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*During 1907 the Street Railway Journal printed and circulated 427,250 copies, an average of 8216 copies per week. Of this issue 8250 copies are printed.*

### Association of Operating Managers

As this paper is going to press a number of electric railway officials are meeting at the headquarters of the American Street and Interurban Railway Association to organize the affiliated association authorized at the Atlantic City convention. Owing to the lateness in the week at which this meeting is being held it is impossible to include in this issue a report of the meeting, but the interest manifested in the movement and the prominence in the traction

field of those present in New York guarantee the establishment of the new association under the most favorable auspices. Its exact scope and even its name yet remain to be determined. The committee of the American Association which called a meeting, wisely decided to leave these subjects to be decided later by the delegates, with, of course, the subsequent approval of the executive committee.

In some respects the new organization constitutes a radical step in the history of the association, in other respects it is a natural outcome of the reorganization effected in Philadelphia in 1905. For some time there has been an obvious need of greater attention to operating problems than could be given by the main association, so that it is a logical step to provide means by which this result is secured. Although the constitution of the new organization has not been promulgated we presume that it contemplates an association which will differ from the passenger and freight associations of the steam railroads, and even from the traffic association recently formed by the electric railway companies of the Central States. The latter was brought into being on account of the interchange of traffic among the electric railways in that section, and its evident purpose as indicated by its articles of agreement is more to promote the general interchange of traffic than to consider technical problems relating to electric railway operation. We have no hesitation in saying that the organization of the new association is one of the most important steps which has ever been taken by the street railway interests of the country, and ranks in importance with the creation of the original association and the reorganization at Philadelphia.

### Aids in Schedule Analysis

The study of schedules and service is a complex problem on most of the larger street railway systems, and it needs to be attacked on more than one side if an efficient and at the same time economical service is to be given. Close watch of conditions on the streets by inspectors and other officials will do much to determine whether too generous or an insufficient car movement is being carried out, but statistical methods also have their place. In another column mention is made of the daily report of earnings used at Buffalo, and it is applicable to many other systems that an interpretation of the kind of data collected on the blank form shown will prove helpful in keeping the schedules at the best point.

The earnings of a given line from day to day and in comparison with the same week day of the year previous are worth studying in the light of schedule changes, but until one begins to secure data on earnings per car mile and per car hour, on schedule speed and headway, number

of cars used compared with the total quartered at a given station, amount of transfer traffic, mileage of regular and extra cars and platform labor, the basis for generalization is but partially complete. One line may earn fifty times as much as another in a day, but the earnings per car mile and per car hour may be nowhere near comparative. The less heavy line may be operating at a higher efficiency than one earning many hundreds of dollars a day, in relation to the cost of service given. By preparing a few simple statistics each day or week along the lines indicated above, and interpreting the reasons for the certain dissimilarities in figures that will result, the work of the inspectors in the field will be valuably supplemented, with a strong probability that the service will be improved in the interests of both the company and the public.

### The Central Electric Traffic Association

The organization at Dayton last week of the Central Electric Traffic Association is another indication of how far the interurban roads in the Middle West have advanced from the methods and theories of urban street railway operation. It is but little more than ten years since the first interurban road was built in that territory. To-day there are over 6000 miles of such roads in the States included by the Central Electric Railway Association, with which the new traffic organization is affiliated. One may ride on electric cars from Paris, Ill., to Zanesville, Ohio, or from Flint, Mich., to Louisville, Ky. These roads carry freight, express, baggage and passengers; they sell mileage books and coupon tickets, run sleeping and dining cars and in every respect are more and more closely approaching the service given by the steam roads in handling through traffic. They have found that through traffic pays, and the new association is the first important step toward developing it in successful competition with the steam roads.

The freight and passenger traffic associations of the steam roads have been of inestimable value in handling through business, and wisely enough the electric railway traffic association has been organized along the same general lines and with the same purposes in view. In fact, the articles of agreement of the Central Electric Traffic Association are substantially a combination of paragraphs taken from the articles of the Central Passenger Association and the Central Freight Association, arranged to include in the one organization matters pertaining to both freight and passenger tariffs and with only such changes in wording as were required to fit them for the use of electric instead of steam railways. The purpose of the association is not to make rates and arrange divisions of through tariffs. It has been formed solely for the purpose of disseminating to all of its members accurate and concise information as to the rates, classifications and tariffs in force on the several roads subscribing to the agreement. The members agree to furnish to the chairman copies of their rates and agreements with connecting steam and electric railways and these will be used as the basis for compiling joint tariffs for all points in the territory included by the association which can be reached by the lines of any of its members. These tariff sheets will be printed and distributed to every station for use in naming rates to any point on connecting roads.

The value of such an organization is obvious, if it can be made to include the great majority of the electric roads in the territory covered. At the present time the most serious obstacle in the way of developing through traffic, both freight and passenger, is the lack of information or the difficulty of applying such meager information as is at hand in naming through rates to points on distant connecting lines. Passengers and shippers want to know what a journey or a shipment of freight is going to cost before starting. The representation at the meeting to organize the association was encouraging and when the work of compiling tariffs has advanced far enough to show some tangible results to the charter members there should be no difficulty in persuading most of the remaining roads to subscribe to the agreement. A road touching competitive points could hardly afford not to subscribe and enjoy the same benefits on through traffic as its competitor in the association.

It will be no easy task to compile such tariff sheets as are proposed. The wide variations in local rates and classifications at present in force on individual roads, the many local interchange agreements and in some cases the fierce competition of parallel lines will inevitably result in some injustice and dissatisfaction at first. Much depends on the caliber of the chairman to be selected by the association and the spirit of fairness and co-operation manifested by the members. Provision has been made in the articles of agreement for arbitration of cases in dispute and the right to make rates and divisions of through tariffs is reserved to each road. If the interurban roads which are striving hard to build up through traffic in competition with the steam roads once come to a full realization of the need of pulling together, the ultimate success of the new association is assured.

### Convention of the Central Electric Railway Association

The progress made by the Central Electric Railway Association since its organization two years ago was summed up concisely in the presidential address of Mr. Nicholl at the Dayton meeting last week. Through the support of a large membership, composed of the interurban railways of Ohio, Indiana and Southern Michigan, the association has been able to advance the subject of standardization of apparatus and rules so that the interchange of rolling stock and even to some extent of crews need no longer be difficult, while through the newly organized Central Electric Railway Traffic Association a medium has been established for conducting the business of accounting for and maintaining through tariffs for both passengers and freight. By this action the association has placed itself upon a basis for handling business on a scale which was not possible when the companies were operated in a disconnected and entirely independent manner and has evolved from an association devoted to the study of engineering problems to one which acts as a stimulus upon the amount of business transacted. In his presidential address President Nicholl takes the position that the work of the future will be as important, if not more so, than that which has been accomplished in the past and suggests various ways in which the association can be of benefit to its members.

Of the three papers presented at the meeting, two were

published last week and one, the report of the standardization committee, appears in this issue. The latter continues the discussion on foundation brake rigging for high speed electric cars which was begun by the paper of Fred Heckler read at the November meeting of the association. Mr. Heckler pointed out the defects in existing foundation brake equipments; the report this week now makes definite recommendations on the essential features of design. Some of these recommendations are radical departures from present practice and all are for the purpose of making the brakes more powerful and effective under all conditions. A discussion on the practicability of certain of the suggestions in this report will also be found in our correspondence department this week.

### Economy in the Transportation Department

In electric railway work there is always in well-managed properties a constant pressure upon the heads of departments to reduce their expenses of operation. It is well that this is so, for only a brief study of the complex and shifting conditions of service in any given city is required to demonstrate the opportunities constantly arising for both the spending and the saving of considerable sums of money. Too great zeal for economy is as blameworthy as extravagance in the conduct of the service; but, on the whole, the policy of making each expenditure on the basis of an estimate which justifies its disbursement is a wise and conservative course.

For many years the supply of power has been the subject of analysis with the object of cheapening its cost of production, and the end is not yet in sight. There is still room for very large improvements in methods of generating electricity for railway service, and the building of each new important plant continues to arouse the interest of designing engineers and operating men—an interest which crystallizes in the question, "How low can the plant run in power cost per kilowatt hour?" It is open to debate, however, if the economics of its power station have not received undue prominence of expert attention at times in comparison with the investigation of possible economies in the transportation department.

The labor cost of conducting electric transportation deserves the most thorough and constant study from operating officials. The cost of idle mileage including its power, and the economies of different types of cars, the expense of operating one timetable as compared with another, the influence of tripper runs upon the cost of regular service—these and similar issues warrant the closest kind of analysis. On many roads the cost of transportation service receives never-ending scrutiny, but on some systems the evidence is not wanting in the shape of wholly or nearly empty cars often reported, that the managements could profitably devote more time to the cutting down of the service on the basis of correct operating records. Even in a city of one or two hundred thousand inhabitants it may pay well to keep on file for convenient use a dozen different timetables conforming to the varying conditions of travel. The running times may be substantially the same between all points on the system, but the times of starting different runs and the combinations of headway and routes desirable will

usually vary through a wide range. On lines operated with long headways like fifteen to thirty minutes it is desirable not to change the schedules as much as on short interval routes, for the reason that the public feels the change in the longer interval more acutely.

No small amount of analytical skill is required to draw wise conclusions from complex service data in street railway work, and yet the institution of economies without injury to the convenience of the great majority of a company's patrons demands the most careful interpretation of records of car and line earnings at different times and through prolonged periods. It is desirable to plot graphically the movements of cars on a given route before deciding that any given run is not worth while. Experienced transportation superintendents can tell a great deal about the way a schedule will operate by seeing it in tabular form, but the graphic diagram of runs is bound to be helpful in the picking out of such trips as appear not to be paying. Progressive companies are leaning more and more toward the graphical method of attack.

Doubtless it is true that some trips on street railway systems must inevitably be operated at a loss. No human foresight can provide for every contingency. Some of the lines of a given system will supply even revenues month after month; the cars will be well loaded, and seldom overcrowded, except perhaps for a few minutes in the peak period, while other lines will fluctuate in earnings like an ammeter needle registering an electric elevator accelerator. Policy requires the maintenance of steady service on certain lines, particularly those where the number of cars needed to maintain the schedule is small. It is on the short interval lines that the best chances for a favorable adjustment of car type and frequency occur.

Without a first-class system of records little can be done toward saving money in transportation cost. These must be simple enough not to require bookkeepers instead of conductors on the cars and yet complete in all essential data. Accurate methods of gaging the use of transfers are exceedingly important, especially in cases where time limits are strictly enforced. A company which takes a record of the passing time of all cars at a single point is in excellent condition to fight transfer abuses. Records of the way discipline is enforced also have their place.

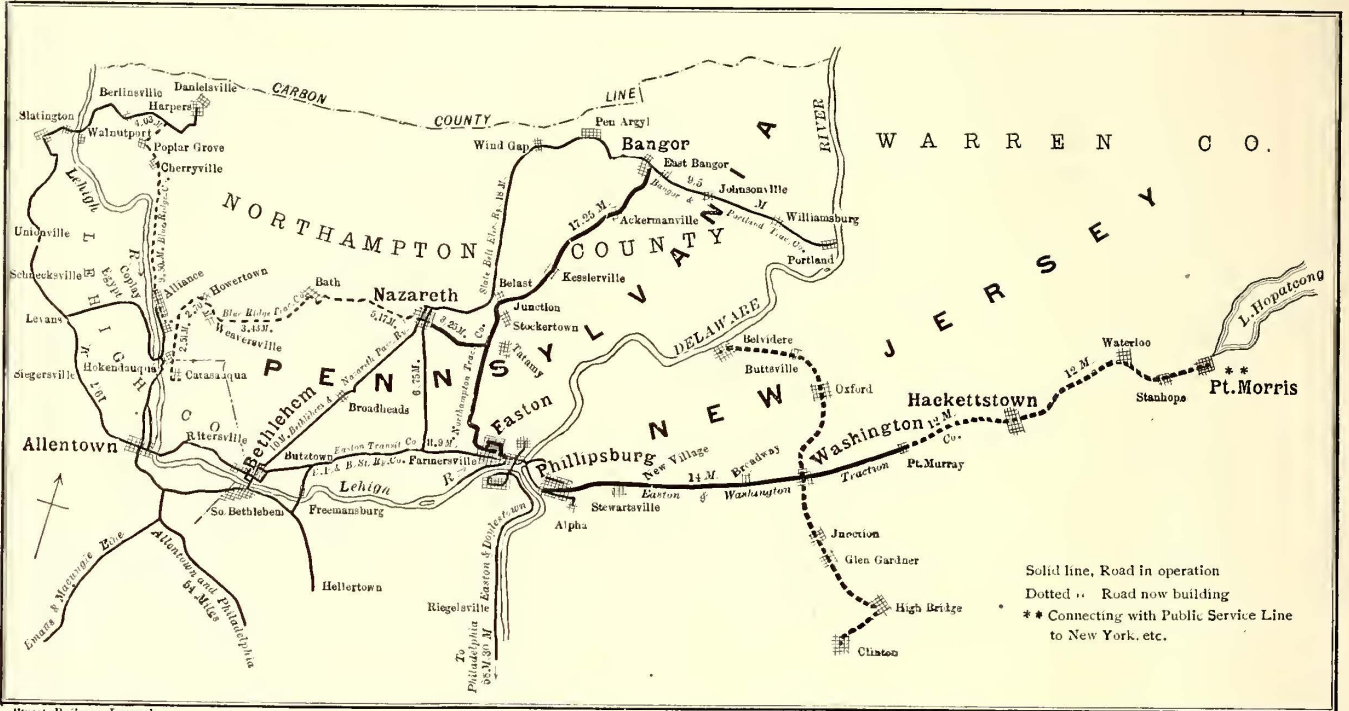
When the conditions are determined by careful analysis the line of economy will generally lie in the direction of reduced non-revenue mileage, increased headway on certain sparsely settled routes at certain times by the use of signed turn-back points, decreased delays and shortened stops, increased schedule speed, use of cars having a high load factor in relation to their carrying capacity, retention of desirable employees, closer inspection of traffic and equipment, provision of ample telephone facilities, power house and feeder capacity, installation of improved and simplified methods of handling clerical work, encouragement of suggestions from car service men and the extension of double tracking on single-track routes. The money value of these matters is difficult to determine in many instances, but, in so far as the records throw light upon the changing conditions and inter-relations of subdivided traffic streams, they are bound to be of high value in making out economical schemes of operation.

**THE NORTHAMPTON TRACTION COMPANY**

In a general way it is known that Eastern Pennsylvania is one of the most flourishing industrial sections of the United States, but few are aware that it is also a region of great natural beauty in which its residents find pure air and recreation at their very hearthstones.

As noted in the article on the Easton & Washington Trac-

The greater part of the route is a single-track line 17.25 miles long, between Easton and Bangor, except the branch to Nazareth, which is 3.25 miles in length. There is also a second route in the upper part of Easton built to secure local traffic and over which every other car leaving Easton is operated. The greater part of the line is over right of way averaging a width of 40 ft. At the time the land was bought for this purpose there was considerable prejudice



Street Railway Journal  
**ROUTE OF NORTHAMPTON TRACTION COMPANY BETWEEN EASTON, NAZARETH AND BANGOR, PA., SHOWING ALSO ELECTRIC RAILWAY CONNECTIONS.**

tion Company,\* this district is well supplied with steam and electric railway lines, the former being great freight carriers, while the latter supply the passenger transportation in and between the many moderate-sized towns and villages. Among the important systems in this district is the North-

among the farmers against a line going through their farms. Hence, in several instances, the company was obliged to purchase farms outright, while in others it was obliged to make long detours. These difficulties were so aggravated by the mountainous nature of the country that grades over



**VIEW OF WIND GAP IN THE BLUE RIDGE RANGE FIVE MILES FROM THE ROUTE OF THE NORTHAMPTON TRACTION COMPANY**

ampton Traction Company, running from Easton to Nazareth and Bangor, as shown on the accompanying map. Connections are made from Bangor for the far-famed Delaware Water Gap and other mountain resorts, and from Easton to Allentown and Philadelphia. As will appear later, the Philadelphia connection is of great importance in the Northampton Traction Company's summer business.

5 per cent are the rule rather than the exception. The following table illustrates this condition in detail:

**GRADES OF THE NORTHAMPTON TRACTION COMPANY**

Location.	Per cent of grade.	Length.
Spring Garden St., Easton.....	9	270 ft.
Car Barn Hill.....	9.5	150 "
Fushkill Park Trestle.....	8	200 "
Walters' Hill.....	8	110 "
Beers' Trestle.....	8	110 "
Belfast Hill.....	6.1	200 "
Belfast Hill.....	8	120 "
Kessleville Hill.....	5	240 "

\*STREET RAILWAY JOURNAL, Dec. 28, 1907.

Location	Per Cent of Grade	Length
Kocher's Hill .....	5.5	80 "
Frutchey's Farm .....	4.7	130 "
Achenbach's Hill.....	6.2	400 "
Ackerman Hill up to Meyer's.....	5	270 "
North Side of same into Bangor.....	5.4	100 "

POWER SUPPLY

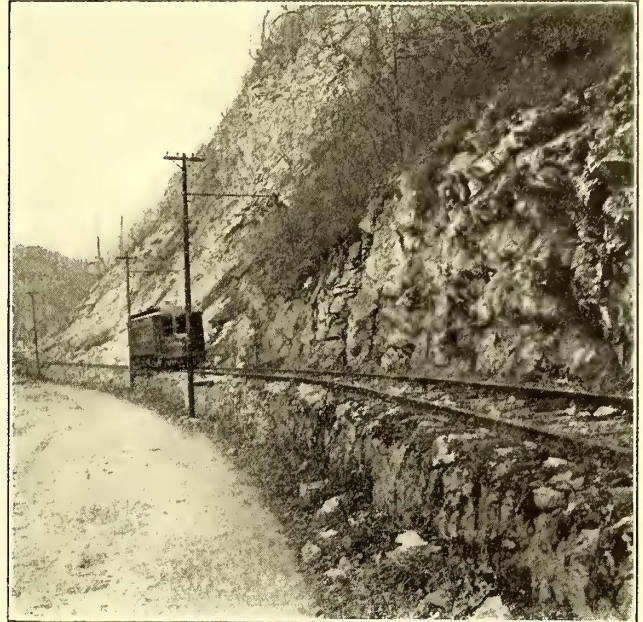
The power house of the Northampton Traction Company is located near Bushkill Creek, three miles from Easton. The older part of the structure has stone walls and a corrugated iron roof, but the recent addition to the boiler room

Despite the unfavorable operating condition shown by the foregoing figures, the fact that there were only three accidents, with no deaths, during the last fiscal year, shows what careful management can do. The company is planning to eliminate some of the sharp curves and heavy grades forced on it by the earlier opposition to electric railways, but in this case engineering considerations must be modified by the desire not to detract from the sight-seeing advantages of the line.

TRACK AND OVERHEAD CONSTRUCTION

As shown in some of the accompanying views, there is plenty of rock along the line available for ballast. Slate shale is laid to a depth of 6 ins. to 7 ins. below the ties at the Bangor end, while cinders are used largely between Easton and Stockertown. The rails originally were laid on 5-in. x 5-in. and 6-in. x 6-in. ties, 7 ft. long, but these are now being replaced by 7-in. x 7-in. ties, 8½ ft. long, laid 24-in. centers. Most of the rail used is a 74-lb. T, except some 80-lb. T-rail on a tangent south of Tatamy Junction. All the track has Roebling soldered bonds. The joints are mostly of the angle type, but Weber joints are used exclusively between Belfast and Bangor, and they are gradually replacing the others elsewhere. All track work, including the double-spring frogs and switches used at sidings, was furnished by the Lorain Steel Company. There is little in the way of special construction except a 480-ft. trestle on the road to Bushkill Park and a 100-ft. steel bridge at Stockertown.

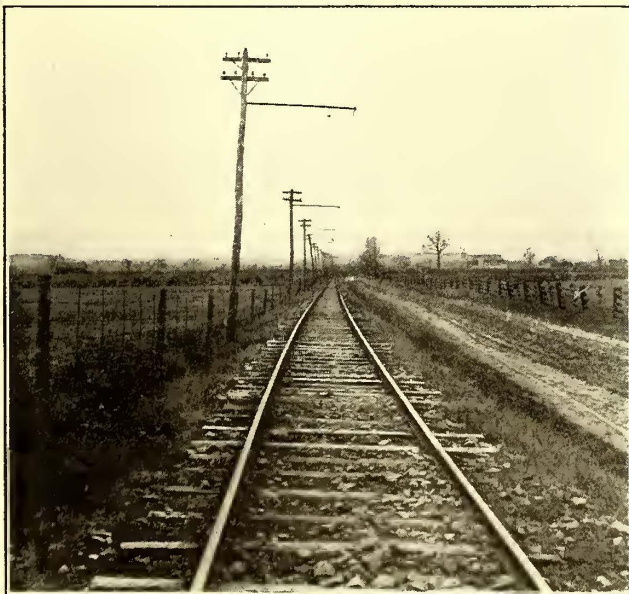
Current from the power house, three miles from Easton, is carried over four No. 0000 copper feeders to Tatamy Junction. At the latter point one feeder branches to Nazareth and another continues to the battery house at Factoryville, leaving two all the way to Bangor. There are three No. 0000 feeders between Easton and the power station.



ALONG THE PICTURESQUE ROUTE OF THE NORTHAMPTON TRACTION COMPANY IN THE HEART OF EASTON

is of reinforced concrete. The adjoining battery house is also of concrete, but has a slate roof.

The steam generators consist of three 200-hp Marietta return tubular boilers and two 260-hp B. & W. water-tube boilers, operated at 120-lbs. pressure. The latter are placed



A LONG ROCK-BALLASTED TANGENT SOUTH OF TATAMY JUNCTION

One of the illustrations shows a home-made, sheet-iron trolley trough used at steam railroad crossings. These troughs have been in service for over five years and have averted many accidents; in fact, this company was one of the first to use such protection.



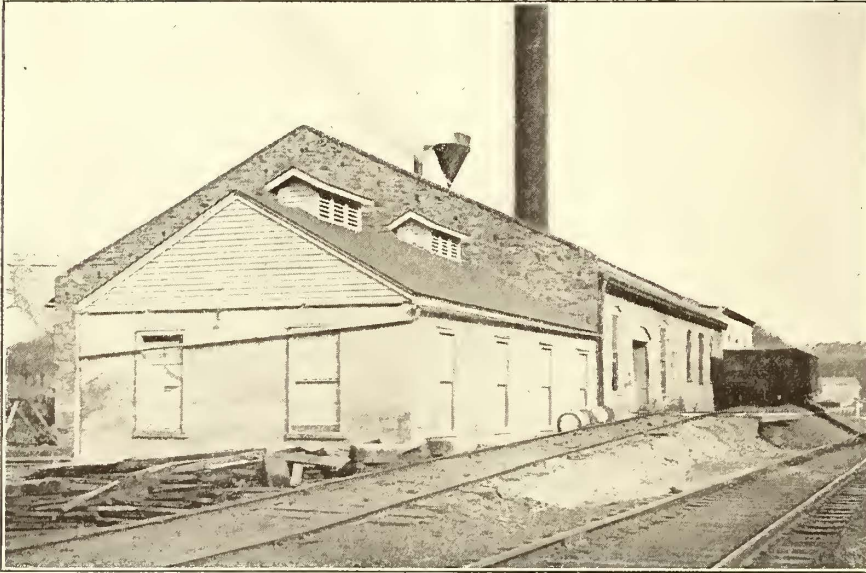
HOME-MADE SHEET IRON TROLLEY TROUGH OVER RAILROAD CROSSING AT ACKERMANVILLE

in the concrete addition shown in one of the accompanying illustrations. The engine equipment comprises two 500-hp Clark Brothers horizontal 24-in. x 30-in. engines, each direct connected to two 325-kw General Electric 550-volt direct-current railway type generators.

The station is well supplied with power auxiliaries, such as jet condensers furnished by the Union Pump Company, of Battle Creek; Webster feed-water heater and purifier; Fairbanks-Morse duplex feed-water pumps, and Sturtevant forced-draft apparatus for the boilers. Coal is received in hopper-bottom cars on a trestle and dropped to chutes lead-

#### ROLLING STOCK AND CAR HOUSE

Owing to the comparative closeness of the towns and villages in this section, it is found much better to run on frequent headway with comparatively light cars than on longer headways with rolling stock of interurban type. The heaviest cars weigh between eighteen and twenty tons and are not more than 43 ft. over all. They are equipped with Westinghouse No. 101 B-2 motors, K-6 controllers, Christensen air brakes, Consolidated electric car heaters, Imperial headlights, Wilson trolley catchers and National brake shoes with cast-iron inserts. There are fifteen cars in all, only six of which are needed in winter. Seven cars are double-truck closed, two single-truck closed and six ten-bench, single-truck open. All of the single-truck cars are operated with G.E.-1000 motors, which were formerly used on the double-truck cars. Most of the cars were furnished by the Wason Manufacturing Company, and have Wheeler plush or leatheroid seats. None of the cars has a smoking compartment. As an ordinary size sand-box would be emptied before the end of a full run on a wet track, because of the many



POWER HOUSE AND COAL TRESTLE WITH CONCRETE BATTERY HOUSE IN THE REAR

ing to the boiler room. This coal is a low-grade rice, and costs \$2.10 per ton delivered and gives one kw-hour per 6½ lbs. The station operates for 15½ cents per kw-hour, which is quite a low figure considering its size. The operating staff consists of a chief engineer, two engineers, two firemen and a helper.

The company has a reciprocal power agreement with the Bangor Electric Light Company and the Easton Power Company whereby one company may buy power from the other at 2½ cents per kw-hour taken at the seller's switchboard.

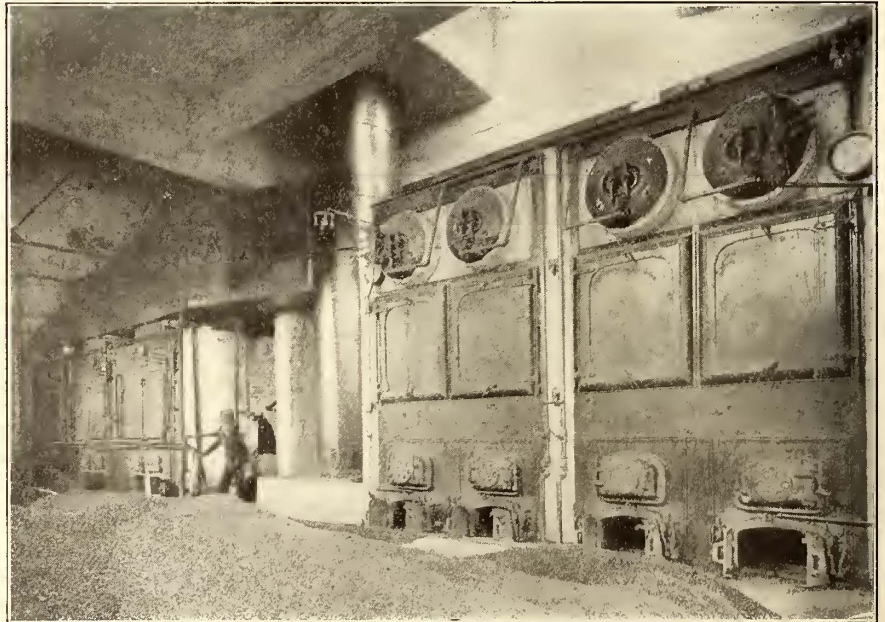
#### STORAGE BATTERIES

There are two storage battery installations to keep up the line potential, as the Northampton Traction Company's system is plain direct current throughout. A Chloride Accumulator battery and booster are housed in the concrete structure adjoining the power house. This battery consists of 283 cells capable of discharging 160 amperes for one hour. The booster set raises the potential of the current over one of the feeders to 650 volts for transmission to the other battery house at Ackermanville, which is eleven miles from the power station and four miles from the Bangor terminus. The Ackermanville building is of brick and contains 236 Gould type No. 013 cells, rated to give 60 amperes for eight hours. These two batteries constitute the only auxiliaries to the company's power system, and are sufficient to keep up the trolley voltage over the entire line.

grades on the line, the cars have extra large cast-iron sand-boxes placed on the platform next to the controller.

