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AWARD TO "ELECTRIC RAILWAY JOURNAL"

The International Jury of Awards, Panama-Pacific International Exposition, has voted to give a medal of honor to the publications of the McGraw Publishing Company, Inc., which include the Electric Railway Journal. This is the highest award granted a publishing company. The principal basis of the award is the general excellence and superiority of these publications.

JITNEY ACCIDENT COMPLAISANCE

We have adverted several times not only to the danger that the directionless jitney imposes upon the streets but to the irresponsibility of the driver when an accident does occur. The traveler in the jitney belt finds aplenty such newspaper headlines as "Killed by a Jitney," "Searching for Reckless Jitney Driver" and "Jitney Beaten by Telegraph Pole"; and on an Oakland ferryboat three elderly females were heard recently to argue a fourth out of her favoritism for the jitney purely through stating accidents that had come to their knowledge. Yet, in the light of all this, every kind of political pressure is brought to secure the restoration of licenses to drivers whose recklessness had forfeited even that little protection to the public, giving another instance of the cowardly complaisance of the minor courts. Thus, on June 5, a California jitney driver ran down and severely injured a woman. He was arrested and asked to furnish just $20 bail. Within an hour the same driver ran down a little girl, the machine breaking both her legs. Verily, "The driving is like the driving of Jehu the son of Nimshi; for he driveth furiously."

TRAFFIC SURVEY ORGANIZATION

Back of Mr. Doolittle's discussion, elsewhere in this issue, of the type of employee, organization and supervision best to be used for traffic survey work, there runs the premise that such work is of a sufficiently important character to warrant in certain cases the establishment of a special department with distinct personnel to provide for its thorough development. We heartily agree with this general statement, but also with the restriction placed upon it by Mr. Doolittle—that while such a method would insure the highest efficiency and the most complete and accurate results, many companies on account of their small size or peculiar organization and operating conditions cannot adopt it. It is difficult to draw the line at the proper point, for no strict classification can be made on the basis of revenue or operating statistics. Yet the point to be remembered is that even if a company is not so large as to allow it to use the special department method as a means of collecting the maximum amount of data at a minimum cost, entire neglect of traffic study is not warranted. Companies of medium size, with regular inspectors, conductors and transportation office clerks, can secure effective results along this line if the work is carried on regularly and systematically under the direction of the superintendent of transportation. In the case of the smallest companies, occasional studies by office employees and the older conductors under the manager's orders can well be made. The necessity and the value of traffic surveys form the vital point; the physical means of accomplishing such work is a minor problem of each management to be settled with business judgment in the light of local conditions.

CHICAGO RAILWAY TERMINAL REPORT

The report of the Chicago Railway Terminal Commission, just rendered, is very careful to avoid any direct recommendation on the subject of electrification. On this point the commission is awaiting the report of the committee on smoke abatement and electrification of the Chicago Association of Commerce, and its particular duty was to report on the most practical rearrangement of the passenger and freight terminal facilities and service in Chicago. Nevertheless, in the analysis of this subject we can read into the report only the logical conclusion that electric motive power is the final answer to the problem in Chicago as well as in other large cities where similar problems are presented. In its discussion of the passenger terminal question the commission clearly points out the necessity for improving the facilities for distributing passengers, especially suburban passengers, after reaching the terminal, by the method of through routing, in other words of applying to the situation the same principles which would be used on a city transportation system. Such a plan would not only reduce greatly the expenses incident to the present competitive system with enormously expensive and inconvenient individual terminals, but would produce a greater intensive use of the property required and would be of much convenience to the traveling public. The principles outlined here for the handling of passenger traffic applies in equal measure to that of freight, and while no comparative figures are presented by the commission, it may be inferred that the economies obtained by the salvage of valuable real estate in the central district of the city from railroad purposes would go a long way toward defraying the cost of making the changes.

THE CHICAGO STRIKE

The real issue in the short-lived Chicago strike was the principle of arbitration. At first the men flatly refused to accept any arbitration at all, saying that they were the sole judges of what constituted fair wages; then, seeing public opinion and the press failed to support them in this attitude, they proposed to limit the choice of third arbitrator to one of five men in a list submitted by them. This claim, according to the Chicago *Evening Post*, was tantamount to the demand that they "should have the right of naming two of the three arbitrators" and "guarantees in advance that they would win their case." It is not strange that such an attitude was of direct benefit to the companies and, coupled with the unflinching position of Mayor Thompson in favor of fair arbitration, brought about the final decision.

We sincerely trust that the board now selected to decide the questions at issue will not merely seek a compromise, as too many boards in the past have done. On account of the size of the railway systems and the number of people dependent upon them for transportation, the question is a very important one. Three years ago the Chicago surface railways established a rate of wages higher than that paid in any other large city in the United States east of the Rocky Mountains, and by it 60 per cent of the trainmen have received more than $1,000 annually. Yet the men are demanding an increase in the minimum wage of more than 40 per cent and in the maximum wage of more than 12 per cent, as well as changes in the working conditions which will still further increase the operating expenses. Obviously there must be some limit. The companies cannot go on indefinitely increasing wages, especially when, as is the case at present, the companies have no difficulty in engaging all the men they need to work at the existing scale. It is said that the employees were opposed to arbitration because in an arbitration hearing on wages to which they were parties three years ago they did not secure all of their demands, but this is not surprising when it is realized that to grant their demand on the wages question alone now would cost the companies $1,500,000 a year. As opposed to the attitude of the men, the companies declared that they were perfectly willing to submit the entire matter to arbitration and even agreed that conditional on arbitration the present state of wages would not be lowered and that working conditions, if changed, should be not less favorable.

As the matter is now in the hands of the arbitrators we shall not attempt to anticipate their decision. Under the ordinance of 1907 the city is now a more than equal partner with the companies in the profits of the surface railways and so is directly interested in having them run on a business basis. This is entirely independent of the natural desire of any city to have such an important agency in its development as the local railway system at least fairly prosperous. Just how far this participation in the profits of the system by the city will affect the settlement of the present problem it is impossible now to state. There are no precedents in this country to show. It is not amiss, however, to say that the present seems an inopportune time in practically every business for employees to talk of increased wages. The country is passing through a period of business depression and unemployment in which almost every line of industry has suffered. This has been especially the case with the electric railway industry, and the spread of the jitney with its effect on the gross receipts has practically capped the climax. A solution for the present situation must come because there is no agency which can perform the necessary service of city and interurban transportation as cheaply as the electric railway, and the country cannot afford to have a stoppage of new electric railway construction. But just what this solution will be is still a question of the future. If the railways, during this period of business depression, should follow the practice of most industrial companies under similar conditions, they would reduce wages 10 per cent or more, or put the men on part time, or both. It is certainly not a favorable season in the electric railway business for either men or officials to talk about an increase of wages or other changes which will increase the operating expenses without adding to the gross receipts.

CONTINUOUS VS. NOMINAL RATING OF RAILWAY SUBSTATION MACHINERY

It is understood that at the Deer Park convention of the American Institute of Electrical Engineers which is to be held during the last week of this month the standards committee will propose for the consideration of the board of directors a revision of the standardization rules as they relate to the rating of railway substation machinery. These revisions will be in the direction of bringing the rating of this class of machinery more nearly into conformity with the rating of other classes of electrical machinery. The circumstances leading up to this recommendation are briefly as follows:

Several years ago rating of electrical machinery received very thorough consideration by engineers in every country where such machinery is made. The result was an international agreement upon the principles of rating, which principles were adopted by the American Institute of Electrical Engineers in the standardization rules issued Dec. 1, 1914. This continuous rating is based upon the load which can be carried indefinitely with specified observable temperature rises shown by experience to be safe for the type of insulation employed and allowing for an ambient temperature of 40 deg. Cent. While the rating of nearly all electrical machines follows these principles, a notable exception was made in the case of railway substation machinery at the request of certain engineers and these machines received a special rating called "nominal."

The system of continuous rating is so simple and rational that it is difficult to realize that it was evolved as the result of years of painstaking study and experimental work. In it the temperatures attained with rated load correspond to the maximum safe tempera-

tures which the insulation will stand. It is therefore not permissible to "overload" machines which are running continuously at rated load. It should not be inferred from this that machines to be built in the future will be different from those built in the past. It will be possible to obtain any reasonable kind of machine by specifying its load requirements and leaving the manufacturer to supply the rating, as is now done with railway motors and locomotives.

On the other hand, in accordance with the nominal rating a machine, after running at nominal rated load continuously with an unspecified temperature rise, has its load increased 50 per cent for two hours, at the end of which period no part of the insulation shall exceed the standard temperature rises. The nominal rating of a given machine is, therefore, less than its continuous rating, and unlike the continuous rating its definition involves the assumption of certain characteristics, not only of the machine, but also of the load which the machine is expected to carry, a most extraordinary idea not at all in keeping with the clearly conceived system of rating used for other machines.

Before the present rules were adopted making specific provision for railway substation machinery, instead of one temperature rise limitation there were two, the lower applying to the continuous load and the higher to certain overloads superimposed upon the continuous load. It is now known that a given machine will have a nominal rating considerably less than its old A. I. E. E. rating, and that the manufacturers are embarrassed by this reduction. In fact, a movement has been started to revise the definition of nominal rating so as to make it more nearly equivalent to the old A. I. E. E. rating. Rather than make such a revision, why not relegate the nominal rating to a secondary place and rate railway substation machinery like other electrical machinery? The proposed revision is a step in this direction and should have the approval of the electric railway industry.

BASING DEPRECIATION ON PAR VALUE

The Nebraska State Railway Commission is pursuing a method of handling depreciation that should be of wide interest to utility operators on account of the peculiarly arbitrary yet facile way in which it has slid over the knotty sections of the problem. In these days when utilities and commissions are generally finding multitudinous points of difference in regard to the distinction between maintenance and depreciation and in regard to the proper life tables and depreciation rates for various classes of property, the Nebraska commission has tackled the problem from the other side in an apparent endeavor to find an easier solution.

Believing that maintenance and depreciation are so intermingled that it is impossible to establish an accounting system that will adequately and accurately separate the two, the commission simply handles these items together. Furthermore (while the commission has no established policy to the following effect), wherever practicable it forgets class rates and bases the allowance for the maintenance and depreciation reserve on the par value of securities issued. It is assumed that the amount issued covers the actual physical value of the property, plus a reasonable allowance for financing and promotion, so that this plan affords a fairly equitable basis for the maintenance and depreciation allowance. The percentage chosen varies with the character of the utility affected, the rate for a water company thus being lower than that for a telephone property. In a recent security authorization for the Omaha & Lincoln Railway & Light Company, the annual rate was 7 per cent, while a review of this commission's orders in 1914 shows that in some telephone cases it allowed 9 per cent and for such cases regards 8 per cent as the minimum allowance.

Concerning the practice of combining the maintenance and depreciation allowances, little need be said, for this is a means that has been recognized in various sources as the most expedient permissible solution of a most intricately technical problem. The basing of the combined allowance upon the par value of securities issued, however, is more of a novelty. It is true that such a close basic relation between investment and physical value was legally recognized as existent under the strict Massachusetts stock laws in the Middlesex fare decision, and various commissions now insist that the par value of newly authorized securities be covered by the actual value of the property. Yet few commissions have to our knowledge had sufficient faith in their own security-supervising ability to use such issues as a basis for operating calculations. The Nebraska commission does not itself seem to regard physical value and investment value as exactly interchangeable, as is shown by its practice in valuation cases, but it feels that these are sufficiently near to permit this somewhat rough-and-ready method of handling depreciation. With the yearly rate properly selected according to experience, this practice provides a reasonable protection for bondholders—provided local conditions in various sections of the State do not cause maintenance costs to vary so unduly as in some cases to leave no provision whatever for depreciation.

The chief point of value in this method, however, lies in the commission's recognition of the difference between the reserve for depreciation and actual accrued depreciation. We have at various times emphasized the fact that an arbitrary percentage chosen to facilitate the accounting treatment of depreciation over a certain period has no conclusive bearing upon the actual deterioration of property during the period. That the Nebraska commission agrees with this distinction is evident from the fact that in all rate cases it disregards its yearly accounting allowance for maintenance and depreciation and fixes an allowance on the basis of an actual appraisal.

Utility operators who have in the past been trying to make this difference clear to commissions can indeed see a glimmer of hope coming out of the State of Nebraska.

Michigan Railway's 2400-Volt, Third-Rail Line

This 94 Mile Road, the First of Its Kind to Be Built, Has Just Been Placed in Operation, Being Designed for Speeds Up to 90 M. P. H.—The Project, Which Was Conceived by the Late W. A. Foote, Includes a 44-Mile Section of Electrified Steam Line

Another link in the chain of interurban railways and electric light and power lines owned by the Commonwealth Power Railway & Light Company, Grand Rapids, Mich., has just been turned over to the Michigan Railway, the operating company. This new line marks a milestone in high-speed electric railroad development, since it is the first 2400-volt, third-rail line ever constructed. Moreover, it represents the culmination of another dream of the late W. A. Foote, who as vice-president of the Commonwealth Company had the courage to install the first 140,000-volt transmission line.

The 50-mile Kalamazoo-Grand Rapids section of the new line has been built for speeds up to 90 m.p.h. and is probably as fine an example of finished, modern electric railway construction as will be found in this country. The 44.5-mile steam road which forms the remaining part of the route was purchased from the Michigan Central Railroad and runs between Allegan and Battle Creek.

Necessity for New Line and Its Service

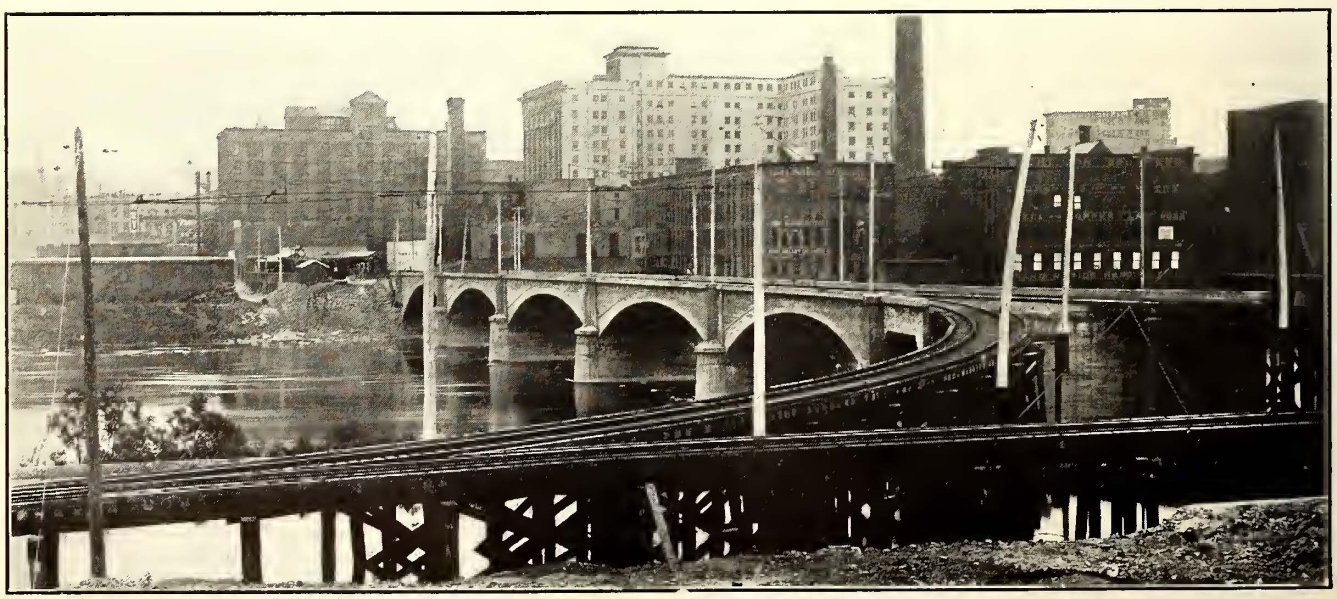
Infrequent steam-road service or none at all was the prime reason for connecting Grand Rapids with Kalamazoo by means of this high-speed electric line. In general, lower Michigan is peculiarly situated, being bounded on three sides by three great lakes, and as a result, only the extreme southern part of the peninsula is served by steam railroad trunk lines. During the entire year there is traffic east and west across the state, and during the summer months, the north and south traffic to the numerous summer resorts in this State reaches considerable proportions, so that steam railroads have been built only to cater to the transcontinental service and to furnish ingress and egress to the summer resorts. As a result but little provision was made for intercommunication between the different parts of the State.

In recent years, Grand Rapids, Kalamazoo and Battle Creek have grown rapidly, and there has arisen a demand for frequent high-speed service between them. Grand Rapids is a large furniture manufacturing center with a population of over 125,000, and a natural line of intercommunication existed between this point and Kalamazoo, another manufacturing city of 40,000 people, and Battle Creek, the home of prepared breakfast foods, a city of 30,000 inhabitants. Before the completion of this new line there was no direct railroad route between Battle Creek and Grand Rapids and only infrequent service between that point and Kalamazoo.

To develop the passenger, freight and express traffic between these points three classes of train service have been inaugurated. These include both local and limited trains, and a special service known as the "Flyer." Single cars from Kalamazoo and Battle Creek are coupled together at Monteith Junction, which is 18 and 30 miles distant respectively from the two terminals, and from this point they run as a two-car train into Grand Rapids, a distance of 32 miles.

Local trains make eleven round trips daily on the Grand Rapids-Kalamazoo line, and the run requires one hour and forty-five minutes. Two local trains make round trips between Grand Rapids and Battle Creek, which requires two hours and twenty-five minutes each way. Limited runs between Grand Rapids and Kalamazoo are made in one hour and twenty minutes and the run from Grand Rapids to Battle Creek takes two hours and ten minutes. The limited service comprises four trains to Kalamazoo and seven to Battle Creek. The third class of service, known as the "Flyer," is furnished only between Grand Rapids and Kalamazoo, and the 50-mile run is made in one hour and ten minutes. Both at Kalamazoo and Battle Creek, the Michigan Railway connects with the lines of the Michigan United Traction Company, a subsidiary of the same holding company. Passengers for points east of Battle Creek or between that point and Kalamazoo, are required to transfer. At Grand Rapids the new line intersects the Grand Rapids, Holland and Chicago Railroad, which is planning to abandon its entrance over city streets and will use the double track line and terminals built by the new road.

All the cars purchased for the new line are of steel

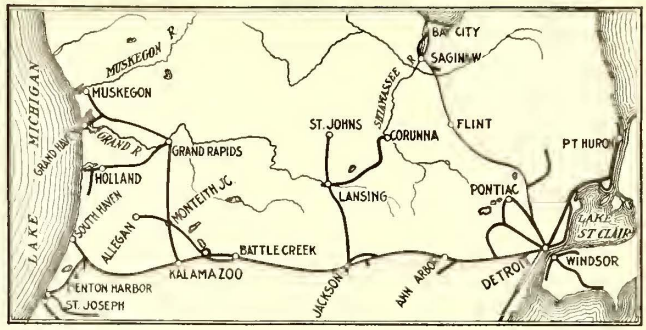


MICHIGAN 2400-VOLT LINE—CONCRETE BRIDGE OVER GRAND RIVER AT GRAND RAPIDS

construction, particularly well equipped and finished. Those in the "Flyer" service are especially fine all-steel coaches with side doors and observation chair-car compartments. These were described on page 1087 of the May 16, 1914, issue of the ELECTRIC RAILWAY JOURNAL. The cars used in local and limited service are also of all-steel construction, but are of the standard arched-roof interurban type with the entrance and exit doors in a rear vestibule. These cars were described on page 106 of the ELECTRIC RAILWAY JOURNAL for July 18, 1914. All-steel express trail and motor cars were also purchased for the package freight service. On the electrified steam road division, the Michigan Railway took over a bulk-freight and express business, and the development of this class of traffic is also planned for the new line.

ROADWAY CONSTRUCTION

The territory traversed between Grand Rapids and Kalamazoo is slightly rolling, some rather heavy cuts and fills being necessary, both near Grand Rapids and near Kalamazoo. The electrified steam road was built through a country where a number of curves and grades were required. Except for the track in the city streets of Kalamazoo, and on a section of private right-of-way in Grand Rapids, a maximum curvature of 3 deg. and a maximum grade of 1 per cent were obtained. Roadway standards provide for an 18-ft. roadbed on fills with 1½:1 slope and a 24-ft. roadbed in the cuts with the same slope. No unusually heavy grading was necessary on this line, although the total for the 50 miles was about 1,000,000 cu. yd. The heaviest cut, however, contained 85,000 cu. yd. and was 20 ft. deep and 2000 ft. long, while the maximum fill contained 60,000 cu. yd. and was 30 ft. deep. Reasonably cheap right-of way made it possible to standardize on a 100-ft. width except where grading requirements made more width necessary. A section of private right-of-way several miles long and sufficient for double track, was purchased through Grand Rapids.

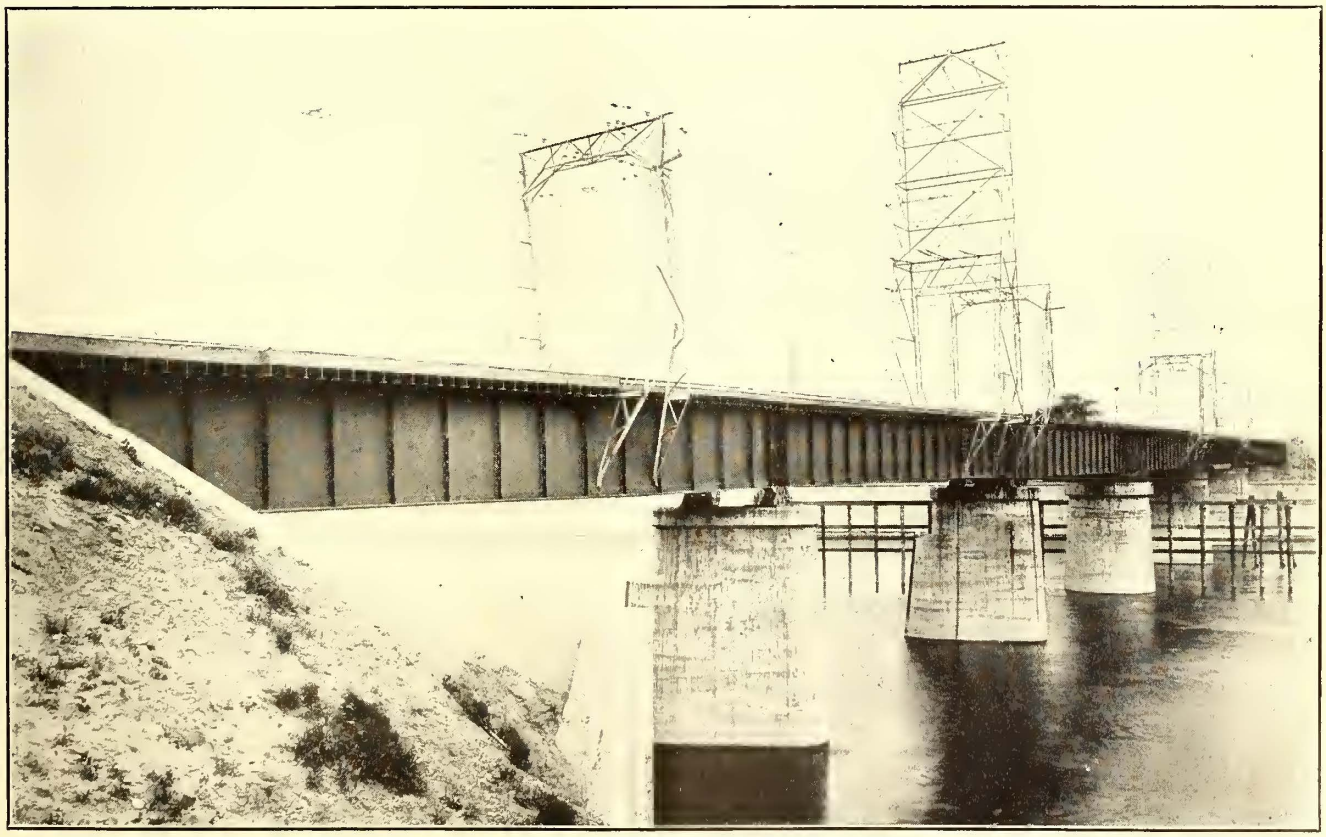


MICHIGAN 2400-VOLT LINE—MAP OF SOUTHERN MICHIGAN, SHOWING MICHIGAN RAILWAY AND ALLIED LINES

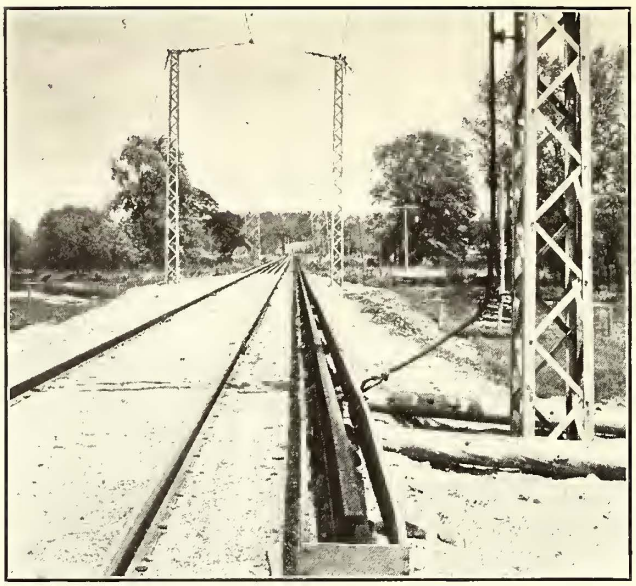
All right of way is fenced with a 48-in., No. 9 American Steel & Wire Company's woven fencing, fastened to 5-in. top, 8-ft. cedar posts, spaced 16½ ft. apart. Wing fences and cattle guards are provided at all road crossings where the lower half of the fence is formed of 27-in. hog-tight woven wire. Above this are nailed two 1-in. x 6-in. boards, which are painted white so that the motorman can see a crossing well in advance of his train. A 14-ft. American Steel & Wire Company's tubular steel gate is used as standard at all private crossings, and the cattle guards are formed of ingot-iron metal strips with projecting angular spikes, laid side by side and spiked to the ties.

WATERWAYS

All waterways and under or over crossings are of concrete or combined concrete and steel. A rather unusual feature in connection with the smaller openings is that all reinforced concrete pipe, which was furnished under contract by the Chicago Reinforced Concrete Pipe Company, was made on the right-of-way with a portable concrete mixing plant which was moved along the line to minimize the haul of the completed pipe. All bridges and viaducts, except those to carry



MICHIGAN 2400-VOLT LINE—OVERHEAD CONSTRUCTION AT DRAWBRIDGE



MICHIGAN 2400-VOLT LINE — VIEW SHOWING CHANGE FROM THIRD RAIL TO OVERHEAD CONTACT WIRE

foreign roads, are designed for Cooper's E-40 loading which is approximately equivalent to a 100-ton car. At points where the electric line passes under a steam railroad or a highway, a clear vertical and horizontal opening 16 ft. square has been provided. The standard overhead highway crossing comprises three short deck spans with the bridge ends resting on abutments and the central span supported on structural steel bents which in turn rest on concrete foundations.

Two bridges of unusual size have been constructed over the Grand River in Grand Rapids. The lower Grand River bridge is made up of seven 88-ft. deck girders resting on concrete piers, the two central spans of which rest on a circular pier and are designed as a draw span. Double-track approaches to this bridge from each side close into gauntlet tracks over the bridge. This structure, with the two 59-ft. towers giving a 210-ft. feeder span, are shown in one of the accompanying illustrations. A double-track, reinforced concrete bridge has been constructed at the upper Grand River crossing. The Grand Rapids passenger terminal yards are at one end of this structure and a freight yard and tracks leading to a repair shop at the other end. The bridge provides a 25-ft. roadway and comprises four 96-ft. arch-spans and one 99-ft. 9½-in. central span. This structure was designed by D. B. Luten of the National Bridge Company of Indianapolis, Ind., and is shown with the business district of Grand Rapids in the background in one of the illustrations.

Track Construction

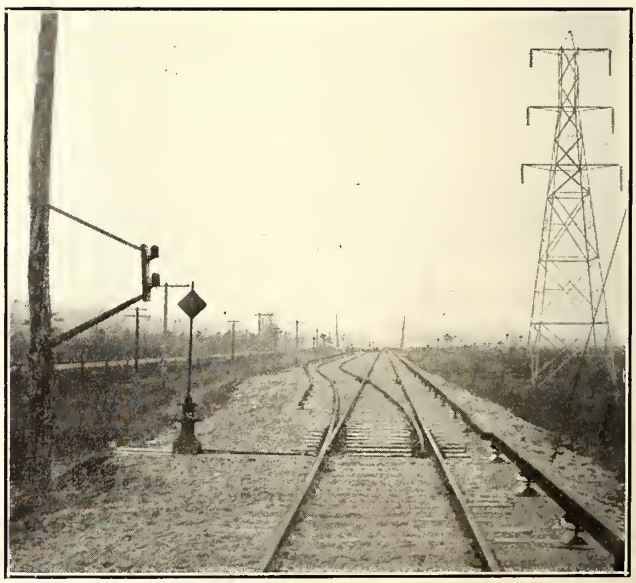
All track, including main line and sidings, is laid with 80-lb. A.S.C.E. rail on 6-in. x 8-in. x 8-ft. cedar ties spaced twenty to a 33-ft. rail. Every sixth tie is 10 ft. long and furnishes support for the third rail. Other track standards include No. 12 rigid frogs, 18-ft. switch points and 90½-ft. leads for all turnouts in the main track. All passing sidings are made approximately 1000 ft. in over-all length, and the standard of construction on passing sidings is equal to that on the main track. Special sawed-oak switch ties and high switch stands with fixed switch-targets are used in all main-track turnouts. All turnouts, including the switch stands, as well as the manganese-steel rail-bound crossings at all grade intersections with foreign roads were furnished by the Cleveland Frog & Crossing Company. It is interesting to note that all grade crossings with other railroads are interlocked, and the signal protection includes mechanically-operated home signals and electrically-operated distant signals for both lines.

Third-Rail Construction

Special interest attaches to the third-rail construction because it is the first to be installed to conduct a 2400-volt propulsion current. Along the main line this is an 80-lb. A.S.C.E. section, low-carbon rail rolled especially for this road. The specifications provide for carbon to be not over 0.14, manganese to be not over 0.40, sulphur to be not over 0.08 and phosphorus to be not over 0.11. The rail is guaranteed to give a relative conductivity with copper of one to eight. The rail is mounted on a three-petticoat insulator furnished by the Ohio Brass Company, and this in turn rests on the 10-ft. track ties. The center of the third-rail is 32 in. from the nearest gage line of the track, and the top is 8-15/32 in. above the surface of the track rail. It is also interesting to note that, on continuous stretches of 1 mile or less in length, this third-rail is laid with expansion joints one and one-half times as wide as those allowed for standard track joints. Where the stretch of third-rail is more than 1 mile long, twice the standard track expansion is provided at joints.

Approaches to the third-rail level at all crossings are provided by bending the rail to form a 4-ft. incline with a total rise of 3 in. The third-rail is drilled with one hole at each end to serve for bolting the malleable-iron fish plates, these being so designed as to produce no strain or unusual friction and being slotted to allow for expansion. The third-rail rests on malleable-iron castings, which in turn dowel to the 8¼-in. two-petticoat, two-piece insulators. These insulators were tested at 5000 volts. They are held in place on the ties by a square, malleable lug, which is fastened with a lag screw and fits into a recess in the insulator base. The dimensions of the cap casting are such as to prevent free longitudinal movement of the third-rail. Lugs on this casting, 1 3/16 in. high, keep the rail from shifting out of line. Third-rail joints are bonded with 7-in. 500,000-circ. mil. bonds of the copper-ribbon compressed-terminal type furnished by the Electric Service Supplies Company.

On industrial sidings and passing tracks the third-

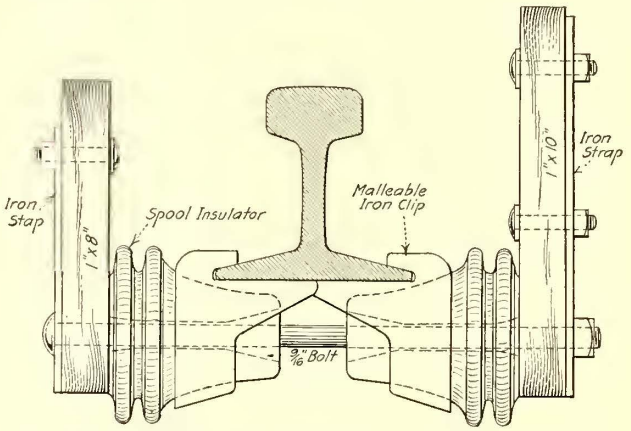


MICHIGAN 2400-VOLT LINE—VIEW SHOWING THIRD-RAIL BEFORE INSTALLATION OF GUARDS. TELEPHONE JACK BOX AT LEFT

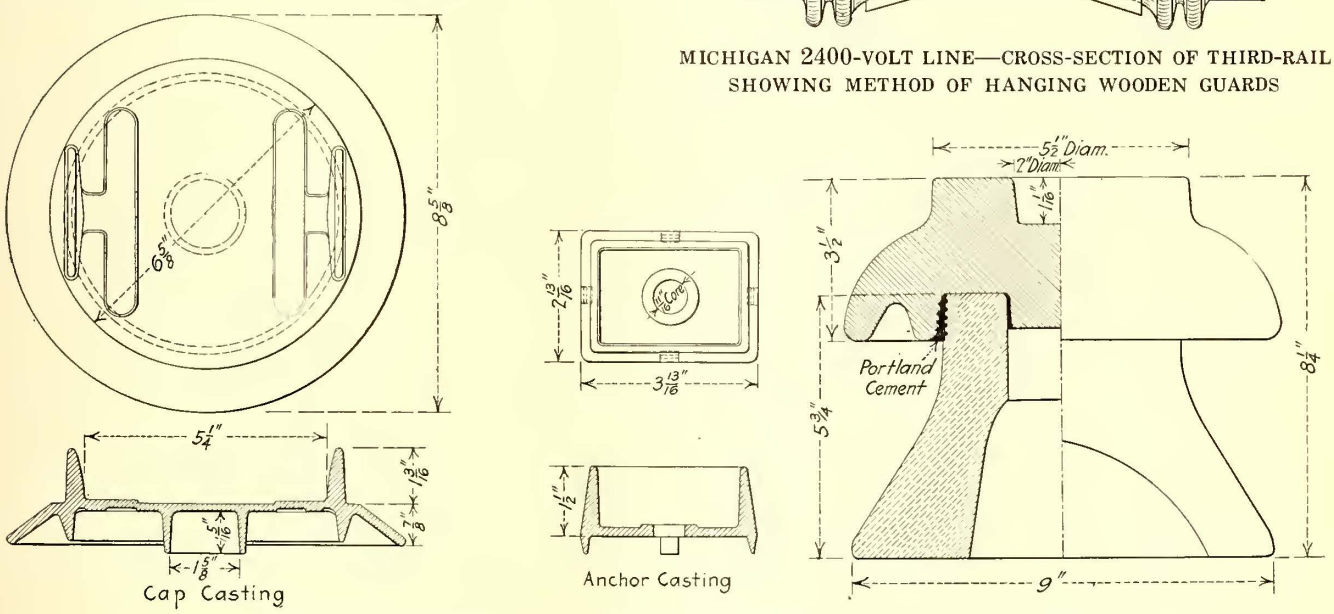
rail insulator is the same as that on the main line, but the third-rail is of 52-lb. weight. To obtain the same horizontal and vertical clearance as that for the main track third-rail, special malleable-iron cap castings were employed. The third-rail at these points is bonded with 250,000-circ. mil bonds of the same type as those used on the main track.

