore was willing, in making a wage scale, to strain its financial resources to the limit. But it must not be forgotten that the company also is under obligations to the interests that have made possible Chicago's constantly improving surface traction system.

"It is with sincere regret that I am obliged to state that the financial condition of the Chicago Railways Company is such that it is unable to grant any further increase in the wage scale beyond what has already been offered to employees of the company. With all due respect for yourself, allow me to suggest that even if we were financially able to make greater concessions than those already offered directly to our employees, it would be a breach of faith on my part to do more for others than I would for the committee directly representing an organization of our men.

"Believing that I have conceded to the employees all that our company can afford, and taking into consideration the equitable and fair treatment of employees, applying to all alike, I beg to suggest to you the acceptance of the graded scale for the old men as first proposed, or the subsequent proposition which was made and finally agreed upon with the committee who represented the employees."

#### Association Meetings

Central Electric Accounting Conference, Indianapolis, Ind., Sept. 11.

American Street & Interurban Railway Association and affiliated associations, Denver, Col., week commencing Oct. 4.

Colorado Light, Power & Railway Association, Denver, Col., Oct. 7, 8 and 9.

Empire State Gas & Electric Association, New York City, October, 1909.

Alabama Light & Traction Association, Birmingham, Ala., Nov. 15 and 16.

National Association of Railway Commissioners, Washington, D. C., Nov. 16.

Central Electric Railway Association, Indianapolis, Ind., Nov. 18.

**Meeting of Traffic Officials with Ohio Railroad Commission.**—Traffic officials of electric railways, responding to a request of the Ohio Railroad Commission, met in Columbus on Aug. 12 to consider the subject of tariffs.

**Meeting of Central Electric Accounting Conference.**—The next meeting of the Central Electric Accounting Conference will be held at Indianapolis, Ind., on Sept. 11. M. W. Glover, chairman of the conference, states that it has not yet been determined at just what place the meeting will be held in Indianapolis.

**New Long Island Line Completed.**—The Long Island Railroad placed its cross-island electric railway extending from Huntington to Amityville in operation on Aug. 25. The new road connects with the Port Jefferson branch of the Long Island Railroad at Huntington, with the main line at Farmingdale and with the Montauk division at Amityville. It is 18 miles long.

**Transit Exhibit at New York State Fair.**—The New York Public Service Commission, First District, will have an exhibit at the New York State Fair which opens at Syracuse on Sept. 14. Some of the charts and maps exhibited at the Conference on City Planning and Municipal Art, an account of which was published in the *ELECTRIC RAILWAY JOURNAL* of May 29, 1909, page 979, will form part of the collection at Syracuse. New material will also be added to the exhibit of the commission.

**Public Utility Planks in Maryland Platforms.**—The Republican State Convention was held in the Maryland Theater, Baltimore, Md., on Aug. 25. Practically all matters were put through as arranged previous to the meeting. A platform was adopted which touches a number of public questions, among them the public service matter. Thus both the Republicans and the Democrats are now on record regarding this issue. The Republican platform says: "We advocate a just, impartial and unprejudiced supervision and control of public service corporations and public utilities generally in this State through incorruptible, enlightened and non-partisan agencies, and we condemn any exemption from such supervision and control, or other special favors to any particular enterprise or corporation." The Democratic platform says: "We favor the creation by appropriate legislation of a public utilities commission applicable to all our public service corporations."

# Financial and Corporate

## New York Stock and Money Market

August 31, 1909.

To-day there was certainly decided dullness compared with the marked activity of the last fortnight. Professional traders are uncertain and timid and outsiders are holding aloof, generally so advised by their brokers when they deal with conservative houses. During the week the general trend of the market has been downward, although there was considerable recovery on Aug. 30. The market leaders have been the principal shares affected, and four or five issues have made up more than half of the trading. The tractions have not been active and, as a rule, have sagged in sympathy with the leading issues.

Money continues to be cheap and apparently plentiful. Rates to-day were: Call, 2¼ to 2½ per cent; 90 days, 3¼ to 3½ per cent.

### Other Markets

In the Philadelphia market, Rapid Transit continues to appear every day in small quantities, and now and then small blocks of Union Traction are offered. Prices are practically unchanged from one week ago.

There is no trading in tractions on the Chicago market that is worthy of mention. A few shares of Subway stock are sold at about 20 every few days, and occasionally an odd lot of Kansas City Railway & Light preferred at around 82, but no other issues are in evidence.

In Boston, Massachusetts Electric and Boston Elevated have each been traded in during the week to a limited degree. Prices have been very firmly held at previous figures.

In Baltimore, the bonds of the United Railways have not been quite so active as heretofore although prices remain unchanged. Both the stock and bonds of the Maryland Electric Railways have been traded in to a limited degree.

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

	Aug. 24.	Aug. 31.
American Railways Company.....	46¾	46
Aurora, Elgin & Chicago Railroad (common).....	49¾	47½
Aurora, Elgin & Chicago Railroad (preferred).....	95	92½
Boston Elevated Railway.....	128½	129¼
Boston & Suburban Electric Companies.....	18	*18
Boston & Suburban Electric Companies (preferred).....	*70	*70
Boston & Worcester Electric Companies (common).....	a13	a13
Boston & Worcester Electric Companies (preferred).....	a53	a55
Brooklyn Rapid Transit Company.....	80¾	78¾
Brooklyn Rapid Transit Company, 1st pref., conv. 4s.....	87½	86¼
Capital Traction Company, Washington.....	*141	136
Chicago City Railway.....	a190	a180
Chicago & Oak Park Elevated Railroad (common).....	*3	*3
Chicago & Oak Park Elevated Railroad (preferred).....	*12	*12
Chicago Railways, pteptg, ctf. 1.....	a112	a112
Chicago Railways, pteptg, ctf. 2.....	a38½	a38½
Chicago Railways, pteptg, ctf. 3.....	a25	a26
Chicago Railways, pteptg, ctf. 4s.....	a9½	a10
Cleveland Railway.....	*78	*78
Consolidated Traction Company of New Jersey.....	*77½	a77½
Consolidated Traction of N. J., 5 per cent bonds.....	a106½	a106½
Detroit United Railway.....	a70	a69½
General Electric Company.....	169	169½
Georgia Railway & Electric Company (common).....	a95	a94½
Georgia Railway & Electric Company (preferred).....	a87	a88
Interborough-Metropolitan Company (common).....	15½	14½
Interborough-Metropolitan Company (preferred).....	47½	47
Interborough-Metropolitan Company (4½s).....	83½	83½
Kansas City Railway & Light Company (common).....	a49	a48
Kansas City Railway & Light Company (preferred).....	a83½	a82
Manhattan Railway.....	142	140
Massachusetts Electric Companies (common).....	a14	15½
Massachusetts Electric Companies (preferred).....	74	74½
Metropolitan West Side, Chicago (common).....	a18	a18
Metropolitan West Side, Chicago (preferred).....	a50	a50
Metropolitan Street Railway.....	a24	a24
Milwaukee Electric Railway & Light (preferred).....	*110	*110
North American Company.....	84½	83
Northwestern Elevated Railroad (common).....	a20	a20
Northwestern Elevated Railroad (preferred).....	a71	a71
Philadelphia Company, Pittsburg (common).....	48¼	47½
Philadelphia Company, Pittsburg (preferred).....	a45	44
Philadelphia Rapid Transit Company.....	30½	30½
Philadelphia Traction Company.....	*91	90½
Public Service Corporation, 5 per cent col. notes.....	*100¼	a100¼
Public Service Corporation, cfs.....	*93½	a93½
Seattle Electric Company (common).....	116½	115
Seattle Electric Company (preferred).....	*106¼	107
South Side Elevated Railroad, Chicago.....	a56	*a56
Toledo Railways & Light Company.....	a10½	*10½
Third Avenue Railroad, New York.....	23½	23¾
Twain City Rapid Transit, Minneapolis (common).....	109	108¼
Union Traction Company, Philadelphia.....	54	54
United Railways & Electric Company, Baltimore.....	a14	13
United Railways Inv. Co., San Francisco (common).....	a39½	38½
United Railways Inv. Co., San Francisco (preferred).....	58	59
Washington Railway & Electric Company (common).....	*47	44½
Washington Railway & Electric Company (preferred).....	*92	90½
West End Street Railway, Boston (common).....	a98	96
West End Street Railway, Boston (preferred).....	106¾	106½
Westinghouse Electric & Manufacturing Company.....	87	86
Westinghouse Elec. & Mfg. Co. (1st pref.).....	a132½	130

aAsked.

\*Last sale.

## Annual Report of Brooklyn Rapid Transit Company

The annual report of the Brooklyn Rapid Transit Company for the year ended June 30, 1909, issued last week, gives the following comparative statement of operations for two years:

	1909	1908	Increase
Gross earnings:			
Passenger.....	\$19,058,693.14	\$18,930,164.18	\$128,528.96
Freight, mail and express....	254,642.81	315,719.08	61,076.27
Advertising.....	155,860.31	155,204.65	655.66
American Railway Traffic Company.....	225,265.85	469,478.64	244,212.79
Total earnings from operation.....	\$19,694,462.11	\$19,870,566.55	\$176,104.44
Operating expenses:			
Maintenance of way and structure.....	1,194,014.13	1,020,103.81	173,910.32
Maintenance of equipment....	1,609,916.33	1,837,550.29	146,633.96
Operation of power plant.....	1,596,759.17	1,653,727.74	56,968.57
Operation of cars.....	4,812,555.95	4,979,750.57	167,200.62
Damages and legal expenses.	1,129,396.31	1,242,361.24	112,964.93
General expenses.....	676,665.93	651,669.03	24,996.90
Freight, mail and express—expenses.....	138,644.45	190,885.29	52,240.84
American Railway Traffic Company—expenses.....	155,702.39	363,524.62	207,822.23
Total operating expenses.....	\$11,394,654.66	\$11,939,578.59	\$544,923.93
Net earnings from operation.....	\$8,299,807.45	\$7,930,987.96	\$368,819.49
Income from other sources:			
Rent of land and buildings..	74,948.65	63,836.85	11,111.80
Rent of tracks and structure.	104,997.11	101,419.29	3,577.82
Miscellaneous.....	425,871.45	512,567.80	86,696.35
Total income.....	\$8,905,624.66	\$8,608,811.90	\$296,812.76
Deductions:			
Taxes.....	1,337,620.14	930,007.47	407,612.67
Interest and rentals (net)....	5,631,395.45	5,604,931.15	26,464.30
Total deductions.....	\$6,969,015.59	\$6,534,938.62	\$434,076.97
Net income.....	\$1,936,609.07	\$2,073,873.28	\$137,264.21
Special appropriations.....	65,429.82	229,781.18	164,351.36
Surplus.....	\$1,871,179.25	\$1,844,092.10	\$27,087.15

Discussing various features of the operations of the company, Mr. Winter says in part:

"The underground terminal at the Manhattan end of the Williamsburgh Bridge was completed by the city and elevated train service across the Williamsburgh Bridge inaugurated Sept. 16, 1908.

"The elevation of surface tracks over Sands Street, Brooklyn, referred to in last year's report, has been completed, and by thus bridging this congested spot surface car operation has been greatly accelerated, not only on the bridge proper, but on all the lines converging at that point. In connection with this improvement, stations were constructed at Sands and High Streets for the transfer of passengers between surface cars and elevated trains for the convenience of local patrons.

"One additional steam turbine unit of 10,000-kw capacity has been installed in the Williamsburgh power station, and the construction of the station in other respects well advanced toward completion. Water from wells driven on the company's property is used for boiler purposes at the central station, and the purchase of water from the city for this plant has been discontinued.

"During the year the cost of power plant operation was reduced by \$56,900, or over 3 per cent, and the cost per kilowatt hour for maintenance and operation from .00862 in 1904 to .00636 in 1909, a decrease of 26 per cent in five years. A greater centralization of power production will come with the completion of the Williamsburgh station, and a further reduction in the cost per kilowatt hour may then be expected.