There are also two Wason single-truck plows for snow fighting, but since the snow problem is a particularly hard one in this section, Root scrapers are attached to all cars in winter, and they perform splendid service.

The car house is of stone and is located two miles



NEW CONCRETE SECTION OF NORTHAMPTON TRACTION COMPANY'S POWER STATION

from Easton. It is 250 ft. long and 50 ft. wide, giving space for four tracks, each of which is provided with steam-heated pits at the rear for 150 ft. The company does all car repair work, including winding, at this point. As the

tracks enter the car house up a grade of 9 to 11 per cent, derailing switches are installed to keep cars in the house from running down to the main line. Extra tracks are to be laid above the car house, so that runaway cars will move up-hill, thus avoiding possible accidents.

CAR OPERATION AND TRAFFIC SOURCES

All cars are despatched by telephone over a private tele-

A practice of the Northampton Traction Company which could profitably be followed by other interurban railways is the posting at all the terminals of schedule dials, as shown in one of the accompanying illustrations. The leaving time of the following car always is set by the last conductor. This practice may appear a trifling detail, but it is one highly appreciated by intending passengers who are unfamiliar with the schedules. Incidentally, the space below



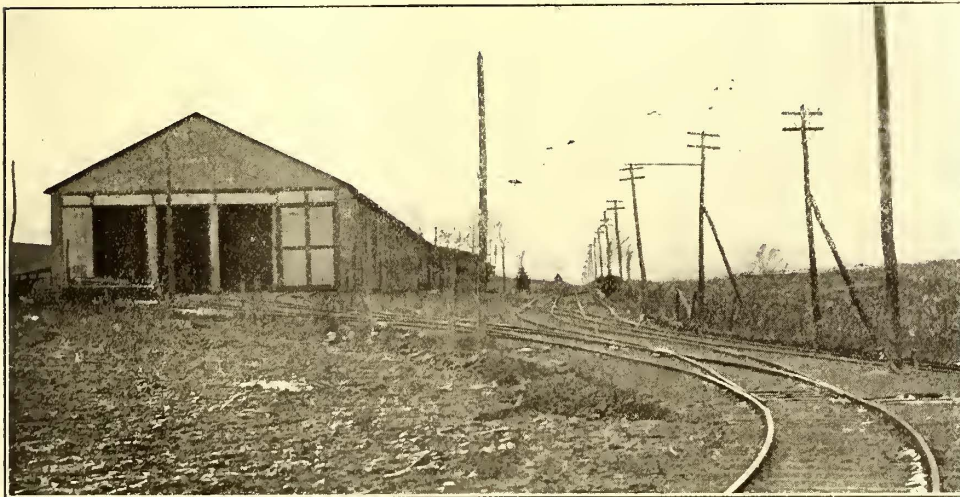
CARS FROM EASTON, NAZARETH AND BANGOR MEETING EVERY HALF HOUR AT TATAMY JUNCTION.

phone line, through which connections can also be made to outside telephones. All crews are instructed to wait at turnouts until ordered to go ahead. The telephones are of Mayer & Englund's iron box type.

The schedule for the greater part of the day is so arranged that every half hour three cars meet at Tatamy Junction, the place where the Nazareth branch meets the main line. This makes it possible to transfer to different operating divisions without any waiting. The eighteen miles between Easton and Bangor are covered in one hour and fifteen minutes, and the nine miles between Easton and Nazareth in

the dials serves for bills advertising special attractions at Bushkill Park, the company's pleasure resort, near Easton.

The company also maintains comfortable waiting rooms at all the terminals, in some cases making arrangements for space in local hotels. The timetables are printed in all the local trolley guides together with information concerning connections. Among lines in close touch with the Northampton Traction Company are those of the Slate Belt Traction Company, Bangor & Portland Traction Company, running to Portland, nine miles from Delaware Water Gap;

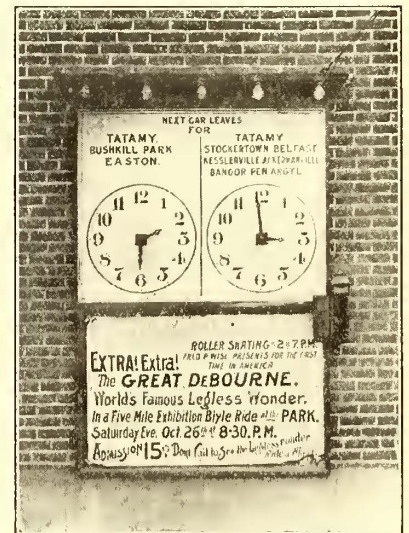


CAR HOUSE OF THE NORTHAMPTON TRACTION COMPANY

fifteen minutes. The fare between the latter points is 10 cents, while the run between Easton and Bangor is divided into five 5-cent zones. A feature of the zone method of fare collection on this line is the use of celluloid hat checks of different colors, according to the fare paid. This enables the conductor to keep easy track of his passengers, and likewise helps the inspector. As previously noted, the company operates over two routes in Easton, and on these it charges only a 4-cent fare—that is, twenty-five tickets are sold for \$1, good only in the city limits.

Lehigh Valley Transit Company, for Allentown; the Easton Transit Company; the Easton & Washington Traction Company, and the Philadelphia & Easton Traction Company, running to Philadelphia and Willow Grove.

A remarkable amount of the pleasure riding on the Northampton Traction Company, popularly known as the "Hay Line," comes from Philadelphia via the Philadelphia & Easton Traction Company. This is largely due to the clever traffic-seeking campaign carried on through the medium of illustrated tourist guides and the Philadelphia Sunday



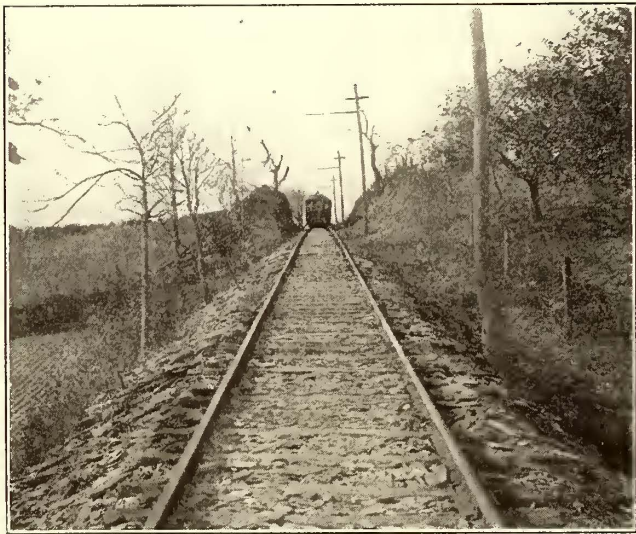
SCHEDULE DIALS AT NAZARETH

papers. In the latter attractive quarter-page advertisements are used with the slogan "All the Way by Trolley to Delaware Water Gap," together with full information concerning all the railway connections and the principal hotels. This form of advertising has proved very successful and is not too expensive, as the cost is shared between the three traction companies carrying the travel and the six hotels advertised.

#### PACKAGE TRANSPORTATION AND CAR ADVERTISING

The company conducts no regular freight or express business, but carries packages for a minimum charge of 10 cents, the higher charges being the usual passenger fare for the same distance. If a bundle is extra large, the charge is double. Most of the baggage checks are sold and the bundles tagged at the main office, but conductors are authorized to accept packages and must enter on their trip sheets the amounts received from this source. Between May 1 and June 30, 1907, the earnings from this source totaled \$373, with no expense except the very slight one for the baggage checks.

The cars transport Philadelphia newspapers every morn-



CUT IN SLATE ROCK NEAR MUD RUN.

ing and conductors keep a record of the number of bundles of each paper handled for the dealers getting this service. Mail is also carried, but in this case the conductor notes on his regular trip sheet the time the mail was received and when delivered, to assist the postoffice in tracing missing mail and otherwise avoiding trouble.

The company solicits advertisements direct, and prefers to fill its cars with announcements of local merchants. It charges \$4 a month for a space 11 ins. x 21 ins. The least number of cars operated is six and the most fifteen. Change in copy is furnished without extra charge every three months. As there are thirty-four spaces per car, the greatest income from these cards is \$136 a month, but small advertisements are carried also in the triangular frame forming the upper part of the car straps. There are thirty-six straps per car and the monthly charge for advertising on them is only 25 cents a strap.

#### MISCELLANEOUS

The financial report of the Northampton Traction Company for the year ending June 30, 1907, shows the following: Gross earnings from operation, \$106,495.21; operating expenses, \$57,824.82; net earnings from operation, \$48,670.39; net income after tax and interest deduction, \$24,-

127.15; cost of snow removal, \$746; passenger car mileage, 472,594; passenger car hours, 41,477; fare passengers carried, 2,073,396; average fare from revenue passengers, .0483 cent; gross car earnings per car mile, .225 cent; operating expense per car mile, \$1,595; operating expense per car hour, .1399 cent. The officers of the Northampton Traction Company are: President, Thomas A. H. Hay; secretary and purchasing agent, W. O. Hay; treasurer, Chester Snyder; executive directors, M. P. McGrath, A. R. Dunn, F. S. Bixler; superintendent, D. L. Beaulieu; chief engineer, Erwin Judd; master mechanic, Daniel Richter; roadmaster, James O'Connell. The principal office of the company is in Easton.

#### PARK CONDITIONS ON THE BROCKTON & PLYMOUTH

The Brockton & Plymouth Street Railway Company operates an attractive park during the warm season at Mayflower Grove, a point situated near the middle of the system. During the past season the experience of the company was similar to that of other roads in Eastern New England. The month of June was very good as to earnings; July was remarkably good, but August and September were poor on account of the cold evenings in the former month and rain in the latter. The gross business of the company was somewhat larger than in any previous season, but the net was not so good owing to necessarily heavier expenditures.

The company expects to make but little change in its methods and attractions next year. Owing to the limited population from which it draws it is unable to put in any expensive and permanent attractions such as chutes, circle swings, roller coasters and the like. The company depends, according to Manager A. H. Warren, entirely upon the natural attractions at the grove and upon good theatrical attractions. Its experience is that good shows pay. J. W. Gorman does the booking, and practically the same shows are put on at Mayflower Grove as are given at Norumbega Park, Auburndale. It costs a good deal to do this, but the results of the past two years have demonstrated that this money is well spent.

Mr. Warren states that the advisability of owning and operating a park must in every instance be determined by local conditions. On the Brockton and Plymouth, which is one of the Stone and Webster properties, the park is a paying proposition, and there is no doubt that the park, which is left in the natural wild state, is a better drawing card than a formal and artificial park could be. The park traffic here is handled on plain passing trucks, the park crowds being handled on regular scheduled trips by the addition of extra cars into the grove before the show starts and extras out after it is over.

According to the *Wall Street Journal*, the stock of the Boston Elevated and West End Street Railway companies is practically all held in Massachusetts. Out of a total of 3,438 stockholders in the Boston Elevated, as of Sept. 30, 1907, 3,009, or 87 per cent, reside in this state. Since Sept. 30, 1906, the number of shareholders increased 217, of which increase 211, or 97 per cent, are represented by Massachusetts stockholders.

There were 8,393 stockholders in the West End Street Railway Company on Sept. 30, 1907, of whom 4,638 were common shareholders and 3,755 preferred. Out of the total of 4,638 common stockholders, 4,093, or 88 per cent, are residents of Massachusetts, and of preferred 3,259, or 86 per cent.



**ELECTRIC RAILWAYS IN CANADA**

BY J. L. PAYNE,

Comptroller of Railway Statistics, Canada.

Canada has played a creditable part among the nations in the development and application of electric power. Graham Bell, the inventor of the telephone, is a Canadian, and Thomas Edison, the discoverer of the phonograph, spent his boyhood days in Canada. At St. Catharines, Ontario, the first electric railway was put in operation—a very imperfect affair, it is true—but imperfection and the genesis of human enterprise are nearly always associated. Ottawa, the capital of the Dominion, was the first city in the world to be lighted entirely by electricity, and Ottawa to-day has the greatest number of incandescent lamps in use per capita of any community under the sun. In electric railway advancement the citizens of Canada have always been courageous and ambitious. No better type of up-to-date and well conducted tramway system is to be found elsewhere, and not a single horse car railway remains in this rugged northland as a reminder of primitive days.

Canada solved the snow problem. This may seem like a flimsy foundation upon which to build a boast, but not to those who know. Back in the early eighties it was assumed that an electric railway within the Dominion was necessarily a hazardous undertaking. Timorous souls, influenced only by the consideration of assured dividends, shook their heads when it was proposed to run electric cars the year round. They reasoned that an electric service could be operated with safety during the open months; but during the long winter, with an aggregate snowfall of from two to six feet, either the cars would be tied up or the net earnings of summer consumed in keeping them running. This was held to be particularly applicable to cities like Montreal, London, Quebec and Ottawa, which do not, like Toronto, in any year escape from severe winter conditions; but in Ottawa the project of electrifying the street railway system was in the hands of two stout-hearted and resourceful men—Thomas Ahearn and Warren Y. Soper. They demonstrated that the wildest blizzard may be met and conquered, and, as one who has many times witnessed the encounter, I feel like saying that it is worth a long journey to see the subjugation of a snow storm in the capital. Montreal and Toronto looked on anxiously while the early battles were one by one decided in favor of the human contestants, and the proof of sufficiency in the methods adopted is found in the fact that neither sleet nor snow has for a single day in sixteen years compelled the citizens of Ottawa to deny themselves the comfort of riding in what I regard as the best warmed electric cars, manned by the politest staff, in the world.

Having in mind these struggles, it rounds off the story to say that the men who risked their all in what was believed to be a handicap fight against natural obstacles have won their reward. To-day the Ottawa Electric Railway Company is one of the most prosperous on this continent, and in all the Canadian cities success has also been achieved. Instead of the blockade which it was asserted the handling of the snow would create, in every Canadian city the street conditions are now infinitely better than in the days when the old covered sleighs provided a precarious winter service.

Statistics with respect to electric railways were not collected by the Department of Railways and Canals until 1901, so that the history of events up to that time is not of record. Beginning with mileage, the following facts are of interest:

Year.	Miles.
1901	512
1902	558
1903	759
1904	767
1905	793
1906	813
1907	815

Whether or not the relatively slow growth in mileage of the past three years indicates that Canada is approaching the saturation point can only be a matter of conjecture. The West has for two years been filling up at the rate of 700 souls a day, and if this tide of immigration is maintained new towns and cities will spring up on the prairies, just as they have done in the Western States. The older provinces are well served at present. Ontario has twenty-nine lines with 402 miles of track; Quebec has eight, representing 198 miles; the Maritime Provinces account for seven, with 71 miles, and in the West are three systems making up 104 miles.

Up to June 30 last the investment of capital stood as follows:

Year.	
1901	\$39,076,018
1902	41,593,064
1903	47,096,453
1904	50,399,188
1905	61,033,321
1906	63,857,970
1907	75,195,476

It will be observed that these figures represent a capitalization of \$76,320 per mile in 1901, and of \$92,263 in 1907. The explanation of this increase is probably to be found in the story of larger earnings and improved sources of power. Investors wanted more stock, and the companies gave it to them; the railways required betterments and they got them by increasing their liabilities. Of the \$75,195,476 outstanding on June 30 last, \$39,251,746 was in ordinary shares, \$4,240,000 in preference stock, \$28,459,537 in bonds and "other sources" made up the remaining \$708,437. A floating debt of \$7,567,025 was also returned. In a few instances aid was given to electric railways, the Dominion Government having contributed \$118,400, provincial governments \$306,945 and municipalities \$173,000. In one instance British Columbia gave a grant of land. Canada has always followed a parental policy in promoting railway construction; but it would be delusive to assume that the public treasuries will again be opened to electric enterprises.

The financial aspect arising out of operation is satisfactory, as the following table shows:

Year.	Gross Earnings.	Operating Expenses.	Expenses to Earnings.
1901	\$5,768,283	\$3,435,163	59.55
1902	6,486,438	3,802,855	58.87
1903	7,233,677	4,472,858	61.83
1904	8,453,609	5,326,517	63.01
1905	9,357,126	5,918,194	63.24
1906	10,966,872	6,675,038	60.87
1907	12,635,905	7,737,252	61.23

It will be observed that very encouraging progress has been made. That the earnings should have increased 119 per cent while the mileage was growing 59 per cent may be taken as proof of the response which comes from the public when satisfactory transportation facilities have been provided. Within the same period the capitalization was enlarged 92 per cent. The proportionate relationship of earn-

ings to working expenses shows the flourishing position of electric railway interests in Canada. As illustrating the sources of revenue, the gross earnings for the year 1907 were made up as follows: Passenger traffic, \$12,010,922; freight traffic, \$344,368; mails and express, \$41,952; other sources, \$238,664. The division of operating expenses was: Maintenance of line, buildings, etc., \$765,685; cost of power, \$1,412,359; working and repairs, \$1,060,783; general operating charges, \$4,498,425.

The history of traffic, mileage and equipment reveals the same relative measure of growth. The following summary gives the essential facts:

Year.	Passengers Carried.	Tons of Freight.	Car Mileage	Number of Cars.
1901 .....	120,934,656	287,926	31,750,754	2,194
1902 .....	137,681,482	266,182	35,833,841	2,374
1903 .....	155,662,812	371,286	38,028,529	2,533
1904 .....	181,689,998	400,161	42,066,124	2,601
1905 .....	203,467,317	510,350	45,959,101	2,798
1906 .....	237,655,074	506,024	50,618,836	2,950
1907 .....	273,999,404	479,739	53,361,227	3,157

These figures give emphasis to what has been said in a preceding paragraph with regard to facilities. While the number of cars in service was added to by 43 per cent the number of passengers carried grew to the extent of 126 per cent. The effect of this larger traffic was to raise the number of passengers carried from 54,995 to 86,791 per car—a betterment in that respect of 57 per cent. At the same time the car mileage was increased by 68 per cent, and within that period there was a general movement throughout the country, in keeping with the tendency everywhere, to put larger cars into use. The effect of all this was to increase the cost of power 181 per cent, but the account as a whole must be viewed with satisfaction from the standpoint of the companies. The average cost of running an electric car one mile was 14.5 cents, and the gross earnings, reckoned on the same basis, were 23.6 cents. It costs about \$1.25 to run an ordinary railway train one mile. It is not surprising, in view of such results that, despite the capital increments above alluded to, electric railway securities in Canada should stand at a high premium.

During the year special inquiries were made with respect to equipment. The number of cars in service was found to be 3157, of which 75.50 per cent was of domestic manufacture. There had been added during the year 207, of which 45 came from the United States—equal to 21.7 per cent. This would seem to indicate that in earlier years the importations made up a larger proportion of total equipment, which was no doubt the case. At one time nearly all the cars for use in Canada were brought in from the United States, and to this day the importation of parts goes on to a considerable extent; but with the steady growth of the electric railway business it was only natural that shops should be erected in Canada for the meeting of home needs. Geographical considerations alone will maintain imports in any measure under present conditions.

With respect to employees, it was shown that the total number reached 9031, divided as follows: Staff officers, 190; clerks, 483; conductors, 2394; motormen, 2252, and others, 3712. Conductors and motormen were paid all the way from a minimum of \$30 per month to a maximum of 27½ cents per hour, the difference being governed by geographical and other conditions. The lowest rate prevailed in the far East, and the highest in the West. The average remuneration in Ontario was about \$55 per month.

The total wage bill was officially reported as being \$5,291,585, and revealed a significant difference as between the operation of electric and steam railways. In Canada last year the cost of labor of all classes made up 56.59 per cent of the working expenses of steam railways; it represented 68 per cent with regard to electric railways.

The story of accidents for the year is most distressing. In all seventy-one persons were killed and 1736 injured. The fatalities exceeded by one the record for the year of steam railways operating in Canada. Of the persons killed, 27 were passengers, 7 were employees and 37 were classed as "others." The fatal accidents to passengers were in the proportion of one in every 10,148,126 persons carried, as compared with 40,311,552 in 1901. That one employee in every 664 was killed, as against one in every 125 on steam railways, shows the relative measure of hazard, but in respect of injuries the danger in each case appears to be about the same. The chief increase in casualties applies to those who are neither passengers nor employees, and clearly demonstrates that the risk is in an almost definite ratio to the number of cars run and the population directly served thereby. The larger the community the longer is the list of sacrifices.

The outlook in Canada is inspiring. The harnessing of Niagara to turbines has brought into definite shape a number of electric railway projects in Ontario on a somewhat extensive scale, and in other directions there are signs of considerable expansion. The established systems are bound to grow, in view of the centralization of population which is always in progress, aided by a vigorous immigration. This latter influence must also produce large results in the West. Calgary, with a population of 12,000, and Edmonton, with 10,000, cannot much longer remain without street railway facilities, particularly as they have coal at their very doors. A dozen other places are rapidly growing toward the point at which tramways become a necessity, so that the prospect is distinctly in the direction of larger things.

### THEATER TRAINS ON THE INLAND EMPIRE SYSTEM

The Spokane & Inland Empire Railroad has announced the inauguration of a new Saturday night theater train service for the accommodation of its patrons living on the Inland division. The announcement came as a sort of New Year's greeting, special postals being printed for calling attention to the service. A list of the theaters in Spokane is printed with the attractions and the prices. The information is conveyed that for the convenience of its patrons the company has arranged for the making of reservations at any of the theaters through the company's agent at any of its stations. The train leaves the Spokane terminal every Saturday night at 11.30, stopping at all points south to Palouse and Colfax.

### SEEING MEXICO CITY BY TROLLEY

The Mexico Electric Tramways Company, Ltd., of Mexico City, on Jan. 2, inaugurated a special "Seeing Mexico" parlor car service. One trip was made in the morning and one in the afternoon. The cars are white, and very prettily decorated and draped inside. Instead of the regulation seats there are comfortable chairs. Guides who speak both English and Spanish accompany the parties who make the trips over the city in these cars and point out the various places of interest.

**OPERATING NOTES FROM BUFFALO**

The International Railway Company, of Buffalo, N. Y., operates about 360 miles of electric lines in the cities of Buffalo, Niagara Falls, Tonawanda and Lockport, including both passenger and freight service. The handling of the train and car service is under the general supervision of a superintendent of transportation whose headquarters are in the Ellicott Square Building, Buffalo, which is the most central traffic point on the system. In Buffalo there are six divisions, each in immediate charge of a division superintendent, and the usual force of inspectors and starters is attached to each division. The following car houses are the operating centers of their respective divisions, with a rolling stock distribution as shown in the accompanying table:

CLOSED CAR DISTRIBUTION

Car House	SINGLE TRUCK			DOUBLE TRUCK—(5000 TYPE)								Total	
	21'	23'	23'	28'	26'	28'	30'	Special	32'	32'	P.E.		Trailer
Hertel . . . .	9			2						10	50	2	93
Forest . . . .	6	4					10		15	50		14	99
Cold Spring . . . .	25	6	2	30	50	8	40			20		15	196
Broadway . . . .	28					9		25		27		9	98
Walden . . . .	38			23						25			86
Seneca . . . .	26							50		15			91
	132	10	2	55	50	17	50	75	15	147	50	40	663

This distribution was worked out at the beginning of the season to simplify the operating conditions by confining, as far as feasible, separate types of cars to a few houses, instead of scattering them all over the system. The grouping together of similar cars also facilitates light repairs. The Cold Spring car house is the largest operating center, and as this is located close by the company's main repair shops, the larger variety of cars here is not an objection on the ground of standardization. There are 144 single and 519 double truck cars on the system in Buffalo. The cars marked P. E. are fifty new pay-as-you-enters, which were recently placed in service. The forty trailers are used largely in the rush hours as smoking cars. The 147 32-ft. 5000 type cars have been standard for about two years on the Buffalo system, and practically no changes have been made in them except a slight lengthening of the platforms in cases where the pay-as-you-enter feature has been considered for future application.

In general the lines in Buffalo are radial from the central business district to the residential sections and suburban territory. There are two belt lines of cars in the city of Buffalo and two or three long crosstown north and south lines which handle a considerable transfer traffic. There are about twenty-seven street car routes in Buffalo and some nine interurban lines entering the city. The service to the various steam railroad stations is unusually good, and the layout of the different routes enables visitors to get an excellent idea of the city by trolley. Night car service is given on over a dozen routes. While the service in Buffalo is focussed upon the Ellicott Square district, not all the cars are brought into the heart of the city over the same street, but instead three or four parallel streets are used to reduce the congestion which would otherwise be present to a considerable extent. The most noted interurban line out of Buffalo is the route to Niagara Falls, the service being rapid and frequent to this famous scenic spot. Starting from Lafayette Square in the heart of the business district, interurban cars are run to Niagara on 15-minute headway during the busy season, the route being through the west-

ern section of the city and the Tonawandas along the east bank of the Niagara River to the Falls. At the Falls the Niagara Belt Line provides excellent service through the gorge district and between Niagara and Lewiston.

The handling of the car service and standardization of trainmen's duties has received a great deal of attention at Buffalo. Many of the operating rules of the company are those of the American Street & Interurban Railway Association, and in the rule book which all transportation department employees carry these rules are printed in Roman type. The handling of trainmen at car stations has been carefully worked out, and some of the particulars of this branch of the work are given in the following paragraphs.

New men when appointed serve as extras, each man being given an opportunity to work in his turn, the arrangement constituting an endless chain. When a regular run becomes vacant it is assigned to the first extra man, and is retained until the next general listing. When a regular man is off on account of sickness or otherwise and does not report for duty by the first of the following month his run is assigned to the first extra on the list, who holds the run until the regular man reports for duty and is considered a regular man while holding the run. All runs except those designated on the time card by "Ex" are considered regular runs. Extra men getting regular runs do not lose their standing for such work on the following day unless there is a relief in the run, in which case it is considered a day's work.

When occasion requires all regular runs are listed up and given to regular trainmen by order of seniority unless special reasons require other assignments. Wages are allowed for platform time services rendered. Trainmen receive no compensation for time lost while under suspension. A daily bulletin book is posted in a conspicuous place in each station not later than 6 p. m., which shows the names of all extra men assigned to duty for the following day, and also the names of all regular men or extras not on the absentee or sick list. In addition to the bulletin book an extra car service sheet is posted showing the names of all men assigned to extra cars for morning service and again in the afternoon for evening service. Extra men and regular men serving on the extra list are required frequently to examine the bulletin book and extra car service sheet, as one man's name may appear several times on either sheet. In assigning crews for extras, the station clerk calls men from the bottom of the extra list, working upward.

Trainmen are required to report at their station at least ten minutes before the car or run is due to leave the station or relief point. In doing this each man goes to the window and gives his name and run number, and does not leave the window until the station master or clerk has acknowledged receipt of the report by checking the name off on the train book. Extra men bulletined to report at the regular "show-up" are obliged to be in the car house assembly room in advance of the specified time and remain there until after the roll call. Failure to answer the roll call, unless excused by the station master or clerk, is considered a miss. Extra men desiring to lay off for the day are obliged to make known their requests to the station master or clerk at the close of the roll call. Extra men so excused are the last for work on reporting for duty. Extra men on duty until midnight or later can, on application, be excused until the later "show-up" on the following day if they can be spared. All regular men who are laying off, and all extra men who have been excused, are required to report at stations immediately in case of a snow or sleet storm. Train-

men failing to comply with this are subject to discipline. Standard clocks are provided at all stations.