The third-rail is guarded on both sides to afford protection to men working on the track. The guard on the track side is a 1-in. x 8-in. fir board, the top of which is level with the third-rail. The guard on the outside is 1 in. x 10 in. in size, and the top is 2 in. higher. In this position these guards prevent a bar or any other piece of metal which may drop across the third-rail from coming in contact with it. The guard boards are 16-ft. long and are fastened together at the ends with malleable-iron plates containing holes punched oblong to permit expansion and contraction. They are fastened to the rail by two malleable-iron clip castings, which fit on the bottom of the rail and are insulated by two porcelain spool insulators. One end of this insulator sets into a recessed casting, and the other sets flush against the guard board.

At all highway crossings, as well as at points where the propulsion current conductor changes from third-rail to overhead, jumpers are provided. At the high-way crossings these consist of 1,000,000-circ. mil bare-copper feeders suspended from a ½-in. steel messenger cable strung from two 30-ft. wooden poles over the crossing. The ends of the jumper are connected to the third-rail by special terminals. An overhead clearance of 21 ft. above the crossing is provided, and the poles are securely anchored to dead men. The same cable and special terminals are used in the jumpers where the third-rail joins with the overhead trolley. At these points, however, the jumpers pass from the third-rail to insulators on the latticed steel poles which are standard in all overhead construction.



MICHIGAN 2400-VOLT LINE—CROSS-SECTION OF THIRD-RAIL SHOWING METHOD OF HANGING WOODEN GUARDS



MICHIGAN 2400-VOLT LINE—THIRD-RAIL INSULATOR AND INSULATOR CASTINGS

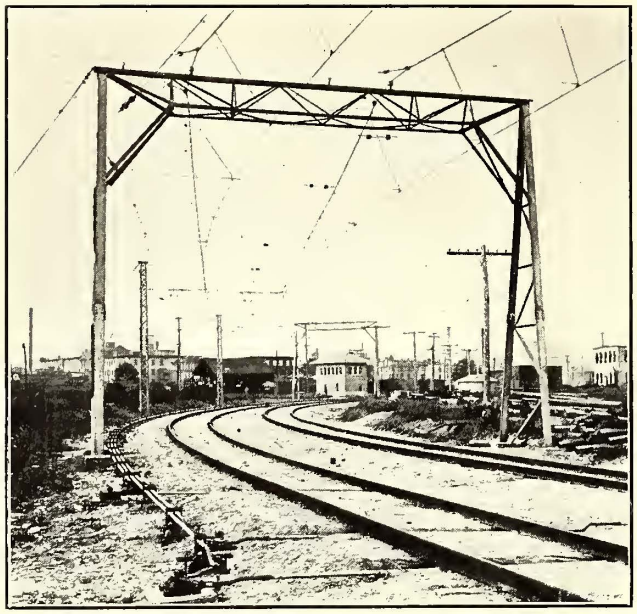
Overhead Construction

Three types of catenary trolley suspension are used at different locations along this new line. Where there are two tracks, the line is spanned at 300-ft. intervals by double-track, special-galvanized steel bridges, built by the Aermotor Company, Chicago. The legs are 32 ft. 1 in. long and set 5 ft. in concrete, and this gives a trolley clearance of 19 ft. above the top of the rail. The clear width between the legs is 29 ft. 10 in. In connection with the design of these bridges it is interesting to note that each is required to withstand a vertical load of 1200 lb. with a factor of safety of two. The structure is also designed for horizontal load parallel to the line of 12,000 lb., distributed at four points on the upper channel. At right angles to the line and equally distributed on both sides, the bridge must carry a load of 4000 lb. with a factor of safety of two.

Trolley suspension on the 300-ft. spans is of the catenary type with a 500,000 circ. mil hard-drawn, copper-cable messenger having maximum sag of 6 ft. 6 in. This cable is designed to withstand 6324 lb. in tension, which will obtain when both the cable and the trolley are subjected to a coating of ½ in. of ice and a wind velocity of 65 m.p.h. The No. 0000 trolley is attached to the messenger by rigid hangers furnished by the Ohio Brass Company. These hangers are spaced at 15-ft. intervals, and hence give a twenty-point catenary suspension on the 300-ft. spans. On curves up to 4 deg., no pull-offs are necessary, the messenger being so attached to the bridge that it permits the trolley to take a natural curve. This pulls the plane of the messenger to a 45-deg. angle from the vertical, and in this position the hangers hold the trolley in its proper position.

Single-Track Overhead Construction

Single-track overhead construction is suspended from special galvanized, hot riveted, steel latticed poles set in concrete. These poles also were furnished by the



MICHIGAN 2400-VOLT LINE — CATENARY-BRIDGE CONSTRUCTION NEAR GRAND RAPIDS

Aermotor Company. They are designed with a factor of safety of two, for a load of 2000 lb. applied at the top and at right angles to the line. They will also support a vertical load of 1600 lb. at a point on the mast arm 10 ft. from the center of the pole.

These poles are set 165 ft. apart on tangent track, or thirty-two to the mile. The messenger on single track is also a 500,000-circ. mil hard-drawn, copper cable with a total tensile strength of 26,400 lb. In the 165-ft. pole spacing, the messenger sags 4 ft., giving a tension not to exceed 3200 lb. when both the messenger and trolley are coated with ½ in. of ice and the velocity of the wind is 65 m.p.h.

The No. 0000 trolley wire is attached to the messenger with rigid hangers 15 ft. apart. In the single-track overhead construction, no steady strains or pull-offs are used on curves up to 6 deg. since the messenger is so hung that it serves both as a messenger and a brail wire.

In order to give to the overhead circuit the same conductivity as the third-rail, a 500,000-circ. mil copper cable is provided. On single track this feeder is carried on a small arm on the inside of the pole, and on double-track bridge construction this feeder is suspended beside the messenger and has a sag of 6 ft. Sectionalizing switches are installed at each town so that any section of the third-rail and overhead may be de-energized.

Where siding tracks parallel the main track the latticed pole with a mast arm is used for the main track, and a wooden pole for the side track. The overhead construction for the side track usually comprises a No. 00 steel trolley wire attached to a cross-messenger suspended between the wooden pole and one end of the mast arm on the steel pole.

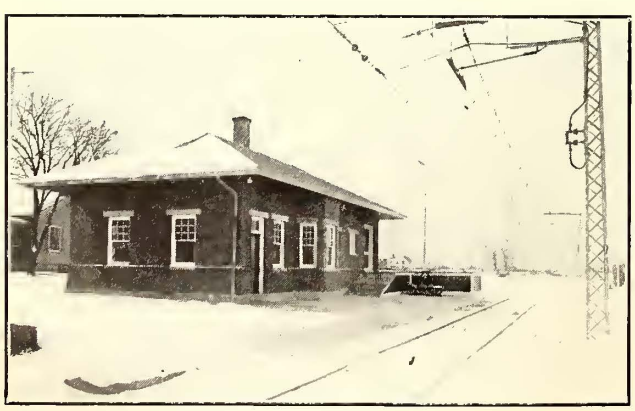
Surge Protection

With a conductor as large as the 80-lb. third-rail, it was necessary to provide surge protection. This consists of a series of aluminum cells with shunting resistances in each to balance the discharge. The series of cells is connected to the line through proper switches, fuses and self-clearing gaps. Each cell comprises a pair of concentric aluminum plates, positive and negative, properly separated and immersed in an electrolyte. Each plate is coated with a special electrolytic film. The air gap is set at a predetermined value and operates only when an excess energy impulse or surge is produced by an instantaneous release of the inductive energy of the rail due to a short circuit or other external cause.

The energy release manifests itself as an increase in voltage, the current approaching zero and the voltage increasing rapidly. The aluminum cells drain this excess energy from the rail to the ground through the large discharge surface of the aluminum plates. The effect of the plates is to produce a large current in the cell, due to the low resistance of the electrolyte. Accordingly the voltage peaks may be limited to any amount simply by increasing the number of cells, and caring for any known condition is simply a question of arriving at the right number of cells. The effect of these cells is similar to that of a safety valve on a steam boiler in that energy in excess of the normal value is permitted to escape by means of the air gap when abnormal conditions obtain.

Sources of Energy

For the present the road, which is 94.5 miles long, is being fed from substations at Grand Rapids and Kalamazoo. A third source of energy will be furnished as soon as the transmission line can be completed into Battle Creek. At the Grand Rapids and Kalamazoo substations, energy is supplied at 2400 volts by connecting two 1200-volt rotary converters in series. The Battle Creek substation will feed the line at the same voltage, but from a motor-generator set. At Monteith Junction, where the Allegan-Battle Creek and the Kalamazoo-Grand Rapids lines cross, disconnecting switches have been installed so that either of the three branches of the road may be cut off. The feed from Monteith Junction to Grand Rapids is 28 miles, to Battle Creek 29 miles, and to Kalamazoo 18 miles. A short section of feeder line also extends from Monteith Junction to



MICHIGAN 2400-VOLT LINE—STANDARD BRICK AND WOODEN WAITING STATIONS

Allegan, a distance of 11 miles. The substation equipment and protecting devices were furnished by the General Electric Company.

Warning Signs

An electric line that uses energy at this unusually high potential in a third-rail must necessarily be thoroughly fenced and supplied with warning signs. All the signs used are uniformly of blue enamel with white letters. At each side of every road crossing, there is suspended from a copper cable, a small danger sign. Also fastened to the wing fences on each side of the road, signs approximately 18 in. x 24 in. in size warn trespassers against the dangerous third-rail. Other types of signs displayed along the right-of-way include whistle, station, distant siding and bridge signs, and all are made of sheet metal with blue and white lettering. Where it was necessary to mount these signs on independent posts, they were attached to special galvanized angles set in concrete.

Unusual signs are also employed to indicate to the motorman the change from 2400-volt to 600-volt trolley, which is necessary when the cars leave the new line to enter the city streets of Kalamazoo, Grand Rapids and Battle Creek. These signs are illuminated by three 40-watt Mazda lamps, receiving their energy from the 600-volt trolley, and each one is 15 in. wide by 39 in. long, being suspended from four I-bolts beneath the mast arm about half-way between the trolley wire and the pole. An arched metal hood projects from the top of the sign over the lamps and serves both as a reflector and as a protection against the weather.

Telephone Lines

Three copper metallic return telephone lines were strung on separate poles set along the edge of the right-of-way. Two of these lines are used by the railway company, one for commercial purposes and the other for train dispatching, and the third line is for the Commonwealth Power Company's dispatchers. Jack boxes on angle brackets are installed beside the head blocks at all passing sidings. If the telephone line is on the side of the track opposite the head block, the wires are carried down the line poles in conduits, thence underground to a special pole set beside the head block which supports the jack-box brackets. If the head block is on the same side of the track as the telephone pole line, the special pole is fitted with a cross-arm and merely serves to carry the telephone line to the conduit which extends from cross-arm to jack box.

Standard Stations and Shelters

Two types of stations were constructed at the cities and villages along the new line—one a permanent brick and concrete building and the other a wooden building similarly arranged, but smaller in dimensions. At important crossroad points, wooden shelters, which cost approximately $200, are provided. These shelters are fully inclosed and rest on concrete foundations. Each one is provided with a small concrete platform.

Grand Rapids and Kalamazoo Terminals

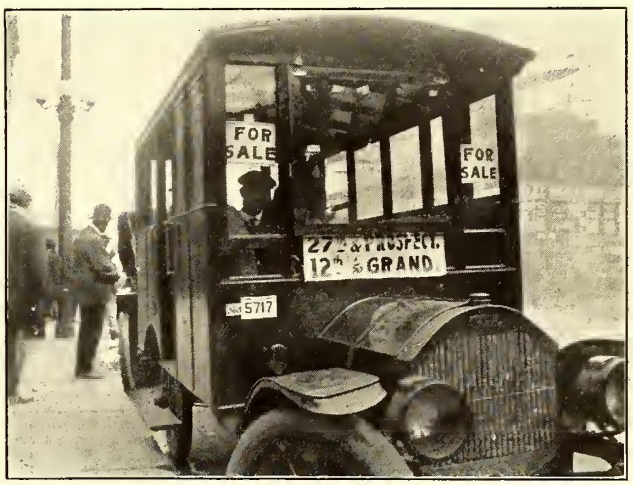
At Grand Rapids and Kalamazoo property was purchased in the heart of the business district and converted into commodious passenger stations with yard tracks for storing eight or ten passenger and express cars. At Grand Rapids the passenger and express terminal building is situated in the business district on the west side of the Grand River, and the freight house and team tracks are on the west bank of the river opposite the terminal. The freight facilities include a warehouse 50 ft. wide and 185 ft. long, built of brick, concrete and steel. Quite an extensive team-track yard, as well as a storage yard leading to a repair shop also situated at this point, have been installed.

At Kalamazoo, the terminal building combines a passenger station, baggage room and freight warehouse. Four storage tracks of sufficient length to hold two cars each, make up the terminal yards. Two of the tracks are used exclusively for passenger coaches and the other two for loading an unloading freight.

The work of building this high-grade, 2400-volt, third-rail line, and electrifying the steam road between Allegan and Battle Creek, was under the immediate supervision of George L. Erwin, president and general manager of the Michigan Engineering Company, and G. J. Wagner, superintendent of construction. During the construction period, the Michigan Railway Company was represented by the late W. A. Foote, vice-president, who promoted the line and who was responsible for many of its unique features.

Jitneys for Sale in Kansas City

The accompanying picture represents the third stage of the jitney transportation industry in Kansas City. A firm of three men which started three buses, each carrying twelve passengers, on April 1, 1915, is now offering the buses for sale. Three of the men had other lines of business and are said to have invested about $5,800 in the two Appersons and one Velie, making two



MONTH-OLD BUS FOR SALE IN KANSAS CITY

of the bodies in the planing mill of two of the company members. Two of these men drove the buses for awhile, until they found that their own business needed their attention. The third bus was driven by an outsider, who finally obtained a small interest in the company. They claim that the business would be profitable if they could give their personal attention to it, which they cannot do.

The Public Service Commission for the Second District of New York has completed moving from rooms in the Capitol and scattered offices in two buildings on Washington Avenue, Albany, to quarters provided by the trustees of public buildings on the three upper floors of the office building at 58 North Pearl Street, corner of Steuben Street. The offices of the commissioners, general offices, hearing room, filing divisions and the various engineering, legal and accounting bureaus gathered under one roof will greatly facilitate the business of the commission. The general offices are located on the fifth floor.

Report of Chicago Railway Terminal Commission

Co-operative and Distributed Terminals for Freight and Passengers Are Recommended

The Chicago Railway Terminal Commission, of which John F. Wallace is chairman, has submitted a preliminary report to the Chicago City Council committee on railway terminals, summarizing the result of its trip to Europe last summer and discussing the needs of passenger and freight terminals in the city of Chicago.

In its letter of transmittal the commission says that in addition to studying the Chicago situation it has made personal examination on the ground of terminals in Toronto, Montreal, Boston, New York, Liverpool, Manchester, London, Paris, Brussels and Antwerp. It has also had referred to it five ordinances and fourteen resolutions orders and communications in regard to electrification and smoke abatement, but it considers it unwise to formulate any views thereon until after the report of the Chicago Association of Commerce committee of investigation on smoke abatement and electrification of railway terminals. As this latter committee has spent four years and several hundred thousand dollars in the accumulation of facts and in the investigation of this subject and as the question of the electrification of the roads and the rearrangement and unification of track facilities are closely interlaced, the commission says that they should be carefully considered in conjunction with each other.

In its preliminary report the commission first described its organization and membership, which consists of Walter L. Fisher, Bion J. Arnold, E. H. Bennett, the Commissioner of Public Works, the corporation counsel, the chairman of the committee on railway terminals, and John F. Wallace to act as chairman. The solution of the railway terminal problem, according to the commission, requires elimination of the waste due to unnecessary and uneconomic duplication of freight and passenger facilities. It says that in the terminal district in Chicago the unnecessary complication of terminal facilities and operating costs is so extensive that it is appalling in its effect upon the railroads, the shippers and the public. The investments by railroads in unused or little used property to protect real or fancied competitive positions or interests is also a source of great expense to the railroads and ultimately to the public.

The report does not recommend a single terminal but a series of interconnected union terminals. Thus it says that a single union passenger station, even if principally devoted to through passenger service, should not be made so large or embrace so many roads that its very size reduces its advantages below those that would come from dividing the service among two or more union stations. The advantages to the railroad as well as to the public of co-operative passenger stations would be more generally recognized if it were not for the mistake which has hitherto been made in many union passenger stations of erecting monumental buildings, not only for their imposing architectural effects, but also to provide accommodations for through passengers and suburban passengers in the same building. The huge size of many union passenger stations, it says, could be materially reduced by recognizing the different necessities of the suburban and through service. The two classes of service do not desire or require the same accommodations. Each would be better served if given separate accommodations more directly adapted to its needs. The suburban service is, in many respects, more nearly related to the service performed by street and interurban railway lines than to the through service of the steam railroads, and these various services can be co-ordinated with great advantage, and in a manner to secure a more intensive utilization of existing rights-of-way.

The commission is also convinced that the co-operative principle recommended for passenger service should be applied also to the freight service. This means the establishment, for example, of a number of universal freight receiving stations for outbound l. c. l. freight, so that shippers may deliver to these stations for all the railroads or for properly classified groups of railroads. This would greatly reduce the amount of teaming and street congestion which results from unnecessary teaming. The commission also believes that serious consideration should be given to the advantages of the two or more level plans in the future development of freight facilities in congested terminals. This plan increases the capacity of a given area considerably more than 100 per cent, depending upon the nature of the plan used.

In referring to electrification the commission says in brief: "Both the railroads and the public are looking forward to the substitution of some less objectionable motive power for the present steam locomotive, especially in the operation of passenger terminals and terminal tracks. Without anticipating the findings of the report of the committee on smoke abatement and electrification, it seems safe to assume from the evidence generally available that electricity is the only motive power other than steam that has demonstrated its practicability for such extensive application as would be necessary in Chicago. It is also apparent that the cost of electrification would be greatly reduced by simplifying and unifying the passenger tracks entering the city, by removing the present tangle of cross lines, by establishment of direct instead of round-about routes within the city, and by the joint use of tracks available for and adequate for more railway companies than those which now use these particular tracks. The adoption of outlying co-operative freight stations will greatly simplify the electrification of the more trans-central freight terminals and tracks."

The commission also recommends the straightening of the Chicago River, by which a large additional area would be reclaimed in the central business district.

The report includes a stenographic report of an interesting interview between members of the commission and H. W. Thornton, general manager of the Great Eastern Railway of Great Britain, on the subject of electrification of steam lines and suburban traffic. Mr. Thornton, who was formerly connected with the Long Island Railroad, believes that suburban commuter business should be profitable. He said that profit in passenger business does not come from carrying a few passengers a long distance. It comes from carrying a great many passengers a short distance. On the long-distance trains the passenger may have a seat reserved in the sleeping car and yet occupy a seat in the cafe car, in the dining car or in the observation car. This means three or four seats for one passenger, and he can sit in only one seat at a time. But in the suburban business he has only one seat, and this is how the trains are filled. This makes the suburban business a profitable one. According to Mr. Thornton, if the Pennsylvania Railroad in New York, instead of building its lines underneath Manhattan Island had built a subway down Seventh Avenue and had connected with the Long Island Railroad at Flatbush Avenue with stations in New York en route as at Thirty-third Street and at Wall Street "there would have been untold millions in it."

Central Electric Railway Accountants

Report of Meeting Held in Indianapolis on June 11 and 12—Abstract of Paper on the Relation of the Accounting and Mechanical Departments

The twenty-seventh meeting of the Central Electric Railway Accountants' Association was held on June 11 and 12 in the Severin Hotel, Indianapolis, Ind. The opening session was called to order at 1:45 p. m. Friday by the president, H. B. Cavanaugh, auditor Cleveland, Southwestern & Columbus Railway. Charles L. Henry, president Indianapolis & Cincinnati Traction Company and the Central Electric Railway Association, made the opening address. Mr. Henry spoke generally on the necessity of modern accounting, and cited several interesting personal experiences and anecdotes of early crude forms of keeping accounts. He thought that there was a possibility of too much refinement in account but believed that accounting had become an art and had been very much simplified by the standard classifications. Mr. Henry touched upon the relations between the commissions and the companies and the burdens that had been imposed upon the street railway business by city councils and other bodies, not with the intention of bettering the conditions for the public but for political effect. He thought that if the business interests were to receive proper treatment in the future, they would have to get into politics in the broadest sense and take part in the primaries or conventions, up to the final vote, and afterwards in the legislatures, so that every candidate would know that business in this country was looking after its interests.

Mr. Henry paid high compliments to the American Electric Railway Association, the Central Electric Railway Association and the Central Electric Railway Accountants' Association. What he particularly liked was the splendid team work of these organizations. No other class of business so new both in life and in character could show such results in so short a time. Mr. Henry mentioned the valuable assistance of the committee on accounts in straightening out things with the Interstate Commerce Commission, and also said that it was through the arguments and efforts of the accountants that the Public Service Commission of Indiana accepted the Interstate Commerce Commission form of report, thereby eliminating the necessity of two separate forms.

Paper by Mr. Hemming and Discussion

The next order of business was the presentation of a paper by R. N. Hemming, superintendent of motive power Union Traction Company of Indiana, on "The Accounting Department and Its Relation to the Mechanical Department." This paper is abstracted elsewhere in this issue. Mr. Hemming supplemented his paper by reading from the report of a steam railroad committee on reclamation, etc., printed in the *Railway Master Mechanic*. The contention of the report was that while "scrap" was usually taken to mean useless cast-off articles, the fact that articles were cast off did not imply that they were without value for other purposes. Yet, in the use of this second-hand material, care must be taken to avoid too much handling, or the cost of handling will exceed the value of the scrap. The report also contained recommendations in regard to handling of the serviceable second-hand material and the classification of the material returned to the storeroom.

In discussing Mr. Hemming's paper, L. T. Hixson, auditor Terre Haute, Indianapolis & Eastern Traction Company, believed it impossible to have any fixed classification for departmental costs for the use of several companies but explained a system of departmental costs that might be used by various companies. He stated that his company had been using such a system for some time. If the mechanical department does work for the roadway department, for example, a departmental bill covering the cost of the material and labor is sent to the auditor's office. Mr. Hixson stated that as yet no charge was made for a certain percentage to cover depreciation, use of tools or superintendence. In his opinion no general classification could be arranged to take care of all departmental charges, unless each company amplified it to meet local requirements.

W. H. Forse, Jr., secretary and treasurer Union Traction Company of Indiana, said in regard to the classification of rolling stock criticised by Mr. Hemming that he did not think it possible to make a hard and fast line of demarcation. In dealing with the Interstate Commerce Commission it had been found necessary to compromise; and if concessions had not been obtained after a hard fight with the commission, the companies might have had a classification much more burdensome. In the distribution of departmental costs Mr. Forse did not think that enough charge was made for overhead expenses. He said that manufacturing companies sometimes charged from 50 per cent to 100 per cent for productive labor, and the charge of 10 per cent to 15 per cent made by some railways was not enough. The mechanical department likes to feel it can make articles cheaper than they can be purchased outside, but in most cases if a proper per cent were added for overhead the price would be found too high.

Mr. Hixson thought that a charge for overhead should be made which could be absorbed in the departmental accounts and not appear on the books. Each department could then show the proper costs, but this would not show on the general books because of the contra credit. He did not think a charge should be made for any profit on the company's own work.

Mr. Hemming stated that it was not his idea to show any profit, but he wished to show actual costs because he thought the mechanical department was operating at a loss. He felt that the roadway department, for example, had nothing to give back to the mechanical department to offset the loss in use of tools, etc.

Walter Shroyer, auditor Union Traction Company of Indiana, thought that if it was figured closely, the power, heat, etc., furnished to the shops would take care of any losses. He said that four or five years ago the Union Traction Company of Indiana figured out the matter and found there was not a great deal of difference. If a charge for supervision, use of tools, etc., was made for doing work for other departments, it was offset by the power and heat furnished by the power department.

T. P. Kilfoyle, auditor Cleveland (Ohio) Railway, in commenting on Mr. Hemming's statement that the storeroom was usually under the control of the purchasing agent, said that the purchasing department should not have anything to do with the storeroom. The latter is a separate department. After the goods are purchased, the purchasing agent is through, and the accounting department does all the checking and should have charge. As regards scrap, Mr. Kilfoyle said that

this is reclaimed at Cleveland, and the material is used again for other purposes.

After considerable discussion, Mr. Hemming suggested that a committee be appointed to settle the various points. Mr. Kilfoyle moved that the paper be referred to the executive committee for decision as to the appointment of a committee to go into the matter further.

Balance Sheet Discussion

Mr. Hixson then read a paper on "The Analysis of the Balance Sheet." An abstract of this paper was printed in the Electric Railway Journal of June 12. Mr. Forse asked Mr. Hixson what became of the reserve for the amount represented as set aside for injuries and damages, bonds purchased, etc. Mr. Hixson explained that if, for example, the annual payment to the sinking fund was $50,000, the entry would be to charge sinking fund $50,000 and credit sinking fund reserve for the same amount. When the bonds were purchased and cancelled, the sinking fund would be credited and bonds debited. There would be no change in the sinking fund reserve. Mr. Forse thought that the balance should be a free surplus or surplus unappropriated. Mr. Hixson agreed that this was correct, but said that if the sinking fund cash was used for bonds the sinking fund reserve would still be preserved, and should be kept until the retired bonds, again capitalized. Mr. Forse asked if the cash could not be used for investment in case it was not desired to issue more bonds. Mr. Hixson stated that the reserve was not cash and could not be used in the payment of dividends, even though it had been used in decreasing the indebtedness of the property.

The report of the compiling committee was next read by C. M. Witt, general storekeeper Union Traction Company of Indiana, chairman. After a short discussion, it was approved and accepted.

The report of the standing passenger and freight committee was read by Mr. Shroyer, chairman. After some discussion on the new form of interline and local way bill adapted in size and form for use on a standard typewriter, the report was approved and accepted. The meeting then adjourned until Saturday morning.

Saturday's Session

The first order of business on Saturday morning was a short talk by P. C. Johnson, general auditor The Prest-o-lite Company, in lieu of the paper on "The General Principles of Accounting as between Common Carriers and Manufacturers" which he had been requested to prepare. Mr. Johnson related some experiences which he had as a steam railroad accountant to illustrate the trouble which may be caused by carelessness or failure to handle properly certain accounts. He thought that a great deal of attention was now being paid to the question of material and supplies on hand. These usually involve a large investment, and they should be safeguarded the same as cash. Not too much idle material should be allowed to remain in stock.

Mr. Johnson also discussed the matter of a proper inventory of such material. He thought that owing to certain practices the actual inventory usually showed above the book value. This was sometimes pointed to with pride, but it should be overcome if possible. Mr. Johnson explained that in manufacturing practice ledger accounts are kept for each class of material handled through the factory. They show what the maximum and minimum amount of material should be, to what department each kind of material is issued, value or cost, balance on hand, etc. Every day a certain number of items are inventoried and compared with the book figure. In this way, in the course of four or five months all items have been actually inventoried and adjusted to the book values, and it is not necessary to shut down the plant and take an inventory at any one date. Trial balances from the stock ledger are drawn off and show the value of material on hand.

In speaking of the balance sheet and the profit and loss statement of either railroad or manufacturing companies, Mr. Johnson stated that they must contain a certain amount of estimates. Such estimates should, therefore, be very carefully made in order to get as closely as possible to the financial condition of the company. In such cases the handling of material is as important as the handling of cash, and it should be followed up closely so that no more is carried on hand than absolutely necessary.

Mr. Hixson agreed with Mr. Johnson that the balance sheet should show everything possible, and that estimates when made should be very close in order not to prove deceptive.

The next paper was on "Electric Light and Power Accounting by a Combined Railway and Light Property," by Oren A. Small, auditor Benton Harbor, St. Joe Railway & Light Company. An abstract of this paper was printed in the Electric Railway Journal of June 12.

Mr. Hixson asked if in posting to the ledger from collection sheets a separate bill is used. Mr. Small explained that the bill is made in duplicate, a receipt for the customer and the stub for the collection agent. The collector writes the ledger account number (no names appear on the bills), and the posting is direct from the collection sheet.

In discussing the classification of accounts, A. C. Van Driesen, chief accountant Toledo Railways & Light Company, stated that Ohio had just put out a new electric classification which differs from the Michigan classification and also from that of the National Electric Light Association. They are, however, arranging a classification to meet the requirements of both states. Mr. Van Driesen explained the method used at Toledo in charging to other departments the power generated by the electric department. General expenses which apply to each one of four departments are divided on a percentage basis in proportion to gross earnings. The charge for power to the railway department is an arbitrary fixed charge, with an additional amount charged for each kilowatt furnished.

F. T. Loftus, auditor Indianapolis & Cincinnati Traction Company, described the method used by that line in making the drops to transformers for supplying lighting current to small towns along the system. There was considerable discussion as to the separation of the transmission and distribution systems in such cases.

The ensuing paper on "The Small Electric Line Handling Carload Freight," by James S. Clark, auditor Marion & Bluffton Traction Company, was abstracted in the last issue of this paper. Mr. Clark said that no tariff was filed except a switching tariff between cars on the Marion & Bluffton Traction Company and the Clover Leaf Railroad. In turning over cars to the steam road, the latter bills out the cars and the traction line does not know where they go. E. L. Kasemeier, auditor Ohio Electric Railway, brought up the matter of track scales. He said that the American Railway Association had made a ruling that no shipment that had not been weighed would be accepted under through rates. The road that weighs the car should charge the other road $3 per car. As the amount of business would not warrant small lines putting in track scales, he thought the proposed charge of $3 per car would be a serious matter to them. Mr. Hixson thought that the

summary in Mr. Clark's paper, showing the volume of business handled with such a small amount of equipment, was one of the good points and should be brought to the attention of officials to help promote greater handling of carload business. Mr. Clark stated that the revenue derived by the Marion & Bluffton line from this carload freight amounted to 22 per cent of the total revenue.

The secretary then read to the meeting by-laws which were submitted as amendments to By-laws 1 and 2 of the Central Electric Railway Accountants' Association. Upon vote, the changes were adopted as presented. The meeting then adjourned.

ACCOUNTING AND MECHANICAL DEPARTMENTS

BY R. N. HEMMING, SUPERINTENDENT OF MOTIVE POWER UNION TRACTION COMPANY OF INDIANA, ANDERSON, IND.

The relation of the accounting and the mechanical departments to the purchasing department of electric railways is so interwoven that their jurisdictions frequently overlap. The accounting department, however, has no jurisdiction over the mechanical operation of a railway property or over the supplies. The supply or storeroom department is usually under the purchasing agent, who often has peculiar ideas as to the system which should be carried out between the mechanical department and the storeroom.

There are wide variations of opinion regarding the relation of the three departments previously mentioned. It seems almost impossible to adopt any set of uniform rules and regulations that can be used universally on all properties. Various managers are inclined to operate their properties to suit their own individual taste, irrespective, in a large number of cases, of what the association or the subsidiary departments have recommended or agreed to do. It also seems that what is good for one property is not always adaptable to the others—in other words, that not every recommendation which passes the associations is a "cure-all," and sometimes the remedy is worse than the disease.

Efficient management, no matter how well worked out its details may be, cannot be fully attained unless the human factor receives careful attention. The human element in any organization is half the problem—the most important half. Full recognition of the intimate relations between cost accounting, production, engineering and the field of industrial relations, each of which has so direct a bearing on both costs and output, is necessary to build a successful organization and to attain economic operation.

To attain this economic operation, it occurs to the writer from practical experience in reference to the railway scrap heap or second-hand material which has accumulated about the property—that all second-hand material should be received in the storeroom or substoreroom and credited to the department from which it is received. This material can be taken back at full or partial value as may be agreed upon. The writer was thus able to save thousands of dollars for a large property with which he was once connected.

It is human nature to want to draw or use new material in preference to old. It would not be economy, however, to operate a separate room for second-hand or used material. The general storeroom should have complete jurisdiction over all material, either new or old. Thus, other departments which use materials which are common to all could aid the company financially by drawing on the storeroom for such material as needed—the order might be filled in whole or in part with used material. This is a question which involves the accounting department and purchasing department, but mainly the operating head. Such a scheme might find objections from the accounting department and the purchasing agent, the former on account of the extra work required to credit such material and the general accounting resulting; the latter because he is responsible for the amount of capital invested in supplies and desires to keep the investment down to a minimum. There seems to be nothing in the Interstate Commerce Commission requirements to show that such a scheme would not be acceptable, nor would it be contrary to law. This is one of the things in which the accounting department can greatly aid the mechanical department and its company by lending a helping hand.

In regard to the Interstate Commerce Commission classification of 1914, relative to Accounts Nos. 66, 67, 70 and 71, the accounting department should present objections. There are many of these items that are chargeable to the mechanical department, yet they come under the heading of "Conducting Transportation." Items pertaining directly to the operation and maintenance of equipment should be included in the accounts provided under the head of "Equipment." Take for instance Account No. 70, "Carhouse Employees." All of the items set forth in this account are under the jurisdiction of the mechanical department, yet they are listed under the transportation department. This is also true of Account No. 71.

What is the definition of rolling stock? What constitutes a snow plow or scraper? Would one not imagine that the snow scraper referred to by the Interstate Commerce Commission means a piece of rolling stock mounted on wheels? Yet are not two planks built in a "V" shape with iron plates on the bottom and fastened to the rear end of a car by ropes, a piece of apparatus that should be charged to the roadway department—likewise, rail grinder, weed burner and bonding outfit to its respective department—equally as much so as the heating and lighting of the shops and the water supply for the same should be charged to the department which uses it? If a weed burner and bonding car are charged to the motive power department, why not hand cars, and if not hand cars, why weed burners and bonding car? One is a piece of rolling stock as much as the other. If the appliances of a crane or pile driver are chargeable to the motive power department, why are not the transformers and rotaries and appliances of a portable substation rightfully chargeable to this department? Cranes and pile-driver appliances are no more used for the motive power department than is the equipment and apparatus in a portable substation. The whole thing is inconsistent.