"An item of service rendered to the city, which from long practice is taken as a matter of course and passes without special recognition, is the free transportation of policemen and firemen. It is the willing practice to issue books of tickets for the use of uniformed members of the police and fire department and to pass uniformed members of those departments without further formality. The value of this concession to the recipients, and to the city, may be judged by the following figures:

"There were issued during the year to police and fire departments 7630 passbooks of 100 fares each, carrying transfer privileges. Counts of several days would indicate that the daily rides of uniformed policemen and firemen average approximately 21,381 rides per day, or 7,804,065 for the year. By applying to passbook tickets the regular rate of fare and to the non-ticket riders the average gross of 3.6 cents received per passenger, it appears that transportation to the current value of \$319,096 has been in this form contributed indirectly to the city during the year.

"The vitality of the transfer evil is worthy of a better cause. Each year it absorbs far more than its proper share of the lean surplus, or unduly increases the deficit from



surface operations. Justice to the paying passenger—if the carrier be left out of consideration—demands that the mistaken theory of 'traffic development,' under which the reasonable and necessary limitations of this insidious feature of the business have been lost sight of, should be corrected. In the last fiscal year 141,326,128 transfers were redeemed—an increase of 110 per cent over 1904 and 9.8 per cent over last year, against an increase of 32 per cent in the gross passenger earnings, 1909 over 1904, and slightly over 1/2 of 1 per cent in the gross passenger earnings of 1909 over 1908.

"Although it is 10 years since the special franchise tax law was first put into effect, there has been no final adjudication by the courts of the general principles and methods which should control the State Board of Tax Commissioners in determining the value of this class of property, and the owners are still in doubt as to the measure of their liability. In the meantime, approximately three billions of assessments have been levied throughout the State, most of which are still in litigation. It is a fair assumption that the new law is actually yielding less revenue than the old method of taxing only the tangible property. There being no method laid down in the special franchise tax law by which the tax commissioners are directed to value such property, and the board persisting in its refusal to divulge the methods of appraisal, the resulting assessments seem to be largely a matter of guesswork, reached by no uniform rule and occasioning great inequalities and injustice. The progress of litigation is necessarily slow owing to the amount and complicated nature of the evidence, and while the procedure may be expedited by the operation of a law passed during the recent session of the Legislature at the suggestion of the Attorney-General and Governor, the ultimate status of the assessments will not be known until the highest court lays down the general principles and methods which should be followed by the State Board of Tax Commissioners. If the Court of Appeals, in a case now pending before it, should make such a general declaration, the atmosphere would probably be clarified and both the taxing officers and the corporations would better understand where their respective duties and liabilities end; but if no such declaration of principle should be enunciated each case must be determined upon its merits and the litigation will be indefinitely prolonged and the confusion intensified.

"The recital of such a condition is enough to condemn any tax law, and the interests of both the State and its creatures, the corporations, imperatively require the modification of the law to the end that its application may be more just and equitable and its operation more direct and certain.

"Out of the \$1,337,620 of taxes charged during the fiscal year all, except \$307,107, or \$1,030,513, are in one sense franchise taxes, being levied either on the right to occupy public streets and places or on the enjoyment of corporate charters. This is equivalent to over 35 per cent of the net income after deducting other taxes and fixed charges—surely a tremendous burden to carry for corporations created to perform a public service. This amount would pay interest at 5 per cent upon upward of \$20,000,000 worth of extensions and improvements.

"Neither do these franchise taxes measure the full extent of such burden, for other official impositions, namely, requirements for paving, free transportation, etc., are in a like category as to principle, although not included under the definition of taxes.

"It is a conservative estimate that, in addition to the taxes of \$1,337,620, the company contributes to the public, annually, a further sum, estimated at not less than \$200,000 per annum, in relieving the city of the expense of maintaining certain portions of pavement in the city streets, shifting tracks for sewers, water mains, etc. This does not take into consideration the item of interest on over \$4,000,000 invested by the company in paving in various streets which the city would have had to pay had tracks not been there.

"The State cannot consistently expect railroad corporations to meet requirements in the transportation of passengers and property, both as to rates and services, and at the same time by the imposition of unreasonable financial burdens cripple their power to discharge their duty.

"The inevitable result of such a policy must be either the withdrawal of private capital from such enterprises or their assumption by the State—and in either case the public must be the chief sufferer.

"A federal corporation tax on net income will apply to the present calendar year and thereafter, and on the basis of the net income of the various companies during the calendar year 1908 will apparently cost the companies of the Brooklyn Rapid Transit System about \$50,000. Inasmuch as your companies get no privileges from the national Government not enjoyed by every citizen and already contribute largely to the support of the federal Government as a consumer of materials (the manufacture of which is pro-

tected by tariff duties), we see no justification for such an additional burden, and it certainly is inequitable to the extent that it is an additional imposition on property already taxed several times and in different ways by the operation of State laws.

The following is taken from a table contained in the report, showing various statistics for the fiscal years ending June 30, 1902-'09, both inclusive:

	1909	1908	1902
Passenger earnings:			
Surface division .....	\$11,645,569	\$11,543,992	\$9,049,229
Elevated division .....	7,413,124	7,386,172	3,272,036
Total passenger earnings.....	\$19,058,693	\$18,930,164	\$12,321,265
Freight, mail and express, etc..	635,769	940,403	189,357
Other earnings .....	605,817	677,824	252,046
Total earnings .....	\$20,300,279	\$20,548,391	\$12,762,668
Operating charges .....	11,460,084	12,169,360	8,268,325
Net income .....	\$8,840,195	\$8,379,031	\$4,494,343
Taxes .....	1,337,620	930,000	742,817
Interest and rentals.....	5,631,396	5,604,931	3,732,633
Total fixed charges.....	\$6,969,016	\$6,534,939	\$4,475,450
Surplus .....	\$1,871,179	\$1,844,092	\$18,893
Passenger earnings .....	19,058,693	18,930,164	12,321,265
Increase over preceding year—per cent .....	0.68	2.64	.....
Passengers carried .....	530,149,597	515,184,967	321,501,524
Increase over preceding year—per cent .....	2.93	0.65	.....
Transfers redeemed .....	141,326,128	128,650,863	67,691,915
Increase over preceding year—per cent .....	0.82	5.57	.....
Revenue mileage .....	74,200,436	73,674,770	52,684,980
Increase over preceding year—per cent .....	0.71	7.91	.....
Earnings per revenue mile.....	25.7 cts.	25.7 cts.	23.4 cts.
Passenger earnings .....	3.60 cts.	3.68 cts.	3.83 cts.
Miscellaneous earnings .....	0.23	0.31	0.14
Total earnings .....	3.83 cts.	3.99 cts.	3.97 cts.
Operating charges .....	2.17 cts.	2.36 cts.	2.57 cts.
Taxes .....	0.25	0.18	0.23
Interest and rentals .....	1.06	1.09	1.16
Total .....	3.48 cts.	3.63 cts.	3.06 cts.
Surplus .....	0.35 cts.	0.36 cts.	0.006 cts.
CHARGES PER CENT OF OPERATING EARNINGS			
Repairs and renewals .....	14.65	14.39	13.81
General operating .....	37.48	39.45	42.85
Damages .....	3.66	4.14	6.88
Legal expense .....	2.07	2.11	1.87
Total operating .....	57.86	60.09	65.41
Taxes .....	6.79	4.68	5.94
Interest and rents (net).....	25.52	24.80	27.82
Special appropriations .....	0.33	1.15	0.68
Surplus .....	9.50	9.28	0.15
Total per cent.....	100.00	100.00	100.00

### Hearing on Valuation of Coney Island & Brooklyn Railroad

A hearing in relation to the fare of the Coney Island & Brooklyn Railroad to Coney Island, at which the valuation of the property was considered, was held by the New York Public Service Commission, First District, on Aug. 25. Commissioner Bassett presided.

The commission made public a statement showing the tangible value of the Coney Island & Brooklyn Railroad as of Feb. 1, 1909. This statement, although relating solely to the physical property, had not taken into account, it appeared, various items of tangible property, the total value of which was large. Commissioner Bassett examined Henry Floy, an engineer connected with the bureau of appraisal of the commission, regarding these items. The statement made public by the commission, showing the tangible value of the property as of Feb. 1, 1909, without allowance for the additions concerning which Mr. Floy testified, is as follows:

Track .....	\$729,852.80
Track special work .....	241,882.30
Paving .....	421,474.73
Overhead trolley construction.....	145,065.63
Overhead feeders .....	110,632.25
Underground conduits and cables.....	336,324.49
Power plants and substations.....	733,393.07
Buildings .....	579,983.80
Rolling stock .....	1,383,461.50
Total .....	\$4,682,970.60
Add incidentals, 5 per cent; organization, 5 per cent; engineering, 5 per cent; total, 15 per cent.....	702,445.59
Miscellaneous stock, fixtures, etc.....	\$5,385,416.10
Real estate—assessed value.....	103,079.77
Real estate—assessed value.....	187,800.00
Grand total .....	\$5,676,895.96

Commissioner Bassett asked Mr. Floy whether there were any elements of physical value that were not contained in the book showing the details of the appraisal. Mr. Floy said that certain items had been discussed between the

appraisal bureau and the owners of the property and that some further light that they had thrown on the matter had raised the question whether some allowance above the total appraisal as reported should not be made.

These matters included a question as to the proper price at which copper should be valued. At present and during the first part of this year copper had been very low in price compared with the average price for the last five years, and it had been proposed to take a five-year average and substitute that for the price applied in the appraisal.

In the same way concrete and piling work, used to complete the land on which the power house is located, had been brought to the attention of the bureau, and the railroad company had asked an allowance, which Mr. Floy thought was \$100,000, for that item, which had not been included. The company had also asked for other allowances.

Under further examination, Mr. Floy said he was testifying that some additional price might properly be allowed to bring the value of copper in the appraisal to the present market price. Similarly, some proper addition could properly be made to bring real estate to the actual value if the assessed values were lower than present values. The report showed the assessed valuations on real estate.

Commissioner Bassett asked whether there were any other items like these. Mr. Floy answered that some real estate and buildings had not been included because they were not used in the operation of the road. For example, the old power house, which was no longer in use, now stood idle, and therefore it had not been included. The question should be considered whether or not some value should not be set on that building and the land on which it stands, and the figure added to the total report for the appraisal. There was a right of way at Coney Island about 25,000 ft. long which might properly be considered, at least, and possibly included.

There was also an old intake to the old power plant which had not been included by the bureau because all of the engines except one were now running non-condensing, and therefore the intake was useless so far as all of the engines except one were concerned. A question existed also as to a certain fill on Coney Island Avenue which might roughly be estimated at about 85,000 cubic yards. No allowances had been made for that, and it seemed to Mr. Floy that the company might give the appraisal bureau some light as to what its expenditures had been or demonstrate that the fill had not been done by the city but by the company, if such was the fact. The same situation existed regarding a change of grade on Coney Island Avenue between Park Circle and Kings Highway. Tracks on the bridges were not included by the bureau because it was understood that the tracks became the property of the city when laid; if paid for by the railway, Mr. Floy thought the expenditure would be a proper capital charge.

Mr. Floy also stated, in response to the questions of Commissioner Bassett, that no value had been allowed to cover franchise rights or the value of a going concern, etc. This aspect of the value of the property was brought before the commission on behalf of the company some months ago by Frank R. Ford, of Ford, Bacon & Davis, who submitted a list of intangible values in the reproduction of street railway property, as described in the *ELECTRIC RAILWAY JOURNAL* of June 19, 1909, page 1122. Mr. Floy added that the 15 per cent added for incidentals, organization and engineering, as indicated in the foregoing table, did not represent any allowance for franchise rights or the value of a going concern.

J. J. Kuhn, representing the Coney Island & Brooklyn Railroad, said that he desired to examine George A. Damon, who was in charge of the appraisal. Mr. Damon has been in Europe; but Commissioner Bassett said that he would return in time to be examined at a later hearing. Mr. Kuhn asked that the hearing be postponed for a month in order that the detail figures might be checked by Ford, Bacon & Davis, engineers for the company. Commissioner Bassett was not willing to allow so long a time, and adjourned the hearing to Sept. 8.