After reporting for duty and before taking cars out trainmen are required to examine the order board and sign the receipt book for such orders as may appear. Failure to do this subjects a man to removal from the car and service on the extra list for the day. When assigned to take a car at a point away from a station special stress is laid upon punctuality. In case of relief trainmen failing to be at the relief point in time to take the car the crew continues the run until relieved, but the misconnection is reported at the company's first telephone to the car station. The station master grants leaves of absence for not over five days. Absentee cards for a longer period have to be approved by the division superintendent. An absentee card is required for all absences above one day. Trainmen on sick leave are not allowed to leave the city without first notifying the station master or clerk and turning over to him the badge, etc., for safe keeping. In case a trainman is unable to report for duty a written notice signed by himself or the attending physician is accepted. In addition, telephone messages are received between midnight and 7 a. m., provided they reach the station at least ten minutes before the time of the run, unless the assignment is at a point away from the station, in which case notice has to be received at least thirty minutes before the run is due to start. Failure to report at the proper time as directed, without notice, subjects men to discipline as follows: For the first offense, two days at the foot of the extra list; for the second offense within six months, five days at the foot of the list, and in addition a report to the division superintendent. Regular or extra trainmen who absent themselves from duty for three or more days without leave are considered dismissed from the service.

After reporting for duty each conductor provides himself with accident and lost article slips, day sheet, envelopes and a supply of transfer tickets, noting that they are for the right line and date, and seeing that the commencing number of the transfer pad is correctly noted on the front of the day sheet. The conductor also provides himself with change and tickets and then compares the register readings on his car with the station clerk's record of them, except at stations where there is a register clerk, with whom register readings are compared. In addition the conductor sees that the car is clean and fit for service and that it is provided with a broom and proper signs.

Each motorman, after reporting for duty, provides himself with a switch iron and three extra fuses; examines the car and sees that the fuse box contains the regular ampere fuse provided by the company; that the car is provided with link, pin and drawbar; that sand boxes are filled, and that sanders, brakes and controllers are in working order. The car house foreman is at once advised of any defective condition.

Before turning a car into a station the conductor sets the registers at zero, changes trolley when necessary and attends to the lighting and heater switches. The motorman sets the brakes and opens the switches as usual. Before going off duty the conductor notes the closing number on the transfer pad, takes register readings, totalizes the day sheet and makes a full settlement of his transactions for the day to the receiver. An accounting of all fares and transfers collected, issued, spoiled or unused is also made at the station at hours specified by the station master. Trainmen are not allowed to enter any car in the station except those to which they have been assigned.

Each conductor is provided with a trip sheet holder measuring when folded once 4½ ins. x 5½ ins. The folder is canvas bound and contains a pocket for report blanks, and a brief set of printed instructions on the inside of the

INTERNATIONAL RAILWAY COMPANY.  
DIVISION SUPERINTENDENT'S DAILY REPORT.

Dec. 18, 1907.  
Broadway Station

To Superintendent of Transportation:

TRAINMEN IN SERVICE				CARS OPERATED	
Conductors Reg.....	95	Motormen Reg....	95	Regular.....	41
" Ex.....	38	" Ex.....	43	" All night..	5
" Sick.....	5	" Sick....	2	Extra A.M.....	42
				" P.M.....	43
Total.....	133	Total.....	138	Total.....	84

TRAINMEN PRACTICING		CARS IN STATION AT 5 P.M.	
		FOR WHAT REASON.	
Conductors.....	Cars in Shop.....	4	.....
Motormen.....	City Cars Crippled..	1	.....
	Inter. ".....	0	.....
	City ".....	0	.....
Total.....	Inter. ".....	2	Yellow Cars.....

CHANGES IN HEADWAY.

LINE	FROM	TO	CARS INCREASED	CARS DECREASED	REMARKS
					No Changes

ACCIDENTS—(Number Reported)....2

CARS CHANGED.

CAR	LINE	TIME	DEFECT	REMARKS
721	Lancaster	10.07 A.M.	Blows over Head Switch	
125	Fillmore	2.15 P.M.	Scrapers Broken	
170	"	2.56 P.M.	Flat Wheel	
5072	Broadway	4.45 P.M.	Blows over Head Switch	
83	"	5.30 P.M.	Trolley Base Bent	
715	Lancaster	10.25 P.M.	Motor Trouble	
TOTAL,				

(REPORT HERE ALL MEN EMPLOYED ON FOLLOWING ACCOUNT NUMBERS).

DIST.	DESCRIPTION OF WORK	MEN	HOURS	COST
22	Cleaning Lamps	1	40	72
23	Sand Car			
23	Cleaning Switches and Curves	2	160	288
24	Cleaning Switches and Curves of Snow			
24	Snow Plows			
24	Hauling Snow			
24½	Hauling Freight			
Total		3	20	360

STATEMENTS OF DELAYS TO LINES.

LINE	CAR	LOCATION	CAUSE	DELAY	
				From	To

Division Superintendent.

(NOTE—This Report to be made in ink and reach Supt. Transportation 10 a. m. daily.)

DIVISION SUPERINTENDENTS' DAILY REPORT.

cover stating the essential points to make sure of in case of accident, including aid to injured parties, witnesses and notification of the company's officials. Each pocket also contains a printed list of numbers from 1 to 206 on the

Buffalo lines and from 207 to 222 on the Canadian division, showing at what points on the system a car can be turned. In case a car turns at any of these points the conductor notes the point number and time on his trip car to facilitate the calculation of mileage by the clerks at the car houses.

Each day a report of the operating conditions is submitted by each division superintendent to the superintendent of transportation, as illustrated in the accompanying form. The original form is 8½ ins. x 14 ins. and it shows the number and status of trainmen, cars in service, in the shop and taken off the lines for any reason, accidents, changes in headway, men doing special work at car houses and on the line and new men practicing.

The performance of the different lines in the way of earnings and schedules is summarized each day in the superintendent of transportation's office on a form reproduced herewith, the original being about 11 ins. x 18 ins. Each sheet shows for each line of cars the earnings for the day compared with those of the same corresponding day of the week a year ago, the percentage of transfers in the day each year, headway, extra and regular service, earnings per car hour and per car mile, and the schedule speed for

**DEPRECIATION OF PUBLIC UTILITY PROPERTIES**

At the meeting of the Northwestern Electrical Association at Milwaukee, Wis., Jan. 15-16, C. N. Duffy, comptroller of the Milwaukee Electric Railway & Light Company, read a paper on "Depreciation." This paper was mentioned editorially last week. It referred especially to electric light companies operating under the new Wisconsin public utilities law, but many of the points brought out apply with equal force to street railway properties operating in any state. A digest follows:

The new Wisconsin public utility law (section 1797 M-15, paragraph 1) provides:

Every public utility shall carry a proper and adequate depreciation account, whenever the commission after investigation shall determine that such depreciation account can be reasonably required. The commission shall ascertain and determine what are the proper and adequate rates of depreciation of the several classes of property of each public utility. The rates shall be such as will provide the amounts required over and above the expense of maintenance to keep such property in a state of efficiency corresponding to the progress of the industry. Each public utility shall conform its depreciation accounts to such rates so ascertained and determined by

INTERNATIONAL RAILWAY COMPANY

REPORT OF EARNINGS

Weather.....  
.....190

Weather.....  
.....190

	EARNINGS		% TRANSFERS		190 CARS 190						PER MILE		MILEAGE		PER HOUR		CAR HOURS		Average Speed Miles per Hour		
	190	190	190	190	HEAD-WAY	REG. M T	EX. M T	HEAD-WAY	REG. M T	EX. M T	190	190	190	190	190	190	190	190	190	190	
BUFFALO DIVISION:																					
Best																					
Broadway																					
Broadway Stub																					
Cazenovia																					
Clinton																					

DAILY REPORT OF EARNINGS ON CERTAIN LINES OF THE INTERNATIONAL RAILWAY COMPANY.

the current day and preceding year's corresponding week day. Analysis of the performance of each line is thus made easy, and the schedules can be studied in the light of earnings.

The Ocean Shore Railroad Company has completed the only tunnel that it will have on the entire line of 78 miles, from Eleventh and Market Streets, San Francisco, to Santa Cruz, more than 70 miles of the run being along the edge of picturesque cliffs or skirting the crescent curves of the numerous little havens that mark the undulating coast line of the little known part of the California shore that this new road will make famous. The tunnel is only 340 ft. long, but it is through solid rock. This point on the line is 20 miles down the line at a place called San Pedro Point, a few hundred yards beyond the present temporary terminal of the daily car service now maintained by the company. Of the 78 miles of proposed road to Santa Cruz the company has 13 miles under operation at the Santa Cruz end and 18 miles in operation at the San Francisco end. The completion of the San Pedro Point tunnel, heavily timbered, double-tracked, 28 ft. wide, 23 ft. high, and the completion of the difficult cliff grading for several miles beyond the tunnel represent the most expensive and trying work on the line.

the commission. The commission may make changes in such rates of depreciation from time to time as it may find to be necessary.

Depreciation as here used may be defined as a "lessening of value." This lessening of value may be brought about, as far as physical property is concerned, from any or all of the following causes:

1. Deterioration due to the ravages of time and the effects of the elements.
2. Wear and tear incident to use.
3. Displacement by reason of obsolescence or supersession, resulting from the development of the art.

The ravages of time and the effects of the elements will eventually cause physical property to deteriorate or disintegrate to such an extent as to render it valueless and unfit for use. From this there is no escape.

Wear and tear of physical property resulting from use, sooner or later, in spite of maintenance, unless maintenance is understood to include replacements and renewals as well as repairs, will be followed by the state of being depreciated. Ultimately replacements and renewals will be required when repairs are no longer possible or economical. In its relation to depreciation the whole question of maintenance, whether understood to cover replacements and renewals large or small, or restricted to repairs, is an im-

portant factor. The measure and extent of depreciation of physical property is dependent, in so far as wear and tear incident to use is concerned, on the amounts expended for maintenance in the physical upkeep of the property.

The displacement of physical property rendered obsolete by the development of the art is a contingency which must be recognized and provided for. Take, for example, the evolution of the power generating plant. The high speed, direct-belted units adopted as standard in the early days were superseded by slow-speed multipolar generators, direct belted to Corliss engines. These in turn were superseded by generators direct connected to horizontal or vertical engines. The direct-current generators were not so very long ago replaced by alternating-current machines in the central stations. With the introduction of the steam turbine the slow-speed alternating generator was replaced by the high-speed type and to-day this is the standard in the most recent power plants. But the development of the gas engine as a prime mover may result in discarding the steam turbine in favor of a more economical machine. George Gibbs, in testifying in the case of the Third Avenue Railroad Company of New York against the State Board of Tax Commissioners said: "I never yet did a piece of work that extended over any considerable time, but that when it was finished is was rather antiquated and had to be done over again. It is a new science." This phase of the problem must not be neglected in considering the allowance to be made for depreciation.

It is a different matter to lay down a fixed rule that will determine the measure of depreciation to be provided for and cover in a practical manner the wide differences in conditions on every public utility property. Broadly speaking the most correct method to pursue would be to arrive at the estimated average life of the different kinds of physical property dealt with, determining this life on the basis of type, methods of construction and installation, as well as the character and extent of its use and the conditions under which it is used. Climatic conditions, the character of the soil, as well as other similar factors, should be taken into consideration. For example, the conditions of soil and climate would materially affect the life of ties, pole lines and buildings, especially if the latter are of wood construction. The kind of water used for the generation of steam is an important element in determining the life of boiler tubes.

The measure of "depreciation" to be provided for, as finally determined on the basis outlined and suggested, and expressed in dollars and cents, worked out in detail for each class of physical property, should be taken up in the accounts monthly. This may be done, as a matter of detail, by one of the following methods:

1. Operating expenses in the appropriate accounts should be debited and "Depreciation Reserve" credited, with the monthly proportion of the total annual depreciation charge based on appropriate unit costs.

2. The monthly proportion of the total annual depreciation charge, based on unit costs, could be treated as a deduction from net earnings from operation, and the amount so deducted credited to "Depreciation Reserve."

The monthly proportion of the total annual depreciation charge, regardless of what the charge may be, based on unit costs, could be treated as a deduction from net earnings from operation, based on the percentage said charge bears to the estimated gross earnings for the year, and the amount so deducted credited to "Depreciation Reserve."

If the depreciation reserve, so created, is to be something more than a mere book-keeping reserve, and the amounts

thus set aside actually invested in interest-bearing securities, the interest earned on such securities should be credited to depreciation reserve.

It should be understood, of course, that when replacements and renewals of physical property are made, the cost should be charged against depreciation reserve.

If the first method suggested is followed, the depreciation charge introduced in operating expenses should be specifically stated and shown in the appropriate operating expense accounts. If this is not done there will be no way of showing ordinary maintenance charges separate and distinct from depreciation charges, and operating expenses will not clearly show actual results.

Unquestionably, the first method proposed is more scientific than the second or third, but the two latter will be found easier to work out and apply. Either of the three suggested will accomplish the same results, in so far as ascertaining, on the same basis, what the net income applicable to return on investment actually is. The measure of depreciation to be provided for is the vital question; the method of its application, if sound and correct, is of secondary importance.

The Milwaukee Electric Railway & Light Company, since Jan. 1, 1898, has followed the third method suggested. John I. Beggs, president and general manager of the company, is a pioneer in recognizing and providing for depreciation. He not only had the wisdom and foresight ten years ago to recognize depreciation, but the courage of his convictions, in the administration of the property, to carry out the policy of providing for it in its accounts and finances.

In addition to providing for depreciation, as previously defined, provision should be made for a shrinkage in the value of the physical property, if, through necessity, it is disposed of as junk or scrap at the expiration of limited term franchises. The amortization of capital liabilities, for which there may be no tangible assets, should also be provided for, or sufficient return on investment be assured, to justify capital assuming the risks attendant on the business.

Depreciation and amortization must be reckoned with, in determining the cost of furnishing any public service, together with interest on investment, as well as the cost of operation, the general expenses incident to the conduct of the business, and taxes. Indeed, to this cost should be added adequate charges to cover reserves for unliquidated damage claims and provision for contingencies before the true cost of operation can be fully and absolutely determined. The subtraction of ordinary or current operating expenses and taxes from gross earnings does not represent net earnings available either for interest on bonds or dividends on stock.

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The first action by an electric railway company to condemn property under the right of eminent domain was decided Dec. 19 by Judge McConnell in its favor. The Pittsburg & Westmoreland Railway Company wanted a small strip of land just outside the borough, owned by Thomas H. Irwin. He asked \$5,000, which the company declared exorbitant. The corporation condemned the property, offering bond to cover whatever damage a board of views might fix. The court held that only two questions were involved, the right to condemn and sufficiency of the board. The owner fixed his damages at \$5,000, but on cross-examination said his property would not be of less value after the line was built than it is at present. The bond was fixed at \$1,000 and approved by the court.

**FIRST AID TO INJURED EMPLOYEES**

BY J. Q. BROWN,

Assistant General Manager and Engineer, Oakland Traction Consolidated Company, Oakland, Cal.

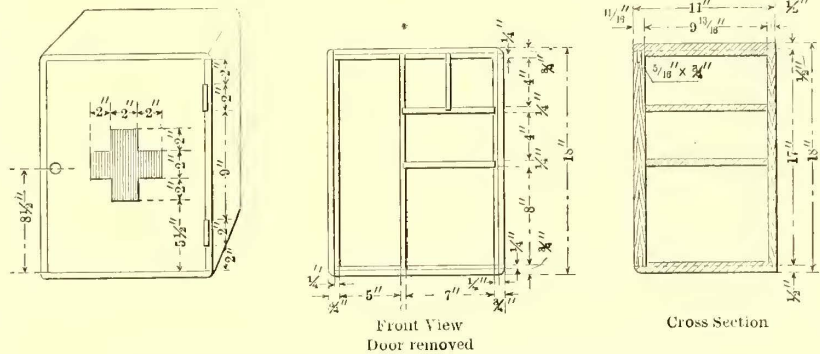
Few roads, even those of considerable prominence throughout the country, give any special attention to caring for employees receiving slight injuries. Generally, when a man is hurt, his fellow workmen try to "do something," but they have little idea what to do and seldom have any available remedies. Consequently, the injured man has to await the arrival of a surgeon, and for many minutes, and sometimes hours, suffers with pain which could be allayed to some degree if a few simple medical supplies were at hand.

In view of this fact, the writer has caused to be installed in the various power stations, car houses, shops, overhead depots, steam-boats, work cars, etc., of the Oakland Traction Company and the Key Route, medical or Red Cross cases such as are shown in the accompanying illustrations. Over each cabinet is a framed copy of emergency instruction which all men are expected to read carefully. These instructions state briefly the proper course to pursue in the case of different accidents causing hemorrhage, fracture or burn with the suggestions of value in emergencies of this kind. A large red cross is painted on the outside of these cases and on the instructions to attract the attention of all workmen.

The key of the cabinet is in the care of the foreman or man in charge of each gang of men, or hung with a large

This list is posted on the inside of the cabinet door and bears instructions to the man in charge to see that at all times the stock is complete. A diagram is also given showing the dimensions of the case now in use. The cost of the outfit is very small and the benefit to be derived from it in times of emergency is invaluable.

This description is submitted, hoping that it may be of



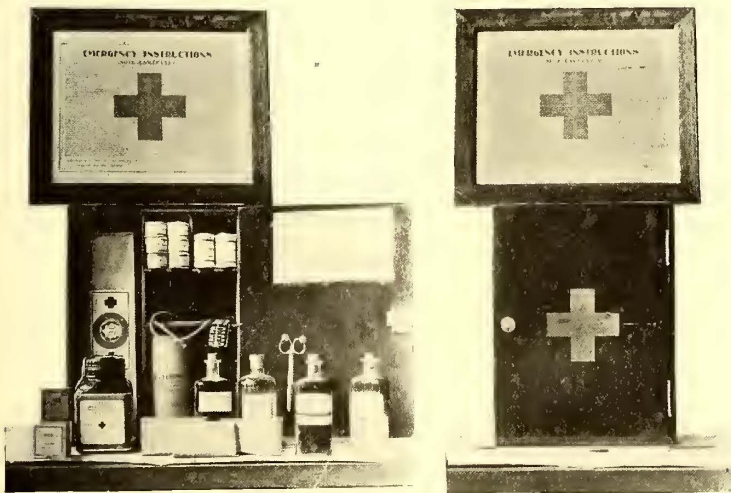
DRAWING SHOWING DIMENSIONS OF EMERGENCY BOX.

use to various employers and of some benefit to mankind when the injured need care.

**DELAY IN IMPROVED SURFACE TRANSIT BETWEEN SULLIVAN SQUARE AND MIDDLESEX FIELDS RESERVATION, BOSTON**

Complications as to a bridge over the Boston & Maine Railroad tracks will delay the opening of the Boston Elevated Railway Company's new surface line between Sullivan Square terminal and the Middlesex Fells Reservation until late next summer, at least. The bridge lies between the Elevated's present surface tracks in Main Street, Charlestown, and the beginning of the new tracks recently laid in Mystic Avenue, Somerville, the steam railroad being practically the boundary between the two municipalities, but the structure is too weak to carry the new heavy semi-convertible, easy access, folding-step cars now standard with the Boston Elevated for suburban lines, and the company will not, it is understood, care to incur the expense of rebuilding that part of the bridge that would be required for its trucks until money conditions are easier. Until the tracks are connected across this bridge, however, the entire new trackage, now completed through Mystic Avenue, Somerville, and the Middlesex Fells Parkway, about three miles, to the Pleasant Street car house on the Malden-Medford line, will be practically useless. If this much of the new parkway line could be placed in operation at once it would give a short city connection from the West End of Malden and also from the Highland Avenue district of Malden, where the company's existing line is a "dead end" by reason of a railroad grade crossing which the street railway can get no authority to use. The rest of the parkway line, northward from Pleasant Street, Malden, to Spot Pond, near Stoneham, will not be constructed until the widening of the present highway thither is finished, some time next summer.

The Scioto Valley Traction Company shows an increase in earnings of approximately 14 per cent for the first two weeks of January over the corresponding period of last year.



EMERGENCY BOX, OPEN AND CLOSED.

tag in a prominent place. The following articles are compactly arranged in their proper places:

- 8 oz. Listerine,
- 8 oz. Tincture Arnica,
- 1 16-oz. pkg. Absorbent Cotton,
- 1 Roll Z. O. Adhes. Plaster, 1/2 in.,
- 1 Pkg. Iodoform Gauze, 2 ins.,
- 6 Rolls Plain Gauze, 1 in.,
- 1 Pkg. Safety Pins,
- 8 oz. Caron Oil,
- 8 oz. Whiskey,
- 1 Roll Z. O. Adhes. Plaster, 2 ins.,
- 3 J. & J. First Aid Pkgs.,
- 2 Rolls Plain Gauze, 2 1/2 ins.,
- 1 Pair Small Surgeons' Scissors,
- 1 Rubber Tourniquet.

**RECENT LONDON CONDUIT CONSTRUCTION**

A paper descriptive of the changes made in the conduit construction of the London County Council since the early portion of the work was presented Jan. 8 by F. R. Rose of the Council's engineering department before the Junior Institute of Engineers of London. According to Mr. Rose there are now 104 miles of single track equipped with conduit, belonging to the London County Council, south of the Thames and about 50 miles north of the Thames:

The conduit is now made 1 ft. 4 ins. wide instead of 1 ft.

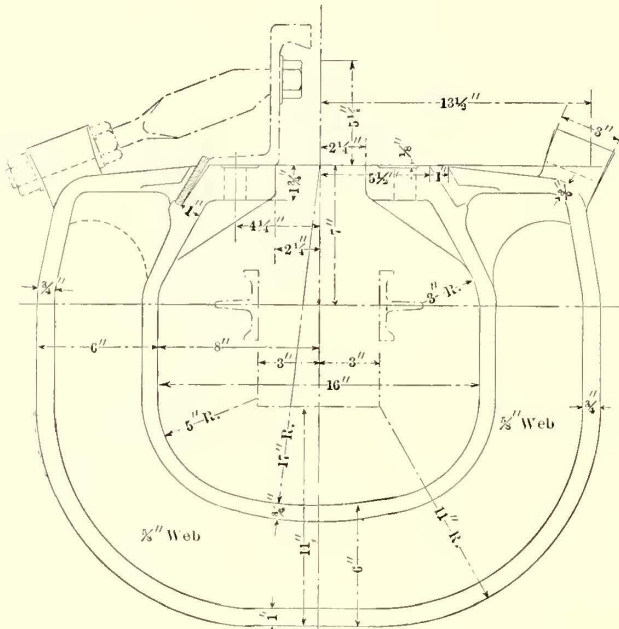


FIG. 1.—SHORT YOKE.

2 ins., as with the latter size there was not enough clearance between the conductor bars and the side of the conduit to prevent mud from accumulating and causing leakage of current. The filling used is 6 to 1 concrete, instead of 5 to 1.

The yokes are of two patterns (a short and an extended).

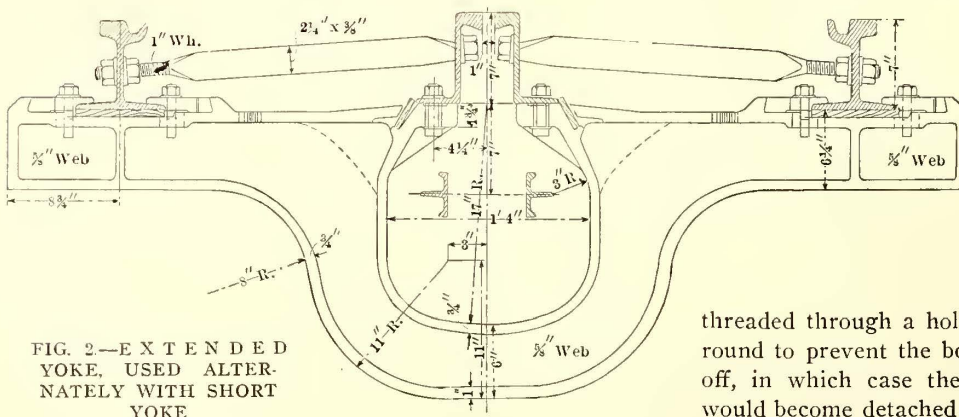


FIG. 2.—EXTENDED YOKE, USED ALTERNATELY WITH SHORT YOKE

The short one (Fig. 1), with the exception of an extra 2 ins. in width to insure greater air gap behind the conductor bars, is similar to the original pattern. These short yokes are placed in the trench at distances of 7 ft. 6 ins., and alternately, at distances of 7 ft. 6 ins. apart, extended yokes, 6 ft. 3 ins. from tip to tip (Fig. 2), are placed.

The extended yokes, besides carrying the slot rails, form anchors, to which the track rails are fixed every 7 ft. 6 ins. They are similar to the short yokes with the exception

of the two extended arms, each of which terminates in a bolting-up face 14 ins. x 7 ins. Each bolting-up face contains two slotted holes, 2 in. x 7/8 in. and is recessed to take a hardwood packing 5/8 in. thick. The method of laying the track is the familiar one of placing the yokes in the trench, and erecting the track and aligning it. The moulds to form the center of the conduit are then set in place and the concrete is packed in. The centering originally employed was of wood, but that now used is of 1/8-in. sheet iron. These sheet-iron forms are kept extended by levers which are collapsible. After the concrete is set the form is removed.

The insulator pockets, instead of being covered by cast-iron boxes, are now fitted with a cast-iron plate. (Fig. 3.) This plate is 2 ft. x 1 ft. 8 ins. in area, and 3/4 in. thick. It has strengthening ribs 2 ins. deep and 5/8 in. thick running longitudinally and transversely, and a portion of the front edge next the slot rail is recessed to clear the insulator. It is covered by square paving blocks known as "dumplings." These covers are considered a great improvement in some ways on the original boxes, which latter, as they became worn by the traffic, had to be replaced, and were also the cause of a great deal of dirt getting into the conduit. The chief disadvantage of the new covers, and one which may prove most serious, is that access to the insulators can only be obtained by ripping up the paving, which takes time. There are only a few miles laid with cover plates at the present time, and it remains to be seen whether they will be universally adopted.

Two improvements have been adopted in the conductor rails. One is that the end of each rail is bevelled off, minimizing the chance of plow shoes being caught by bad joints. The other is that the conductor rail, with the exception of the rubbing surface, is coated with a preservative paint.

One or two improvements have also been adopted in the construction and erection of insulators, which are set with cement into porcelain sockets, as in the New York and Washington construction. The pin is now made with a square shoulder to prevent turning when being bolted up. There is also a piece of 3/16-in. galvanized iron wire

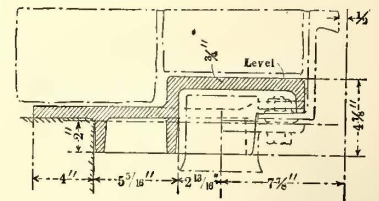


FIG. 3.—VERTICAL SECTION OF INSULATOR BOX, SHOWING PAVING BLOCK COVER.

threaded through a hole in the end of the pin and twisted round to prevent the bottom nut working loose and falling off, in which case the conductor bar, losing its support, would become detached from its proper position. The usual split pin is not employed here, as any shock tending to loosen the insulator pin in its cement setting must of course be avoided. The cement filling is now only inserted to within 3/4 in. of the top of the porcelain cup instead of 3/8 in. as formerly, as it was found that moisture collected here, and leakage of current occurred, sometimes resulting in a burnt-out insulator.

With the exception of these slight alterations, the insulators retain their original design. When the insulators are assembled, they are left to set for eight weeks, and



before being erected in the road, they are submitted to a mechanical and electrical test. The former consists of bolting the insulator to a beam and leaving a weight of about 1 cwt. suspended to the pin for a certain time. If the pin remains rigid the insulator is taken to a sub-station to undergo the electrical test, which is effected by first immersing it in water and then placing it with a number of others upside down in tanks of water to half the height of the casting, and connecting the pins in circuit with a pressure of 2000 volts. Should no leakage occur after 15 minutes, the insulators are considered fit for use.