Is it not equitable and fair that the mechanical department should charge other departments a percentage for the use of shop tools and machinery, and for the supervision of such work as is performed by the mechanical department for the roadway department, power department, etc.? If it became necessary for the mechanical department to purchase new machinery, the roadway or the power department would not be willing to stand any part of the costs of replacement or renewal of such machinery. Yet the wear and tear of doing their work is bound to depreciate the usefulness of such machinery. Each department that does work for another department, even though both are in the same company, should charge a percentage, just as much as the committee on uniform charges of repairs on foreign equipment has recommended to charge, cost plus 15 per cent. There is nothing in the Interstate Commerce Commission system of accounts to prevent such a scheme. It is the duty of the Accountants' Association to see what it can do to carry this out.

Billing of inter-departments should be put into effect.

Each department should bill the other departments on a regular billhead for any work or material furnished, so that the chief of the department can observe the cost on such work. The policy of the auditing department simply charging up these items to the respective departments is misleading to the department chiefs, as each department must make out its yearly estimate and is expected to operate within such estimate. If in checking over his monthly or yearly expenditure he does not have at hand vouchers of work done by other departments, the chief may have to his discredit many items which may be difficult or impossible to explain.

The mechanical department should, where it is consistent with the size of the property, use a calculagraph to keep accurate account of all work done for it as well as for other departments, in order to insure that all charges for labor and material are placed against the proper account and the proper departments. With the human element, errors are bound to occur. One account will be overcharged and another one under. This is a good opportunity, however, for the accounting department to lend some assistance to the mechanical department and to the company in general. The Indianapolis Traction & Terminal Company has such a system in vogue at its shops, and it has proved very successful.

Cost accounting and time-keeping should be done by the storeroom as it is, or should be in close touch with the source of supplies and production. The storeroom is usually located adjacent to the main shop, and its close relation in this respect affords a more economic means of computing time consumed and costs.

Many small items in the way of improvements are frequently being placed on cars. It is strange that when such items only amount to a few dollars or as high as $25, a construction account number cannot be secured authorizing the installation, and such items have to be charged to maintenance. No ruling is found in the official system of accounts prohibiting the issuance of the desired order, regardless of the amount involved in dollars and cents.

Forms of stationery common to the auditing or accounting department and another department should receive the co-operation of both departments. One department should not proceed with getting out printed blanks without consulting the other department involved. The use of legal-size paper should be avoided entirely, and as much as conditions permit stationery of a standard letterhead size should be used.

In the last year the Central Electric Railway Association appointed a special committee on uniform charges of repairs of foreign equipment. This greatly concerns the accounting department and its relation to the mechanical department. The writer was not in favor of a blanket proposition of cost plus 15 per cent. The items of brakeshoes, brake heads, journal bearings, journal wedges, trolley wheels, poles, harps, axle bearings, coupling hose and accessories, carbon brushes, signal lamps, etc., should be billed at a fixed price, for the reason that cost plus 15 per cent means the exposure of many contract prices. The whole subject deserves serious consideration.

There is vast room for improvement which can be obtained by closer co-operation, not only between the accounting and the mechanical departments, but all other departments. The accounting department can aid very materially by making a strenuous effort at least in the direction of securing accurate mileage data on the operation of revenue and non-revenue cars over its own lines, as well as the individual car mileage operated over foreign lines. As the purchase of supplies is regulated largely upon the mileage obtained in service, accurate mileage records should be kept pertaining to everything, especially regarding rolling stock.

The Boston Center-Entrance Trailer

Being a Description of the Construction and Equipment of the New Rolling Stock of the Boston Elevated Railway

A description of the general plan and dimensions of the Boston (Mass.) Elevated Railway's new center-entrance surface trailer was published in the Electric Railway Journal of Jan. 9, 1915, page 99. An order for seventy-five of these trailers was placed about that time with The J. G. Brill Company and for twenty-five trailer car bodies with the Laconia Car Company. The following article describes additional features and details of this car, and accompanying illustrations show interior and exterior views of the completed car.

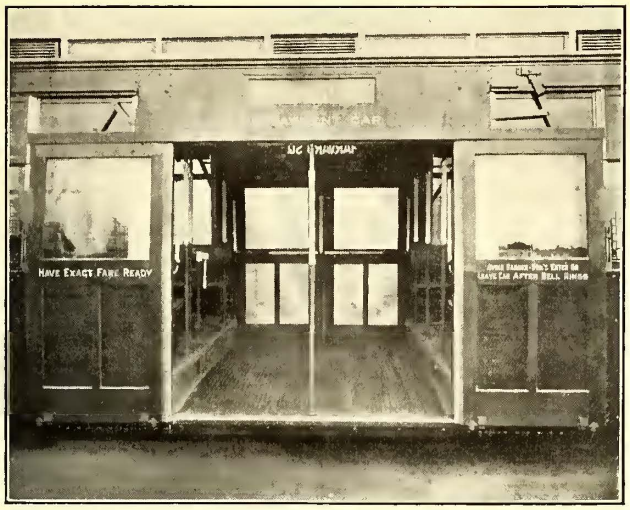
General Construction

The weight of the new trailer car body is 15,900 lb. and its length is 48 ft. 2½ in. over anti-climbers. The all-steel underframe is composed of ⅛-in. pressed-steel crossings, side sills of 5-in. x 3-in. x ⅜-in. angles reinforced with 2-ft. 1¾-in. x 3/32-in. sheets, and end sills of 3-in. x 3-in. x ⅜-in. angles. The side posts are of 1½-in. x 2-in. x 3/16-in. x ¼-in. "T" construction. The side of the car is slightly tapered from window rail to eaves. The roof is of the wooden monitor-deck type and is equipped with seven Perry ventilators on each side.

Center-Entrance Arrangement

A feature of the new trailer is the arrangement of the center-entrance section shown in an accompanying illustration. This section consits of a well extending across the car. The width of the well is the same as that of the door openings, 6 ft. 6 in., and its floor is 15 in. above the rail. A 10-in. step on each side of the well leads to a ramp, which has a rise of 4 in. in a length of

BOSTON CENTER-ENTRANCE TRAILER—EXTERIOR VIEW



BOSTON CENTER-ENTRANCE TRAILER—VIEW OF SLIDING DOORS AND CENTER-ENTRANCE WELL

4 ft. The well floor is equipped with Universal safety treads. The entrance to the well is guarded by two doors which slide open on runways located outside the car siding. The upper halves of the doors are slightly bent inward in conformity with the tapering car siding. The doors are controlled by an operating mechanism of the Consolidated Car Heating Company.

Both doors are operated by levers actuated by an air valve over the door entrance. The air valve will be mechanically controlled by the throwing of a handle on the conductor's stand which will be located in the center of the well. The closing of the doors will be automatically announced to the motorman by means of a signal light. A white-enameled stanchion is located at the center of the door opening for the assistance of boarding passengers, and a row of three vertical stanchions, joined together overhead by a transverse pipe, border each side of the well, as shown in the accompanying interior view. White-enameled grab handles are bracketed on each side of the door entrance. The entrance well will be arranged for prepayment operation.

INTERIOR EQUIPMENT

The seating capacity of the car provides for sixty-two persons. The end space used ordinarily for door entrances and exits or for the motorman's compartment is in this case utilized entirely for seating accommodations at both ends by means of a semicircular seven-passenger seat. In addition there are ten transverse and two longitudinal Brill "Winner" cherry slat seats on each side of the car. The cross-seats are 35⅛ in. long and are separated by an ample aisle space of 28½ in. Under the seats will be installed Consolidated heaters equipped with tilting heat deflectors for preventing the overheating of seats by deflecting the heated air to the rear of the seat. The upper deck has no headlining but the lower deck is lined with Agasote. The interior has a mahogany finish. Trimmings are of Aero metal. The curtains are of double-faced Pantasote material with Curtain Supply Company's curtain fixtures. The hand brakes are operated by a Pittsburgh drop handle installed close to one of the middle stanchions. The car is equipped with the Consolidated buzzer system.

BOSTON CENTER-ENTRANCE TRAILER—INTERIOR VIEW

EXTERIOR EQUIPMENT

The double-truck equipment is known as the Brill 53-F, which has a wheelbase of 5 ft. and 24-in. wheels. The size of the journal boxes is 3½ in. x 6½ in. Other exterior equipment includes Tomlinson Type A, form 8 couplers, Westinghouse air brakes and Keystone destination signs, installed on the letterboard over the center-entrance door.

The "Journal" at the Fair

Headquarters of This Paper at the Panama-Pacific Exposition in San Francisco

The headquarters of the ELECTRIC RAILWAY JOURNAL at the Panama-Pacific Exposition at San Francisco are in the Palace of Electricity, at the corner of Avenue C and Second Street. The accompanying illustration shows the attractive booth which is occupied by this paper, in conjunction with the other papers published by the McGraw Publishing Company. The signs are illuminated by means of lino-lites, and the exhibit consists of bound copies of the papers for several years, with current copies and issues of the directories. There is also an exhibit of interesting views of important installations in the electric railway field and other fields covered by the McGraw papers, the views being thrown on a screen by means of a stereomotograph. These views have attracted a great deal of attention.

HEADQUARTERS OF "ELECTRIC RAILWAY JOURNAL" AT EXPOSITION

Readers of this paper are cordially invited to visit these headquarters when in San Francisco.

C. E. R. A. Meeting

Abstracts of Papers on Track Joining and Bonding, the Human Element in Electric Railway Operation, and Engineers and Public Service

The summer meeting of the Central Electric Railway Association was held on board the *S.S. City of Erie* on June 17 and 18 between Cleveland and Buffalo. Abstracts of three of the papers presented at the meeting follow. Owing to the fact that the meeting was held on the boat it was not possible to secure a report of the proceedings for this week. This, with an abstract of Mr. Allen's paper, will appear in a later issue.

TRACK JOINING AND BONDING

In a paper with this title E. C. Price, vice-president Indianapolis Switch & Frog Company, Springfield, Ohio, gave a review of the history of joint construction on interurban and city track as well as the methods of bonding the joint, pointing out the importance of a permanent joint, both electrically and mechanically. This, he said, is specially important in paved streets where any repairs or renewals of joints or bonds necessarily entail a heavy expense.

The speaker then reviewed the four types of welded joints put on the market: (1) The Lorain or spot welded joint, (2) the cast or molded joint, (3) the thermit joint, and (4) the Indianapolis arc welded joint which is made by welding a fillet of steel electrode around the periphery or edge of a pair of plates. According to the speaker, this process of applying is similar to joining one piece of fabric to another by sewing around the edge, which in arc welding of plates is accomplished without heating up the rail to the point of impairment, as heat is only generated under the point of the ¼-in. diameter electrode as it travels the edge of the plates, and the latter are so shaped and placed that no lines of welding are opposite, and thus tend to heat the rail through the opposite sides. This joint is applied with a small inexpensive outfit, known as the portable electric welder, requiring but one man to operate it. Any number of joints may be applied as economically as a quantity and under traffic conditions where necessary.

Efficiency tests of this joint show the conductivity and strength of the joint is from 100 per cent to 125 per cent compared with the unbroken rail. In a test for strength, two pieces of 7-in. T-rail, joined together with these welding plates, were subjected to a pressure of 30,000 lb. when supported on 2 ft. centers. This test resulted in curving the head of the rail and in stretching the base of the two plates, representing an area of 1½-in. thickness of metal, without impairing the welding fillet excepting for a distance of 2 in. or 3 in. at the point of elongation of the plates. Other tests have been made by removing the ties for a distance of 3 to 4 ft. each way from the joint, but, under traffic, less deflection was shown at the joint than within the rail proper.

The speaker, after then referring to some conductivity tests described in the paper read before the Iowa Street & Interurban Railway Association by F. V. Skelly, assistant superintendent Tri-City Railway & Light Company, and reported in the Electric Railway Journal for April 24, 1915, described the results of a test made by the Bureau of Standards in Washington. In this case the rail joint tested consisted of two sections of 7-in., 70-lb. T-rail, 2 ft. and 5 ft. in length respectively, joined together by two arc welded plates similar to plates 3391 and having approximately the following dimensions: Mean length 22½ in., width 4½ in., thickness ¾ in. The resistance of 3 ft. of joint and 3 ft. of adjacent rail was determined by measuring the drop across the respective sections with a Weston millivoltmeter while the rail carried approximately 300 amp. The results follow:

Result of Test	
Resistance of 3 ft. of joint	0.0000272 ohm
Resistance of 3 ft. of adjacent rail	0.0000376 ohm
Conductance of 3 ft. of joint in per cent of conductance of continuous rail equals 138 per cent.	
Resistance of rail per foot	0.0000125 ohm

In conclusion the author said in part:

"Many roads heretofore deprived of welded joints on account of quantity or cost are now installing this combined joint and bonding plate largely in the reclamation of old track and welding broken rails. For this purpose the manufacturers have designed what is known as the Apex type, reinforcing and supporting the head or tread side of girder or side bearing rails that have become weakened or split along the web. The Simplex type is similar but without the head support. This joint being of more recent origin than any other of the welded type is not as widely known. The plates, which are nominally ¾ in. thick, 30 in. in length at the base and 20 in. at the top with ends beveled, are fitted to the contour of the base of the rail and are temporarily bolted or clamped in position during the welding.

"The metal electrodes used are of special steel of the requisite resistance, melting point and content, which in combination, with contributed elements in the flux coating, insure a perfect, homogeneous weld, of maximum strength and free from blow-holes and impurities necessary to resist electrolytic and corrosive action. The arc is drawn between the electrode as the positive and both the edge of the plate and the rail as the negative, producing a cavity in the negative members which is filled in and built up by the molten electrode. The time required for welding a joint is from twenty to forty minutes, depending upon size of rail and traffic.

"The cost of welding a 9-in. girder rail, including the plates, welding steel, current and labor is given as from $3.50 to $5 per joint, varying with the type of plate used and conditions which applied. In new construction the rail ends should be either milled or slightly under cut to allow the heads to join closely together. In old track with open joints, a dutchman cut from a rail of the same section is inserted, completely filling the space between rail ends. These joints, as all others, should be ground to a perfect surface alignment after welding.

"The practice of welding the joint is no longer confined to the high sections but is now extensively used for all weights of rail, if bound in by paving or a surrounding roadbed and particularly if anchored to steel ties, and even without this provision in localities of even temperature.

"Expansion and contraction, if restrained, is said to produce a stress of 1000 lb. per square inch for each 7 deg. variation in temperature. This, under extremes, will be sufficient to cause failures at weak points in the continuous track either at or between the welds. Fail-

ures of this nature may be due to the quality of the rail or an impairment through welding, both of which may be prevented.

"From the foregoing it would appear that if the jointless track of perfect conductivity, the value of which is recognized, is of a permanent nature, eliminating joint and bond maintenance and materially reduce other items of upkeep, through maintaining high physical condition of the track, it will lead to the utmost universal adoption for city tracks, excepting at special work, where it is not practical.

"In the final analysis we find that the manufacturers have specialized and developed joint and bond materials, with the aid and co-operation of railway engineers, and that the progress has more than kept pace with increased requirements. Furthermore, it may be said that there is now a prevention as well as a cure for joint and bond disease."

HUMAN ELEMENT IN ELECTRIC RAILWAY OPERATION

BY H. C. DECAMP, REPRESENTATIVE OF THE WESTINGHOUSE ELECTRIC & MANUFACTURING COMPANY, CINCINNATI, OHIO

Lack of education and training is the root of all evil represented by improper operation of cars, and explains the high cost of power per ton mile and excessive maintenance of equipment, overhead and track expenses. Since the first electric car was operated in Richmond, Va., it seems to have been the opinion of operating men that the position of motorman called for unskilled labor. This is probably caused by the fact that in the early days horse-car drivers or cable grip-men were used for that position, in an endeavor to keep the organization intact. It is true that it did not require much skill to operate cars in those days, as schedules were slow, cars light in weight and lacking in complicated equipments. The principle of operating a controller or hand brake is practically the same to-day as it was then—that is, in the motions taken to utilize these. Yet the art of operating electric cars has made as rapid advancements as any other feature in electric transportation, although this fact seems to have been overlooked by many operating officials in their haste to keep pace with improvements along other lines.

Betterment of the condition of the motorman in recent years has been forced, while other improvements have been for the most part made voluntarily, or as a matter of course in order to keep pace with events. The working conditions of traction employees to-day are ideal compared to what they were twenty-five years ago, but the responsibilities have increased in like proportion. The compensation paid is far greater than in the old days, but the companies are getting very little more for what they give. The fault must lie at the door of the management, for overlooking an opportunity to benefit by an educational course for the employees.

There are more opportunities for the education and training of men for any other position or trade than that of motorman. The American Association has made arrangements for a course of training for railway employees through a correspondence school, but nothing is said about the motorman. One cannot learn to be a motorman by correspondence, for it takes practical experience as well as practical demonstrations to train one properly for this position.

Owing to the fact that there never has been a general school of instruction for motormen, such as can be found for every other trade, it becomes necessary for each company to train its own employees before putting them in service. This is usually accomplished by placing the prospect under the guidance of a tutor, usually one of the oldest men in the service. If the applicant has had some experience in railroading he becomes familiar with the road in a short time and is instructed as to operation of controller and brakes. But who has instructed the instructor? Instead of improving conditions he may be teaching the new man in the old out-of-date way.

Some companies have the applicant, after he has been turned in by his instructor, placed in the shop for a stated time and thoroughly instructed in the equipments he will come in contact with. Please note the word "thoroughly," for there are men who have spent the regular time in the shop but did not gain much valuable information, owing to the fact that there were no regular shop instructors or predetermined course for them to follow, and they were left to shift for themselves. In such cases the applicant begins his work with a feeling that all he has to do is to get by the best he can. There are some electric railways which have educational courses, but they are in the minority.

Some time ago an article on instructions to motormen was drafted, and some of the member companies had it printed in pamphlet form and placed in the hands of their men. It was both surprising and gratifying to learn that the men as a whole took a deep interest in the subjects mentioned. When they found that some of the suggestions for the operation of their cars conflicted with their individual methods they willingly changed to the proper course. The majority had been following out their own way because they had not been instructed differently.

Most motormen are sadly lacking in the art of coasting with a corresponding saving in power, and this can be accounted for by their lack of knowledge of the expense to which the company is put to produce it. Coasting clocks and meters are being used in an endeavor to increase the amount of coasting, with marked success, but the men should be educated in the use of these instruments, as well as the method and the expense of producing power. Instructions to men in a body, with lantern slides or other illustrations, do very well in their way, but practical demonstrations on a car by a competent authority are of greater value. There are not many motormen in service to-day gifted with the art of judging weight, speed and distance. The practical demonstrations, therefore, can be used advantageously to convince them of the saving in power which can be accomplished by obtaining the maximum amount of coasting in any given run and under all conditions. By using a car for demonstrations, the proper method of accelerating, running and braking can also be shown to advantage.

Another very important point to consider is being prepared for emergency stops. A motorman, as a rule, runs his car every day in the same manner and all goes well. When something unexpectedly happens he has to decide instantly what to do, in his excitement he loses his head and invariably does the wrong thing. It is well to instruct the men what to do in each case so that they will always be prepared for emergencies. Preparedness on the part of the motorman may be the means of saving thousands of dollars in claims.

Some managers may say that it is not advisable to educate motormen, as it is unnecessary to make electrical engineers of them. Quite true, in some respects. The efficiency of a motorman may be classed as 80 per cent good judgment and common sense and 20 per cent knowledge of his equipment. Many may say that too much knowledge may lead to trouble on account of the men meddling with the equipment, but there are not many men who are looking to do another's work. They

do want to have sufficient knowledge of the apparatus to bring their cars into the shop if anything happens.

In all of the educational efforts expended to-day on the part of accident preventions, such subjects as the saving of power, reduction of maintenance and service to the public could be covered at the same time if a method of instruction had been mapped out which would show the men that their interests were being considered as well as the prevention of accident claims. In any organization, whether railroading or otherwise, it is essential to have every man in the organization satisfied with his position and a loyal booster. When the human element is in this condition of mind it is easy to bring about other reforms than accident prevention.

There is another unfortunate condition which exists in many railways—that is, a lack of co-operation between the operating and the mechanical departments. Of all departments these two above all others should work in harmony. The mechanical department working at a high state of efficiency and with modern appliances overhauls a car and sends it out for service as good as new. The operating department may place it in charge of an inexperienced man, and it is shortly turned in for control or motor trouble, or possibly for brakes, which is of course objectionable to the mechanical department. It is true that cars are turned in for imaginary troubles, but on the whole, the mechanical department should welcome information from the operating men. A motorman operating a car all day under service conditions, if he is a competent man, is usually in a better position to discover faults with the equipment than is the man in the shop.

In taking up the education of employees, companies should not lose sight of the fact that conditions surrounding the daily life of the men will have a great deal to do with winning the human side of the men to the methods of increasing their efficiency. Pleasant surroundings and various classes of concrete welfare work will be bound to have their effect upon the human element in the men.

The question of education for employees is of such importance it should be considered by the association as a whole for the influence such action would have on other companies. There are standardization committees on almost every subject in electric railway transportation, but little has been done in educational or welfare work, which without doubt presents the greatest opportunities for reforms in transportation problems.

ENGINEERS AND PUBLIC SERVICE

BY PROF. M. E. COOLEY, DEAN ENGINEERING DEPARTMENT UNIVERSITY OF MICHIGAN, ANN ARBOR

To-day lies in an engineering age. Modern civilization is an engineering product. Were the engineer's work to be stopped, civilization would stop. The engineer, having produced the structure of modern civilization, cannot now shirk the task of perpetuating it. The real work of the engineer is but now begun. Upon him devolves the task of making the country support the growth of population. This means increasing the food-bearing land, co-workers in other fields increasing its productiveness. It means bringing the food from remote districts to the point of consumption. It means many other things of a constructive character. But more than all, it means conserving the things now possessed.

The work which is now and in the future must be the engineer's, if the public is to be served most effectively, cannot be done at all without the support of his neighbor in other walks of life. To win this support, he must make his neighbor understand. Thus the engineer must become a teacher, an apostle, to preach the gospel of understanding to those who do not now realize the condition of things.

The conditions of the times are well represented by the quarrels between capital and labor, between the public service corporation and the public. The men in control of each and all of these great forces must be made to understand the facts and principles upon which their respective demands are based, and how far they can reasonably expect to have them satisfied. For example, railroad employees must be made to realize that omitting taxes and depreciation, one-half or more of the total operating expenses goes to them in wages. Thus, if there is a 10 per cent increase in wages, there is a 5 per cent increase in operating expenses. That much less is available for taxes, depreciation and support of the investment.

The state and federal commissions should be made to understand that there is a limit below which operative earnings cannot go if the demands of labor are to be met with increasing frequency and the property is to be maintained always in condition to render the service required. Where the two lines, decrease of earnings on the one hand and increase of expenses on the other, cross, or soon after, there must be a crash. To use a hydraulic term, there will no longer be any difference of head to turn the wheels.

The public service commission stands for the public. It is a splendid controlling force. Its motives are not to be impugned. Yet it needs the kind of information which engineers can furnish. Congress has recently made the acquirement of some of this information possible on the grandest scale ever undertaken. The valuation of railroads by a federal board has already begun. It is a stupendous task in its details, and still more stupendous in its possibilities of application. The engineering profession has a direct interest in the conduct of the work and its welfare. It should not stand aloof but interest itself now and until the last figure is made. Then will come the application of the results by the Interstate Commerce Commission to the problems of capital and rates to be allowed. Here again the engineer will have a teaching work to do. What elements of cost shall be considered proper for capital, and what factor shall make up the allowance out of earnings for operating expenses and maintenance of the property in a condition to render safely at all times the service demanded. These are new fields for most engineers, and before they can become teachers they must become students.

Engineers have so closely confined their attention to the details of their work as not to see very far beyond. It may be, and probably is, a result in large measure of the engineer's ability to center himself on specific things that the world has advanced so far in a multitude of directions. There must still be inventors, men content to devote a lifetime to the accomplishment of a single thing, specialists in the various fields. But engineering has widened its scope beyond the capacity of individuals. With this expansion there has grown the necessity of men trained in a broader way, not alone in engineering, but in all other walks of life.

The question must frequently arise in the future—whether it will or will not be wise to go to public ownership. Somebody should be able to give the true answer. The engineer is the natural man. His training fits him particularly for the necessary analysis of the problem, and upon his judgment the public must, or should, rely.

The conditions as between the public and the public service corporation have now become so serious as to involve more than individuals. There is a widespread

belief that the public service corporation has not been dealing fairly. This may have been true in the past and probably was in some cases; indeed, it may still be true, but nowhere nearly to the same extent. The mistake is now recognized, and the attitude of the utilities is for peace on favorable terms. The public, however, wants peace on its own terms. Right here the danger lies. The pendulum is likely to swing back too far, and in revenging itself the public is liable to cripple itself. That must be guarded against.

The importance of utilities to present civilization has been pointed out. Nearly $37,000,000,000 of private capital is invested in them. More will be needed as the country grows. Where will it come from? Certainly not from individuals when they understand the attitude of the public towards utilities. Capital will seek safer and more remunerative fields. The statistics of 1911 show that the net income of all utility corporations was $843,855,442. This is an average rate of return on all the capital of but 2.3 per cent. If the stocks, amounting to $19,329,023,135 be eliminated, there is but 4.85 per cent return on the $17,383,237,766 of bonds. No one will contend that the bonds alone represent the entire value of the property. Bonds are protected by a mortgage, and the mortgages are not given on full values. If it is assumed that the total value is represented by the bonds plus one-half the stock, the rate of return becomes 3.12 per cent on $27,047,749,333. Thus the average rate of return on utility investments is less than can be had in the savings banks. Why, then, does money flow into public utilities? Largely for the same reason that it flows into gold mines—namely, ignorance of the true conditions, particularly on the part of the small investor. The large investor is not usually found in the non-paying companies, except as he invested when the conditions were different and cannot now readily withdraw.

There are many things to be made clear to the general public before public service corporations can feel that cordial relations have been re-established. None is more important than an understanding of the real cost and value of utility property. One would expect this to be an engineering matter, but the courts have had a hand in laying down the rules for valuing property, and these must of course govern. Unfortunately the courts and the engineers have not always approached the problems in the same way or had the same point of view. Thus the engineer has often been obliged to sail a rather tortuous course in an effort to bring about what he believes is the right result of an appraisal of property. A problem already complex enough is thereby rendered more complex.

Another deplorable matter is the practice in this country of discounting the testimony of witnesses in hearings before commissions and courts. That is, the apparent necessity of having several engineers testify to the same set of facts. In England and in Canada, one engineer who has shown by his qualifications that he is competent to testify, is considered enough. But here, notwithstanding the array of engineering talent brought into court, the issues seem still to remain in doubt. This is particularly true in hearings before commissions relating to public service properties. The reasons appear to be that as far as the public is concerned the case has been prejudged, and no amount of controverting testimony can effect a change. Then, too, there is the feeling that engineers whose testimony is favorable to the corporation have been bought.

It behooves engineers, therefore, so to regulate their conduct that the people will have confidence in them. The engineer's capital is his reputation. He must not depreciate or destroy it. He must stand ready to serve the people with a loyalty commanding the respect and confidence of everyone. To do this most effectively he must, in addition to whatever specialty he may have in mind, rise above it and view his profession of engineering in a broader aspect. He must recognize that his duty as a citizen is even more important than as a specialist, and stand ready at all times to aid in the solution of public questions for which his training has so well fitted him.

As an illustration a recent action of an engineering society might be cited. In Detroit, where for years there has been a fight between the city and the street railway, the society sent the following communication to the Street Railway Commission: "In view of the fact that many of the problems that you have under consideration are largely engineering problems, especially those pertaining to valuation of existing railway property and to the study and planning of radical improvements of Detroit's transit facilities—we, of the Detroit Engineering Society, respectfully offer you our most cordial co-operation both as engineers and as citizens of Detroit." It is pleasing to add that this offer was accepted. Another instance of recent date is the action of the Western Society of Engineers in outlining the proper relations to be followed with engineering advisers.[1]

Harold Albert in a recent paper read before the Western Society of Engineers discussed in cogent language the engineer as a student of public relations. He said that upon the engineer rests the responsibility, and with him lies the capacity, to render the largest public service possible in setting the lawmakers' and the consumers' fears of excessive profits at rest, and also aiding in securing the right for the public utility to earn a fair return, all hazards considered.

These are a few out of many examples to illustrate what is meant by the engineer in the service of the public, or engineering in a broader aspect. Every true American must do his part in the work of general betterment, but to the engineer falls the task of explaining many things of an engineering nature which the citizen uses and does not understand. The one great obstacle to present welfare is ignorance—ignorance of things based on engineering and economics. Engineering in its broadest sense may include the latter. The engineer in the service of the public must as speedily as possible be made to understand that there are other things than mere material things to plan and execute. He should enlarge his horizon, look out upon the world, and try to comprehend the problems waiting to be solved. He should as a first requisite acquire a broad knowledge of the complex man of to-day.

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[1] WHEREAS, The president of the Sanitary District of Chicago appointed a commission early in 1912 to investigate and report, among other matters, on the water power development of the Sanitary District, which report, after careful investigation, has recently been made public; and

WHEREAS, Certain members of the Sanitary District, the City Council of Chicago, and the daily free press have poured out a torrent of fretful rebuke and personal insinuation against the individual members of the commission, all apparently because the facts and conclusions of said report were not what had been expected;

Therefore be it resolved—that this society views with regret this public attempt to abuse men who were apparently trying to do their duty to the public in setting forth facts as they found them and testifying to the truth as they saw it, and the society would point out for the benefit of the public officials, who have been conspicuous in this controversy, the following proper relations with engineering advisers, which it wishes to emphasize at this time, as a matter which vitally affects the public welfare:

(1) That an engineer's first duty to his client is to tell him the truth, no matter where it may lead, or how unpalatable it may be.

(2) That engineering and engineering economics are subject to natural law, which cannot be altered to suit the whims of human nature.

(3) That the most serious disgrace that comes to an engineer is to conceal, prevent, or distort natural and economic law, either to please a client or temporarily advance his own interests, and so ultimately lead his client into difficulties.

(4) That an experienced engineer of standing ranks as a confidential professional adviser, feeling keenly his responsibilities, and whose integrity and conscientiousness, when properly established, should be appreciated and upheld by his client.

(5) That engineers, while not infallible, or superhuman, are more apt than laymen to be right in their findings on engineering facts and economic truth connected with engineering matters.

Organizing the Traffic Survey

General Discussion of Type of Man, Organization and Supervision to Be Employed in Traffic Surveys—Work Mapped Out for Large, Medium and Small Companies

BY F. W. DOOLITTLE, DIRECTOR BUREAU OF FARE RESEARCH, AMERICAN ELECTRIC RAILWAY ASSOCIATION

Although the development of extensive traffic studies has been relatively recent, various companies in order to judge of operating efficiency have for many years prepared certain traffic statistics. At first such data were usually taken from conductors' trip reports and confined to the determination of the number of passengers carried throughout the day and to the number of cars provided for their accommodation, with particular reference to the occurrence of heavy loads and the profitable use of trippers. The figures so obtained were variously plotted and analyzed.

A description of a method used in 1901 on the New Orleans & Carrollton Railroad, where it was introduced by George H. Davis, former manager of the road, now of the firm of Ford, Bacon & Davis, was published in the Street Railway Review of Sept. 15, 1901, in an article by A. H. Ford, now general manager of the Cumberland County Power & Light Company. Since that time, however, necessity for greater and greater detail has arisen, and to meet this more extensive traffic studies have been made.

No attempt will be made here to pass on the value of these traffic studies, but it will be worth while to examine later the details of some of them as showing what practice has been and is. In this article the topic will be the organization of a traffic survey. It is well agreed that the type of man and organization to be employed in such a survey is of vital importance to its success. In the following paragraphs especial attention will be paid to the details of organization.

Function of the Traffic Survey Organization

The function of the traffic survey organization is the collection and the compilation of information concerning traffic characteristics which it is necessary for the officers in charge of operation to have in order that the maximum operating efficiency may be reached. That organization is best which permits the collection of the maximum amount of pertinent and reliable data at a minimum cost.

There are three distinct classes of work in making traffic surveys:

(a) The collection of data by observation in the field.

(b) The compilation and tabulation of field data in the office.

(c) The supervision of this work (a and b) and the study of results.

Based on these studies is the construction of time-tables, and it would be of advantage in many cases to place the working out of schedules under the man who directs and supervises the making of traffic studies, and who analyzes their results. When this is done, there should be added a fourth division of the work:

(d) Construction of time-tables.

Before discussing further the general features of the organization and the supervision of the work, it will be well to examine both the purpose and the nature of the work to be done in the field and in the office.

Field and Office Work

The extent of the data required and the frequency of their collection present problems which will receive more extended attention later. Here it is pertinent to note that the field data to be recorded will consist of such items as the number of passengers boarding or leaving a car at certain points, the number of seated passengers on the car, the number standing, the time at which the car passes certain points, the condition of street traffic, the types of passengers, classified as to occupation, and other similar information. All items must be neatly and accurately recorded and turned in to the office in such shape as to facilitate their combination with similar records taken by other observers.

Although there is substantial agreement as to the duties of observers, there is some disagreement among traffic experts as to who these field men should be—conductors on regular duty, conductors especially assigned to the work, or inspectors and special agents drawn from other departments or not previously connected with the company. The 1910 report of the committee on construction of schedules and time-tables of the Street and Interurban Railway Association shows[1] that out of thirty-eight companies reporting on the matter, twenty-four used inspectors, twelve used conductors, and two used special agents. In the discussion that followed this report it was brought out (three to one) that conductors' reports were uniformly unreliable and that inspectors were far more efficient.

If it could be done without sacrificing efficiency, it would be economical to have observations made and data recorded by the conductor on duty with each car. Experience with this method of procedure, however, has been generally unsatisfactory in city operation. Bion J. Arnold, in his San Francisco survey made in 1912, reached the conclusion that a traffic study based on conductors' reports is unreliable[2]. Yet it might be noted that conditions of interurban operation permit conductors to devote more time to recording traffic statistics than those prevailing on city lines, and that results under these conditions are reliable[3].

A. M. Taylor, director of the Department of City Transit, Philadelphia, in reporting the Philadelphia traffic survey of November, 1912[4], speaks of the great accuracy of the results as being caused by the

[1] 1910 Proceedings of the Transportation and Traffic Association of the American Electric Railway Association.—p. 256 a.

[2] San Francisco Transportation Problem, December, 1912. Report on Traffic and Service.

"To make results, as many as five observers were stationed on the non-prepayment cars. . . . These counts showed the following missed fares or passengers missed by the conductor on a single trip:

"One line was ninety passengers short.
"Four lines were fifty passengers short.
"Eight lines were twenty-five passengers short.
"Thirteen lines were ten passengers short.