**Brunswick Dock & City Improvement Company, Brunswick, Ga.**—A special meeting of the stockholders of the Brunswick Dock & City Improvement Company has been called for the purpose of changing the name of the company to the Brunswick Terminal & Railway Securities Company and authorizing an increase in the capital stock of the company so as to provide for the acquisition of additional properties. H. H. Barnes, president of the company, in a circular addressed to the stockholders outlining the plans of the company, said in part: "For a number of years, the Mutual Light & Water Company has been supplying light and water in Brunswick, and it has already established a profitable business. Certain of the leading citizens of that

city have lately procured a franchise for the construction and operation therein of an electric street railway, which is now in course of construction and is expected to be open for traffic early in the autumn. Our plans have been perfected to the point of arranging for the acquisition of the entire capital stock of the Mutual Light & Water Company and of all of the stock and bonds of the street railway company. In order to provide for these purchases, and for carrying into effect the other matters concerning which negotiations have not yet been completed, our directors have resolved that it is advisable that an increase in the capital stock of your company from 50,000 to 100,000 shares be authorized. Twenty thousand shares of the new stock are to be issued for all of the stock of the Mutual Light & Water Company, which shall in turn hold all of the stock of the street railway company, and for which, in addition, we are to receive \$150,000 in cash. It has been agreed that not more than \$100,000 shall be expended by those now controlling the street railway in constructing and equipping it, and that all sums advanced for the purpose shall be repaid out of the \$150,000 to be received by us in cash, whereupon all bonds or other securities or obligations issued by the street railway company are to be transferred to your company. This will leave unissued 30,000 shares which the directors desire to utilize for further corporate purposes, as they shall deem best. In order that the company's title may be more suggestive of the business in which it will be engaged if these plans are carried out, it is also proposed to change its name from the Brunswick Dock & City Improvement Company to the Brunswick Terminal & Railway Securities Company."

**Burlington County Railway, Mt. Holly, N. J.**—John S. McMullin, Moorestown, N. J., has applied for a receiver for the Burlington County Railway. It was announced by the company that the interest on the first mortgage bonds of the company would be defaulted on Sept. 1, 1909. The rule to show cause why the receiver should not be appointed is made returnable on Sept. 7, 1909.

**Chicago, Lake Shore & South Bend Railway, South Bend, Ind.**—The officials of the Chicago, Lake Shore & South Bend Railway notified the Indiana Railroad Commission on Aug. 25, 1909, that arrangements had been made to turn over the management of the company to the Warren Bicknell Company, Cleveland, Ohio.

**Farmington Street Railway, Hartford, Conn.**—It is stated that the Farmington Street Railway, Hartford, Conn., will be taken over by the Connecticut Company, New Haven, Conn., which is in turn controlled by the New York, New Haven & Hartford Railroad. The authorized capital stock of the Farmington Street Railway is \$189,000, of which \$157,000 is outstanding. The bonded debt of the company is \$30,000 and the floating debt \$35,905.86.

**Grand Rapids, Holland & Chicago Railway, Holland, Mich.**—Hattie A. Smart, Detroit, Mich., has filed a petition in the Circuit Court in Detroit, asking that a receiver be appointed for the Grand Rapids, Holland & Chicago Railway, and that the consolidation of the Grand Rapids, Holland & Lake Michigan Railway with the Grand Rapids, Holland & Chicago Railway be declared void.

**Illinois Traction System, Champaign, Ill.**—The Illinois Traction System has increased its authorized capital stock from \$13,000,000 to \$16,000,000 by adding to the number of shares already authorized 20,000 shares of common stock and 10,000 shares of preferred stock.

**Long Island Electric Railway, Jamaica, N. Y.**—The Public Service Commission of the First District of New York has approved the application of the Long Island Electric Railway for the reduction of its capital stock from \$2,100,000 to \$600,000. The Long Island Electric Railway was originally organized with an authorized capital of \$600,000. In 1899 the property was consolidated with the New York & North Shore Railway as the New York & North Shore Railway with an authorized capital stock of \$2,100,000. The agreement of consolidation stated that the capital stock of the Long Island Electric Railway was \$600,000 and the New York & North Shore Railway \$1,500,000. In addition, the property of the New York & North Shore Railway was encumbered by mortgage bonds amounting to \$1,261,000. After consolidation default took place in the payment of interest upon these bonds and the mortgage securing the same was foreclosed. After this foreclosure the only property remaining in the ownership of the New York & North Shore Railway was the property which had been acquired by the Long Island Electric Railway prior to consolidation. In 1903 the name of the corporation resulting from the consolidation was changed to the Long Island Electric Railway. The present company has obtained the surrender to it of all of the stock of the original

New York & North Shore Railway amounting to \$1,500,000 par value. The application of the company was for permission to cancel this stock.

**Maryland Electric Railways, Baltimore, Md.**—It is reported that plans are being considered for merging the Baltimore & Annapolis Short Line Railroad, the Maryland & Pennsylvania Railroad, operating a steam road between Baltimore and the Pennsylvania State line, and the Maryland Electric Railways, Baltimore, with the last company as the probable holding company. Alexander Brown, of Alexander Brown & Sons, Baltimore, is said to be interested.

**Metropolitan Street Railway, New York, N. Y.**—Judge Lacombe of the United States Circuit Court has granted an order in the case of the Morton Trust Company against the Metropolitan Street Railway, the New York City Railway Company, and the receivers of both, making Adrian H. Joline and Douglas Robinson, receivers of the Metropolitan Street Railway, parties defendant with the Morton Trust Company to a bill of complaint brought by the Twenty-third Street Railway line. The judge has also denied the application of the Morton Trust Company for the right to sue in the State Supreme Court, and has directed that any action be brought in the Federal Court. The Twenty-third Street Railway has also secured permission to sue the receivers of the Metropolitan Street Railway and William W. Ladd, receiver for the New York City Railway, in the United States Circuit Court, and make them parties defendant with the Mercantile Trust Company to its bill of complaint. The controversies in which the Twenty-third Street Railway became involved refer to an issue of \$250,000 debenture bonds, held by the trust companies, and for other moneys expended for maintenance and operation. The Public Service Commission of the First District of New York has approved an agreement between the receivers of the Metropolitan Street Railway and the Central Crosstown Railroad, providing for the operation of the Eighth Street and Fourteenth Street crosstown lines. Under an agreement made more than a year ago, the receivers of the Metropolitan Street Railway agreed to operate the lines for one year and to pay certain amounts for the privileges. Operating for a year under this agreement, the receivers found the financial obligations too heavy, so a new agreement was made. This released the receivers from the obligation to pay the interest of 5 per cent on the three-year notes of the Central Crosstown Railroad, totaling \$2,500,000; also from the burden of the franchise tax. This makes a total reduction of \$120,000 over the first agreement, or approximate, \$210,000 per year than was paid by the Metropolitan Street Railway before the receivership. The receivers, however, are to pay the interest on the funded debt and the fixed charges and other obligations involved by outstanding leases and other contracts.

**Southwestern Traction Company, London, Ont.**—Formal application was made on Aug. 23 by Messrs. Fraser and Moore, acting for Messrs. Thompson, Tilley and Johnston, of Toronto, who represented the London & Western Trusts Company, trustee for the bondholders of the Southwestern Traction Company, London, Ont., for the sale of the railway company's line, which extends from London to Port Stanley, a distance of 28 miles. The bondholders have secured an order for the sale of the property at London on Oct. 20, 1909.

**Springfield (Mass.) Street Railway.**—The Railroad Commission of Massachusetts has fixed Sept. 8, 1909, as the date for the hearing on the application of the Springfield Street Railway for permission to take over the Western Massachusetts Street Railway.

**Third Avenue Railroad, New York, N. Y.**—A number of stockholders of the Third Avenue Railroad met in New York on Aug. 31, 1909, and organized a permanent committee to investigate the use by the Third Avenue Railroad of \$10,000,000 which Frederick W. Whitridge, receiver of the company, has testified was not expended in the electrification of the road, so far as he could ascertain. An executive committee was chosen consisting of William N. Amory, chairman; Charles G. Goodhue and H. E. Colby. It was stated that it is probable that J. Aspinwall Hodge and Leslie G. Ferguson will be retained as counsel by the committee.

**Toledo Urban & Interurban Railway, Toledo, Ohio.**—The Toledo Urban & Interurban Railway has been sold under foreclosure to the Toledo, Bowling Green & Southern Railway, Findlay, Ohio, for \$40,000. Under the terms of the sale the old bondholders of the Toledo Urban & Interurban Railway will exchange their holdings for bonds in the Toledo, Bowling Green & Southern Railway as soon as the sale is confirmed by the Common Pleas Court, which reconvenes Sept. 20. It is announced that there are no immediate plans for the extension of the Toledo, Bowling Green & Southern Railway from Findlay to Cincinnati, but this project, it is believed, ultimately will be consummated.

## Traffic and Transportation

### Interstate Commission Asked to Enforce Through Rates Between Steam and Electric Roads

On Aug. 13, 1909, the Southern California Sugar Company filed a complaint with the Interstate Commerce Commission against the San Pedro, Los Angeles & Salt Lake Railroad, the Atchison, Topeka & Santa Fe Railway, the Southern Pacific Company and the Pacific Electric Railway for discriminating against it in the matter of freight rates to the Missouri River and other Eastern points.

The Southern California Sugar Company is organized under the laws of California and manufactures and sells sugar from sugar beets. Its factory is at Delhi, on the Pacific Electric Railway, in Orange County, California. The freight shipments of sugar from the factory of the company, so its officers say, will amount to 10,000 tons annually, on which freight charges in excess of \$100,000 will be paid, based on the through rates to other sugar factories, and \$20,000 to \$25,000 additional if the company is required to pay two freights.

The Pacific Electric Railway has a system of side tracks in the yards of the Southern California Sugar Company, and is properly and adequately equipped to transport freight between the company's factory and the points where the Pacific Electric Railway connects with the San Pedro, Los Angeles & Salt Lake Railroad, the Atchison, Topeka & Santa Fe Railroad and the Southern Pacific Company; namely, with the San Pedro, Los Angeles & Salt Lake Railroad at Long Beach, Burnett, Clearwater, Fruitland, Los Angeles and other points; with the Atchison, Topeka & Santa Fe Railroad at Slauson Junction, Los Angeles, Los Nietos and other points, and with the Southern Pacific Railroad at Los Angeles and other points. The Pacific Electric Railway has been ready and willing to make through joint freight rates from Delhi Station with each and all of the railroads, to points outside of California, but it is alleged that the steam railroads have refused to make any joint rates, although often requested to do so, and particularly for sugar manufactured by the Southern California Sugar Company. This the Southern California Sugar Company alleges is a discrimination against it in favor of other sugar factories in California, of which there are nine in operation. In its complaint the Southern California Sugar Company says, in part:

"The complainant has no other railroad connection at its factory than the Pacific Electric Railway, and cannot load upon any of the railroads against which complaint is made. It is therefore compelled to pay two railroad rates for the shipment of its sugar to jobbing points of the Missouri River and the East, to wit: the rate charged other sugar factories by the said roads and the local rate charged by the Pacific Electric Railway, whereas its competitors are required to pay only one through rate as made and published by the Transcontinental Freight Bureau. The Pacific Electric Railway has nearly 600 miles of standard-gage track, and is fully equipped to handle, and does handle and transport, freight, express, telegraph and United States mail service. The Pacific Electric Railway has recently continued its line from Delhi, at which point the factory of the complainant is built, to Huntington Beach, and the said extension is over and through the territory from which the Southern California Sugar Company obtains its raw product. No other railroad is built in that territory, and it is impossible to ship raw product to the company's factory over any other line than that of the Pacific Electric Railway. The opportunity has been extended to each and all of the roads against which complaint is made to construct spurs and tracks in and upon the grounds of complainant. All of the roads against which complaint is made are members of the Transcontinental Freight Traffic Association; the Southern Pacific Railroad and Atchison, Topeka & Santa Fe Railroads make through joint rates with other electric railroads in California in the territory covered by the Pacific Electric Railway."

The Southern California Sugar Company asks that an order be entered by the Interstate Commerce Commission requiring the railroads against which discrimination is alleged to make and publish through joint rates in conjunction with the Pacific Electric Railway from its factory at Delhi to all points outside of California, along its and connecting lines, equal with the rates made from other sugar factories in California. The complaint concludes:

"Whereas, the Southern California Sugar Company will begin operations and be prepared to ship sugar on July 25, 1909, and as it has frequently requested the said steam roads to make a joint through rate on sugar long prior to the date of publication of the present East-Bound Tariff No. 3-G, to wit: April 14, 1909, and

"Whereas, the said roads refused to make such joint through rate at that time and at all times since Jan. 1, 1909, and now advise the complainant that the matter will be taken under consideration at the meeting of the Transcontinental Railway Association, which meets at Atlantic City in September, 1909, and

"Whereas, the complainant has no assurance that favorable consideration will be given its requests,

"It is therefore requested that an order be made requiring the said steam roads to accept the through interstate business of the Southern California Sugar Company from the Pacific Electric Railway, upon through joint rates, the same as are made by said steam roads on sugar shipments from all other sugar producing points in California, and that said order be made immediately effective in order that the complainant may not be required to pay additional and exorbitant freight."