### PENDING PUBLIC UTILITIES LEGISLATION IN OHIO

At the annual banquet of the Central Electric Railway Association held at Dayton, Ohio, Jan. 23, Judge Dennis Dwyer, president of the Dayton, Covington & Piqua, spoke on the bill pending in the Ohio Legislature which proposes to raise the major part of the state revenue from taxes on public utility properties. This measure, known as the Howe bill, is favored by Mayor Johnson, of Cleveland. Judge Dwyer said in part:

The so-called Howe bill relieves all real and personal property of individuals from all forms of state taxation, except inheritance taxes, and proposes to raise sufficient revenue for state purposes from licenses, taxes on intoxicating beverages and on public utility and other corporations in the form of franchise and excise taxes. Each county and municipality would be free to levy and collect taxes for their needs without any partnership with the state either in assessment or distribution. The plan suggested is more simple in its operation than the one at present in force; the only objection is the danger that such a method of raising the entire revenue for the state in such a manner will lead to reckless extravagance in legislature appropriations. When the taxes to be raised do not directly affect the individual citizen, when he does not see the money come out of his pocket, he is liable to become indifferent as to the amount to be levied and collected, and this situation affords the best opportunity for vultures and schemers who are anxious to fatten on liberal legislative appropriations. We hear every day of new suggestions as to how more revenue can be raised from corporations. At the present the author of the bill boasts that if it passes \$12,000,000 will be raised annually from excise, franchise and other taxes on public utility and other corporations.

Corporations are composed of individual stockholders who invest their money in the expectation of profit, but in a great many cases they are unfortunately disappointed. The interurban electric railways of Ohio have been disappointing so far in this respect to their stockholders. The report of the Ohio Railroad Commission for the year 1907 gives the names of fifty-eight interurban electric roads in the state with an aggregate capitalization of \$114,326,903, with gross earnings of \$12,256,659 and with operating expenses of \$7,403,396, about \$4,000,000 of which had been paid out for labor, leaving for interest on bonds, insurance, taxes, maintenance, betterments and dividends on stock \$3,984,558. Of this only \$628,570 was available for dividends. Three of the roads reported show a deficit, making them practically insolvent, and only eight out of the fifty-eight roads paid any dividend and these only from 2 to 5 per cent. If the aggregate of dividends paid should be estimated on the capital stock of \$114,326,903 it would amount to only three-fifths of 1 per cent. It may be said, however, that the capitalization of the electric railroads is

too high, that there is too much water in the stock. Conceding for the sake of argument that the capitalization is too high and that it be cut down one-half, which is far below the actual cash cost of the roads. Even then the dividends declared would not be over 1 1-5 per cent on the entire capital stock so reduced. There is danger that the present tax rate of nearly 6 per cent on the gross earnings of the interurban street railroads will be greatly increased if the new scheme of legislation becomes a law. It is evident that any further increase of taxes will result in forcing many of the interurban street railroads into the hands of receivers. At the conclusion of Judge Dwyer's address J. Sprigg McMahon explained more fully the purposes of the bill and the methods proposed of arriving at the tax value of the properties. He read a circular letter of protest against the passage of the act and a resolution was offered that the Central Electric Railway Association endorse the protest and use every effort to defeat the bill. After some discussion the matter was referred to the executive committee of the association for action.

### CONVENTION OF THE CENTRAL ELECTRICAL RAILWAY ASSOCIATION

The rapidly growing importance of the Central Electric Railway Association was evidenced by the large attendance and great interest that marked the second annual meeting and banquet which took place at the Phillips House, Dayton, Ohio, Thursday, Jan. 23. Many prominent men from Ohio, Indiana, Michigan and other sections of the country were present and especial attention was given to all details brought out in the various papers and the discussions which followed. This may have been the result to some extent, at least, of the organization of the traffic men on the preceding day and the fact that a radical step in advance was about to be taken. Whatever the cause there seemed to be renewed zeal and greater hope in the future of the work than had ever been evinced before, although this is putting the assertion strongly, for the members of the organization have been faithful in the past and determined to make the association a success.

Realizing that the fullest measure of success for the electric railway companies lies in the direction of co-operation in every way possible, the officers and members are anxious that the membership be extended, not only among the roads but among individuals as well, since it has been shown that many good ideas come from a large membership. For this reason all in attendance at Dayton were urged to interest others with whom they come in contact and get them into the organization. As Secretary Milholland put it, both men and money are needed that the work may proceed with the desired rapidity.

In opening the meeting President Nicholl presented a review of the work of the association during the past year in the form of an annual address. This is published on another page. At its conclusion he was given a rousing ovation.

After the reading of the minutes of the Indianapolis meeting by Secretary Milholland a paper on "Promotion of Traffic" was read by Charles F. Price, general passenger agent of the Western Ohio Railway Company. This paper was published last week.

President Nicholl opened the discussion by saying that, as 95 per cent of the income of electric roads comes from the passenger traffic, the paper was of the greatest interest and should bring out a lively discussion.

In answer to a question as to whether the Western Ohio gives passengers the benefit of twin tickets, such as are used in competition with the interurbans by steam roads, Mr. Price said that since the State Railroad Commission had ruled on that question the Lake Erie & Western and other competing steam roads had ceased to issue such tickets. This relieved the Western Ohio of the necessity of meeting such a cut. George Whysall, general manager of the Columbus, Delaware & Marion, stated that the Hocking Valley Railway, a direct competitor, is still using twin tickets and that he would like to discover some reason why it should not, since his lines would be benefited by a discontinuance of the practice.

Mr. Brown, of the Michigan United, stated that his company had ceased to advertise in the newspapers on a cash basis as far as possible and is confining its business of this kind to exchange contracts. Special advertising in the way of handsome cards which merchants will be glad to hang in their windows have been found very helpful, he said, especially when announcing special trips or exclusive features of any kind. Mr. Price said that until the first of last year the Western Ohio had had exchange contracts with the newspapers, but that through 1907 the company had done its advertising on a cash basis and found the results much better.

E. C. Van Valkenburgh, an electric railway advertising man of Chicago, mentioned the Trolley Tourist, published by some of the New England roads, and suggested that it afforded an excellent medium for advertising. It not only contained the time tables, but much interesting matter regarding the towns and points of interest reached by the various roads. It was intended for circulation among the general public. A small subscription price, sufficient to cover the postage, is charged for the publication where it is sent regularly. The speaker said that time tables in the newspapers are good if they are complete and are given a good position. He was questioned as to how a time table could be arranged for publication if every train or car was mentioned. One reply was that the time of the first train each day could be given and then the statement made that trains run every forty minutes or every hour thereafter, but this was not considered satisfactory, since the reader would be compelled to calculate the time of all other trains and if fractions of an hour had to be considered mistakes would be made. Mr. Van Valkenburgh said he believed a complete schedule might be worked out for most roads that would not take up a large space in the papers.

For the excursion business it was suggested that window cards, with good cuts, are perhaps as effective as any other form of advertising. The proper manner of using these cards and the methods of getting them into windows were not discussed. One important fact brought out was that every piece of literature should contain the trade-mark of the company. All agreed that this is important and that individual roads should be identified as far as possible by their trade-marks. It was stated that most of the steam roads are doing very little advertising now and that for this reason the publicity given the electric roads will be so much the more effective.

Mr. Thompson, of Seymour, Ind., stated that he believed it would be a good plan to advertise all over Ohio, Indiana and possibly Illinois. He suggested a folder, containing from sixteen to twenty-four pages, printed in two colors and nicely gotten up. The discussion then turned to the cost of folders and the number that would be necessary to

use if such a plan were adopted. The kind of matter that such folders should contain was also discussed. The prevailing opinion seemed to be that folders to accomplish the purpose should be of good quality and should contain the time tables of the road, some of the advantages it offers for travel and possibly a panoramic view of the territory covered. The circulars used by the Lake Shore Electric of Cleveland were mentioned as examples. In addition some of the interesting points reached might be described and a few illustrations published.

F. J. J. Sloat, of the Ohio Electric Railway Company suggested that an inch or two of space in the newspapers in the towns through which the lines pass would be sufficient to give the time of trains in each place and that space of this size would serve the purpose well. It would call attention to the road and would give some general information, while details could be secured at the office.

H. P. Clegg asserted that the electric railway companies are depending too much on the old steam road systems of advertising, with their time tables and other things of the kind. He said they should do something to create talk. This will advertise them more than any other one thing. Library chairs in the smoking cars will do more to popularize the roads than a considerable amount of printed schedules. Traffic officials should take advantage of everything that will cause favorable comment about the roads. It was suggested that such innovations would be expensive, but Mr. Clegg asserted that it would be worth all it cost.

President Nicholl suggested that the plan of publishing a pathfinder or wayfinder, discussed a year ago, be taken up again. Since a traffic department has been organized a publication of this kind could be maintained to good advantage, he thought. J. C. Rothery, of East Liverpool, thought that a good folder, giving full information would serve the purpose if the roads give good service. This, he said, must be such as will make every passenger a walking advertisement for the road. As features making up such a service he mentioned good cars, a first-class roadbed, rapid schedule and courteous employes.

A traveling man stated that it was difficult to get information about electric railway schedules from the average hotel clerk and that some publication giving such information should be supplied constantly to hotel offices. This brought out the statement that an eight-page card had been put out at Lima at a price of \$2.50 per 1,000, with a schedule for over 100 miles of track, a map and a great deal of general information. This would be suitable for hotel offices and would furnish such information as travelers desire.

Mr. Wilson, of the American Engineering Corporation, made an earnest talk on advertising and told of some of his own methods promoting publicity. He said he had spent thirteen years in the newspaper business and thoroughly believes in that kind of advertising, but that it should not end there. He advised the use of good paper and good illustrations in all kinds of advertising matter, as people will pay little attention to any other kind. Moreover, the quality of the advertisement indicates the quality of the merchandise, equipment or railroad service that it is intended to benefit. He said he would prefer to have a few people read a good advertisement from his office than to have many read a poor one. Different kinds of advertising interests different classes of people, but in railway advertising all classes must be reached. Necessarily the traffic man must put considerable thought upon the advertising he does and make it such that it will appeal to

the people. To have a good effect it must be of superior quality in every respect. Cheap advertising never pays.

Mr. Clegg said he thought that the freight service should also receive some attention while advertising was being discussed and suggested the use of post cards as a means of keeping shippers informed that electric roads furnish a cheap and economical way of transportation. He said that they should be constantly told that there is a freight office in every town and shown the advantages the roads have to offer. This constant hammering, he said, would produce the desired effect in time. The strong point made in all the talks, however, was that good service must be furnished as well as publicity.

#### BLOCK SIGNALS

The paper on "Telegraph Signal System," by Chauncey P. Button, manager of the Telegraph Signal System Company, Rochester, N. Y., excited a great deal of interest. This paper was published in part in the STREET RAILWAY JOURNAL for Jan. 26. In the discussion Mr. Button stated that his work so far in the electric railway field has been in the nature of educating and instructing railway men to the necessity for a protective device of the kind shown. The device may be adopted by electric roads with equally as much advantage as the steam lines. The most important feature about an equipment of this kind is that it will prevent head-on collisions and the multiplication of damage suits. The cost is nominal and within the reach of all.

President Nicholl stated that the Indiana Union Traction Company has the system in operation on one line and will install it between Indianapolis and Muncie. G. H. Kelsay, superintendent of power, said he co-operated with Mr. Button in the installation of the system over portions of the Indiana Union lines and added a few suggestions to make it fit the special conditions found there. The dispatchers are able to handle it with satisfactory results, he said. The important feature is that it always returns a record of the signal thrown to the dispatcher's office which is printed on a tape as well as sounded. Mr. Kelsay said that the lights in the semaphores are turned on by the substation operator. The semaphores are set midway from the ends of the sidings and on the opposite side of the turnout. Most of the semaphores are furnished with two 300-volt lamps wired in series with those at the ends of the siding, so that the light at one end may be out and those in the semaphore still burn. He said he was not satisfied with the source of the current, as sections of the trolley or transmission lines might be out for some reason and the lamps thus be dark. He thought there should be an independent circuit from the battery, controlled from the dispatcher's office. This would give a constant current.

Mr. Button had an equipment with two semaphores set up in the room and demonstrated its operation in every detail, answering meanwhile a number of questions brought out as the demonstration proceeded. He showed how a change could be made from a lower to a higher number if the key or plug is moved before the report from the first semaphore begins to sound, or, in other words, before the hand on the clock reaches the lower number. This always indicates the time the signal will operate. He stated that he would always operate according to train rules and not endeavor to operate trains against this signal, although it could be done without danger.

#### BRAKE RIGGING

At the opening of the afternoon session R. C. Taylor,

chairman of the standardization committee, read a paper on brake rigging. This paper is published elsewhere in this issue.

In the discussion the point that received the greatest attention was the proposition to stop cars within a shorter distance than has been the practice in the past. Mr. Taylor was asked to name the shortest distance he considers practical for stopping a car running fifty miles an hour and weighing forty tons. He replied that 500 feet should be sufficient and that he believes, with the recommendations in the paper followed, it could be done in half that distance. Mr. Rothery said that a stop in that distance would be almost as violent to the passengers as a head-on collision. A railroad train running forty miles an hour could not be stopped within 500 feet, he said, and he did not believe that an electric car could be brought to a standstill in the distance named with safety. Mr. Taylor replied that steam railroad trains have been stopped within very short distances, in some instances 450 feet, and that the full pressure of the brakes was not used then. The trouble is that sufficient pressure is not applied when retardation commences. If the maximum pressure is applied at the beginning and kept just so that skidding will be avoided the results will be much better than past experiences have shown. He thought that motormen still have much to learn about effective braking.

S. D. Hutchins, representative of the Westinghouse Air Brake Company at Columbus, said he believed that Mr. Taylor is working along right lines, as indicated by his paper. Steam roads at times use a higher pressure than is mentioned in the paper. Occasionally 95 lbs. pressure in the cylinder is used when running at a speed of sixty miles an hour. Roads are working out plans for a rigging that will operate with reduced pressure in proportion as the speed of the train is reduced. Magnetic brake operation was peculiar in that skidding relieved the pressure by stopping the generation of current that produced it. When the wheels ceased to skid and began revolving again the brakes were again picked up. This is an ideal method of braking. Mr. Hutchins explained that 100 per cent of the light weight of a car may be taken as the basis for braking, but it is ordinarily worked at 90 per cent, with 50 lbs. pressure in the cylinder. In braking at 100 per cent, with 50 lbs. on the piston, excellent results may be obtained, but a little greater move gives 60 pounds on the piston, which will give 120 lbs. braking power. Every railroad manager, said Mr. Hutchins, is seeking those devices that will still further protect the lives entrusted to his care. Mr. Hutchins criticized the truck manufacturers for not making more ample provision for installing brake equipment and said the association is in good position forcibly to bring this matter to the attention of manufacturers. As brake equipments must be installed along rigid lines on some trucks a little wear of the shoe will cause fouling and there will be trouble soon after the car is put into service. Aside from a good foundation there should always be plenty of room for the levers and every provision possible should be made for their proper operation. The speaker said he thought 1000 feet a reasonable distance within which to stop a car and that steam trains sometimes take as low as 900 feet, but this is short.

Mr. Taylor said that he had addressed a letter to all the truck builders in the country asking for information as to what lever ratio would be preferable for use. He heard from but two and their ideas were so different that they could not be reconciled. He said that the brake manufac-

turing companies should get up something that may be considered as standard in this respect.

A representative of the Baldwin Locomotive Works stated that the truck manufacturers would welcome any information which would make their product better adapted to operation.

On motion of C. N. Wilcoxon the report was adopted with instructions to place it before the standardization committee of the American Street and Interurban Railway Association.

Following this Mr. Norveil read the articles of agreement of the Central Electric Railway Traffic Association which were adopted by the parent organization.

The report of the nominating committee, composed of Messrs. Norveil, Whitney and Ohmer, was read and adopted, the secretary being instructed to cast the unanimous vote of the organization for the candidates proposed, with the following result: President, F. D. Carpenter, general manager Western Ohio Railway Company; first vice-president, A. A. Anderson, general manager the Indianapolis, Columbus & Southern Traction Company; second vice-president, F. J. J. Sloat, general manager the Cincinnati Northern Traction Company; treasurer, W. F. Milholland, secretary-treasurer the Indianapolis Traction & Terminal Company; executive board—Ohio members, C. N. Wilcoxon, E. C. Spring, F. W. Coen, Ervin Fullerton and George Whysall. Indiana members, H. A. Nicholl, C. D. Emmons, C. G. Lohman, H. S. Dickey and F. T. Grover.

In accepting the office Mr. Carpenter thanked his fellow-members for the confidence they had shown in him by bestowing their highest honor on him. He said he realized that the star of success had been pushed away into the distance and that much work was before the association the coming year. Plans have already been formulated for much that is to be done and from time to time other matters will present themselves. The organization of a traffic association is an important step in the right direction, he said, and the work accomplished by the various committees has been of the greatest benefit. The time will come, he said, when a car can pass over any and every line in the country without inconvenience. This will mean proper standardization in track and car equipment. Mr. Carpenter is an enthusiastic worker for the association and during the past two years has never flinched from a duty that was placed upon him. Because of this fact, as well as his practical work as a manager, he is well fitted to occupy the first office in the association.

A vote of thanks was given to President Hugh J. McGowan, of the Indianapolis Traction and Terminal Company, for the quarters occupied by the association in the Traction building. He has furnished the rooms free of charge because of his desire to see the movement succeed and has assisted the association in various other ways.

The annual banquet in the evening was held at the Phillips House. About 125 members and guests attended. E. C. Spring, of the Dayton, Covington & Piqua Company, presided as toastmaster. Mayor Ed. E. Burkhardt, of Dayton, made an address of welcome and was followed by H. A. Nicholl, of the Indiana Union Traction Company, the retiring president. The incoming president, F. D. Carpenter, of the Western Ohio Railway, spoke on the benefits to the communities served resulting from the expansion of the interurban electric railway systems. The next speaker was Judge Dennis Dwyer, of the Dayton, Covington & Piqua Company, one of the pioneer interurban road builders of Ohio. An abstract of his address is printed else-

where in this issue. J. Sprague McMahon, a prominent traction company attorney, supplemented Judge Dwyer's remarks on the bill pending in the Ohio legislature to increase the taxes on public utility properties. Other speakers were: Ex-Governor W. T. Durbin, of Indiana; Dr. D. Reiley, E. B. Grimes and Ed. Hanley.

The next meeting of the association will be held in Indianapolis on March 26.

A meeting of the supply men was held after the regular meeting of the Central Electric Railway Association Thursday. The annual assessment was increased from \$3 to \$8 in order to meet the requirements made by the parent organization. In making the assessment for expenses that sum was charged up to the supply men and they merely made arrangements at this meeting to meet the increased amount.

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### ORGANIZATION OF THE CENTRAL ELECTRIC TRAFFIC ASSOCIATION

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A brief report of the first meeting of representatives of twenty-four interurban roads in Indiana, Ohio and Michigan at Dayton, Ohio, Jan. 22, to organize the Central Electric Traffic Association, was printed last week. A second meeting was held on Thursday, Jan. 23, immediately preceding the annual meeting of the Central Electric Railway Association, at which the report of the joint committee appointed to arrange details of affiliation with the Central Electric Railway Association was presented and approved.

The joint committee proposed that the Traffic Association be organized as an affiliated body of the Central Electric Railway Association under the direction of a salaried chairman who should also act as secretary and treasurer of the parent association. Such a chairman is to be a man experienced in traffic matters and in the making of rates and compilation of freight and passenger tariffs. He will have as an assistant a male stenographer also experienced in such matters. Applications for the position of chairman should be made to the president of the Central Electric Railway Association and will be referred to a committee of three members of the Traffic Association for consideration as to fitness and ability. This committee will recommend the appointment of the best qualified applicant to the executive committee of the Central Electric Railway Association for approval. The committee of the Traffic Association consists of W. S. Whitney, Ohio Electric Railway; C. G. Lohman, Chicago, South Bend & Northern Indiana Traction Company, and Chas. F. Price, Western Ohio Railway. Action on the division of expense to be made between the two associations for joint work was deferred until the next regular meeting, March 25.

The articles of organization as amended were adopted unanimously. They resemble closely the articles of agreement of the Central Freight Association and the Central Passenger Association composed of representatives of the steam railroads operating in the Central States. The following is a brief abstract of the principal clauses:

The Central Electric Traffic Association is to comprise roads located within the area included in the states of Illinois, Indiana, Ohio and the southern peninsula of Michigan on a line south from Buffalo, N. Y., through Pittsburgh, Pa., to Wheeling, W. Va., thence along the southern bank of the Ohio river to Ashland, Ky., direct to Richmond, Nicholasville, Versailles, Frankfort, Shelbyville, Louisville and southern bank of Ohio river through Paducah, Ky., to East Cairo, Ill. The general offices of the association will

be located at the same place as the general office of the Central Electric Railway Association.

The purposes of the association are "to promptly secure to each of the parties authentic information in relation to the tariffs, rate sheets and tickets, regulations of the respective parties and changes therein and the due filing and publication thereof; to aid in securing compliance with the federal and state laws relating to and regulating commerce and to enable the parties hereto to mutually confer, advise and act in relation to the subjects above stated and the proper methods to secure the purposes aforesaid."

The duties of the officers and procedure of the association are summed up in the following extracts from the Articles of Organization:

The members agree to arbitrate all differences upon questions coming within the scope of the organization which are not otherwise properly reconciled. Each member will send to the Chairman two copies of each local and joint state and interstate tariff of rates and of changes therein, also classification and rules at the time of making, issuing and filing the same with the Interstate Commerce Commission; also of all agreements or arrangements with other common carriers in relation to the rates coming in whole or in part under this agreement, when such arrangement or agreement is entered into.

The Association will meet on the Wednesday before the fourth Thursday of the months of January, March, May, September and November, of each year.

The executive officer of the association is to be a chairman, who shall be elected annually.

The chairman shall preside at all meetings of the association. He shall represent the association in negotiations with adjacent associations when no other provision is made. He shall be, ex-officio, a member of all committees. All communications regarding divisions of through rates, and their issuance, between lines in other associations and those in the territory of the association, shall be through the chairman. The chairman shall construe this agreement and all resolutions adopted thereunder. His decisions shall be subject to appeal to the association, or to arbitration, but shall be conformed to until such appeals are decided. He is authorized, subject to the approval of the association, to appoint a secretary and to employ the force and incur and supervise the expense requisite to the discharge of his duties. He may suspend the interim action of committees which he finds to be in conflict with the articles or rules connected therewith, or he may reconvene them to reconsider their action. He shall compile and issue the statements, statistics and joint publications from time to time authorized by the association, and shall also compile and issue monthly detail statements showing the receipts and expenses of the association. He may exchange the proceedings of the association with the officers of other associations. Copies of proceedings shall be withheld from companies not members of the association.

In cases of disagreement on any subject on which any of the committees are authorized to act, and upon which prompt action is required, the question at issue shall be submitted to the chairman for decision. In case the subject is one which, in the judgment of the chairman, does not require immediate decision, or which requires further investigation and consideration, it shall be further considered at a meeting of the association to be called by the chairman at the earliest practicable day after the necessary information has been obtained. If no agreement can then be reached, the question shall be decided by arbitration.

If any member of the association objects to the decision of the chairman, the case shall at once be reported to the association for its action.

If any case is submitted to arbitration it shall go to the decision of one or three arbitrators, experienced in traffic matters, as may be decided by the parties at issue in each instance. The decision of a majority of said three shall be final. If either or both parties to an issue fail to appoint their arbitrators within ten days after appeal to arbitration the chairman may designate the arbitrators for the delinquent party or parties, and the two so chosen shall select a third. The chairman shall in no case act as an arbitrator. The arbitrators may prescribe the times and rules for hearing, but shall hear all parties desiring to be heard, provided they present their views and arguments within ten days from the time the questions are sent to the arbitrators. The arbitrators may extend this time, but shall decide all questions within three days after their final

hearing thereof. The expense of any arbitration shall be paid share and share alike by the parties to the submission, unless otherwise agreed by the interested parties.

It shall be the duty of any member of the association, having knowledge of any alleged violations of these articles or the rules of the association, to report the same fully to the chairman, who is hereby empowered and directed to employ such means as he may elect to ascertain the facts.

To defray the financial obligations of the association promptly, there shall be deposited with the chairman a deposit of \$..... Contributions to this fund shall be assessed amongst the roads parties thereto as may be agreed on. The expenses shall be paid therefrom and reimbursed thereto monthly by the roads parties hereto, on the basis as agreed upon, upon the certificate or approval of the chairman.

This organization shall continue for one year and thereafter until dissolved by a majority vote of its members; but any member of the association may withdraw therefrom after said year by giving thirty days' prior notice in writing to the chairman of such desire, provided such notice takes effect on the first of a month, and also provided the assessment against such members are fully paid. The withdrawal of any member or members shall not thereby dissolve the association, except with the consent of a majority of the remaining members.

The following is a list of the interurban roads represented at the meeting:

Chicago, South Bend & Indiana Northern Railway Company.  
Cincinnati Northern Traction Company.  
Cleveland, Painesville & Ashtabula Railroad Company.  
Cleveland, Painesville & Eastern Railroad Company.  
Dayton, Covington & Piqua Traction Company.  
Dayton & Troy Electric Railway Company.  
Dayton & Xenia Transit Company.  
Ft. Wayne & Springfield Railway Company.  
Ft. Wayne & Wabash Valley Traction Company.  
Indiana Union Traction Company.  
Indianapolis & Cincinnati Traction Company.  
Indianapolis & Louisville Traction Company.  
Indianapolis, Columbus & Southern Traction Company.  
Kokomo, Marion & Western Traction Company.  
Louisville & Northern Railway and Lighting Company.  
Louisville & Southern Indiana Traction Company.  
Marion, Bluffton & Eastern Traction Company.  
Michigan United Railways Company.  
Muncie & Portland Traction Company.  
Ohio Electric Railway Company.  
Springfield, Troy & Piqua Railway Company.  
Terre Haute, Indianapolis & Eastern Traction Company.  
Toledo Urban & Interurban Railway Company.  
Western Ohio Railway Company.

## FUNDAMENTAL BRAKE RIGGING FOR HIGH SPEED ELECTRIC RAILWAY CARS\*

BY R. C. TAYLOR,

Superintendent Motive Power Indiana Union Traction Company, Chairman Standardization Committee Central Electric Railway Association.

Supplementing the excellent paper on this subject prepared by Fred Heckler and read at the November meeting of this association† the standardization committee has continued its work of considering and investigating the question of the proper standards for foundation brake apparatus. This subject for the purpose of this meeting will be confined to the consideration of foundation gear for high-speed interurbans and include only that part of the apparatus from the air-brake cylinder to the wheels.

The foundation brake gear as at present usually employed consists of a series of levers, rods and pins of various proportions, ratios and designs for transmitting the pressure from the air-brake cylinder to the shoes. The usual practice of stopping a car is by pressure applied to the brake shoes, producing a friction between the shoe and

\*Report presented at Dayton meeting of Central Electric Railway Association Jan. 23

†See STREET RAILWAY JOURNAL for Nov. 30, 1907, page 1058.

the revolving periphery of the car wheels. The usual maximum pressure applied to the shoes is from 70 to 100 per cent of the light weight of the car.

Before submitting to this association recommendations as to the standard brake gear the committee has deemed it advisable to inquire whether this practice of 70 to 100 per cent of the light weight is the best practice to recommend to this association. Before proceeding to design or recommend for adoption a standard form of brake gear it seems proper to consider what are the requirements of a perfect brake for stopping a high-speed interurban car.

Summarizing these requirements very briefly:

After a car has attained the maximum speed there may be two reasons for bringing it to a stop: First, at some pre-arranged station for convenience in ordinary course of transportation business, and, second, for the purpose of bringing it to a stop in the shortest possible distance for the purpose of avoiding accident and possible injury to person or property.

To stop a car for the first reason requires a certain force which may be applied in any convenient manner to accomplish the purpose. To stop a car in the shortest possible distance, however, requires the instantaneous application of the greatest possible amount of retarding force, and the continuous action of this force at its maximum until the energy of the car is entirely destroyed. The maximum retarding force that may be applied in any given case is that due to the friction resulting from the pressure applied to the brakes against the tires of the wheel. This friction between the brake-shoes and wheels tends to impede the rotation of the wheels and through the adhesion of the wheels to the rail tends to destroy the energy of the car. The maximum retarding force therefore is limited to the adhesion between the wheels and the rail.