"In one case . . . during a typical rush-hour period, 38 per cent of the total registration was missed on a single car trip. In comparison therewith, only two prepayment lines showed ten passengers or over missed by the conductor, the average being four or five. In these two cases, the excessive crowding on the rear platform (against the company rules) prevented the conductor from reaching the passengers clinging to the rear step."

[3] Howard F. Fritch, in Electric Railway Journal, Sept. 21, 1912, comments as follows:

"Passenger counts are taken both by inspectors on the street and by conductors. The conductors take the counts most frequently. Not only have very good results been obtained from counts taken in this manner but it is much more economical, as a large force of inspectors would have to be employed to take counts over so large a territory as is covered by the Bay State Street Railway, while a large number of counts can be taken by the conductors at one time with practically no additional expense."

[4] "The Solution of a City's Transit Problem."—*Electric Journal*, October, 1914, page 518.

employment as checkers of experienced conductors borrowed for the purpose from the Philadelphia Rapid Transit Company. These conductors did not have charge of the cars but confined their attention to the collection of traffic data. In 1909, Stone & Webster[5] in making a traffic count on the Metropolitan Street Railway lines in New York City resorted to the same expedient, namely, borrowed a number of experienced conductors from the company and used them as checkers. It must be borne in mind, however, that the purposes of both these studies and the extent of the data recorded were such that sufficient accuracy could be obtained only by men extremely familiar with local conditions.

Efficiency is developed by instructions as well as by experience and practice[6], and whether conductors undertake the work in addition to their regular duties or devote their whole time to recording traffic data, or whoever the field men may be, it is considered good practice to give the men taking the data thorough instructions in methods best calculated to insure accurate results. Bound pocket books ruled into columns with proper headings or printed cards should be provided for the recording of all data, and frequent checks should be made of the accuracy[7] of the record.

The office force has as its duties the assembling and the analysis of the data collected by the observers and the preparation of information for use in constructing time-tables. It may also be called upon to prepare special information of various sorts for various other departments. Questions of routing, transfers, extensions, time of loading under different conditions, effect of changing social and business conditions, etc., are subjects on which the traffic survey department may make reports. The office force should be recruited from those in other departments which have shown an aptitude in grasping the significance of figures. There will be drafting to be done, but this will be largely the construction of curves and for that reason will not require great technical proficiency.

SUPERVISION

Whether the traffic survey is carried on under the superintendent of transportation, with the work done by regular conductors and clerks from his office, or is placed in a separate department whose director reports to the manager or superintendent of transportation, will of necessity depend many times on the size of the company and on the distribution of other duties among the officers and departments. It is of interest that the chief engineers of two state railroad commissions have recommended very strongly the establishment of separate and distinct organizations wherever possible for the collection and analysis of traffic data[8].

In this connection the ELECTRIC RAILWAY JOURNAL of April 25, 1914, reports the Pittsburgh Railways as having maintained for some years past a department of traffic statistics composed of divisions dealing with:

(a) Routing and time-table.
(b) Traffic counts.
(c) Dispatching.
(d) Publicity.

In outlining the transportation department of the Metropolitan Street Railway, New York, the ELECTRIC RAILWAY JOURNAL of June 25, 1910, states that a distinct time-table and statistical bureau is maintained in the department under the supervision of the superintendent of transportation. This bureau is under the immediate control of a chief who is aided in the work by a force of clerks and stenographers, tallymen and time-table makers.

Another article in the ELECTRIC RAILWAY JOURNAL of Sept. 21, 1912, by Howard F. Fritch of the Bay State Street Railway time-table department, describes that organization and its work. The department was originated in June, 1910, under Prof. A. S. Richey as superintendent of transportation. Its duties are as follows:

(a) To make investigations of traffic.
(b) To keep graphical records.
(c) To make time-tables for the entire system of 938 miles of track.

The preceding discussion of the organization of a department of traffic studies brings out certain general principles which have been deemed of value in the past and which it may be worth while to emphasize further and summarize at the same time.

As regards the type of man and organization to be employed on the work, it may be said that a separate, distinct, permanent traffic study department, under the sole and responsible direction of a first-class trained man with initiative and executive ability, may well be established by many companies. The subordinates of this organization should be intelligent, accurate, well-instructed, and properly aided and supervised men, and the personnel of the department should be kept separate and distinct from all others. Yet while this would insure the maximum of efficiency and results which would be of the best in accuracy and completeness, it is manifestly not practicable in all cases, and for the smaller companies would be out of the question. A simplified organization for these companies is to be desired and the following is recommended:

For present purposes, companies will be classified as large, medium and small, but no attempt can be made

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[5]Stone & Webster's *Public Service*, March, 1913.

[6]Speaking in general of the efficiency of inspectors, R. W. Harris, electrical engineer and traffic expert, says in "A Method for Determining the Adequacy of an Electric Railway System"—American Institute of Electrical Engineers, Proceedings for 1910:—

"At first glance it might seem that the amount of data to be taken of each car going in one direction is more than could be expected without sacrificing accuracy, and especially when the time spacing of cars is often as short as ten seconds; this feature, however, is overcome by practice in making observations. As a matter of fact, the inspectors became so efficient that the data were found to be 95 per cent accurate by test, which is sufficiently close for this class of work."

[7]R. M. Feustel, chief engineer State Public Utilities Commission of Illinois, who made the recent Winnipeg (Canada) traffic survey, says in the Public Utilities Commission of Manitoba 1913 Report:—

"Inspectors chosen were intelligent, accurate workers. The notes taken were entered into books in a form previously prepared and each man was provided with a watch, so that all records were accurately taken and uniformly listed. The inspectors were checked two or three times each day, both by chief inspector and myself, to see that the notes were accurate, and each man was carefully instructed in the work."

[8]C. M. Larson, chief engineer Wisconsin Railroad Commission, in an article in *Municipal Engineering*, February, 1914, says:

"If the system is of considerable size a traffic study department should be established, under the direction of either the manager or the operating officer. If the system is small this officer may himself have direct charge of the details of the work, provided he is thoroughly familiar with the nature and scope of the investigation to be made. This department should not be a spasmodic affair dependent for its existence upon a shortage of work in some other department. It should be permanent and should be prepared to supply to the manager or operating department reliable information on traffic conditions for any season, day or hour, and upon any point of every line. In whatever way this is done (data collected), the collection should be under the direction of the head of the traffic study department in order that the results may be consistent and trustworthy."

E. Swenson, chief engineer, Pennsylvania Railroad Commission in Case No. 87, 1910, Report on Pittsburgh Railways, says:

"Establish a central organization . . . which shall be in full control of securing all the data of the movement of population from and to the many centers of population, and all other traffic data in this territory . . . The personnel of this department shall be kept separate and distinct from that which takes care of the operatives and their interests. It should be composed of the following bureaus: Traffic; routing and scheduling; dispatching and checking, and publicity. The first two and the fourth bureaus, the duties of which do not in any way pertain to the operatives, their time, etc., shall have a personnel composed solely of first-class, technically trained men and that of the very best talent, as the efficient and profitable service depends largely upon their data and deduction."

to define any more closely the limits of these classes by reference to annual revenue, car-miles or other operating statistics. It may very well be that, because of peculiar conditions surrounding the operation of a property, this classification will place it in a group where it would not naturally fall under a classification based on operating data.

It is recommended that large companies establish permanent departments for the purpose of traffic study under the superintendent of transportation, but directly in charge of a chief of a bureau of traffic statistics, who will devote his entire time to this work. Under him there should be two general classes of employees, inspectors or field men, and clerks and draftsmen, who will compile and analyze the data furnished by the inspectors and prepare them for use in the construction of time-tables.

For companies of medium size, it is desirable that there be made regular and continuous studies under the direction of the superintendent of transportation, and that there be used for the work, as inspectors, in addition to the employees regularly engaged in the supervision of loading, headways, schedules, etc., conductors and clerks from the office of the superintendent of transportation. These men will naturally be in closer touch with such types of information as it is desired to compile than men in other branches of the service. The information secured should be worked up by the regular office force of the superintendent of transportation.

In the small companies, only occasional studies will be made, and these should be made under the direction of the manager by men from various offices. In so far as the collection of data is concerned, the older and more experienced conductors should be used.

Regardless of the size of the company and the detail in which the information is desired, the purpose of the traffic studies will be to enable the company to reach two results: (1) That the maximum service which it is possible to render for the fare paid shall be offered, and (2) that as great a saving as possible in car-miles shall be made. The problem becomes that of making car-miles coincide both as to time and place with passenger-miles.

In a later article the extent and the frequency of the collection of data necessary under different conditions will be discussed.

The C. E. R. A. Boat Trip

A telegraphic dispatch sent from Buffalo Friday morning reported that the Steamship *City of Erie*, carrying the members of the Central Electric Railway Association, their families and guests reached Buffalo safely on Friday morning. About 225 persons participated in the trip.

The meeting of the executive committee of the association was held Thursday morning and the technical session in the afternoon. President Henry presided and S. W. Greenland, Fort Wayne, presented the report of the committee on uniform charges for repairs to foreign equipment. Four new members were elected, and amendments to the constitution and by-laws, making steam and water transportation lines eligible for membership and making the office of secretary and treasurer an appointive one were passed. The four technical papers on the program were presented, but there was no discussion. President C. Loomis Allen of the American Electric Railway Association addressed the members and spoke of the importance of the company section movement. He also expressed the hope that the association would so amend its constitution as to admit all railway employees to membership at lower rates.

Two special cars from Indianapolis, one by way of Columbus, and the other by the way of Fort Wayne brought a number of members to Cleveland on their way to the boat. Those who traveled by way of Columbus stopped at the Mansfield Country Club where the Ohio Brass Company tendered a banquet to them.

Conference on the National Electrical Safety Code

As has been announced in the Electric Railway Journal from time to time, the national bureau of standards had scheduled a general conference on the proposed national electrical safety code to be held in Washington on July 1 and 2. At this conference the railway association was to have been represented by W. J. Harvie, Syracuse, N. Y.; A. S. Richey, Worcester, Mass., and C. L. Cadle, Rochester, N. Y. In order to allow more time for the study of the proposed code, which is now available in pamphlet form, the conference has been postponed to Oct. 27.

The code circulars can be obtained from the superintendent of documents, Government Printing Office, Washington, D. C. The prices are: No. 49, operating rules, 10 cents; No. 54, construction rules, 25 cents.

N. E. L. A. Convention

List of Officers Elected and Brief Abstract of Secretary's Report Are Given

Supplementing the extended abstract of the proceedings of the annual convention of the National Electric Light Association held in San Francisco, June 8 to 11, printed in last week's issue, the following items covering occurrences too late for that issue are given.

The elections to offices and the executive committee resulted thus: E. W. Lloyd, Chicago, Ill., president; H. A. Wagner, Baltimore, Md., first vice-president; W. F. Wells, Brooklyn, N. Y., second vice-president; R. H. Ballard, Los Angeles, Cal., third vice-president; R. S. Orr, Pittsburgh, Pa., fourth vice-president; W. H. Atkins, Boston, Mass., treasurer; W. H. Blood, Jr., Boston, Mass., insurance expert; T. C. Martin, New York, N. Y., secretary; Harriet Billings, New York, N. Y., assistant secretary and assistant treasurer; J. E. Davidson, Portland, Ore.; H. C. Abell, New York, N. Y.; H. C. Bradlee, Boston, Mass., and R. F. Pack, Minneapolis, Minn., executive committee members.

In his annual report T. C. Martin described the large volume of business conducted in the headquarters office. During the year 150,000 copies of the association *Bulletin* were issued, an average of more than 13,000 for the eleven months of publication. The effort has been maintained to build this up into a publication of magazine character without encroaching upon the legitimate field of the technical magazines. The activities of the vigorous and aggressive commercial section have been expanded greatly, and it has now taken over the publication of *Rate Research*, and has also taken a further most important step in the creation and organization of its educational course. The organization of the accounting section marks the apparent increasing tendency in the association to differentiate into group work, which may lead in time to the reconstruction of the old hydroelectric section or its merger into a broad technical section. The lecture bureau has a working list of thirty-five lectures, most of which are illustrated. During 1914 the lectures were delivered before 40,000 persons. The association, also, has on file rate information from practically all member companies, and has sought to develop and maintain friendly interchange relations with all the public service commissions.

Master Car Builders' Convention

At the Annual Meeting at Atlantic City, June 14-16, Car Construction, Draft Equipment, Brakeshoes, Impacts between Moving Cars, and Couplers Were Among the Subjects Discussed

At the forty-ninth annual convention of the Master Car Builders' Association, which was held at Atlantic City June 14-16, a large part of the discussion centered on the general subject of the increased buffing and pulling strains to which modern freight cars were subjected. This was evidenced by the extended reports made by the committees on car construction, couplers, and draft equipment.

With regard to passenger equipment, however, an important recommendation was made to the effect that a dimension of 51 in. be established as the standard height above rail for the top of the platform buffer. The committee on car construction also took up an important subject in submitting, tentatively, complete designs for a standard M. C. B. box car, the idea being that the members of the association should study the drawings and submit suggestions for modifications by Dec. 1, 1915. The proposed design, it may be said, is of the steel-sheathed type, the inside length being 40 ft. 6 in.

In its report also this committee stated that a large number of failures can be attributed to improper center-sill construction and that it had therefore formulated some rules based on fundamental principles and comparable with the strength of other parts of the car. Many roads are at present modifying wooden cars, making it desirable to have a guide for minimum strength requirements for reinforcement of existing wooden cars to fit them for some years' further service. For such cars the following rules are submitted:

The draft attachments, including draft arms, if used, must be of metal and may be of either integral or riveted construction. The strength value of the draft attachments and center-sill construction must be equivalent to at least 10 sq. in. of steel in tension and compression, 6¼ sq. in. of rivet-bearing area, and 12½ sq. in. in shear. The ratio of unit stress to end load must not exceed 0.15. Metal draft arms applied to wooden center sills must extend at least 30 in. beyond center line of bolster, toward center of car, must be securely fastened to bolster and center sills, and where possible should butt against compression members placed between draft arms and needle beams and also between the needle beams.

Hardwood or yellow pine center sills may be considered equivalent to steel in center-sill construction between bolsters, if they have four times the specified unit values, namely, 40 sq. in. tension and compression area, and a ratio of unit stress to end load not exceeding 0.0375. Where wooden members are reinforced with metal (composite construction) either the steel or the wood alone must meet the strength requirements.

Draft Equipment

The committee on draft equipment submitted a tabulation made up from replies received to twenty questions sent out in a circular of inquiry for the purpose of finding out general practice and the weaknesses of the present draft gear appliances. The great majority of replies stated that the wooden cars were being equipped with higher-capacity draft rigging, the general practice being the application of metal draft arms and steel sills. Sixty per cent of the total number of cars were of steel center sill construction, and 65 per cent of these were equipped with friction draft gear ranging in capacity from a minimum of 100,000 lb. to a maximum of 260,000 lb. The capacity of these cars varies from 80,000 lb. to 120,000 lb. It is evident that a draft gear of low capacity necessitates a better construction of car in order to take care of the shocks, which are meant to be absorbed by the gear.

Eighty per cent of the total replies show preference for a friction draft gear on new equipment. Thirty-six per cent express a preference for more coupler travel than the present standard of 2¾ in. between coupler horn and striking plate. The matter of keeping up nuts on drawbar carry-iron bolts is a great source of trouble. Almost all who advise no trouble in that respect are using nut locks, while some of the largest roads are overcoming this trouble by placing these bolts in shear instead of in tension, as has been the general practice. Keys are preferred to rivets in the coupler yokes by an overwhelming majority.

Brakeshoes

In its report the committee on brakeshoe and brake-beam equipment submitted a résumé of the tests so far made on brakeshoes for the years 1906 to 1914, inclusive. During this time, a considerable number of brakeshoes of differing materials and construction have been tested on the Master Car Builders' machine at Purdue University, and it has become apparent that the coefficient of friction diminishes as the pressure on the shoe is increased, but between the pressures of 12,000 lb. and 18,000 lb. the change in coefficient is slight. It is furthermore apparent that pressures in excess of 18,000 lb. are not economical.

The coefficient of friction at high speeds is very much less than at moderate speeds, the average coefficient at 80 m.p.h. being less than 10 per cent or less than one-half the corresponding average at 40 m.p.h. The coefficient of friction of filled or composition shoes is, in all cases, considerably greater than the average, being from 50 per cent to 100 per cent in excess of that for cast-iron shoes.

General conclusions cannot safely be drawn as to the effect of speed and pressure on the loss of weight, except that pressures in excess of 18,000 lb. cause an abnormal loss. The tendency, however, is for the loss in weight to increase as the pressure and the speed increase.

Clasp Brakes for Passenger Cars

The committee on train-brake and signal equipment stated that, to date, there are in service about 2500 sets of clasp brakees in use for modern passenger car equipment on about a dozen leading railroads of the country. So far as the committee has been able to learn, this type of rigging is maintaining its claims for reduced brakeshoe wear per given number of foot-pounds of brake work done, for reduced number of hot journals in so far as the brake may be responsible for them, for smoother riding of car during time of brake action and for a remarkably low cost of maintenance both with respect to the parts of the rigging itself and to the cost of brakeshoe renewal. The stopping efficiency is about 20 per cent greater than the single shoe arrangement. It appears that where the wheel load is approximately 12,000 lb., clasp brakes should be used. The committee recommends, therefore, that clasp brakes be applied to all four-wheel truck passenger cars weigh-

ing 96,000 lb. or more, and to all six-wheel passenger cars weighing 136,000 lb. or more.

Impact between Moving Cars

An individual paper on impact between freight cars in switching service, presented by Louis E. Endsley, included the results of tests made with a chronograph having a cylinder revolving at a speed of 45 r.p.m. and a marking needle that was attached to the car whose movement was to be registered. As the cylinder was 20 in. in circumference, this gave a speed for the paper on the cylinder of approximately 15 in. per second. In the test, eight or ten cars in a string were placed on a track that had just sufficient grade to keep a car in motion after it had been started but not enough to accelerate the car. The brakes on the last two cars on the down-grade end were set, and a locomotive was coupled on to the up-grade end and the slack was pushed in until only the draft-gear movement was left between each pair of cars. The end car was then disconnected and pulled up the track some distance, the chronograph having been connected to the end car of those standing. The motor was then started and the drum allowed to revolve. The car that the engine had pulled up the track was allowed to drift into the string of stationary cars, the speed being determined by stop watches, and the velocity and acceleration of the first standing car were obtained from the record made on the cylinder of the chronograph.

The tests were made on the Norfolk & Western 90-ton cars and the Pennsylvania 55-ton cars, both kind of cars being tested light and loaded. For the purpose of distinguishing the different cars, the moving car was called "A," the first car of those standing "B," the second standing car "C," the third standing car "D," etc. The instrument was connected to Car "B," which was the first car in the cut of standing cars. In each case the weight of the car and load was known, and the acceleration was determined from the curve drawn on the drum. The weight of the trucks included in the weight of the car, as the maximum force occurred after the car had moved approximately ¾ in., and the trucks must have been in motion by that time.

The following table gives the results obtained:

Weight of Car in Pounds	Velocity of Car "A" in Ft. per Sec.	Speed of Car "A" in m.p.h. at Impact	Maximum Velocity of Car "B" in Ft. per Sec.	Maximum Pressure in Pounds
48,000	1.35	0.92	0.67	12,600
48,000	3.57	2.43	1.64	41,500
48,000	5.00	3.41	2.48	90,600
48,000	8.12	5.54	3.30	158,500
60,000	3.26	2.22	1.25	101,000
60,000	5.00	3.41	2.37	128,800
60,000	8.83	6.02	4.94	468,000
143,300	2.75	1.87	1.75	119,100
143,300	3.45	2.35	2.04	167,000
143,300	5.36	3.65	3.26	453,000
143,300	6.98	4.76	3.82	640,000
248,000	2.46	1.68	0.59	110,000
248,000	3.49	2.38	1.69	263,000
248,000	4.76	3.25	1.80	530,000
248,000	5.65	3.85	2.65	655,000

The loss of kinetic energy in some cases amounted to as much as 70,000 ft.-lb. This can only be accounted for by the destruction of some part of the car. During the testing on the 90-ton cars a few impacts were made with bumper blocks installed. A larger percentage of the kinetic energy was transmitted to Car "B" when the bumper blocks were used. Also the force of impact between the cars was usually somewhat greater. This, no doubt, is accounted for by the fact that the load is distributed over three points and thus a greater force was produced with less destruction than when the couplers and draft-gear connection received all the load. The maximum force of impact for any given speed is almost directly proportional to the weight of the two cars in impact.

An interesting thing, plainly shown from the curves made on the chronograph, was the fact that the maximum force on Car "B" occurred always before it had moved 1 in. although Car "B" usually moved a total distance of from 4 in. to 12 in. Therefore, the maximum force on Car "B" occurred before any appreciable force was exerted between Cars "B" and "C," and the speed of Car "B" was very slow before Cars "C" and "D" had any pressure between them. Car "B" was always stopped before the impact between Cars "D" and "E" occurred. The largest percentage of kinetic energy is taken out of the moving car in the impact between Cars "A" and "B," and the greatest damage would be done at this point. As the greatest force occurred before Car "B" had moved 1 in., the damage to the end of the car would be just as great if only one car was standing as if a dozen were backing it up, provided there was at least 1 in. slack between the first and second cars of those standing. Of course, as regards damage to the center sills at the center of the car, no doubt this damage would be greater if the cars were backed up by other cars. But the results given in this paper seem to indicate that there would be just as great an impact between the cars if one car struck a single car or struck a string of cars.

Couplers

The standing committee on couplers, which has had under consideration the development of a single standard design, presented in detail the result of the extended tests made during the past year. A number of the experimental couplers of both "A" and "B" type were tried out in service, others being submitted to static strength and endurance tests, and the results showed the experimental types to be satisfactory.

The opinion has been voiced, although no specific objection has been made, that the weight of the experimental type is too great. However, the objections that have been raised are apparently commercial and are based on the increased cost due to the increased weight rather than to any definite mechanical features. The experimental standard couplers were planned originally to withstand a static pull of 200,000 lb. without exceeding the elastic limit, and the coupler head and other parts were designed to conform to this load, making the knuckle the weakest part of the coupler, as it should be. After developing the design it was found that the 200,000-lb. requirement could not be obtained with a height of head that would go under passenger-car buffer. Limiting dimensions were placed upon the height of the head and these reduced the strength to 175,000 lb. without permanent set, establishing a coupler weighing approximately 400 lb. This gave a 33 per cent increase in weight with a 100 per cent increase in strength over existing designs.

Attention was called to the desirability of designing any new equipment to accommodate the proposed new design of coupler. It has been found that a 6-in. x 8-in. shank is essential, and therefor provision should be made for this so that the new standard couplers can be applied when the design is finally adopted.

As a result of the investigation and tests during the year the manufacturers of the "A" and "B" experimental couplers are to make final changes in the designs, and they have submitted models of these changes, which, however, do not alter the general principles of the coupler in any way. Therefore it has been decided to designate the modified "A" coupler as "C," and the modified "B" coupler as "D" in order to avoid any confusion in the tests and records. It is expected that the committee will be in position to make final recommendations as to the selection of either the "C" or the "D" type as a standard at the 1916 convention.

Chicago's Two-Day Strike

Mayor Thompson's Efforts for Arbitration Succeed, Despite the Stolid Refusal of the Men at First to Accept Arbitration as a Means of Adjusting Wage-Scale Differences

A two-day strike, involving the acceptance of the principle of arbitration as a means of settling the new working agreement between the Chicago Surface Lines, the Elevated Railroads of Chicago and their employees, has been won by the railway companies. The managements of the two companies felt that they owed it not only to Chicago but to the whole country to stand by the principle of arbitration, particularly when the employees refused to consider offers which were clearly so just. Preliminary negotiations leading up to this strike included at first a number of conferences between the representatives of the employees and President Britton I. Budd, of the Elevated Railways, and President Leonard A. Busby, of the Surface Lines. From these resulted a satisfactory adjustment of working conditions, but when the employees refused to consider any offer of increased wages short of their demand for a 33-cent minimum and a 36-cent maximum, negotiations ended.

In former wage controversies one of the principal points at issue has been a graduated scale. This question was raised by the employees in their demands this year, and accordingly both the elevated and the surface lines offered to raise the wages of the lower-grade men but not to increase the maximum wage of 32 cents an hour. In taking this stand the Chicago Surface Lines held that 60 per cent of the trainmen were receiving the maximum wage which gave them average yearly earnings of approximately $1,000. That this was deemed sufficient to make train service highly desirable employment was shown by the number of applications received. In making this offer on June 9, the company agreed, if the proposition was not satisfactory, to arbitrate the entire question.

On the same day the men declined the company's offer, refused to arbitrate and issued an ultimatum to the effect that unless the company made what they considered a fair proposition within forty-eight hours the men would be called out. In regard to the usual form of arbitration the representatives of the employees stated:

"From the experience we have had with your usual way of settling questions of this kind, either in the State Legislature or in the City Council, we can assure you that we want no repetition and the usual way you proposed will not be accepted. In refusing your proposition we wish you to bear in mind that the refusal is not the act of any man or individual, or a committee of officials, but is the act of the whole organization. We, therefore, wish to inform you that acting in full concert and with authority vested in us by our membership, every proposition in your communication has been rejected."

In response the company again offered arbitration and pointed out that the men and the company were apparently unable to agree upon what was a fair proposition. Accordingly this question was put to the employees: "Who is to determine what is a fair proposition after the parties, in the course of their negotiations, have failed to agree?" On June 10, in replying to this question, the employees declined to consider arbitration. They said: "We must remain the judges of what constitutes a fair proposition concerning wages." At this point both the surface and elevated railways dropped further negotiations and Mayor Thompson endeavored to bring about a settlement. Through his efforts the time of beginning the strike was delayed until President W. D. Mahon, of the Amalgamated Association, could be summoned from Detroit. Mr. Mahon arrived on the morning of June 11 and conferred with representatives of the union and the Mayor, but the men declined to consider arbitration as a basis of settlement. Conferences continued all through Friday and part of Saturday, and at 7:30 p.m. Saturday evening the so-called form of arbitration was submitted to the Mayor. The basis of this proposition, as stated in the letter accompanying it, was to safeguard the arbitration in such a way as to secure an impartial result. In the employees' plan, under the heading of points conditional to arbitration, were included demands which meant an increase in wages of approximately $1,500,000. These conditions were set forth as follows:

EMPLOYEES' DEMANDS ON JUNE 12

"First—Conditional to arbitration, mutual agreement that:

"(*a*) Runs arranged so that 50 per cent be straight runs and 50 per cent be completed within fourteen consecutive hours.

"(*b*) Graded wage scale limited so as not to exceed two years, maximum wage paid at the expiration of that time.

"(*c*) Night platform service completed within eight consecutive hours.

"(*d*) Period of contract two years, ending May 31, 1917, and findings effective as of June 1, 1915.

"(*e*) No run shall be less than nine hours or over eleven hours, and no run shall pay less than nine hours' pay, except Sunday.

"Second—Questions to be arbitrated:

"(*a*) How much, if any, raise above the present wage shall be paid all employees members of the association?

"(*b*) All other points in dispute raised in the proposed contract that cannot be settled before arbitration takes place.

"Third—Subject matter to be covered upon question of ability of the company to pay, and justice of the demands of the men:

"(*a*) Actual money investment of the properties of the surface lines and returns on such actual investment.

"(*b*) Salaries and considerations paid general officers of the company and comparison with like salaries paid like officers in like corporations; also comparison between increase in such officers' salaries since the 1907 ordinance and increase in wages paid employees.

"(*c*) Nature and effect of contracts by surface lines and constituent companies, in regard to operation and charges thereon, and comparison of such contracts with like contracts in other cities.

"(*d*) Use of all books, documents and vouchers, whether private or otherwise, of the company, to determine its ability to meet the demands of the men, and profits actually earned and dividends to stockholders.

"(*e*) Relationship and extent of salaries and expenses of board of supervising engineers.

"Fourth—Plan of arbitration:

"Each party, within twenty-four hours, select a member of the arbitration board. The two thus chosen, within forty-eight hours, select a third one, who will serve, from the following five named representative citizens: Governor Edward F. Dunne, Judge Marcus Kavanagh, Carter H. Harrison, Judge William E. Dever, Judge John P. M'Goorty.

CHICAGO STRIKE—MONDAY EVENING RUSH AT ILLINOIS CENTRAL SUBURBAN STATION

"Board to be convened without delay; hearings daily except Sunday; award within ten days after close of hearing and arguments; award binding upon both parties when signed by majority of the arbitrators; rulings binding upon both parties if made by majority of the arbitrators.

"Fifth—The same arbitration board above selected and chosen shall serve in the same manner with respect to the dispute between the elevated company and the association, the arbitration to be as to wages and conditions upward of the present rate.

"The period of contract shall be the same as between the surface lines and the association, and findings to date back in the same way.

"The subject matter to be covered upon questions of ability to pay and justice of the demands to be the same as sections *b*, *c* and *d* of the surface lines' proposition under such sections, and the following:

" 'The arbitrators shall consider as to the actual investment in the property of the elevated railroads an amount not to exceed the amount determined by the valuation commission of the City Council, in their report submitted to the City Council.

"The conditions preceding the arbitration shall be along the same general lines as those prescribed with reference to the surface lines, and the period for maximum pay shall be as specified in the proposed contract and conditioned further upon the provision that, if either the surface lines or the elevated railroads shall not accept the arbitration, as herein outlined, the association withdraws the offer as to the other."

Reply of Companies

In response to this plan of arbitration submitted to Mayor Thompson, President Busby, of the surface lines, and President Budd, of the elevated lines, to show that they were seeking nothing but the prompt settlement of all these questions on a basis of fair arbitration, submitted the following proposition:

1. We offer to arbitrate all questions pertaining to working conditions.

2. We offer to arbitrate the question of wages, including wage scale for employees who are members of the association. We further state that we shall not in that arbitration ask for any decrease in the rate of wages of any employees.

3. We offer to arbitrate any other question upon which we are unable to agree.

4. We will accept a board of arbitration selected as follows: The association will select one man, the company will select one man. If these two men are unable to agree upon a third arbitrator within forty-eight hours the Mayor of Chicago will tender five names, the arbitrator chosen by the association to have the right to strike out two names, and the arbitrator chosen by the company to have the right to strike out two names, and the remaining name to be the third arbitrator.

In response to the request that the railways be given time to call their directors together on June 14, to place the whole proposition before them, the representatives of the employees declared that a strike would be called at midnight Sunday, June 13. Since some of the members of the board of operation of the Chicago Surface Lines were out of the city, it was impossible for them to take any action on this ultimatum. At the time set all the men turned in their runs. During the strike the surface railways did not attempt to operate while the elevated railroads were able to operate trains at a fifteen-minute headway between Sixty-first Street, the terminal of the South Side Elevated Railroad lines, and Wilson Avenue, the terminal of the Northwestern Elevated Railroad lines. For this service old employees were used who had refused to accede to the union order.

The Effect on Chicago Transportation

The combined surface and elevated railways in Chicago transport 3,750,000 passengers daily. All the steam roads with suburban service and a number with lines through districts not served by any other means of transportation put into operation all the passenger equipment they could muster, but even with this equipment the steam roads were taxed to the limit during the morning and evening rush hours. In fact, the congestion was so great that conductors found it practically impossible to collect tickets en route. Passenger-carrying vehicles of every description were put in service on the streets. Every available motor truck was equipped with seats and charges for the haul from the Chicago loop district to points 5 and 6 miles out varied from 10 cents to $10 per passenger. On Monday morning most everybody was delayed in reaching his place of business, and some were unable to get downtown. By Tuesday the improvised modes of transportation had been so perfected that most persons were able to reach their places of business at the regular time. Vehicular traffic on the principal streets in the "loop" district and the arteries leading to the various steam-road stations became greatly congested.

Only one attempt at violence was reported on Monday. A wooden block was hurled through a window of an elevated train from a building beside the South Side Elevated structure and a police detective was slightly injured by flying glass.

CHICAGO STRIKE—EVENING RUSH IN THE NORTHWESTERN RAILROAD STATION

Approximately 14,000 men and women were engaged in the strike. Of this number 300 were ticket agents, 2900 were trainmen and other employees in the elevated railroad service. The number of surface line trainmen, car cleaners and repairmen called out was about 10,800.

EVENTS ON JUNE 14 AND 15

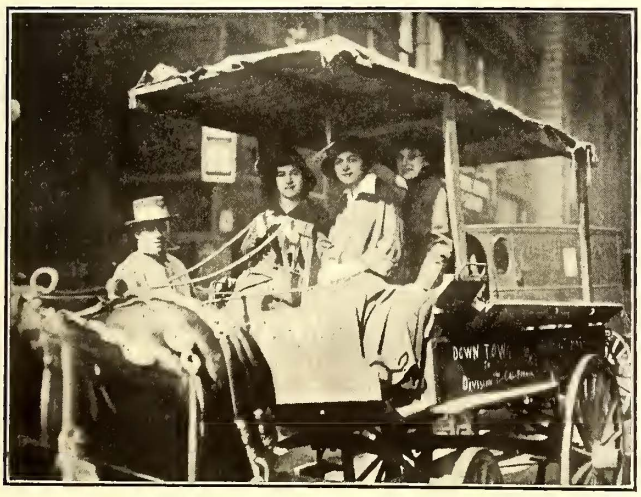
At the regular meeting of the Chicago City Council on Monday night Mayor Thompson was empowered to name a special committee of Aldermen to take charge of the strike situation in so far as the city government was concerned and to make an effort to effect an immediate settlement. The Council indorsed the Mayor's efforts to bring about peace between the companies and their employees, and passed an ordinance to prohibit the use of strike breakers. This ordinance provided that no motorman or conductor could be employed by the surface or elevated lines until he had from fourteen to twenty-one days' instruction. As the Council passed this ordinance under a suspension of rules it could not go into effect until it was signed by the Mayor, who had until the next Council meeting to approve or veto it. In other words, more than two weeks were required before the ordinance could become operative.

On Tuesday, June 15, important developments in the strike situation occurred in close succession. The inconvenience experienced by the public Monday and the full-page advertisements in all the local morning and evening papers, placed by the Chicago Surface Lines under the heading "Who Is Responsible for This Strike?", created strong public sentiment against the employees. In this advertisement all the steps leading up to the strike were outlined and the final paragraph read, "The management believes that a duty devolves upon it at this time to uphold the principle of arbitration. If this principle is surrendered there will no longer exist any peaceful and lawful method of adjusting differences of this character in this city. In deciding to adhere to and uphold the principle of arbitration at this time, the management has also undertaken to show what its position with reference to fair arbitration is by leaving the selection of the third arbitrator to be determined, in effect, by the Mayor of the city of Chicago."