#### Circular on Courtesy

H. A. Nicholl, general manager of the Indiana Union Traction Company, Anderson, Ind., recently addressed a circular to the employees of the company on the subject of courtesy, in which he embodied the gist of a communication addressed some time ago by the Delaware, Lackawanna & Western Railroad to its employees. This letter has since its original publication been used by several companies as a text in addressing their men, as instanced in the case of the communication of the Hartford & Springfield Street Railway to its employees, which was reprinted as modified by that company on page 194 of the *ELECTRIC RAILWAY JOURNAL* of July 31, 1909. Mr. Nicholl in his introduction, said:

"A railway company is known by the manner in which its business is conducted, and by the service it renders the public. By service we mean the treatment the public receives at the hands of the company's employees; the speed, safety and reliability of the train operation; the character of the cars operated; the condition of the track, and the other appointments of the company. If its employees are kind and courteous, if its cars are clean and comfortable, if its track is smooth, and its other appointments are good, then the railway is favorably known. On the other hand, if the conduct of its employees is indifferent or discourteous, no matter how fast, safe and reliable its train operation, how clean and comfortable its cars, how smooth its track, or how perfect its other appointments, the railway is certain to be unfavorably known.

"When a railway is favorably known it is certain to have friends, but when it is unfavorably known it is sure to have enemies. If a railway has the friendship of the general public, it is altogether likely to be successful, and therefore it might be said that the success of a railway—and the success of its employees depends on that of the railway—may be measured by the good will of its patrons and by its standing in the community which it serves.

"This company has always endeavored to give the people in its territory the best practicable service, and it believes that it enjoys the good will of the people it serves. Wishing that the favorable consideration of the public may continue, we desire to impress upon you the necessity of treating all our patrons courteously at all times, and that you each perform the duties devolving upon you to the best of your ability.

"That you may more fully appreciate the benefit derived from the practice of uniform courtesy to all, your attention is invited to the circular recently issued to its employees by one of the large and successful Eastern steam railway companies."

#### Increase in Wages in Milwaukee

At the annual outing of the employees of the Milwaukee Electric Railway & Light Company, Milwaukee, Wis., on Aug. 25, 1909, John I. Beggs, president and general manager of the company, announced that, commencing on Sept. 1, 1909, the pay of all motormen and conductors in the service of the company would be increased to the following rates, platform time: 20 cents per hour, first year's continuous service; 21 cents per hour, second year's continuous service; 22 cents per hour, third year's continuous service; 23 cents per hour, fourth year's continuous service; 24 cents per hour, fifth year's continuous service; 25 cents per hour after five years' continuous service with the company.

Prior to June 1, 1900, the wages of motormen and conductors in the service of the company were 15 cents to 19 cents per hour, the maximum being attained the fourth year. On June 1, 1900, the pay was advanced to 17 cents to 20 cents per hour, the maximum being attained the fifth year. On June 1, 1902, a further advance was made to 18

cents to 21 cents per hour, the maximum being attained the fourth year. On Jan. 1, 1903, wages were again advanced to 19 cents to 22 cents per hour, the maximum being attained the fourth year. On Jan. 1, 1904, the rate of wages was changed to 18 cents to 22 cents per hour, the maximum being attained the fifth year. This change affected only new men entering the service. On Jan. 1, 1906, the pay of all men in the service of the company for 10 years or more was advanced to 23 cents per hour, and on May 1, 1906, the wages of trainmen were made as follows: 19 cents per hour, first year; 20 cents per hour, second year; 21 cents per hour, third year; 22 cents per hour, fourth and fifth years; 23 cents per hour, sixth, seventh, eighth, ninth and tenth years; 24 cents per hour after 10 years' continuous service.

These rates were continued in force until Sept. 1, 1909, when the new schedule went into effect. The new rate of pay is an increase of practically 33 1/3 per cent over the wages in force prior to June 1, 1900.

#### Fenders Discussed at San Francisco

The Public Utilities Committee of the Board of Supervisors of San Francisco requested the United Railroads of San Francisco recently to equip one of its lines running down Market Street to the Ferry and around the loop with projecting fenders of the basket type.

Owing to the congestion at the ferry, Charles N. Black, vice-president and general manager of the company, stated at the meeting of the committee that in his opinion this type of fender would cause more accidents than it would prevent, owing to the long over-hang when rounding the curves at the ferry loop and that the company would be unwilling to assume the risk without a specific order from the board. Besides the curve at the ferry loop there are many other curves on the system where the same objection would hold. The severe grades in San Francisco also require any type of projecting fender to be carried so high from the rail as to practically make useless the best features of this type of fender.

#### Successful Excursions at Portsmouth, N. H.

Copies of a circular issued by the Portsmouth (N. H.) Electric Railway to stimulate business between Portsmouth and Hampton Beach, N. H., have been received from F. P. Fosgate, assistant superintendent. Excursions are run each Wednesday evening for a fare of 30 cents for the round trip.

The circular says in part: "No crowding. No jamming. A seat for every patron." Attention is also called to the following conditions: "Everybody must have a ticket. None sold on cars. No money collected by conductors." The distance from Portsmouth to Hampton Beach is 13 1/2 miles. The regular one-way rate is 21 cents and the round trip, 42 cents as compared with the excursion fare of 30 cents for the Wednesday evening occasions. If the weather permits a display of fireworks is made at the beach on the evening of the excursion.

The idea of Mr. Fosgate in issuing the circular in the form indicated was that it would appeal to a class of people who object to riding in a crowded car, and would lead them to acquire the habit of riding on the electric lines. Double-truck open cars are used for the excursions, which have been very popular.

**Lincoln (Neb.) Employees Demand Increase in Wages.**—The employees of Lincoln (Neb.) Traction Company on Aug. 26 made a demand upon the company for an increase of 1 cent an hour in pay and for one day off each week.

**Philadelphia Transit Company to Test Fenders.**—The Philadelphia Rapid Transit Company has ordered to each of the latest type of Parmenter, H. B. and Providence fenders for the purpose of experimenting with them in actual service.

**Application to Justify 10-Cent Fare.**—Application has been filed with the Nebraska State Railway Commission for permission to show why the Nebraska Traction & Power Company should charge 10 cents fare between Omaha and South Omaha.

**Dishonest Conductor Sentenced in New York.**—Richard Kenny, a conductor who entered the employ of the Metropolitan Street Railway, New York, N. Y., on June 3, 1909, and who was detected on Aug. 10 stealing 60 fares out of 177 collected, has been sentenced to two months' imprisonment by the Court of Special Sessions.

**Complaint of Speed of Cars.**—The New York Public Service Commission, Second District, has served upon the Chautauqua Traction Company the complaint of L. M.

Sweet as to alleged running of cars at Gifford Park, Lakewood, at a dangerous speed and failure to give signal of approach. The company was given 10 days in which to answer the complaint.

**Additional Tracks in Traction Terminal, Indianapolis, Ind.**—The Indianapolis Traction & Terminal Company is laying the seventh and eighth tracks north from the train sheds to Ohio Street in order to accommodate the increased number of trains during State Fair week. The ninth, tenth and eleventh tracks will be laid ultimately. The increasing business due to the service to the new Speedway park makes this number of tracks necessary.

**Stage Lines Must Submit Traffic Schedules.**—The Public Service Commission of the First District of New York has adopted an order extending the provision of the order requiring street railways to submit tariff schedules to companies operating stage lines in accordance with the provision of an amendment adopted at the last session of the Legislature, by which stage lines are brought under the jurisdiction of the Public Service Commission under much the same condition as electric railways.

**Aldermen of Lawrence, Mass., Investigate Electric Express Service.**—The Board of Aldermen of Lawrence, Mass., made a visit to Brockton, Taunton and New Bedford on Aug. 12, to study the operation of the electric express service in those cities. The party was accompanied by David Bruce, superintendent of the Lawrence division of the Boston & Northern Street Railway. A representative of the Lawrence *Sun-American* accompanied the party and interviewed various merchants in Brockton and Taunton regarding their satisfactory experience with the electric express service.

**Fare Hearing in Massachusetts.**—The Massachusetts Railroad Commission will give a public hearing on Sept. 8, 1909, upon a petition recently filed with the board by a number of citizens of New Bedford, who ask that the fare between all points within the city limits be fixed at 5 cents. The Old Colony Street Railway operates between the city line and Lund's Corner, in the northern portion of the city, and charges a single 5-cent fare. Between Lund's Corner and the other portions of New Bedford the Union Street Railway handles the traffic, and charges a 5-cent fare as a separate organization.

**Indiana Railroad Commission Ruling.**—The Indiana Railroad Commission has ruled that interurban railways in Indiana cannot under the provision of the Railroad Commission Law of 1907, carry free children gathered from the homes of the poor under the guise of charity. Neither can they carry children and refund the fare paid for their transportation without violating Subdivision 3, Sec. 13 of the Act of 1907, which declares that only children maintained in orphan homes or other charitable institutions may be carried free. The decision resulted from an excursion for poor children conducted by Miss Lydia Stauffer, South Chicago, part of the trip being over the Winona Interurban Railway from Goshen to Warsaw. The amount paid by Miss Stauffer for transporting the children over the Winona Interurban Railway was only \$2.15. She suggested to the company that, as the outing was given in the name of charity, it would be appreciated if the company would refund the \$2.15 expended for fare. The management asked for time to investigate its right to do this and presented the matter to the railroad commission with the afore-mentioned result.

**Crusade Against Rowdiness Continued in New York.**—Police Commissioner Baker, of New York, announced on Aug. 28 that he would double the force of men previously assigned by him to suppress the rowdies who have been terrorizing passengers on subway and elevated cars in New York on Sunday recently, and as a result of the efforts of the commissioner and the uniformed police of the Interborough Rapid Transit Company there were few reports of disorderly conduct and only a few arrests were made. Several of the prisoners were sent to the workhouse and a few were fined. In speaking about his appointment of additional men to service on the transit lines, Commissioner Baker said: "This Sunday rowdiness in the subway and on elevated and street car lines must be stopped, and to this end double the force of plain clothes men that were on this special duty on Aug. 22 will be sent out on Aug. 29. Four hundred able-bodied policemen, dressed as citizens, will keep watch all day and during the evening, and when the slightest sign of this kind of disorder arises arrests will be made. These specially assigned members of the force go out with instructions to nail any outbreak at the start, and I look for a goodly clean-up before sundown. On Aug. 22 we made 200 arrests for these disturbances, and few of these rascals escaped the net. This time 400 men will watch for them, and let them look out for themselves."

## Personal Mention

**Mr. William R. Willcox**, chairman of the Public Service Commission of the First District of New York, has returned from Europe, where he spent a month touring France, Germany and Switzerland.

**Mr. George H. Brauer** has resigned as treasurer of the Oklahoma Railway, Oklahoma City, Okla., and Mr. H. M. Brauer, formerly secretary and auditor of the company, has been elected treasurer, and Mr. J. J. Johnson, formerly assistant secretary, has been elected secretary of the company.

**Mr. John A. Cleveland**, superintendent of new business for the Saginaw Valley Traction Company, Saginaw, Mich., has been appointed general manager of the company, succeeding Mr. John A. Cunningham, who recently resigned to take charge of personal interests in Kentucky. Mr. Cleveland will take up his new duties on Sept. 1.

**Mr. J. E. Woodbridge**, formerly editor of the *Electrical World*, is leaving the railway engineering department of the General Electric Company to become connected with the firm of Ford, Bacon & Davis. Mr. Woodbridge will take local charge for this firm of work in and near San Francisco in connection with the completion of the Stanislaus power development and the supply of power to the United Railroads of San Francisco.

