

# Electric Railway Journal

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## VEHICULAR TRAFFIC AND SERVICE DELAYS

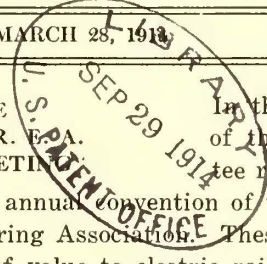
A statement recently compiled by the Rochester lines and published elsewhere in this issue relative to the loss of time and causes of interruption to their service during the past fourteen months is of decided interest as being a concrete representation of a problem that confronts all city electric railways. The statement mentioned shows a loss of almost four days' time owing to wagons and autos breaking down or becoming stalled on the car tracks, this being exclusive of the multitudinous petty delays that occur every day before moving vehicles clear the tracks. Could this lost time be calculated, the total would undoubtedly assume far greater proportions. The problem of avoiding these delays is a serious one all the year round. In the winter months the facility and speed with which the railways open up their snow-covered tracks is in reality a special invitation for vehicles to flock to that part of the street, an opportunity of which they are not slow to take advantage. During the other months, too, the smooth surface of the rails attracts them, and the result is a persistent annoying obstruction to efficient service as well as increased danger of collisions.

## REMEDY FOR TRAFFIC OBSTRUCTIONS

One remedy for the obstructions to electric railway service from the use of the track by vehicles is, of course, the installation of a rail which does not encourage vehicle use, like a high T-rail. Another remedial plan is that followed by the Rochester lines, which have made a direct appeal to the teamsters' union of that city to co-operate in minimizing the number of traffic delays. In commenting on this request, the *Labor Herald*, the official paper of the Central Trades and Labor Council in Rochester, says that "one of the most serious hindrances to rapid transit is the thoughtless and, it must be admitted, sometimes malicious blocking of the tracks by automobiles and other vehicles," and it calls attention to the fact that the teamsters and drivers as union men are committed to the rule of co-operation, efficiency and fair dealing as regards not only the carmen's union but also the public. The public is, indeed, the chief sufferer from this outrageous abuse of the streets. It seems the height of absurdity to let the driver of a coal wagon, whose time is worth perhaps \$2 a day, delay unnecessarily fifty or a hundred business men in reaching their offices or homes, simply because it is somewhat easier for the coal wagon to run on the tracks rather than on some other part of the street, and it is to be hoped that this fact will be realized by city authorities.

## THE A. R. E. A. MEETING

In this issue is printed a digest of the discussion of the committee reports presented last week at the annual convention of the American Railway Engineering Association. These reports contain much that is of value to electric railways. At the same time it should be borne in mind that the track conditions of the steam roads differ in several particulars from those on electric roads so that the conclusions accepted for the former cannot be applied directly to the latter. With the steam roads, for example, the weights to be carried by the track are very great, and this condition is not duplicated to any great extent on electric railways. This great weight per axle is the source of much of the wear on ties and the disturbance of ballast. Any element of track construction, therefore, in which weight of load is the determining factor does not greatly interest electric railway engineers. An example of this is the matter of tie wear, one of the serious problems in steam practice, as disclosed by the reports and discussion at Chicago. Tie wear is insignificant on electric railways. Another difference between the two kinds of practice is in the relation of strength to wearing qualities of rails. The broken rail is the *bête noire* of the steam railway engineer. He must take every precaution to secure rails free from pipes and proof against cracking. Life of the rail from the standpoint of wear is secondary to safety of passengers. The electric railway is not bothered by broken rails. Wearing qualities are everything. Of course, care in manufacture to reduce cooling stresses results in a more uniform rail texture which all appreciate. The steam road engineer, however, goes primarily after safety and gets other benefits incidentally, but a rail might be entirely suitable for interurban electric track which would be out of the question on steam track. Thus when the advisability of using expensive alloying metals comes up for settlement the decision must be reached on different grounds in the two cases. The above citations are made merely to illustrate the fact that, while electric and steam roads have many common interests, the conclusions reached for one are not necessarily binding upon the other. At the same time, each has much to learn from the other, and the increasingly closer relation between the railroad and electric railway engineering associations is evidence that this is appreciated. There is need for two separate organizations, but closer co-operation between them is desirable and should be fostered. This can be done best through individual membership in each association on the part of leading members of the other.



### RENEWABLE CENTER OR SOLID-MANGANESE SPECIAL WORK

The use of manganese steel in the manufacture of electric railway special work is so new that until recently no service records were available. Sufficient time has now elapsed, however, since both the renewable center and solid-manganese special work have been in use for some definite conclusions to be drawn as to their ultimate economy and special fitness for different classes of service. There can be no question as to the superior qualities of manganese steel in resisting abrasion as compared with steel manufactured by the ordinary processes. There is, however, considerable question as to the economy of purchasing solid manganese instead of hard-center special work for frogs and crossings where the traffic over one piece produces flange wear and that over another results in a flowing or chipping of the metal under repeated impact blows.

On interurban roads where the equipment is heavy, the traffic is comparatively infrequent and the frogs are subjected to severe tensile strains as well as impact at the intersections of the flangeways, the economy of installing the solid-manganese special work has not been questioned. There seems also reason to believe that the solid manganese is more desirable than renewable center special work for certain other classes of installations, such as at crossings with steam railroads, where the special work is made up of A. S. C. E. rail sections and is subject to severe blows and tensile strains. But in both of these cases, of course, the conditions at each crossing should be considered to determine whether the service is sufficient to warrant the installation of a solid-manganese crossing instead of built-up special work which can be installed at much lower first cost. If the interest on the investment in the solid-manganese crossing exceeds the average annual maintenance charge on the built-up work, there is, of course, no economy in the solid-manganese crossing.

In city service, crossing frogs do not fail so much through severe blows or faulty foundations as from the constant succession of comparatively light impact blows caused by the continuous passage of city cars and the other traffic on the street. Under traffic of this kind there has developed, in some cities, a flowing or a chipping of the manganese steel, and as the life of the part where this wear occurs is no greater with solid manganese than with the renewable manganese-insert special work, and as the latter is considerably less in first cost, economy dictates its employment. On the other hand, with a frog in a wye connection or in a turnout, present indications point to greater life from solid-manganese construction. There are no bolted joints to fail as in built-up work, and the angle of intersection is usually so flat that a uniform flange wear rather than impact wear at one point governs the life of the piece.

To sum up, the following conclusions may be drawn from the information at hand: Where the flange wear governs the life of the piece and is uniform under either heavy or light equipment, the solid manganese is de-

sirable, but where the wear is due largely to impact blows the hard-center construction should be employed. For interurban and steam road service, where A. S. C. E. rail sections are used and there is considerable question about maintaining a perfect bearing on the foundation under crossing frogs, the solid manganese commends itself because it is able to withstand more severe tensile strains than built-up or hard-center special work.

### A DECADE'S GROWTH

The statistics of the electric railway industry obtained by the Census Bureau for the year ended June 30, 1912, are becoming available, and the first preliminary summary for the country was published in our issue of last week. These figures give statistics of the number of companies, miles of track, cars, persons employed, power, passengers and car mileage and a consolidated income statement, but do not include any of the balance-sheet figures. For this reason it is impossible yet to know the added investment during the past five and ten years. The table as given out by the Census Bureau contains a column giving the percentage of increase for each item between 1902 and 1912, and a column was added in our issue last week of the percentage of increase between 1907 and 1912 to show what proportion of the growth had occurred during the past five years.

As might have been expected, the table shows that most of the increase in miles of track occurred during the first half of the decade from 1902 to 1912. The passengers carried during that period increased much more rapidly than the car miles did, and in even a greater ratio during the last five years. This was undoubtedly due to a considerable extent to the use of longer cars, and perhaps also to a closer study of schedules on the part of the companies and to better loading conditions. During the decade, also, the transfer passengers increased more rapidly than the revenue passengers, but the column of the 1907-1912 percentages shows that this increase occurred entirely during the first half of the decade and that in the last five years the conditions were reversed. This, in turn, is undoubtedly due to the greater care recently exercised in preventing transfer abuses by the adoption of more scientific transfer systems.

A very interesting coincidence is shown by the increases in gross income, operating expenses and gross income less operating expenses for the decade. The increase in each of these figures from 1902 to 1912, by a singular coincidence, is the same, namely, 133.9 per cent. During the latter half of the decade the figures are respectively 36.6, 32.5 and 41.2. The operating ratios for the three years 1902, 1907 and 1912 were respectively 57, 60 and 58. It is possible that these latter figures reflect to some extent the placing in operation of a number of rapid transit lines, such as the New York subway, the Hudson & Manhattan and the Boston subway, which have low operating ratios but high fixed charges, but the data so far published

are too meager to warrant any definite conclusions. The surplus for the two periods shows a decrease of 30.3 and 26 per cent respectively, indicating that most of the decrease in surplus has come during the latter half of the decade.

#### WHY NOT A TECHNICAL COMMISSION ON ELECTRIFICATION?

In our issue of March 29, 1913, we had occasion to comment on the suggestion brought before the New York Railroad Club by Frank J. Sprague that it was time to form a technical commission for two purposes, first, to decide upon the merits and limitations of each system of electrification, and, second, to devise means of financing which would enable the railroads to electrify with a minimum outlay of their own capital. Another "electrical night" of the club has come and gone, but the project for a technical commission apparently has not advanced one step. The way in which the second part of Mr. Sprague's suggestion would be carried out is a matter for future determination, but certainly no valid objections have yet been offered against an impartial engineering study of the electrification problem.

What one technical commission accomplished is perpetuated in the famous Zossen tests, which yielded many of the fundamental data for the present work of the Prussian and Bavarian State Railways electrifications. What another and similar commission has helped to do is attested by the remarks made by Mr. Huber-Stockar on the last "electrical night" of the Railroad Club, where he discussed the forthcoming electrification of the Erstfeld-Bellinzona section of the Swiss Federal Railways. The Swiss Electrification Commission was formed by the competing electrical manufacturers of Switzerland, by the Federal Railways and by other interests which would be affected in an important way by electrification. As previously reported in these columns, this commission studied the problem from every angle and suggested eventually that the single-phase system at 15,000 volts and fifteen cycles was the one which was best for Switzerland as a whole. While the opinion of the commission was not binding, it is worthy of note that the independent study conducted by the Federal Railways seems to point to the same conclusion except that the management saw no need to make a final decision while the extensive hydroelectric plants were building. In any event electrification is assured and a large sum has already been granted for the prosecution of the work.

It is clear from this experience that technical commissions made up of competing interests can certainly accomplish tangible results, and the history in this country ought not to be different. Even if such a commission did no more than determine questions of fact in regard to present conditions on existing installations, it would perform an important service. But with a strong body of unbiased engineers much more than that ought to be accomplished. Such a commission should be able to use its knowledge of existing conditions to determine the directions in

which improvements during the future may be expected. Surely nothing is more discouraging to a steam railroad desirous of electrification than to have electrical engineers disagreeing, not only upon the probable operation of electrical apparatus on a proposed line, but even in regard to its present service on lines already in operation.

#### MAKING OPPORTUNITIES

Sooner or later the ambitious young technical graduate who has obtained a foothold in electric railway work is likely to feel himself hemmed in by departmental organization, particularly if he is employed by a fair-sized company. The specialization of modern industry has gone as far into transportation as into other fields, and the tendency of men without heavy responsibilities to become largely creatures of routine needs to be resisted. Under such conditions the ability to make opportunities for becoming more than normally useful is of great value. It is a splendid feature of electric railway work that it offers so many chances to the man with constructive imagination to develop along congenial and ultimately profitable lines.

To illustrate by concrete cases, an electrically trained graduate was put at work in the civil engineering department of a city railway company and for some months assisted older men in the calculation of track-work layouts, in tracing, blueprinting and other jobs that pertain purely to the drawing office. A new system of lines was under construction, including extensive additions to the car service, and as the entire problem was in the hands of the chief civil engineer, the young graduate saw an opportunity to make himself more useful by volunteering to prepare a special study of the car movements, with special diagrammatic analyses never before used in the department, tables of possible schedules and other traffic data. The informal report submitted was welcomed by the chief engineer and led to the compiler's being transferred from the drawing office to the designing room, thus giving him opportunity to do further new work along the lines which he desired and for which his education and tastes peculiarly fitted him. Out of this voluntary work came a closer association with the operating department prior to and following the inauguration of service on the new lines, an increase of nearly 300 per cent. in salary, and experience which led to work of great desirability and association with many of the abler men in the district in which the company operated.

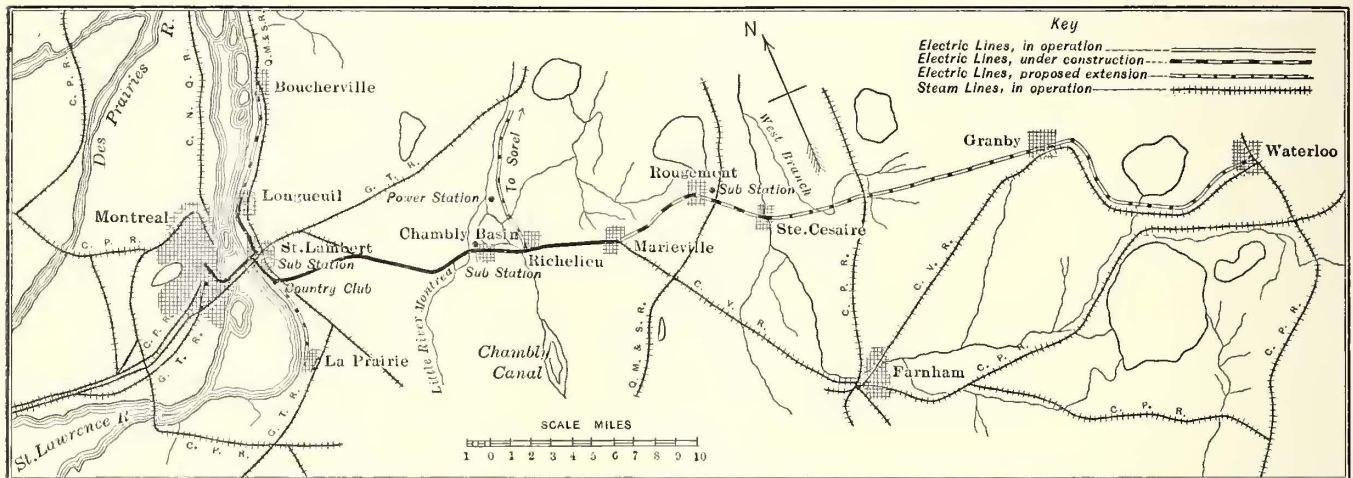
No young man of enthusiasm and willingness to work hard for advancement can tell when such an incidental accomplishment as the ability to use the slide rule rapidly or a cultivated interest in testimony before a public utility board may lead to his selection for new and useful duties under the closer observation of his superiors. It is a good thing to try to become a master of one's work, and the history of all operating companies is filled with the stories, usually unwritten, of men whose advancement was based upon their determination to make themselves useful along lines previously unrealized.

# Montreal & Southern Counties Railway

A 600-Volt D.C. Electrification of the Central Vermont Railway South from Montreal, and the First D.C. Catenary Line in Canada

One of the most important electrifications in Canada now partly completed is that of certain parts of the Waterloo branch of the Central Vermont Railway, a subsidiary of the Grand Trunk system. These routes extending south of Montreal are not for heavy freight service but are really to be extensions to a suburban

however, was left to the advice of Bion J. Arnold, consulting and constructing engineer. Mr. Arnold had been responsible for the single-phase electrification of the Sarnia tunnel, and he, too, was at first disposed to favor single-phase for the new work. He concluded in favor of 600-volt d.c., however, on a closer



Montreal & Southern Counties Railway—Route and Connections of Road

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type electric railway. The parent line of the system is a 7-mile section between Montreal, St. Lambert and Longueuil, over the Victoria Jubilee bridge and along the southern bank of the St. Lawrence River, opposite Montreal, and this line and the others hereinafter described are operated under the name of the Montreal & Southern Counties Railway.

#### REASONS FOR CHOOSING 600-VOLT DIRECT CURRENT

When the question of electrifying the steam track arose, the Grand Trunk Railway was very strongly in

examination of the conditions. In the first place, the company had already in service in the vicinity of St. Lambert and Longueuil a 600-volt d.c. system with ten comparatively new eighty-passenger motor and three motor work cars. In the second place, the 7000-ft. Victoria Bridge, the only highway to Montreal, would be up to its allowable maximum loading on the cantilevered roadway with cars not exceeding 65,000 lb. weight. These weight limitations precluded the use of any single-phase cars except with two motors only. On the other hand, the use of direct current



Montreal & Southern Counties Railway—Motor Car and Trailer

favor of the single-phase system owing to its satisfactory experience with the single-phase operation of the Sarnia tunnel. It seemed as if the Central Vermont tracks were also suitable for that system, inasmuch as some 30 miles would be electrified, with the possibility of longer extensions later. The final choice,

made it possible to get maximum adhesion by the use of a four-motor car within the prescribed weight. The third reason was that the company was not certain as to the ultimate extent of its electrification.

It was therefore decided to operate across Victoria Bridge and into Montreal with 600 volts d.c. and to

build the Central Vermont extensions with highly insulated catenary construction suitable for eventual operation with either high-tension single-phase or direct current. This decision saved a large amount of money in the initial installation, yet left the company in an advantageous position to change to high-tension operation when conditions regarding the extensions are better known.

#### ROUTES

The electric line begins at McGill and Youville Streets, Montreal, and passes to the southern counties over the Victoria Bridge. The steam railroad electrification at present is about 18 miles of main line between St. Lambert and Marieville. An extension of this line is under way for the following 9 miles from Richelieu to St. Césaire, the electrified section of 4.4 miles to Marieville having been opened Sept. 27, 1913. The continuation of the road to Granby will be undertaken this year and will be over a new right-of-way beyond St. Césaire. With the completion of the latter electrification no steam trains will be operated on the electrified sections.

The branches now in operation are the pioneer 7-mile line between St. Lambert and Longueuil, and that between St. Lambert and Country Club, 1 mile. The company contemplates extending the first branch on new right-of-way to Boucherville, 5 miles, while



Montreal & Southern Counties Railway—Catenary Work on Curve

the second branch is to be extended 4 miles to La Prairie during 1914. The charter of the company also gives it the right to build new lines from Richelieu to Sorel and through towns along the southwest shore of the St. Lawrence River. The total number of miles in operation as of Dec. 1, 1913, was thirty-one.