The maximum retarding force to stop a car can thus be obtained by applying a pressure to every wheel on the car and continuing the pressure necessary to produce sufficient friction to the rotation of the wheel just equal to the friction between the wheel and the rail. This maximum retarding force if continued beyond this point stops the rotation of wheel causing it to slide on the rail, very greatly reducing the efficiency of the stop. In order therefore to determine the maximum retarding force that must be transmitted through the brake levers it is necessary to determine the coefficient of friction between wheels and rails. This will obviously vary with the weather conditions and conditions of the rail, but it has been found from a large number of experiments to average 0.18 of the weight on the rails.

It has also been determined by experiment that while the same frictional resistance between the shoe and the wheel will skid the wheel at any speed the pressure required on the brake-shoe to produce this same frictional resistance varies inversely as the speed of the car. Consequently a higher brake-shoe pressure is required to skid wheel at high speed and a lower brake-shoe pressure at low speed.

With a coefficient of adhesion of 0.18 per cent between the wheels and rails there is required to skid the wheels a ratio of brake-shoe pressure to total weight on braked wheels:

at 7½ miles per hour of	0.70 per cent
at 20 miles per hour of	0.95 per cent
at 40 miles per hour of	1.2 per cent
at 60 miles per hour of	2.4 per cent

Consequently the foundation brake rigging throughout should be so designed to sustain without distortion or

undue wear a pressure of 2.4 times the total weight of the car to which it is attached. It was the intention of your committee to submit detailed dimensions of the car body levers and truck levers which it recommended as standards, but on investigation it was found that the arrangement of the electrical apparatus under the car, the design of the trucks themselves and the electrical apparatus mounted thereon made it quite impractical at this time to do so, and therefore it submits for your consideration the following fundamentals of recommended practice for foundation brake gear:

#### FUNDAMENTALS OF DESIGN

The following are fundamentals of design:

- Total lever ratio, 10 to 1.
- Maximum braking pressure, 2.4 weight of car.
- Maximum pressure in brake cylinder, 90 lbs.
- Maximum stress in all brake levers, 23,000 lbs. per square inch.
- Maximum stress in all brake rods, 15,000 lbs. per square inch.
- Maximum stress in all brake rod jaws, 10,000 lbs. per square inch.
- Maximum shear on all pins, 1000 lbs. per square inch.
- Diameter of pins to provide a bearing value, 23,000 lbs. per square inch.
- Maximum hand brake power, 2.4 weight of car.
- Equalized brake levers.
- Inside hung brakes.
- Brake hangers on part of truck, not spring supported.
- Brake lever to bring a straight line bearing on shoes.
- Brake hangers and heads designed for maximum shoe wear.
- C. E. R. A. Standard brake head and shoes.
- Automatic slack adjuster.

Last, but not the least important, there should be provided an automatic friction regulator, so that a high-speed interurban car may be equipped to get the maximum possible retarding force on the shoes without skidding the wheels. If the above recommendations are adopted it is quite certain that the apparatus will be free from many of the objections of present designs, that the brake rigging will be reliable and free from failure and that a high-speed car may be reduced from maximum speed to a stop in the very shortest possible distance and in the shortest length of time.

## THE ELECTRIC RAILWAY SITUATION IN THE CENTRAL STATES \*

BY H. A. NICHOLL,  
General Manager Indiana Union Traction Company

Prior to two years ago the electric railways in Indiana and Ohio each maintained a separate organization—the Ohio organization, known as the Ohio Electric Railway Association; the Indiana organization, known as the Indiana Electric Railway Association. Recognizing the similarity of conditions and the value of co-operation, the two organizations amalgamated under the title of the Central Electric Railway Association. The first anniversary convention and banquet of this association was held at Indianapolis on Jan. 24, 1907. This convention, meeting in Dayton to-day, marks the second anniversary, and I am much pleased to state that we are now on a stronger and more substantial footing than ever before. During the past year we have gained many new members and lost but few.

All our meetings have been well attended and the subjects that have come before them for discussion have been upon topics concerning vital operating problems and have not only been interesting and instructive, but have been of

\*Presidential address delivered at Dayton meeting of Central Electric Railway Association, Jan. 23.

great importance and value to the individual members of this association and the companies they represent.

#### STANDARDIZATION

Our standardization committee has favorably reported standards for wheels, brake-shoes, rails and axles, and its recommendations have been unanimously adopted by this association. I wish to state further, with reference to this matter, that the standards that were adopted by this association were considered of such importance that they were practically all adopted by the American Street and Interurban Railway Association at its last meeting, held in Atlantic City, N. J. We believe this speaks well for our standardization committee and the work done by this association, inasmuch as it has proved to the rest of the fraternity that standards that are good enough for the railways of the Central Electric Railway Association are good enough for all the other electric railways of this country.

Our committee on rules has also reported on a standard code of rules for interurban railways, which has been adopted by us and which we believe will be so favorably looked upon as eventually to become the standard rules of not only the railways that are members of our association, but of all the interurban railways of this country. Copies of these rules have been requested by railways located in various districts all over the Central States, and all emphatically pronounce them absolutely practical and complete.

The adoption of these standards is a step in the right direction and great credit should be given the members of these committees who so faithfully and diligently worked out results that are so satisfactory to us.

However, we must not stop at the mere adoption of these standards by the association itself, but every individual member of our association must see that the standards are put into actual use on his system. Without this co-operation on the part of the individual railway the standards approved by this association will be of no avail. We therefore wish to impress upon you the importance of taking prompt action in this regard.

In adopting standards for wheels, brakes, rules, etc., we have only just begun our task. Other essential features must be standardized, such as brake rigging, couplers, drawbars, height and width of cars; also our tickets, accounting and track and bridge construction, and through the connecting of all the roads together—thereby forming one grand system of tracks similar to the steam railways—it will be possible and more convenient from year to year for longer hauls to be made and heavier and greater traffic to be transacted. Freight and passenger business can then be more readily interchanged and cars moved from one section of the country to another.

It is up to us to all work together along these lines as rapidly and effectively as we possibly can, so as to enable us to extend the much desired through business inaugurated some time ago and thereby more thoroughly compete with the steam roads for both long and short distance travel.

#### TRAFFIC

At the present time a person can buy a through ticket from almost any point in one central state to almost any other point in Indiana, Ohio, Illinois, Michigan, Northern Kentucky and parts of Pennsylvania and New York, and in soliciting and encouraging this business more commodious and faster service has been put on various of our electric railways, so that even to-day we have in operation on some of the railroads cars that are palatial both inside

and out and as comfortable and convenient as any up-to-date steam railroad coach.

Passenger traffic is not the only business that has been developed. Our freight and express has been more thoroughly exploited, until to-day we find the freight and express business forming a no inconsiderable percentage of our revenue. Quite a few of the leading lines are now handling express matter through the old line express companies and we must look forward to an extension of this portion of our business, as no doubt it will prove most profitable for us to work in conjunction with these express companies. They can and will turn over to us business from far and remote sections of our country, which we could not hope to get through any express department which we would inaugurate ourselves and which latter service usually does not contemplate the collecting or delivery of express matter.

#### UNITED STATES MAIL

The carrying of United States mail on trains of the electric railways has not been entirely satisfactory. The compensation allowed by the Federal Government for this purpose is not considered adequate for the service rendered, and according to the last report made by the committee appointed by the American Street and Interurban Railway Association it is apparent that no satisfactory results had been obtained by it, either through the post office authorities in charge of these matters or the house committee on post offices and post roads. It would seem wise, therefore, that this association should well consider the advisability of the appointment of a committee to confer with the American association committee to see if we could render it some assistance looking toward the enactment of proper legislation through which we could secure a greater volume of this class of business at prices that would compensate us for the handling of same.

The carrying of a large portion of the Government mail we believe rightly belongs to the interurban electric railways and by united effort we should be able to secure the enactment of legislation fair to the traction interests.

#### FARES

At the present time there is a wide variation in the rates of fare per mile charged by electric railways in our territory. An equalization of the rates should be made so that all roads will have practically the same basic rate of fare. This is an important subject and should be given the careful and analytical attention of this association in the near future.

Our interchangeable coupon book, which has been in use on some twenty-four of our properties, aggregating a mileage of 2363 for these last three years, does not seem to meet with the same degree of favor that it enjoyed in its earlier use, and I believe this association should take steps either to modify the conditions under which it is sold or to adopt some other form of mileage book similar and corresponding to the \$15 1000-mile book now sold by some of the companies that are members of this association.

On account of the apparent necessity for a modification of our interchangeable coupon book and on account of the requirement of the State Railroad Commissions calling for the filing of local and joint tariffs, and further on account of the diversity of passenger and freight rates that are now prevalent among the railways which are members of this association, it has been thought well that the traffic officials of our various lines should act more nearly as a unit and get closer together. It has therefore been suggested that

a traffic association, auxiliary to, but a part of the, Central Electric Railway Association, be formed for the particular purpose of permitting the traffic officials of the various electric railway properties to take up matters pertaining exclusively to traffic and further for the adjustment and equalization of rates and other questions pertinent to the promotion of traffic—the work to be done somewhat along the lines of the Central Passenger and Central Freight Associations. In accordance with the above view your president has taken upon himself the authority to approve the calling of a meeting for this purpose of the various traffic officials of Indiana, Ohio, Illinois, Kentucky and Michigan who were present at the meeting held yesterday and we hope it will prove to be of great benefit to all the electric railways in this field.

We find, in reflecting on the past, that our interurban electrics have advanced to a marked degree and that to-day nearly every vestige of the trolley or street car has disappeared and in place of it the modern, up-to-date electric railway has put in an appearance, so that we are gradually assuming a style and manner equal in convenience but still distinctive to the vast steam railroad lines.

We must not lose our identity entirely in this advancement. We must still retain our individuality and the distinctive appearance of electric railways and should not attempt at any time to approach the operation of the heavy freight and passenger trains entirely distinctive of the steam railroads.

#### IMPROVEMENTS

We now have in operation four distinct systems of electric transmission for the propulsion of cars—the 600-volt d. c. overhead trolley, the 600-volt d. c. third-rail, the 1200-volt d. c. overhead trolley and the 3300-volt a. c. single phase. All of these forms of transmission are apparently giving satisfaction in their various localities, taking into consideration the conditions under which they were installed. However, it would appear that some uniform system should be adopted in the future after it has been clearly demonstrated which system is the best for universal use.

During the last year the electric railways of Indiana have been extended and new ones put in operation to the extent of 400 miles, thereby increasing the total mileage in operation in that state from approximate 1350 miles to 1750 miles and at this time there are approximately 200 miles under construction. In the state of Ohio there have been put in operation approximately 35 miles, which has increased the mileage in operation in that state from 2359 miles to 2395 miles, and there are approximately 135 miles under construction. In Southern Michigan there have been constructed and put in operation during the year about 60 miles of road, increasing the total from 700 to 760 miles. This shows how fast new territory is being opened to us and the necessity for the standardizing of our equipment and tracks and the connecting of same so that the new business created by the opening of these lines can be taken advantage of, not only by the new road itself, but also by the various lines connecting therewith. This same increase in mileage and consequent increase in new business may be expected from year to year in the same or greater ratio.

#### TWO-CENT FARE LAW

We have all been up against the two-cent fare law, which has unquestionably operated against us in favor of our steam road competitors. How far reaching the effect of this law on our earnings will be is yet to be seen, but we are of the opinion that it will require superior service on our lines for both long and short hauls to permit us to

hold the major percentage of the business which we now enjoy.

However, by the improvement of our roads to some degree and by the operation of high-class equipment, thereby giving our patrons practically the same or better accommodations than our steam road competitors and with our more frequent train service, the electric roads can successfully compete with their steam rivals at the same rate of fare. In this connection I wish to state that there seems to be a growing opinion among leading electric railway managers that in certain localities the electric railways have been carrying passengers at a rate not commensurate with the service given and that a readjustment and increase in the rate of fare must soon be made, so as to approach more nearly the two-cent legal rate charged by steam roads.

#### CLAIMS.

In view of the fact that in many parts of the United States fraudulent claims are on the increase and the tendency of many claimants, who may have some legitimate claim for personal injury, is to exaggerate such injury, being aided and abetted by the ambulance chaser, the shyster lawyer and unscrupulous members of legal and medical profession; and in view of the further fact that street and interurban railway corporations are made victims of such fraudulent claims and at times are required to pay such claims, and believing that each of the member companies ought to be, as far as possible, protected against this class of claims, I would suggest that we seriously consider the appointment of a committee to devise a plan of exchange through our secretary's office of certain information regarding claimants for substantial amounts, the claim department of each member company to report upon blanks for the purpose, such information for the benefit of any or all of the other member companies who may desire to make inquiry concerning this matter. A plan of this kind ought to result in placing in the possession of each member company definite information regarding claimants that will prove quite valuable in the handling of such claims.

#### FINANCES.

At our last annual meeting the association had to its credit in the bank \$178. We are pleased to report that we have at this time \$246.05. We have also paid extraordinary bills that were contracted the previous year, to the amount of \$564.50. We have 22 companies contributing to the success of the secretary's office and 392 individual members in the association. We have increased our individual list by 33, and 12 have resigned for various reasons.

The needs of the association are unity of purpose and action. Let us all stand together and do what we can for the upbuilding of our respective properties and our association. Let us get after recruits, each man using his influence in his respective territory to increase our membership, so that we can say with pride that all of the electric railways of our states belong to our association, and that each and every one of them takes an interest and an active part in its welfare.

#### SUPPLY MEN.

The supply men have taken an unusual interest in our meetings and have been of great assistance to us, not only in a financial way but in aiding our committees to secure valuable information from the companies they represent; also by the exhibition of their wares and appliances and



through the zeal and vim which they have injected into our conventions. We wish to extend to them our thanks for the help they have been to us, and we ask of them their continued assistance and support.

#### THE WORK OF THE ASSOCIATION.

I wish publicly to thank Hugh J. McGowan, the president of the Indianapolis Traction and Terminal Company, for his liberality and great kindness to this association. He has, for the last two years, given the room which we now occupy in the Traction Terminal Building free to this association, and if rent were paid for it at the usual rate it would amount to approximately \$500 per year. Mr. McGowan has been of every service to this association and we owe him a great debt of gratitude.

I also desire to thank the members of our executive committee for the good work they have done, and for the interest and support they have given to this association. Doubtless the incoming president will be surrounded by an executive board of equal ability, willingness and prominence. However, it will be difficult for him to obtain members that will work together more harmoniously and in a more efficient manner than those that have been in office during the last year.

I also wish to thank Mr. Milholland, our secretary-treasurer; also Miss Merrimon, his assistant, for the able manner in which they have contributed to the success of our association and the efficiency with which they have performed their duties.

I bespeak for the incoming president your hearty support and I trust you will all endeavor to make his administration pleasant, profitable and beneficial, to the end that it may be known as a "record breaker." I assure you that your president feels the high honor you conferred upon him this time last year, and he wishes to thank you all for the able support you have given him.

### INTERURBAN CAR TESTS BY PURDUE STUDENTS

The senior class at Purdue University has recently been engaged in making a careful test of power consumption on the system of the Indianapolis, Crawfordsville and Western Traction Company. This line is forty-five miles long, and its entire power equipment of power plant, sub-station and cars was furnished by the Allis-Chalmers-Bullock Companies. The engineering work was done by the Electrical Installation Company, of Chicago.

The power station contains four 350-hp Stirling boilers with two engine-generator units, each consisting of a 1000-hp cross-compound 20 in. and 24 in. x 42 in. engine direct connected to a three-phase, 25-cycle, 700-kw alternator. The transmission voltage is 33,000 volts and there are three other sub-stations. The rolling stock consists of six local cars, two limited cars and two freight cars. Each car is equipped with four 75-hp Bullock motors and hand control. The motors operate at 650 volts trolley pressure. The road has been in operation about six months and an hourly schedule is maintained between Indianapolis and Crawfordsville. The running time between termini is one hour and fifty minutes.

The tests were conducted on Dec. 26, 27 and 28 under the direction of Prof. H. T. Plumb, of Purdue University. The sub-station test lasted twenty-four hours and during that time simultaneous readings were made in each sub-station and in the main station. During certain portions of the time readings were taken every half minute. At other times the interval between readings was five minutes. The object of the sub-station test was not to learn the efficiency

of the machines, but to obtain data with which to study the current distribution from the sub-stations to the cars. It also gave the daily load curve of each sub-station and the total energy required to operate the entire line during twenty-four hours.

The car tests were made on car No. 104 while it was being run in regular passenger service. The recording apparatus was installed in the baggage compartment so as not to interfere in any way with the passengers. There were two autographic recording machines and a number of auxiliary pieces of apparatus, such as watt-hour meters, clocks, etc. The object of the recording apparatus was to keep a complete written record of the car's performance during every instant of the test. The recording machines were built by Purdue students during the last year and are similar to a machine designed by Professor Plumb for the Electric Railway Test Commission. One machine recorded time, distance, volts pressure, total amperes, and speed of the car. The other machine recorded time, place (mile-posts, stations, stops, curves, grades, etc.), speed, acceleration and braking of the car, air reservoir pressure and the amount of each air-brake application. These quantities were plotted as the ordinates of continuous curves with time in seconds as the abscissa.

Such curves give a very complete knowledge of the performance of a car. Recording watt-hour meters kept an automatic record of the energy taken by the car motors, and by the air pump. The temperatures of each motor and of the controller were measured with thermometers both before and after each day's run.

Eight trips were made over the line, or a total of 360 miles. During this time the recorders ran continuously, and, as the paper moved at the rate of 3 ins. per minute, a total of about 450 ft. of record was obtained.

The seniors in charge of the car test were: L. S. Twomey, B. L. Benbow, C. Green, A. Flannigan, H. S. Russell and A. L. Good. They were assisted by: W. A. Black, O. M. Booher, L. S. Hall, R. S. Thomas, J. R. Ong and C. Merkel. The seniors in charge of the sub-station tests were: I. H. Montgomery and F. J. Horner. They were assisted by: C. E. Schutt, V. T. Brigham, E. A. Hollaway, H. Woodworth, E. R. Warbritton, O. M. Booher, L. S. Hall and J. R. Ong.

### CORRESPONDENCE

#### FOUNDATION BRAKE RIGGING

CHICAGO, Jan. 25, 1908.

EDITORS STREET RAILWAY JOURNAL:

The report of the committee on standardization of the Central Electric Railway Association, presented at the Dayton meeting\* emphasizes the importance of brakes which shall be more powerful and more effective under all conditions than those at present in general use. The desirability of placing means at the disposal of the motorman for making more rapid stops will be generally admitted, but it is doubtful whether this result can be secured by the plan suggested in the report, particularly so far as the second and last recommendations are concerned.

A maximum braking pressure of 240 per cent of the light weight of the car, which is recommended by the committee, would be effective in shortening the time of deceleration between 60 and 40 m. p. h., but unless controlled in some way would be dangerous in making emergency stops at slower speeds. The committee suggests in its last recommendation (published on page 1058 of your issue of Nov. 30)

\*Published on page 177 of this issue.

that there should be provided some form of automatic friction regulator to adjust the retarding force exerted by the brake shoes to an amount just equal to the adhesion between the wheels and the rail at all times so that skidding at any speed would be impossible. This is one of the strongest claims made for the magnetic track brake, but so far, in this country at least, no entirely automatic device has been designed which could be applied to control the power in an air brake cylinder. The high speed brake reducing valve attempts to accomplish the purpose by introducing a fixed time element into the reduction of maximum braking force, but this method is unscientific and inadequate if such an excessive initial braking force as is proposed is employed.

Some trials have been made in Great Britain on cars of the North Eastern Railway of a device known as the Maximus brake which partially accomplishes the desired result. It is an ingenious arrangement of toggle joint connections between brake beams which are applied on both sides of each wheel and are hung on springs in such a way that when the retarding force on either brake shoe exceeds a predetermined amount the brake shoe drags around the wheel against spring pressure and thereby opens out the toggle joint connection, reducing the pressure of the shoe against the wheel. As applied with either Westinghouse or vacuum brakes to a steam coach, a maximum initial braking force of 160 per cent of the light weight of the car was used. This resulted in a saving of between 35 and 40 per cent in length of stop at speeds from 65 to 75 m. p. h. Skidding was prevented in making stops at even very low speeds with the large excess of braking power.

The principal objection to the application of the device to electric equipment would be the space required between the wheels for putting in the toggle joint connections between brake beams. This is the stumbling block of more than one improvement in brake rigging for electric cars. The motors have been increased in size to get more speed and power and they have encroached on every available space between the truck frames. Wheels, journal boxes, truck frames and brake rigging have been redesigned to squeeze in a little larger and more powerful motor and in this redesign important functions of the subordinated parts have too frequently been neglected.

The brakes are just as important as the motors; they have to destroy in 500 or 600 ft. the energy generated by the motors in several times that distance, and their failure or lack of efficiency may result in accident and death. They should be the last detail of truck design to be subordinated to increased speed; in fact the speed should be regulated by the available braking power. Faulty design of truck brake rigging should not, however, be blamed entirely on the truck builder. The mechanical and operating departments too seldom co-operate with suggestions as to how the brake apparatus might be improved on a given type of truck. If no complaints are heard of hard riding or weak parts the truck builder is apt to be satisfied and pay no further attention to the details of his product. Meanwhile the car may be going to the shop to have the brake rigging adjusted every round trip, the motorman loses confidence in his brakes and gets behind on schedule and the air brake company which furnished the car body brake gear is kept busy explaining that the lack of braking power is not its fault. Cases have come to my attention of trucks in which the live lever came to a stop against the truck frame before the brake shoes were worn  $\frac{1}{4}$  in. Mr. Taylor and Mr. Heckler are to be congratulated upon the

attitude they have taken in advocating more effective braking, and if these mechanical obstacles to the use of efficient brakes can be removed a distinct advance will be made in high speed electric railroading.

MECHANICAL ENGINEER.

◆◆◆◆◆  
**GAS ENGINE MAINTENANCE**  
ALLIS-CHALMERS COMPANY.

MILWAUKEE, WIS., Jan. 21, 1908.

Editors STREET RAILWAY JOURNAL:

In reading the letter on "Gas Engine Maintenance," appearing in your issue of Jan. 11, nobody can help agreeing with Mr. Ryerson that a prime mover of the undoubted economy of the gas engine would be of no avail "if this economy is to be more than offset by the very heavy charges for keeping the apparatus in repair." If Mr. Ryerson's fears were justified it would indeed be a serious matter for the enormous young industry based on this type of prime mover. Little cause for alarm, however, can be found in the experience had so far, and certainly none whatever in the two cases cited in the letter.

The installation of the Lackawanna Steel Company is of a type of engine which has proved inferior to the four-cycle type to such an extent that it has practically been abandoned in this country and even the inventors of this type in Europe are now building four-cycle engines in large numbers. From Mr. Ryerson's letter, however, it seems that even with this type the maintenance charges were not such as to "more than offset" the gain in economy, for high maintenance charges are not claimed as the main reason for abandoning the installation, but only as a "considerable inducement in making the decision."

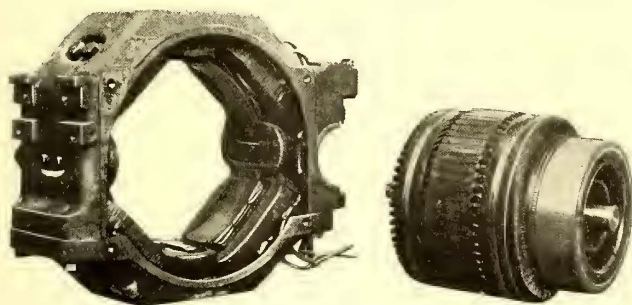
The failure of the second plant mentioned is evidently due less to the gas engine itself than to the particular type of producer and the kind of gas used. There have been steam turbines which, after a week's operation, had to be dismantled and changed, and it has not occurred to anybody to claim that such an installation should be used as a basis for conclusions regarding the cost of maintenance chargeable against the steam turbine. No more can the attempts of putting into successful operation a particular type of installation never before tried be taken as evidence that maintenance charges of gas engines are excessive. The comparatively short experience had with the American gas engine seems to explain sufficiently Mr. Ryerson's failure to obtain actual data. European experience has been of considerably longer duration and has proved the cost of maintenance to be fairly moderate, even though, comparing gas and steam engines alone, the maintenance of the latter may be lower. It should be noted, however, that American builders have simplified the gas engine as compared with European types, which should result in a reduction of maintenance charges. It should also be borne in mind that all auxiliaries as boilers, producers, etc., should be taken into account, which will be found to affect the comparative cost of operation and maintenance considerably, not to speak of furnace gas installations where the simplest kind of gas cleaning apparatus is all that is needed as compared with a boiler plant for the steam installation.

As stated above, our information regarding maintenance of the American gas engine is somewhat limited. In the meantime, judging from the experience of other countries, there is little reason for being pessimistic.

L. C. MARBURG.

**SIEMENS-SCHUCKERT INTERPOLE RAILWAY MOTORS**

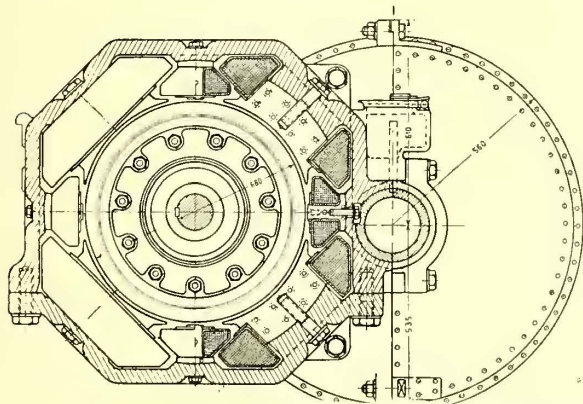
Although the Siemens-Schuckert Works of Germany have made successful 750-volt direct-current railway motors of the ordinary series type for several years, they have also given attention to the design and construction of interpole railway motors. The first large order for motors of the latter type was given to the Works for the Cologne-Bonn Railway. This standard gage interurban railway, which is 28 km. (17 miles) long, was opened in January, 1906. The motor cars are each equipped with two motors, having an hourly rating of 130 hp each at 1000 volts. The road was described in the JOURNAL for May 5, 1906. The gear ratio is 1:3.1 and the diameter of the running



STATOR AND ROTOR OF INTERPOLE MOTOR.

wheels 950 mm. (37.3 ins.), and the maximum speed of the cars is 70 km. (43.4 miles) an hour. This motor has four main and four auxiliary poles. The former are laminated, and, while the latter are solid, they are slotted in a plane perpendicular to the axis to avoid eddy currents. The armature current flows through both sets of windings; a reversal in the direction of running causes a simultaneous reversal in both the primary and secondary windings.

The Works have also built an interpole motor with an hourly rating of 160 hp at 630 r.p.m. and 1000 volts. This



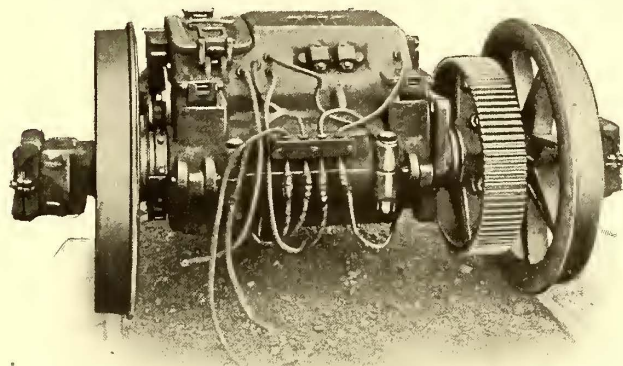
INTERPOLE MOTOR BUILT FOR METER (39.37 IN.) GAGE.

type was first employed by the Mosel Mines Railway, which is 15 km. (9.3 miles) long. As described in articles on this installation in the STREET RAILWAY JOURNAL of May 4 and Nov. 23, 1907, two of the motors per locomotive are permanently in series to operate on 2000 volts d.c. This railway is only 1000 mm. (39.37 ins.) gage and the running wheels of the locomotives are 1250 mm. (49.2 ins.) diameter. The motors are geared for a maximum speed of 30 km. (18.6 miles) an hour. The success of the first interpole motors has led the Works to build them in 30-hp and 40-hp sizes, which are popular German standards for city service, and a large number is already used on the Cologne and Bochum-Gelsenkirchen Railways. The arma-

ture bearings are oil-lubricated under a pressure of seven atmospheres.