ARBITRATION WINS

Early Tuesday morning Mayor Thompson called together the aldermanic conciliation committee. A series of conferences followed between this committee and representatives of the railways and employees, which at 5 o'clock Wednesday morning ended in an agreement to submit all questions to arbitration. The principal point contested by the employees after they had acceded to the principle of arbitration, was that of selecting the third arbitrator. A number of names were suggested and finally President Busby offered Mayor Thompson as the third arbitrator, and he was accepted. The absolute fairness of the Mayor in these conferences and the firm stand he took for the principles of arbitration on a fair basis, are credited by all as being the largest factor in bringing an end to the strike. On the other hand, adverse public opinion coupled with the fact that both the surface and elevated railway companies had employed a large number of trainmen and fully intended to resume operation on all lines, caused the men to look upon arbitration as the best course.

CHICAGO STRIKE—TYPICAL LOADING ON AN IMPROVISED AUTOBUS



CHICAGO STRIKE—A 10-CENT BUS WITH DESTINATION SIGN

Although the arbitrators for the employees and the companies have not been selected, all the issues they must settle have been accepted. Concessions by employees which made arbitration possible included all the items set forth in their proposed basis of arbitration, except the term of contract and the existing tripper system. President Busby for surface lines, and President Budd for the elevated railways, agreed to the two-year term of contract and to eliminate the existing tripper system of computing wages.

Points to be arbitrated upon which agreement was reached are as follows:

Percentage of straight runs and consecutive hours in which single runs shall be completed.

Maximum time covered by straight runs on Sundays.

Allowance for fall-backs for meals and reliefs if any, on the street for meals.

Hours of service including week-days, Sundays and holidays for employees other than trainmen provided for in the agreement.

Length of wage scale and wages for all trainmen, including trainmen on cinder, sprinkler, supply and other cars.

Hours of service and wages paid car repairers, motor repairers, inspectors, dopers, car placers, car cleaners, janitors, terminal men and other men around the barns.

Allowance for turning in time.

Seniority and efficiency with reference to men outside the train service.

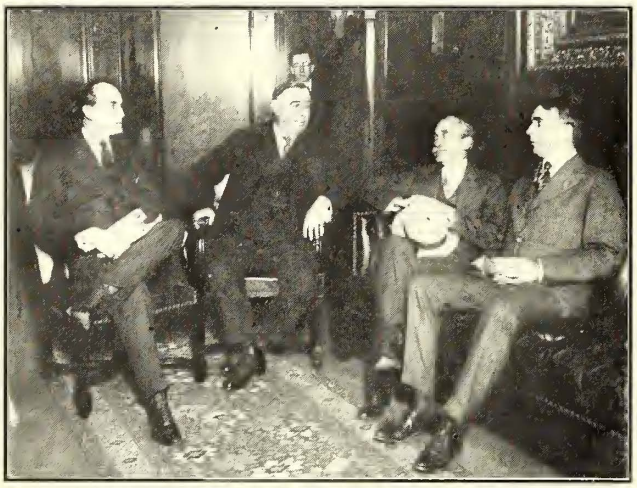
Officially the strike was called off at 5:30 Wednesday morning, but some time was required before complete service could be resumed. The elevated railways began full schedule operation shortly after 7 a. m. and by 9:30 the service was normal. The surface lines, a

more complicated task to handle, was unable to effect full operation before about the noon hour. The announcement of the strike's end was enthusiastically received by the public and the first cars in the downtown districts were greeted with cheers. It is planned to begin arbitration as soon as the arbitrators for the companies and the employees can be selected.

Various Interviews

Regarding his efforts at conciliation which resulted in the ending of the biggest street-railway strike in history and his appointment as referee, Mayor Thompson had the following to say:

"We fought it out behind locked doors. This tells the whole story of the settlement of the strike. Both sides acted splendidly. It is a victory for the great principle of arbitration. Both sides fought desperately for their cause, but the great underlying principle at stake was



(From left to right: Mr. Budd, Mayor Thompson, Mr. Blair, Mr. Busby)

CHICAGO STRIKE—PRINCIPALS WHO BROUGHT ABOUT THE SETTLEMENT

whether we should have real arbitration or arbitration with a specific agreement beforehand. The car men were suspicious. They told of their previous experiences. But arbitration won.

"I cannot say all I would like to say about the splendid spirit of sacrifice for the common good shown by both sides to the controversy. That spirit makes for the building of a greater Chicago. The city was in a desperate plight and on the threshold of grave developments. Bloodshed might have resulted, business would have been stagnated and the public enraged. This cloud has passed and the city can settle down to business again. The situation has been tense since trouble began. Beneath the surface was a feeling of bitterness that nerved the disputants. This feeling finally gave way to sober reason.

"I accept this responsibility with a full realization of what it means. The routine duties of the city hall are hard enough, and this means extra work. But I am glad to take on the additional burden. There is too much at stake. I will do my duty as I see it. I devoutly thank God that I can be of service. I will see that a square deal is given to all concerned."

In an interview Mr. Budd said: "When the strike was declared, the entire controversy resolved itself into more than the question of wages and working conditions. It involved the principle of whether arbitration as a means of bringing about the settlement of disputes could be cast aside and force used. The railways feel that they were not only obligated to the people of Chicago, but to the country at large to maintain the principle of arbitration. They endeavored in every way possible to accommodate the public by restoring service, and the elevated railroads succeeded to the extent of operating a fifteen-minute service between Wilson Avenue on the Northwestern line and Sixty-first Street on the South Side line. This service was made possible by a number of the old employees who refused to accept the strike order. We feel that the principle of arbitration has been upheld by the railways' attitude and action. While the people of Chicago have suffered great inconvenience and discomfort uncomplainingly, and the financial loss to the community has been enormous, the compensating fact is established that reason and not force shall govern in the settlement of these differences in this community."

Henry A. Blair, Mr. Busby and Mr. Budd issued the following statement to the press:

"We settled the strike this morning at 5 o'clock, the men finally agreeing to submit all questions to arbitration. We offered the Mayor as the third arbitrator and he was accepted by the men.

"The surface lines will be in operation before noon and we hope to have a normal schedule for the evening rush.

"The people have been remarkably cheerful and patient under very trying circumstances. Mayor Thompson is entitled to the gratitude of the people of Chicago for the way in which he upheld and stood by the principle of arbitration upon a fair basis. He handled the situation throughout not only with tact, but with a remarkable degree of firmness. He never hesitated for a moment from the time he stepped into the situation to insist first and last that the matter must be arbitrated if the parties were unable to agree. In accepting the place as third arbitrator he did so knowing that this would impose a very heavy and additional burden upon him.

"Chief of Police Healey is also entitled to the gratitude of the people for the prompt and efficient way in which he organized his force for the protection of life and property. He gave every one to understand from the start that there would be no rioting in the city and none occurred.

"We feel grateful for the good will which has been manifested toward the company by the people and for the co-operation we have received from the city officials."

Sidelights on the Strike

Sidelights on the effect of the strike include a well-organized move to bring about a compulsory arbitration statute for public utilities. Former Secretary of the Interior, Walter L. Fisher, made this prediction, and such a movement is supported by a number of prominent citizens. The Federal Government also took a hand in the strike situation in connection with the Oak Park Elevated Railroad. Judge C. C. Kohlsaat, of the United States District Court, issued peremptory orders to the company to resume service at once. President Budd announced that operation on this line would begin Wednesday morning in compliance with the order of the court. The Aurora, Elgin & Chicago Railroad was permitted to continue operation over the Metropolitan West Side Elevated Railroad structure to the Fifth Avenue terminal, but only upon the understanding that local passengers would not be transported. Likewise the Chicago & West Towns Railway, operating in the suburbs west and northwest of Chicago, the Evanston Railway and the Chicago & Interurban Traction continued operation without interruption. General Manager F. L. Butler of the Chicago & West Towns Railway announced that his company would accept the result of the Chicago controversy and accordingly his employees remained at work.

Equipment and Its Maintenance

Short Descriptions of Labor, Mechanical and Electrical Practices in Every Department of Electric Railroading

(Contributions from the Men in the Field Are Solicited and Will be Paid for at Special Rates.)

Los Angeles Illuminated End Destination Sign with Car and Run Numbers

BY E. L. STEPHENS, MASTER MECHANIC LOS ANGELES (CAL.) RAILWAY

The cases of our illuminated end destination signs are of No. 24 gage galvanized iron, stiffened with two ⅜-in. x 1-in. irons, and supported by cast-end brackets, as shown in the accompanying illustration. The "Hunter" sign cloth is used with soft copper edges, to keep the curtain absolutely straight and free from raveling on the edges. The size of cloth is 55½ in. wide by 40 ft. long, with block letters 5 in. high, so that the sign may be read distinctly one block away during the day or night. The present number of names used is fifty-four with sufficient spare cloth for seventeen more. At the lower left hand corner of the sign is the car number in figures 2⅝ in. high, made directly on the glass.

LOS ANGELES CAR SIGN WITH CAR NUMBER PAINTED DIRECTLY ON THE GLASS AND WITH SEPARATE MECHANISM FOR DISPLAYING RUN NUMBER

Another unusual feature of these signs is the inclusion of the run number instead of the general use of separate tags or signs. These run numbers are at the lower right-hand corner of the sign. The figures are 3 in. high, and are made on two separate strips of cloth, one 3½ in. wide by 7 ft. long, with numbers from 0 to 9 inclusive, the other 3½ in. wide by 9 ft. long, with numbers from 1 to 20 inclusive, giving a total from 1 to 200 inclusive.

Operating wheels or handles for the large curtains are provided with a friction band for holding the rolls in position. As illustrated, the run numbers are changed by means of hand wheels, fastened on ⅜-in. shafts which, by means of an interlocking device consisting of a pin in the shaft and a slot in the curtain-roll flange-hub, allow motion in either direction. The rolls are of wood, 1¼-in. diameter, and are finished with metal flanges on the ends to guide the curtains.

This sign is illuminated by three 16-cp lamps, which are connected by wires running through ½-in. gas pipe supports, as shown above the case. The extreme height, depth and length of the sign are 16 in., 11 in. and 5 ft. 3½ in. respectively.

Track Tools—Supplies and Appliances

BY R. C. CRAM, ASSISTANT ENGINEER WAY AND STRUCTURE DEPARTMENT BROOKLYN RAPID TRANSIT SYSTEM

The tools and appliances which make up the working equipment of the way department are very important items in connection with track maintenance work. This becomes more evident when available statistics are consulted wherein it will be found that under "maintenance of way and structures," the materials and labor expenditure for strictly track accounts for the average road will range between 60 per cent and 70 per cent of the total. The item of track and roadway labor will range from about 40 per cent to 60 per cent of the track maintenance costs, depending upon the character of the property. Probably the actual tool-using men will comprise between 70 per cent and 80 per cent of the gang and the greater part of their time is spent in work requiring the constant use of tools.

The design of even the simple, every-day tools such as picks and shovels, will be found to have a direct bearing upon the character of the work done when their predominance in use on the average job is considered. The cost of tools and tool maintenance may run from $225 to $250 per mile of single track on heavy reconstruction work in city streets. It therefore becomes quite apparent that first-class tools should always be used, since they cost little more than inferior grades while better work and greater durability are obtained. Good tools also furnish an incentive to good workmanship and afford no shield behind which the lazy man may hide his laziness. Good tools will also tend to lessen accidents. However, it is poor practice to purchase good tools and then neglect to ascertain that they are put their proper uses and are properly cared for until real breakage or actual wear requires their replacement.

The desirability of having standard plans of all tools seems to be evident, and such plans will be found to assist in correct purchase and inspection. If the making of these plans appears burdensome and unnecessary, it certainly is possible as well as worth while to select tools from the catalogs of reliable supply houses and always order the same makes and styles by the catalog numbers.

Each regular gang should be supplied with a full outfit of such tools and supplies as may be required by the average number of men and the character of the work done. The importance of having all gangs equipped with one style of tools is worth noting. The advantages come from the familiarity with one style of each particular tool and the avoidance of jealousies between gangs through real or fancied superiority of the same tool (jacks, for instance) over another. Also, if the gangs come together on rush work there will be less tendency to borrow the other fellow's good tools and return poorer ones in their places.

In addition to a full outfit of tools, each gang should also be allowed an appropriate number of extra tools, and parts to replace such tools as regularly require sending to the shop for repairs or redressing or are subject to a certain amount of breakage, as is the case with such items as hammer and maul handles. Even

here care should be taken to limit the extra supply because an excess tends to lessen the care necessary to conserve the supply and secure full usage up to the allowable wear limits.

Many of the larger roads find it advisable to employ a man whose sole duty is to keep track of the tool supply and maintenance. On small properties the roadmaster or general foreman should assume such duties, and some form of monthly report of tools showing stock on hand, stock away for repairs and new stock received should be rendered by all foremen who have tools in charge.

In connection with tool repair and maintenance full advantage should be taken of portable tool sharpening devices for use on the job. On large jobs it will often be found advantageous to maintain a blacksmith with his portable forge who will be available for sharpening picks, chisels and many other tools as well as for fitting up joint plates.

The repair of tools in general can best be done at some central point under the supervision of the master mechanic and upon proper orders from the way department to facilitate accounting.

On roads of the larger class, regular tool and supply cars and emergency automobile service are maintained, which make routine and special trips to the several gangs to pick up worn, broken and surplus tools and leave new or repaired tools as required. On the other hand, the smaller systems arrange to have the tools sent in for repairs on the regular work cars generally on their return after leaving materials. In some cases a man is detailed from the gang to take a bunch of tools to the repair shop, stowing them upon the front platform of the first passenger car available. This method of transporting tools is somewhat annoying to passengers, causes some delays to the car and is apt to hinder the motorman in the safe performance of his duties. It is justified only in emergencies.

One man in each gang should be directly responsible to the gang foreman for the tools. It should be his duty to see that tools are properly distributed among the men, that they are all returned to the tool box at night and that they are in good condition for use. However, this arrangement should not relieve the foreman of his responsibility for the tools and their fitness for service at any moment.

Increasing the Output of Hydraulic Presses

BY "VULCAN," A. M. I. C. E., A. M. I. E. E., ENGLAND

In forcing axles into or out of car wheels, the ram of the hydraulic wheel press often has a considerable amount of idle travel before reaching the object to be forced. On many jobs this idle travel almost equals, and on certain work considerably exceeds, the load travel, or distance moved under appreciable pressure. To give the very heavy pressure required, the ram must of necessity move very slowly. With the ordinary type of machine having only one belt-driven, constant-speed pump plunger, the traveling speed of the ram is practically the same whether the latter is exerting a light or a heavy pressure. The time wasted on idle movement is proportionately very high and various arrangements have therefore been devised with the object of increasing the ram speed at this period.

Some makers provide the hydraulic press with two plungers of different diameters, power-driven from the same crankshaft. The larger plunger, or both together, is for use during the idle movement of the ram, and the smaller one for providing the greater ram pressures required when the work is reached. Others have used a single plunger and have driven this from a two-speed countershaft. In this case the high speed is employed for small ram pressures and the low speed when the loading is great. This method has been more or less successful, but the following device, which has been adopted by the writer on presses having only one pump plunger, meets all requirements in the simplest possible manner and obviates the mechanical disadvantages of the other plans.

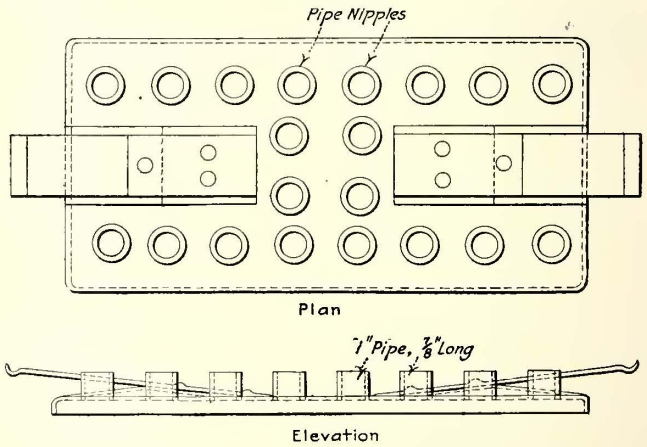
A tank is fitted on the wall of the building as high as possible above the press cylinder and it is connected to the latter through a 1-in. pipe and through a $\frac{5}{8}$-in. hydraulic valve on the press. The tank is connected to the local water main through a ball-float valve. By supplying water from the tank to the press during the idle forward travel, a ram speed many times greater than that produced from the pump may be obtained, the tank supply being shut off when the normal forcing pressure is required.

With a tank located 20 ft. above the press it is possible to obtain by this means a total force of 680 lb. on a 10-in. ram, which is more than sufficient to move the ram forward. This addition to an ordinary hydraulic press increases the output very considerably and costs very little to install.

A Simple Ventilating Scheme for Increasing Motor Output

BY R. H. PARSONS, ELECTRICAL FOREMAN

The following scheme for ventilating a motor not originally designed as a ventilated motor will be found preferable to the method, sometimes employed, of throwing away the top covers and allowing the motor to run entirely open. A few pipe nipples and a little drilling are all that are necessary in the making of perforated, and at the same time protected, covers.



PLAN AND ELEVATION OF VENTILATED MOTOR COVER

As the accompanying drawing shows, the motor cover is drilled with a number of holes to accommodate nipples made of 1-in. pipe, $\frac{7}{8}$ in. long. The number of holes necessary is determined by judgment to give the desired degree of ventilation. The holes should be drilled for a driving fit of the nipples, which should be well cleaned where they come in contact with the cover.

This construction allows about $\frac{3}{4}$ in. of pipe to project above the level of the cover, making it impossible for water to enter the case excepting under very unusual conditions. The size of the hole in the pipe is such as to keep out large objects, while the currents of warm air rising from the motor tend to exclude dust.

The nipples should be fastened in place with the aid of an acetylene welding outfit or an electric arc, or by brazing or soldering if welding is not practicable.

A Steel Underframe, Open-Bench Car

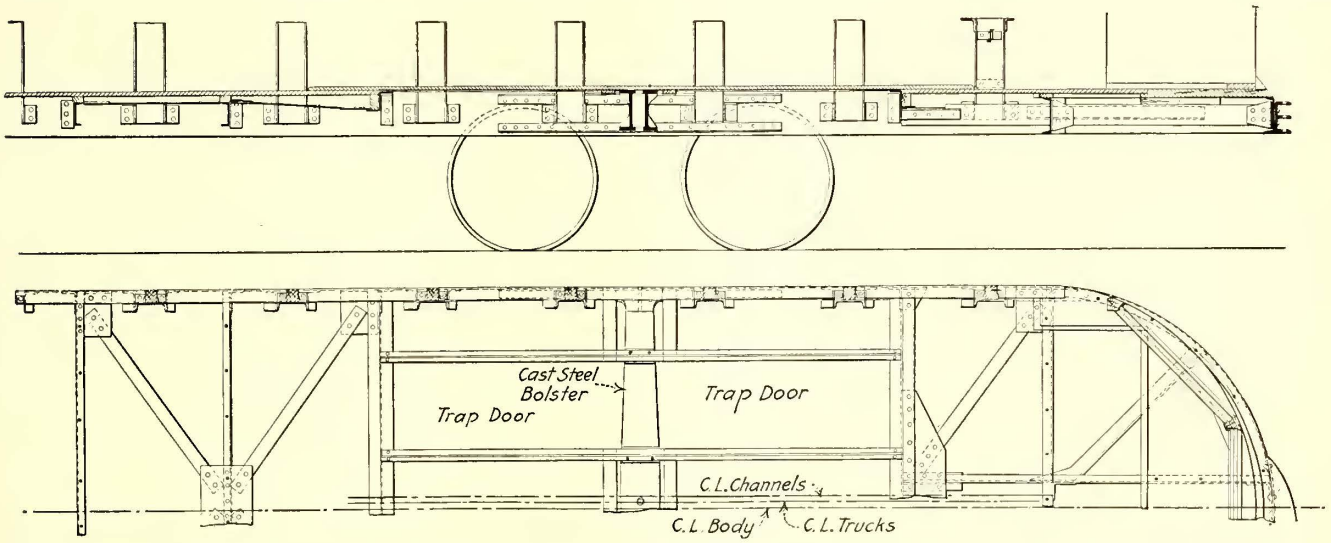
The Public Service Railway of New Jersey recently completed at its Plank Road Shops in Newark, N. J., twenty large open-bench cars. These were built to provide a large seating capacity for the summer season at a reasonable cost, this type of car being very popular on certain lines of the company. The company does not find that the proper use of open-bench cars is conducive to accidents, and such accidents as do occur are of a trivial nature. By providing ample seating capacity and keeping passengers off the running board as much as possible the results are very satisfactory.

In designing the car for minimum cost and reasonable lightness standard structural shapes were used throughout and the underframe was laid out as a truss to give the necessary resistance to horizontal twisting and end shocks, while vertical stresses were provided against through the use of deep channels as side sills.

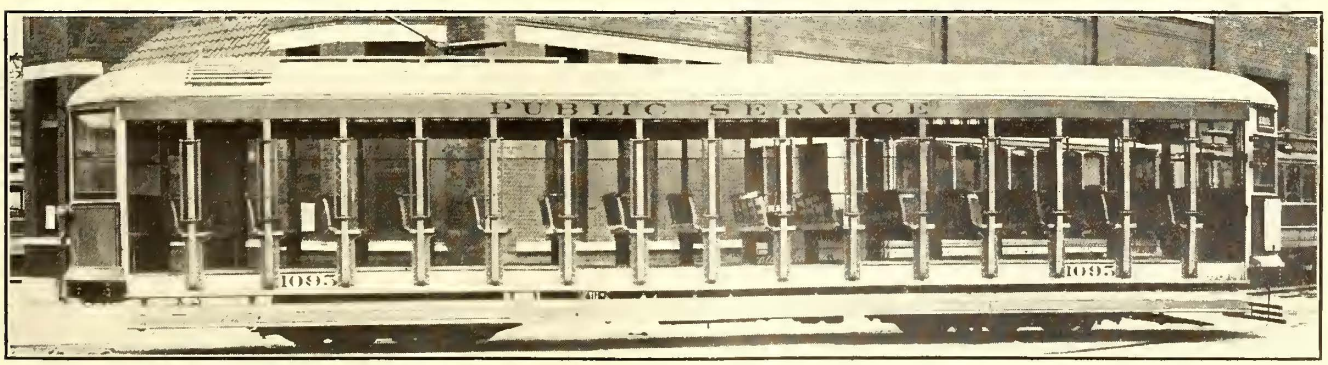
There are no bulkheads in the car, which is therefore open from end to end. A double step, of which the lower step can be folded up inside the line of the upper one to give necessary clearance, provides easy access from the street. The first step is 15 in. from the top of the rail, the next 13⅛ in., while the final step to the car floor is 8⅜ in. The floor is thus slightly over 3 ft. above the rail. Wheel guards without fenders are used on the cars.

The side sills are of 10-in. 20-lb. channels, stiffened over the bolsters with 2-in. x 2-in. x ⅜-in. angles 5 ft. 5 in. long above and 3 in. x 3 in. x ½ in. at the bottom where the channel is cut away to clear the truck frame. The end sills are of 8-in. 11¼-lb. channel. Each end sill forms one side of a truss designed to take the shock of collisions and to stiffen the frame generally. The other side of the truss is a Z-bar, 3 1/16 in. x 4 in. x 3 1/6 in. x ¼ in., so placed as to give the maximum truck clearance. That is, the high flange of the Z-bar is toward the bolster. Diagonal braces of 3-in. x ⅜-in. strap, riveted to 3/16-in. gusset plates, are used to stiffen the trusses. Near the center of the car are two other stiffening panels in the underframe. At a distance of 12 ft. 10 in. from each end sill is another Z-bar of the same size as that already mentioned, and longitudinal

PUBLIC SERVICE OPEN-BENCH CAR—FRONT VIEW



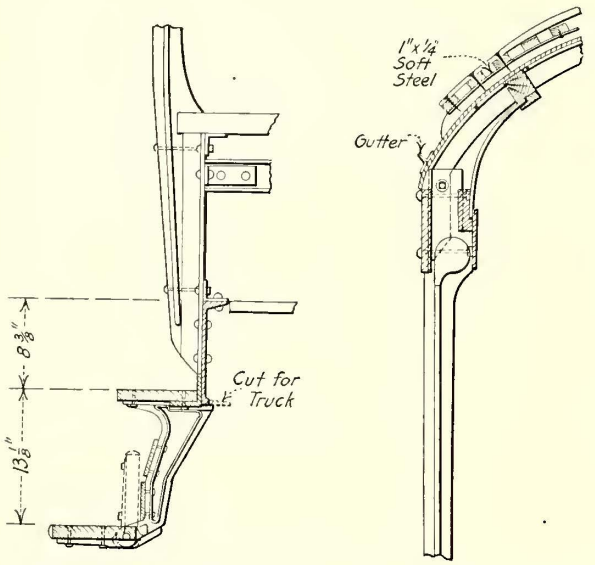
PUBLIC SERVICE OPEN-BENCH CAR—PARTIAL VERTICAL SECTION AND PLAN OF UNDERFRAME



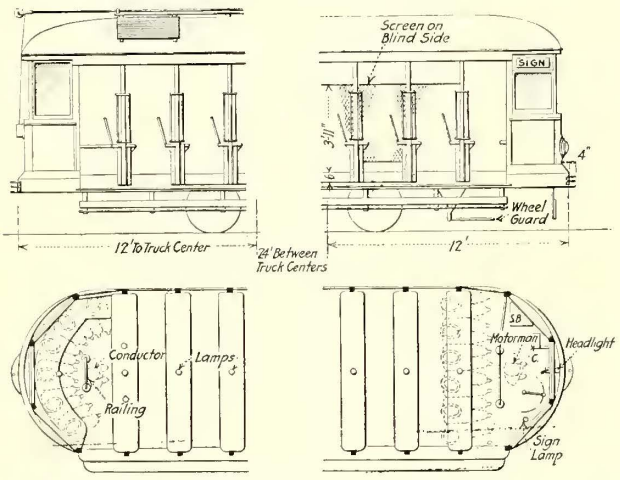
PUBLIC SERVICE OPEN-BENCH CAR—SIDE VIEW OF CAR

T-bars rest upon the flange of this and the end Z-bar, forming supports for the trap doors over the motors. These light T-bars also rest upon the bolster which is midway between, and which is the standard cast-steel bolster of the company modified somewhat to fit the deep side sills.

The bumper iron is an 8-in. channel weighing 11¼ lb. per foot, and its ends are riveted to extensions of the side sills. Fitted into the top of the bumper is a wooden crown piece 2 in. thick. The bumper is stiffened by means of two 3-in. x 3-in. x ¼-in. diagonal braces and 5-in. 6½-lb. channel knees. Nailing strips for the floor, which is of ⅞-in. pine, are mounted on the lower



PUBLIC SERVICE OPEN-BENCH CAR—DETAILS OF STEP AND SIDE POST POCKET, AND POST AND CARLINE JUNCTION



PUBLIC SERVICE OPEN-BENCH CAR—PARTIAL SIDE ELEVATION AND HORIZONTAL SECTION, LATTER SHOWING ALSO POSITION OF LAMPS

flanges of the Z-bars and upon light cross channel irons supplied for the purpose.

The side posts are anchored between two 2½-in. x 2-in. x 3/16-in. angles each, which form pockets for the posts and at the same time furnish end supports for the seats. On the step side the pocket angles are riveted on the outside of the channel, but on the blind side, in order to give a smoother exterior, they are mounted above the channel and braced securely by means of angle brackets. The seats rest upon the tops of the angles which are cross connected by 3-in. 4-lb. channels to furnish center supports for the seats.

The seats are non-reversible and are 8 ft. long between side posts. The seat proper is of 1 5/16-in. maple strips with ⅛-in. air space between. It is 15 in. deep, and 17-in. spaces are provided between adjacent seats. The back is curved to give greater comfort in riding than is possible with the straight back.

The side posts are of ash and of the standard form except that at the top they are fashioned for attachment to T-iron carlines. These carlines are 2-in. x 2-in. x ¼-in. T-irons, set into the tops of the posts in the manner shown in one of the illustrations. They are bent to form an arch roof and are covered, on the straight part, with 5/16-in. Agasote and with ⅜-in. Agasote on the curved ends.

On both ends of the car the side sash are stationary and inside lining of the end is thus rendered unnecessary. In the center of each end are two sashes, the upper of which drops outside of the lower. On each end is a Hedley combination drawhead and anti-climber.

The cars are equipped with four Westinghouse 101-B2 motors and Westinghouse HL control. The purpose in using the latter was to get the contactors out of the sight of the passengers who are apt to be frightened by the arcs in the ordinary form of controller. It is felt that the danger of accident will be thus greatly reduced.

The car is called a fifteen-bench car which rating, however, does not include the seat in the rear. As each seat accommodates six passengers the total seating capacity of the car is ninety-six passengers. Exclusive of the carlines there are about 5300 lb. of steel in the car. The weights of the different parts and of the complete car equipped but without load are as follows:

Body	13,200 lb.
Control	1,800 lb.
Air brakes	1,220 lb.
Hand brakes	200 lb.
Wheel guard	200 lb.
Motors	10,580 lb.
Trucks	13,000 lb.
Total	40,200 lb.

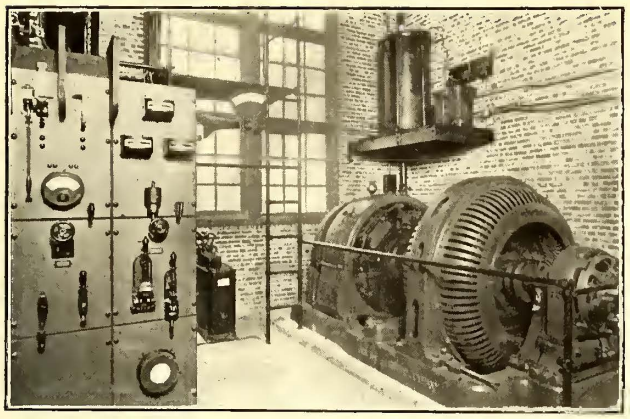
This total is about 420 lb. per seated passenger.

The new cars have just been put into operation on the company's Orange line which connects the Pennsylvania Railroad station in Newark with the Harrison Avenue terminal in West Orange. It passes through East Orange, Orange and West Orange. On this line there is considerable short-haul business. The cars are proving very popular, particularly with women.

Electrification of the Great Falls Terminal of the C., M. & St. P. Railway

The electrification of an important section of the main line of the Chicago, Milwaukee & St. Paul Railway for 3000-volt d.c. operation gives interest to an auxiliary electrification in the city of Great Falls, Mont. This city is at present the terminal of the new 138-mile feeder line from Lewiston, Mont., connecting with the main line transcontinental division at Harlowton, the eastern terminus of the main line electrification now under construction. The relation of this feeder to the main line is shown on the map published in the issue of the Electric Railway Journal for Nov. 14, 1914, page 1157. The Great Falls terminal yards are located in the center of the city and are connected by a cross-town line about four miles in length, known as the Valeria Way line. The total trackage in the terminal is about seven miles. The terminal buildings include a large freight house, a roundhouse, a power plant for heating purposes and a passenger station.

The Great Falls electrification is at 1500 volts, 750-volt motors in series being used on the one locomotive employed at present. Provision has been made to handle



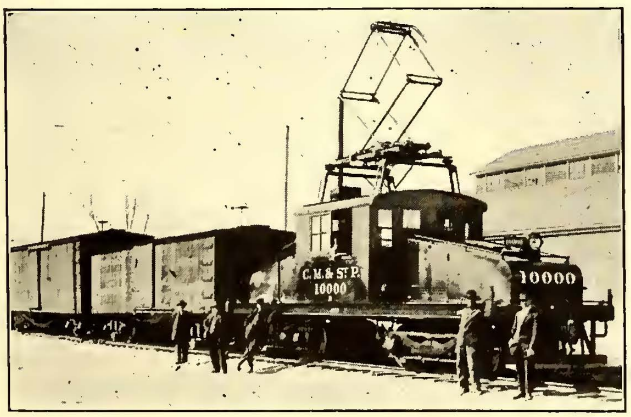
GREAT FALLS TERMINAL ELECTRIFICATION—
SUBSTATION EQUIPMENT

freight trains up to 580 tons in weight at a speed of about 9½ m.p.h. on the maximum grade of 0.65 per cent. Three-phase electric power at 6600 volts, 60 cycles, is furnished by the Great Falls Power Company from the hydroelectric plant at Rainbow Falls, 6 miles from the substation.

The substation is housed in the heating-plant building. It comprises a synchronous motor-generator set together with auxiliary apparatus. The set comprises a 6600-volt motor, rated at 435 kva at 80 per cent power factor, with compensator starter. The generator is of the commutating-pole type, rated at 300 kw. The set can carry 900 kw momentarily. Excitation for the motor field and for the shunt winding of the d.c. generator is supplied by a 10-kw, 125-volt, d.c. exciter. The appearance of the substation equipment is shown herewith.

The locomotive is of the standard 50-ton type shown in the second illustration. It is equipped with four GE-207, 750-volt, box-frame, commutating-pole motors insulated for 1500 volts. The motors have a one-hour rating of 79 hp. They are ventilated from a blower direct connected to the dynamotor in the cab used for supplying low-voltage current for operating the auxiliaries. The gear reduction is 64 to 17. Sprague, General Electric type M control is used, and provision is made for ten series and seven series-parallel steps.

The current collector is of the type being installed on the main line locomotives, the slider being lifted into position by air pressure and held against the wire by steel coil springs. Compressed air for all purposes is supplied from two CP-29, 1500-volt motor-driven compressors located in the cab, each having a displacement of 27 cu. ft. of air per minute at 90 lb. pressure.



GREAT FALLS TERMINAL ELECTRIFICATION—
1500-VOLT ELECTRIC LOCOMOTIVE

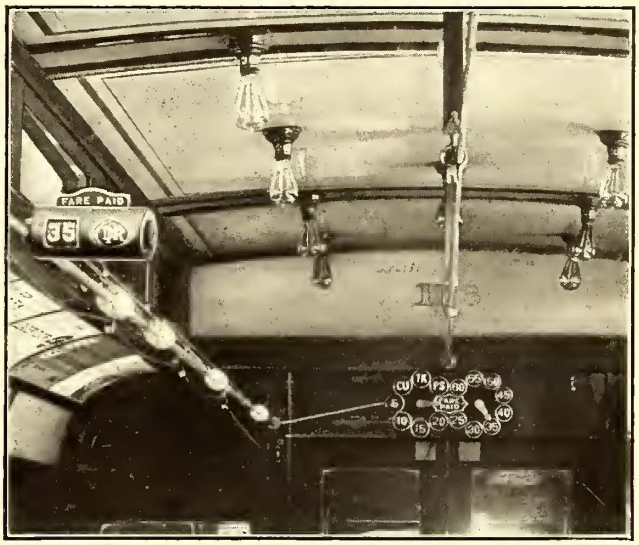
On each end of the locomotive is a headlight containing a 100-cp, concentrated filament Mazda lamp.