#### TRACK AND LINE

The track is of new 60-lb. or old 56-lb. A.S.C.E. section throughout, except for 80-lb. rail on the lines between Montreal, St. Lambert, Longueuil and Country Club. The standard electrical connections for the old rails are No. 0000 flat ribbon-covered bonds and for new rails No. 0000 cable concealed bonds. The heaviest grade is only  $3\frac{1}{2}$  per cent and 550 ft. long at the east approach of the Victoria Bridge, and elsewhere the grades do not exceed  $1\frac{1}{2}$  per cent.

The first installation of catenary construction covered 15 miles of track, the hangers and fittings being supplied by the Ohio Brass Company. With few exceptions, the  $\frac{7}{16}$ -in. steel catenary and the No. 0000 grooved copper trolley are carried from wooden poles and T-bar brackets over porcelain insulators. The

poles are spaced 110 ft. apart on tangents. The sherdardized hangers which are installed at intervals of 14 ft. are of the new type shown in an accompanying cut. This type is designated as C. N. flexible hanger with a three-screw Detroit clamp which is riveted to the  $\frac{1}{8}$ -in. x  $\frac{3}{4}$ -in. steel suspension strap. The strap has a  $3\frac{1}{2}$ -in. x  $\frac{3}{4}$ -in. loop to allow vertical movement of the hanger. This loop is snapped over the messenger cable and springs shut automatically to avoid disengagement through accident.

The standard clearance between rail and trolley is 22 ft., and this is increased to 23 ft. at railroad crossings. The bare aluminum d.c. feeders are carried the complete length of the lines. Their conductivity is equivalent to 500,000 circ. mil copper. The feeder lines are carried on malleable-iron composition insulators set on standard oak pins, which in turn are supported by pine cross-arms. Garton-Daniels 625-volt lightning arresters are installed every ten poles in connection with Dossert feeder taps. The private telephone line is transposed every three poles to protect it against inductive effects.

#### ENERGY SUPPLY

Energy is purchased. All substations are arranged for additional units and in every case the principal machines are of Westinghouse manufacture.

The original line was supplied with power from



Montreal & Southern Counties Railway—Tangent 3 Miles from St. Lambert

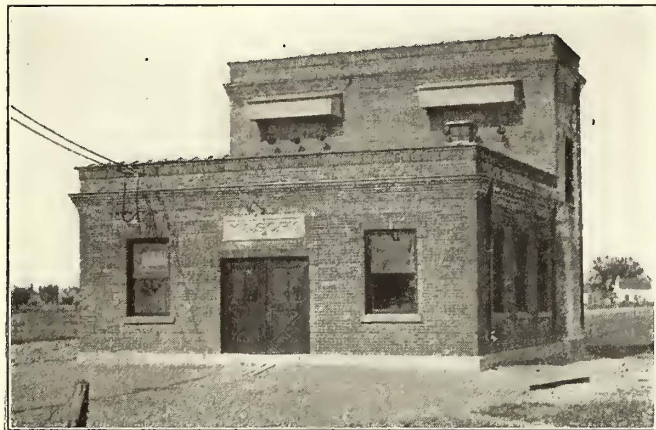
two engine-driven generators located in the Port St. Charles power house of the Grand Trunk car department. The increase in business on the original and proposed lines necessitated greater capacity in generators, and accordingly a substation situated at St. Lambert was designed not only to supplant the old steam station but to take care of the new interurban business on the electrified track. This substation has three 500-kw, three-phase rotary converters which receive energy via step-down transformers from two 22,000-volt, sixty-three-cycle lines of the Montreal Light, Heat & Power Company.

Owing to the fact that the voltage supply at Chambly may vary as much as 12 per cent, the substation at that place has a motor-generator set which is of 400-kw capacity. Normally the St. Lambert and Chambly stations, which are 14 miles apart, are in parallel with a section breaker midway. A third substation is to be located at Rougemont, about 3.5 miles from St. Césaire. This will contain one 300-kw motor generator set to be fed from a new line which will be built from Chambly on the railway's own right-of-way over a separate line for the 4 miles between

Richelieu and Marieville and over the trolley poles from Marieville Junction to Rougemont, 4.7 miles. The combination railway and transmission poles are 40 ft. long, but owing to the difficulty in obtaining this length those on the right-of-way will be 35 ft.

#### CARS AND CARHOUSE

The first twelve cars of this company are 49 ft. 4 in. long over all and were built at the shops of the



Montreal & Southern Counties Railway—Substation at Chambly

Grand Trunk Railway and by the Ottawa Car Company. Ten are passenger with smoking compartment and two are combination baggage and passenger motor cars. They have single-end K control with four Westinghouse 101-B-2 40-hp motors, geared 18:66, placed on Curtis trucks. The cars are also fitted with Westinghouse automatic air brakes. They weigh approximately 54,500 lb. Eight more cars have since been furnished by the Ottawa Car Company. These cars resemble the first type, except that they have steel underframes and carry four Westinghouse 306 interpole motors, double-end, HL control and Tomlinson form 8 air-connecting coupler for train service. Two of these cars are straight passenger, two are combination baggage and passenger, and four are passenger cars with a smoking compartment. The other rolling stock includes two passenger trailers which weigh 36,000 lb., one sweeper-locomotive, equipped with four Westinghouse 306 motors; also two rotary snow plows and one work car with quadruple Westinghouse 101-B-2 motor equipment and one single-truck sweeper.

The Montreal & Southern Counties Railway has placed an order with the National Steel Car Company, Ltd., Hamilton, Ont., for six motor passenger cars and two trailer passenger cars, each 54 ft. 2 in. long over all and 8 ft. 6 in. in width. Each car is to be a combination smoker and passenger car, to seat a total of sixty passengers. The cars are to be of steel underframe construction, Pullman design, the motor cars arranged for single-end operation. The latter will be equipped with Westinghouse interpole No. 306 50-hp motors and non-automatic HL Westinghouse control. Each car will have two toilet rooms and will be heated with Gold electric heaters.

The company also has placed an order with the same car builder for two motor baggage and express cars with over-all dimensions of 49 ft. 4 in. x 8 ft. 6¼ in. These cars will have a steel underframe,

wooden superstructure and a plain arch roof. The electrical equipment of each baggage car will be similar to that of the motor passenger cars, except that the baggage cars are to be for double-end operation.

To accommodate the additional cars required by the extensions and increase of local business, the carhouse at St. Lambert has been enlarged from three tracks for eight 50-ft. cars by a 200-ft. x 55-ft. addition, housing four tracks, which makes the total capacity twenty-four cars. A 125-ft. x 30-ft. annex is used as a general office and operating quarters. All heavy repairs, however, are carried on at the St. Charles shops of the Grand Trunk Railroad.

#### SERVICE AND ENGINEERING

The best headway on this system is the twenty-minute service between Longueuil and Montreal. A two-hour service is given to Richelieu and Marieville, while the stub-line service to St. Lambert and Country Club varies greatly in accordance with traffic conditions.

The line was constructed by the railway company's forces under general direction of W. B. Powell, general manager, according to plans and specifications prepared by B. J. Arnold. All the work was also under the supervision of Mr. Arnold, who was represented in the field by A. T. Hunt, assistant engineer.

#### STATISTICS OF RAILS AND PIG IRON

The Bureau of Statistics of the American Iron and Steel Institute has issued bulletins containing figures for the total production of all kinds of rails and of pig iron by grades in the United States in 1913. The production of all kinds of rails in 1913 amounted to 3,502,780 tons, against 3,327,915 tons in 1912, an increase of 174,865 tons, or over 5.2 per cent. Included in the total for 1913 are 195,659 tons of girder and high T steel rails for electric and street railways, against 174,004 tons in 1912 and 205,409 tons in 1911. The maximum production of all kinds of rails was reached in 1906, when 3,977,887 tons were rolled, or 475,107 tons more than were produced in 1913.

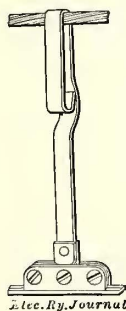
Of the total production of rails in 1913, 3,303,944 tons were rolled from open-hearth Bessemer and electric steel blooms or billets, against 3,165,939 tons in 1912; 43,793 tons were rolled from new seconds, defective new rails and steel crop ends, against 42,586 tons in 1912, and 155,043 tons were re-rolled from old steel rails or were renewed steel rails, against 119,390 tons in 1912.

Included in the 157,479 tons of rails rolled in 1913 and classified as electric and re-rolled steel are 2436 tons of rails rolled from electric steel and 155,043 tons of renewed rails or rails rolled from old steel rails which the makers were unable to classify as open-hearth or Bessemer. In 1912 there were 3455 tons of rails rolled from electric steel and 119,390 tons rolled from old steel rails or from renewed rails. Twenty-five works in thirteen states rolled or re-rolled rails in 1913, as compared with twenty-four works in twelve states in 1912.

#### FIG IRON PRODUCTION IN 1912 AND 1913

Grades—Gross Tons	1912	1913	Inc. or Dec.	Per Cent
Bessemer and low-phos.	11,664,015	11,593,385	†70,630	†0.6
Basic	11,417,886	*12,537,746	1,119,860	9.8
Foundry and ferro-sil.	5,073,873	5,219,918	146,045	2.8
Malleable Bessemer	825,643	923,736	168,093	20.3
Forge pig iron	469,183	324,832	†144,351	†30.7
Spiegeleisen	96,346	110,338	13,992	14.5
Ferro-manganese	125,378	119,496	†5,882	†4.6
White and mottled, direct castings, ferro-tit., etc.	54,613	66,850	12,237	22.4
Total	29,726,937	30,966,301	1,239,364	04.1

\*Includes a small quantity of basic pig iron made with charcoal.  
†Decrease.



Catenary Suspension

# Electrical Night of New York Railroad Club

The Principal Feature of This Meeting Was an Address by Emil Huber-Stockar on Swiss Electrification—  
Particulars Were Also Given by Other Speakers on American Electrifications

The tenth annual electrical night of the New York Railroad Club was held on Friday, March 20. The principal feature of the evening was an address on "Swiss Electrification" by Emil Huber-Stockar, permanent consulting engineer on electrification Swiss Federal Railways. The speaker was introduced by C. O. Mailoux, president American Institute of Electrical Engineers, New York, as a member of a family which had done notable work in electric transmission and traction. Previous to his connection with the Swiss government, Mr. Huber was manager of the Maschinenfabrik Oerlikon.

## MR. HUBER ON SWISS ELECTRIFICATION.

Mr. Huber, in opening his address, reviewed the development of electric traction in Switzerland to date. The first electrification had been made as early as 1894. A three-phase line had been built in 1899. Shortly thereafter an 800-volt d.c. third-rail line had been constructed, and this was followed by the three-phase electrification of the Simplon tunnel. The last large work was the 15,000-volt single-phase electrification of the Lötschberg Railway, which now has thirteen locomotives and three motor cars. Of the 319 km (198 miles) of electrified railways in all Switzerland, 210 km (130 miles) were single-phase, and of the latter mileage 146 km (91 miles) were operated at fifteen cycles. It was apparent that Swiss engineers had enjoyed excellent opportunities for studying the principal systems of electric traction at home. The standard-gage railways of Switzerland amounted to 3400 km (2108 miles), of which 2800 km (1736 miles) were owned by the government.

The saving in operating expenses was not the principal object in the general electrification of the Swiss Railways, because for their conditions the possibilities of steam traction were not exhausted. Still, it might be said that Switzerland was nearer a general electrification than any other country in the world, because it was public policy to bring this about in a country which has no coal and plenty of water-power. The principal benefits to be obtained from electrification were the raising of speeds on grades, the increase of tonnage per train, the elimination of extra and pusher locomotives, and, last but not least, the elimination of smoke in tunnels to encourage travel and reduce track maintenance.

Mr. Huber then gave an abstract of the report made by the board of managers to the board of directors of the Swiss Federal Railways, substantially as published in the *ELECTRIC RAILWAY JOURNAL* for March 21. He drew special attention to the fact that in Switzerland the greatest hindrance to getting the full benefits of electrification was that the weakness of car couplers usually prohibited a greater drawbar pull than 10,000 kg (22,040 lb.) at the end of the locomotive. For train weights exceeding 300 metric tons it was necessary to have a pusher. For passenger service it would probably be possible to go to higher train weights, owing to the stronger construction of the equipment. He feared that it was too late to go to the draft-rigging practice of America.

Referring to the question of system, Mr. Huber said that the Electrification Commission (see *ELECTRIC RAILWAY JOURNAL* March 7, 1914) had recommended the single-phase system, although the costs of the three systems were not greatly apart, for the reason that sin-

gle-phase would give the greatest flexibility in speeds on the Swiss railways as a whole. However, no final decision was essential at this time because further data could be gathered while the power plants were being constructed. If the single-phase system was adopted ultimately, it was quite possible that half-voltage—7500 volts—would be used during the transition period from electricity to steam in order to avoid troubles from the deposit of smoke on the insulators, etc. Regeneration had been carefully studied, but it was of no importance so long as it could not save any water.

## REMARKS BY GEORGE GIBBS

William McClellan, chairman of the electric traction committee, New York Railroad Club, then introduced George Gibbs, consulting engineer Pennsylvania Railroad, New York. Mr. Gibbs referred briefly to the Norfolk & Western electrification, the first split-phase locomotive of which had just been tested at Pittsburgh. The electrified section would be ready for experimental runs in the autumn and would be completed in the early winter of 1914. The catenary system would cover 30 miles of route or 90 miles of single track. All of the lines were double-tracked except 4000 ft. of tunnel, which is single track. In this case it was cheaper to increase the capacity of the line by electrification than by double-tracking the tunnel or building a relief line. On the 30-mile section 65,000 tons a day were carried eastbound, and of this tonnage 48,000 tons was revenue business. This tonnage was composed exclusively of coal gathered from mines along the route and so was in addition to through business. The local business amounts to twenty trains a day. The trains started out empty and gradually picked up cars until they had a maximum load of 3250 tons trailing, which was hauled up a 2 per cent grade. With steam operation it was customary to use three Mallet engines, consisting of a head engine, helper and pusher. This combination would be replaced by a front and a rear electric locomotive. Each locomotive was a double unit weighing 130 tons, of which 110 tons was carried on the drivers. The locomotives were carried on six driving wheels with a pair of trailing wheels at each end. Guiding wheels were used because the curvature amounted to fully 42 per cent of the total trackage. The maximum drawbar pull of a half locomotive was 48,000 lb. during acceleration and 38,000 lb. during running. The maximum tractive effort of 62,500 lb. was equivalent to a drawbar pull of 100,000 lb. at the head of the train during acceleration, or five times the figure admissible on the Swiss Railways. Single-phase current at 44,000 volts would be transmitted to the 11,000-volt contact line from a power house containing 9000-kw single-phase generators. On the locomotives a phase converter and transformer are used to transform the current for use in three-phase traction motors.

Mr. Gibbs then discussed the reasons which led the Pennsylvania Railroad to undertake the electrification of the Chestnut Hill and Paoli suburban trackage at Philadelphia. It was important to relieve the congestion at the Broad Street yards and, particularly, one junction where six routes converge. Electrification would improve the capacity of this throat movement by 16 to 20 per cent, enough to relieve the situation for the next five or six years and at less expense than any other method.

The Pennsylvania Railroad was also co-operating with the Westinghouse Electric & Manufacturing Company and the New York, New Haven & Hartford in adapting the mercury rectifier to locomotives. The Pennsylvania Railroad had loaned to the Westinghouse Company a standard steel car which is equipped with four 225-hp motors. A mercury rectifier and transformer had been placed in the baggage compartment for the experimental service. After very promising trials at Pittsburgh for some months, the car was now in experimental service on one of the lines of the New Haven company.

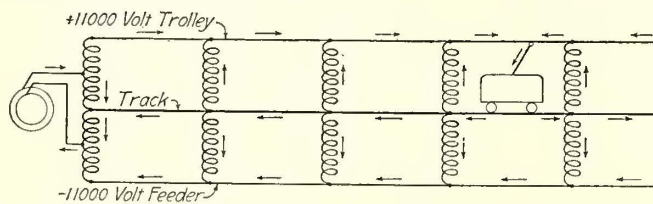
In conclusion, Mr. Gibbs deplored the tendency of electrical manufacturing companies to identify themselves exclusively with some one system of electrification. He complimented the manufacturers highly on the splendid work they had done in developing the apparatus, but he felt that only the user and his consulting engineer could make a decision which would be free from commercial bias. Certainly, the tactics of an engineer-salesman should not be presented in the guise of engineering advice.

#### REMARKS BY A. H. ARMSTRONG.

A. H. Armstrong, engineer railway department General Electric Company, did not agree with Mr. Gibbs that the engineer of a manufacturer was prejudiced as to systems of electrification. In fact, he said, such an engineer was likely to lean backward in his desire to avoid such a charge. As an example of satisfactory consulting engineering work by manufacturers he mentioned the 2400-volt d.c. electrification of the Butte, Anaconda & Pacific Railway, on which loads of 4000 tons were being hauled.

#### REMARKS BY W. S. MURRAY

W. S. Murray, consulting engineer New York, New Haven & Hartford Railroad, was the next speaker. He described briefly the new 22,000-volt balanced distribution system which had been installed on the New Haven Railroad to eliminate electromagnetic effects on adjacent telephone and telegraph lines. This was the last straw that had been held up against a.c. traction, and now even that straw was removed. The function of the new distribution system was to break up the cause which created the disturbing lines of force. On the day that



New Haven Railroad—New Arrangement of Conductors and Auto-Transformers to Eliminate Inductive Interferences

the system was changed over he stood in the Cos Cob power house at a telephone receiver connected to the Harlem River yards at New York, 25 miles away. With the original system in use he could not hear distinctly. After the 22,000-volt system had been substituted he could distinguish no difference in the clearness of the telephone transmission during a period of four hours while the load was climbing from zero to 23,000 kva. Under the new system there are 11,000 volts between each wire and ground, a total difference of potential between the two sides of the circuit of 22,000 volts. The rails act as if they formed the neutral conductor of a three-wire system. Auto-transformers are used to transfer the return current from the rail to an aerial circuit connected with the power house.

#### MR. STORER ON NORFOLK & WESTERN LOCOMOTIVES

The last speaker was N. W. Storer, Westinghouse Electric & Manufacturing Company, who described the articulated double-truck locomotives of the Norfolk & Western Railway with the aid of a series of slides. This locomotive has the parallel-rod drive common to steam locomotives, the transmission from each pair of motors being obtained through one jackshaft. The first locomotive had now been on the test track at Pittsburgh for six weeks, and the entire system had operated perfectly. All the weight was spring-supported to the same extent as in steam locomotives. The electrical characteristics of the locomotives were, of course, the same as those of a straight three-phase machine. The Norfolk & Western type was designed for the fixed speeds of 14 m.p.h. and 28 m.p.h. Originally cascade connections were provided to give the further speed of 7 m.p.h., but the railway requested that this be omitted as too low for service.