**Mr. Arthur C. Moore** has been appointed auditor of the Oklahoma Railway, Oklahoma City, Okla. Mr. Moore has been connected with the accounting department of the Indiana Union Traction Company, Anderson, Ind., for some time, and for the last three or four years he has served as assistant to the auditor of that company. Mr. Moore succeeds Mr. H. M. Brauer, who was recently elected treasurer of the Oklahoma Railway.

**Mr. Harold Ulmer Wallace** has resigned as general manager of the Chicago, Lake Shore & South Bend Railway, Michigan City, Ind., and will be succeeded by Mr. C. N. Wilcoxon, as noted elsewhere in this column. Mr. Wallace will retire from the Chicago, Lake Shore & South Bend Railway on Oct. 1, 1909. He expects to rest for about a month before taking up new work.

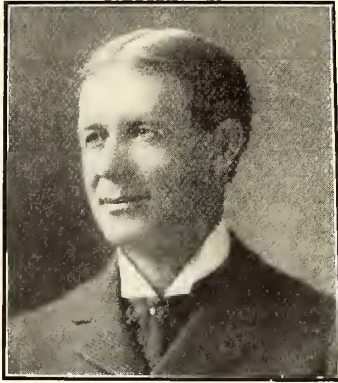
**Mr. Bion J. Arnold**, Mr. W. C. Rosecrans, who is associated with Mr. Arnold, and Mr. T. G. Seixas, formerly general manager and purchasing agent of the Pacific Traction Company, Tacoma, Wash., recently visited the Cascade Tunnel of the Great Northern Railroad, through which are operated three-phase locomotives. Before leaving the Northwest Mr. Arnold and Mr. Seixas expect to make the peak of Mount Tacoma, and possibly to go into Alaska a short distance.

**Mr. H. W. Hudgen** has been appointed claim agent of the Oklahoma Railway, Oklahoma City, Okla., to succeed Mr. M. L. Spitzer, resigned. Mr. Spitzer has been devoting only part of his time to the work of the claim department of the company, and his private practice has increased so rapidly as to require his whole attention. Mr. Hudgen has had an extensive experience in claim department work with steam roads. Since 1903 he has been claim agent for the St. Louis & San Francisco Railroad at Fort Worth, Tex.; Lawton, Okla., and Monett, Mo.

**Mr. E. J. Dickson**, general manager of the Uxbridge & Blackstone Street Railway, Milford, Attleboro & Woonsocket Street Railway, Interstate Consolidated Street Railway and the Attleboro Branch Railroad, Attleboro, Mass., has been appointed general manager of the Springfield (Mass.) Street Railway, Western Massachusetts Street Railway and the Central Massachusetts Electric Company to succeed Mr. H. C. Page, whose appointment as general manager of the Worcester (Mass.) Consolidated Street Railway and affiliated companies is noted elsewhere in this column. Mr. Dickson was born at Joliet, Ill., in 1872. After obtaining his education he entered the employ of the Chicago, Burlington & Quincy Railroad and was employed at Galesburg and Quincy, Ill., in the mechanical, transportation and freight departments as clerk, chief clerk and stenographer. After 14 years' service with this company Mr. Dickson, in 1901, entered the employ of the Northern Pacific Railroad, with headquarters at St. Paul, as chief clerk to the superintendent of motive power. Subsequently he was appointed to a similar position on the Lehigh Valley Railroad at Bethlehem, Pa. In 1907 Mr. Dickson entered electric railway work under Mr. L. S. Storrs, vice-president of the New England Investment & Security Company, and in September, 1907, he was made vice-president and general manager of the Milford, Attleboro & Woonsocket Street Railway and the Uxbridge & Blackstone Street Railway, with headquarters at Franklin. On Feb. 1, 1908, he was appointed general manager of the Interstate Consolidated

Street Railway and the Attleboro Branch Railroad and transferred his headquarters to Attleboro.

**Mr. C. N. Wilcoxon** has resigned as general manager of the Cleveland, Southwestern & Columbus Railway Company, Cleveland, Ohio, to accept a similar position with the Chicago, Lake Shore & South Bend Railway, Michigan City, Ind. He will succeed Mr. H. U. Wallace, resigned. Mr. Wilcoxon was born at Muncie, Ind. The early part of his business career was spent in the construction and management of gas and water works systems. In 1893 he accepted a position as general manager of the local street car lines at Muncie, Ind., where he remained until 1898, when he went to Decatur, Ill., as general manager of the Decatur Traction Company. During his association with this property the system was rebuilt and put on a substantial paying basis. In 1901 Mr. Wilcoxon became general superintendent in charge of the operating department of the Western Ohio Railway, Lima, Ohio, where he remained until 1905, when he went with the Cleveland, Southwestern & Columbus Railway. During the time he has been associated with the latter company it has constructed about 75 miles of new track and has rebuilt and practically re-equipped the older part of the lines owned by the system.



C. N. Wilcoxon

**Mr. Henry C. Page**, vice-president and general manager of the Springfield (Mass.) Street Railway, has been appointed general manager of the Worcester (Mass.) Consolidated Street Railway to succeed Mr. E. G. Connette, who has become chief of the transportation department of the Public Service Commission of the First District, New York. Mr. Page has also been appointed general manager of the Uxbridge & Blackstone Street Railway, Milford, Attleboro & Woonsocket Street Railway, Interstate Consolidated Street Railway and the Attleboro Branch Railroad, to succeed Mr. E. J. Dickson, who has been appointed to succeed Mr. Page with the Springfield Street Railway. In addition, Mr. Page has been appointed general manager of the Worcester & Southbridge Street Railway, Worcester & Blackstone Valley Street Railway, Worcester & Holden Street Railway, Marlboro & Westboro Street Railway and the Quinsigamond Park Company, to succeed Mr. Connette. Mr. Page was born in Brownville, Me., on June 19, 1864, and spent his early life upon his father's farm. At the age of 17 he went to work in Somersworth, N. H., as a clerk in a store. In 1883 he secured a position as a conductor with the Lynn & Boston Railroad, and worked on the horse cars between Chelsea and Boston for three years. He was then appointed assistant superintendent in charge of the operation of all cars running from Chelsea to Boston. In 1890 he was appointed superintendent of the Newburyport (Mass.) Street Railway, which at that time operated a horse car line between Newburyport and Amesbury. During the term of Mr. Page's service with this company the road was equipped with electricity. When the Naumkeag Street Railway was consolidated with the Lynn & Boston Street Railway Mr. Page re-entered the service of the Lynn & Boston Street Railway as division superintendent at Salem and continued in this position from October, 1892, to July, 1900. He was then appointed general superintendent of the entire Boston & Northern Street Railway, a system comprising 450 miles of track. He left that company in April, 1903, to become general manager of the Berkshire Street Railway, Pittsfield. On June 13, 1905, Mr. Page became general manager of the Springfield Street Railway, and on Nov. 8, 1907, he was elected vice-president of the Springfield Street Railway. Mr. Page has always been active in the affairs of the New England Street Railway Club, and in 1907 was president of that body.



H. C. Page

## Construction News

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

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

### RECENT INCORPORATIONS

**\*Quincy, Mount Sterling & Northeastern Traction Company, Quincy, Ill.**—Incorporated to build an electric railway from Quincy to Liberty, Mount Sterling and Rushville. Capital stock, \$5000. Principal office, Quincy, Ill. Incorporators: Henry A. Gardner, Henry L. Stern, Henry A. Gardner, Jr.; Abel Davis, William F. Anderson, Julius H. Masser, Herbert J. Friedman, M. M. Hart, G. H. Bent, F. P. Lasier and Charles T. Farson.

**\*South Bend & Logansport Traction Company, South Bend, Ind.**—Incorporated to construct an electric railway from South Bend to Logansport, via Plymouth and Rochester, a distance of 69½ miles. Capital stock, \$400,000. Incorporators: Thomas P. Moredock, Virginius Nicar and P. J. Haulihan, South Bend; Henry F. Coleman, Logansport, and David Pepper, Jr., Philadelphia.

**\*Kansas City, Harlem & St. Joseph Railroad, Kansas City, Mo.**—Incorporated to build an electric railway from Kansas City across the Missouri River through Clay County to Dearborn in Platte County and thence to St. Joseph, connecting with Union Terminal Railway and also to build a branch line from that point to Tiffany Springs in Platte County. The total length of the main and branch line is to be 53 miles. Capital stock, \$530,000. Headquarters, Ridge Building, Kansas City. Officers: Edward J. Ward, Chicago, Ill., president and chief engineer; Daniel O. Ketchum, Kansas City, vice-president; Ralph B. Throop, Chicago, Ill., secretary-treasurer. Directors: Edward J. Ward, Ralph B. Throop, D. O. Ketchum, William H. Dickinson and A. A. Dunham.

**\*Hampstead & Haverhill Electric Railroad, Manchester, N. H.**—Incorporated under the laws of New Hampshire and Massachusetts to build an electric railway from Manchester to Derry, via Hampstead, and connecting with the electric railways of Massachusetts, making a direct connection from Manchester, N. H., to Haverhill, Mass. Incorporators: Arthur M. Emerson, Hampstead, president; Albert A. McReel, Exeter, secretary and treasurer. Directors: Roswell Annis, Manchester; Henry T. Rosewell, Derry, and George A. Sawyer, Atkinson.

**Clarion & East Brady Electric Railway, Clarion, Pa.**—Incorporated to build an electric railway from Clarion to East Brady, via Sligo and Rimersburg, a distance of 25 miles. Cars will be operated for both freight and passenger business. Incorporators: G. E. Arnold, R. M. Werner, T. S. Arnold, I. N. Langham and E. W. Witherell. [E. R. J., July 17, '09.]

### FRANCHISES

**Long Beach, Cal.**—The Board of County Supervisors has granted to the Pacific Electric Railway, Los Angeles, a 40-year franchise for an electric railway on East Seventh Street, Long Beach.

**Mayfield, Cal.**—The Board of Trustees has granted to the Peninsular Railway, San Jose, a franchise for an electric railway in Mayfield. The Peninsular Railroad was the only bidder and paid \$50 for the franchise.

**San Diego, Cal.**—The San Diego, El Cajon & Escondido Railroad has petitioned the Common Council and the Board of Park Commissioners for an electric railway franchise to enter San Diego. [E. R. J., May 1, '09.]

**\*Aurora, Ind.**—The City Council has granted to the Engineering & Equipment Company, Aurora, a franchise to build an electric railway, for the use of both passenger and freight transportation, to connect Aurora and Rising Sun.

**Newcastle, Ind.**—The Newcastle Union Railway, which has a franchise for a street railway system in Newcastle, has applied to the City Council for an extension of two years' time in which to commence work and complete the system. [E. R. J., Feb. 6, '09.]

**Boone, Ia.**—At a special election recently held in Boone, the Iowa Light & Traction Company was voted a 25-year street railway, lighting and heating franchise.

**Oswego, N. Y.**—The Town Board has granted to the Syracuse, Lake Shore & Northern Railroad, Syracuse, N. Y., a franchise to extend its electric railway through Oswego. The extension will start from Fulton, through Oswego to Syracuse, about 20 miles distant.

**\*Hendersonville, N. C.**—The City Council has granted a franchise to H. S. Anderson to build an electric railway over certain streets of Hendersonville.

**Chattanooga, Tenn.**—Bowdre Brown has requested the withdrawal from the City Council of the ordinance granting him a franchise to operate lines over certain streets of Chattanooga. [E. R. J., July 31, '09.]

\***Columbia, Tenn.**—Col. Allen Brown, representing local capitalists, and Judge W. B. Turner, representing foreign and local capitalists, have each applied for a franchise to build a street railway in Columbia.

\***Stamford, Tex.**—The City Council has granted to B. E. Sparks and associates a 50-year franchise for an electric railway in Stamford. [E. R. J., May 1, '09.]

**Wheeling, W. Va.**—The City & Elm Grove Railroad has been granted a franchise by the County Commissioners to extend its electric railway around Wheeling Park and Park View.

#### TRACK AND ROADWAY

**Montgomery (Ala.) Traction Company.**—This company advises that it is making a number of improvements to its street railway. It is now at work relaying its tracks with heavier rails.

\***Eureka, Cal.**—It is stated that prominent capitalists of Humboldt County, headed by William S. Clark, president of the Humboldt Gas & Electric Company, and E. E. Skinner, have taken preliminary steps for the organization of a company that will undertake to build an electric railway between Eureka and Redding. The route of the proposed railway is over 100 miles long.