The overhead line construction is of the catenary type, similar in a general way to that installed on the Butte, Anaconda & Pacific 2400-volt railroad. Both span and bracket constructions are used, depending upon local conditions. Poles are spaced approximately 150 ft. apart on tangent track, supporting No. 0000 grooved trolley wires from three-point suspension. No feeder copper is installed.

The work was done by the electrification department of the Chicago, Milwaukee & St. Paul Railroad, R. Beeuwkes, engineer in charge, under the direction of C. A. Goodnow, assistant to the president. All of the electrical apparatus, including locomotive, substation equipment and line material, was furnished by the General Electric Company.

New Forms of Fare Indicators and Recorders

The accompanying illustrations show some of the interesting features of the new line of computing fare recorders and indicators developed by the Dayton Fare Recorder Company of Dayton, Ohio. Two illustrations show the register mechanism with the case removed. It has been designed with a view to avoiding intricate or delicate parts and the use of springs as far as possi-

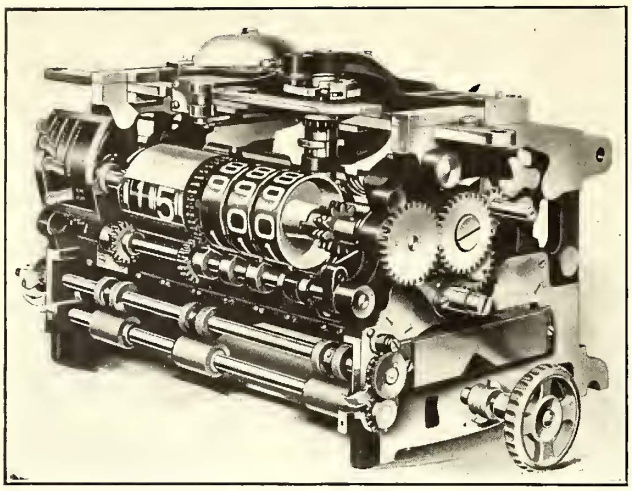


INDICATORS USED WITH DAYTON FARE RECORDERS

ble, and to securing simplicity, compactness and durability. Two sets of printing counters are used in each machine, one to register and print the results of the fare collections on each trip and the other to register and print the total of all fares collected during the entire period of work by each conductor. The classification of the fares is made by means of a setting rod, and a system of fare indicators which guide the conductor in registering the fares and also serve as visual receipts. The registering operation is performed in the usual manner by means of a cord.

In connection with the register a double-dial indicator, located on the bulkhead at the end of the car opposite the recorder, and two-way indicators located in the center of the car and in each compartment are used to indicate the amount of fare paid.

The double-dial indicator, comprising two dials and two hands or pointers, each indicating a different range of fares, is shown in one of the illustrations. The two-way indicators are small cylindrical devices having openings on both sides through which the fare indi-



MECHANISM OF DAYTON FARE RECORDER, FRONT VIEW

cations can be seen. One of these is also illustrated. All of the indicators work in unison, permitting the checking of the classification of registration from every part of the car.

An improved type of indicator is also used on the recorder to verify the registration. To show positively when the mechanism has been changed to cancel the indications, a "Fare Paid" sign and a "Not Registered" sign are used. When a fare is registered the "Fare Paid" sign appears prominently above the indicator, and when the position of the indicator is changed to indicate a fare different in denomination or kind from that last registered the "Fare Paid" sign disappears and the "Not Registered" sign is exposed to view. The latter remains prominently above the fare indicator until a fare is registered, when the "Not Registered" sign disappears and the "Fare Paid" sign is again brought into the indicating position. This method of distinguishing the fares actually registered from those only indicated and keeping the indicators distributed throughout the car in unison with the indicator on the recorder overcomes the serious objection to having the indicator covered up during the registering operation. When the indicator is so covered it is impossible to check registration when the fares are "bunched" or rung up in rapid succession.

All of the connections from the operating mechanism to the recorder are made by means of intersecting shafts and bevel gears, no sprocket chains being used. The mechanism is, therefore, smooth and nearly noiseless in operation.

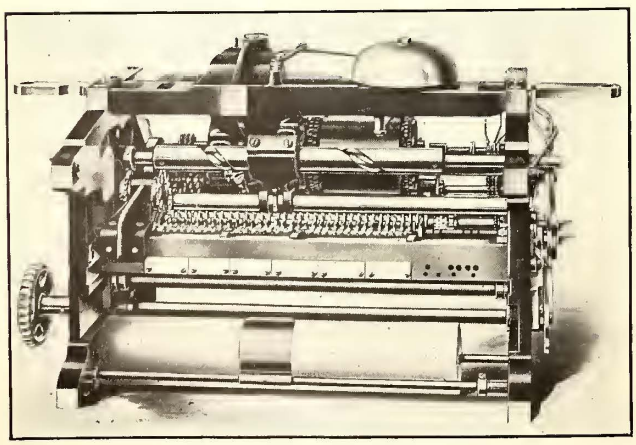
This type of register makes complete computations of the fares registered, the detail and total registrations being printed in the form of a balance sheet, like that shown herewith, ready for the receiving office. The printed record is a double check upon the fare collections.

RECORDER NO. 2950 — THE CLEVELAND & EASTERN TRACTION CO. — RUN NO. ____ TOTAL RECORD MOTORMAN ____ LINE NO. ____ DATE ____

	PASS	TICKET	TRANSFER	5c.	10c.	15c.	20c.	25c.	30c.	35c.	40c.	45c.	TOTAL PASSENGERS	REGISTER TOTAL
	14	63	26	37	53	48	21	26	12	14		8 17	339	15987

TIME	TRIP RECORD												CAR NO. 1426
11 00 PM	02	08	05	03	07	04	3	2	1	2	0	4	41	C-2550
9 45 PM	03	08	07	04	08	08	2	4	1	2	1	2	50	C-2550
8 35 PM	00	12	04	08	06	09	7	5	2	3	2	1	59	C-2550
7 15 PM	03	15	02	07	10	12	4	6	2	1	1	3	66	C-2550
6 00 PM	04	11	04	07	10	09	3	6	3	4	2	3	66	C-2550
4 45 PM	02	09	04	08	12	06	2	3	3	2	2	4	57	C-2550
3 30 PM	00	00	00	00	00	00	0	0	0	0	0	0	00	C-2550

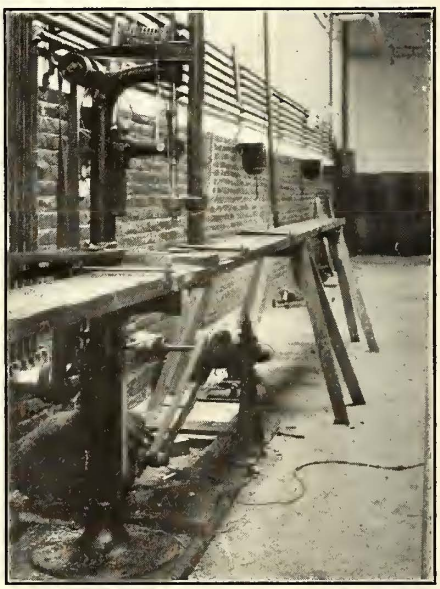
SAMPLE RECORD SHEET FROM DAYTON FARE RECORDER



MECHANISM OF DAYTON FARE RECORDER, REAR VIEW

Temporary Drilling Outfit for Toe Plates

A second running board on open cars has been recently ordered by the Massachusetts Public Service Commission, and in response to this the Holyoke Street Railway has set up a temporary drilling outfit in the carhouse as shown in the accompanying photograph to save handling the heavy toe plates to and from the machine shop. These plates are 4½ in. wide and ⅛ in. thick, and are frequently 25 ft. long. A vertical drill was installed in an aisle of the shop. This drill is belt-driven by a 2-hp, 550-volt d.c. motor which is used in the summer to run an ice-cream freezer at a park controlled by the company. A temporary cable and starting box for this were rigged up in the shop. The stock is laid on a plank about 35 ft. long, that is supported on wooden horses. A minimum of handling is required as the car undergoing alterations stands within 5 ft. or 6 ft. of the machine, and in operation the equipment has proved to be a time-saving and a labor-economizing arrangement.



TEMPORARY DRILLING OUTFIT

Trade-Marked Waste

A novelty that will interest every electric railway official who may have to do with the work of the repair shop or carhouse has recently been brought out in the form of trade-marked waste. The material, which is manufactured by the Royal Manufacturing Company, Rahway, N. J., is selected waste of high-grade cotton and wool, refined by the removal of all impurities and cleared of the small pieces of wood, wire, etc., that are a far too frequent annoyance at present. The waste is made extra soft, absorbent and spongy. It is reported to absorb even the stickiest kinds of grease, and it is

manufactured in twelve special grades, six white and six colored, all of which are absolutely standardized.

The most interesting feature of the product, however, aside from its standardization of quality, lies in the fact that the weight of each bale is guaranteed and that the tare weight is also warranted to be within 6 per cent of the net weight, refunds being made in case a greater difference is found to exist. This standardization of the bale weight naturally puts a stop to the custom of furnishing and billing for bales weighing 125 lb. or even 150 lb. when 100-lb. bales were ordered. In filling orders for Royal waste the makers give the exact poundage that is ordered.

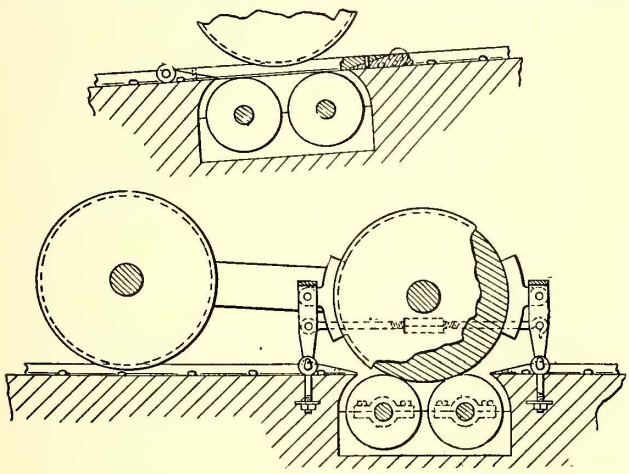
Corrosion Test of Sheet Steel

At a recent meeting of the American Iron and Steel Institute Dr. A. S. Cushman reported results of a corrosion test made by bending up the edges of flat non-corrugated sheets so as to make of them shallow pans. These pans were filled wih coal slack cinders and exposed in a horizontal position so that the rains could descend upon them. The results are given in the accompanying table.

Material	Sul.	P.	C.	Mn.	Cu.	Ni.	Condition after nine months
Bessemer steel.....	.038	.094	.012	.36	.016	—	15 holes
Basic coppered steel..	.028	.008	.10	.19	.26	—	6 holes
Pure basic O. H. iron..	.020	.004	.012	.008	.032	—	sound
Pure basic O. H. iron..	.029	.006	.012	.023	.024	—	1 hole
O. H. nickel alloy....	.020	.007	.010	.037	.036	.16	5 holes
O. H. copper nickel alloy	.019	.009	.010	.015	.23	.26	6 holes
O. H. copper nickel alloy	.027	.006	.010	trace	.17	.20	sound
O. H. high nickel alloy	.024	.004	.010	.015	.028	1.00	sound

An Inexpensive Wheel Grinder

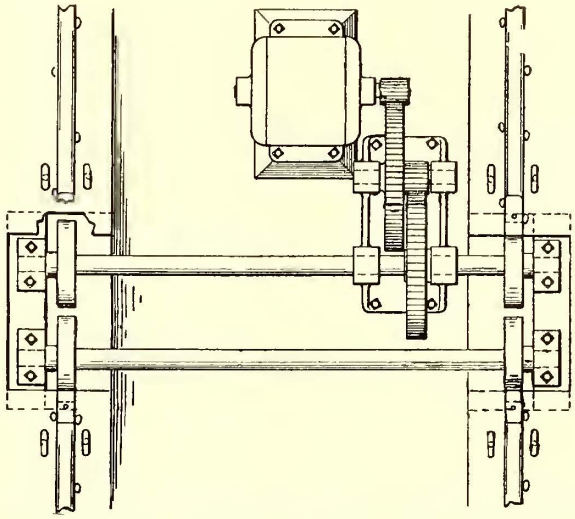
A cheap and practical wheel grinder to be used in connection with the well-known wheel-truing brakeshoe has recently been patented by the Wheel-Truing Brakeshoe Company, Detroit, Mich. It is not the company's intention, however, to manufacture this apparatus but to allow such of its patrons as wish to grind their wheels in the shop rather than on the road to make use of it in accordance with their needs. The material necessary in the construction of the grinder



CROSS-SECTIONAL ELEVATION OF DEVICE WITH TRUCK IN PLACE, AND SECTION SHOWING REMOVABLE SECTION OF RAIL REPLACED

is to be found in or about almost every carshop and the device can be cheaply and easily assembled by the shop force.

The advantages of the machine are self-evident from the accompanying cuts. It is not necessary to remove wheels for grinding nor is it necessary to jack up the car. Idle wheels or trailers can be ground as well as driver wheels, because in all cases the wheel is rotated by an under-running roller to which is geared a motor set in a shallow pit between the rails. Normally, these rollers are covered by a removable section of rail, but when it is desired to grind a wheel the rail section is removed and the car is run forward until the wheel in question rolls down the beveled joint that is provided

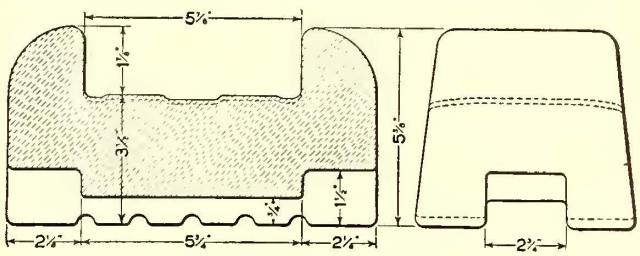


PLAN OF WHEEL GRINDER, SHOWING DRIVING GEAR AND MOTOR

for the removable rail section and rests upon the rollers. Wheel-truing brakeshoes are then attached to a pair of uprights on either side of the wheels, and pressure is applied between these shoes and the wheel tread by means of a turnbuckle on a rod connecting the two uprights. Any degree of pressure within the capacity of the motor may be applied in this way. Both wheels on an axle may, of course, be ground at the same time, as rollers and uprights for brakeshoes are installed on either side of the track.

A New Third-Rail Insulator

A new third-rail insulator, known as the Type K, has been placed on the market by the Ohio Brass Company. The insulator is held in position by means of a bar-iron forging that is lagged to the tie. Across the bottom of the insulator are slots, recessed at each end, to provide clearance for lag-screw heads. The forging may be extended to provide a support for a protection board, if



THIRD-RAIL INSULATOR

so desired. The device is covered by the Roger patent No. 1,090,234, issued March 17, 1914, half interest of which has been assigned to Nathan Shute, and the Ohio Brass Company has entered into a contract that gives it exclusive manufacturing and sales rights for the general market under that patent. A large number of these insulators have already been placed in service on an important Eastern road, where they have proved highly satisfactory.

News of Electric Railways

SIR EDGAR SPEYER'S RETIREMENT

The Part He Played in Connection with the London Underground System

The retirement of Sir Edgar Speyer from all his public positions in England was referred to briefly in the ELECTRIC RAILWAY JOURNAL of May 22. The part played by Sir Edgar in the work put under way in connection with the London underground roads by the late Charles T. Yerkes is not fully appreciated in this country, except perhaps in banking circles. Commenting on the retirement of Sir Edgar and on the work the London *Financial News* said in part in a recent issue:

"From the city's point of view one of the most striking results of the recent campaign against everyone of German origin living in this country has been the announcement from Sir Edgar Speyer that he has determined to resign his membership of the Privy Council, as well as his other honorary distinctions, and to ask for the revocation of the baronetcy conferred upon him in 1906. He also retires from the chairmanship of the Underground Electric Railways, which he has held since 1906, following the death of C. T. Yerkes.

"His succession to Mr. Yerkes was, in itself, natural enough. Though the latter was the actual organizer of the scheme for the acquisition and conversion of the District Railway to an electrically-worked line, the financial power behind the throne was James Speyer, head of the New York house of Speyer & Company. Mr. Edgar Speyer, as he then was, had assumed control of the London house of Speyer Brothers in 1887, and at the time of this American invasion in 1902 he had already established his reputation as one of the ablest financiers in the city.

"As it happened his accession to the control of the Underground Electric Railways occurred at a time when his services were of the utmost importance. The position in 1906 was exceedingly critical. The hopes of those who had embarked upon the scheme for providing London with a rapid transit service by means of tubes and the electrification of existing underground railways were threatened with disaster on account of the growing competition of the municipal tramways and the threat of the motor omnibus. The financial crisis in America in 1907 brought matters to a head, and it was then that Speyer Brothers stepped into the breach, and by arranging, in conjunction with the American and Frankfurt houses, for the payment of the December coupon on the 5 per cent profit-sharing notes saved the situation, and gave time for a reorganization of the concern under more favorable conditions. The operation involved the payment of a sum of about £175,000, and the courageous action of the firm did much to rehabilitate the company's fortunes. Since then the Underground Electric Railways has floated into smoother waters, but much yet remained to be done, and in the subsequent negotiations which have resulted in the consolidation of all the principal tube railways with the District, the London United Tramways and the London General Omnibus Company, Sir Edgar Speyer has played the leading part, and may almost be said to have been the controlling genius."

MAYOR CHURCH'S ATTITUDE

Discussing the work of the Ontario Legislature with respect to the railway measures affecting Toronto, Mayor Church of that city said recently:

"When the city's bill was before the private bill's committee of the Ontario Legislature last session, one clause related to the taking over of the Toronto & Suburban Railway in ward seven and the cancellation of the franchise of the company on the streets not built on. The bill was considered by the committee under the chairmanship of I. B. Lucas, attorney-general, but it was laid over, and the attorney-general advised the city to prepare a brief of the whole matter and take it up with the government in the recess, so that, if necessary, the government might deal with the matter in a general way. I am having the brief prepared.

"The report of C. R. Barnes on traffic in Toronto was another matter before the private bill's committee. The city asked for an order to compel the company to carry out the recommendations in the report and build 150 new cars and a further 13 miles of new track at once. The bill would have passed the committee only for the promise of R. J. Fleming, manager of the Toronto Railway, that fifty new cars would be ready next fall, and the tracks built. This it has not done, the Railway Board having allowed the company an extension owing to the war and the financial situation. The company has since been allowed to take a large number of cars off the existing routes and to dismiss more than 100 men, and further to restore the old time-table of 1911, although the railway act says that the company is not to use this without first having the Railway Board approve the new time-table. Another matter is the running-board on the open cars. The whole matter should be taken past the Railway Board to the government, and a new form of summer car ordered, and a private bill laid at the next session to give effect to it. The Board of Control has decided to confer with the government. I am going to take all these matters up with the attorney-general. The city has appealed to the Governor-in-Council from the decision of the Railway Board and I propose to bring these matters before the Board of Control."

CLEVELAND & YOUNGSTOWN RAILWAY

After making a trip over the proposed freight terminal to be built by the Cleveland & Youngstown Railway, the transportation and trolley freight committees of the Cleveland Chamber of Commerce on June 10 informally agreed to support the company's plans before the City Council.

At a meeting of the City Council as a committee of the whole on the following day Attorney J. L. Cannon, representing the company, stated that the company is perfectly willing to revise its plan as far as possible, in order that the inconvenience resulting from the change in streets may be minimized.

Members of Council made a tour of the property on June 8. They were accompanied by Attorney J. L. Cannon and W. E. Pease, chief engineer of the company. Both members of Council and the committees of the Chamber of Commerce visited the congested freight depots of the steam roads and were shown the advantages that would accrue from proper terminals practically on a level with the business section of the city. It is estimated that the cost of transportation from the stations at present is 20 cents a ton.

Councilman Bernstein insisted at the various meetings that a clause be included in any franchise to the effect that electric power be used for the freight terminal.

MERIT SYSTEM SUGGESTED FOR DETROIT

In reply to the request of officers of the street car men's union for modifications in the agreement existing between the union and the Detroit (Mich.) United Railway, particularly as related to disciplinary matters, F. W. Brooks, general manager of the company, has suggested the re-establishment of the merit and demerit system to replace the suspension plan now in effect. Mr. Brooks points out that the suspension plan, which has been favored by the union, frequently works a hardship on the wives and families of offenders without benefiting the service. He suggests the appointment by the company of a disciplinary officer who shall hear all cases that arise, whether for acts resulting in merit or demerit marks, with provision for quick appeal from the decision of this officer. Mr. Brooks offers the plan of immediate appointment of a board of five, three by the company and two by the union, to establish a standard of marks to be given under the merit and demerit system. It is also suggested that in future all arbitration boards have five members instead of three. In reply to the suggestion that the speed of cars be reduced, Mr. Brooks points out that frequent complaint is made by the public that the present average schedule speed of 9.25 m.p.h. is too slow.

NEW JERSEY GAS CASE

State Court of Errors and Appeals Reverses Own Decision, but Case Will Be Carried to Supreme Court

By vote of six to four the Court of Errors and Appeals of the State of New Jersey has reversed its decision of Dec. 9, 1914, which in turn reversed a Supreme Court decision affirming a 90-cent rate order of the Board of Utility Commissioners applying specifically to the so-called Passaic District, but upon recommendation of the commission extended by the company to all communities in which it operates. The case is of interest to all other public utility corporations because of the contention, now disallowed, that a special franchise is property and has value which must be considered in establishing a basis for the regulation of rates. On June 17 the company decided to take a writ of error to carry the case to the Supreme Court of the United States.

The case originated in a complaint filed with the Board of Public Utility Commissioners in June, 1911, by the Mayor of Paterson, which is in the Passaic district, relating to all public utility rates charged in that community. On Dec. 26, 1912, the commission fixed a 90-cent rate for gas to be effective on Feb. 1, 1913. The case was then taken before the Supreme Court, which in July confirmed the order of the commission. Carried to the Court of Errors and Appeals, the Supreme Court decision was reversed and the 90-cent rate order was set aside. Immediately following the decision a petition for a rehearing was filed and allowed and the reargument was heard early in March. As a result the original order is again enforced. The decision of the Board of Utility Commissions was published on page 35 of the issue of this paper for Jan. 4, 1913; that of the Court of Errors and Appeals on page 1331 of the issue for Dec. 19, 1914.

In order to explain the course followed by the case in the courts the following facts regarding the conditions may be of interest. The Supreme Court of the State of New Jersey consists of nine members, who usually deputize the hearing of causes to branches of three justices each. The Court of Errors and Appeals, to which appeals are made from Supreme Court decisions, consists of all the members of the Supreme Court and in addition six lay judges who are theoretically laymen. As a matter of fact, all but one of the lay judges are now lawyers. The chancellor of the State presides over the Court of Errors. In this court the three Supreme Court justices who formed the branch court hearing the original action are debarred from serving on the Court of Errors and Appeals, so that thirteen of sixteen members only are available. In this particular case after the arguments had all been made before the Court of Errors and Appeals two members died and a third failed to vote in the decision, leaving only ten to make the decision which reversed by six to four the Supreme Court decision. When the case came up for rehearing the two vacancies caused by death had been filled, the three members of the original branch court were still debarred, one of the new members declined to sit on account of his having been a member of the commission which made the original ruling, another judge withdrew from the case so as to remove any possible suspicion of prejudice due to his business connections, and the term of another, who was ill when the reargument was started, expired before the case was concluded. As a result the same number of judges heard the reappeal and they reversed their own decision by the same vote, six to four. Those who voted on both appeals voted the same way, but the new members reversed the votes of the judges whom they replaced.

COMMERCIAL EDUCATION FOR FOREIGN TRADE

The National Foreign Trade Council of New York has sent letters to the heads of 1000 corporations and firms engaged in foreign trade asking responses to five questions bearing on the adaptability of the American system of commercial education to the needs of foreign trade and what changes should be made to render the system more helpful. The inquiry is made through the committee on commercial education for foreign trade, which is composed of business men and educators. The data obtained will be communicated to a large number of educators and made the basis for a consultation of educational opinion, with the idea that this will lead to changes in curricula.

Commission Bills in Alabama.—Several bills have been introduced into the Legislature of Alabama with the object in view of creating a public utilities commission for the State.

Fire at an Amusement Park.—On June 5 fire broke out at Rock Springs Park, Chester, W. Va., owned by the East Liverpool Traction & Light Company, East Liverpool, Ohio, and leased to an amusement company. Several persons were badly burned.

Small Property for Sale.—The Hendersonville (N. C.) Traction Company, it is understood, would entertain an offer to purchase its property. The line is 2 miles long and extends from the railroad depot to Columbia Park. Two Carlson gasoline cars are operated. The president of the company is David L. Fuller.

Decision in Superior Fare Case.—The Supreme Court of Wisconsin has confirmed the ruling of the Circuit Court of Dane County sustaining the order of the Railroad Commission of Wisconsin requiring the Duluth (Minn.) Street Railway, operating in Duluth, Minn., and Superior, Wis., to sell tickets in Superior at the rate of six for 25 cents.

Steinway Tunnel Ready.—The Interborough Rapid Transit Company has notified the Public Service Commission for the First District of New York that the Steinway tunnel, connecting Manhattan and Queens, will be opened for traffic at noon on June 22. Three trains composed of four cars each on a headway of four to five minutes will be operated under the opening schedule.

Rapid Transit Bill Disapproved. — Governor Brumbaugh of Pennsylvania has vetoed the bill to give cities of the second class in that State the right to build or to acquire by lease or purchase underground or elevated railways. The Governor characterized the move as "a proposed adventure by municipalities into a range of service that were far better left to competition and to the action of the local authorities."

"Advertising Week."—The eleventh annual convention of the Associated Advertising Clubs of the World will be held in Chicago, Ill., June 20-24. This organization includes all branches of periodical publishing, daily, weekly, monthly, popular, religious, technical trade, etc. President Wilson has accepted an invitation to present an address. Cabinet members will attend and the Mayor of Chicago has officially recognized this gathering by proclaiming "Advertising Week."

Changes in Power Arrangement.—The Texas Traction Company's lines, beginning July 1, will be furnished with power by the Texas Power & Light Company. In the past the railway has operated its own power plants, but a company was organized recently to take over the light and power plants. The transmission lines between Dallas and Denison are being changed from 19,000 volts, twenty-five cycles to 30,000 volts, sixty cycles. A survey is being made at the present time for a transmission line from Waco to Taylor.

Decision on Delayed Deliveries.—The Supreme Court of Appeals of Virginia has set aside a verdict obtained by the Westinghouse Electric & Manufacturing Company against the Washington & Old Dominion Railway for $81,652 for apparatus supplied. The railway company claimed that the material had not been delivered on time, and in consequence it had been obliged to operate its Bluemont branch for six months by steam power at larger expense than it could have been operated by electric power.

Source of Trouble Removed.—Motorman Peter J. Whaling, because of whose discharge for reckless operation the motormen and conductors of the Detroit (Mich.) United Railway went on a one-day strike, is no longer in the employ of the company. Whaling was returned to the service by a majority of the arbitration board in his case, but charges outside of his activities as a company employee were filed against him last week by a fellow employee and before any further action looking to his discharge by the company was taken Whaling left the service.

Sale Offer in Alexandria.—The Southern Traction & Power Company, Alexandria, La., has offered to sell the street railway property to the city for $50,000, less the price of rail already sold, taking payment in certificates

of indebtedness issued by the city maturing within ten years and bearing interest at 5 per cent a year. As an alternative the company has suggested the fixing of the sale price by two disinterested engineers. The appointment of receivers for and the suspension of service by the company were referred to in the Electric Railway Journal of June 5, page 1088. If the offer made by the company to the city is not accepted the property will probably be offered for public sale by the receivers about Aug. 1.

Freight Subway Ordinance at Cleveland.—The ordinance giving the Cleveland, Akron & Canton Terminal Railroad the right to build a subway under East Fifty-fifth Street, Cleveland, passed to its second reading in the City Council on the evening of June 14. Disputed points between the city and the company are to be taken up by special committees. It was announced by representatives of the company that the proposed clause requiring a valuation of the land to be filled in at the foot of East Fifty-fifth Street at the end of seventeen years would be equivalent to killing the entire proposition. It is also proposed to reduce the period of the franchise from ninety-nine to seventy-five years.

Sale or Lease of Seattle Municipal Line Suggested.—The sale or lease of Division "A" of the Seattle Municipal Railway to the Puget Sound Traction, Light & Power Company is proposed in a resolution introduced in the City Council by Councilman Allen Dale. The resolution recites the difficulties encountered by the city in acquiring the Rainier Valley line, the Seattle, Renton & Southern Railway and in extending Division "A," and provides that the city utilities committee, when it takes up for consideration the use of canal bridges by the Puget Sound Traction, Light & Power Company, shall also consider the sale or lease of Division "A" to the company, with the understanding that it be connected with the present system and extended to meet new requirements. It is understood that Mayor Gill favors leasing the property.

The Cleveland 1-Cent Fare Line.—Statements which have appeared in the daily press elsewhere than in Cleveland have misrepresented the 1-cent fare line in Cleveland. The fare on all the lines in the city except the one in question is at present 3 cents with 1 cent for a transfer. The line on which the 1-cent fare is in force extends from the Public Square to the new passenger piers on the lake front, a very short distance. Three cars are operated on it. Nearly all the patrons of the line use the regular city cars, and it was decided that the simplest method of operation would be to charge a 1-cent fare on the line to the piers, patrons who change to or from the regular city cars at the Public Square paying the usual fare on those cars. This relieves the conductors on the pier line from handling transfers and facilitates rapid loading at the terminals. The establishment of this line and this rate of fare is entirely separate from all other lines and the rate of fare on those lines. It is an experiment being made to meet operating conditions for the purpose previously noted.

Franchise Without Consents Valid.—In the case of residents of Reading Road, Cincinnati, Ohio, against the city and the Cincinnati Traction Company, to prevent the construction of a street railway on that thoroughfare to furnish service to the village of Bond Hill, the Hamilton County Court of Appeals on June 1 held that the legislation relating to the procuring of consents under Sections 3770 to 3777, and Section 9105 of the general code is unconstitutional, and that the ordinance passed by the Cincinnati Council, giving the company a franchise on Reading Road, without securing the consents of a majority of the owners of abutting property, is a valid legislative enactment. The case has been taken to the Supreme Court in an action known as David L. Carpenter et al. against the City of Cincinnati et al. Mr. Carpenter represents the residents of Reading and Paddock Roads, and he asks that the Cincinnati Traction Company and the city of Cincinnti be restrained from building a track through these streets for the extension of the Avondale line to Bond Hill. The Superior Court granted a permanent injunction to the property owners some time ago, but it was recently reversed by the Appellate Court. The case hinges on the necessity of obtaining consents of property owners along the proposed line.

PROGRAMS OF ASSOCIATION MEETINGS

New England Street Railway Club

The annual ladies' outing of the New England Street Railway Club will be held on June 25 at the Point Shirley Club. It is planned to have the members leave Park Square, Boston, at 10 a. m. for an auto ride through some of the beautiful sections of the North Shore and Point Shirley Club. Those who do not care to take the auto ride can go by ferry from Rowe's wharf on Atlantic Avenue to East Boston, connecting with the narrow-gage line for Winthrop Beach station, there taking the Point Shirley Street Railway for the club. Dinner will be served at the club at 1 p. m. The entertainment program will be begun at 3 p. m. It will include baseball and athletic sports, dancing, whist, etc. The return to Boston may be made at any time desired. Tickets, including the auto ride and everything except transportation between Boston and the club, are $2.50 each. The outing will be held rain or shine.

American Institute of Electrical Engineers

At the annual convention of the American Institute of Electrical Engineers, to be held at Deer Park, Md., from June 29 to July 2, the following papers dealing with electric railway matters will be read and discussed:

"Construction and Maintenance Costs of Overhead-Contact Systems," by E. J. Amberg and Ferdinand Zogbaum.

"Contact System of the Butte, Anaconda & Pacific Railway," by J. B. Cox.

"Third-Rail and Trolley System of the West Jersey & Seashore Railroad," by J. V. B. Duer.

"Unprotected Top-Contact Rail for 600-Volt Traction System," by Charles H. Jones.

"Contact Conductors and Collectors for Electric Railways," by C. J. Hixson.

"Contact System of the Southern Pacific Company, Portland Division," by Paul Lebenbaum.

The headquarters will be at Deer Park Hotel.

New York Electric Railway Association

The complete program has been announced for the thirty-third annual meeting of the New York Electric Railway Association to be held at the Oriental Hotel, Manhattan Beach, New York, Tuesday and Wednesday, June 29 and 30.

Following the regular business meeting of the association at 10 a. m. on June 29 the reports of committees will be presented by John J. Dempsey, chairman, on safety rules, and by James P. Barnes, chairman, on workmen's compensation insurance. The subject for discussion at this session is "The Proper Type of Car for City and Suburban Service," introduced by W. G. Gove, superintendent of equipment of the Transit Development Company, Brooklyn, N. Y. At the session on the afternoon of June 29 the subject for discussion is "What Can We Give for a Nickel?", introduced by E. G. Connette, president of the International Railway, Buffalo, N. Y. Three-minute written discussions by members will follow both papers.

At the session on June 30, at 10 a. m., the subjects for discussion are "Jitney Bus Competition," introduced by James E. Hewes, general manager of the Albany Southern Railroad, Rensselaer, N. Y., and "The Protection of Interurban Railway Highway Crossings," introduced by William H. Hyland, claim agent of the Fonda, Johnstown & Gloversville Railroad, Gloversville, N. Y. The question box will also be opened at this session. The questions for discussion under this head have been published in this paper.

The annual banquet will be held at 8:30 o'clock on Tuesday evening. The speakers will be William Temple Emmet, of the Public Service Commission for the Second District; Charles C. Peirce, vice-president of the American Electric Railway Manufacturers' Association; Nathan C. Kingsbury, vice-president of the American Telephone & Telegraph Company, and E. E. McCall, of the Public Service Commission for the First District. An excellent entertainment program will be provided, with special features for the ladies. Arrangements for space for light exhibits can be made directly with Joseph B. Greaves, manager of the hotel. Hotel accommodations may be secured direct through Mr. Greaves.