The phase converter itself was an induction motor with a squirrel-cage winding driven by single-phase current from the transformer, and the other phases were obtained on the plan of the Scott two-phase, three-phase method. This type of machine was particularly desirable for heavy freight service, because it gave the same speeds on down-grades and up-grades. The one-hour rating of each locomotive was 1650 hp at 14 m.p.h. and 2000 hp at 28 m.p.h. It had tractive effort of 45,000 lb. at the lower speed and about 25,000 lb. at the higher speed.

A feature of the motor construction was that the stator and armature could be lifted bodily from the machine and that the armature bearings were carried in the side frames of the locomotives. The motor was of the standard induction type, the rotor having three collector rings on each end. The winding was as solid as an induction motor winding could be. The phase converter had a starting motor to bring it up to speed. The phase converter also drove the fan motors and the compressor. The speed changes from the eight-pole to the four-pole combination were made by means of a commutating switch operated by compressed air.

The dynamometer tests made at Pittsburgh gave very interesting results. The locomotive used weighed 140 tons, which was somewhat heavier, both mechanically and electrically, than calculated. However, the later locomotives would weigh 125 to 130 tons each, as desired. The tractive effort of the first locomotive during acceleration, with a trailing load of 1280 tons, went up to 45,000 lb., and the speed came up very smoothly. A liquid rheostat was used for the latter purpose. It was possible to get a jerk in bringing up the speed, but this was inexcusable. Smooth starting was especially desirable for heavy trains on grades.

Mr. Storer also presented a record of standing tests which, like the other tests, were made on March 9, 1914. Not enough power was available, however, to show what could be done with four motors. With motors Nos. 1 and 2 the tractive effort, dead pull, came up to about 39,000 lb.; with motors Nos. 3 and 4, 43,000 lb. was secured without slipping the wheels. About 112,000 lb. weight was exerted upon the drivers, and the very high coefficient of adhesion of 86,000 lb. tractive effort was secured on the entire locomotive with practically a dead straight pull. He was satisfied that they were going to have a locomotive that would fulfil every detail of the specifications. The rest of the locomotives had now been released and were being built as rapidly as possible.

After a vote of thanks had been tendered to Mr. Huber and the other speakers the meeting was adjourned.



# New York Electric Railway Association Convention

At the Nineteenth Quarterly Meeting of the Association, Which Was Held at Lake George, N. Y., on March 21, the Whole Program Was Devoted to the Consideration of "Safety First"—Abstracts of the Papers and an Account of the Proceedings Are Published

The nineteenth quarterly meeting of the New York Electric Railway Association was held at Lake George, N. Y., on March 21. President Hedley welcomed the delegates with a brief opening address and spoke of the value of opposition in throwing light on all sides of any matter under discussion. He advised the delegates to question freely any of the points made in the various papers and then called for the first address scheduled for the meeting.

This was a paper prepared by J. S. Doyle, superintendent of car equipment Interborough Rapid Transit Company, New York. Mr. Doyle was prevented from attending the meeting, owing to an extraordinary press of work which kept him in New York, and his paper, entitled "Practical 'Safety First,'" was read by C. C. Dietz, secretary of the association. An abstract appears on another page of this issue.

In the discussion which followed, W. H. Collins, general manager Fonda, Johnstown & Gloversville Railroad, pointed out that any of the movements, such as "safety first," which were made the subject of analysis should be followed up in an analytical way. They did not amount to much unless this was done. President Hedley, in answer to a question, stated that some of the low-level, center-entrance cars described in the paper had been in service in New York for about a year and that they had never had a boarding or alighting accident with them.

James P. Barnes, general manager Syracuse & Suburban Railroad, said that in considering a type of center-entrance car for use in the city of Syracuse many difficulties had been encountered. Among these were unpaved streets and places where the cars actually swung over the curb. It would be necessary to make physical changes in some streets before the low-level car could be used. There were two types now under consideration, he said, but the necessity for taking on a new type of car entirely different from the ones already in service involved difficulties. He expected to see a number of interesting compromise types develop in the near future.

Harry A. Bullock, staff assistant to the president Brooklyn Rapid Transit System, presented the next paper entitled "Safety Organization." This appears in abstract elsewhere in this issue. Discussion was postponed until after the other papers which were scheduled for the meeting had been read.

Following this Edward A. Maher, Jr., assistant general manager Third Avenue Railway, New York, presented a paper entitled "Possibilities of the Safety Campaign," which is abstracted elsewhere. During the course of his address Mr. Maher stated that the Third Avenue system had been endeavoring to eliminate boarding and alighting accidents without going to the heavy expense of replacing all of its rolling stock. This had been done by equipping the present pay-as-you-enter cars with disappearing steps and folding doors electrically connected with the controller. This had been accomplished at the rate of two cars a day and at a cost of \$310 per car. At the end of six years it was expected that every car on the system would be equipped in this way and that boarding and alighting accidents

would be largely eliminated. He said, further, that no boarding or alighting accidents had yet occurred on any of the cars thus equipped, and he believed that this was the longest step that street railway companies could take in the "safety first" movement. With reference to the possibility of passing ordinances to prevent people from crossing streets except at street intersections, he said that such a rule had proved to be most satisfactory in European cities. Opposition was bound to develop when such ordinances were proposed, but if the matter was broached by an organization made up of representatives of the public service corporations and the large concerns having many vehicles on the public highways, the opposition could be overcome. The assistance of the civic organizations should always be obtained. In New York the problem of reducing the number of accidents and the expenses incidental thereto was most serious, as it actually amounted to the question whether a dividend could or could not be paid. There were four ways of reaching the objective point of accident elimination—first, the organization of all who used the public highway; second, the arrangement of conferences upon methods and means for remedying the accidents; third, the education of the public by such means as might be decided to be the best, and, fourth and most important, the development of thought by everyone involved.

Allison J. Van Brunt, director of safety education Public Service Railway, Newark, then presented a paper which is printed in abstract elsewhere in this issue. At the conclusion of this address the whole subject was placed before the delegates for general consideration.

The discussion was opened by Ralph M. Eisenberg, Carbolineum Wood Preserving Company, who called attention to the fact that while the judicious use of signs was wise they should be used only where danger was not evident. If all places where accidents were liable to occur were guarded by signs, the latter would be so numerous that the employees and the public would become accustomed to them and would grow correspondingly careless. The danger sign always compelled attention, but it had to be changed frequently to be interesting or for the warning to be effective. He also suggested that cautions should be printed upon pay envelopes because that was one thing that all employees were certain to read.

William H. Hyland, claim agent Fonda, Johnstown & Gloversville Railroad, continued the discussion with the statement that the railways had become unnecessarily wrought up about teaching the public. With folding doors and steps the passengers on the cars were amply safeguarded, and the only thing left was to teach the motorman that he was responsible for avoiding injury to pedestrians. With regard to educating the public he thought that the use of pictures was good, but believed that written or spoken warnings, continually applied, were better. He did not believe in sending the claim agent into the schoolroom, but thought instead that the teacher should warn the children against the dangers in the street each day before they left the school.

Mr. Bullock thought that it was practical to have safety instruction undertaken by the teacher and made a

part of the instruction in the school, but said that in the larger communities it was practically a physical impossibility to get teachers to assume the additional work of teaching safety methods. In that case the only solution was for the railroad company—or, better, the public organizations—to supply the teaching. The character of the instruction was most important, as the education of children was an exceedingly difficult psychological problem. With regard to the suggestion to regulate the movements of pedestrians upon the street, he believed that strong opposition would be encountered at the present time. He was in accordance with this idea, however, and said that in New York the police held power to make such regulations as were necessary for proper regulation of vehicular traffic. The commissioner might be approached on that subject, and in this way a beginning could be made.

Mr. Hyland stated that the present method of going into the public schools with "safety first" propaganda was spasmodic and was to some people objectionable. It lost its value if not continuously repeated. In answer, Mr. Van Brunt stated that when visiting schools within the past two weeks he had asked the school children whether they recollected his previous visits and that about 75 per cent of the children stated that they did so. He therefore felt that the lessons he had given had been of lasting value.

Mr. Barnes remarked in connection with the matter of getting people to cross streets only at the crosswalks that such an effort had been made in Syracuse and had met with excellent results. The services of the boy scouts had been enlisted for Saturday afternoons, and four boys stationed at each street intersection handed cautionary cards to pedestrians who crossed the street diagonally.

President Hedley, on behalf of the officers of the association, then extended to the four speakers the sincere thanks for the able papers presented. He requested a standing vote of thanks from the delegates as an expression of appreciation, after which the meeting adjourned.

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#### POSSIBILITIES OF THE SAFETY CAMPAIGN

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BY EDWARD A. MAHER, JR., ASSISTANT GENERAL MANAGER  
THIRD AVENUE RAILWAY, NEW YORK

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On the surface lines of the Third Avenue Railway in Manhattan and the Bronx, and in the plants and shops operated in connection with them, there has been for the past five years a steady improvement along the lines of the present "safety first" movement. In the shops the moving parts of machinery have been guarded to prevent workmen from coming into contact with them. On the streets a better rail has been installed. The question of pavement between and alongside the rail has received more systematic attention. The old cars are rapidly giving way to the pay-as-you-enter type with folding doors and disappearing steps. Employees in charge of cars receive instruction touching upon all branches of operation in special schools. At stated intervals lectures are delivered by division attorneys, and there is a persistent effort to raise the standard of platform men by making their employment congenial as well as remunerative.

In brief, this is what has been done along the lines of safety by the Third Avenue system. The company is, however, a long way from the elimination of accidents. During the year ended Dec. 31, 1913, there were 26,981 accidents. These have been classified as follows: boarding, 18.39 per cent; alighting, 20.23 per cent; knock-down, 10.32 per cent; car collision, 9.41 per

cent; vehicle collision, 26.68 per cent; employees, 7.49 per cent; miscellaneous, 7.49 per cent. Of these 26,981 accidents, 1801, or 6.67 per cent, occurred to minors, and while the exact figures are not available, it is safe to say that not more than two-thirds occurred to persons under the age of fifteen years. Therefore, only about 4 per cent of the accidents occurred to children.

The boarding and alighting accidents together, amounting to 38.62 per cent of the total number, have received a great deal of thought, as a large percentage can be eliminated when the cars are equipped with folding doors electrically interlocked with the controller. Experience with the cars already equipped justifies this opinion.

The combined knock-down and vehicle-collision accidents represent 37 per cent of the total, and it is probable that a large majority of these are due to the negligence of the persons injured. There seems to be no hope of reaching many of these unless they can be brought to realize that when using the public thoroughfares they were constantly in danger. One step in this direction would be the formation of an organization of which the membership would consist of representatives from all of the large concerns having a number of vehicles in use daily on the public highways. After the formation of such an organization there should be urged upon its members a scheme of additional compensation for drivers based upon efficient handling of vehicular traffic. So long as the employees of these business concerns avoided accident they should, in some part, share in the saving enjoyed by their principals. One of the first things that such an organization should do is to obtain the passage of an ordinance providing that pedestrians might cross the street only at street intersections.

The types of accidents referred to as car collisions and accidents to employees may be combined as next in line of importance. In 1913 these constituted 16.89 per cent of the total. I am free to confess that I do not know any remedy for these classes of accidents. We do not find car collisions limited to inexperienced employees, so they cannot be attributed to lack of training or of knowledge. However, there are two things that may go some way toward eliminating them. First, rigid discipline and the strict enforcement of a rule that a motorman who participates in a car collision shall suffer; second, that the motorman who goes through a year's service without a collision of any kind shall profit thereby. However, there are so many things that enter into this class of accidents that it is a physical impossibility, to my mind, for anyone to map out a method of procedure that would come anyway near eliminating it. If it were possible to have uppermost in the mind of every motorman the constant thought that "in all cases of doubt or uncertainty the safe course must be taken and no risks run," many car collisions would be avoided.

Under the head of miscellaneous accidents were 7.49 per cent of the whole number. These were of various kinds, including interior accidents, tearing of clothes, assaults, and the like, and so far as these are concerned there is no evidence that their number could be substantially reduced.

The number of accidents suffered by children under the age of fifteen has been shown to represent only about 4 per cent of the total number. That even this small number should be eliminated is, of course, desirable, but in the city of New York, where the streets are the children's playground, it seems doubtful that this goal can be actually reached. However, it is incumbent upon us to use every effort within our power to impress upon their minds as well as upon those of adults that continual thought is a necessity to any safety movement.

## PRACTICAL "SAFETY FIRST"

BY J. S. DOYLE, SUPERINTENDENT OF CAR EQUIPMENT INTERBOROUGH RAPID TRANSIT COMPANY AND NEW YORK RAILWAYS COMPANY

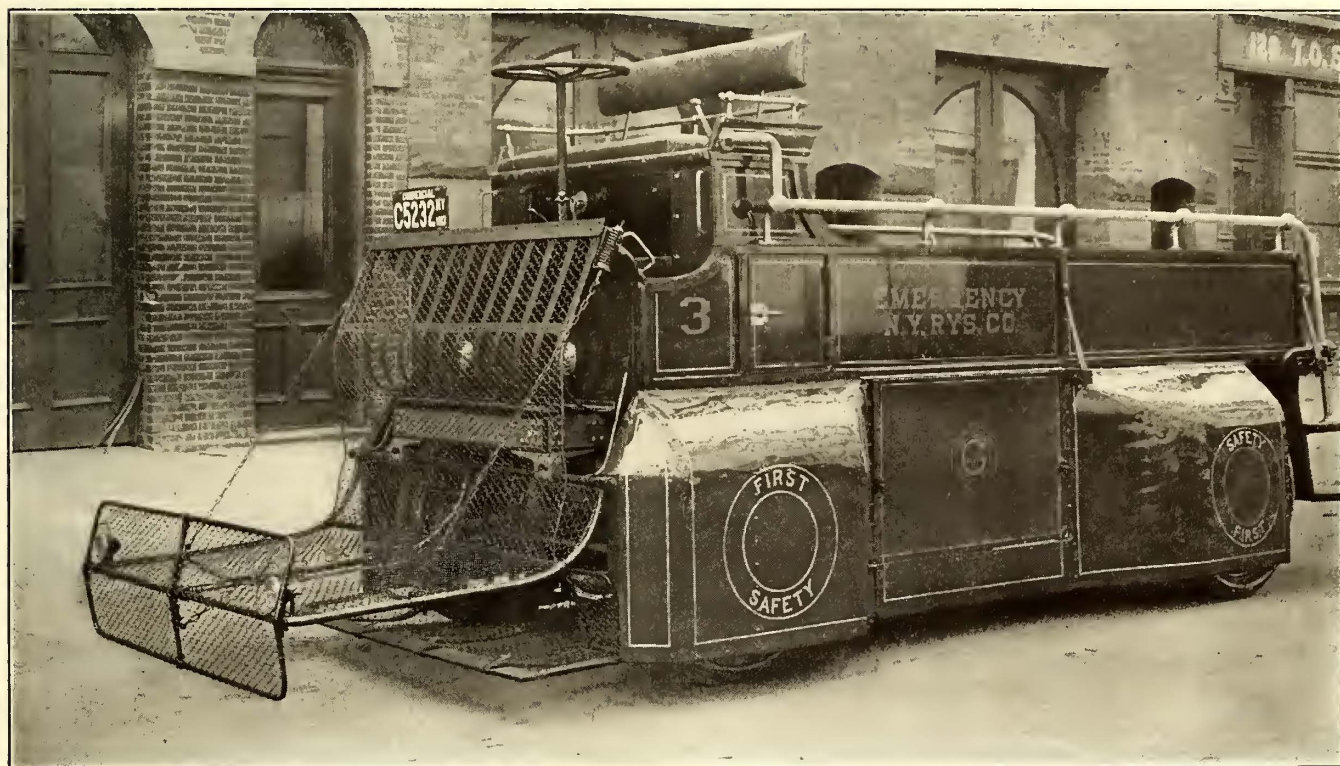
One of the most notable advances in the protection of passengers on electric traction properties in this country has been accomplished through modifying the design of street car equipment.

Boarding and alighting accidents on the ordinary types of street cars have caused more economic loss to our communities than any other single item, and it is gratifying to be able to say that this feature of our big problem has been satisfactorily solved.

When the New York Railways properties were turned over to the Interborough Rapid Transit Company's officers for operation one of the first problems confronting the new management was that of accident preven-

minimize front-end accidents to street pedestrians. A careful analysis of the situation indicated that, although various types of wheelguards now in use are a very creditable addition to safety, they by no means afford the protection desired. An accidental collision with a standing street pedestrian introduces the possibility first of an injury to the skull or spinal column from impact with the front of the car and a further hazard of the same nature when the pedestrian is thrown to the street pavement. If the person has been fortunate enough to escape these very grave dangers, and a careful analysis of operating conditions indicates that a number are not, the wheelguard then comes into play, and whatever remains of the unfortunate is gathered up by the wheelguard apron.

It is apparent that street pedestrians should not be permitted to come in contact with the solid front of cars, but that the principles involved in the original lifeguard, as usually designed, should be brought into



Safety First in New York—Gasoline Emergency Wagon with Fender and Housing for Wheels

tion, which finally resulted in the creation and development of a continuous low-level center-entrance car.

It was found that provision had been made for the prevention of premature starting of cars through connecting the door operation with the car-control circuits, thus eliminating the possibility of a car starting with doors open, but nothing had been done to prevent the premature opening of car doors when cars were in motion. This was accomplished by utilizing the motion of motor armatures as an element of car movement to keep the doors stationary while cars were en route. The electromotive force generated by the motor armatures was in this way utilized to interlock and keep the car doors closed until the rotation of the motor armatures stopped, whereupon the doors were again under the control of the conductor. If for any reason the car doors locked in this manner had to be opened while the car was in motion, the conductor was provided with an emergency stopping valve, which, when operated, caused the car to stop, and when the car was stopped, the conductor, of course, was able to open the doors.