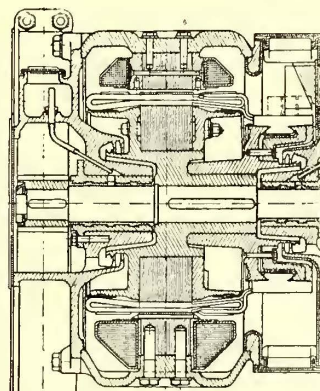
An interesting contrast to these large motors is afforded by the company's compressor motors, which are also furnished with auxiliary poles and operated two in series. These motors give 3 hp at 850 r.p.m. and 1000 volts. In this type, both sets of poles are laminated and screwed to the motor frame.

Among the advantages of the interpole construction are



INTERPOLE RAILWAY MOTOR ON AXLE.

the reduction of flash-overs, enabling the motors to carry heavier momentary overloads than would otherwise be possible. The Siemens-Schuckert Works believe, however, that the hour rating and the ability to carry overloads for considerable periods are not improved by an interpole motor of the same external dimensions and ventilation as an ordinary well-constructed series motor. It follows that the temporary overload ability of the interpole motor is balanced by corresponding lower efficiencies at other times; in short, the variations in the load curves of this motor can be greater than in the ordinary type.



It has been pointed out that a smaller air-gap is permissible when auxiliary poles are used, but in the judgment of this builder the size of the air-gap of a railway motor is not fixed primarily for electrical reasons but to permit easier maintenance by securing a maximum wear of the armature

bearings. For this reason these motors have the same air-gap as the company's other railway motors. In general, therefore, the Siemens-Schuckert Works recommend that all d.c. motors of 900 volts or over should be interpole, but below that potential the extra cost is hardly justified except by severe service conditions.

The Inland Empire System, of Spokane, Wash., has just issued two display cards, one 12 ins. wide x 11 ins. high, the other 20 ins. wide x 11 ins. high, both containing maps of the system. The larger card is for street railway advertising, but the smaller has been framed and placed in each car on the company's lines, in all depots, hotels, etc.

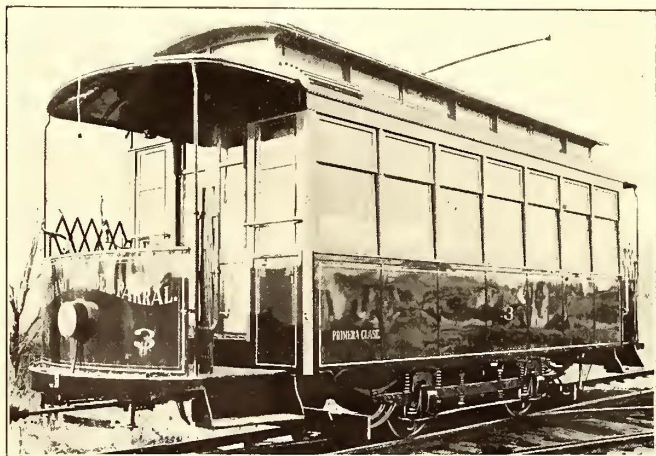
## NEW CARS FOR PARRAL, MEXICO

The Danville Car Company has recently built for Parral, Mexico, a miscellaneous lot of equipment including four first-class car bodies, ten second-class, closed, trailer car bodies, and gondola motor and trailer cars. The bodies of the first-class cars measure 19 ft. 5 1/32 ins. over the corner posts, 28 ft. 5 1/32 ins. over the bumpers, and 8 ft. 2 ins. wide over all. They are all of the company's semi-steel, semi-convertible type. The two second-class closed trailer car bodies are of same dimensions as the bodies of the first-class cars. The interior finish of these cars is of ash, including doors, sash and mouldings. The side sills are of yellow pine, with steel plate between. The subsidiary



EXTERIOR OF SECOND-CLASS CAR FOR PARRAL.

sills on each side for the truck are of yellow pine, while the end and cross sills are of oak. The body framing is of ash, and the longitudinal rails and plates of yellow pine. The sides of the car are covered longitudinally with tongued and grooved yellow pine and from the arm rail down are covered with No. 14 sheet steel in panels. The interior of the car is of No. 14 sheet steel, riveted together in one length, forming an interior truss. The first-class motor cars have cross seats on each side and four longitudinal seats at the corners, all of the Hale & Kilburn Manufacturing Company's make. The second-class trailers are



EXTERIOR OF FIRST-CLASS CAR FOR PARRAL

equipped with longitudinal seats of ash. The curtains are of printed duck mounted on Hartshorn rollers, with Forsythe No. 26 bottom fixtures. The roof is of monitor deck pattern, extending the entire length of the body. The gondola motor car is 8 ft. wide. The four 24-ft. trailer gondola cars are also 8 ft. wide. The side sills of the motor gondolas are plated with steel, and the subsidiary sills on each side for the truck are of yellow pine. The bottom framing of the trailer gondolas is of yellow pine.

The motor gondola is equipped with a hand brake, sand boxes and 12-in. pedal alarm gong.

## FAST RUN BETWEEN DAYTON AND INDIANAPOLIS

A car of the Indianapolis & Louisville which was sent to Dayton, Ohio, as an exhibit at the annual meeting of the Central Electric Railway Association made a fast run on the return trip between Dayton and Indianapolis over the Dayton & Western and the Terre Haute, Indianapolis & Eastern. The car left Dayton at 11:20 P. M. Jan. 23 and arrived in Indianapolis at 2:50 A. M., making the run of 108 miles in three hours and thirty minutes at an average speed between terminals of 31 miles an hour. The route is along the public highway for the entire distance and runs through the main streets in Richmond and Knightstown. The car was one of the new 600-1200 volt equipments now in through service between Indianapolis and Louisville.

## A NEW SYSTEM OF LIGHTING

A new system of lighting, known as the Linolite System, which employs a long tubular lamp in which the filament reaches from end to end is manufactured by the H. W. Johns-Manville Company, of New York. The source of light being continuous, the illumination is uniformly distributed, and the alternate bright and dark spots, characteristic of lighting with bulb lamps, are eliminated. The lamps are arranged in a semicircular reflector which is made up in any lengths required up to and including 10 ft. The position of the lamp relative to the reflector is such that the filament is located uniformly throughout its length in the focus of the reflector, and thus a maximum of reflecting efficiency is obtained.

Another advantage of the Linolite system is the small space which it requires. The entire reflector is only 2 1/4 ins. wide x 1 in. deep over all, so that it can be placed in show windows, show cases, etc., back of the window frames or fillets, in such manner that the fixture will be invisible



GONDOLA MOTOR CAR FOR PARRAL

or practically so, and the source of light screened entirely from the eye of the spectator.

Linolite is particularly adapted for lighting show windows, show cases, pictures, signs, desks, etc., also for theatrical stage lighting, and the outlining of buildings for display purposes. An important application of it is in the illumination of room interiors by reflected light, in which case Linolite is placed above the cornices near the ceiling, from which the light is reflected.

### A BATTERY ON THE UNIT PRINCIPLE

A principle very different from that of other batteries is employed in the cell made by the Standard Electric Accumulator Company, of New York. It is the complete enclosure of the active material and its lead electrode in a very thin, strong, and porous box of unglazed pottery. The result is a cell having the same chemical properties as other lead-lead-oxide couples, but very light for its

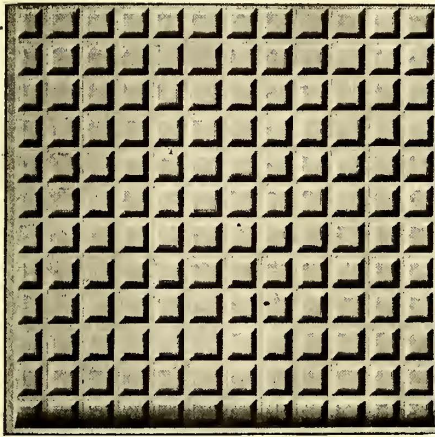


FIG. 1.—RETICULATED INNER SURFACE OF POROUS PLATES

output, since the supporting grids have been replaced by the much lighter earthenware. Moreover, the active material stays permanently in place.

The cells are built up on the unit system. Each unit box is about  $3\frac{1}{2}$  ins. square and half an inch thick over all. Its sides are porous plates, of which the inner surfaces are reticulated, as shown in Fig. 1, and the outer faces ribbed, as shown in Fig. 2. The reticulations strengthen the plates and firmly grip the active material, while the ribs give added strength and also serve as spacers to hold adjacent boxes far enough apart to permit free circulation

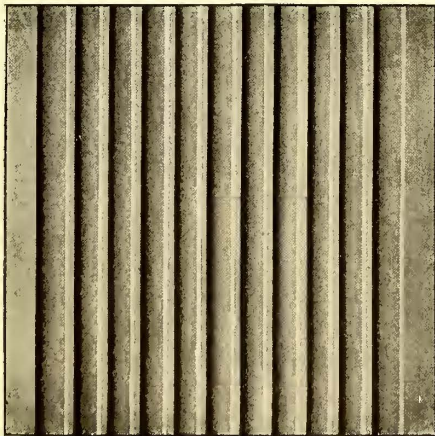


FIG. 2.—RIBBED OUTER SURFACE OF POROUS PLATES

of the electrolyte when the cell is in use. When assembled the opposed ribs provide vertical flues in which the acid flows freely. The body of the plate is about  $\frac{1}{32}$  of an inch thick, and so porous that liquid goes through it almost as through blotting paper, while the pores are so fine as completely to prevent any infiltration of the active materials.

In building the battery the reticulated sides of the plates are compactly filled with a paste of lead oxide, and a sheet-lead electrode is placed between two plates. The edges are

closed tight, either by flanges on the plates themselves or by edge pieces applied when the cell is assembled. In the larger cells as many unit plates as are necessary are assembled with a single large lead sheet as electrode between the active surfaces, and these composite boxes are assembled with non-conducting backing plates and hard lead bands. The element thus assembled is placed in its electrolyte, "formed" in the ordinary manner, and is then ready for use.

It is said that despite the complete and permanent enclosure of the active material the Standard cells show

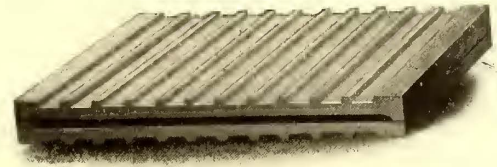
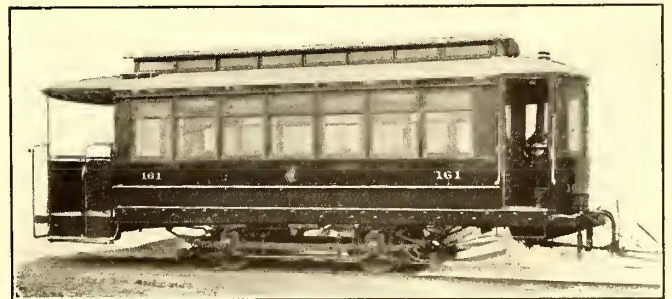


FIG. 3.—AN UNFILLED UNIT BOX

no unusual internal resistance, first, because the plates are so porous as to produce little effect, and second, because the internal resistance of any cell varies inversely with the effective area of plates.

### INTERESTING CARS FOR TOPEKA, KAN.

There are several interesting features connected with the cars for Topeka, eight in number, which the American Car Company has just completed. These cars are operated in the one direction only, the front platform being used exclusively by the motorman and the "Detroit" rear platform affording the only means of exit and entrance for passengers. To safeguard against passengers attempting to board or leave the car while it is in motion, screen doors are provided which are operated by a rod which extends to the motorman's compartment. Passengers are therefore at all times under the direct supervision of the motorman. On top of the dasher opposite the entrance of the rear platform is a screen extending about one-

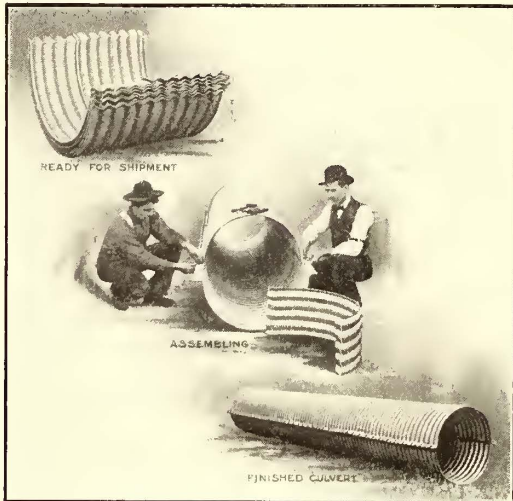


DETROIT PLATFORM CAR WITH SCREEN GATES FOR TOPEKA

third around the platform for protection. Another interesting point in connection with the cars is that the side sills are continued as far as the crown piece; the familiar dropped platform with knees supporting it being missing. The cars are 20 ft. 8 ins. over the end panels. The front platforms are 4 ft. and the rear 6 ft., making length of cars over crown pieces, 30 ft. 8 ins. The width over the sills is 7 ft. 10 ins.; and over the posts at the belt, 8 ft. 2 ins. The height from floor to ceiling is 8 ft.  $5\frac{1}{4}$  ins. The trucks are the No. 21-E type, with 8 ft. wheel base, the standard single-truck for the road.

### CORRUGATED GALVANIZED METAL CULVERT

The Canton Culvert Company, of Canton, Ohio, manufactures what it claims is an advancement in corrugated galvanized metal culvert, which is especially adapted to street railway and steam railroad construction and which is being increasingly specified and used in both these classes of service. The metal from which the culverts are made is a special analysis open-hearth stock heavily galvanized and non-corrosive and differing, so it is said, in chemical homogeneity from steel or other metal culvert materials.



METAL CULVERT IN DIFFERENT STAGES OF ERECTION

In addition their strength or sustaining power is considerably increased from the effects of a patented lateral flange joint used in connecting along the center of the cylinder at both sides what may be described as opposite or upper and lower members of the culvert proper—the flange snugly interlapping the corrugations and being rigidly held in place by galvanized bolts in alternating corrugations. Being manufactured in sections, the culverts can be shipped as built and assembled at the site of the work, thus facilitating delivery and reducing freight expense and the possibility of damage in transit. This feature also makes it possible for dealers to carry stock for immediate delivery.

### VICTORIAN RAILWAY ELECTRIFICATION

Thomas Tait, chairman of the Victorian Railway Commission, which for some time has been considering the electrification of the Melbourne Suburban Railway system, has published his report on the subject. The total population of Melbourne and suburbs amounts to 531,000 and the suburban railway route mileage totals 149 miles, with 148 stations, or a station to every mile of route. The annual number of suburban passenger journeys is over 64,000,000, and the average distance traveled (single trip)  $4\frac{3}{4}$  miles. The annual revenue, not including parcels, mails or miscellaneous receipts, is £645,500. The total number of passengers carried in a year is over 125,000,000; the aggregate revenue is £1,166,500. After giving these preliminary statistics Mr. Tait proceeds to discuss the reasons that have led to railway electrification and divides electrically operated lines into two categories, those originally constructed for electric traction and those converted from steam operation.

A table of the services to six of the principal suburban stations shows that the number of daily trains each way is 97, 95, 76, 74, 72 and 71 respectively. While some gain in traffic and gross revenue are expected to result from elec-

trification, due to an improved and especially a quicker and more frequent service, Mr. Tait does not think that any such proportionate increase can be looked for as the result of the conversion of the Melbourne lines as in the case of electrified lines where the service before conversion was considerably less than that now existing on most of the Melbourne lines. He is of opinion that some reduction in the cost of working the existing service (exclusive of the increased interest charges) may be expected in the event of at least two of the busiest lines being electrified, and says it must be determined whether the gain in traffic and the accompanying increase in gross revenue and reduction in working cost will together produce sufficient additional net revenue to meet the interest charges on the cost of electrification, or, if not, how far the additional net revenue will go toward meeting those charges.

### FARE COLLECTION IN PROVIDENCE

Recent testimony in regard to the Rooke system of the automatic registration of fares in Providence bears out the expectations of the management published in the *STREET RAILWAY JOURNAL* for July 13, 1907, soon after the system was put in operation. The officers of the company say no difficulty was experienced with the public conforming to the method of payment demanded by this system, which differed from the old method of payment only in the fact that the fare was inserted into a hand register presented by the conductor instead of being placed in the conductor's hand. At first some of the conductors did not take kindly to the registers, but this prejudice has worn away and the riding public has become accustomed to the use of the device. The employees are also now in favor of it. They state that they are less tired at the end of their day's work, and are relieved from the fear of mistakes or suspicion. Fares are now collected with speed on crowded open cars where passengers ride on the running board. The lines now equipped require 370 registers and a few officials who were originally opposed to the system have been won over to it by reason of its working advantages which have developed under their personal observation.

One novel use of the Rooke system and one which has attracted considerable attention is its adoption by the Fifth Avenue Bus Line in New York City. The fare is 10 cents and the register is arranged properly to record this charge. Other street railway systems are beginning the use of this method of fare collection.

The Milwaukee & Northern Railway, whose gas engine power station system was described in the *STREET RAILWAY JOURNAL* for Dec. 7, underwent an interesting experience during the recent heavy snow storm in the Northwest. Most of the right of way is through a flat, open country, where there was full exposure to the storm. Snow fences had been erected along the worst places, but were of little avail owing to the severe wind. The company had running three large interurban cars, one large snow plow, one large sweeper and four city cars. The interurban cars when going through heavy snow would take as much as 550 hp. This, added to the snow plows and city cars, gave the single gas engine installed a swinging load of from 280 to 2400 hp. The engine acted extremely well under these trying conditions and picked up the heavy load with apparent ease. Although the Milwaukee Northern did not run on schedule time during the day, the cars kept going and by nightfall were back to their regular schedule.

## LONDON LETTER

(From Our Regular Correspondent.)

We have unfortunately again to record two serious accidents, one in London and the other in Glasgow. The London accident took place on the newly electrified portion of the tramways on Pentonville Road between the Angel and King's Cross, but fortunate resulted, so far as we know, in no one being killed. The brakes refused to act, and soon after the car started on its descent of the hill it got beyond control. The driver stuck to his post and the conductor endeavored to allay the fears of the passengers. The Glasgow accident, unfortunately, was more serious, resulting in the loss of several lives, including that of the driver, who died a day or two after the accident. The car was descending the hill on High Street near the Cathedral, and for some curious reason seemed to get completely out of control, crossing George Street, an important thoroughfare, fortunately, without meeting any other vehicles, and finally was arrested by means of collision with lorries before it reached the next important cross thoroughfare at Glasgow Cross. In this case also the motorman made heroic efforts to stop his car and stuck to his post until he was pitched headlong into the street when the car crashed into the second lorry.

While on the subject of accidents, it is interesting to note that the report of Colonel Yorke of the Board of Trade on the Birmingham accident, which occurred last October, states that he considers the immediate cause was the action of the inspector, who took the car down the hill in Warstone Lane with a defective magnetic track brake, evidently experimenting with that brake on the incline. Had the hand brake been properly applied before starting down the incline no accident would have occurred. The Board of Trade have also reported on the accident which took place in October on the Halifax Corporation Tramways. Lieutenant Colonel Druitt states that he considers the motorman must be regarded as being careless and that he failed to notice the style of controller fitted to the car, and in consequence did not make proper use of the controller at his disposal. The inspector also recommends the Halifax Corporation in future to equip the cars for service on the very steep gradients with a form of slipper brake that can be fully applied instantaneously. He also considers that while the cars are on very steep gradients the conductor should be on the rear platform ready to assist the motorman in applying the brake and dropping sand on the track as well in case of the car starting to run backwards.

A most unusual and extraordinary accident recently happened on the tramways of the Bradford Corporation. It appears that the trolley wheel came off the wire for some unexplained reason, the pole springing upwards. When the car came to the next span wire the pole was, of course, driven down again and unfortunately happened to strike on the head with great force a passenger who at the moment was standing on the car, the seats being wet, with the result that he died from a fractured skull.

Good progress is now being made with the electrification of the London County Council tramways in the East End of London, extending from Whitechapel along Bow Road for a distance of about three miles of double track. These lines are particularly interesting owing to the fact that they are being equipped on the G. B. Surfact contract system. The work is being done by Messrs. Dick, Kerr & Company, and about three-quarters of it is already completed, so that it is expected that trams will actually be running on the system by March. The cost per mile of single track work on the G. B. system is about £11,000, which is a little more than it would have cost on the overhead system but not much more than half of what it would have cost on the underground conduit system. The extension of the electric tramway service from Aldwych to the foot of Waterloo Bridge is also nearing completion. It will be remembered that the line of Aldwych tramways is in a shallow subway, and this has been extended across the Strand through the arches of Waterloo Bridge Approach, and a special exit has been made for them at one side of the Bridge on to the Embankment, where they will join the whole southern system. Considerable difficulty has been experienced in doing this work, as a complete new arch has had to be made on the west side of the bridge of sufficient width to accommodate a double set of rails, and the work of cutting through the existing arches of the bridge supporting the approach under Wellington Street

has been extremely severe. On the solid portion of Wellington Street single tubes have been adopted, running underneath the Strand and joining the existing subway in Aldwych. The technical advisers of the London County Council have placed before that body some interesting estimates as to the future earnings of its tramway system. The capital involved, including a proportion of moneys spent on street widenings, is stated to be about £12,250,000, though this figure will be reduced by repayments to \$9,500,000 by the year 1915, at which time the estimated gross income from the trams will be £2,500,000, and the estimated net expenditure is stated to be under £1,500,000. The gross estimate of the profit, therefore, works out at about £1,000,000 a year, and, after allowing for interest, sinking fund charges and renewals, which alone amount to the handsome sum of £230,000, a surplus is expected of about £60,000 a year. It is expected, however, that five years after this date a net profit will accrue to the extent of £150,000 a year. It is not to be forgotten, however, that during these years a large portion of the capital charge is being repaid and by the year 1915 it is estimated that £3,000,000 will have been repaid. The Council will, therefore, save the interest on the repaid portion of this capital, and the annual profits ought thus to show a continual increase. It would therefore appear that the London County Council has a valuable asset in its tramway system and that with proper, vigorous and progressive management there ought to be no difficulty in fulfilling the above estimate.

It will be remembered that the Manchester Tramways Committee some time ago experienced on one of its routes with long-distance fares. Mr. McElroy, the general manager, has now presented a report showing that the receipts per passenger decreased from 1.25 to 1.21 pence, but that the earnings per car mile increased in the proportion of from 10.40 to 10.57 pence. It has also been ascertained that on the average the earnings per car mile are about thirty per cent. more from twopenny and threepenny passengers than from the penny passengers. The matter has now been referred to a sub-committee, which is to consider the whole question of long-distance fares. It is also interesting to note that at the recent meeting of the Manchester Tramways Committee it was stated that the result of the work of the Parcels Department during a period of nine months has resulted in a clear profit of £1,084.

The Tramways Committee of the Belfast Corporation some little time ago came to the conclusion to buy out the Cavehill and Whitewell Tramway Company, which was operating a system of tramways which came within a hundred yards of the city lines and which was endeavoring to obtain running powers over the lines of the Belfast Corporation into the centre of the city. The corporation therefore undertook to promote a bill in Parliament to buy the Cavehill tramways at a price not to exceed £60,000. At a public meeting of the ratepayers of Belfast, however, strong opposition was developed to this procedure and a requisition was made asking that a plebiscite of the ratepayers should be taken and the Lord Mayor has now undertaken that this course shall be adopted.

We referred last month to the fact that the members of the Oxford City Council had paid a visit to Hastings with a view to inspecting the Dolter System of surface contact system which is in operation there. Judging by the published accounts of this inspection, it would appear that the members of the Council were well satisfied with what they witnessed. Mr. Stephen Sellon, the consulting electrical engineer to the corporation, accompanied the party, and he has now made a report to the Council which we can only characterize as unfavorable. Mr. Sellon is evidently not in favor of any surface contact system and considers that they are all in the experimental stage. In considering this particular question it has to be remembered that the Oxford and District Tramways Act provided that the City of Oxford could install the surfact contact system in Oxford if it could be proved that such a system had been working satisfactorily for six months in any place in Great Britain, the visit to Hastings being made with the object of deciding whether the corporation would be justified in permitting the adoption of the system at Oxford. Mr. Sellon now reiterates that the system at Hastings is still experimental and states that no system can be said to be out of the experimental stage that requires the services of a patrol numbering about four men to the mile for the purpose of locating and dealing with live studs. Mr. Sellon also believes that the favorable circumstances at Hastings do not present themselves at Oxford, and he suggests that as the Hastings Tramways Company is under an agreement with the Dolter Company to take over the system

this month, should the system comply with the terms of the guarantee, it would be well to await this decision before committing itself. He also urges that the corporation should say that on the advice of its consulting engineer that it is of opinion that the lines at Hastings has not worked satisfactorily for the last six months, and that this will put the onus on the Dolter Company to show that the line has been working satisfactorily in Great Britain for the last six months, and that an arbitrator could then be appointed to decide the question. At a meeting of the General Purposes Committee of the Oxford Town Council this report was considered, and a resolution to the following effect has been adopted by the Council, namely, "That in the opinion of the corporation on the Dolter surface contact system has not been working satisfactorily for six months in any place in Great Britain," and at a recent meeting of the Council this resolution was adopted. Needless to say, therefore, progress in Oxford is once more at a standstill, and it would appear as if it would be some time yet before any definite action is taken.

Mr. Dalrymple, the manager of the Glasgow Corporation Tramways, has recently issued a report especially on the subject of a through route of tramways from Maryhill to Springburn, which would involve a large expenditure. The interesting portion of the report, however, is that he points out that on certain routes in Glasgow, which might fully be expected to pay well, there has been really a very decided loss. For instance, the route from Paisley Road to Mount Florida was opened in October, 1906, and to the ordinary observer there appeared every likelihood that this route, which passes through a very thickly populated district, would at least pay expenses. The actual result, however, of the year just closed has been a loss of £3,000. Another route was opened in November, 1906, from Garnagad to Polmadie, the cars of which also passed through a district of dense population, and the loss on this route is even greater, being about four thousand pounds. The proposed route to Springburn could not possibly be expected to develop any such traffic as on the two routes mentioned above, and it has therefore been decided that this route will not for the moment be continued. In other words, Glasgow will do nothing for some time as far as tramway extensions of any magnitude are concerned. In this connection, it is interesting to note that the inhabitants of Milngavie recently took a plebiscite on the question of the proposed introduction of the Glasgow Corporation Tramways to their town, and a large majority voted in favor of the tramways. On the above decision, however, it would seem as if they would not see tramways as far as Milngavie for some time. Mr. Dalrymple, in his report, also calls attention to the fact that many people consider the well-paying portions of a city's tramway routes should pay for those on which the earnings are not so large. He points out the fact that in the portions that pay well a much more frequent service of cars has to be maintained at greater cost, with probably smaller receipts per car mile and heavier expenses for maintenance. The report is an interesting and useful one, and points the moral that a system of tramways to be successful must have its limitations.

With reference to the late action of Thermit Limited against Weldite Limited for infringement of the former's patent rights for the production of pure metals and for welding metals by the well-known Thermit process, in which Justice Warrington in April last gave judgment in favor of Thermit Limited, we learn that on Saturday, December 21, an order was made by Justice Parker on the petition of Thermit Limited for the revocation of Patent No. 10,881, of 1905, granted to Claude Vautin for the process, the use of which by Weldite Limited formed the subject of the above action.