**San Francisco, Vallejo & Napa Valley Railroad, Napa, Cal.**—It is stated that this company will immediately construct a 7-mile extension of its electric railway, which already extends from Vallejo to St. Helena, to Calistoga. The company also expects to build another extension into Lake County with termini at Lakeport and Clear Lake. Two preliminary surveys have been made for this extension. One is by a tunnel through Mt. St. Helena and the other is to branch off from the present line at Rutherford, a small station north of Napa, and to extend through the series of valleys into the mountains of Lake County.

**San Diego, El Cajon & Escondido Railway, San Diego, Cal.**—G. W. Pursell, general manager, advises that this company has been only organized to make preliminary arrangements for the building of an electric railway to connect San Diego, La Mesa, El Cajon, Bostonia, Lakeside, Morton, San Pasqual, Bernardo and Escondido, a distance of nearly 65 miles. It is the intention to form a permanent organization about Sept. 1. Surveys have been completed, and it is probable that construction will be under way about Oct. 1. The proposed railway will be operated by an independent company and not as part of any other system. Arrangements for the power supply have not yet been considered. Officers: G. A. Davidson, Jr., San Diego, secretary and treasurer; G. W. Pursell, San Diego, general manager and purchasing agent; Charles Harlowe, Jr., Oakland, chief engineer. [E. R. J., May 1, '09.]

**Connecticut Company, Willimantic, Conn.**—This company, on Aug. 26 formally opened its new line between Willimantic and South Coventry, a distance of 6 miles.

**Athens (Ga.) Electric Railway.**—This company has recently purchased from the Lorain Steel Company about 300 tons of 70-lb. rails, to replace the 60-lb. and 40-lb. rails now in use.

**Atlanta, Griffin & Macon Electric Railway, Atlanta, Ga.**—As a result of the passage of the Boyd bill by the Senate, it is said that a consolidation will soon be effected by the interests of the Macon Railway & Light Company, Macon; the Central Georgia Power Company, Atlanta; Atlanta, Griffin & Macon Electric Railway, and the Macon, Americus & Albany Electric Railway, the two last named companies holding charters for interurban railways, to connect the cities mentioned in their titles. It is stated that the Central Georgia Power Company will furnish the power for the proposed lines. It is completing the construction of a dam and power plant on the Ocmulgee River which will have a capacity of 21,000 hp.

\***Elk City, Idaho.**—It is stated that George Carter, Jackson, Mich., is considering plans to build an electric railway, 30 miles in length, from Elk City to the Clearwater River.

\***Aurora, Ind.**—The Engineering & Equipment Company, Aurora, Ind., advises that it will soon be in the market for rails, cross ties, oil engines, generators and other railway equipment to be used in the construction of the company's proposed electric railway which is to connect Aurora and Rising Sun. All except three miles of the survey has been completed and rights of way are being secured. The company has just been granted a franchise to build its line in Aurora. Both passengers and freight will be carried.

**Cincinnati, Madison & Western Traction Company, Indianapolis, Ind.**—Subsidy elections in aid of the construc-

tion of the Cincinnati, Madison & Western Traction Company's line will be held Sept. 28 in Madison, Hanover and Republican Townships. The aggregate amount asked is \$67,000, which, added to the amount previously voted, will total \$110,000. The proposed railway will connect Madison and Scottsburg. [E. R. J., Aug. 28, '09.]

**Des Moines (Ia.) City Railway.**—It is stated that this company will shortly begin the construction of 10 miles of new track.

**Baltimore & Eastern Shore Railway, Baltimore, Md.**—This company has made a formal request of the United States board of engineers for rivers and harbors for a preliminary survey of Chesapeake Bay for the purpose of establishing a channel for a ferry between Bay Shore Park and some point opposite on the eastern shore. This ferry will be used in connection with the proposed electric railway between Baltimore and Cambridge. [E. R. J., Aug. 28, '09.]

**Detroit, Lansing & Grand Rapids Railway, Detroit, Mich.**—Sealed bids will be received by the chief engineer of the Detroit, Lansing & Grand Rapids Railway until Sept. 15 for all necessary surveys and plans for an electric railway about 62 miles in length from Farmington to Lansing. Headquarters, 706 Union Trust Building, Detroit. F. A. Bean, chief engineer. [E. R. J., Aug. 7, '09.]

**Missoula (Mont.) Street Railway.**—It is announced that this company is about to award a contract for the construction of 2½ miles of grade for the interurban railway from East Missoula to the entrance of Cedar Street. The grade is to be constructed to connect with the grade recently vacated by the Northern Pacific Railroad between Missoula and Bonner and will be carried to the east banks of the Rattlesnake Creek. [E. R. J., July 24, '09.]

**Nebraska Traction & Power Company, Ralston, Neb.**—This company announces that it expects to place contracts during the next six weeks for the construction of 5 miles of new track.

**Morris County Traction Company, Morristown, N. J.**—It is announced that this company proposes to extend its railway at Denville 3 miles to Boonton. Construction will start at once, according to David Gring, president of the company.

**New York, Westchester & Boston Railway, New York, N. Y.**—This company has placed contracts for approximately 25,000 tons of steel for bridges, viaducts and subways, to the American Bridge Company, of New York. It has also placed contracts for grading and masonry work between 174th Street and the northern boundary of New York City to the O'Brien Construction Company, Waterbury, Conn., and for grading and masonry work in Mt. Vernon, N. Y., to Lathrop & Shea, New Haven, Conn. Office, 65 Beaver Street, New York, N. Y.

**Rockland Railroad, Suffern, N. Y.**—The Public Service Commission of the Second District has received an application from the Rockland Railroad, which proposes to build an electric railway to connect Tappan, Suffern, Stony Point and Nyack, for permission to issue bonds in the amount of \$2,767,000 and for increase of its capital stock from \$100,000 to \$630,000, and permission to issue stock up to the total of its capital as so increased. The proposed railway is to have a total mileage of 49.62 miles, of which 41.12 are within New York and the balance within New Jersey. [E. R. J., July 10, '09.]

**Zanesville & Meigs Valley Traction Company, Zanesville, Ohio.**—At the annual meeting of this company, recently held in Zanesville, the following officers and directors were elected: C. T. Gale, Chandlerville, president; Frank P. Ames, Rockland, vice-president; W. G. Lawhead, Zanesville, secretary; F. M. Cruise, Zanesville, treasurer; H. D. Blodgett, general manager; T. W. Jackson, W. W. Patterson, A. H. Needham. The company proposes to build an electric railway from Zanesville to Beverly, via McConnellsville. [E. R. J., July 10, '09.]

**Northampton Traction Company, Easton, Pa.**—This company is building about 1500 ft. of new track and also a concrete and steel bridge 272 ft. long.

**Sunbury & Northumberland Electric Railway, Sunbury, Pa.**—The board of directors of this company have voted \$1,000,000 bonds for construction and equipment purposes. The company will extend its electric railway from Northumberland to Lewisburg in the near future.

**Coal Creek Railway & Light Company, Coal Creek, Tenn.**—J. P. Stanton writes that this company was incorporated on Aug. 4 for the purpose of building an electric railway from Coal Creek to Briceville, a distance of about 6 miles. It will also reach the fair grounds. It has not yet been decided when construction will be started. It is the inten-

tion of the company to generate its own power. James Day, chief engineer. [E. R. J., Aug. 14, '09.]

**\*Tacoma, Wash.**—It is reported that R. Green, San Francisco, Cal., is planning to organize a company to construct a scenic railway to the summit of Mount Ranier, where it is proposed to erect a hotel. It is the intention to secure power for the operation of the line from a power station to be operated by water-power from one of the water-falls.

**Washington Traction Company, Walla Walla, Wash.**—At a meeting of the stockholders of the Washington Traction Company on Aug. 21, it was decided to increase the capital stock from \$3,500,000 to \$5,000,000. The company contemplates building a railway from Dayton to Wallula, via Walla Walla. It is stated that the proposition has been financed and that work will be begun not later than Oct. 1. Officers: Gilbert Hunt, president; W. H. Richardson, Dayton, vice-president; B. C. Holt, secretary, and J. C. Armstrong, general manager. [E. R. J., May 22, '09.]

**\*Wenatchee, Wash.**—It is stated that the Commercial Club of Wenatchee has taken up the proposition of building an electric railway between Wenatchee and Waterville, a distance of about 20 miles. A committee, consisting of George H. Ellis, Jr., E. M. Tupper and W. R. Prowell, has been appointed to look into the feasibility of the project.

**Sabraton Railway, Morgantown, W. Va.**—This company expects to place, during the next 10 weeks, contracts for the construction of a 1-mile extension to Rock Forge.

**Southern Wisconsin Railway, Madison, Wis.**—This company expects to build during this season over 1 mile of new track to its railway.

**SHOPS AND BUILDINGS**

**Vincennes (Ind.) Traction Company.**—This company announces that it has about completed the remodeling of its car houses and repair shops.

**Southwestern Interurban Railway, Arkansas City, Kan.**—This company is said to have completed plans for the erection of a new car house near Island Park, Winfield.

**Nebraska Traction & Power Company, Ralston, Neb.**—Contracts will be awarded by this company, during the next six weeks, for the erection of a car house.

**Washington Water Power Company, Spokane, Wash.**—This company has awarded a contract to Peter Hughes for the construction of a two-story brick passenger depot on Wall Street between Front Avenue and Post Street, Spokane. The building will be 80 ft. long and will be set back from the street enough to allow tracks on the ground owned by the company.

**POWER HOUSES AND SUBSTATIONS.**

**Athens (Ga.) Electric Railway.**—This company expects to purchase, during the next two weeks, a 300 kw 60 cycle railway rotary converter.

**East St. Louis & Suburban Railway, East St. Louis, Ill.**—This company has recently purchased a horizontal Curtis turbine and a 2000 kw, three phase 25 cycles, 1500 r.p.m., 13,200-volt generator.

**Cedar Rapids & Iowa City Railway & Light Company, Cedar Rapids, Ia.**—This company is remodeling and enlarging the boiler room of its power plant. It is also being equipped with a 500-hp unit, new coal and ash-handling apparatus and clam grates. A 1500-kw Allis-Chalmers turbine has recently been installed in the plant. In addition the company is extending its district steam and heating mains.

**Nebraska Traction & Power Company, Ralston, Neb.**—This company expects to place contracts during the next six weeks for the erection of a substation.

**New York Central & Hudson River Railroad, New York, N. Y.**—George W. Kittredge, chief engineer, announces that this company expects to place contracts during the next two weeks for the erection of a substation at White Plains.

**Pittsburgh (Pa.) Railways.**—It is stated that this company is asking bids for a one-story brick substation to be built at the south end of the Mount Washington Tunnel. The building will be 70 x 100 ft.

**Tazewell (Va.) Street Railway.**—This company has installed a new engine in its power house and expects to build an extension to its coal wharf, located at the plant.

**Simcoe Electric Railway & Power Company, Midland, Ont.**—It is reported that this company is about to commence work on the power plant at Big Chutes, on the Swern River, 30 miles from Midland. The work is in charge of C. H. and P. H. Mitchell, electrical engineers, Toronto, Ont. The company proposes to build an electric railway to connect Penetanguishene, Midland, Victoria Harbor, Waubaushene and Coldwater. Douglas L. White and James Playfield Midland are interested. [E. R. J., April 3, '09.]

**Manufactures & Supplies**

**ROLLING STOCK**

**Springfield (Mo.) Traction Company** is in the market for six single-truck cars.

**Mexico Tramways Company, City of Mexico,** is building 25 box cars 40 ft. long in its own shops.

**Detroit (Mich.) United Railway** is building a steel under-frame combination switch and work car in its shops.

**Coney Island & Brooklyn Railroad, Brooklyn, N. Y.,** has purchased 175 registers of the No. 15 type from the Sterling-Meaker Company.

**Winona Interurban Railway, Warsaw, Ind.,** expects to buy 18 new cars, two of which will be combination chair and sleeping cars.

**Old Colony Street Railway, Boston, Mass.,** has ordered three express cars from the Laconia Car Company, the trucks for which will be Standard O-60.