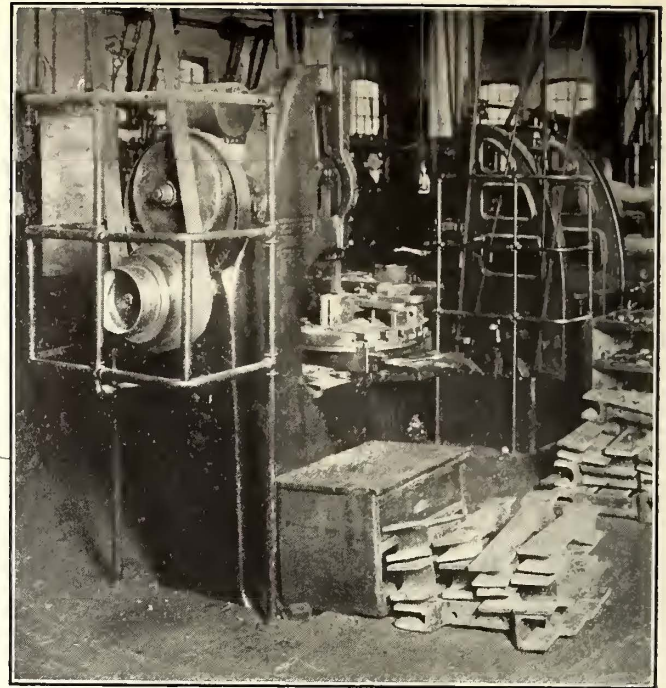
The next most important part of the problem was to

play, and the unfortunate pedestrian should be tripped below the knee line and gathered up in an extending device designed to eliminate the possibility of head or spinal injuries. In addition to this, it was also absolutely necessary that the function of the present-day wheelguard be combined with the extending lifeguard. In other words, all the protection that has been established by years of practice in both these devices—that is, the wheelguard and lifeguard—should be consolidated into one device.

One of the illustrations of the new fender shows the pedestrian in the act of falling upon the lifeguard, the tripping gate having moved to a position to fill the gap between the bottom of the lifeguard and street pavement, which movement also, it should be noted, instantly shuts off the power to the motors and applies the brakes. This further reduces the hazard of accident through stopping the car in half the distance necessary in the case of ordinary cars. When the pedestrian lies prostrate upon the street pavement, a typical wheelguard action occurs, except that the gate operation in this case instantly shuts off the power and



**Safety First in New York—Air Hammer with Safety Latch Held Open by Left Hand of Operator**



**Safety First in New York—Slotter and Planer with Pipe Railing Protectors for Belts**

applies the brakes. Another cut shows the function of the life fender gate. This action causes the truck apron to fall on the track in position ready to gather up the body; meanwhile the gate motion has instantly shut off the current and applied the brakes.

The lowering of the car body to within 6 in. of the street pavement also has a value, for accidents of the character in which people are struck by automobiles, cars or wagons and are thrown against the side of cars going in an opposite direction. Such accidents frequently result fatally in the case of the old types of cars because the unfortunate person is thrown beneath the moving wheels, whereas in the case of the low-level car the distance between the car and pavement, 6 in., is

too small to permit a person to roll beneath the car body and thus be run over by the car trucks.

White-enamel grab poles have been installed throughout the interior of the car for the purpose of preventing what are known as "knock-down" accidents, or accidents where passengers are unexpectedly caught off their balance when a car starts or stops and thrown to the floor.

The combined lifeguard and wheelguard is also being tried out on the New York Railways Company's automobile trucks as shown in an illustration.

In addition to the fender, the low-level idea contained in the design of our center-entrance cars was adopted for the automobiles by carrying a sheet-iron



**Safety First in New York—Fender Gate Acting with Fender by Raising Pedestrians' Feet from Ground**



**Safety First in New York—Action of Fender Gate in Dropping Wheelguard**

cover to within 5 in. or 6 in. of the ground. In highly congested streets, such as those in New York City, the number of fatalities that are caused by people being knocked down or thrown between the wheels of moving vehicles is very large, hence the idea of installing what may be termed a "longitudinal side-wheel guard."

Traffic regulations in New York City prohibit the operation of moving automobiles within a 15-ft. zone of a car unloading passengers, and it is with this particular point in mind that allusion is made to the combined movement of automobiles and street cars. If this statute could be rigidly enforced, a very great saving in the prevention of injury and loss of life would be made.

Cautionary warning signs should be displayed, both within and without cars, and we have tried one of them, but it is an experiment at present. This sign is connected with the center-door operation and extends over the roadway the instant that doors begin to open. It is simple in design, but its adoption is problematical.

What have we done to provide safety for our employees, especially our shop workers? Some of the data exhibited at the recent safety exposition showed the really marvelous results accomplished by the United States Steel Corporation as the product of six years of safety endeavors. A reduction of 43 per cent in accidents to employees was accomplished, and the lives of an army of 9000 were saved.

It is generally conceded that shop safeguards now in vogue among the principal industries and railway organizations will result in a saving of from 30 to 40 per cent in shop accidents. Some of the cuts shown are illustrative of the protective devices used on machines in the shops of the Interborough Rapid Transit Company and the New York Railways Company.

#### ORGANIZATION FOR A "SAFETY FIRST" CAMPAIGN

BY HARRY A. BULLOCK, STAFF ASSISTANT TO THE PRESIDENT BROOKLYN RAPID TRANSIT SYSTEM

At the outset I wish to state that the Brooklyn Rapid Transit System has not yet adopted within its own working force any specialized safety organization of a general character. We are going slowly in that particular for the reason that we are now operating very efficiently as regards safety. In 1902 damages consumed 6.88 per cent of the gross earnings and legal expense was 1.87 per cent additional. In 1907 damages required 3.86 per cent of the gross earnings, while legal expenses required 1.85 per cent. In 1910 damages had been reduced to 2.66 per cent of the gross, and legal expenses to 1.75. In 1913 damages required but 2.51 per cent and legal expenses but 1.16 per cent, making a total of 3.67 per cent for both damages and legal, the latter item including all legal expenses and not simply those attributable to damages.

This result has been accomplished largely through the care used in the continued instruction of employees in all departments and also by an intelligent study of accidents as they occur. A comprehensive classification forms the basis of continuous study by the train department and by operating, mechanical, electrical and way departments, and this is of the utmost value in checking the results of inspection of track, structures and equipment and also in the instruction of operating employees.

We believe thoroughly in co-operation between departments and we are looking forward to the organization of a central safety committee consisting of the heads of the departments affected and certain of the executive officers. This committee will assume the per-

manent direction of our various specialized safety activities.

My personal view inclines toward the establishment under such a general committee of two bureaus. One of these should be a bureau of public safety and the other a bureau of safety inspection and investigation which, by the assignment of qualified men from different departments, will conduct a continuous inspection throughout the system similar to that which is maintained in connection with the fire hazard. I also incline to the belief personally that this inspection bureau should have facilities for making special investigations of accidents from the point of view of prevention.

Co-operation seems to be a necessity, and the best method of obtaining it seems to be the organization of a central safety committee as above outlined and the establishment, under such a committee, of the bureau of inspection and investigation with a staff selected by the various department heads who compose the central committee. There should also be a competent supervisor who should be recognized as one of the important officials of the company. In this way, on one hand, we can avoid the difficulty inherent in the isolation of each department's safety activities and, on the other hand, we can steer clear of the perils of creating an outside agency unrelated to the routine operation of the road and more or less likely to clash with those engaged in such routine operation. We have also the proper basis for the study of the problem of public safety, because the bureau of public safety can co-ordinate with the bureau of inspection and investigation, and this will put the central safety committee in a position to handle the education of the public in a most intelligent manner and without undue tax upon the time of the department heads themselves.

The organization of safety committees among the men themselves should, I believe, be coupled with the central safety organization. Safety committees of the rank and file are unquestionably the most common form of safety organization in all classes of safety campaigns, and their popularity appears justified.

Two reasons underlie this statement. This first is the general recognition that the spirit with which a large force of men undertakes its work depends to a considerable extent upon the participation allowed to them in determining the conditions under which their work is performed, although any attempt at unrestricted application of the idea would probably lead to trouble. However, in the matter of depot discipline we have succeeded, on the Brooklyn Rapid Transit System, in a trial lasting now for a year and a half, in placing the responsibility for the proper conduct of employees in and about one of our club rooms largely upon the shoulders of a house committee elected by the men themselves. The experiment has been an unqualified success.

The second reason is that any central bureau of inspection which may be established can have at best only a limited force. Departmental inspection must necessarily be limited as to time as well as in the number of men engaged in it. However, if by the organization of safety committees the entire working force of the company can be enlisted in the work of inspection, a remarkable continuity and minuteness of inspection can be attained. I do not believe that such inspection, through the encouragement of men to report danger points or danger processes to their safety committee, is a complete substitute for inspection by a central bureau. The safety committee must necessarily have a rotating membership so that many men can get the actual beneficial training resulting from service on such committees. Such committeemen, therefore, cannot be expected to become skilled observers, and many

conditions apparent to the trained eye must be likely to escape notice of the safety committee, however efficiently it may be organized.

The bureau of inspection and investigation, as has already been pointed out, does not need more than a limited staff. Indeed, I have been informed by one of the leading safety engineers of the country that such inspection could be efficiently conducted on a system like the Brooklyn Rapid Transit with one man for the mechanical department and one for the department of way and structures. There might also be one man for the electrical department whose observations should include conditions involved by the transmission of current through the streets. These three men would work under a general supervisor who would require a limited stenographic and clerical force.

Underlying this plan of organization one or two principles must, in my judgment, be strictly observed. First, there must be an open-mindedness on the part of superintendents, heads of departments and executive officials with regard to trying out suggestions that involve some little expense. Second, there must be a liberality of expenditure for educational literature. Third, much thought must be given to making safety education interesting and attractive, and I wish to lay emphasis on the use of moving picture lectures among the men and wherever possible among their families. I found no difficulty in Brooklyn in interesting the Vitagraph Company of America in making a safety motion-picture film when we were able to supply a subject that made such films attractive to the general public.

The Vitagraph Company gave us one film free and is preparing, in co-operation with ourselves, the Brooklyn Committee of Public Safety and the Fire Department of New York City, to stage a fire scene on a similar basis. The Vitagraph Company is, of course, reserving the commercial rights to the film. I believe that within a comparatively short time there will be in existence a substantial number of safety films which can be reasonably obtained by any railroad company not in a position to stage pictures itself. For ourselves, we have under consideration the staging of "technical" pictures to be used in depots and in shop instruction. These would hardly interest the public, and we would pay for their cost. But if they are produced we will certainly put any other company desiring to obtain the film in a position to obtain it as nearly free of cost as possible.

The fourth principle underlying the proposed plan of organization is the provision of some special method for stimulating initial activity by the men and for recognizing and continuing merit in safety inspection. There are various proposals based on what is known as "suggestion-award"—the theory under which machinery is set up for recognizing in some substantial way suggestions relative to safety or efficiency in operation. I am inclined to believe that along this line the most practical method of stimulating safety activity among employees will be developed.

I shall not attempt to discuss at length the public safety organization in Brooklyn, as I believe that street railway companies in general are fairly well in touch with what we have done. However, if anyone here is not familiar with the details of this campaign, I will gladly send a file of our public safety literature upon application. I want to say, however, that to conduct effectively a public safety campaign the railway must get the co-operation of a substantial body of representative citizens or else of some representative organization whose activities touch as many phases as possible of the life of the community. Otherwise the company will be suspected of using public facilities to advance

its own ends and much of the effectiveness of its work will be lost. In cities where there is a chamber of commerce, or a similar body, in a position to recognize civic issues, the problem is, of course, comparatively simple, always provided that the railway is ready to put up the money for the initial activities.

With such a representative organization it is possible to get into touch directly with the sources of community life, and first of all this brings us to the public schools. I am convinced that there is no place where safety education for the general public can be made more effective. We reach there the most impressionable part of the community and one of the hardest to deal with from the standpoint of safety. We instantly win the sympathy of parents and thus enlist a very substantial proportion of the adult community in the safety movement.

Ultimately I believe that there should be established, in all communities of substantial size, branches of some national organization such as the National Council of Industrial Safety. We have joined this as an individual company, and from it we are deriving great benefit through the weekly distribution of safety material. I am disposed to believe, however, that the start of any safety movement should be local in order to arouse the civic pride of the town and to obtain for any public activities the impetus of official sanction and general public sympathy.

I have one word of caution, however. Public safety and industrial safety have, like all other popular subjects, stimulated the activities of that kind of individual in the community who seeks to attach himself to the industrial structure as a salaried adviser and thus to draw as much money as possible for his advice while contributing as little as possible in actual work. It is sometimes difficult to tell when a company is approached by an institution having a reputable body of trustees whether or not the actual management of its affairs may not be in the hands of some one or more of these professional civic workers. Therefore, all companies, I believe, should scrutinize approaches of this kind with the utmost care and if possible work up the safety propaganda under conditions that will insure a proper expenditure of their money.

#### THE "SAFETY FIRST" MOVEMENT ON THE PUBLIC SERVICE RAILWAY OF NEW JERSEY

BY ALLISON J. VAN BRUNT, DIRECTOR OF SAFETY EDUCATION PUBLIC SERVICE RAILWAY, NEWARK, N. J.

On the Public Service Railway we endeavor to begin a platform man's career in such a manner that the usual thought that "accidents must happen" will not dwell in his mind. In addition to this preliminary training it is my practice to meet semi-annually practically every man connected with our transportation department and to talk with him about the conditions existing. This intensifies the keen rivalry which exists among our carhouses in the effort to eliminate accidents. The Public Service Railway has not considered it best to use printed matter extensively, as we feel that the personal appeal is the most desirable method of furthering the movement, and in January, 1912, we inaugurated a state-wide educational effort in the public, parochial and private schools to reduce accidents and spread the doctrine of "safety first."

Our method was to have competent lecturers visit the schools after arranging a schedule of dates with the superintendent of instruction. That the lesson has been lasting has been demonstrated by subsequent visits to the same schools, where our lecturers found that more than 80 per cent of the children previously

talked to remembered a greater portion of the lessons taught. Our records also prove the efficiency of the method, and since the schools were first visited no child of school age has been injured in the State of New Jersey by contact with a live wire notwithstanding the fact that thousands of live wires were down throughout the State during the blizzard of March 2, and that this resulted in the death of several adults.

We have delivered a large number of lectures at night in social centers, lodge rooms, churches and meeting rooms of drivers' unions and to boy scouts, camp-fire girls and others. Nearly 7000 people have been reached in this way. These lectures have been illustrated by lantern slides and by a film of moving pictures, which has also been exhibited in various moving-picture houses. We have prepared also a card containing warnings and suggestions to wagon drivers, but upon this no reference to our corporation appears. About 230 wagon owners employing 6000 drivers and chauffeurs have signed this card and hung it in their stables. One of our lecturers spent four weeks in the largest department stores in our cities lecturing to the women shoppers and showing lantern slides.

In New Jersey we have a new law which compels the teaching of personal safety to all of the school children. Because of the lack of immediately available funds this law has not as yet been put into effect, but there has been written a text book, in the preparation of which we have participated, and in the near future it will be put in use. At this time our lecturers are revisiting the schools, and in talking to the children this year we have been telling them that the "safety first" thought is so new that necessarily their parents have received no education along this line. We have, therefore, secured promises from the children that, while wearing the safety first button which we furnish, they will set a good example to the older members of their families.

The Public Service Corporation has a well-organized safety committee composed of the heads of its departments with the general claim agent, H. B. Drown, as chairman. To his committee are referred all matters and suggestions relative to the reduction of accidents. If the suggestions are feasible, they are adopted.

I consider that the training of platform men and the inspectors, although it is extremely necessary, will not be of sufficient value to pay for the expenditure unless the general public and the children are also educated. They should be appealed to strongly and frequently. Therefore, in conclusion, I wish to urge upon everyone connected with any claim department to devote a large part of his energy and a fair proportion of his cash allotment to the spreading of the "safety first" movement and to assist in educating the public to think of personal safety.

#### NEW YORK ELECTRIC RAILWAY ASSOCIATION BANQUET

On the evening of Friday, March 20, the New York Electric Railway Association tendered a banquet to the delegates who had assembled at the Fort William Henry Hotel at Lake George, N. Y., for the quarterly meeting on March 21. After an excellent dinner a number of addresses were made by prominent citizens of central New York, among whom were J. T. Schoolcraft, Mayor of Schenectady; Edward M. Angell, of Glens Falls; James F. Hooker, president Schenectady Board of Trade; P. C. Dugan, general counsel United Traction Company; J. H. Callanan, editor *Schenectady Union-Star*, and J. Edward Singleton, city attorney, Glens Falls. Frank Hedley, president of the New York Electric Railway Association, acted as toastmaster.

Mr. Callanan's exceptional speech was the feature of the evening, and this was made evident by the extraordinarily vigorous applause that followed his address and was later accorded to him at an informal gathering of the delegates after the banquet. He emphasized the need for men of poise in the industrial and political life of the nation, saying that, while the ultra-conservative was required to balance the ultra-radical whose desire for change kept the country from becoming stagnant, there was an unfortunate scarcity at the present time of men who were not aligned with either of the two sides and who could therefore retain an unprejudiced viewpoint of present-day affairs. The entertainment provided during and after the banquet was fully up to the standard set by previous meetings and included two-part song renditions by Messrs. Fasset and Castle.

#### THE SIXTY-CYCLE ROTARY CONVERTER IN ELECTRIC RAILWAY WORK

In the issue of the *ELECTRIC RAILWAY JOURNAL* for April 5, 1913, page 618, an account was given of the then new substations in Cleveland, Ohio, in which sixty-cycle rotary converters of 1500-kw capacity each were employed by the Cleveland Railway. At that time these machines were the largest which had been put into commercial operation at a frequency of sixty cycles, and by some engineers the experiment was considered a rather dubious one. These machines have now been in operation for a year with entirely satisfactory results, and their operation and some features of their design were given in a paper before the Cleveland Section of the American Institute of Electrical Engineers on Monday, March 23, by L. P. Crecelius, superintendent of motive power Cleveland Railway.

Mr. Crecelius stated that, in the absence of standard practice in the use of sixty-cycle converters for railway purposes, a very critical consideration was made by the company of the essential details of design. The contract for the converters contained some unusual provisions, which were discussed in the paper. Among the most important of these was the limitation of the current density and of the magnetic flux density. The former was specified not to exceed an average of 3500 amp per square inch based upon d.c. output rating, that is, considering the converter as a generator. Similarly the flux density in the teeth of the armature core was limited to 130,000 maxwells per square inch and that in the core to 65,000 maxwells, based on d.c. output at the rated load. The current density at the brush surface was limited to 45.5 amp per square inch. As the substations are largely located in residence districts, the ventilating ducts and general construction of spiders and fixtures was specified with the object of minimizing all unnecessary noise, such as vibrations, humming and high-pitched windage tones.