After negotiations lasting over several years, the London United Tramways Company, of which Sir Clinton Robinson is managing director, recently commenced the relaying of the tramway track in Actonvale, between Shepherd's-bush and Acton. On nearly every part of the company's service in West London councils have made strong protests about the noise of the running of the cars, and hundreds of property owners have complained of their houses becoming empty entirely on this account.

At a meeting of the Liverpool Corporation, the Electric Tramways Committee reported that last year's traffic, both as regards receipts, passengers carried, and earnings per car mile, were the greatest recorded. The passengers numbered 124,000,000, nearly 2,000,000 more than in the previous twelve months. Receipts were nearly £572,000—an increase of over

£8,000. The car mileage was over 12,200,000, an increase of near 116,000 miles.

The Halifax Corporation Tramways Committee has approved a scheme of mutual insurance drawn up by the chairman and the vice-chairman. The Halifax Corporation at present is only insured for £1,000 for any single accident, and for a total of £4,500 for accidents that may occur in any one year. It is claimed that, if the insurance scheme in question is adopted by municipalities and tramway companies, total liability for all accidents can be covered. The Halifax Town Council will be asked to endorse the decision of the Tramways Committee, and take the initiative in convening a conference of representatives of corporations and tramway companies to discuss the advisability of formulating a joint insurance scheme.

The directors of the Rio de Janeiro Tramway, Light & Power Co. announce that owing to increasing business in Europe they have opened offices at 46 Threadneedle street, London, and that Mr. William Mackenzie, of Toronto, has resigned the presidency, but will remain chairman of the board. Dr. F. S. Pearson has been elected president and R. M. Horne-Payne and E. R. Wood additional vice-presidents. George Flett, managing director of Dick, Kerr and Company, Limited, has also been elected an additional director.

A. C. S.

## ANNUAL MEETING OF THE NORTHERN OHIO TRACTION & LIGHT COMPANY

At the annual meeting of the stockholders of the Northern Ohio Traction & Light Company, a few days ago, all the directors were re-elected and they organized by choosing the same officers that formed the staff last year. The company made an excellent record for the year and the stockholders were particularly well pleased with the results. The addition of the Canton-Akron lines to the system has proved all that was expected and the prospects of still further development of business through them is good.

The annual report shows a gain of \$206,000 and \$116,808 in net earnings over the previous year. A total surplus of \$300,063 had accrued to stockholders, of which \$158,778 was distributed in dividends. Extracts from the report of President Henry A. Everett are as follows:

"The total mileage of the company at the end of the year 1907 was 214.53 miles, as compared with 204.12 for the year 1906, being an increase of 10.41.

"The line from Barberton to Wadsworth, which was under construction during 1906, was completed and placed in operation on April 9, 1907, the distance being 6 miles. An extension of the line from West Brookfield to East Greenville, in Stark County, was made, a distance of 3 miles.

"Additional private right of way has been purchased on the A. B. C. Division, between Cuyahoga Falls and Newburg, making about 85 per cent of total right of way needed for the purpose of moving the tracks that are at present on the highway.

"Twenty-six additional cars, including equipment, were placed in service during the fiscal year. In the lighting department 400 new arc lamps were installed in the city of Akron for street lighting purposes.

The annual report showed the following figures, in comparison with the previous year:

	1906.	1907.
Gross earnings .....	\$1,703,339.98	\$1,909,060.75
Expenses and taxes.....	1,006,842.31	1,095,755.11
Net earnings .....	\$696,497.67	\$813,305.64
Fixed charges .....	483,173.85	513,241.86
Surplus .....	\$213,323.82	\$300,063.78
Dividends on stock.....	113,526.50	158,778.00
Balance ..	\$99,797.32	\$141,285.78
Average number of miles in operation .....	200	207
Gross earnings per mile.....	\$7,885.45	\$8,556.23
Net earnings per mile.....	3,114.77	3,558.32
Ratio of expenses to earnings...	59.11	57.40

Only three quarterly dividends were paid during 1906.

The officers are as follows: H. A. Everett, president; Will Christy, first vice-president; Charles Currie, second vice-president; C. F. Moore, secretary; J. R. Nutt, treasurer.



**REPORT OF CONNECTICUT RAILROAD COMMISSIONERS**

The report of the Railroad Commissioners of Connecticut for the year ended June 30, 1907, has just been transmitted to the Governor. In regard to the electric railways, the report says in part: Important changes have taken place during the past year in the street railway situation. The Consolidated Railway Company, which at the beginning of the year, owned and operated more miles of street railways within the state than any other company, leased the property of the Connecticut Railway & Lighting Company, which was the second largest operating company in the state. The Consolidated Railway Company next obtained, by merger or otherwise, the New England Navigation Company, representing the various steamboat lines plying between various New England ports and New York and Philadelphia. The New York, New Haven & Hartford Railroad Company was then merged with the Consolidated Railway Company, under the name of the New York, New Haven & Hartford Railroad Company, and as thus constituted owns all the steam railroads, electric lines, lighting, gas and water supply companies, and steamboat properties, heretofore owned and operated by the New York, New Haven & Hartford Railroad, and the Consolidated Railway Companies. Later, the name of the Thomaston Tramway Company, owning an unfinished line of road extending from Thomaston to Waterville, was changed to that of the Connecticut Company, which now operates the street railways owned and leased by the New York, New Haven & Hartford Railroad Company, comprising 479,603 miles of single track of the street railways of the state. Furthermore, the capital stock of the 325 miles of single-track of street railways owned by the New York, New Haven & Hartford Railroad Company is represented by the stock of that company, with which it has been merged. Of the \$121,878,100 of capital stock of that company, \$52,435,926.80 is apportioned to steam railroads, and the balance, \$69,442,173.20, the electric apportionment being as follows:

Cost of steamships owned by the Consolidated Railway Company at the time of merger, and subsequent expenditures was .....	\$19,261,726.59
Cost of street railways owned by the Consolidated Railway Company at the time of merger, and subsequent expenditures .....	26,872,806.41
Cost of street railway equipment at time of merger, and subsequent expenditures .....	3,756,284.98
Steamboats, tugs and floats leased.....	2,333,515.76
Cost of interest in the Central New England Railway Company over and above adjusted book value of securities .....	4,672.37
<b>Total.....</b>	<b>\$52,229,006.11</b>

The line from Seymour to Naugatuck has been completed. It is built mostly on private right of way and is the most expensive piece of street railway construction yet undertaken within the state. The Thomaston tramway, now the Connecticut Company, extending from Thomaston to Waterville, has been under construction during the past summer, but is not yet completed. The line from Branford to Stony Creek, part of the New York, New Haven & Hartford Railroad Company's system, has been completed and is being operated. The Shore Line Electric Railway in the towns of Essex and Old Saybrook is also in process of construction.

The total mileage of street railways is 799,981 miles. The total bonded debt of the street railway companies, not including the 396,399 miles owned by the New York, New Haven & Hartford Railroad Company, is \$17,052,078.36, being \$46,158.68 per mile of single track owned. It will be seen that \$13,466,078.36 of the foregoing is the bonded debt of the Connecticut Railway & Lighting Company, and the bonded debt of what was formerly the Consolidated Railway Company is now included in the report of the New York, New Haven & Hartford Railroad Company.

The floating indebtedness of nine of the companies, representing 167,201 miles, is \$716,466.69, being \$4,285.06 per mile. Connecticut Railway & Light Company has no floating debt.

The cost of construction and equipment, including the lines owned by the New York, New Haven & Hartford Railroad Company, is \$40,140,917.78, representing the cost of 370.218 miles of single main track.

The gross earnings of the companies for the past year were \$6,813,686.14, an increase of \$464,483.83 over the earnings of the previous year.

The operating expenses amounted to \$4,521,072.50, an increase of \$725,378.39 over the previous year.

The net earnings were \$2,292,613.64, a decrease of \$265,988.50 from the net earnings of the previous year.

The dividends paid by seven of the twelve companies amounted to \$1,003,206.04. Of this amount the Bristol & Plainville Tramway Company paid \$15,000; the Connecticut Railway & Lighting Company \$741,640.19; the Consolidated Railway Company, \$200,000; the Danbury & Bethel Street Railway Company, \$12,800; the Groton & Stonington Street Railway Company, \$15,000; the Hartford & Springfield Street Railway Company, \$14,855.85, and the West Shore Railway Company, \$4,000.

The amount of interest paid was \$2,146,747.74, compared with \$1,725,615.71 paid the previous year.

The taxes paid the state amounted to \$343,266.24; the amount paid the previous year was \$295,892.53.

The number of passengers carried was 127,701,425, an increase of 6,378,519 over the number transported last year, and compared with 76,687,838 carried by the steam railroads.

**HEARING ON THE OPERATION OF ELECTRICS IN INDIANA**

The following is a copy of the official call of the Indiana Railroad Commission to the electric railways of the state in reference to the details of the operation of their properties.

CIRCULAR No. 19.

To all Traction or Interurban Railroad Companies:

It being the duty of the Railroad Commission "to keep informed as to the condition of railroads and railways, and the manner in which they are operated with reference to the security and accommodation of the public," an inquiry and investigation is hereby instituted as to the rules for operating and despatching cars, and as to the qualifications of motormen and conductors, on the traction lines of this state.

The managers, superintendents and dispatchers of said railroads are, therefore, requested and directed to appear before the Commission at its Public Hearing Room, on Monday, February 10, 1908, at 10 o'clock A. M., for conference and information upon these subjects, and for the purpose of formulating and adopting uniform operating rules and practices, and for providing for the instruction of conductors and motormen in their rules and duties, and to take such other steps for safe operation, and the prevention of accidents as may be agreed on or ordered.

By order of the Commission. CHAS. B. RILEY, Secretary.

**ANNUAL MEETING OF CLEVELAND, SOUTHWESTERN & COLUMBUS COMPANY**

At the annual meeting of the stockholders of the Cleveland, Southwestern & Columbus Railway Company, held in the office at Cleveland last Tuesday, J. O. Wilson, treasurer of the company, was chosen as a member of the board of directors to fill the vacancy caused by the recent death of S. C. Smith. All of the other directors were re-elected as follows: A. E. Akins, M. L. Benham, George N. Chandler, L. M. Coe, F. L. Fuller, F. H. Ginn, J. F. Harper, W. H. Lamprecht, F. E. Meyers, M. J. Mandelbaum, F. T. Pomeroy, H. Pomeroy, H. Q. Sargent, M. A. Sprague, A. B. Taylor and W. B. Thompson. The officers are: F. T. Pomeroy, president; A. E. Akins, first vice-president; F. E. Myers, second vice-president; J. O. Wilson, treasurer; E. F. Schneider, secretary.

In the report the earnings for 1907 are included the earnings, operating expenses and taxes for the Ohio Central since last April when it was taken over. The figures for 1908 do not include the Ohio Central report for any part of the year. The gain in gross earnings thus shows very large, but a goodly portion must be credited to the Ohio Central. The gain in net earnings, \$8,667.13, shows that the business is increasing. The statement is as follows:

	1906	1907
Gross earnings.....	\$645,849.95	\$756,989.37
Less operating expenses.....	303,856.39	440,934.67
Net earnings.....	\$281,993.56	\$316,054.70
Deductions .....	179,251.70	205,454.71
Net income.....	\$102,741.86	\$111,408.99

## AFFAIRS IN NEW YORK

Judge Lacombe, in the United States Circuit Court, heard arguments Friday, Jan. 24, on the application of the receivers appointed by the State Supreme Court to assume control of the surface lines of the New York City Street Railway Company. John P. Murray, representing the state receivers, argued that the roads in question were wholly within the bounds of this state and should therefore be subject exclusively to the state's jurisdiction. The fact that diversity of citizenship threw the original suit into the Federal court does not alter the situation, he declared. Arthur H. Masten, counsel for the Federal receivers, Joline and Robinson, replied that inasmuch as the lines referred to had been placed under their control it would be both injudicious and harmful to all concerned to interfere in the management. The court fixed Wednesday, Jan. 22, for final argument.

Judge Rosalsky, of General Sessions, on Monday, Jan. 25, gave a decision in the proceedings instituted against Paul D. Cravath for contempt of court in declining to answer questions put to him when before the November Grand Jury in connection with the sale of the stock of the Wall & Cortlandt Street Ferries Railroad to the Metropolitan Securities Company in 1902. Mr. Cravath based his refusal upon the fact that he was Mr. Ryan's counsel, and Judge Rosalsky upholds him in this contention. In his decision, Judge Rosalsky delivered a severe arraignment of District Attorney Jerome.

According to a report to the New York Stock Exchange, there has been deposited with the Central Trust Company, under terms of the agreement of the protective committee for the first consolidated 4 per cent bonds of the Third Avenue Railroad Company, a total of \$21,272,000 of the \$37,560,000 outstanding issue of the bonds. In addition, \$510,000 of the bonds are pledged to be deposited. Under the terms of an offer made by Kuhn, Loeb & Company, a large majority of the coupons due Jan. 1, 1908, on those bonds deposited have been paid by Kuhn, Loeb & Company, and the certificates of deposit given in exchange for the bonds have been stamped to read that Kuhn, Loeb & Company are entitled to the proceeds accruing under the agreement in respect to the Jan. 1 coupon, or to the delivery of the coupon in case of the return of the bond. The committee on stock list recommends that the certificates of the bonds deposited be admitted to list, and also certificates for the balance of the \$16,288,000 bonds as deposited with the Central Trust Company from time to time up to March 1, 1908.

Chairman Willcox and Commissioner Maltbie and Commissioner Eustis, of the Public Service Commission, are in favor of the building of the Broadway-Lafayette Avenue subway bridge loop in Brooklyn. Chairman Willcox is quoted as saying that the commission's investigation of the Interborough-Metropolitan is proceeding vigorously. Expert accountants are at work on the books of the companies, and their findings when ready will be read into the record of the investigation. Certain men have not been put on the witness stand and will not be because of the immunity clause.

The trial trip of the first train through the south tube of the McAdoo tunnel from Hoboken tunnel to Sixth Avenue and Eighth Street, New York, was successfully made Saturday, Jan. 25. The tunnel is expected to be ready for regular service in two weeks.

The Brooklyn Rapid Transit Company put into effect Monday morning, Jan. 26, the new service on the Brooklyn Bridge. Hereafter the old cable local trains will not be operated. In their stead, as far as local passengers are concerned, a local trolley service between the two terminals of the bridge will be operated. From now on the company will operate a through elevated service to Manhattan at all hours and a special local Brooklyn service.

The New York Connecting Railroad, which is to extend through Brooklyn and Queens and serve as a connecting link between the Pennsylvania system and the New Haven system, has made application for a two year extension of time in which consents of property holders may be obtained. About 80 per cent of the land necessary for the right of way has been acquired. Vice-President Rea states that this delay will not postpone the completion of the Pennsylvania Tunnel & Terminal Railroad or the through operation of trains from Jersey to Queens through the Manhattan and river tunnels. Under the franchise granted by the board of estimate of New York the company had until Feb. 28 next to obtain the necessary consents.

## HUDSON COMPANIES ABOUT TO UNDERTAKE NEW FINANCING

The Hudson Companies, the holding corporation for the New York & Jersey Railroad Company and the New York & Manhattan Railroad Company, is about to undertake some new financing, it is understood, to provide funds for the completion of the tunnels under the Hudson River at Cortlandt Street and Christopher Street and the terminal building in Church Street, for making the final payment on the tunnel equipment and for working capital. The financing, it is reported, will take the form of an issue of \$15,000,000 two-year 6 per cent notes, to be secured by deposit with the Standard Trust Company of a large block of the 4½ per cent convertible bonds of the Hudson & Manhattan Railroad Company, of which bonds \$57,000,000 are outstanding, the remaining \$43,000,000 being still in the company's treasury. Formal announcement of the new issue is expected to be made within a few days. It is said to be probable that the notes will be underwritten by a syndicate headed by Harvey Fisk & Sons.

Contracts for the use of the tunnels have been closed with the Pennsylvania Railroad Company, which will use the tubes running to Cortlandt Street; the Erie and the Delaware, Lackawanna & Western. The big new terminal building in Church Street is now expected to be in readiness for occupancy by May 1. Among its tenants will be the Carnegie Steel Company, the American Bridge Company, the American Steel & Wire Company, the National Tube Company and the United States Steel Products Export Company, all of which are subsidiaries of the United States Steel Corporation, and which will together occupy three floors of the new structure; the Railroad Club, which will have the two upper floors; the General Electric Company, the American Steel Spring Company, the American Locomotive Company and the American Brake Shoe & Foundry Company.

## THE ORGANIZATION OF THE LEXINGTON & INTER-URBAN RAILWAY

General Manager Crawford of the Lexington & Interurban Railway Company has issued the following announcement to the employees of the Lexington Railway Company, Central Kentucky Traction Company and the Blue Grass Traction Company:

Commencing Jan. 1, 1908, the operating organization of the above named companies will be as follows: J. P. Pope, chief electrical and mechanical engineer; Geo. MacLeod, superintendent of railways; O. R. Bilbro, auditor; G. W. Brown, master mechanic; J. P. McKeever, superintendent Lexington power station; C. K. Morrell, superintendent light and gas departments; W. V. Greene, superintendent ice department; John Sallee, local superintendent, Frankfort; Henry Bush, local superintendent, Lexington; A. F. Woehner, claim agent; J. H. Kearney, road master; L. Kitchen, chief line foreman; Bruce Cropper, storekeeper.

Messrs. Pope, MacLeod, Bilbro, Brown and Woehner will each report directly to the general manager.

Messrs. McKeever, Morrell, Greene and Kitchen will report to Mr. Pope, who will have charge of the power, light, gas, ice and overhead line departments and those employed in these departments.

Messrs. Bush, Sallee and Kearney will report to Mr. MacLeod, who will have charge of the railway and maintenance of way departments and those employed in these departments.

All clerks and employes of the accounting department will report to Mr. Bilbro.

All station agents will report to Mr. Bilbro in so far as accounting for sale of tickets and collection of money.

The storekeeper will report jointly to the auditor and master mechanic.

The local superintendent at Frankfort will report to Mr. Pope in matters pertaining to power plant operation and line work.

In view of the fact that Mr. A. L. Smith has tendered his resignation, it has been decided to abolish the position of superintendent of transportation.

It has also been decided to abolish the position of chief engineer of construction.

**DIVIDEND PAYING STREET RAILWAYS IN MASSACHUSETTS**

In accordance with state law, the Massachusetts Railroad Commissioners have certified to the Bank Commissioner that the following street railway companies incorporated in that state are shown by their returns to have earned and paid, without impairment of assets or capital stock, dividends of not less than 5 per cent on their capital stock for the last five years:

The Bank Commissioner may now allow savings banks and similar institutions to invest in bonds of such of the listed companies as he deems proper.

**SYMBOL FOR THE UTICA & MOHAWK VALLEY RAILWAY**

The Utica & Mohawk Valley Railway has just awarded prizes in the competition instituted to suggest desirable symbols or trade-marks for the company. The first prize was won by W. T. Schwarz, of Syracuse, whose design showed an Indian standing with hands outstretched on a bluff overlooking a valley in which a trolley is seen to be running. The drawing taking second prize exhibited the forward end of a trolley car, with a cut of an Indian in the center overlooking a part of the Oriskany Valley. A pipe of peace was included in the drawing. The third prize was awarded to the representation of a winged wheel running on a section of track and connected above with a winged trolley wheel.

At the same time a similar competition was conducted by the Oneida Railway Company, which is associated with the Utica & Mohawk Valley Company. In this contest the first prize was won by B. E. White, of Utica, who suggested a large arrow head, with the name of the company appearing in white letters. The design which won the second prize in the Oneida Railway contest was a large letter O, with the sectional view of a rail in the center. The third prize was given for a drawing of the side view of a car resting on an abutment, with an ornamental design underneath, comprising the head of an Indian.

**ANNUAL REPORT OF WINNIPEG ELECTRIC STREET RAILROAD COMPANY**

The Winnipeg Electric Street Railroad Company has issued its annual report. The city receives 5 per cent of the gross earnings and in addition the company pays \$20 tax on each car. For the past year the car tax will amount to about \$3,000. The following statement shows the earnings by months during the past year:

	Cash.	Tickets.	Total.
January .....	\$13,099.90	\$46,834.40	\$59,934.30
February .....	11,904.80	43,830.05	55,734.85
March .....	14,499.05	51,193.30	65,734.85
April .....	15,204.10	51,773.25	66,976.35
May .....	17,741.60	54,892.75	72,634.35
June .....	20,108.40	63,116.90	83,225.30
July .....	24,477.35	75,068.75	99,546.10
August .....	18,424.40	58,043.15	76,485.55
September .....	15,988.20	54,771.55	70,759.75
October .....	15,374.10	52,188.05	67,652.15
November .....	15,847.45	52,001.30	67,848.75
December .....	16,392.20	56,289.75	71,681.95

\$199,079.55      \$659,002.20      \$858,081.75

Sunday fares..... 3,775.67

Amount (5 per cent) paid to city..... 43,092.87

Amount paid last year..... 36,386.30

The following shows the earnings of the company during the past six years:

1902 .....	\$199,728.80
1903 .....	287,279.20
1904 .....	407,542.20
1905 .....	551,650.60
1906 .....	727,726.00
1907 .....	861,857.42

Several new lines have recently been opened, and, with the proposed extension for 1908, it is expected the gross earnings for 1908 will exceed \$1,000,000.

**FORT WAYNE & WABASH VALLEY COMPANY TO ADOPT MERIT SYSTEM**

R. T. Gunn, superintendent of transportation of the Fort Wayne & Wabash Valley Traction Company, has issued a bulletin putting into effect the merit system of discipline on the city lines at Fort Wayne, Logansport, Peru, Lafayette and Wabash. The method has been in vogue on the interurban lines for some time and has proved very effective. Merit marks will be given for good service and demerit marks for bad service. A motorman's and a conductor's prize of \$25 each will be given at the end of six months for the best record, and in cases of ties the money will be divided. The first prizes will be awarded July 1, 1908. A discipline committee will hear cases where employes believe they have not received justice in the award of demerit marks. Ninety demerit marks will be the signal for a reprimand by the superintendent and 100 will result in dismissal.

**THE TREND OF LEGISLATION IN MASSACHUSETTS**

To perfect the New York, New Haven & Hartford Railroad's system of electric railways extending north and south across the western end of Massachusetts, President L. S. Storrs, of the Berkshire Street Railway, has had a bill introduced into the Massachusetts Legislature giving that company authority to purchase the franchise and property of the Bennington & North Adams Street Railway. This would give the residents of Berkshire an extension into Vermont, continuing the connection which has already been established from Connecticut points up through Great Barrington, and Pittsfield, as far as North Adams, in Massachusetts, and the state boundary. The bill provides for a two-thirds vote of acceptance by stockholders of both companies before it becomes binding; puts the combined company under Massachusetts laws so far as its Massachusetts sections are concerned, and with reference to issue of securities, and provides that the president, clerk, treasurer and majority of the directors shall always be citizens of Massachusetts, with the company's principal office perpetually in that state.

Among other new bills offered is one to change the non-spitting by prohibiting the throwing of "any lighted match or lighted cigar or lighted cigarette" in any "railway car, any railroad car except a smoking car, any railroad or railway station or waiting room, or on any sidewalk or platform connected therewith" except in receptacles provided for the purpose; one to require preferment of personal injury or death claims against an insolvent railroad or street railway before all other claims except bonded indebtedness; one to require three-cent fares in Holyoke between 6:30 and 7:30 a. m., 11:30 a. m. and 1 p. m., and 5 and 6 p. m., under a penalty of from \$20 to \$1,000 for each violation; and a bill amending the street railway location law of 1906 so as to place the revisory powers with reference to a location more completely in the hands of the railroad commission instead of the local boards of aldermen or selectmen.

**MOSCOW TRAMWAY PURCHASE RUMORED**

According to a recent article in the London *Standard*, the negotiations, protracted over many months, which F. C. Armstrong has carried on in Moscow against a powerful German combination, in connection with the electric tramway contract for two millions sterling, have resulted in the formation of an English syndicate, which will specially devote itself to the vast opportunities offered in Russia to British enterprise since the signing of the Anglo-Russian Convention. The Hon. Arthur Stanley, representing an English group of financiers, has recently visited Moscow, and the syndicate, which is called the Anglo-Russian Company, and is headed by Mr. Stanley, not only takes over the tramway contract from Bruce Peebles & Company, but is prepared further to float a loan for the Moscow municipality. Mr. Stanley, during his visit, had an interview with M. Kokovtseff, the Minister of Finance, and has fully discussed the situation in Russia with the leading men. His interviews with the Mayor of Moscow were especially satisfactory with regard to the future of the English enterprise. The English paper states that the credit for this commercial victory against hitherto overwhelming opposition is entirely due to the indomitable efforts of Mr. Armstrong, who is now the managing director in London for the syndicate.

## SUBWAY BIDS DELAYED IN BOSTON

It is regarded as somewhat significant that, by request of the Boston Transit Commission, the letting of a contract for the last section of the new Charles River embankment in Boston has been delayed until such time as a proposed gate-chamber, having to do with the marginal sewer, could be relocated far enough toward the edge of the proposed embankment to allow width for a double-track location on its land side.

It is taken to mean that the Transit Commission wishes to be free, if it thinks best, to settle the much-discussed question how to connect the out-of-town end of the proposed Riverbank subway with the existing surface tracks in Beacon street and Commonwealth avenue extension by deciding to locate them on an S-curve through the Back Bay Fens at surface level. A subway under the Fens is the present alternative; but since the Transit Commission had a very lively series of public hearings on the matter a bill has been introduced in the Legislature by certain real estate interests giving the commission what it did not have under the original subway act, namely, authority to continue the tracks underground from the limit of the subway as at present proposed to a point beyond the intersection of Beacon street and Commonwealth avenue. The new proposal is the only one of all considered that will allow the commission to make such use of sub-subways at the portal as will obviate the overlapping of one "Y" with the other. This sub-subway method of avoiding such crossings at grade was used with great success at the Pleasant street portal of the original subway, where, under the original arrangement, surface cars emerged from the subway into Shawmut avenue on one arm of the "Y" and into Tremont street on the other, each line of cars thereby avoiding a level crossing with the opposite incoming cars. The Pleasant street layout is still intact and will be again used by surface cars when the "L" trains are diverted through the new Washington street tunnel.

## CHANCE TO BID ON MATERIAL FOR EUROPE

The Daily Consular and Trade Reports, the bulletin of the Bureau of Manufactures, Department of Commerce and Labor, states that an American Consul in Europe forwards a list of specifications for the construction of a new electric railway, work upon which it is expected will commence during the coming summer. The equipping of this railway will offer an opportunity to American manufacturers to supply steel rails, iron sleepers, double truck motor cars, tugs, steam turbodynamos, and other necessary items. In applying for information refer to file number, 1864.

## CAR BLOCKADE CAUSES IN NEW ORLEANS

Messrs. Dressel and McGivney, of the New Orleans Railway & Light Company, called upon Mayor Behrman, recently, to explain some of the causes of recent delays in the local car service. About thirty photographs were submitted by the company to show that the majority of interruptions to service on different lines are caused by obstructions placed on the tracks by contractors for the sewerage and water board in the installation of either sewer or water mains in the public streets. Each picture gave in detail conditions causing street car congestion and preventing the maintenance of regular schedules. Other interferences are caused by the stalling of overloaded wagons and floats on the tracks. The pictures were taken in many different parts of the city and on a large number of different car lines.

After examining the photographs, Mayor Behrman stated that he fully appreciated the difficulties that the company had to contend with in operating under present conditions, and pointed out that the citizens should be willing to suffer some inconveniences for the public good during the conduct of these large water and sewer construction undertakings. In regard to the failure of motormen to pick up passengers at certain times, the company stated that it was doing everything possible to correct the deficiencies of its service, and in every instance of a case where a motorman was reported for running by a passenger in the way complained of, that motorman lost a full day's pay, and if the offense was frequent was discharged from the service. In regard to complaints through the switching back of cars, there was no other way of restoring the regularity of the service in case of emergency. It has been necessary in many cases to turn back cars on account of the stalling of vehicles on the company's lines in extremely wet weather.