**Ware & Brookfield Street Railway, Ware, Mass.,** expects to buy two 20-ft. car bodies, to be mounted on Bemis trucks and to have Westinghouse equipment.

**San Angelo (Tex.) Street Railway** has purchased five 21-ft. closed motor cars mounted on Brill 21-E trucks from the Dorner Railway Equipment Company, Chicago.

**Windsor, Essex & Lake Shore Rapid Railway, Kingsville, Ont.,** is in the market for some new flat and box cars of standard railroad type or good second-hand cars of 40,000 lb. capacity.

**Union Street Railway, New Bedford, Mass.,** has purchased 12 30-ft. closed cars from the J. M. Jones Sons Company, Watervliet, N. Y. Standard O-50 trucks were purchased for these cars.

**Bay City Railway, Green Bay, Wis.,** has purchased one 14-bench, open Narragansett car, mounted on Wason trucks and equipped with two GE-57 motors from Dorner Railway Equipment Company, Chicago.

**Fort Wayne & Wabash Valley Traction Company, Fort Wayne, Ind.,** has purchased 10 gondola cars of 80,000-lb. capacity from the Haskell-Barker Car Company, Michigan City, Ind., for handling stone from the quarries on the company's line.

**Sabraton Railway, Morgantown, W. Va.,** has purchased trucks from the New York Car & Truck Company, Kingston, N. Y.; four motor equipments complete from the Westinghouse Electric & Manufacturing Company and air brake equipments from the Westinghouse Traction Brake Company.

**Maryland Electric Railway, Baltimore, Md.,** mentioned in the ELECTRIC RAILWAY JOURNAL of July 31, 1909, as being in the market for three large cars, has ordered the cars from the Jewett Car Company, Newark, Ohio. American Locomotive Company's trucks and complete Westinghouse equipment were specified.

**Illinois Traction System, Champaign, Ill.,** mentioned in the ELECTRIC RAILWAY JOURNAL of May 22, 1909, as being in the market for 30 cars for service into St. Louis, has ordered this number of cars from The J. G. Brill Company. GE-216 motors, K-35-C controllers, U. S. No. 13 trolley bases and Westinghouse automatic air brakes were also ordered. The cars will be so constructed as to be readily convertible for pay-as-you-enter service.

**Wheeling (W. Va.) Traction Company** has ordered eight semi-convertible cars from G. C. Kuhlman Car Company with semi-steel bodies. The bodies will be 30 ft. long over corner posts, 45 ft. long over bumpers, with an extreme width of 8 ft. 8 3/4 in. The cars will each seat 44. The bulk-head doors will be telescopic and one platform door at each end corners will fold, while the other will be of the sliding type, operated by the motorman. Brill 27 FE-2 trucks, with 5-ft. wheel base. Westinghouse No. 307 quadruple motor equipment was specified, with K-35 controllers. Mention of this contemplated purchase was made in the ELECTRIC RAILWAY JOURNAL of May 19, 1909.

**Ohio Electric Railway, Cincinnati, Ohio,** has drawn up the following specifications for the six combination inter-urban cars mentioned in the ELECTRIC RAILWAY JOURNAL of June 26, 1909, as being built by the Cincinnati Car Company:

Seating capacity.....	58	Curtain material...Pantasote
Bolster centers,		Hand brakes.....Peacock
length .....	38 ft. 6 in.	Heating system,
Length of body..	.60 ft. 2 in.	Peter Smith Hot Water
Width over sills..	8 ft. 8 3/8 in.	Headlight.....General Elec.
Sill to trolley base	9 ft. 6 in.	Arc and Dayton No. 1559
Body .....	Wood	Inc. Dash



Interior trim.....Mahogany  
Underframe .....Composite  
Air brakes,  
    Westinghouse AMM  
Bolsters, body..Built-up steel  
Bumpers.....Steel plate  
Car trimmings..Solid bronze  
Couplers,  
    Janney M.C.B. radial  
Curtain fix....Curtain S. Co.

The details of the six motor express cars are:  
Wheel base..... 6 ft. 10 in.  
Length over all.50 ft.  
Width inside.... 7 ft. 7/4 in.  
Width over all.. 8 ft. 8 in.  
Height—Sill to  
    trolley base... 9 ft. 4 in.  
Height from top of rail  
    to sills.....45 in.  
Body .....Wood  
Underframe .....Composite  
Air brakes,  
    West. Automatic  
Control system.....K-34

The eight freight trail cars have been specified as follows:  
Bolster centers,  
    length .....27 ft. 6 in.  
Length of body....38 ft. 6 in.  
Width over sills.... 8 ft. 8 in.  
Sill to trolley base.....9 ft.  
Height from top of rail  
    to sills.....45 in.  
Body .....Wood  
Interior trim..Pine sheathing

TRADE NOTES

**Grip Nut Company, Chicago, Ill.,** reports that Grip nuts are to be used on 1800 box cars which are being built by the Pullman Company for the Northern Pacific Railroad.

**James E. Daly, Inc., New York, N. Y.,** agent for Empire woolen yarn box packing and dealer in cotton wiping waste, has moved its office from 88 Leonard Street to 10 Union Square.

**Peter Smith Heater Company, Detroit, Mich.,** has received an order from the Louisville (Ky.) Railway for 33 No. 3 type C hot-water heaters to be installed on the cars recently ordered from the St. Louis Car Company.

**Alfred J. Thompson, 71 Broadway, New York, N. Y.,** has formed a selling organization to promote the sale and installation of American machinery in Latin American countries. Resident engineers in each of the principal cities of South and Central America will act as representatives of the organization.

**Walpole Rubber Company, Ltd., Granby, Que.,** has nearly completed its new building, which is 120 ft. x 60 ft., and will have a basement and four stories, three of which are already built. In addition, there is being constructed a paint factory 30 ft. x 40 ft. and a boiler and engine house 20 ft. x 30 ft. This company will manufacture for the Canadian trade a line similar to that of the Massachusetts Chemical Company, of Walpole, Mass., including insulating tapes, Armalac and Insulac compounds and rubber splicings.

**Parmenter Fender & Wheel Guard Company, Boston, Mass.,** since the investigation of the subject of fenders and wheel guards by the Public Service Commission of New York, First District, and the establishment of a high record for the Parmenter apparatus in these tests, has done a large business with the Metropolitan Street Railway, New York. The last order received from the company was for 550 wheel guards, making a total of 1200 Parmenter guards purchased by the Metropolitan Street Railway within the last three months.

**Pacific Car & Foundry Company, San Francisco, Cal.,** has taken over the W. F. Holman Car Manufacturing Company of that city and after enlarging the plant will install a \$400,000 branch factory at Portland. Incorporated for \$1,000,000, the Pacific Car & Foundry Company is represented by M. J. Hynes, who is president, and also president of the National Bank of the Pacific. Other officers are: J. W. Reiss, former manager of the W. L. Holman Company, who will be manager of the new concern; C. M. Greene, treasurer; W. H. Judson, vice-president; B. W. Buxton and G. F. Martin.

**Coleman Fare Box Company, Buffalo, N. Y.,** has recently received orders for its No. 2 fare boxes from the Buffalo & Lackawanna Traction Company, Buffalo, N. Y., and the

Motors.....Four West. 121  
Roofs .....Monitor  
Sash fixtures,  
    Edwards raised  
Seats.....H. & K. 99-EE  
Step treads.....Mason  
Trolley retrievers,  
    Knutson No. 2  
Trucks, type..Taylor M.C.B.

Couplers,  
    Janney M.C.B. radial  
Fenders...Locomotive pilots  
Hand brakes.....Peacock  
Heating system,  
    Caboose stove  
Headlights...G.E. Magnetite  
Motors.....Four West. 121  
Roofs .....Monitor  
Sanders ....Nichols-Lintern  
Trolley retrievers,  
    Two Knutson

Trucks.....Taylor M.C.B.  
Underframe .....Composite  
Air brakes,  
    West. freight car  
Couplers,  
    Janney M.C.B. radial type  
Hand brakes,  
    Tower freight car type  
Trucks.....Standard motor  
    truck, M.C.B., 80,000 cap.

Detroit United Railways, Detroit, Mich., as well as an order from the Schenectady Railway Company for 15 small hand fare boxes. All of the patents of the company have now been allowed. In a recent issue of the Buffalo Commercial, E. M. Bassett, Public Service Commissioner of the First District of New York, who has recently been making an inspection of street railways in Buffalo, Niagara Falls, Toronto and other cities, is quoted as saying that the International Railway Company of Buffalo "is standardizing its cars on a pay-as-you-enter type with the best fare box I have ever seen." An opinion of this kind from a disinterested source is very flattering.

ADVERTISING LITERATURE

**Western Electric Company, New York, N. Y., and Chicago, Ill.,** is distributing a bulletin illustrating and exploiting the Sunbeam tungsten miniature lamp for use on voltages between 1 1/2 and 20. These lamps vary in efficiency from .9 watt per cp to 1.33 watts per cp.

**W. N. Matthews & Brother, St. Louis, Mo.,** have published a catalog of wiring and other electrical specialties which they make and sell, in which are included a number of wiring tables and other useful data and a reprint from the *Electrical World* of an article by Anthony Gorham on "Heavy Wire Terminations."

**Watson-Stillman Company, New York, N. Y.,** has collected in Catalog No. 73 an assortment of sheets from its general printed matter showing all of the types of hydraulic tools made by this company for use on steam and electric railways. Among the new tools illustrated are a hydro-pneumatic wheel press, motor driven rail bender, overhead crane and hydraulic beam shear.

**Trussed Concrete Steel Company, Detroit, Mich.,** has published a third edition of its handbook for architects, engineers and builders, containing tables, formulas, drawings and other useful information on the design of reinforced concrete after the Kahn system. The information given covers the design of columns, floor and roof slabs, bridges, sewers, storage bins and other applications of reinforced concrete.

**The J. G. Brill Company, Philadelphia, Pa.,** in *Brill's Magazine* for August, describes the conditions of street railway operation in New Orleans, La., as affecting the type of cars in use. Among the other articles are a description of semi-steel cars for the Milwaukee Electric Railway & Light Company, an article on composition flooring for cars and short descriptions of recent new cars built at the various plants of the company.

**Peckham Truck Company, Westminster, London, Eng.,** has recently brought out a catalog descriptive of the Peckham system of pendulum and radial gear trucks for electric railway cars. A number of important claims are made for this system of trucks, particularly in regard to the saving of power consumed, the cost of maintenance of trucks, motors, car bodies and track, and easy riding. It represents the long experience of Mr. Peckham in truck design and construction.

**General Electric Company, Schenectady, N. Y.,** has issued the following bulletins: No. 4680, which is entitled, "Sign Lighting with Tungsten Lamps"; No. 4688, which describes a compound meter board; No. 4665, which describes the electrical operation of pulp and paper mills. Booklet No. 3839, recently issued by this company, illustrates and describes fan motors for residences and telephone booths. The company is also distributing two booklets containing data relative to the new G. E. tungsten lamp.

**H. W. Johns-Manville Company, New York, N. Y.,** has issued an illustrated folder descriptive of "J-M Asbestoside." The folder also contains a number of views of buildings in which "asbestoside" has been applied. Two interesting views are also given of an actual fire test of rubber roofings and J-M asbestos roofing and asbestoside. The company is also distributing a leaflet describing Brickline asbestos fire-brick cement, a compound used for setting up bridge walls and inner courses. The folder contains directions for applying Brickline and a price list.

**Wagner Electric Manufacturing Company, St. Louis, Mo.,** in bulletins issued by it recently has adopted a radical departure from the usual argument of such publications. One, on the subject of alternating-current generators, just received, is typical. It contains a great deal of valuable information to any prospective purchaser of alternating-current generators and is written without reference to the particular design of the Wagner Company, reliance being placed in that regard almost entirely upon carefully selected illustrations and the descriptions which accompany them as captions. Other interesting recent Wagner literature relate to generators, central station transformers, polyphase motors and single-phase motors.

TABLE OF MONTHLY EARNINGS

Notice:—These statistics will be carefully revised from month to month, upon information received from the companies direct, or from official sources. The table should be used in connection with our Financial Supplement, "American Street Railway Investments," which contains the annual operating reports to the ends of the various financial years. Similar statistics in regard to roads not reporting are solicited by the editors. \*Including Taxes. †Deficit. ‡Includes Ferry earnings up to April 1.