Mr. Crecelius said that the introduction of the commutating pole had been very beneficial, especially to converters, as it had afforded the means of increasing the output per pole, had caused a reduction in the number of poles, thus providing a marked improvement in mechanical design of the sixty-cycle converter, and had given more latitude in the width of pole face and spacing of brushes, thereby reducing the disastrous consequences of flash-overs. The commutating pole had made possible good commutation at the higher speeds resulting from the use of fewer poles. One objection to the increase in speed, however, was the resulting noise.

In addition to the noise inherent in all machines, irrespective of speed and not thought especially objectionable, there was windage and brush chatter which increased at a tremendous rate with speed. The opera-

tion of several machines, such as those under discussion, in one station without compensation for noise was out of the question, as the sounding of alarms and ringing of tell-tale bells could not be heard. The noise also had a detrimental effect upon the nervous systems of the operators, and was apt to be considered a nuisance in the neighborhood. By far the most objectionable part of the noise was due to high-pitched windage tones, but these had practically been eliminated in the present case by sealing up both ends of the armature and providing a shield behind the commutator leads. The resulting reduction of ventilation required that especially careful consideration be given to the size of the armature conductors.

Mr. Crecelius called particular attention to the increased heating resulting from the use of power factors less than unity. The use of over-excitation of the converters to produce leading wattless current sufficient to overcome the reactance drop not only involved extra heating due to the low power factor at rated load, but this effect was greatly exaggerated at overload. To illustrate this, Mr. Crecelius gave the following figures: Theoretically the ratios between the heating of the winding of a six-phase converter operated as a converter at unity power factor and running as a generator mechanically driven are: average value of all coils, 0.27 to 1; coils tapped to slip rings, 0.418 to 1. When the converters are operated at 0.975 power factor, the values become: average of all coils, 0.313 to 1; coils tapped to slip rings, 0.656 to 1. This means that the average coil has become 15 per cent hotter and the tap coil 57 per cent hotter at the same load. When the converter is overloaded to 150 per cent rating these values are: average of all coils, 2.59 times the heating at 100 per cent load and 100 per cent power factor; tapped coil, 3.63 times the heating at 100 per cent load and 100 per cent power factor. It is evident, therefore, that reactance should be held down to low values when unity power factor is essential in the supply circuit.

The provision in the contract relating to flux density was placed there on account of the company's desire to have considerable generator capacity in the machines to "drive through" short-circuits on the d.c. side. On the Cleveland Railway system short-circuits occur at the ratio of 428 d.c. to five a.c. short-circuits per annum per substation. These short-circuits, which are caused by falling trolley wires, cars opening circuit-breakers, etc., were factors to be reckoned with.

To permit starting from the a.c. side with low reactance in the armatures and the main field poles equipped with proper dampers, it was necessary to interconnect or bridge the dampers between poles to produce a squirrel-cage connection all around the field structure. This bridging of gaps between poles caused the commutating poles to become surrounded by the field damper circuits and seemed objectionable because of the possibility of making this field sluggish to load changes. In the present case, however, no objectionable influence upon the sensitiveness of the commutating pole had been noted. A low-resistance field-damper circuit of pure copper grids had been found superior to other arrangements of open and bridged damper circuits of various resistances which were tried.

Taking up the subject of the effect of commutating poles upon converters at times of hunting, Mr. Crecelius stated that, while the rotary converters in Cleveland were in general operated from turbine-driven generators, with consequent freedom from hunting, on several occasions engine-driven generators had been paralleled with the turbines and the operation of the converters carefully observed. Instantly wild hunting was set up, the pulsations of which agreed in frequency with the speed of the engine, 100 r.p.m., and violent sparking at

the brushes at very light load occurred, with flash-overs at about full load. At any stage of the load the operation was absolutely unsatisfactory. By the application of Kapp's formula it was found that the natural period of oscillation of the converters corresponded sufficiently closely with the pulsations of the supply circuit to explain the result. The experiments gave conclusive evidence that commutating poles were objectionable on converters operating on a.c. circuits, subjected to pulsations or to frequent and periodic disturbances. Therefore, reciprocating engines at customary speeds are not suitable for use in connection with 600-volt, sixty-cycle converters.

In the Cleveland converters the efficiency was high because of the liberal use of copper and iron. It was 91.8 per cent at half load, 95 per cent at full load and 95.8 per cent at one-and-one-half load, where it was maximum. As a result the substation efficiency was very high, the ratio of a.c. input to substations to d.c. output at converter terminals over a period of one month being 92 per cent.

In summing up his conclusions as to the features of sixty-cycle synchronous converter application to railway work, the author stated that pulsations in the a.c. supply circuit must be entirely eliminated, the design must include, in addition to the commutating pole, liberal proportions of iron and copper notwithstanding the high speed, and the field dampers must be very low in resistance and bridged to permit of a.c. starting. The advantages accompanying the use of sixty-cycle apparatus include the standardization of frequency, low cost and high efficiency.

#### DISCUSSION

The comments on Mr. Crecelius's paper centered largely on the matters of hunting and of the reasons for the practicability of constructing high-frequency converters. His statement that wild hunting necessarily accompanies the use of reciprocating engines was questioned. One speaker cited a case where only moderate hunting resulted with light Sunday loads when engines and turbines were operated together. For example, when the load on the reciprocating engines was from 800 kw to 1600 kw and that on the turbines was from 9000 kw to 14,000 kw, current variations were from 2 to 6 per cent. Another speaker stated that hunting may be expected when the natural period of vibration of the system is within the range 70 to 140 per cent of the regular impulses of the prime mover.

The improvements in rotary converter design were stated to be due to the increased surface speed of the armature and the decreased angular speed resulting in greater distances between brushes and in greater leakage whereby the frequency of oscillation was decreased. High commutator speeds had become possible with improved mica and better construction, but very true commutators are required at these high speeds.

High-frequency converters are coming into use rapidly, a statement made by one speaker showing the installation of 67,500 kw of capacity during twenty months, of which more than half was for railway work. The efficacy of the squirrel-cage dampers was pointed out. In one mentioned there was a substation containing a number of converters which had a tendency to hunt. A machine with a squirrel-cage damper was placed in parallel with them and largely eliminated the hunting. The continuous squirrel-cage eliminates "dead-points" and thus facilitates starting.

As a whole the discussion indicated that the sixty-cycle rotary converter is an assured success and that fear of unsatisfactory operation need deter no one from adopting it in any case where good reason exists for so doing.



# Annual Banquet of New England Street Railway Club

The Fourteenth Annual Meeting and Banquet—The Speakers Included Mayor Curley, Governor Walsh and W. H. Sawyer—John T. Conway Was Elected President for the Ensuing Year

Six hundred members and guests of the New England Street Railway Club gathered at the Hotel Somerset, Boston, Mass., on the evening of March 26 for the fourteenth annual meeting and banquet of the organization, which was one of the most successful in its history. Long before the dinner hour arrived the corridors and parlors of the hotel were thronged with members and friends renewing acquaintances and interchanging experiences. The annual meeting with the election of officers was held in the afternoon as usual. The banquet hall was tastefully decorated with the national colors, and music was furnished by an orchestra of six pieces and a double male quartet, the entertainment also including legerdemain, impersonations and other vaudeville.

At the head table were seated Governor David I. Walsh of Massachusetts; Chairman Frederick J. McLeod of the Massachusetts Public Service Commission; Mayor James M. Curley of Boston; President C. S. Hawley of the American Electric Railway Manufacturers' Association; President Elton S. Wilde and President-elect John T. Conway of the New England Street Railway Club; President William A. Bancroft, Boston Elevated Railway Company; President H. H. Crapo of the Massachusetts Street Railway Association; W. H. Sawyer, of Ford, Bacon & Davis, New York, and D. F. Sherman, vice-president Rhode Island Company, Providence, R. I. The dinner was enlivened by popular songs, and the menus were of novel design, the successive courses being featured as advertising displays in the racks of a folding pasteboard semi-convertible special car about a foot in length.

In extending a welcome to those present, President Wilde expressed his appreciation of the co-operation of the membership during the past year and introduced President-elect John T. Conway, who predicted the continuance of support and team work during his forthcoming administration and thanked the membership for honoring him with the highest gift within its power. Cornell S. Hawley, president of the A. E. R. Manufacturers' Association, was then presented as the toastmaster of the evening. Voicing the belief that this is the age of the expert, Mr. Hawley called upon Mayor James M. Curley of Boston as an expert in government. Mayor Curley urged the club members to do everything possible to bring the American Electric Railway Association to Boston for its 1914 convention and emphasized the need of New England men's co-operation on behalf of securing uniform labor laws throughout the country. He pointed out that Massachusetts is the only state in the Union whose Legislature is annually elected and criticised the tendency toward excessive lawmaking resulting from yearly sessions.

#### ADDRESS OF GOVERNOR

Governor Walsh received a most enthusiastic welcome. He extended the greetings of the commonwealth, and announced that in his first ten weeks as Governor he had not received a single complaint regarding the street railways in the State, citing this as ample evidence of the stability and high quality of the service rendered. The speaker expressed sympathetic appreciation of the struggles which electric railway

managers are obliged to carry on in order to eke out dividends in the face of constant demands on the part of the public for better service and perfected methods of operation. He pointed out that the people of Massachusetts appreciated this trying problem. He believed that a better understanding was in sight as a result of the agitation of the railroad question. "The public must not go too far in its demands," said the Governor, "and honest management will be upheld by public opinion. The day has passed for reckless and extravagant management, and the best opinion of the State is that you can operate the street railways more efficiently and more in the public interest than the public itself." Closing, he emphasized the efforts of the present Legislature to secure sound laws and urged confidence in the good intentions of its members. The Governor said that he purposed to strengthen the Public Service Commission and urged his hearers to have no fear of regulation by an honest board dealing with honestly managed companies.

#### ADDRESS OF W. H. SAWYER

William H. Sawyer, of Ford, Bacon & Davis, New York, was the next speaker. After referring to the effect of the electric railway upon the growth of communities, Mr. Sawyer said, in part:

"The expansion of the assessed value of the property in a city depends upon the building up of the territory of the city, and the amount a city can raise for its corporate purposes depends upon the assessed valuation of property. Therefore all of the city's corporate life, its fire and police protection, health, condition of streets and the many comforts of its citizens depend largely upon a constant outlying growth. A city will not expand as it should unless the means of transportation keeps ahead and reaches out into comparatively unpopulated territory. In this way electric railway development has more to do with the building up and expansion of the city than any other element. It is therefore to the best interests of the community not only to obtain from the company the best up-to-date electric railway facilities and service but to continue to extend the lines ahead of rather than to attempt to follow an increase in territory or population which cannot, from the very nature of things, increase without the means or incentive for increasing. The desire of New England to-day is to have the abandoned farms taken up. The telephone and the electric light are minor luxuries compared with the necessity of electric railways, if this back-to-the-land movement is to be accomplished.

"Adding to the direct taxation the indirect taxation in the form of paving, lights, transportation of police and firemen, loss in carrying mails, etc., the average company in that way returns to the public much more than a dollar for every dollar paid to its stockholders, and it should be noted that the public always gets its dollar while the stockholders get theirs, sometimes, may be, perhaps. In view of the importance to the city of this street railway development the city should not permit anything to hinder such an undertaking but should co-operate upon any reasonable basis to enable the company to obtain its capital cheaply and for long periods, which means long-term franchises.

"We all know that the continued development and extension of our electric railway systems is an absolute necessity if our cities and towns are to go forward, advance and prosper. But a large portion of the so-called riding public seems to have entirely lost sight of this really important fact in its almost unquenchable desire to obtain individually more expensive service, or lower fares, or both.

"It is your business as electric railway men to protect your interests, it is the riding public's right to make certain that you deal fairly with them, but above and beyond all that is the big broad civic duty of every member of the community. Until there is a change in attitude the development of electric railway enterprises requiring new money other than that necessary to protect or help protect present investments has practically ceased.

"This has been prophesied before now, but look at the figures. Taking the New England States, we find them some ten years ago with approximately 4000 miles of electric railway track, increasing at that time about 10 per cent a year. The average annual increase in track mileage dropped to approximately 4 per cent for the period 1902 to 1907, dropped to about 2 per cent from 1907 to 1912, and now, for the year 1913, the miles of new track built are absolutely insignificant, amounting to only about 1 per cent—not even keeping up with the increase in population in a portion of the country which merits constant endeavor to increase its population. It is truly appalling when we stop to realize that in neither Vermont nor New Hampshire nor Maine was there one single mile of new extension built in the last year reported by the commissions of those states.

"Much has been written, many an eloquent phrase has been spoken regarding the injustice and unfairness meted out to present investors who made your present systems possible. The sad plight of the widows and orphans has been pathetically told. All true, too true, but affecting only a minor portion of the community, mere platitudes and idle vaporings compared with the solitary, ice-cold fact that electric railway extensions have ceased, and that our communities as a whole will receive no further advantage from the many benefits accruing from new construction.

"It is certainly pertinent that we, as public citizens, vitally interested in the civic welfare of the community, stop, look, listen—whither are we drifting? Let us briefly recapitulate:

"(1) Electric railway extensions are a necessity for the future prosperity and advancement of the New England States.

"(2) The public wants, expects and needs these extensions.

"(3) Practically no new extensions have of late been built or are under serious consideration in the New England States.

"(4) It takes money to build electric railways.

"(5) There is always private money seeking investments where the profit is commensurate with the hazard taken.

"It needs no further diagram for you to see the real solution that must ultimately be arrived at."

#### THE REST OF THE PROGRAM

A gentlemen with long whiskers at the head table was then introduced as a distinguished tramway expert from Europe who would give his impressions of American electric railways. He made some humorous remarks and concluded by singing "Annie Laurie." During the last verse he removed his disguise and disclosed a well-known entertainer in Boston. During the remainder of the evening there was an attractive vaudeville entertainment.

#### BUSINESS SESSION

At the annual meeting held during the afternoon the following officers were elected:

President: John T. Conway, Brockton, Mass.

Vice-presidents: L. H. McCray, Kennebunk, Me.; J. Brodie Smith, Manchester, N. H.; Frank C. Wilkinson, St. Albans, Vt.; C. E. Learned, Boston, Mass.; D. F. Sherman, Providence, R. I.; W. P. Bristol, Hartford, Conn.

Secretary: H. A. Faulkner, Boston.

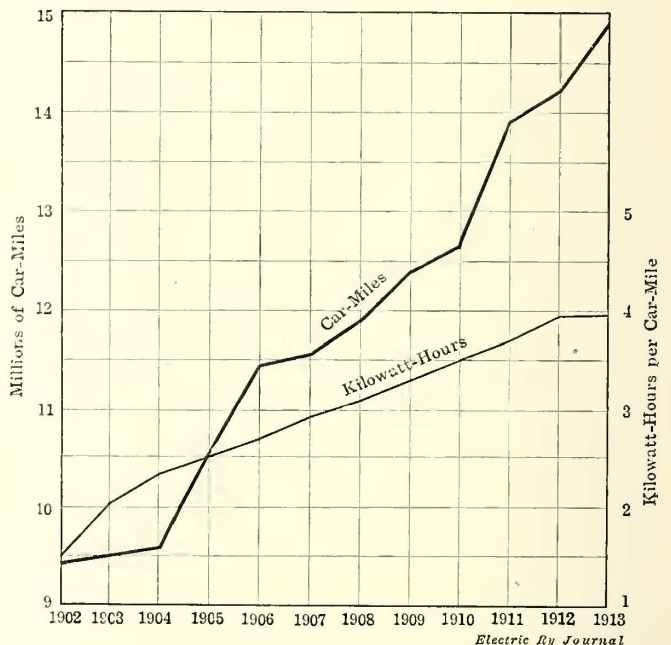
Treasurer: E. P. Shaw, Jr., South Framingham, Mass.

Executive Committee: Elton S. Wilde, New Bedford, Mass.; Harry B. Ivers, Boston; J. T. G. Nichols, Boston; William Pestell, Providence, R. I.; J. E. Dozier, Lynn, Mass.; J. W. Belling, Boston; A. A. Hale, Boston.

Finance Committee: John T. Conway, Brockton, Mass.; H. B. Potter, Boston; Robert E. Hamilton, Boston.

#### WHY POWER PLANTS MUST BE ENLARGED

In the issue of the ELECTRIC RAILWAY JOURNAL for Feb. 21 a description appeared of the modern generating station which has just been completed by the Louisville Railway Company. Although there were



Louisville Railway—Growth of Power Requirements

other reasons why a new power plant was needed, some of which were given in the article, the main one was the rapid growth of the power demand on the system. The accompanying diagram has been prepared to show the rate of increase of car mileage during the past ten years and also the rate of increase of the power consumption per car mile.

From the figure it will be noted that the increase in car mileage has been at practically a uniform rate since 1902 and amounts to about 500,000 per year. During the same period the energy consumption per car mile has more than doubled. This condition is typical of the growth that is going on in electric railway power plants throughout the country.

According to a census report just issued, there were 1562 municipal electric light stations in this country in 1912. This number compares with 1251 in 1907 and 815 in 1902.

# Mr. Huber-Stockar Discusses Electrification

This Noted Swiss Engineer Expresses His Admiration for Both the A.C. and D.C. Electrifications Carried Out at New York and Discusses Various Features of Line and Locomotive Design Here and Abroad

Prior to his departure for Switzerland on Tuesday, March 24, Emil Huber-Stockar, president of the Electro-technical Committee of Switzerland and permanent consulting engineer on electric traction to the board of general managers Swiss Federal Railways, discussed informally with representatives of the *ELECTRIC RAILWAY JOURNAL* his impressions of electrification in Europe and America.

## D.C. AND A.C. SYSTEMS

With regard to a.c. commutator motors in general, Mr. Huber expressed the opinion that many of the difficulties experienced with them were due to the rapid development of the larger-sized motors. D.c. motors had advanced slowly step by step, whereas the a.c. motor had made more abrupt advancements in capacity within a much shorter period. It was really not more difficult to make a good a.c. motor say of 200-hp capacity than a like-sized d.c. motor using 1200 volts at the commutator. For instance, when with the Oerlikon Company some four years ago he had built 1500-volt d.c. equipments for the Bellinzona-Mesocco Railway. Nevertheless, where d.c. motors were used in railway service with a trolley voltage higher than the normal motor brush voltage, as when two motors are permanently connected in series, the speed flexibility of the ordinary series-parallel system was impaired to an appreciable degree.

The third-rail was excellent in its way, said Mr. Huber. Perhaps it could be adapted for 2400-volt service, but he would prefer to let others try it first. Further, if one was compelled for economic reasons to use 5000 volts or more, direct current seemed to be out of the question to-day. High-tension direct current was really more difficult to handle than alternating current in such respects as flashing over and short-circuit currents. In fact, one valuable feature of a.c. was its reactance effect, which tended to throttle excessive currents.