Financial and Corporate

ANNUAL REPORTS

Terre Haute, Indianapolis & Eastern Traction Company

The statement of income, profit and loss of the Terre Haute, Indianapolis & Eastern Traction Company, Indianapolis, Ind., for the year ended Dec. 31, 1914, is as follows:

Gross earnings from operation	$3,168,532
Operating expenses	1,866,002
Net earnings	$1,302,530
Taxes	142,945
Earnings from operation, less operating expenses and taxes	$1,159,585
Other income —	
Dividends on stocks owned, etc.	$129,146
Sale of power	116,161
Total	$245,307
Earnings from all sources, less operating expenses and taxes	$1,404,892
Deductions and rentals:	
Bond interest	$803,106
Dividends	218,813
Interest on notes	26,665
Maintenance of organization—leased lines	3,000
Total	$1,051,584
Surplus	$353,308
Sinking fund	116,301
Balance	$237,007

The total operating expenses during 1914 were 58.89 per cent of the gross earnings. There was an increase of $123,573 in the railway department, of which additional expenditure $66,000 was for maintenance of track and roadway, reballasting, etc. The increase in wages granted to motormen and conductors on April 1, 1914, made an increase of $35,910 in operating expenses. The light and power department showed an increase of $22,521 in operating expenses. There was an increase of $14,895 in taxes paid in 1914. During the year there was expended and charged to capital account for added property the sum of $217,659. Of this amount, $169,598 was expended on leased lines and $48,061 on owned lines. Further installations of block signals were made on the Northwestern, Martinsville, Eastern and Brazil Divisions.

In 1914 the company paid $141,102 to the trustees on account of sinking funds. Up to Dec. 31, 1914, the total amount, par value, of bonds held for sinking funds, including cash in hands of trustees to purchase additional bonds, was $435,519. No dividends for the company proper were paid during 1914. The surplus of $237,007 was expended for construction purposes, for which no securities have been issued, and in the reduction of the company's liabilities.

Owing to the very serious business depression, the increase in gross earnings for 1914 over 1913 was only 1.8 per cent, the greater part of this coming from the light and power department. There was also a decrease of $162,354 in the dividends received from the Indianapolis Traction & Terminal Company, all of the stock of which company is owned by the Terre Haute, Indianapolis & Eastern Traction Company. This was also caused by the depression in business and the increased operating cost of the Indianapolis Traction & Terminal Company, the increase in wages of trainmen and other employees resulting from the award of the arbitration commission in March, 1914, adding more than $100,000 to operating costs.

Miscellaneous statistics for the year follow:

Passengers carried—interurban lines	9,378,866
Passengers carried—city lines	14,233,118
Total passengers carried	23,611,984
Freight handled (tons)	77,742
Express handled, exclusive of United States and Wells-Fargo express (tons)	7,781
Car miles operated—interurban lines	6,278,575
Car miles operated—city lines	2,156,798

Honolulu Rapid Transit & Land Company

The gross operating revenue of the Honolulu Rapid Transit & Land Company, Honolulu, Hawaii, for the year ended Dec. 31, 1914, amounted to $615,583, of which $602,842 consisted of revenue from transportation. This transportation revenue showed a decrease of $10,296 as compared to the results in 1913. The total operating expenses decreased by $3,448 to $367,794, giving a net revenue from operation of $247,788, a decrease of $6,692. The total deductions amounted to $103,215, a decrease of $13,594, so that the net revenue carried to surplus was $144,573, an increase of $6,902.

In comparison with 1913 the passenger traffic showed an increase of 145,918 fare passengers and 3833 free passengers, the total for 1914 being 12,241,032. In 1914 there were 2,878,719 transfers issued as compared to 3,466,750 in 1913. The freight traffic of 1913 fell off 10,376 lbs. The operating revenue in 1914 per car-mile was $0.313 and per car-hour $2.879, while the operating expenses per car-mile were $0.187 and per car-hour $1.720. In 1914 the company expended $12,582 for betterments and additions.

The falling off in revenue in 1914 was almost wholly attributed to the large increase in the number of automobiles of both a public and a private character put into service during the year.

CANADIAN ELECTRIC RAILWAY EARNINGS

The report of the Comptroller of Statistics on electric railway operation in Canada for the year ended June 30, 1914, shows that gross earnings from operation of all companies amounted to $29,691,007, while miscellaneous earnings totaled $3,503,104. Operating expenses amounted to $19,107,807, and taxes, funded debt, etc., to $4,756,055, leaving net income of $6,566,853. Other statistics were as follows: First main track mileage, 1560.82; total car-mileage, 98,517,808, and fare passengers carried, 614,709,819.

According to the Comptroller four operating lines, the Montreal Tramways, the St. John Railway, the Yarmouth Street Railway and the Pictou County Electric Company, submitted no reports for the year. These companies operate under provincial charters and believe that they are not required to report to any dominion department. In these cases it was necessary to insert figures for the preceding year. The other reports in general disclosed a year of financial progress by the electric railway interests in Canada.

The total operating expenses and miscellaneous charges, $23,863,862, deducted from the gross earnings from operation and the miscellaneous earnings, $33,194,111, gives an amount of $9,330,249. The discrepancy between this figure and the net income figure of $6,566,853 is caused by the fact that no items are included in miscellaneous charges for the Montreal Tramways and the St. John Railway.

FAVORABLE TAX DECISION

By a decision of the United States Circuit Court of Appeals at Cincinnati the government will be obliged to return to the Cincinnati Street Railway, the Dayton & Western Traction Company, the Columbus, Newark & Zanesville Electric Railway, the Fort Wayne, Van Wert & Lima Traction Company, and the Indiana, Columbus & Eastern Traction Company, about $100,000 collected from these companies under the old federal corporation tax law. The question in dispute was whether these companies carried on business within the meaning of the law. All the companies had leased their properties to other corporations, and the only business done by them was to collect and pay out the rentals under the leases. The Court of Appeals held that they transacted business only incidentally to that of their lessor companies, thus reversing the findings of the lower court.

Albuquerque (N. Mex.) Traction Company.—The District Court on June 4 ordered the foreclosure sale of the Albuquerque Traction Company, unless bonds with accrued interest and costs are paid within ninety days. The property will be offered by L. F. Lee, special master. The receivership of this company was noted in the ELECTRIC RAILWAY JOURNAL of May 22.

American Cities Company, New York, N. Y.—The directors of the American Cities Company have declared a semi-annual dividend of 1½ per cent on the company's cumulative preferred stock, payable on July 1 to holders of record on June 20. This compares with the full rate of 3 per cent paid from January, 1912, to January, 1915. President Hugh McCloskey has submitted a statement explaining the dividend reduction and attributing the decreased earnings for the subsidiary companies to the conditions resulting from the European war and to the inroads made by the jitneys. Inasmuch as the stock is cumulative, payment of the 1½ per cent now in arrears will be made as soon as such is justified by earnings.

Boston (Mass.) Elevated Railway.—The Boston Elevated Railway has awarded $1,000,000 of 5 per cent bonds, dated 1912 and maturing in 1942, to a banking syndicate composed of R. L. Day & Company, N. W. Harris & Company, Estabrook & Company, Blodgett & Company, Merrill, Oldham & Company and Curtis & Sanger. These bonds are part of a general issue of 5 per cent debentures, of which $4,000,000 are now outstanding. The proceeds will be used to cover a floating debt incurred for extensions and additions.

Camaguey (Cuba) Company, Ltd.—It is reported in Montreal that the offer to purchase $1,000,000 of capital stock of the Camaguey Company, Ltd., for $500,000, as noted in the Electric Railway Journal of June 12, is part of a plan to amalgamate a number of electric light and traction companies in the West Indies.

Columbus, Delaware & Marion Railway, Cincinnati, Ohio.—Judge Kinkead has taken under advisement the question as to whether the receiver of the Columbus, Delaware & Marion Railway should be authorized to issue $150,000 of receiver's certificates to meet obligations falling due on Aug. 1, or the company through a default in bond interest should be sold and reorganized. References were made to this company in the Electric Railway Journal of May 1 and June 12.

Fort Wayne & Springfield Railway, Decatur, Ind.—Edward M. McKinney, general freight agent of the Cincinnati, Bluffton & Chicago Railroad and a representative of F. A. Dolph, Chicago, states that a deal for the purchase of the Fort Wayne & Springfield Railway by Mr. Dolph and others who recently purchased the Cincinnati, Bluffton & Chicago Railroad, would in all probability be completed by July 4. Mr. McKinney said that the interurban line would become part of a system of a 420-mile electric system reaching into Ohio and northwestern Indiana, but details cannot be given out at this time. The receiver's sale of the traction company was noted in the Electric Railway Journal of May 22.

Interborough Rapid Transit Company, New York, N. Y.—The Appellate Division of the Supreme Court on June 11 confirmed the decision of the lower court in dismissing in December, 1913, the suit of Clarence H. Venner and his corporation, the Continental Securities Company, against the original directors of the Interborough Rapid Transit Company. The complaint charged fraud and extortion by August Belmont and other directors in connection with the organization of the Interborough company. The court, however, found no evidences of fraud, bad faith or the exaction of an exorbitant bonus by Belmont & Company. J. P. Morgan & Company have taken $5,000,000 of additional first and refunding 5 per cent bonds of the company, which makes a total of $103,356,000 issued to the bankers since the underwriting agreement was made. Of the amount thus far taken $52,600,000 has gone for refunding and the remainder for financing the construction of the new subways and extending the elevated lines.

Kanawha Traction & Electric Company, Parkersburg, W. Va.—The stockholders of the Kanawha Traction & Electric Company and the Parkersburg, Marietta and Interurban Railway have approved a proposition to merge the two companies under the name of the former with a capitalization of $3,000,000. The new company will operate the city lines in Parkersburg, W. Va., and in Marietta, Ohio, as well as the interurban line operating between these cities and to Lowell and Beverly, Ohio. The Kanawha Traction & Electric Company was originally incorporated in West Virginia to build an electric railway in Parkersburg from a point on the west bank of the Ohio River to extend by the most practicable route to a point at or near Murdock Avenue, as noted in the Electric Railway Journal of May 8. The consolidated company has sold $1,000,000 of notes to a syndicate formed by the Fidelity Trust Company, Baltimore.

National Securities Corporation, Boise, Ida.—The Idaho Public Service Commission has authorized the amalgamation of the Idaho-Oregon Light & Power Company, the Idaho Railway, Light & Power Company, the Idaho Power & Light Company, the Great Shoshone & Twin Falls Water Power Company, the Southern Idaho Water Power Company and other electric generating and distributing companies in southern Idaho into the National Securities Corporation, organized by Electric Bond & Share Company interests. The commission states that the plans of the National Securities Corporation are lawful and their consumation will prove beneficial to holders of the securities of the old companies as well as to the consumers of their service and will improve the state of their credit. The National Securities Corporation was formed early in the current year with $21,000,000 of stock. Previous details were published in the Electric Railway Journal of April 17.

New York, Westchester & Boston Railway, New York, N. Y.—The New York, Westchester & Boston Railway has been incorporated in New York State with $6,000,000 of authorized capital stock, to complete the corporate union of the present company of the same name and the Westchester Northern Railroad. The details of this amalgamation were published in the Electric Railway Journal of June 5.

New York (N. Y.) Railways.—Clark, Dodge & Company, New York, are offering at 95 and interest, to yield about 5.3 per cent, part of the $1,500,000 of improvement and refunding mortgage (closed) 5 per cent gold bonds of the Twenty-third Street Railway. These bonds are due on Jan. 1, 1962, and are redeemable, all or in part, at 107 and interest on any interest date on four weeks' notice.

Pacific Electric Railway, Los Angeles, Cal.—The California Railroad Commission has extended to Jan. 1, 1916, the time within which the Pacific Electric Railway may issue $1,554,000 of refunding mortgage fifty-year bonds, this being the unsold portion of $2,942,000 authorized on Nov. 23, 1914. The commission has also given the company until Jan. 1, 1916, to issue $1,866,000 of these bonds, the unsold portion of $6,839,000 authorized in the latter part of 1914.

Pacific Gas & Electric Company, San Francisco, Cal.—It is announced that the board of directors of the Pacific Gas & Electric Company will meet on June 30 and declare a common stock dividend of 6 per cent to be issued in two installments, one-half on July 15 and one-half on Dec. 15, to holders of record on June 30, in certificates for whole shares of fully paid new common stock and warrants for fractional parts of such shares, exchangeable at par for stock certificates for integral numbers of shares but not bearing interest or entitling the holder to participate in dividends prior to exchange for stock certificates. The total amount of common stock to be distributed amounts to $1,926,600, and represents an equivalent amount of bonds retired with earnings, through the operation of sinking funds, since Jan. 1, 1914. The company's total outstanding capitalization will not be increased as a result of this distribution. It is said to be the expectation of the board of directors to continue similar distributions of common stock from year to year in addition to such cash dividends as the earnings of the company and general financial conditions may warrant. As the obligatory bond retirements are running at the rate of about 2½ per cent per year of the total amount of common stock outstanding, it is anticipated that the portion of such dividends which may be paid in common stock in future will be approximately at this rate. It has been the practice of the company for a number of years to set aside each year a portion of earnings as a reserve for depreciation. The amount to be so set aside this year will be $100,000 per month, or $1,200,000 for the year. The company makes this statement to remove any possible apprehension that the policy above outlined will disturb the present relation between assets and issued capital.

Public Service Newark Terminal Railway, Newark, N. J.—The Fidelity Trust Company, Newark; Drexel & Company, Philadelphia, and Clark, Dodge & Company, New York, are offering at 95½ and interest $5,000,000 of first mortgage (closed) sinking fund forty-year 5 per cent gold bonds of the Public Service Newark Terminal Railway. These bonds are dated June 1, 1915, and are due on June 1, 1955. They are unconditionally guaranteed jointly and severally as to principal, interest and sinking fund by the Public Service Railway and the Public Service Corporation of New Jersey. They are redeemable as a whole at 105 and interest on June 1, 1920, or on any interest date thereafter on six weeks' notice, and are also callable for the purposes of the sinking fund on June 1 of each year, beginning with June 1, 1920, at 102½. This company was incorporated under the laws of New Jersey to construct and operate the new electric railway terminal in Newark.

St. Joseph Valley Railway, Elkhart, Ind.—The St. Joseph Valley Railway has been authorized by the Ohio Public Utilities Commission to issue $10,000 of common capital stock to be sold for the highest price obtainable but for not less than par. The proceeds are to be applied to the payment of applicant's indebtedness incurred in the construction of its line of railway from the Indiana and Ohio State line eastward into Ohio.

San Francisco-Oakland Terminal Railways, Oakland, Cal.—It is reported that a committee of twelve, representing various persons and corporations interested in the San Francisco-Oakland Terminal Railways and its subsidiary corporations, has been formed to consider the present financial condition of the company and its problems. If three-fourths of the members of the committee approve a general financial plan for the reorganization of the corporation, it will then be made public and a reorganization committee will be selected to take steps to put such a plan into effect. The committee of twelve hopes to have a reorganization and refinancing plan ready to submit to the security holders within a comparatively short time. A statement from the board of directors showing why a readjustment is essential was abstracted in the ELECTRIC RAILWAY JOURNAL of June 5.

Syracuse & South Bay Electric Railroad, Syracuse, N. Y.—It is reported that the properties of the Syracuse & South Bay Electric Railroad and of the Syracuse, Watertown & St. Lawrence River Railroad will be sold at foreclosure in about sixty days in order to make way for a reorganization proceeding. The appointment of Ernest Gonzenbach as receiver of these companies and details concerning the reorganization plan were noted in the ELECTRIC RAILWAY JOURNAL of May 29.

Waterloo, Cedar Falls & Northern Railway, Waterloo, Ia.—The Waterloo, Cedar Falls & Northern Railway has filed an amendment to its articles of incorporation to cover an increase in its capital stock from $2,250,000 to $5,000,000. The capital stock is to be divided into 16,650 shares of preferred stock and 33,350 shares of common stock, par value $100. The amendment also provides for an increase in the number of executive officers. Heretofore the company has had a president, one vice-president, a secretary, a treasurer, an auditor and a general counsel. By the amendment the company is authorized also to elect "one or more vice-presidents," and an assistant secretary.

West Virginia Traction & Electric Company, Wheeling, W. Va.—William Morris Imbrie & Company and William P. Bonbright & Company, New York, are offering at 98 and accrued interest, to yield about 7.1 per cent, $1,500,000 of two-year 6 per cent collateral trust notes of the West Virginia Traction & Electric Company, dated June 1, 1915, and due on June 1, 1917. These notes are callable at 100½ and accrued interest on forty days' notice. They are a direct obligation of the company and are secured by the pledge and deposit of the entire outstanding $1,875,000 of its first refunding and improvement mortgage thirty-year 6 per cent gold bonds. The bonds thus deposited are a general lien upon all the property of the company and its subsidiaries, subject to the prior lien of $3,123,000 of divisional bonds, for the retirement of which bonds of this issue are reserved.

Worcester & Warren Street Railway, Brookfield, Mass.—It is announced that the Warren, Brookfield & Spencer Street Railway has changed its name to the Worcester & Warren Street Railway. No changes have been made in officials or employees. The foreclosure sale of this company was noted in the ELECTRIC RAILWAY JOURNAL of April 17.

DIVIDENDS DECLARED

American Cities Company, New York, N. Y., 1½ per cent, preferred.

Bangor Railway & Electric Company, Bangor, Maine, quarterly, 1¾ per cent, preferred.

Capital Traction Company, Washington, D. C., quarterly, 1¼ per cent.

Cleveland (Ohio) Railway, quarterly, 1½ per cent.

Duluth-Superior Traction Company, Duluth, Minn., quarterly, 1 per cent, preferred.

Eastern Texas Electric Company, Beaumont, Tex., 3 per cent, preferred.

Illinois Traction System, Peoria, Ill., quarterly, 1½ per cent, preferred.

Manila Electric Railway & Lighting Corporation, Manila, P. I., quarterly, 1½ per cent.

New Orleans Railway & Light Company, New Orleans, La., quarterly, 1¼ per cent, preferred.

Northern Ohio Traction & Light Company, Akron, Ohio, quarterly, 1½ per cent, preferred.

Springfield Railway & Light Company, Springfield, Mo., quarterly, 1¾ per cent, preferred.

Toronto (Ont.) Railway, quarterly, 2 per cent.

Twin City Rapid Transit Company, Minneapolis, Minn., quarterly, 1¾ per cent, preferred; quarterly, 1½ per cent, common.

Union Passenger Railway, Philadelphia, Pa., $4.75.

Union Traction Company, Philadelphia, Pa., $1.50.

United Traction & Electric Company, Providence, R. I., quarterly, 1¼ per cent.

West Philadelphia (Pa.) Passenger Railway, $5.

ELECTRIC RAILWAY MONTHLY EARNINGS

AMERICAN RAILWAYS, PHILADELPHIA, PA.

Period			Operating Revenues	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., May,		'15	$448,672	.....	.....	.....	.....
1 "	"	'14	487,461	.....	.....	.....	.....
5 "	"	'15	2,130,304	.....	.....	.....	.....
5 "	"	'14	2,195,560	.....	.....	.....	.....

BROCKTON & PLYMOUTH STREET RAILWAY, PLYMOUTH, MASS.

1m., Apr.,		'15	$7,407	*$8,431	†$1,024	$1,111	†$2,135
1 "	"	'14	8,338	*8,545	†207	1,081	†1,288
12 "	"	'15	121,522	*101,198	20,324	13,374	6,950
12 "	"	'14	121,655	*100,919	20,735	12,922	7,813

CUMBERLAND COUNTY POWER & LIGHT COMPANY, PORTLAND, MAINE

1m., Apr.,		'15	$186,786	*$111,821	$74,965	$70,403	$4,562
1 "	"	'14	186,634	*115,608	71,026	63,745	7,281
12 "	"	'15	2,543,812	*1,437,484	1,106,328	762,960	343,368
12 "	"	'14	2,407,857	*1,384,718	1,023,139	741,474	281,665

EASTERN TEXAS ELECTRIC COMPANY, BEAUMONT, TEX.

1m., Apr.,		'15	$50,669	*$29,484	$21,185	$8,728	$12,457
1 "	"	'14	52,519	*32,365	20,154	8,212	11,941
12 "	"	'15	669,127	*389,105	280,022	103,868	176,154
12 "	"	'14	542,580	*344,953	197,627	88,639	‡136,190

EAST ST. LOUIS & SUBURBAN COMPANY, EAST ST. LOUIS, ILL.

1m., Apr.,		'15	$193,827	*$119,538	$74,289	$60,996	$13,293
1 "	"	'14	213,998	*143,327	70,671	55,708	14,963
12 "	"	'15	2,531,939	*1,519,661	1,012,278	737,802	274,476
12 "	"	'14	2,745,570	*1,701,837	1,043,733	607,090	436,643

GRAND RAPIDS (MICH.) RAILWAY

1m., Apr.,		'15	$83,353	*$67,025	$16,328	$13,702	$2,626
1 "	"	'14	101,454	*67,016	34,438	13,538	20,900
12 "	"	'15	1,258,480	*835,100	423,380	162,162	261,218
12 "	"	'14	1,300,544	*825,407	475,137	161,446	313,691

LEWISTON, AUGUSTA & WATERVILLE STREET RAILWAY, LEWISTON, MAINE

1m., Apr.,		'15	$53,817	*$35,755	$18,062	$15,681	$2,381
1 "	"	'14	49,773	*37,748	12,025	15,567	†3,542
12 "	"	'15	696,011	*459,466	236,545	187,161	49,384
12 "	"	'14	674,730	*451,953	222,777	183,115	39,662

NASHVILLE RAILWAY & LIGHT COMPANY, NASHVILLE, TENN.

1m., Apr.,		'15	$176,040	*$103,949	$72,091	$41,992	$30,099
1 "	"	'14	186,150	*116,394	69,756	41,338	28,418
12 "	"	'15	2,216,599	*1,294,976	921,623	491,119	430,504
12 "	"	'14	2,228,645	*1,404,493	824,152	480,219	343,933

PORTLAND (MAINE) RAILROAD

1m., Apr.,		'15	$75,238	*$50,816	$24,422	$24,309	$113
1 "	"	'14	77,306	*50,147	27,159	21,435	5,724
12 "	"	'15	1,048,915	*643,385	405,530	258,014	147,516
12 "	"	'11	1,039,980	*658,453	381,527	229,184	152,343

PORTLAND RAILWAY, LIGHT & POWER COMPANY, PORTLAND, ORE.

1m., Mar.,		'15	$445,544	*$266,308	$179,236	$183,854	†$4,618
1 "	"	'14	547,393	*280,263	267,130	117,185	89,945
12 "	"	'15	5,978,042	*3,221,351	2,756,691	2,196,100	560,591
12 "	"	'14	6,763,416	*3,322,134	3,441,282	2,067,420	1,373,862

TAMPA (FLA.) ELECTRIC COMPANY

1m., Apr.,		'15	$81,176	*$42,739	$38,437	$4,376	$34,061
1 "	"	'14	79,258	*44,590	34,668	4,454	30,214
12 "	"	'15	993,778	*510,893	482,885	52,988	429,897
12 "	"	'14	907,485	*505,862	401,623	55,851	345,772

*Includes taxes. †Deficit. ‡Includes non-operating income.

Traffic and Transportation

THE JITNEY BUS

Terms of New Springfield and Portland Regulatory Ordinances Are Summarized

Springfield, Mo., has amended its jitney ordinance to accord with the decision of the courts in the case brought to have the municipal law declared unconstitutional. The amended ordinance provides that jitneys shall display the name of the party operating it and the route and destination, shall be lighted after dark and shall not exceed in speed 4 m.p.h. when approaching a crossing, 6 m.p.h when turning a corner of any intersecting streets, 8 m.p.h. when passing intersecting streets, 8 m.p.h. on streets within the business district and 15 m.p.h. otherwise. The penalty for the violation of the ordinance is a fine of from $10 to $100, or imprisonment from five to sixty days or both. The amended ordinance also provides that conviction for drunkenness or for a violation of the provisions of traffic ordinances shall act as a forfeiture of a motor-vehicle license, which will not thereafter be reissued for six months. The main feature of the ordinance is a provision for a $2,000 indemnity bond, which provision was indorsed by the courts.

The Portland, Ore., jitney measure, the approval of which by the voters was noted in the Electric Railway Journal of June 12, was carried by a vote of 22,115 yeas against 14,284 noes. No indemnity bond of any kind or in any amount is required, and the jitneys need operate only from 6 to 10 a. m. and 3 to 11 p. m. Railway cars, autos used exclusively for sightseeing, hotel buses and taxicabs are not considered motor-buses within the meaning of the grant. Licenses must be secured with the approval of the Commissioner of the Department of Public Utilities of the city. The route set forth in the license is not to be transferred or assigned without the consent of the commissioner. The rate of fare is not to be more than 5 cents. Stops are to be made on the near side. The number of passengers to be carried is limited to the registered seating capacity of the car. Cars must be submitted to the city for inspection every thirty days. Interiors must be lighted at night. Small license fees are fixed. The fine is $100 for conviction for the violation of any provisions of the measure.

In Kansas City, Mo., there has been a renewal of the effort to get a jitney ordinance passed. The Council committee having the matter in hand met a few days ago to consider anew the form the ordinance should take. Interest in the subject has been renewed mainly by the recently-formed transportation companies which are operating buses on the boulevards and feel that their business would be improved by weeding out the irresponsible small-car jitney operator, who does not operate at all during the quiet hours and has no fixed route when he does operate. A representative of one of the leading jitney companies is quoted as having said to the Council committee that his company and others were voluntarily taking out bonds for the protection of their drivers and property and for the safety of their patrons and the public. He declared himself in favor of bonding those in the business, of establishing routes for the various lines and of compelling strict adherence to them. The committee, however, did nothing and it is considered unlikely that there will be an agreement soon on anything that will serve any important purpose.

C. W. Ferguson, state manager of the Pacific Coast Casualty Company, Seattle, which is bonding jitney operators in the sum of $2,500 each, recently announced that bonding rates would be increased 25 per cent to 50 per cent after June 10. The company has bonded about 600 machines in Washington. The increase in the number of accidents has caused the advance in the insurance rates.

Charges of violating the city speed ordinance regulating street cars were preferred recently against ten motormen in the employ of the Puget Sound Traction, Light & Power Company in Seattle by R. J. Miller, president of the Auto Drivers' Association. On the same day E. H. Worthen, investigator for the Puget Sound Traction Company, applied for warrants against nineteen drivers of jitneys on the charge of violating the bonding law.

GEORGIA JITNEY RULING

Opinion of Commission Regarding Regulation—Rules Prescribed for Operation

In its ruling assuming jurisdiction over the jitney the Railroad Commission of Georgia said in part:

"We repeat that in order for this commission fairly, justly and intelligently to regulate the street railroad company's business and intelligently to decide whether such service is adequate it is essential that the commission have the same power of regulation over other public service operators in competition with street railways over the same routes. This is in the interest of the public and not of the street railroad company.

"Passenger transportation service, to be of value to the public, must be regular and dependable. No common carrier in this State now under the regulatory supervision of this commission is allowed to discontinue temporarily or abandon permanently any established service without the consent of this commission. No one questions the wisdom of this regulation.

"The same regulation ought to apply to the jitney, if it holds itself out as a common carrier and expects to establish itself in the confidence of the public as a dependable transportation agency.

"We have attempted to demonstrate that respondents in this complaint not only come within the letter of the law prescribing the jurisdiction of this commission, but also clearly within its spirit and general scope, and that there is plain need of some governmental supervision and regulation of their business. . . . Motor car transportation, in our opinion, has come to stay, and hence all the more the necessity for regulation. Proper and reasonable regulation does not mean, nor should it be exercised, for prohibitory or strangulation purposes.

"These public servants, like their competitors, the steam and street railroad companies, are entitled to fair treatment, to reasonable fares and sane regulation. Observation by members of the commission of the operation of jitneys in Atlanta, and of their practices, has convinced us that supervision and regulation are essential to the public safety and welfare, and, believing under the act of 1907 that it is made our duty to exercise supervision over the conduct of their business, we shall do so, and from time to time prescribe such just and reasonable regulations as seem to us demanded. In doing this, it is neither our desire nor purpose to interfere with or supersede the police powers of local authorities or their powers or duties in reference to license or other forms of taxation."

Tentative rules have been prepared by the commission and will form the basis of discussion at a hearing to be held on July 13. These rules follow:

"(a) Each and every person, firm, company or corporation owning or operating any automobile, auto-bus, auto-truck or other motor vehicle for the transporting for hire of passengers over any definite route, highway, street or streets, or between definite points, places or terminals, in any town or city within this State, or between any towns or cities within this State, shall observe and obey in the conduct of their public business the following rules and regulations hereby prescribed by the Railroad Commission of Georgia for the government of the business of each and all such common carriers of passengers:

"(b) Provided that these rules and regulations shall not be construed to apply to the owners or operators of automobiles, auto-buses, auto-trucks or other motor vehicles operating and using the same in the service of hotels for transporting their patrons, nor to the owners or operators of automobiles or other motor vehicles or cars operated or used for hire to one or more individuals for individual, special or exclusive transportation service.

"Each and every person, firm, company or corporation owning or operating any public motor vehicle, as defined and described in Section A, Rule 1, prior to or simultaneously with the beginning of operation as mentioned in said Rule 1, shall file with the Railroad Commission of Georgia a typewritten declaration or statement showing:

"(a) The name and business address of the carrier filing.

"(b) If a corporation, the names and addresses of its executive officers, with a certified copy of its charter.

"(c) If a firm, the names and addresses of the members or partners thereof.

"(d) The number of vehicles to be operated, the makers thereof, the State license numbers for each, and the manufacturer's rated seating capacity of each.

"(e) The name or names of the driver or drivers of each car and the age of each driver.

"No person under eighteen years of age shall be allowed to operate or drive, while in public use, any public motor vehicle as defined or described in Section A of Rule 1.

"(f) The route or routes, highway or highways, street or streets over which, and the terminals or points between which, the owner or operator proposes to conduct the business of a common carrier of passengers, and whether such service is to be daily or otherwise.

"(g) A certified copy of the city license for each vehicle, owner, operator or driver as the case may be, in any city or cities where licenses are required.

"(h) The fare or rate desired to be charged.

"No passenger shall be allowed to ride on the running boards or elsewhere on any public motor vehicle as defined and described in Section A, Rule 1, while in the public service, except within the tonneau, or seated by the side of the driver.

"Not more than two persons in excess of the manufacturer's rated seating capacity shall be allowed on any public motor vehicle as defined and described in Section A, Rule 1, at one and the same time; provided that children under five years of age, in arms, need not be counted.

"No fare or fares shall be collected by the driver while a vehicle is in motion, but all fares shall be collected, when taken by a driver, prior to the starting of the vehicle or after it has been brought to a full stop.

"Public motor vehicles as defined and described in Section A, Rule 1, shall be regularly and continuously operated over the route or routes designated and filed with this commission by the owners or operators, or as included and designated in municipal licenses where required, unless prevented by causes beyond the control of such owners or operators, between the hours of 6 a. m. and 11 p. m. within incorporated cities; and where operated between designated cities or towns, as near as practicable upon regular schedules, information as to which shall be given to the public by printed card or circular, one copy of which shall be posted and kept posted at a conspicuous place at each terminal of the route. One copy of each schedule or time table required in this rule shall be mailed to the office of the commission.

"No person, firm, company or corporation, after having filed with the Railroad Commission the declaration or statement required in Rule 2, unless from causes beyond his or their control, shall discontinue such public service or withdraw his or its facilities from any designated route or service, except after the expiration of twenty-four hours after written notice of intention so to do shall have been filed with the Railroad Commission of the contemplated discontinuance of service or withdrawal of facilities.

"Each motor vehicle as defined and described in Section A, Rule 1, when in operation in public service, shall plainly indicate in suitable print on an attached sign the terminals between which and the route over which it is being operated.

"Nothing in these rules shall be construed so as to interfere with the lawful police regulations of any municipality of this State in reference to the uses of the public highways of such municipalities, or with any lawful requirement as to business licenses, or taxation, nor to authorize any person, firm, company or corporation to carry on the business of a common carrier of passengers upon, over or through the streets or upon the public places or highways of any municipality in this State, without first complying with the lawful ordinances of such municipality concerning the same."

PARTICIPATION PLAN PROPOSED IN LEXINGTON

Employees, union or non-union, of the Kentucky Traction & Terminal Company, Lexington, Ky., will be placed on a co-operative, profit-sharing basis beginning on July 1, if the contract read to more than forty of the company's conductors and motormen at the company's office recently is approved by the men. The present contract between the company and the men expires on July 15, and it is proposed by F. W. Bacon, vice-president of the company, to substitute the profit-sharing plan. The proposed contract would increase the wages of the conductors and motormen 1 cent an hour immediately and would set aside 18.5 per cent of the gross earnings derived from freight and passenger traffic for the payment of the wages of the trainmen and the costs of the claim department, except as to fees paid to attorneys, adjusters and surgeons.

If during the fiscal year ending June 30, 1916, the amount paid for wages and legal expenses do not exceed 18.5 per cent of the gross revenues of the company, derived from the transportation of passengers and freight, the amount paid to conductors and motormen is to be increased 1 cent an hour for the fiscal year beginning July 1, 1916. If during succeeding years the amount paid out for claims and wages does not exceed 18.5 per cent of the gross receipts, the saving is to be apportioned among the trainmen as increases in wages, while in case the amounts paid out exceed 18.5 per cent, the trainmen are to submit to a reduction in wages, though at no time are they to be paid less than the rate for the year beginning July 1, 1915, which is an increase of 1 cent an hour.

The contract, if accepted by the men, will take the place of the present contract and will continue in force for three years from July 1, 1915.

Ninety-two of the 125 motormen and conductors have signed the agreement submitted to them by Mr. Bacon.

TORONTO SERVICE PROBLEM

Transportation matters occupied the attention of the Board of Control of Toronto, Ont., for several hours on June 8. The most perplexing problem which confronted the members was the policy to be adopted in regard to the operation of the Metropolitan radial line of the Toronto & York Radial Railway south of Farnham Avenue after the expiration of the franchise at midnight on June 16. The company is anxious to arrange with the board for some form of compromise which will enable it to continue the operation of its Yonge Street service to the terminal at the Canadian Pacific Railway crossing. It is possible the company may be permitted to run its passenger cars over the tracks on sufferance from day to day, until the Council finally decides on its policy for dealing with the traffic problem in the suburban districts.

It has been decided by the city to take over the line from Farnham Avenue, but it cannot be utilized for the Toronto Civic Railway, unless an arrangement is entered into with the radial company. The comptrollers will not recommend the Council to sanction anything but a temporary arrangement until after the report on the rapid transit and hydro-radial systems, now in the course of preparation, has been presented and considered. What action the management of the Toronto & York Radial Railway will take cannot yet be ascertained, but it is thought the company will refuse to allow the city to run its cars over the tracks unless the company is permitted to run freight cars to the present terminals. Consequently residents of North Toronto and the suburban districts may have to walk to reach the Toronto Railway cars at the Canadian Pacific Railway crossing. The situation is complicated by the fact that the Toronto Railway is entitled to operate its cars up Yonge Street to Farnham Avenue. So far it has refused to operate beyond the Canadian Pacific Railway tracks. Mayor Church is inclined to recommend the Council to order the company to extend its service up to Farnham Avenue. If it refuses to do so after reasonable notice, the city can operate cars over the line.

PENSION SYSTEM AT HAMPTON, VA.