Company	Period	Gross Income	Operating Expenses	Gross Income Less Operating Expenses	Deductions From Income	Net Income	Company	Period	Gross Income	Operating Expenses	Gross Income Less Operating Expenses	Deductions From Income	Net Income
AKRON, O. Northern Ohio Tr. & Light Co.	1m. July '09	200,392	105,377	95,015	44,052	50,963	MILWAUKEE, WIS. Milwaukee Elec. Ry. & Lt. Co.	1m., July '09	361,915	169,018	192,897	106,013	86,884
	1 " " '08	227,012	115,650	111,361	43,392	67,970		1 " " '08	336,889	160,883	176,005	99,989	76,016
	7 " " '09	1,038,136	623,035	415,101	307,950	107,151		7 " " '09	2,400,421	1,183,578	1,216,842	730,058	486,784
	7 " " '08	1,200,954	669,016	531,938	306,711	225,227		7 " " '08	2,227,308	1,165,648	1,061,660	691,706	369,954
BELLINGHAM, WASH. Whatcom Co. Ry. & Lt. Co.	1m. June '09	30,605	18,039	12,566	8,085	4,481	Milwaukee Lt., Ht. & Trac. Co.	1m., July '09	158,632	37,325	121,307	70,617	50,689
	1 " " '08	26,129	16,862	9,267	7,970	1,297		1 " " '08	145,759	34,237	111,521	64,388	47,133
	12 " " '09	378,032	219,130	158,902	101,920	56,982		7 " " '09	815,563	216,895	598,668	440,913	157,355
	12 " " '08	363,288	204,893	158,395	93,030	65,366		7 " " '08	778,989	210,606	568,383	410,482	157,901
BIRMINGHAM, ALA. Birmingham Ry., Lt. & Power Co.	1m. July '09	183,186	101,974	81,212	.....	.....	MINNEAPOLIS, MINN. Twin City Rapid Transit Co.	1m., June '09	593,101	260,881	332,220	140,251	191,969
	1 " " '08	170,261	99,775	70,486	.....	.....		1 " " '08	553,501	270,019	283,482	128,250	155,232
	7 " " '09	1,276,482	711,880	564,602	.....	.....		6 " " '09	3,250,066	1,622,482	1,627,584	827,758	799,826
	7 " " '08	1,232,307	714,952	517,355	.....	.....		6 " " '08	2,982,849	1,535,590	1,447,259	749,428	697,831
CHAMPAIGN, ILL. Illinois Tr. System.	1m. June '09	341,192	210,765	130,427	3,542	126,885	MONTREAL, CAN. Montreal St. Ry.	1m., July '09	345,574	180,412	165,161	49,884	115,278
	1 " " '08	324,272	188,258	136,013	.....	136,013		1 " " '08	326,524	162,414	164,110	49,345	114,765
	6 " " '09	2,054,218	1,218,122	836,096	19,393	816,703		7 " " '09	3,137,547	1,894,815	1,242,731	359,775	882,957
	6 " " '08	1,913,517	1,138,593	774,924	.....	774,924		7 " " '08	2,999,288	1,814,428	1,184,859	368,909	815,951
CHARLESTON, S. C. Charleston Con. Ry. Gas & Elec. Co.	1m. July '09	71,112	44,188	26,924	13,917	13,007	NORFOLK, VA. Norfolk & Portsmouth Trac. Co.	1m., June '09	164,511	97,269	67,242	.....	.....
	1 " " '08	68,988	41,012	27,976	13,817	14,160		1 " " '08	164,527	98,623	65,904	.....	.....
	5 " " '09	322,934	197,720	125,214	69,583	55,631		6 " " '09	923,527	547,490	376,037	.....	.....
	5 " " '08	323,169	202,759	120,410	69,083	51,327		6 " " '08	875,620	547,535	328,085	.....	.....
CHICAGO, ILL. Aurora, Elgin & Chicago Railroad.	1m. June '09	142,568	71,332	71,236	28,892	42,254	OKLAHOMA, OKLA. Oklahoma City Ry.	1m., July '09	41,468	24,657	16,811	.....	.....
	1 " " '08	125,592	62,698	62,894	27,844	35,050		1 " " '08	26,781	20,899	5,882	.....	.....
	12 " " '09	1,458,998	796,127	662,871	337,776	325,095		7 " " '09	228,194	145,968	82,226	.....	.....
	12 " " '08	1,408,892	788,268	620,624	333,700	286,924		7 " " '08	148,384	105,180	43,204	.....	.....
CLEVELAND, O. Lake Shore El. Ry.	1m., June '09	95,825	48,784	47,041	34,478	12,563	PADUCAH, KY. Paducah Traction & Light Co.	1m., June '09	18,101	10,613	7,488	6,631	856
	1 " " '08	90,662	51,562	39,100	31,268	7,832		1 " " '08	18,496	12,223	6,273	6,848	175
	6 " " '09	474,676	278,375	196,301	206,650	110,349		12 " " '09	222,535	130,560	91,975	82,381	9,594
	6 " " '08	453,034	279,367	173,667	186,568	112,901		12 " " '08	235,940	143,690	92,250	83,312	8,938
DALLAS, TEX. Dallas Electric Corporation.	1m., June '09	103,593	67,711	35,883	28,433	7,050	PENSACOLA, FLA. Pensacola Electric Co.	1m., June '09	20,126	11,292	8,834	4,263	4,571
	1 " " '08	88,501	71,654	16,846	29,431	112,585		1 " " '08	19,020	14,020	5,000	4,315	585
	12 " " '09	1,245,732	786,143	459,589	342,819	116,771		12 " " '09	229,151	136,471	92,681	51,961	40,719
	12 " " '08	1,136,113	760,386	375,727	349,160	26,567		12 " " '08	216,361	152,928	63,433	50,340	13,093
DETROIT, MICH. Detroit United Railway.	1m., June '09	710,656	423,826	286,830	*156,997	129,833	PHILADELPHIA, PA. American Rys. Co.	1m., July '09	290,669	.....	.....	.....	.....
	1 " " '08	640,457	*384,191	256,266	137,179	119,087		1 " " '08	271,613	.....	.....	.....	.....
	6 " " '09	3,710,137	2,251,359	1,458,778	*926,334	532,444		7 " " '09	1,661,702	.....	.....	.....	.....
	6 " " '08	3,313,037	*2,110,307	1,203,730	812,973	390,757		7 " " '08	1,596,481	.....	.....	.....	.....
DULUTH, MINN. Duluth St. Ry.	1m., July '09	91,658	47,146	44,422	18,417	26,005	PLYMOUTH, MASS. Brockton & Plymouth St. Ry. Co.	1m., June '09	12,557	9,755	2,802	1,672	1,130
	1 " " '08	88,501	44,529	43,979	18,417	18,622		1 " " '08	12,152	8,915	3,238	2,264	973
	7 " " '09	544,149	326,509	217,640	128,917	88,723		12 " " '09	126,271	86,522	39,749	24,114	15,635
	7 " " '08	493,418	308,376	185,042	128,917	56,125		12 " " '08	122,041	90,218	31,822	27,585	4,237
EAST ST. LOUIS, ILL. East St. Louis & Suburban Co.	1m., July '09	170,250	92,371	77,879	.....	.....	PORTLAND, ORE. Portland Ry., Lt. & Pwr. Co.	1m., July '09	424,815	195,141	229,674	123,391	106,283
	1 " " '08	165,451	87,622	77,828	.....	.....		1 " " '08	384,170	191,814	192,356	113,741	78,515
	7 " " '09	1,127,466	639,728	487,739	.....	.....		7 " " '09	2,697,593	1,267,566	1,430,027	857,429	572,593
	7 " " '08	1,143,447	602,974	540,474	.....	.....		7 " " '08	2,482,966	1,249,739	1,233,227	810,037	423,185
EL PASO, TEX. El Paso Elec. Co.	1m., June '09	47,075	27,701	19,375	7,943	11,432	RICHMOND, VA. Virginia Railway & Power Co.	1m., June '09	179,626	109,206	70,419	.....	.....
	1 " " '08	41,995	30,397	11,599	7,415	4,184		1 " " '08	174,858	125,152	49,706	.....	.....
	12 " " '09	557,317	372,033	185,284	91,267	94,017		6 " " '09	1,014,195	580,711	433,484	.....	.....
	12 " " '08	533,492	376,413	157,079	79,117	77,961		6 " " '08	956,396	648,486	307,910	.....	.....
FAIRMONT, W. VA. Fairmont & Clarksburg Tr. Co.	1m., June '09	42,122	12,946	29,176	1,893	27,283	ST. JOSEPH, MO. St. Joseph Ry., Lt., Heat & Pwr. Co.	1m., July '09	85,392	43,766	41,626	21,636	19,990
	1 " " '08	36,318	11,698	24,620	1,069	23,551		1 " " '08	80,739	38,787	41,952	20,666	21,286
	6 " " '09	212,293	76,886	135,407	11,373	124,033		7 " " '09	543,997	289,554	254,443	148,263	106,180
	6 " " '08	189,194	70,821	118,373	6,444	111,929		7 " " '08	493,796	262,903	230,893	143,337	87,556
FT. WAYNE, IND. Ft. Wayne & Wabash Valley Tr. Co.	1m., June '09	115,981	70,688	45,293	.....	.....	ST. LOUIS, MO. United Railways Co. of St. Louis.	1m., July '09	948,240	*597,509	350,731	232,449	118,282
	1 " " '08	110,035	65,442	44,592	.....	.....		1 " " '08	898,210	*578,528	319,682	232,852	86,830
	6 " " '09	648,655	390,835	257,820	.....	.....		7 " " '09	6,339,810	*4,028,702	2,311,108	1,637,080	674,028
	6 " " '08	615,201	360,594	254,607	.....	.....		7 " " '08	6,061,765	*3,946,025	2,115,740	1,628,401	487,339
FORT WORTH, TEX. Northern Texas Elec. Co.	1m., June '09	103,308	57,028	46,280	17,190	29,091	SAN FRANCISCO, CAL. United Railroads of San Francisco.	1m., June '09	597,484	344,800	252,684	.....	.....
	1 " " '08	90,550	66,051	24,499	19,191	5,308		1 " " '08	551,193	347,037	204,156	.....	.....
	12 " " '09	1,176,360	662,191	514,169	199,085	315,085		6 " " '09	3,568,904	2,085,332	1,483,572	.....	.....
	12 " " '08	1,061,577	611,496	450,082	174,986	275,095		6 " " '08	3,341,453	2,209,117	1,132,336	.....	.....
GALVESTON, TEX. Galveston-Houston Elec. Co.	1m., June '09	105,803	57,806	47,997	21,218	26,758	SAVANNAH, GA. Savannah Elec. Co.	1m., June '09	52,134	33,386	18,748	17,343	1,405
	1 " " '08	92,442	53,235	39,207	21,009	18,198		1 " " '08	50,006	30,498	19,508	17,323	2,185
	12 " " '09	1,155,391	664,337	491,054	251,822	239,233		12 " " '09	605,976	376,034	229,942	209,377	20,565
	12 " " '08	1,069,016	625,598	443,418	237,977	205,441		12 " " '08	601,157	406,317	194,840	203,895	19,055
GRAND RAPIDS, MICH. Grand Rapids Railway.	1m., June '09	91,764	42,838	48,926	19,137	29,789	SEATTLE, WASH. Seattle Elec. Co.	1m., June '09	522,470	313,014	209,456	105,093	104,363
	1 " " '08	85,324	42,789	42,535	18,708	23,827		1 " " '08	358,207	202,875	155,332	93,695	61,637
	6 " " '09	479,809	233,759	246,050	113,711	132,339		12 " " '09	4,955,754	2,955,392	2,000,361	1,179,602	820,760
	6 " " '08	437,665	234,989	202,676	110,072	92,604		12 " " '08	4,384,439	2,593,636	1,790,802	1,018,159	772,643
HOUGHTON, MICH. Houghton County Tr. Co.	1m., June '09	27,538	13,183	14,355	6,242	8,114	TACOMA, WASH. Puget Sound Elec. Railway.	1m., June '09	162,057	106,187	55,870	48,292	7,578
	1 " " '08	23,343	12,781	10,561	4,624	5,938		1 " " '08	137,178				