He deplored the war of the systems among engineers. This war now seemed to be more pronounced in America than in Europe. The exaggerated claims and the defamatory reports of the various proponents and opponents had frightened the steam railroad man far more than any mere differences in cost.

Although he believed that for general railway problems the single-phase system was the most adaptable as to flexibility of speed, distance of transmissions and simplicity of contact line, he had nevertheless recommended the extension of the Simplon line on the present three-phase system. He favored this addition partly because it would be needless waste to discard the present equipment and partly because the extension would demonstrate whether the three-phase system was too limited in its range of economic speeds. The conditions in the Simplon tunnel, so far as moisture and heat were concerned, were not favorable, and operation at a line voltage much higher than the present one of 3300 volts might be difficult.

Referring to the Norfolk & Western electrification, he thought that the use of a locomotive with four or eight single-phase series motors would eventually have proved more satisfactory than the split-phase combination with rotating machinery and liquid resistance on the locomotive, notwithstanding the absence of commutators on the motors and the possibility of regeneration. For all that, the combination had been carried out in an admirable way. The a.c. commutator motor

really was not so formidable as to justify this complication. If the operator is content with two speeds he was tempted to ask why not go to straight three-phase operation? He realized that the admissible three-phase line voltage was too low for the Norfolk & Western, but this objection could be overcome by more substations.

If at the present time manufacturers were unable to supply sufficiently good single-phase apparatus, certain large electrifications would have to be postponed until they could.

Mr. Huber said that he would carry away a most excellent impression of the operations of all the main-line electrifications in the New York district and of the Hoosac Tunnel as well. He was particularly pleased to see that certain rumors which were going the rounds in Europe about the New Haven single-phase system were in total contradiction to the things that he saw by visits to all parts of this railway. The present splendid maintenance of the New Haven traction equipment was of especial interest to him. As an instance, he mentioned that every one of sixty commutators examined personally was in good condition. Out of a total of 100 locomotives and a number of cars only four locomotives were in the shops for some kind of attention. Indeed, the care-free behavior of the several enginemen that he observed was, in itself, pretty good evidence that their equipment was giving them very little to worry about.

The single-phase operation of the Hoosac tunnel was naturally of the greatest interest to him because of the tunnel conditions on the Swiss railways. Here, too, he found that the locomotives were giving excellent service. Only one machine was not available for service, and even this one was in the shops merely for cleaning. He was told that the insulators in the tunnel were cleaned monthly by rubbing them down with the line "dead," but this seemed an excess of caution.

## LOCOMOTIVES

In discussing the mechanical design of the Lötschberg locomotives, which were described in the *ELECTRIC RAILWAY JOURNAL* for Nov. 15, 1913, Mr. Huber said that the Scotch yoke drive was apparently too rigid for a locomotive with such an elastic frame. As the same design had proved satisfactory on the meter-gauge Rhätian locomotives, it would seem that the larger machines on the Lötschberg, Dessau-Bitterfeld and Wiesental lines had reached the critical point where the coupled masses exerted too much momentum on the driving system.

The principal electrical troubles of the Lötschberg locomotives disappeared after the end coils of the transformers had been furnished with better insulation and after the protective condensers had been so installed that they were no longer exposed to the precipitation of moisture upon them. Such mischances as these were not defects of system but natural occurrences in pioneer work. The Lötschberg motors did not heat beyond admissible limits, but some inconvenience had been caused by the commutators for reasons more mechanical than electrical. From the standpoints of acceleration and speed, these motors were perfect.

As to locomotive drives generally, there was a tendency toward the geared driving rod. Personally, he believed that the connecting rod was an alien element and that the limits of its use were still to be settled by experience.

For the passenger service of the St. Gothard Railway a double-unit locomotive of 3200 hp, one-hour rating, at 50 km (31 miles) an hour would be used. This performance could hardly be obtained from gearless locomotives with a reasonable number of driving axles. It was proposed to buy a few experimental locomotives of different types as a basis for the final decision.

Returning to the subject of gearless locomotives, he expressed the opinion that this type was most attractive in connection with direct current, provided one had to deal with high speeds on tracks which are level for the greater part.

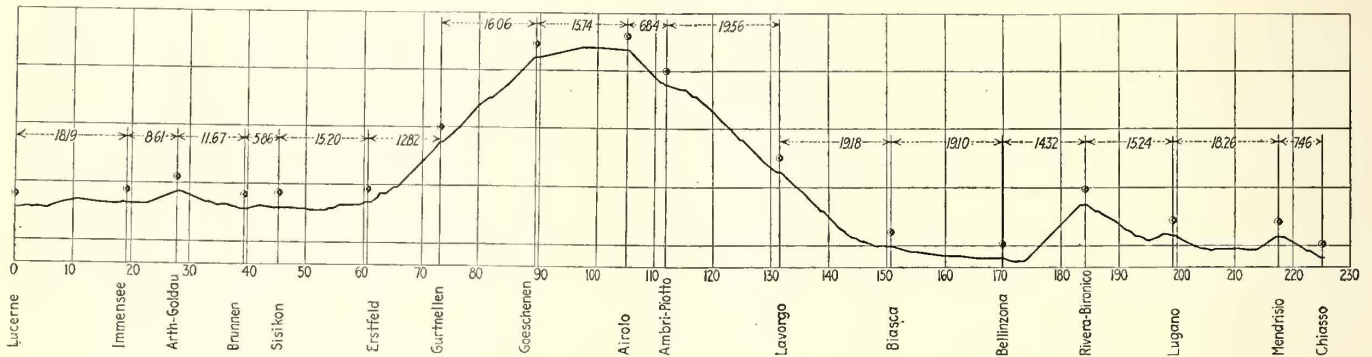
#### GENERATING CONDITIONS AND LINE CONSTRUCTION

Mr. Huber, in talking about the power situation in Switzerland, observed that the conditions of hydroelectric generation did not favor the operation of railway, lighting and industrial circuits from single plants or systems. Supply systems there might be tied

minimum clearance in the Lötschberg tunnel. The clearance between any live point on the pantograph and the tunnel vault would be 250 mm (9.8 in.). The contact line would be carried from straight-arm brackets placed toward the axis of the tunnel, and the line would be hung through five or six multiple chain insulators. A chain of insulators of the type proposed had withstood 180,000 volts dry. He did not think that it was satisfactory to use insulators of petticoat or grooved type to obtain the completely independent insulation of the contact lines of each track.

To avoid the unpleasant consequences of a train becoming stalled in the 9½-mile St. Gothard tunnel a feeder wire would be so placed between the trolley lines that an auxiliary current collector could be run under it in emergencies.

The use of steel for contact wire, he said, was almost unknown in Europe. With steel contacts on the collector and running at high speeds, the steel wire ap-



Profile of St. Gothard Railway Between Chiasso and Lucerne—Distances in Km

together for emergency purposes, but not for obtaining a diversity factor. In fact, the railway circuits were low frequency, say fifteen cycles, while lighting and industrial circuits were fifty cycles. Frequency changes were too inefficient and expensive for general installation. In the case of steam plants, it might pay to have a common station, not for the sake of the diversity factor, but for the sake of having a larger and consequently more economical plant. In Switzerland, however, the size of a plant was limited strictly by the water supply, and the interconnection of plants for even the same service was simply an operative precaution or convenience. The same conditions might apply to some hydroelectric developments in the United States.

An important advantage of the voltage control of the single-phase system from the power station viewpoint was that the starting of trains did not cause such sudden and high peaks as the d.c. and three-phase systems.

Referring to the contact line construction in the Lötschberg tunnel, Mr. Huber said that discharges had occurred only at insulators and these principally in the main tunnel. Troubles in the beginning had been due partly to the erection of the line before the track was laid, thereby causing discrepancies in the relative position of the contact line and the roadbed. However, the principal trouble was that the insulation in certain parts had proved insufficient, notably in the main tunnel where the insulators were fouled by the precipitation of dirty water from the tunnel roof.

Mr. Huber considered a 15,000-volt single-phase contact line practicable for long tunnels, but it was imperative to operate at half voltage, say 7500 volts, during the period of transition from steam to electricity. With steam entirely abolished, he would apply full voltage.

In the tunnels of the St. Gothard Railway no live point of the line would be less than 300 mm (11.8 in.) from ground. This distance was far greater than the

appeared to be necessary. An advantage of the steel contact wire was that its elasticity could be used to compensate for dilatation. In Europe brass and, more commonly, aluminum contacts were used in connection with copper trolley wires, the expansion of which must be compensated for by special devices.

He thought that the redistribution scheme of the New York, New Haven & Hartford Railroad, introduced as a protection for weak-current circuits, was a surprisingly clever solution, inasmuch as the increase in the voltage from 11,000 volts to 22,000 volts would possibly save more than the cost of the equipment. He did not believe that the devices for the protection proper would cost \$5,000 to \$6,000 a mile, as was rumored. He estimated that \$2,000 per mile, or \$6,000 to \$7,000 per substation, would be nearer the truth as only one 2000-kw transformer was used about every 3 miles. However, the New Haven solution was only one of several, and not even the cheapest. So far as experience in Switzerland taught, electromagnetic disturbances were lessened primarily by the use of a low frequency, and they were minimized by the elimination of higher harmonics in generators and motors by means of closed slots or notches set at angles; by installing aerial return wires near the trolley wires and feeders whereby boosting might be used or not; by the removal of weak-current lines to a reasonable distance from the railway line, and by the different known methods of equalizing inductive effects, as by transposition.

In conclusion, Mr. Huber stated that he could not help expressing his admiration for what had been accomplished here in steam railroad electrification. One proof of the satisfaction which these electrifications were giving to their operators was the charming frankness with which access to all parts of the lines and free permission to examine any details had been accorded to him.

PROCEEDINGS OF THE RAILWAY ENGINEERING  
ASSOCIATION CONVENTION

The committee reports presented at the fifteenth annual convention of the American Railway Engineering Association, held in Chicago on March 17 to 21, were abstracted in the issue of the *ELECTRIC RAILWAY JOURNAL* for March 21, page 664. The attendance at the convention was the largest in the history of the association. In his presidential address, Edwin F. Wendt, member engineering board Interstate Commerce Commission, after dwelling on the growth of the association, its financial affairs and committee work, took up the question of recent advancements in signals and track, the development of electric traction during the last fifteen years and the valuation of common carriers. In closing his review of steam road electrifications, he stated that "the broad future of railroad electrification is dependent upon its thorough demonstration of great economic advantages over steam. If these are shown, nothing can prevent its ultimate general introduction. If these are not so demonstrated, its limitations as regards introduction will soon be reached."

ACTIONS ON COMMITTEE REPORTS

The report of the committee on rules and organization was adopted after being slightly modified, and the attention of the association was then directed to the report of the committee on signals and interlocking. The association voted to adopt symbols approved by the Railway Signal Association and substitute them for the symbols now shown in the manual. The observations as regards economies in labor and signal maintenance and the rules governing the construction, maintenance and operation of interlocking plants adopted by four Central States were received by the association as information.

The roadway committee's report on unit pressures allowable on roadbeds of different material was received as a progress report, and after considerable discussion as to the advisability of continuing this work it was decided to continue the tests and broaden their scope. This committee's conclusions regarding tunnel construction and ventilation were adopted with minor changes. After considerable discussion regarding the use of inner-guard rails as brought up by the committee on wooden bridges and trestles the committee's conclusions were adopted. The report of the committee on iron and steel structures was accepted as information, the value of the "inhibitive stimulative" theory, however, being questioned. Discussion of other portions of this committee's report was carried over until the Wednesday morning session, when the requirements for protecting traffic at movable bridges were referred back for further consideration, and the bridge clearance diagram was referred to the electricity committee. The report of the track committee was accepted after considerable discussion, after which its chairman presented recommendations for further study. One of these provided for a study of the matter of proper seasons for various kinds of track work and the date of the beginning of the fiscal year when funds are available to do track work. The five clearance diagrams presented by the committee on electricity were adopted. The report of this committee on the question of electrolysis was received as indicating progress and the work of this committee will be continued. The conclusions presented by the wood preservation committee met with considerable opposition with regard to the limiting of the use of coal tar in creosote oil of the second and third grades. After a long discussion in which it was recommended that coal tar should also be used with Grade 1 creosote

oil as well as the other two grades, the conclusions of the committee were adopted as presented. The buildings committee report was received and approved for publication in the manual. Statistics of rail failures contained in the report of the committee on rail were received as information, and its conclusions were approved without discussion. The report of the committee on ties brought out considerable information on the merits of screw spikes under varying traffic conditions. The report was received as information.

Two forms of signs, namely, a road-crossing sign and a trespass sign, were recommended by the committee on signs, fences and crossings after a most thorough consideration of standard types and of the laws requiring their installation. The recommended crossing sign plan involved only the form and material and not the wording to be placed upon it. The discussion brought out the fact that several companies were using concrete instead of wooden posts in crossing-sign construction. The type of trespass sign recommended by the committee and adopted by the association does not include the wording shown on the drawings in the committee's report.

Further investigation of the proper depth of ballast, as well as information regarding methods and cost of cleaning stone ballast, was presented by the ballast committee. The latter was received as information, and no action was taken on the proposed ballast sections submitted by this committee. This committee received additional funds to carry on the work of investigating track stresses and will continue its work along that line.

ANNUAL DINNER

At the annual dinner of the American Railway Engineering Association, held in the "gold room" of the Congress Hotel on the evening of March 18, President Wendt acted as toastmaster and the speakers included the Hon. Charles A. Prouty, director division of valuation, Interstate Commerce Commission; the Hon. Charles Marciel, M. P., ex-Speaker of the Canadian House of Commons, and J. M. Schoonmaker, vice-president of the Pittsburgh & Lake Erie Railroad. In Mr. Prouty's remarks he called attention to the fact that within the last fifteen years the price of every article of universal and general consumption, with but one exception, had been advanced, and that exception was transportation by rail. Mr. Marciel's address was regarding the railway problems of Canada, and Mr. Schoonmaker closed with some very complimentary remarks regarding the railroad engineer of to-day. At this dinner it was announced that the following officers of the association were elected for the coming year: President, W. B. Storey, vice-president Atchison, Topeka & Santa Fé Railroad System, Chicago; first vice-president, Robert Trimble, chief engineer maintenance of way northwest system of Pennsylvania Lines West of Pittsburgh, and second vice-president, A. S. Baldwin, chief engineer Illinois Central Railroad, Chicago.

EXHIBITS

Conforming to the usual custom, the National Railway Appliances Association held its annual exhibit in the Coliseum during the week of the American Railway Engineering Association convention. As heretofore, the exhibits included a complete line of materials used in the construction and maintenance of steam and electric railroad track and roadways. At the annual meeting of the appliances association, held on the morning of March 17, Treasurer Reynolds reported a surplus of \$8,930, with no liabilities. At the close of this meeting the following officers were elected: President, Norman M. Hench, Carnegie Steel Company; vice-president, T. W. Moore, of the P. & M. Company, and treasurer, C. W. Kelly, of the Kelly-Derby Company.

## COMMUNICATIONS

### MAINTENANCE AND DEPRECIATION

BROOKLYN RAPID TRANSIT COMPANY

BROOKLYN, N. Y., March 23, 1914.

To the Editors:

The editorial on the subject of maintenance and depreciation in your issue of March 21 strikes the right keynote. There has been a great deal of confusion among public service commissions and also among expert accountants as to the theory of depreciation. The old-fashioned idea of depreciation, as it applied to a private manufacturing establishment, involved no nice scientific theories and was comparatively simple in application. The extent to which it was applied depended upon the conservatism and foresight of the business managers. In the case of public service commissions, however, depreciation is not merely a matter of business prudence but is necessarily involved in the large questions of rate making, valuations and taxation.

As I understand the latest attempt to solve this question in scientific accounting, it is that all maintenance and depreciation charges should be shown directly in operating expenses and not concealed by more or less sporadic charges to the profit and loss account. The tendency seems to be to require a uniform charge per month for the maintenance and depreciation, and if this proves to be insufficient at the end of the fiscal year, the charge must be adjusted during the succeeding year to make up for any deficiency. This idea is sound and if generally carried out would reflect accurately the burden of maintenance.

I think that observers of railway reports in the past have been struck with the great variations in maintenance charges as made by different companies operating under more or less similar conditions. The latitude heretofore allowed to railway managers and accountants in this respect has frequently offered an opportunity for great abuses in accounting. In other words, it has frequently been utilized, not necessarily to reduce the maintenance expenditures, but to divert on the books a large portion of such expenditures from operating accounts to capital accounts. Since 1901, when the paper mentioned in your editorial was read by me at a meeting of the Street Railway Accountants' Association, a wave of railroad reform has spread over the country and has produced the new laws and regulatory commissions from which all corporations are now more or less suffering. My own idea has always been that a stricter observation of one of the Ten Commandments would have obviated the necessity for a great deal of radical legislation.

The present confused opinion which your editorial so well reflects ought to be clarified by discussion, and I think that a great public service would result if a consensus of an intelligent and practical opinion could be obtained on the subject.

T. S. WILLIAMS, President.

### THE TENTATIVE SYSTEM OF ACCOUNTS

TRI-CITY RAILWAY & LIGHT COMPANIES

DAVENPORT, IA., March 23, 1914.

To the Editors:

I feel that the Interstate Commerce Commission and the committee on a standard classification of accounts of the American Electric Railway Accountants' Association are to be congratulated upon the comprehensive manner in which they have handled the revision of the classification.

I have no suggestions or criticisms to offer.

H. E. WEEKS, Secretary.

PUBLIC SERVICE RAILWAY COMPANY

NEWARK, N. J., March 25, 1914.

To the Editors:

A standard classification of accounts for an industry should keep pace with the growth of the industry and the changes in economic conditions.

The committee that has been working with the representatives of the Interstate Commerce Commission in preparing the latest uniform system of accounts for electric railways has evidently had this in mind. Their joint work has been most thorough and the classification as finally presented to carriers proves once again that electric railways have been working upon a proper basis in the past in so far as their system of accounts is concerned, for the changes that have been made are all logical developments and are not, by any means, revolutionary.

Important additions that have been made since the last classification for electric railways was issued are the classifications of income, profit and loss and general balance sheet accounts. Standardization of these accounts has not heretofore been made and the industry has, no doubt, suffered to some extent because of this lack of standardization. In all work of standardization there must be some give and take, but if accounting officers will study the new system they will find few items indeed to take exception to. The provision for a new general account, "Power," in operating expenses is a decided improvement over the old classification and a great convenience to companies which control both electric railway and electric lighting properties.