The Newport News & Hampton Railway, Gas & Electric Company put into force on June 1 a pension system for superannuated employees. Any employee is eligible who has reached the age of seventy years, or is between seventy and sixty years and has been continuously in the service of the company for more than twenty-five years and has become physically disqualified for such service, or has been continuously for twenty-five years or more with the company and has become physically disqualified by reason of injury received while in the discharge of his duties. The system is limited, however, to those whose maximum wages have not exceeded $1,800 per annum for a period of more than ten years, prior to retirement. The pension is based

on an allowance of 1 per cent of the average yearly pay received during the last ten years of service preceding retirement for each year of service with the company, the minimum pension being $240 per annum. Thus an employee would receive 25 per cent of his annual wages as a pension if he had been with the company twenty-five years. The company, through its welfare board, reserves the right to discontinue the plan or to revoke any pension as it may desire.

At the same time that it announced its pension plan the company made public a statement in regard to an insurance plan under which all employees now under sixty years of age who have been in the employ of the company continuously for three years and all employees, on completing three years of continuous service with the company, will be entitled to life insurance to the amount of $1,000 for white employees and $500 for colored employees.

Near-Side Stops in Springfield.—Mayor T. K. Bowman of Springfield, Mo., has signed the ordinance, passed by the City Council, which provides for the stopping of all street cars on the near side of the intersections of all paved streets in the city.

Charging for Packages.—The State Public Service Commission of Washington has ordered the Seattle, Renton & Southern Railway, operating in Seattle, not to charge passengers for packages which they carry with them on the cars. The road has been making a fixed charge of 10 cents for each package taken on the car by a passenger. The patrons protested against the charge, and the city, through the office of the Corporation Counsel, asked that an order be made prohibiting the charge.

Through Service Between Gary and Chicago.—The Gary & Interurban Railroad, Gary, Ind., operating 85 miles of road in northern Indiana, has made a contract with the Hammond, Whiting & East Chicago Railway whereby through cars will be run from Gary to Chicago. The Hammond, Whiting & East Chicago Railway is owned by the same interests as the Chicago Surface Lines, and through cars from Gary will run into a Chicago terminal at Sixty-third Street and Madison Avenue.

Ferry-Car Transfers Continued.—The Board of Estimate and Apportionment of New York City has approved the report of the transit committee to continue the system of transfers between the Staten Island municipal ferry and the lines of the New York Railways for the coming six months. The division of the fare is on the basis of 3 cents to the company and 2 cents to the city. The arrangement is in the nature of a concession to the residents of Staten Island under the new rapid transit arrangement.

Hearing on Stops in St. Louis.—The hearing before the Public Service Commission of Missouri on the application of the United Railways, St. Louis, to that body for permission to eliminate more than 700 stops was begun at the Planters' Hotel on June 11. Bruce Cameron, superintendent of transportation, was the principal witness for the company. He outlined the advantages of the plan proposed and exhibited samples of "car stop" and "no stop" signs which the company proposes to install if its application is granted.

Car Capacity Ordinance Upheld.—The order of Dr. S. S. Goldwater, commissioner of health of New York, to the Brooklyn Rapid Transit Company limiting the number of street-car passengers to one and one-half times the seating capacity of cars, has been upheld in the Court of Special Sessions in Brooklyn. Jacob Horowitz was adjudged guilty of violating the sanitary code for persisting in boarding a Third Avenue car which already contained forty-eight passengers, the maximum permitted under the ordinance. Sentence was suspended.

Increase in Wages on Suburban Line.—The employees of the Hartford & Springfield Street Railway, Wharehouse Point, Conn., have been granted an increase in wages. In future all men in the employ of the company five years or more will receive 28½ cents an hour, and all under five years will be paid accordingly, rating from 23 cents an hour for those employed one year or less, with a gradual increase each year until the maximum of 28½ cents an hour is reached. The new scale of wages will go into effect on July 1 for one year.

Re-routing in Baltimore.—Mayor Preston of Baltimore, Md., has suggested the appointment of a commission to consider the question of rerouting cars of the United Railways & Electric Company. He would have the commission consist of a member of the board of estimate, representing the Mayor and the City Council; a member of the Maryland Public Service Commission; an official of the railway, and a representative of the public. Thomas A. Cross, manager of the company, has stated that the company would gladly co-operate with such a body.

John Barleycorn and Traffic.—There has been a noticeable increase in passenger traffic on the Louisville & Interurban line, which connects Shelbyville, Ky., and Louisville, since the saloons in Shelbyville were closed. Ticket sales on Saturday, June 5, totaled $157, compared with total sales of $38.40 for the last Saturday during which the saloons were open in Shelbyville. On the Saturday night in question fifty tickets were sold to Eight Mile House, the first "wet" spot between Shelbyville and Louisville. On the latter Saturday, when Shelbyville was still wet, no tickets were sold to the roadhouse in question.

Refrigerator Service.—The Illinois Traction System, Peoria, Ill., has inaugurated a refrigerator service between St. Louis and points on its line in Illinois. At present two iced refrigerator cars depart from the Twelfth Street and Lucas Avenue depot in St. Louis each Monday and Wednesday, destined for Springfield and stations south. One car carries shipments to Mount Olive, Litchfield and Hillsboro, and the other to Benld, Gillespie, Carlinville, Nilwood, Girard, Virden, Thayer, Auburn, Chatham and Springfield. Tonnage so far consists almost entirely of meat, most of which was heretofore shipped by express.

New Hampshire Crossing Law.—New Hampshire has just passed a law requiring every city and town to maintain a warning sign on every highway approaching a crossing at a reasonable distance on each side of the crossing. Under the act grade crossing protection is put in the hands of the Public Service Commission. That commission has ordered that enamel metal signs 24 in. x 12 in., white letters on a blue ground, shall be placed at varying distances from grade crossings. If any town for sixty days neglects to comply with the commission's order, it forfeits $1 for each day. Anyone injuring these signs is liable to a fine of $10.

Indiana Safety-First Banquet.—Ninety men connected with the Union Traction Company of Indiana enjoyed the hospitality of the company at the June safety-first banquet at the Doxey Hotel, Anderson, on the evening of June 4. Interesting and instructive talks along the lines of extending the safety-first movement were made by A. W. Brady, president of the company; H. A. Nicholl, general manager; C. A. Baldwin, superintendent of transportation; S. R. Dunbar, purchasing agent; E. E. Slick, claim adjuster, and several others. The winning safety-first essays were read by E. H. Mitchell, George E. F. Kincaid and A. C. Bounsall. Essays written by these employees were selected as prize winners from among thirty-two papers.

Improved Service to Boston Beach Resorts.—Rapid transit to Revere Beach from Boston, Mass., will be inaugurated next month as the result of an operating agreement between the Boston Elevated Railway and the Bay State Street Railway, associated with the opening for service of the West End extension of the East Boston tunnel. Through service to and from this resort, which is sometimes visited by 100,000 persons on warm Sundays and holidays, will be afforded by the construction of the tunnel extension, supplemented by the building of a new line on a private right-of-way east of Belle Isle inlet, with a trestle bridge capable of carrying 50-ton cars. Crews will be changed in East Boston, and service on the Boston Elevated system to and from the beach will be established on an 8-cent check basis.

Helping the Commerce Club.—The St. Joseph Railway, Light, Heat & Power Company, St. Joseph, Mo., working in close harmony with the Commerce Club, has for the last three months, while the Commerce Club was exploiting various campaigns, joined in the movements by displaying appropriate posters in its street cars. The posters are printed in colors on sheets 21 in. by 28 in. In the clean-up campaign particularly did the company render excellent service. The posters were attached in pairs to the windows

of the cars, one pair on each side of the car. One sheet of the pair was exposed to the passengers, and the outside sheet of the pair was exposed to the passers-by on the street—or those passed by. Another poster recently used backed up the local campaign to "Trade with Your Merchants in St. Joseph." H. C. Porter, commercial manager of the company, is third vice-president of the Commerce Club, and on its active committees.

The Safety-First Traffic Rules.—Brief reference was made in the ELECTRIC RAILWAY JOURNAL of June 12, page 1137, to the twenty recommendations concerning street traffic regulation prepared by the street traffic committee of the Safety First Federation of America at its meeting in Detroit on June 4 and 5. It was decided at the Detroit meeting to communicate with C. Loomis Allen, chairman of the Federation's transportation committee, also president of the American Electric Railway Association, with the request that a sub-committee be appointed to confer with the street traffic committee with the view to the adoption of some of the suggestions, which it is believed would make for the greater convenience and safety of the patrons of the street railway lines. Among the members of the street traffic committee of the federation are Joseph A. McGowan, auditor of the Indianapolis Traction & Terminal Company, and F. W. Bacon, vice-president of the Kentucky Traction & Terminal Company.

Bridge Material by Electric Railway.—In sharp competition with two steam roads, good pike roads and motor trucks, the Louisville & Interurban Railroad, Louisville, Ky., has won the contract for transporting the materials to be used in a big concrete bridge being constructed by the county east of Louisville. The site of the bridge is 6 miles from the end of the Fern Creek line of the railway, and the sand and gravel, cement and steel, will be hauled from that place by the trucks of the contractor, the Hoke Company. The sand and gravel will be taken from the bins of the Ohio River Sand Company, which are located on the tracks of the Louisville Railway at Thirty-first Street and Broadway, and it is probable that the cement will be delivered to the railway at the end of its Orell line, which will mean a haul of about 30 miles by car. There will be about 1,500 barrels of cement. The sand and gravel will be delivered by trains of four cars each, each car holding thirty-five cubic yards. These are side dump cars and will dump at the end of the line, the contractor having thus to handle his materials only once.

Safety First Discussed in Louisville.—What the safety-first work of the Louisville (Ky.) Railway has accomplished is illuminatingly indicated in a recent statement made by Dr. Ellis Duncan, coroner of Jefferson County. Speaking before the members of the Louisville Rotary Club at that club's last meeting, when consideration was concentrated on the electric railway interests, Dr. Duncan said that the records of his office show that in former years the fatal accidents to be charged to street railway operation in that county ranged between twelve and fourteen each year. Last year, 1914, when the Louisville Railway began its safety-first work in earnest, the record was reduced to only four deaths, while for what is practically half of 1915 there has not been a fatal accident. Samuel Riddle, superintendent of transportation of the company, went further than Dr. Duncan when he stated that there had not been a fatal accident chargeable to the company since last August. Mr. Riddle is the electric railway representative of the Louisville Rotary Club and, in accordance with the plan by which all the members take their turns in "boosting" their special interest, Mr. Riddle discussed the work of the company in the direction of accident prevention and asked for co-operation of his fellow Rotarians in getting results. Three speakers supported him, Dr. Edward Grant, city health officer; Dr. Joseph W. Fowler, superintendent of the City Hospital, and Dr. Duncan, the coroner. The principal address of interest was that of Dr. Duncan, who suggested that the civic and commercial organizations of the city further a movement looking toward the appointment of a safety commissioner by the city, after the plan followed in Chicago, to investigate accidents and determine causes, as well as outline plans by which they might be prevented. Mr. Ridd'e expressed his approval of the proposal and it is expected that definite will be obtained.

Personal Mention

Mr. Frank Sullivan Smith has been elected a member of the executive committee of the American Light & Traction Company, New York, N. Y., to succeed the late Gen. Thomas Hubbard.

Mr. J. H. Merrill, Youngstown, Ohio, has been appointed purchasing agent of the Rockford & Interurban Railway and the Rockford (Ill.) City Traction Company, to succeed Mr. Charles A. Ingle, who resigned some time ago.

Mr. Emerson McMillin, chairman of the board of the American Light & Traction Company, New York, N. Y., has also been elected chairman of the executive committee of the company to succeed the late Gen. Thomas Hubbard.

Mr. Charles F. Wallace was elected president of the Stone & Webster properties at Dallas, Tex., known as the Rapid Transit Railway and the Dallas Electric Light & Power Company, at the annual meeting of these companies on June 10.

Mr. John W. Brown has been appointed by the Kansas City Court of Appeals to succeed himself as the representative of Kansas City on the board of directors of the Kansas City Railways, the company which will have control of the street railways of Kansas City if the new franchise is accepted. Mr. Wagner's term had expired. Mayor Jost nominated him and two others as a list from which the Court of Appeals might name a representative.

Mr. R. W. Berliner, who for the last two years has been general maanger of the Colonial Power & Light Company, the Claremont Railway & Lighting Company and the Claremont Power Company, all of Claremont, N. H., has been appointed engineer in charge of general construction work in the South and East for the Eastern Power & Light Corporation, which controls the Claremont companies. Mr. Berliner's headquarters after July 1 will be in New York Citiy.

Mr. Byron T. Burt, who resigned as general manager of the Chattanooga & Tennessee River Power Company early this year, has been appointed vice-president of the Rutland Railway, Light & Power Company, and will have charge of the operation of the company with headquarters at Rutland, Vt. The Rutland Railway, Light & Power Company is controlled by W. S. Barstow & Company, New York, N. Y. Mr. Burt was manager of the Chattanooga Electric Company until its consolidation with the Chattanooga Railway & Light Company. When the Chattanooga & Tennessee River Power Company was organized to construct the hydroelectric plant at Hale's Bar on the Tennessee River he was made general manager of the company.

OBITUARY

Joshua Hale, for some years a partner of John Balch Blood in the engineering firm of Blood & Hale, Boston, Mass., was instantly killed by an automobile at Newburyport, Mass., on June 15. Mr. Hale was born in Boston in 1869 and was educated at the Massachusetts Institute of Technology and at Harvard University. At the time of his death he maintained an office in Boston, and was in close touch with engineering and financial interests.

A blackberry grower's organization at LaGrange, Ky., about 25 miles from Louisville, in Oldham County, will this year, for the first time ship its produce to Louisville, where R. H. Wyatt, general freight agent of the Louisville & Interurban Railway, has found purchasers among several preserving concerns. Heretofore the berry growers have shipped their entire product to the Eastern markets by steam roads. The crop this year will come to Louisville in the express cars of the Louisville & Interurban. This business has resulted in part from the efforts of Mr. Wyatt to show the potential shippers on the company's lines that often their best market is to be found close at home. In this instance the net returns figure out as well in spite of the fact that a lower price is paid, for the whole crop is contracted for, and, with the short haul, there is no need of iced-cars, and consequently the freight rate is lower. The berry traffic around Louisville, where the electric roads figure, will run to about 3,000 crates daily in the next week or so, all being hauled to Louisville.

Construction News

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

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

RECENT INCORPORATIONS

*Cumberland & Manchester Railroad, Manchester, Ky.—Incorporated in Kentucky to build a railway from Manchester to Barbourville, 24 miles. Capital stock, $50,000. Incorporators: F. M. Heidrick, Brooksville, Pa.; R. E. Heidrick, Clarion, Pa.; W. D. Clark, Franklin, Tenn., and C. B. Lytle, Manchester, Ky.

*Nashville, Springfield & Northern Railroad, Nashville, Tenn.—Incorporated in Tennessee to build an electric railway between Nashville, Springfield, Clarksville, Tenn., and Franklin, Ky., 80 miles. Capital stock, $10,000. Officers: E. G. Stribbling, Nashville, president; W. B. Myers, Goodlettsville, vice-president, and Robert C. Leonard, Nashville, secretary and treasurer.

FRANCHISES

Globe, Ariz.—The Globe & Miami Traction Company has received from the Council a six months' extension of time on its franchise to build a line between Globe and Miami. L. L. Lichtfield, president. [May 9, '14.]

Adams, Mass.—The Berkshire Street Railway has received from the Council in Adams a franchise to relocate its track on Columbia Street near the corner of Friend Street and Columbia Street.

Ayer, Mass.—The Lowell & Fitchburg Street Railway has received a franchise from the Council for the extension of its tracks on Main Street, Ayer, across the railroad tracks to connect with the Ayer terminus of the Shirley-Ayer line of the Fitchburg & Leominster Street Railway.

Haverhill, Mass.—The Bay State Street Railway has asked the Council for a franchise to alter and relocate some of its track in Haverhill.

Haverhill, Mass.—The Massachusetts Northeastern Street Railway has asked the Council for a franchise to relocate and change the grade on some of its track in Haverhill.

Pontiac, Mich.—The Detroit, Pontiac & Owosso Railway has asked the Council for a franchise to build a railway in Pontiac. This is part of a plan to construct a railway from Owosso to Detroit. George H. Lau, Detroit, is interested. [Aug. 1, '14.]

Kenmore, N. Y.—The International Railway has received a five-year franchise from the Council to extend its line on Military Road to the Velodrome, Kenmore.

Pittsburgh, Pa.—The Pittsburgh Railways has asked the Council for a franchise to construct additional track in Pittsburgh. The franchise asked is for a single track on Diamond Street from Grant Street to Wood Street, a double track from Try Street to Grant Street and for connections to be made with existing tracks on Forbes Street, Grant Street, Smithfield Street and Wood Street.

Portland, Ore.—O. M. Clark and associates have asked the Board of County Commissioners for a franchise to build a railway from Portland to Linnton. [May 15, '15.]

Portland, Ore.—The United Railways has asked the Board of County Commissioners for a franchise to build an extension from Portland to Oilton.

Belpre, W. Va.—The Marietta-Parkersburg Interurban Railway has asked the Council for a franchise to construct a railway in Belpre. This is part of a plan to construct a railway from Parkersburg to Marietta.

TRACK AND ROADWAY

Los Angeles & San Joaquin Valley Railroad, Los Angeles, Cal.—This company reports that on account of financial conditions no work has been undertaken on the project to build an electric railway between Los Angeles, Olig and Tejon Pass. Efforts will be made to revive the project when conditions improve. T. E. Gibbon, president. [Sept. 6, '13.]

Pacific Gas & Electric Company, Sacramento, Cal.—The following improvements in Sacramento are being planned by this company: Reconstructing P Street from Third Street to Tenth Street with single track, replacing 40-lb. T-rail; reconstructing J Street from Second Street to Twelfth Street with 87-lb. groove rail to replace 51-lb. rail; reconstructing 60-lb. T-rail with 87-lb. groove rail and building a new track on Second Avenue from Stockton Avenue to East Avenue, thence on Park Avenue to Thirty-fifth Street.

Bay Shore Railroad, San Diego, Cal.—Material for the construction of this company's lines from San Diego to Mission Beach has been received and work will be begun at once laying tracks on the bridge across the Mission Bay inlet. The railway will extend the length of Mission Boulevard and will cross the bridge over Mission Bay inlet, connecting with the Ocean Beach line for transportation to and from San Diego. [Aug. 1, '14.]

Municipal Railways of San Francisco, San Francisco, Cal.—Engineer O'Shaughnessy is preparing to let the contract for the building of the Church Street line from Market Street over the Church Street hill as far into the Noe Valley as the available funds will take it. The Board of Supervisors has authorized the building of the line, opposition having been withdrawn by the interested property owners.

Norwich, Colchester & Hartford Traction Company, Hartford, Conn.—The stockholders of this company have accepted the charter amendment which extends the rights of the company to complete its line between Norwich and Hartford for two years, and have practically planned to finish it within that time. The line is completed from Silver Lane to Glastonbury, 7 miles, and about 25 miles remain to be constructed. New York financiers have become interested in the proposition. At a recent meeting the following directors of the company were elected: Walter S. Garde, Hartford; Elmer Robinson and W. A. Strickland, Glastonbury; Stanley R. Ketcham, New York; Dr. C. E. Stark, Mayor T. C. Murphy, Frank Kromer and C. S. Holbrook, Norwich. [Jan. 19, '15.]

Jacksonville, Fla.—S. J. Pegram, Jacksonville, has offered to give $10,000 toward the construction of the proposed railway from Ortega to the Florida State camp ground at Black Point and a committee is canvassing among other realty owners to see what financial assistance they will be willing to render. Committees were appointed at a recent meeting of the military body of the Jacksonville Chamber of Commerce and it is expected that definite information will soon be ready with reference to the construction of the line. [May 8, '15.]

Jacksonville (Fla.) Traction Company.—The Council of Jacksonville has authorized this company to build an extension of its line along Kings Road, Jacksonville.

St. Petersburg & Gulf Railway, St. Petersburg, Fla.—Amended articles of incorporation have been prepared by this company to increase its capital stock from $400,000 to $1,000,000. An extension of its line from the Jungle to Pinellas Park and Clearwater is contemplated.

***Evansville, Ind.**—In connection with the proposed Dixie Bee Line Highway from Chicago to Nashville, to pass through Terre Haute, Evansville, Henderson, Ind., and on south to Tennessee, it has developed that there is a movement on foot to build an electric railway between Evansville and Terre Haute. The Terre Haute, Indianapolis & Eastern Railway reaches Sullivan and the Evansville Railway reaches Patoka, leaving a gap of 60 or 70 miles. Business men of Vincennes, Princeton and Terre Haute are interested in the proposition to build the line.

Iowa Railway & Light Company, Cedar Rapids, Ia.—Plans are being made by this company to extend its lines to Jefferson this summer. The company is now purchasing the right-of-way and material has been received for the construction of the line.

Ottumwa Railway & Light Company, Ottumwa, Ia.—This company reports that it is relaying about 1 mile of track in Ottumwa. All material for the construction has been purchased.

Iola (Kan.) Electric Railroad.—New rails are being laid by this company on its line on East Madison Avenue, Iola.

Bay State Street Railway, Boston, Mass.—The Public Service Commission of Massachusetts has authorized this company to operate its cars over a new location of tracks on Martin Street near Prospect Street, Essex.

Massachusetts Northeastern Street Railway, Haverhill, Mass.—This company has asked the Public Service Commission of Massachusetts for its approval of the relocation of its tracks on Hampshire Street at Arlington Street, Lawrence, established under an order from the Council Nov. 9, 1914.

Muskegon-Saginaw Electric Company, Muskegon, Mich.—Plans are being considered to extend this company's proposed line to St. Johns via Crystal, Carson City and Maple Rapids. The amount asked for the preliminary survey has been secured. [May 29, '15.]

Minneapolis & Northern Railway, Minneapolis, Minn.—This company, operating an 18-mile line between Minneapolis and Anoka, has contracted with the Minneapolis Street Railway whereby the lines of that company will be used for an entrance into Minneapolis.

St. Paul Southern Electric Railway, St. Paul, Minn.—Officers of this company recently voted to accept practially in full the terms offered by the St. Paul City Railway for the use of its tracks inside the city limits. A conference will be held within a few days to arrange further details and to sign the contract. Immediate steps will then be taken to make operating arrangements and it is expected that regular service from Hastings to St. Paul will be inaugurated within two weeks.

Metropolitan Street Railway, Kansas City, Mo.—This company has begun construction on its new track from the Pacific Bridge to the city limits on Electric Street, Jefferson. New and heavy rails have been laid.

***Mexico, Mo.**—Plans are being made by the Mexico Investment & Construction Company to build a railway from Mexico southwest, 14 miles, if a bonus of $30,000 can be obtained.

Trenton & Mercer County Traction Company, Trenton, N. J.—This company is rebuilding and repairing some of its lines in Trenton and the suburbs. The company has purchased 18,000 ties for this work and the overhead construction is being practically rebuilt in many cases.

Brooklyn Rapid Transit Company, Brooklyn, N. Y.—The Public Service Commission for the First District of New York has received bids for the supply of certain track materials to be used in equipping the New Utrecht Avenue elevated railroad and possibly on other lines of the dual system of rapid transit. The New Utrecht Avenue line is to be an elevated railroad connecting the Fourth Avenue subway through Thirty-eighth Street, New Utrecht Avenue, Eighty-sixth Street and Stillwell Avenue with Coney Island. It will be operated by the New York Consolidated Railroad Company (Brooklyn Rapid Transit) under the contract between the city of New York and the New York Municipal Railway Corporation. The bids covered open-hearth rails, manganese rails, splice bars, anti-creepers, cast-iron separators, cut track spikes, screw spikes and lag screws, ties and timber, bolts and nuts, nut locks, malleable-iron rail braces, washers and end inclines, tie plates, hand rails, frogs and switches. Contracts will be awarded this week.

***Olean, N. Y.**—O. P. Brown, Olean, and associates are considering plans to build an electric railway between Olean and Cuba, via the Haskell Road. Rights-of-way have been secured and a report has been presented to the Western New York & Pennsylvania Traction Company, which has signified approval of the route.

Cleveland (Ohio) Railway.—Peter Witt, street railway commissioner of Cleveland, stated on June 4 that the 123d Street crosstown line will be built just as soon as the city accepts the streets on which it will operate. They are new streets and are still owned by real estate operators.

Columbus Railway, Power & Light Company, Columbus, Ohio.—Work has been begun by this company on the extension of its Arlington Avenue line from Arlington Avenue and Fifth Avenue to Arlington Avenue and Cambridge Boulevard, Upper Arlington.

Lancaster Traction & Power Company, Lancaster, Ohio.—This company reports that plans are being made to build a 2-mile extension of its lines. All material for the construction has been received.

Toronto (Ont.) Railway.—Owing to the amount of track work ordered by the Ontario Railway Board and the financial stringency, this company has informed the city that it will not lay new track on McCaul Street from a point 400 ft. north of St. Patrick Street to College Street, Toronto. The city asked the concession in order that a proper roadbed might be put down as the southern portion of the street has already been done.

***Southern Counties Railway, St. Cesaire, Que.**—Construction has been begun and track is being laid on this company's proposed railway between St. Cesaire and Granby, 16 miles.

Chattanooga Railway & Light Company, Chattanooga, Tenn.—The construction on this company's new Chickamauga Park line is progressing rapidly. Grading has been completed to a point below Rossville and poles and wire are in place. Before the end of the summer the line will be extended to Fort Oglethorpe.

Nashville Railway & Light Company, Nashville, Tenn.—Work will soon be begun on the new $45,000 viaduct which is to span the Nashville, Chattanooga & St. Louis Railway tracks at Cedar Street, the city and the Nashville Railway & Light Company by agreement to divide the expense of construction. The street railway has two tracks over the present wooden bridge at this point.

***Beeville, Tex.**—Plans are being considered for the construction of a railway to connect Beeville, Cadiz, Oakville and Three Rivers, 25 miles. C. O. Williams, Corpus Christi, is interested.

Texas Traction Company, Dallas, Tex.—Construction on the extension of this company's line from Waco to Austin which was recently surveyed has been abandoned for the present. Officials of the company say that the construction will not be undertaken until conditions improve. While the line from Austin to San Antonio is assured, the time of its actual construction is still vague.

Tacoma Railway & Power Company, Tacoma, Wash.—Work will be begun at once by this company on the reconstruction of its tracks and foundations on Pacific Avenue between South Thirteenth Street and South Seventh Street, Tacoma.

Charleston, Parkersburg & Northern Railroad, Parkersburg, W. Va.—Financial backing from Eastern capitalists has been secured by this company and construction will be begun at once on the proposed line between Charleston and Parkersburg, 74 miles. The road will be standard gage, and self-propelled cars will be operated on it. K. B. Stephenson, Parkersburg, secretary. [Dec. 26, '14.]

Chicago & Wisconsin Valley Railroad, Madison, Wis.—Preliminary arrangements are being made to begin construction this summer on this company's line between Madison and Janesville. It is planned to start in Madison and Janesville simultaneously and work from each city. Arrangements have been made with eastern capitalists to furnish the necessary finances and equipment. J. E. Jones, president. [Sept. 26, '14.]

SHOPS AND BUILDINGS

Kankakee & Urbana Traction Company, Urbana, Ill.—The contract has been let for this company's new passenger and freight station at Rantoul. The building is to be modern in every way.

International Railway Company, Buffalo, N. Y.—This company plans to build a new station at Lockport to be a terminal for all interurban lines entering Lockport. The plans provide for a waiting room, ticket office, parcel room, dispatcher's office and news stand on the first floor, and for the superintendent's office, trainmen's rooms, lockers, etc., on the second floor.

POWER HOUSES AND SUBSTATIONS

Savannah (Ga.) Electric Company.—A report from this company states that it has purchased one 1000-kw, 650-volt railway motor generator, one 1250-kva, 13,000-volt transformer and two 200-kw, 2300-volt voltage regulators for use in its power station.

Toledo Railways & Light Company, Toledo, Ohio.—This company reports that its Detroit Avenue substation is about completed and machinery will be installed during July. A new 20,000-kw Westinghouse turbine and condenser will also be erected next month at the main plant.

Manufactures and Supplies

ROLLING STOCK

Lincoln (Neb.) Traction Company expects to purchase one snow-plow.

Salina (Kans.) Street Railway has purchased two single-truck cars which will be put into operation when the new union depot is completed about Sept. 1.

Sandwich, Windsor & Amherstburg Railway, Windsor, Ont., expects to purchase within the next two weeks two single-truck pay-as-you-enter cars.

TRADE NOTES

G. Drouvé Company, Bridgeport, Conn., supplied the sash operating device for the shops of the Norfolk & Western Railway, which were described in an illustrated article in the ELECTRIC RAILWAY JOURNAL of June 5.

Corliss Carbon Company, Bradford, Pa., manufacturer of motor and generator brushes exclusively, has opened its office at 1052 Peoples Gas Building, Chicago, Ill. The Western district is now in charge of Frank D. Frawley.

Ford, Bacon & Davis, New York, N. Y., engineers, are rebuilding a pier at Galveston, Tex. A new building is being erected on the pier, and arrangements are being made for the loading and unloading of material from steamships and for shipment by rail.

Union Switch & Signal Company, Swissvale, Pa, has just completed the installation of one block of the T. D. B. system of automatic signals controlled by continuous a. c. track circuits, on the line of the Michigan United Traction Company, between Grand Rapids and Kalamazoo.

Templeton, Kenly & Company, Ltd., Chicago, Ill., manufacturers of Simplex jacks, report that they have received orders for complete equipment of Simplex jacks from fully 50 per cent of the electric railway companies in Pennsylvania which have equipped their cars with emergency jacks in accordance with the State law effective June 1. Among these roads are the following: York Railways Company, Scranton & Binghamton Traction Company, Philadelphia Railways Company, Hershey Transit Company, Lehigh Valley Transit Company, North Branch Transit Company, Easton Transit Company, Wilmington & Philadelphia Traction Company, Buffalo & Lake Erie Traction Company, Frankford, Tacony & Holmesburg Street Railway and Schuylkill Railway Company.

S. K. F. Ball Bearing Company, New York, N. Y., has greatly increased its office space and now occupies a full wing on the sixth floor of the Hudson Terminal Building, 50 Church Street. This company says that it is the only company importing ball bearings from Europe that has not been interfered with by the war. Sweden, being a neutral country, is enabled to send large and regular shipments via Norway and Denmark without entering the war zone. These Swedish imported ball bearings are now very much in demand on account of the high grade of the material and superiority of workmanship. The bearings are made in Gothenburg in a model factory employing 3000 hands, engaged exclusively in the manufacture of S. K. F. ball bearings.

Graphite Lubricating Company, Bound Brook, N. J., announces that, due to expansion of the two departments of its business—the "Bound Brook" and "Nigrum" departments—it has purchased additional property which will be devoted exclusively to the manufacture of "Nigrum" graphite impregnated oil-less bearings. The manufacture of "Bound Brook" graphite and bronze oil-less bearings will be conducted as in the past in the original plant. The new plant is 2 miles from the original property and covers a plot of more than 500 ft. x 200 ft. It is situated on the tracks of the Central Railroad of New Jersey, Philadelphia & Reading Railroad and Baltimore & Ohio Railroad. A side track is available from each of these roads. This item corrects a note published in the ELECTRIC RAILWAY JOURNAL of June 12, in which it was stated that the company had transferred the manufacture of both products to the new plant.

Esterline Company, Indianapolis, Ind., has received the following orders from electric railways for "Golden Glow" headlights during the month of May: Mahoning Valley Railway, Los Angeles (Cal.) Railway, Charles City & Western Railway, Western Railways & Power Company, Atchison Railway, Light & Power Company, East St. Louis & Suburban Railway, Metropolitan Street Railway, Lawrence Railway & Light Company, Sioux City Service Company, Noord-Zuid-Hollandsche Tramweg Matschappij, Haarlem, Holland; Cleveland & Eastern Traction Company, United Railways of St. Louis, Salina Street Railway, Menominee & Marinette Street Railway, Granite City Railway, Long Island Railroad, Virginia Railway & Power Company, Wausau Street Railway, Titusville Traction Company, Chambersburg, Greencastle & Waynesboro Street Railway, Union Street Railway, Cedar Rapids & Marion City Railway, Harrisburg Railway, Chicago & Joliet Electric Railway, Hocking-Sunday Creek Traction Company, Lincoln Traction Company, Chambersburg & Shippensburg Railway, Iowa Railway & Light Company, Bristol & Plainville Tramway, St. Joseph Railway, Light & Power Company, Peoples Gas & Electric Company, Union Electric Company, Regina Municipal Railway.

ADVERTISING LITERATURE

Walter A. Zelnicker Supply Company, St. Louis, Mo., has issued folder No. 171 listing its stock of dump and flat cars.

Chicago Pneumatic Tool Company, Chicago, Ill., has issued Bulletin No. 34-X describing and illustrating its A-G "Giant" gas and gasoline engines.

Roller-Smith Company, New York, N. Y., has issued a number of bulletin sheets which illustrate and contain price lists of its various types of switchboard apparatus and portable instruments, including circuit breakers, reverse-current relays, frequency meters, volt-ammeters for d.c. and a.c. railway signal operation and watt-hour meters.

John C. Dolph Company, Newark, N. J., has issued a folder on its lacquer, an alcohol black finishing varnish for protecting armatures, field coils, dynamos or motors from the action of lubricating oils or moisture. Among the users of this varnish are the Hudson & Manhattan Railroad, Long Island Railroad, New York, New Haven & Hartford Railroad, Pittsburgh Railways and Texas Traction Company.

Barnes & Kobert Manufacturing Company, Milldale, Conn., has issued a catalog describing its trussed steel pole line bracket hardware. In the manufacture of this equipment the locust or oak bracket cobs are thoroughly kiln dried and impregnated with kerosene under pressure. Cold drawn steel shells are forced on and the cobs screwed on to the brackets. The shells are then swedged into position. A locking feature prevents thimbles from backing off or becoming loose owing to shrinkage. No metal portion of the brackets touches the insulator.

Electrical Testing Laboratories, Inc., New York, N. Y., has issued a bulletin which contains a general description, accompanied with illustrations, of the equipment, organization and work of its testing service. The electrical testing laboratories of this organization offers to manufacturers and operating companies a testing service which is complementary to that furnished by their own laboratories. Its comprehensive equipment includes some instruments and apparatus which often even the best equipped private laboratories do not possess. The company commands an experienced staff and an extensive organization which keeps in close touch with the electrical engineering field. The work of the laboratories is confined to testing and inspecting. It undertakes practically every work within its field of activity, which involves the ascertaining of facts and performance. Its testing service consists of tests and investigations at the laboratories upon apparatus and materials submitted by clients, acceptance tests at the factories or at the laboratories upon apparatus and materials to determine compliance with clients' specifications, and operating or service tests made after installation. In addition to the above the company offers facilities with which clients may conduct their own tests and investigations. Well equipped rooms are available if privacy is required.