## ELECTRIC RAILWAY DEVELOPMENT IN CALIFORNIA

A recent special issue of the San Francisco *Chronicle* contained a long article on the electric railways in California, both built and proposed, which was in part as follows:

Los Angeles is served by an aggregate of 636 miles of urban and interurban electric roads; about San Francisco bay there are already 589 miles of electric lines that will be interconnected and greatly augmented for the work of serving the population of the Greater San Francisco.

While the Los Angeles country has about reached the fulfillment of adequate trolley service to all its suburbs, though Mr. Huntington expects to extend from McCampbell to Downey and from Covina to Pomona, San Francisco is only beginning a great campaign of conversion and extension.

The Ocean Shore, operated temporarily at each end with steam cars, is to be, when completed, a 78-mile electric line out of San Francisco and down the ocean shore through a series of beach suburbs to Santa Cruz. The Southern Pacific has already appropriated money for a great electric power plant of its own on the Oakland estuary, where current will be generated, first for the new Alameda and Fruitvale electric suburban train service, and later for the expected conversion of the Oakland and the Berkeley lines to electric. The entire line from Oakland through Hayward to San Jose has been definitely planned for electric service by the Southern Pacific. That line to San Jose is 50 miles, and the steam suburban roads to be converted on the Alameda route will be about 25 miles. The Key Route is constantly expanding its admirable electric train service on the Alameda County side of the bay.

The Northern Electric has 108 miles of line in operation now, from Sacramento to Marysville, to Chico, and to Oroville. Its proposed extensions would reach from Chico up the east side of the Sacramento River to Red Bluff, from Yuba City westward and across the Sacramento to Colusa, and from Sacramento to Folsom.

The California Midland, which has already built 5 miles of road along the Sierra slopes northeastward of Sacramento, has projected 70 miles to Marysville and Auburn. All these schemes indicate the immense interest in the traffic possibilities of that section where power for a thousand railroads can be cheaply developed.

The Lake Tahoe Electric has been mentioned as a prospective line around Lake Tahoe. The Sacramento-Lake Tahoe line, 128 miles in length, is another electric enterprise. The Shasta Southern is supposed to be projected from Redding to Hamilton by way of Red Bluff and Corning, on the west side of the Sacramento River. Richard Hotelling's Napa & Lakeport Railway is a proposed road to be extended 27 miles from Richardson's Bay by way of Napa, Rutherford and Lower Lake to Lakeport. The already established San Francisco, Vallejo & Napa Valley Road is to be extended 9 miles up to Yountville. The Sonoma & Lake County is to be extended 27 miles from Cloverdale to Lakeport, with a branch to Kelseyville. The Vallejo & Northern is to run from Vallejo to Sacramento by way of Suisun and Woodland. The Central California Traction is to supplement its 9 miles between Stockton and Lodi by a line to Sacramento. The Fresno Traction Company is to augment its present 16 miles of line by an extension to Hanford and Empire by way of Summit Lake and Laguna de Tache. Another proposed road is an extension from Polasky, eastward of Fresno, 100 miles to the Yosemite. Still another mentioned road is the Irwin City & Southeastern, from Turlock to Irwin City and Modesta. Another is the Oakland-Antioch line, 14 miles from Oakland to Antioch by way of an intercounty tunnel. The Pajaro Valley has mentioned an extension from Spreckels Junction to Salinas. The Peninsular Electric is to run from Mayfield southward and connect with the San Jose-Los Gatos Interurban. The San Jose & Santa Clara is the title of a 17-mile road to run from San Jose to Berryessa. The Santa Barbara Consolidated is supposed to be reaching for a 5-mile extension into the Montecilo Valley. The Redlands & Yucaipa Electric has planned for a 19-mile road from Redlands through the Yucaipa Valley, and the San Diego & Ocean Beach is mentioned for a line from National City to Ocean Beach, with a possible connection north to Los Angeles.

In the San Joaquin Valley, with Fresno as a center, they have 75 miles of track, and interurban electric lines are being projected and talked of. About San Diego there are several electric projects. Out from Port Los Angeles for a run up the coast is a 6-mile road projected 50 miles to end first at Hueneme and perhaps eventually to reach Santa Barbara.

## SALE OF THE CHICAGO UNION TRACTION COMPANY

The United States Supreme Court, on Jan. 23, denied the application of the minority bondholders of the Chicago Union Traction Co. for an appeal from the final decree of Judge Grosscup ordering the property to be sold at a receiver's sale. The sale was held on Jan. 25. It was a perfunctory affair, only one bidder, the Chicago Railways Co. making an offer. This company bid \$2,090,000 for the separate properties and \$2,000,000 for the property as a whole. A check for \$150,000 was deposited with the court to bind the offer. It is expected that the court will as soon as possible direct the receiver to issue a bill of sale to the Chicago Railways Company, and that before Feb. 1, the date of expiration of the franchise offer, the reorganized company will accept the conditions of the new franchise and take over the operation of the lines. The trustees of the new company hold \$24,130,000 of the \$25,394,000 outstanding bonds of the company, and \$4,380,000 of the \$4,393,125 receiver's certificates. Plans have been completed to raise \$5,000,000 immediately for the rehabilitation work required under the new franchise and ultimately, it is said, \$24,000,000 will be spent in improvements and extensions.

## INTERURBAN RAILROAD TO BE MOVED FROM CALIFORNIA TO WASHINGTON

The Chehalis & Centralia Railway & Power Company, organized to connect those cities in Washington, is about to undertake the unique project of moving the rails, power plant and rolling stock of a 10-mile interurban railway from Southern California and reinstalling the equipment between Chehalis and Centralia. The interurban road in question now connects two small cities near Los Angeles. It was built by F. M. Boyne, a Los Angeles promoter and capitalist, at a cost of \$180,000, but owing to financial reasons, it is stated, its operation was discontinued after the first three days. Boyne was anxious to rid himself of the line, and when he was offered \$50,000 for the road and its equipment by the Chehalis Company, he sold the property. General Manager Weeks, formerly of the Pacific Traction Company, of Tacoma, and Vice-President Spear have gone to Los Angeles to move the equipment. Everything will be brought north excepting the ties and ballast of the roadbed. There are six passenger cars and 20 freight cars, a modern steam power plant, fully equipped, and almost ten miles of 60-pound steel rails. It is expected to have the new line in operation within a year.

## STREET RAILWAY PATENTS

UNITED STATES PATENTS ISSUED JANUARY 7, 1908.

[This department is conducted by Rosenbaum & Stockbridge, patent attorneys, 140 Nassau Street, New York.]

875,733. Appliance for Opening and Closing Switches on Car-Lines; William A. Poindexter, Allegheny, Pa. App. filed July 30, 1906. Comprises a primary centrally pivoted lever, having a projecting lug at each end thereof, a centrally pivoted secondary lever having one extremity directly attached to the primary lever, and the other extremity directly attached to the switch point, and a movable arm depending from the the car to selectively engage either of said lugs.

875,768. Rail-Joint and Nut-Lock Therefor; James B. Baum, Grand Junction, Colo. App. filed Apr. 6, 1907. The rail chair is transversely divided into two sections having depending guideways for the reception of a sliding bar.

875,788. Pressure Device for Electric Current Collectors; Coloman De Kando, Budapest, Austria-Hungary. App. filed May 6, 1905. Pneumatic apparatus acting in conjunction with tension springs to maintain the requisite pressure between the trolley wire under different running conditions.

875,791. Controller Regulator; John P. Durkin, Philadelphia, Pa. App. filed Aug. 31, 1907. Means whereby the current cannot be too rapidly applied, consisting of a circular flange attached to the controller handle and having a tortuous groove therein in which rides a steel ball, which is also contained by grooves in the surrounding casing.

875,817. Vegetation-Destroyer; Clarence H. Howard, St. Louis, Mo. App. filed Oct. 18, 1907. Relates to means for mounting and adjusting gasolene burners to car trucks.

875,822. Pressure Device for Electric Current Collectors; Coloman de Kando, Budapest, Austria-Hungary. App. filed Nov. 27, 1903. The trolley pole is pressed upward by tension springs, which can be released by a pneumatic cylinder on the roof of the car. Means for increasing the pressure when the car is operating at high speed.

875,843. Apparatus for Track Circuit Control; James A. Peabody, Evanston, Ill. App. filed July 25, 1907. Means for supplying alternating current to track rails for signaling purposes, consisting of a battery having its circuit connected to a pole changer and another battery having its circuit connected to a vibrator operating said pole changer.

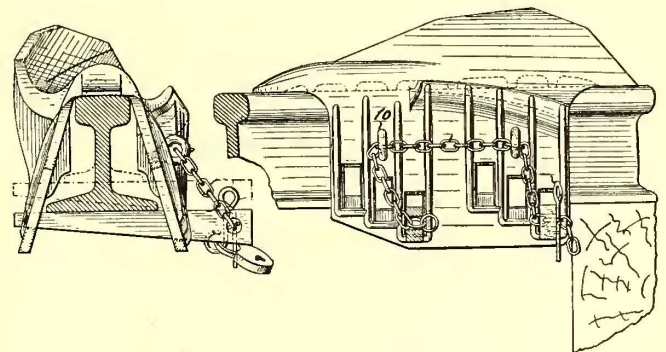
875,901. System of Control for Electric Motors; Arthus C. Eastwood, Cleveland, O. App. filed May 22, 1906. Means for altering the circuit connections of the motors with respect to one another, and with respect to the supply mains in order to control the speed and power of the motors.

875,911. Safety Signal System for Railways; William F. Herting & Frank C. Chlan, Baltimore, Md. App. filed Apr. 20, 1907. A block signal system, including electrical and mechanical features; has mechanically operated signals and electrical circuits completed by the movement thereof.

875,996. Portable Derailer; Stanley W. Hayes, Geneva, N. Y. App. filed Oct. 18, 1906. Details.

876,064. Single Track Signaling and Train-Controlling System for Railways; Frank E. Kinsman, Plainfield, N. J. App. filed Oct. 10, 1905. Differentiated characteristics of a track-circuit are made use of to indicate whether a danger or a safety condition is present at the entrance of a block which the train is about to enter, and a record is made of such condition of the system at that point at such time for either direction of running.

876,100. Odometer for Use in Connection with Fare Indicators; Berthold Schneider, Berlin, Germany. App. filed Oct. 3, 1906. Indicates not only the total distance traversed by the vehicle, but also that portion of this distance wherein the vehicle has been occupied by a fare.



PATENT NO. 875,996

876,107. Railway Rail Joint; Joseph M. Steele, Fayette City, Pa. App. filed Dec. 10, 1906. The joint conforms somewhat to the shape of the rail and has V-shaped recesses in each end, the ends of the rails being tapered to fit therein.

876,186. Extension Car-Step; Frederick E. Hopkins, Sterling, N. Y. App. filed Oct. 15, 1907. Provides an auxiliary car-step, which may be readily adjusted by a single movement of a controlling lever.

876,274. Electrically Controlled Releasing Device; Charles J. Kintner, New York, N. Y. App. filed Apr. 20, 1906. Device for use in connection with railway signals, providing means in the nature of a solenoid having a core operatively connected with an appliance which it is desired to release, and adapted to operate in such manner that said core will impart a blow to the part to be released when the coils of the solenoid are disconnected from the circuit.

## PERSONAL MENTION

PROF. WILLIAM F. M. GOSS, D. ENG., is to be officially installed as dean of the College of Engineering of the University of Illinois, on Wednesday, Feb. 5, at Urbana, Ill.

MR. HARRY SLUSH, paymaster of the Chicago & Southern Traction Company, was married recently to Miss Lulu Lempke, of Detroit. Mr. Slush is a nephew of Mr. Matthew Slush, president of the Chicago & Southern Company.

MR. FRED A. MARTIN has been appointed general manager of the Minneapolis, St. Paul, Rochester & Dubuque Traction Company. Mr. Martin was formerly acting chief operating inspector of the New York Central Railroad.

MR. M. J. BLONDELL, for a number of years master car builder and later superintendent of construction for the United Railways & Electric Company, of Baltimore, died a few days ago. He retired from active work several months ago on account of ill health.

MR. T. R. GABEL, until recently general superintendent of the Los Angeles-Pacific Company, has accepted the management of a new railroad enterprise for the San Joaquin Valley which will connect several of the most important commercial centers in that section and cover 120 miles.

MR. CHARLES FIFER has resigned as superintendent of the Salem Electric Railway Company, of Salem, Ohio, to accept a position as superintendent of the Philadelphia, Coatesville & Lancaster Railway Company, to become effective Feb. 1. Mr. Fifer will be succeeded at Salem by Mr. Herman H. Gaver.

MR. ALBERT J. PATERSON, general manager of the Meridian Light & Railway Company, Meridian, Miss., was married on Jan. 22, at St. Paul's Church, in that city, to Miss Annie Brown, daughter of Mr. and Mrs. W. A. Brown. Mr. and Mrs. Paterson will return to Meridian from Washington about February 1.

MR. WATSON TOWNSEND has resigned as assistant engineer of the Great Northern to become chief engineer of the St. Paul, Minneapolis & Seattle Electric Railroad Company. Mr. James W. Mossop has resigned from the Omaha to become general superintendent of the St. Paul, Minneapolis & Seattle Electric Railroad Company.

MR. GEORGE R. SCARRETT, roadmaster of the Berkshire Street Railway Company, of Pittsfield, Mass., and Mr. Richard T. Lawless, purchasing agent for the same company, have resigned, to take effect Feb. 1. Mr. Lawless will engage in business. Both Mr. Scarrett and Mr. Lawless have been in the employ of the company since the road was first operated, six years ago.

MR. EDWIN W. ROBERTSON, of Columbia, who has been president of the Anderson Traction Company, of Anderson, S. C., since April, and Mr. William Elliott, who has been general manager for the same length of time, have resigned. Their resignation takes effect at once. Mr. Robert E. Ligon, of Anderson, has been appointed temporary president, treasurer and general manager.

MR. W. E. KIRKPATRICK, secretary and treasurer of the Metropolitan Street Railway Company, of Kansas City, Mo., has been elected vice-president and treasurer of the company and Mr. J. W. Harder, auditor of the company, has been elected secretary. As vice-president of the company Mr. Kirkpatrick will be in active charge of the property during the absence of President Corrigan, who is planning a vacation in Bermuda and may possibly go to Europe.

MR. CHARLES W. SMITH has resigned the treasurership of the following subsidiary companies of the Boston Suburban Electric Companies and has been succeeded by Mr. E. M. Richards: Newton Street Railway, Newton & Boston Street Railway, Lexington & Boston Street Railway, Natick & Cochituate Street Railway and the Westboro & Hopkinton Street Railway Company. Mr. Smith continues as a trustee of the Boston Suburban Electric Companies.

MR. MORRIS K. JESUP, prominent in New York City affairs and formerly a banker and member of the firm of Cuyler, Morgan & Company, is dead. As president of the Chamber of Commerce Mr. Jesup served, ex-officio, as a member of the Board of Rapid Transit Commissioners from 1899 to 1907, when the powers of the commission were transferred to the new Public Service Commission. While on the Rapid Transit Board Mr. Jesup had much to do with the planning of the city's system of subways and tunnels.

MR. ISAAC S. RUTH has resigned as superintendent of the Allentown & Reading Traction Company, to take effect Feb. 1. Ill health is the cause of Mr. Ruth's retirement. For 15 years he was employed on the Schuylkill Valley branch of the

Pennsylvania Railroad. Later he became connected with H. E. Ahrens & Company, of Reading, contractors, and as foreman of construction for them built the Allentown & Reading Electric Railway, becoming the superintendent of the road in 1901. Mr. Ruth has purchased a farm and for the present at least will devote his entire time and attention to this property in the hope of improving his health.

MR. HERBERT H. VREELAND is to be the guest of honor at a reception and dinner to be tendered to him by his fellow members of the New York Railroad Club on the evening of Friday, Feb. 7. During the years that Mr. Vreeland has been president of the New York Railroad Club he has given a great deal of time and effort to its interests, and it is now one of the largest and most successful in the country. The committee in charge of the dinner consists of Mr. W. G. Besler, chairman; Mr. Frank Hedley, Mr. William B. Albright, Mr. Richard L. Thomas, Mr. Otis H. Cutler and Mr. Daniel M. Brady. Announcement will be made by the committee later of the place at which the dinner will be held.

MR. W. H. GLENN has just been elected vice-president and general manager of the Georgia Railway & Electric Company to succeed his brother, Mr. Thomas K. Glenn, whose resignation is announced elsewhere in this issue. He is a graduate of the Georgia School of Technology, and has been connected with the Atlanta Company and its constituents since 1891, when he began his work as a rodman in the engineering department of the Atlanta Consolidated Street Railway Company. Subsequently he entered the shops, and in 1893 was made master mechanic. Later he was appointed to the position of purchasing agent, and in 1898 was made assistant superintendent in charge of the construction department. When the Georgia Railway & Electric Company was organized, in 1902, Mr. Glenn was appointed head of the construction department of the railway lines.

MR. ALLAN C. HAWKINS, who was recently appointed foreman of electrical construction for the Connecticut Company, at Hartford, Conn., was recently presented by his associates in the company with a handsome Masonic charm as a token of their esteem. Mr. Hawkins is the only son of Probate Commissioner and former Mayor A. C. Hawkins, of Evansville, Ind., and at one time was assistant engineer for the Evansville & Eastern Electric Railway. Later he became superintendent of the Evansville Electric Plow & Traction Company, and subsequently entered the electrical department of the Indiana Union Traction Company. Following his connection with this company, he became superintendent and chief electrician of the Evansville & Mt. Vernon Electric Railway. Moving East about two years ago, Mr. Hawkins entered the electrical department of the Hartford division of the Consolidated Railway as foreman of the Wethersfield Avenue car house, which position he held until his recent appointment.

MR. THOMAS K. GLENN, vice-president and general manager of the Georgia Railway & Electric Company, of Atlanta, Ga., has resigned to become president of the Atlanta Steel

Hoop Company, and will be succeeded in the Atlanta Company by Mr. W. H. Glenn, his brother, now superintendent of construction of the company. The company with which Mr. Thomas K. Glenn becomes associated is capitalized at \$1,000,000, and has what is perhaps the largest manufacturing plant of its kind in the South. Mr. Glenn has long been connected with the Atlanta Company and its constituents, and it was with deep regret that his associates learned of his

determination to enter another field. Mr. Glenn began his street railway career in 1891 as secretary to Mr. Joel Hurt, vice-president and general manager of the Atlanta Consolidated Street Railway Company and has served with the company and its successors continuously since that date. In 1902, when the Georgia Railway & Electric Company was organized, he was placed in charge of the claims department, and in the following year was appointed to the position of vice-president and general manager, from which he has just resigned.



T. K. GLENN.

TABLE OF OPERATING STATISTICS

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. ‡ Including Rapid Railway system, Sandwich, Windsor & Amherstburg Railway, and Detroit, Monroe & Toledo Short Line Railway.

Table with columns: COMPANY, Period, Total Gross Earnings, Operating Expenses, Net Earnings, Deductions From Income, Net Income, Amount Available for Dividends, COMPANY, Period, Total Gross Earnings, Operating Expenses, Net Earnings, Deductions From Income, Net Income, Amount Available for Dividends. Rows include companies like AKRON, O., BELLINGHAM, WASH., CHICAGO, ILL., CLEVELAND, O., DETROIT, MICH., etc.

# NEWS OF THE WEEK

## CONSTRUCTION NOTES

Items in this department are classified geographically by States, with an alphabetical arrangement of cities under each State heading.

For the convenience of readers seeking information on particular subjects, the character of the individual item is indicated as follows:

- \* Proposed roads not previously reported.
- o Additional information regarding new roads.
- † Extensions and new equipment for operating roads.

Numerals preceding these signs indicate items referring to:

1. Track and roadway.
2. Cars, trucks and rolling stock equipment.
3. Power stations and sub-stations.
4. Car houses and repair shops.
5. Parks and amusement attractions.

oBISBEE, ARIZ.—Preparations are now being made for the trial trips of the new cars which will be used on the Warren-Bisbee Railway between Warren and Bisbee. The contractors have finished very nearly all of their work with the exception of the laying of tracks on Naco Road, which cannot be done until the city has completed the task of bringing the road to a uniform grade.

oARGENTA, ARK.—It is said that overhead work on the lines of the Argenta Street Railway will begin in a few days. The contract for the work has been let to the Electric Construction Company, of Little Rock. It is expected to have the work completed within ninety days.

†HOLLYWOOD, CAL.—The Los Angeles-Pacific Railroad Company has installed a regular half-hour car service on Highland Avenue, from Santa Monica Avenue to the north city limits. This line is just completed and is standard gage.

†OAKLAND, CAL.—Under a resolution recently passed by the City Council the Oakland Traction Company is permitted to abandon its franchise on East Third and Twelfth Avenues, connecting the East Twelfth and Sixteenth Streets. A new ordinance will permit the company to run its line entirely on Sixteenth Street from First Avenue to Thirteenth Avenue.

†OROVILLE, CAL.—The petition of the Northern Electric Company for the abandonment of a portion of Grand Avenue in Thermalito has been granted by the Board of Supervisors.

\*PASADENA, CAL.—Horace M. Dobbins, president of the Pasadena Cycleway Association has announced that he is at the head of a company that has been capitalized at \$5,000,000, for the construction of an electric railway between Pasadena and Los Angeles that will be three miles shorter than the present short line of the Pacific Electric Railway Company. According to the calculations of Mr. Dobbins and his associates, the new line will make the trip between the two cities in fifteen minutes. All grade crossings will be eliminated and the business center of Los Angeles will be entered by a subway. It is estimated that it will cost \$2,500,000 to construct the road. President Dobbins says the proposed line will skirt all the high hills between the two cities, and that it will be in actual reality an air line between the two terminal points. The third-rail system has been decided upon. It is the intention to use the old cycle-way right of way well into Los Angeles.

oREDLANDS, CAL.—The trustees have granted George H. Dunn and Charles S. Chesnut an extension of three months from Feb. 6 in their franchise to build electric roads on Colton Avenue, Sixth Street, State Street, Citrus Avenue, East Highland Avenue and Reservoir Street.

\*SAN DIEGO, CAL.—The City Council has adopted an ordinance, granting a right-of-way franchise to F. W. Peterson to construct and maintain a railway with the necessary sidings, switches, and bridges along certain highways at South San Diego. Work is to be completed in from four to eighteen months from date of franchise. Wm. H. Francis is county clerk.

2oDENVER, COL.—The Colorado & Southern Railway Company has let the contract for twelve passenger coaches for its electric interurban line to the Woeber Carriage Company, of Denver. The cars will be almost as large as regular passenger coaches and will be similar in finish to the "Seeing the Foothills" cars now in use on the tramway lines. The new road to Boulder will be opened on May 1, and the contract requires the completion of the cars by that time.

†DENVER, COL.—The Denver & Interurban Railroad Company has practically completed grading its forty-four-mile line between Denver and Boulder. It is expected to have the road in operation between these two

cities by June 1, 1908. An extension of seven miles to Fort Collins was completed and placed in operation on Dec. 20.

oGREELEY, COL.—F. O. Olsen, of St. Paul, has obtained a private right of way from Sixteenth to Tenth Street for the Greeley & Northern Railway Company. Upon the right of way the grade of the road will be extended from Sixteenth Street northward to within a block of the present Union Pacific depot, and south from Sixteenth Street the road is already built out of Evans to the southwest.

oHARTFORD, CONN.—Preliminary steps toward financing the construction of the Windsorville & East Hartford Street Railway Company have been taken. The incorporators have opened books for subscriptions and say that the prospects of raising the needed capital are fairly good. The charter gives the company the right to operate in the towns of East Windsor, South Windsor and East Hartford. The company has a capital stock of \$500,000.

†HARTFORD, CONN.—The Railroad Commissioners have granted the petition of the New York, New Haven & Hartford Railroad Company for power to take, under condemnation proceedings, land needed for the right of way for an electric road in the town of Middlebury. The property is desired in connection with an electric railway that the company will build from Waterbury to Middlebury and thence to Woodbury.

oWILMINGTON, DEL.—J. Frank Ball, counsel for the West Chester & Wilmington Electric Railway Company, has received the charter of the company from Dover, which has been approved by Secretary of State Cahall. The capital stock is \$200,000. The capital stock of the Pennsylvania end of the line is \$300,000 and a charter for that company was granted by the secretary of the commonwealth of Pennsylvania some time ago. The incorporators of the Delaware company are Thomas E. O'Connell, C. P. Faucett and Dr. F. Harvey Day, Isaac C. Elliott and Howard D. Ross. The company was required to deposit with the state \$3,000 as a bond, to build the road in this state. President O'Connell states that the first part of next week he will be engaged on the Pennsylvania end in securing some rights of ways that have not yet been definitely obtained.

†WASHINGTON, D. C.—Senator Burkett, of Nebraska, has introduced a bill providing for a crosstown railway, the Capital Traction Company being authorized to construct double-track extension on Florida Avenue to Eighth Street east and thence south to Pennsylvania Avenue; a double-track extension from Eighth Street westward on F Street to Second, and thence to connect with tracks already authorized to the Union station.

oFITZGERALD, GA.—The Fitzgerald & Ocilla Electric Railway & Power Company has been granted a charter. The company proposes to operate an electric railway in and between these two cities, and also to furnish electric lights and power. The capital stock is to be \$80,000, and the principal office in Fitzgerald. Among the incorporators are S. T. Holzendorf, of New York; L. C. Holzendorf, of Valdosta; C. P. Holzendorf, of Atlanta; R. I. Kirkland, of Irwin County; C. A. Holzendorf, T. M. Parsons, D. B. Jay and Clayton Jay, of Fitzgerald, and B. F. Holzendorf, of Douglas.

\*LEWISTON, IDA.—Frank McKean, of Chicago, who represents Eastern parties, has proposed to the people of Lewiston, to build an electric railway from Lewiston to Anatone and Cleveland, a distance of 45 miles. A committee of twenty men, of five each from Lewiston, Clarkston, Anatone and Cloverland, was appointed to consider the proposition and report later. By some, this is considered a Northern Pacific proposition. The company has been considering the plan to electrify the Clearwater branch. McKean says the line will cost \$2,000,000. He wants the citizens to subscribe \$400,000, or 20 per cent of the stock, and none of the money is to be paid until the road is in operation.

oBELLEVILLE, ILL.—The Secretary of State has issued a license to the Red Bud & Belleville Interurban Railway Company to construct an interurban line from Red Bud, Randolph County, through the counties of Monroe and St. Clair, to Smithton, Ill. Incorporators and directors are Conrad Becker, Charles C. Smith and Herman Schryver, of Red Bud; John Keller, of Hecker, Ill., and John A. Gundlach, of Belleville.

\*CHICAGO, ILL.—The Secretary of State has granted a license to Paul A. Neuffer, Harry H. Phillips, James E. Hauronic, Charles J. Horn and Rollo M. Cole, all of Chicago, to incorporate the Western Illinois & Iowa Railroad. The object of incorporation is to construct an interurban railway in Hancock County. The capital is placed at \$2,500,000.

†EAST ST. LOUIS, ILL.—The East St. Louis City Council has passed an ordinance granting a franchise to the East St. Louis & Suburban Company to lay tracks between St. Clair Avenue and Illinois Avenue on Tenth Street.

†JERSEYVILLE, ILL.—The City Council has granted an extension of the franchise of the Alton, Jacksonville & Peoria Railway Company for eighteen months.

†DECATUR, IND.—The Ft. Wayne & Springfield Railway Company expects to place contracts during the next six months for the construction of a concrete bridge and a branch line from Decatur to Berne. W. H. Fledderjohann, of Decatur, is general manager of the company.