Probably the most discussion will surround the treatment of depreciation and amortization in the accounts. Fortunately few accountants nowadays differ upon the question of the desirability of such accounts being provided for, and practically only the question of method of treatment is open for discussion. The system would seem to provide a logical way for the treatment of both depreciation and amortization, though in operating expenses under the head of "Equipment Retired" an account is provided which is unnecessary if the theory as to the treatment of depreciation outlined in the accounts is followed out. This account is evidently provided for the use of companies which are not charging into operating expenses an amount for depreciation and accruing a corresponding reserve. With this account "Equipment Retired" in the classification, it would seem desirable to have similar accounts for other classes of property retired or abandoned in operating expenses under the respective maintenance accounts.

In the general account, "Power," in operating expenses it would seem as if an account "Other Operations Dr." is required. This would also conform with the same accounts under the general accounts "Way and Structures" and "Equipment" in operating expenses. It would seem desirable to provide an additional account under the general account "Power" in both road and equipment and operating expenses for underground transmission conduits, to show the separation of the transmission system between underground and overhead in the same way as shown under the general account "Way and Structures."

The provision of the equalization accounts under "Way and Structures," "Equipment" and "Power" will be a convenience to some companies, but they are optional with the carrier, with the requirement that if carried they should be cleared annually to prevent abuse. Personally I am not in favor of their use.

The balance sheet accounts have evidently been made the subject of considerable study, and their arrangement is such that the information presented in a balance sheet prepared from these accounts, together with the income and profit and loss accounts, which fol-

low accepted practice, should give investors in electric railway properties and the public clear and definite information as to the condition of the property to which they apply.

P. S. YOUNG, Comptroller.

THE AMERICAN RAILWAYS COMPANY  
PHILADELPHIA, March 25, 1914.

To the Editors:

Replying to your inquiry, I send you herewith copy of the letter which I sent to the Interstate Commerce Commission.

C. L. S. TINGLEY, Second Vice-President.

Mr. Tingley's letter, addressed to Fred W. Sweeney, chief examiner of accounts Interstate Commerce Commission, says:

"Accounts Nos. 30, 'Depreciation of Equipment,' and 40, 'Equipment Retired,' both provide sub-accounts for floating equipment. Account No. 534, under 'Road and Equipment' accounts, also provides for floating equipment, but no appropriate maintenance account is provided therefor.

"Account No. 44 provides for the maintenance of coal pockets and trestles when considered part of the power plant. Account No. 538 provides for coal trestles and pockets when part of the power plant. Account No. 525 provides for the cost of coal pockets and trestles not considered part of the power plant. Now this seems to me to be totally illogical. You are now providing a separate group of accounts to cover the cost of your power plant and a separate group of accounts to cover the maintenance and operation of the power plant so that you may get a unit cost for your power including all the elements thereof. Now we have five power plants where the coal is dumped from cars or elevated from cars and boats into bins adjacent to the power house, where there is a coal trestle which elevates the coal and delivers it to the coal pockets attached to and a part of the power house, so that without question this storage capacity and machinery for handling the coal is physically attached to and connected with and a part of the power house, and maintenance and upkeep will therefore be charged to Account No. 44. We have in another place a coal pocket situated about 40 ft. from the power house, where the coal is dumped from cars into a hopper, elevated into bins and later discharged into charging cars which are wheeled into the power house. This building is not physically connected with the power house and might very readily be considered as belonging in Account No. 525, and the maintenance thereof might very readily be charged to Account No. 24. It would therefore not become part of the cost of the production of power.

"It does seem to me that to be consistent and to secure uniform accounting all coal-storage and coal-handling apparatus used exclusively for company work should be grouped under the power classification, and that where coal for power is handled on or by structures used for revenue purposes the cost should be apportioned so that power would bear its proper proportion of the expense. I know that this question has been passed upon once before, but then the buildings were not segregated into a power group and the logic of the situation was not as forcible as it is now.

"Account No. 203: 'This account shall include amount receivable by the carrier . . . including interest on funded debt, guaranteed dividends on stocks.' Now this seems to be an undue inflation of the income account of the carrier. I have in mind one instance, a piece of road leased for a lump sum plus the interest charges and taxes. Now, one of the provisions of the lease provided for the execution and sale of additional bonds from time to time as the lessee company extended the property. Now, if the account-

ing company is required to include this bond interest which it never sees in its income account, it is going by so much to inflate its income account, it will be required to pay the federal tax thereon, and it will be taxed on its income therefrom by the state, as will also the lessee, thereby creating double taxation. I cannot assent to the soundness of this proposition from an accounting point of view, and I must most assuredly protest against it from the point of view of taxation.

"Take another example of how it would work. In the State of Ohio, for example, the lessee company would report its gross earnings to the Tax Commission, would be taxed upon them for its franchise tax, and the State Tax Commission would then proceed to value the property irrespective of its fixed charges by capitalizing 37½ per cent of the gross minus 7 per cent for taxes, at the rate of 10 per cent, thereby taxing the property as a whole as a going concern by means of its gross income. The lessor company, being required to display this bond interest in its income account, would again be subjected to the same rule and again be taxed on the value of the property already taxed in the hands of its tenant, from which there would be no escape.

"The same criticism will apply to Account No. 210. I can see no valid reason for including in your income account appropriations for sinking funds or accruals to sinking funds remaining in the hands of the trustee uninvested. They do not accrue to the benefit of the earnings of the company, they are applicable only to the reduction of its indebtedness, are earmarked and absolutely beyond its control. It is not income arising out of the transaction of its business and would be an unwarranted addition to its taxation.

"Account No. 216, and more particularly Note C, would seem to require segregation of taxes, which would not be possible. For example, under the tax laws of the State of Ohio, as stated above, your property is taxed as a whole as a going concern and not upon its physical elements.

"Account No. 224 seems to provide only for the amortization of discount on funded debt, whereas Account No. 311 would seem to contemplate the inclusion of the expenses incident to the creation of the securities based upon the mortgage such as legal fees, printing and engraving and what not. The latter seems to be the more logical proposition and conforms to the practice which our companies follow.

"Account No. 228 is subject to the same criticism as Account No. 210. It seems to contemplate an unwarranted inflation of the income account.

"Account No. 407: I must take serious exception to this account. Cash on deposit with the trustee due on demand upon coupons which have already matured is beyond the control of the company and no longer available as a cash asset. It is an earmarked fund for the liquidation of the matured debt, which the trustee is bound to hold until the obligations are presented, and if they are not presented, to hold indefinitely against their presentation, and it is in no sense an asset of the company. The same is true in a large measure of moneys deposited in a special dividend account to meet dividends which have been declared and are now due and payable. This money represents a debt which is past due and is the property of the persons to whom it is due and for which checks have been issued. It is not a resource upon which the company can draw for its general purposes, and if it should draw upon it the company would commit a grave breach of trust.

"Account No. 411: The note requiring discount for prompt payment of bills to be credited to the accounts charged by the original invoices. I must take exception to this. In my judgment, it is an operation of the treasury department and is no more a credit to the

accounts benefited than would the interest on the money required to pay those bills if the treasury department went out and borrowed the money to pay them be a debit. If necessary, show this in a separate income account, but do not require its distribution over a multitude of small accounts, necessitating changes of your unit values in your storeroom and what not.

"Account No. 412: It does not seem to me to be sound accounting or sound finance to take into account dividends which you may assume to have accrued and which have not yet been declared. The same is true of interest on deposits from current balances which can be computed only by the bank, as you are not advised of the dates upon which your checks have been charged to your account.

"Account No. 416 should, I think, also include the expenses as well as the discount.

"Accounts Nos. 435 and 436: When the interest upon a funded debt matures and in accordance with the terms of the bond the company pays the trustee upon the day fixed the amount of said interest, it has discharged its liability, and the liability should not appear upon its balance sheet any more than the cash should appear as an asset upon its balance sheet; and when a funded debt matures and the cash is deposited with the trustee upon the date of maturity the company would be entitled to, and frequently does, demand of the trustee that the mortgage shall be satisfied of record and the lien removed from its property, and it would therefore seem to be an absurdity to continue to carry it as a liability upon its balance sheet. As an illustration, we to-day received a one-thousand-dollar bond out of an issue of \$2,500,000 which matured in 1911. The lien has long since been satisfied of record and refunding operations conducted, and it would therefore have been an absurdity, it seems to me, to have continued as a liability an obligation which had already been paid to the representative of the obligee.

"Account No. 447: This account is subject to the same criticism as has been made against Accounts Nos. 210 and 228.

"Account No. 517 would seem to require the structure carrying the tracks of the accounting corporation over a highway to be charged to Account No. 516, but the restoration or creation of the highway to be charged to Account No. 517. This seems to me very much like hair-splitting and would probably result in an arbitrary and estimated division of the cost rather than correct accounting, without due compensation in information obtained.

"Account No. 526: Should not this definition indicate that the wharves, docks, etc., herein charged, but more particularly the coal-handling machinery, are those designed for revenue purposes? For example, I have one wharf equipped with coal-handling apparatus which is never used except to handle coal for the power house, which stands back about 100 ft. from the wharf. The coal-handling apparatus is unquestionably a part of the cost of the power house and its maintenance a part of the cost of the production of power."

#### APPRENTICE TRAINING ON NEW YORK STATE RAILWAYS

NEW YORK STATE RAILWAYS  
ROCHESTER, N. Y., March 6, 1914.

To the Editors:

In view of your interest in the success of the experiment described in the issue of the *ELECTRIC RAILWAY JOURNAL* for March 15, 1913, page 461, you may be pleased to learn that, for the present year, two boys are taking the first year of the apprenticeship course,

and two the second, as outlined in your columns a year ago. I find that about 50 per cent of the boys who start the course continue in it to the end. I am able to interest the boys in this work to a greater extent now than heretofore, as we now have a very good trade school in Rochester. The boys taking our apprenticeship course can attend this trade school with no charge for tuition. Under the present law, the State of New York subsidizes industrial or trade schools and Rochester has been quick to take advantage of this and already has a first-class shop school.

Considerable attention is being paid to industrial education in this city, and the Rochester Chamber of Commerce is making a special study of the subject. This work is being carried on by a special committee of which the writer is a member. The work of this committee has consisted mainly in bringing the schools and manufacturers together in such a way as to encourage boys to continue in school for a longer period, and especially so when they can take up trade or vocational work in the schools. The school work of our apprenticeship course will soon be taken care of completely by a special course in the city industrial school. This will undoubtedly be the means of securing permanency for the work.

It might be interesting to you to know that the effect of a few apprenticeship courses in this department has been very pronounced on the older men who are engaged in electrical work. As an instance of this, some time ago I called at one of our outside stations and, in talking with the foreman regarding the boys who were taking the apprenticeship course, was surprised to learn from him that in addition to these two boys every electrician at the station was taking a course in electrical work. The older men who were employed during the daytime became interested in the work of the boys and are now attending night school.

It is thus easily seen that in addition to the benefit derived by the boys who take the apprentice course is the further benefit to the older men who, through the example set by the boys, become interested in obtaining more training and attend the night schools.

G. M. CAMERON, Master Mechanic.

[The plan mentioned by Mr. Cameron was one by which students spent one part of the day at the Mechanics' Institute and one at the railway company's shops. The original article gave some details of the course.—EDS.]

#### ELECTROLYSIS TESTS IN SPRINGFIELD

Since the publication of the abstract of the report on electrolysis mitigation in Springfield, Ohio, in the issue of the *ELECTRIC RAILWAY JOURNAL* for March 21, 1914, page 646, a revised copy of the report has been received containing slight changes in the tables. The differences from the figures published in the above issue are few and of minor importance. The revised report shows that 20 per cent instead of 19 per cent of the voltage drops exceeded the limit in Germany of 2.5 volts during average traffic conditions. The average of all peak-load gradients for the hour and for highest ten-minute period were 0.33 volt and 0.63 volt, instead of 0.35 volt and 0.64 volt respectively.

In order to relieve the congestion at the large main station in Hamburg, Germany, a proposal is to be embodied in the next Prussian railway budget for the electrification on the Hamburg-Altona-Blankenese single-phase system of the suburban line to Bergedorf and Friedrichsruhe. The work is likely to be completed in two or three years, and will form an extension of the lines already electrified.



# Criticism of Tentative System of Accounts

Suggested Changes in Accounting Series Circular No. 41 Made by Central Electric Railway Accountants' Association in Cleveland, Ohio, March 13, 1914

At the meeting of the Central Electric Railway Accountants' Association held in Cleveland, Ohio, on March 13, 1914, the Accounting Series Circular No. 41, recently issued by the Interstate Commerce Commission and containing a tentative system of accounts for electric railways, was discussed and criticised, and a report was adopted containing suggestions for certain changes to be offered to the commission. This report, published below in full, shows the accounts affected and the alterations and additions suggested. Interpolated matter is printed in italics.

## OPERATING EXPENSES

### 1. Superintendence of Way and Structures:

Omit the words "track foremen," fourth line of the text.

### 3. Ties:

"This account shall include the cost of cross, switch, bridge and other track ties used in repairing and renewing *main and repair tracks, sidings, spurs, and tracks in tunnels, station yards, shop and other yards; on piers, wharves, track scales, inclines, bridges, trestles and culverts, in carhouses, shops, and storehouses; transfer tables and turntables.*"

### 5. Rail Fastenings and Joints:

The words "welded joints" are omitted for the reason that it might be construed that labor also was to be included. No change is suggested in the remainder of the text.

### 11. Cleaning and Sanding track, and

### 12. Removal of Snow, Ice and Sand:

These accounts should be eliminated from "Way and Structures" and placed under the head of "Conducting Transportation."

### 15. Bridges, Trestles and Culverts:

Omit the words "and bridge watchman" from the tenth line of the text. It would appear that the services of bridge watchmen would be more in the nature of an operating expense than maintenance.

### 25½. Way and Structures Retired:

This is a new account which it would seem desirable to include under "Way and Structures," inasmuch as a similar account is shown under the head of "Equipment."

### 34. Electric Equipment of Cars:

"This account shall include the cost of labor and material used in repairing the electric motive *wiring and equipment of all passenger, combination, freight, express, mail and service cars.*" No change is suggested in the rest of the text or in notes A and B.

Note C is added as follows: "Electric motive equipment includes trolley poles, wheels, pantographs, sliding bows, third-rail shoes and so forth."

### 43½. Superintendence of Power—Maintenance:

The tentative classification includes, under operation, items which are properly maintenance; therefore, it would be desirable to show a new account under the maintenance group—power.

### 47. Transmission System:

Add to the note: "Tie lines between generating stations and substations shall follow the same rule as other lines."

### 48½. Power Station Equipment Retired:

This is similar to Account 40 under "Equipment."

### 50. Superintendence of Power—Operation:

Eliminate the words "maintenance and" in the second and third lines of the text.

### 60. Power Transferred—Credit:

"This account may be credited and the appropriate operating expense *and road and equipment* accounts charged . . ." No change is suggested in the remainder of the text.

### 66. Miscellaneous Car Service Expenses:

The second paragraph of text is changed to read: "This account shall include also the cost of secret-service inspection, conductors' books, punches and portable registers; rent of fare registers; repairs and renewals of fare boxes; car-service employees' badges and uniforms; refilling of fire extinguishers in cars; portable signs on cars for guidance of passengers; meals furnished trainmen on rush days; temporary grain doors, and other car-service supplies and expenses." No change is made in the note.

### 67. Station Employees:

The note is changed to read: "When a station employee is engaged in various duties and his wages can be readily apportioned among the accounts affected, such apportionment should be made."

### 71. Operation of Signal and Interlocking Apparatus:

The following note is inserted: "When an employee is engaged in various duties and his wages can be readily apportioned among the accounts affected, such apportionment should be made."

### 72. Operation of Telephone and Telegraph Lines:

Add to Note A: "The cost of telephone service should be charged to the accounts affected when such charge can be readily determined; if such charge cannot be readily determined, Account 86, 'Miscellaneous General Expense,' should be charged."

Eliminate the text of Note B and substitute the following: "When an employee is engaged in various duties and his wages can be readily apportioned among the accounts affected, such apportionment should be made."

### 75. Other Transportation Expense:

Add the following note: "The cost of repairs to a company's own tracks and equipment necessitated by collisions, derailments, etc., shall be charged to the proper maintenance accounts."

### 78. Parks, Resorts and Attractions:

"This account shall include the cost of *maintaining and operating amusement parks, resorts, . . .*" No change is made in the remainder of the text or the note.

### 80. Salaries and Expenses of General Officers:

Eliminate the words "the entire system" in the fifth line, and substitute the words "various departments."

### 81. Salaries and Expenses of General Office Clerks:

Omit the second paragraph.

Add the following note: "When the salaries of clerks employed in general office can be readily apportioned among the accounts affected, such apportionment should be made."

### 85. Pensions and Gratuities:

"This account shall include pensions and gratuities paid to retired and incapacitated employees or their heirs, *insurance on employees,* and expenses in connection therewith."

Add the following note: "The cost of liability insur-

ance should be charged to Account 91, 'Injuries and Damages.'

#### 86. Miscellaneous General Expenses:

Add after the word "telegrams," in line 3, "which cannot be readily apportioned to other accounts." No change is suggested in the remainder of the text.

#### 91. Injuries and Damages:

Add after the word "claims" in line 5 of the first paragraph, "cost of liability insurance."

Add after the word "books" in line 4 of the second paragraph, "cost of appeal bonds."

#### 92. Insurance:

Add an additional note as follows: "Account 85, 'Pensions and Gratuities,' includes benefit insurance; and Account 91, 'Injuries and Damages,' includes liability insurance."

#### 93. Stationery and Printing:

Omit Note A.

#### 94. Store Expenses:

Eliminate from line 4 the word "collecting and."

#### 96 Rent of Tracks and Terminals:

Change to read, "This account shall include payments for rent or use of tracks *and bridges* . . ." No change is made in the rest of the text.

#### 97. Rent of Equipment:

Eliminate this account, as well as Account 116, "Rent of Equipment," and insert two new accounts under "Income"—one for rental paid for equipment and one for amounts received for equipment rented.

#### 98. \_\_\_\_\_

This is a new account to be added as set forth in suggestions relative to the road and equipment accounts. (Section 3, Basis of Charges, page 88 of Circular 41.)

There seems to be considerable difference of opinion as to undistributed accounts. A number of those present at the meeting were of the opinion that these items should be distributed directly to the various accounts with the option being given carriers to include them in the present undistributed classification, instead of following the note shown in the tentative classification, which states that "carriers are at liberty to distribute items covered by the following accounts, but all reports to the commission must show the amounts properly charged to the undistributed accounts."

#### REVENUE ACCOUNTS

No changes are recommended in these accounts.

#### INCOME ACCOUNTS

#### 209. Income from Unfunded Securities and Accounts:

Add the words "cash discounts," making the last line of the text read, "cash discounts and other analogous items."

Eliminate Note B. The item of cash discount is very similar to interest received on bank balances, and is a financial, rather than an operating item. If note B as shown in the tentative classification were to apply, it would be necessary, in order to be consistent, to charge the interest on notes given in settlement of invoices to the accounts to which the invoices were charged.

#### 210. Income from Sinking and Other Reserve Funds:

This account should not be included among the income accounts. Transactions of the sinking fund are entirely separate matters, and an analysis of that account should reflect all such transactions. The only entry in the surplus account referring to the sinking fund should be for the annual payment, and it would be shown in Account 307, "Appropriations of Surplus to Sinking and Other Reserve Funds."

#### 212½. Rent Received for Equipment:

This new account, in connection with Account 217½, "Rent of Equipment," would take the place of the

operating expense account No. 97, "Rent of Equipment," as now shown in the tentative classification.

#### 217½. Rent of Equipment:

This is a new account. See explanation regarding Account 212½.

#### 224. Amortization of Discount on Funded Debt,

#### 228. Appropriations of Income to Sinking and Other Reserve Funds,

#### 229. Dividend Appropriations of Income,

#### 230. Appropriations of Income for Investment in Physical Property,

#### 231. Stock Discount Extinguished Through Income, and

#### 232. Miscellaneous Appropriations of Income:

The above accounts now shown under "Income," which are also included under "Surplus," should be omitted from the income accounts.

#### PROFIT AND LOSS ACCOUNTS

No changes are recommended in these accounts, although a number of those present at the meeting were in favor of changing the title from "Profit and Loss" to "Surplus" for the reason that "Profit and Loss," in a great many cases, is considered to be synonymous with the term "Income Accounts" as used in the circular, and for the further reason that the word "Surplus" appears in Accounts 307, 308, 309, 310, 311 and 312.

#### GENERAL BALANCE SHEET ACCOUNTS

#### 407. Cash:

Add the following note to the text of this account: "This account should not include funds deposited with the trustee for the purpose of paying bond interest coupons. All such amounts should be shown in Account 408, 'Special Deposits.'"

#### 408. Special Deposits:

Instead of grouping this account on the general balance sheet under "Working Assets," it would appear that it should be shown under "Deferred Debit Items."

#### 411. Materials and Supplies:

Change the note to read as follows: "Discount allowed for prompt payment of bills for material or supplies shall be credited to Account 209, 'Income from Unfunded Securities and Accounts.'"

#### 412. Interest, Dividends and Rents *Receivable* Accrued:

This account should be shown in the balance sheet under the head "Deferred Debit Items," instead of "Working Assets."

#### 414. Insurance, Rents, *Interest* and Taxes Paid in Advance.

#### 428. Receivers' *Notes and* Certificates.

#### 439. Accrued Taxes *and Insurance*:

This account should also include the amount of insurance accrued, such as liability insurance based on payroll, etc.

#### ROAD AND EQUIPMENT ACCOUNTS

The last sentence of the second paragraph of Section 3 of General Instructions, Basis of Charges, is changed to read: "If such charge be made, the amount thereof shall be equitably credited to a new account under undistributed accounts."

#### 505. Ballast:

After the word, "delivery," line 3, add the parenthesis (except final distribution).

#### 506. Ties:

After the word "tracks," in line 3, add: "cost of transportation, inspection and handling (except final distribution)."

#### 531. Service Equipment:

Change to read, "Locomotives,"

#### 532. Electric Equipment of Cars:

Change to read, "Service Equipment."

## 533. Locomotives:

Change to read, "Electric Equipment of Cars."

These changes are recommended so that the accounts above-mentioned may appear in the same order as in the classification for operating expense and road and equipment accounts.

## FURTHER RECOMMENDATIONS

It is also recommended that the general balance sheet form should be changed to provide for two groups of accounts under the present head of "Deferred Debit Items," as follows:

Deferred Debit Items	{	Accrued Accounts
		Prepaid Accounts

It is also suggested that it might be advisable to leave blank numbers between the various groups of accounts "Way and Structures," "Equipment," etc. It is suggested that the word "station" be substituted for "plant" in Accounts 45, 48, 51, 55, 538 and 541.

Finally, it is resolved that it is the sense of the association that the fiscal year of electric railways end on Dec. 31, and that the tentative classification go into effect Jan. 1, 1915.

### MEETING OF THE PUBLIC SERVICE A. E. R. A. SECTION

The regular monthly meeting of the Public Service Railway Section of the American Electric Railway Association was held at Newark on Thursday evening, March 19, with 184 members and sixty guests in attendance. In accordance with custom, an address was delivered before the presentation of the technical subject of the evening. On this occasion George J. Roberts, first vice-president of the company, spoke on "Duties to One's Self."

## INSPECTION OF ROLLING STOCK

The next order of business was a paper by John Hanf, division master mechanic, entitled "Inspecting the Rolling Stock." The paper was read by S. B. Cunningham, executive clerk to the mechanical engineer. Mr. Hanf reviewed the growth in the size of car bodies during the last twenty years from 16-ft. to 18-ft. bodies weighing 6000 lb. to 8000 lb. and costing \$600 to \$800 complete to the present 32-ft. to 34-ft. city car weighing 50,000 lb. to 54,000 lb. and costing from \$6,000 to \$7,000 complete. The rolling stock of the southern division, which is in charge of the author, consisted of 161 closed, seventy-three open and thirty-nine miscellaneous service cars, making a total of 273 cars. These cars were operated over 153 miles of broad-gage track. The rest of the Public Service Railway has standard-gage track.

Inspection was on a time basis and most of it was carried out during the daytime. At the office a card system was kept of all cars, and from this record a daily list of cars to be inspected was sent to the foreman. This list gave in detail what was to be done on each car. The list was returned by the foreman at the end of each day for record. Of the assigned cars 12½ per cent were inspected daily. As no inspection was done on Sundays, each car was inspected on an average once every ten days. The journal and motor-bearing waste of 2½ per cent of the cars was repacked daily except Sunday. In addition to the regular ten-day inspection, cars are also examined every night for defective brake or truck parts. The general overhauling of the trucks was carried out about once in twelve months.

Owing to the use of air brakes and heavier cars it had been necessary to change from cast-iron to steel wheels on all of the larger cars. During the past year

they have been using a steel wheel with a 7/8-in. flange instead of a 3/4-in. flange. It was found that the wheel with the deeper flange was not practicable on their division, especially in the city, because the groove in the rail was not deep enough to accommodate this size flange. This caused the wheel to ride on the flange instead of the tread until the flange was worn down to 3/4 in. or less, which was the depth of the rail in a number of places. Under these conditions the deeper, or 7/8-in., flange had a tendency to ride the rail at switches, crossovers, etc. He did not think they should attempt to use for city service a wheel with more than a 3/4-in. flange.

Mr. Hanf favored well-painted, clean car bodies because the public judged a company by that feature more than any other. In conclusion, he pointed out the need for giving ample attention to service cars. These cars were usually equipped with old motors and ought to be inspected daily; further, such daily inspection was certainly necessary because the construction cars were often loaded to double their capacity and generally received less care than passenger cars. Snow plows and sweepers were operated by the trainmen only. It was customary on many other roads, he said, to send a shopman out with each plow or sweeper, but he thought it wiser to keep the men at the shop ready for jobs beyond the ability of one man or small gangs. The mechanical department of his (the southern) division also took care of all derailments. This was another argument in favor of keeping the shopmen at the maintenance quarters during a severe snowstorm.

## DISCUSSION ON CAR INSPECTION

Mr. Hanf's paper was discussed by D. H. Roszel, who considered the matter from the trackman's standpoint, and W. C. Pierce, supervisor, who presented the viewpoint of the transportation man.

Mr. Roszel noted that Mr. Hanf had referred to the use of the 7/8-in. flange wheel in city service. He would like to see such a standard flange adopted for this type of service, but under present conditions it was not practicable to do so. Two reasons might be given for this. The first was the decreased life of the rail, and the second the pounding of the special work. Many of the old standard rails, such as the 9-in. tram rail and the 7-in. trilby rail, had a flangeway only 1½ in. deep. With a 7/8-in. flange the permissible wear would be only 4-16 in., while with an 11-16-in. flange the wear would be 7-16 in. Thus the 7/8-in. flange would reduce the life of the rail more than one-third. As they had many miles of this rail in good condition it was inadvisable to adopt this standard for some time to come, as the cost of reconstruction would be prohibitive. The new rail, with a flangeway 1½ in. deep, eliminated this feature. The second reason, namely, pounding of special work, was also very important. The company was compelled to design all of the special work intersections for flange bearing, instead of tread bearing, because of the narrow tread of the wheels; that is to say, the groove at that point was made as deep as the flange was high. Tread bearing would cause the wheel to pound each time it crossed the groove of the intersecting rail, resulting in damage to the track and car and annoyance to the passengers. If they were to design such special work to be used for a 7/8-in. flange, the wheels with the smaller flange would not get the desired bearing, and the result would be the pounding of the point. Therefore, it was not generally advisable to use both 11-16-in. and 7/8-in. flanges on the same line. However, as greater safety demanded 7/8-in. flanges for all high-speed interurban cars, it was necessary occasionally to make an exception.

Other items less known, perhaps, than the flat wheels

so obnoxious to the public required careful investigation. One was the necessity of keeping the distance from back to back of wheel outside of a definite minimum. This limit had been placed earlier at 4 ft. 5 13-16 in. for the northern division. This allowed a decrease of only  $\frac{1}{8}$  in. from the standard distance for new wheels. This figure was not very easily obtained, and as a general thing it was assumed to be correct provided the gage distance was within its limits. However, as a wider range of variation was permitted for the gage width than was possible for this measurement this latter should be tested independently. The necessity of this could be appreciated when one realized that these flanges had to pass through special work where the groove was only 1 9-16-in. wide. This condition fixed definitely the distance between the guards, and if the distance from back to back of wheels was less than this, the wheel was pulled over the top of the guard or special work, causing a derailment.

It was also important to keep the flange thickness within a certain maximum limit. The standard thickness was 1 3-16 in., while according to their investigations 1 4-16-in. was the maximum thickness that could be safely allowed. This figure was based on a truck of 6-ft. wheelbase, operated over a rail with a groove 1 9-16-in. wide. Lately the tendency had been to increase the wheelbase to 7 ft. One could easily realize that, in taking a curve, the flange on a truck with 7-ft. wheelbase would ride at a greater angle to the gage than would a flange on a 6-ft. wheelbase. Therefore it was necessary to be more careful in testing this width as the wheelbase increased. In very sharp curves even this thickness could not be used safely with a wheelbase greater than 6 ft. They had found it advantageous to use the 1 9-16-in. groove because anything larger would not give them the full advantage of the guard and because an increase of the width of the opening at the throat of frogs, mates, etc., would increase the tendency to pound. This measurement had to be made with a special gage. Unless flanges were kept within the limits named (1 3-16 in. to 1 4-16 in.) it would be necessary to change the type of guard rail and special work on many miles of track.

Another item that required measurement was the height of the flanges. If this exceeded the maximum limit, cutting of the rail might result. If it was below the minimum, there would be excessive pounding at all special work like that which occurred when a  $\frac{3}{4}$ -in. flange was operated over an intersection designed for a  $\frac{7}{8}$ -in. flange.

There were other things, such as chipped flanges, sharp flanges, soft spots and treads, thickness of rims, etc., which interested the trackman aside from many items in connection with the electrical and braking equipments. However, he had said enough to indicate that many details required the co-operation of the mechanical and way departments to the end that any change in construction by one would not involve a more costly change by the other department.

Mr. Pierce confined his discussion to a statement of the practices on the northern division, stating that it was customary to inspect cars every seventh day. He believed that the stationmaster should be furnished with a list which gave the car number and day of inspection. If it was necessary to operate cars that were due for inspection, they should be put on as trippers. A brake examination should follow three days after the general inspection. Wreckers and sand cars should be inspected just as carefully as passenger cars. Work cars which were under a heavy strain should be inspected every day, and snow plows, sweepers, rotaries, levelers, etc., should receive attention immediately after each storm.

Mr. Hanf's paper was also discussed informally by R. E. Danforth, general manager, and J. E. Quinn and W. R. Ricker, shop foremen.

#### RESOLUTIONS

L. J. Tynan, of the legal department, then spoke of the great personal and engineering loss which had come to all through the recent death of E. J. Dunne, superintendent of distribution. He presented a resolution of condolence, and on motion the secretary was instructed to send a copy of this resolution to the members of the bereaved family.

The meeting was adjourned at 10:30 p. m., after a vote of appreciation had been extended to the speakers of the evening.

#### WISCONSIN COMMISSION DISMISSES COMPLAINT AGAINST MILWAUKEE COMPANY

The railroad commission of Wisconsin has issued an order dismissing a complaint of the city of Racine against the Milwaukee Light, Heat & Traction Company. The complaint was filed early in 1913. At that time the company had under construction a number of new cars for use in Racine. Shortly before then it had undertaken to secure certain new franchises in order to extend its lines into outlying territory which had shown rapid development during the previous years. Some of the members of the Common Council sought to impose burdensome franchise restrictions and the company therefore withdrew its application.

In dismissing the complaint the commission sustains the action of the company on every point and makes recommendations with respect to the construction of new tracks in accordance with the company's previous plans and franchise applications.

The order of the commission says in part:

"The city of Racine in its petition alleges in substance that the cars operated by the respondent in Racine are inconvenient and inadequate; that at certain times of the day the cars are overcrowded; that the extension of certain lines is necessary for proper service to the public, and that the sale of six tickets for 25 cents, good at any time when the cars are running, is justified because of the increase of street car traffic in Racine.

"Subsequent to the hearing several new cars were placed in service, satisfying the complaint with reference to the frequency of operation. The company still retains in service a number of remodeled cars. The city attorney in a letter subsequent to the hearing contends that the service will not be satisfactory until these cars are discarded for new cars. The testimony shows that the cars referred to have been used in Racine about ten years, having been operated in Milwaukee previous to that time. During the summer of 1912 they were remodeled at an expense of something over \$1,500 per car, and changed to a prepayment type. The old trucks were replaced by others which had been in use for two years in Chicago.

"Members of the commission's engineering staff have investigated the remodeled cars now in use and report that their operation does not result in unreasonable inconvenience to passengers, so long as the cars are maintained in proper repair. They are also of the opinion that the present traffic in Racine can be best handled by comparatively small cars.

"The company has added new cars to its equipment as a result of this complaint, and should continue to do so whenever traffic conditions require it.

"The petitioner asks the commission to require the company to extend its lines as desired by the city. Counsel for the respondent questioned the jurisdiction

of the commission to enter such an order. This matter was considered at length in a former decision (City of Merrill v. Merrill Railway & Light Company, 1910, 5 W. R. C. R., 418), in which the following language is used:

"The public utilities law has vested in common councils the power to compel extensions and additions to public utility plants when necessary to serve the public requirements. The common council is the proper body to which such authority should be given, if possible, over all public utilities, including street railways. It has the control of streets and is best situated, in the first instance, to determine what extensions and additions are required and where they should be made. Such authority, however, has not been conferred upon the common councils or this commission in respect to street railways, and hence we are without jurisdiction of the subject matter of the petition."

"No legislation has been enacted subsequent to that decision affecting the question involved, and the position taken must be sustained in the present case."

The chief engineer of the commission and his staff investigated the advisability of the extensions suggested at the hearing, especially with reference to the present needs of the city. Based upon the reports of the engineering staff, the commission recommends, in the interest of better street railway service that the city of Racine grant, without unreasonable encumbrance, and that the company accept certain franchises.

No testimony was introduced with respect to the complaint that the company sells six tickets for 25 cents only for certain portions of the day. It was therefore ordered that the petition be dismissed.

### SNOW REMOVAL IN NEW YORK

During February and March of the present year the amount of snow which had to be removed in New York City was greatly in excess of that for any one of the entire previous four years. In the removal of the snow forces of men up to 20,500 were employed. Practically the same force was engaged in snow removal work for the four weeks succeeding the first storm on Feb. 13, 1914.

COST OF SNOW REMOVAL PREVIOUS SEASONS, BOROUGH OF MANHATTAN, BROOKLYN AND BRONX

Season	Snowfall, In.	Cu. Yd. Removed	Total Cost	Cost per Cu. Yd.
1909-10	30.0	1,873,236	\$1,405,873	\$0.75
1910-11	24.7	2,628,890	1,475,985	0.56
1911-12	22.7	1,637,593	893,233	0.55
1912-13	11.8	497,757	249,307	0.50
1913-14	34.7	*5,257,562	*2,248,288	0.43

\*From Feb. 14 to March 18, inclusive.

The contracts under which snow was removed from the streets of the several boroughs of New York during the past winter were as follows: Borough of Manhattan, Belmont Trucking Company, 56 cents per cubic yard; Bronx Borough, Harold Christiansen, Jr., 42 cents per cubic yard; borough of Brooklyn, Robertson Construction Company, 41.9 cents per cubic yard. The total mileage of streets scheduled for snow removal was 570.5, and of streets not scheduled 695.8. The total area scheduled for snow removal was 20,076,372 sq. yd.

John D. Fetherston, commissioner of street cleaning, states that the cost per cubic yard of snow removed during the present year is below that of former years, owing to the fact that approximately 334,018 cu. yd. were disposed of through the sewers by city forces at greatly decreased cost as compared with contract work. He states that "to have every sewer in town available for the disposal of snow as it falls and to secure a sufficient number of men to keep snow moving into the sewer as it falls appears to be the most feasible scheme for the

snow-removal proposition. It has been demonstrated this year that even small-pipe sewers can be used for the removal of snow, and as the maximum rate of snowfall seldom exceeds 1 in. per hour (or approximately 0.1 in. of water per hour) the capacities of the sewers on the whole should not be overcharged by a maximum snowfall. The principal difficulty in snow fighting will be to secure an adequate force of men ready and willing to begin work on the first appearance of snow and to start actually removing the snow not less than one hour after the first flake has fallen, under conditions which indicate that a continued storm may be expected. Mr. Fetherston estimates that for the 570 miles of street scheduled for snow removal a force varying from 20,000 to 40,000 men working continuously for eight hours will put into the sewers an 8-in. snowfall at a cost not to exceed \$75,000. In putting the snow into the sewers the manholes are surrounded by wire baskets into which the snow is shoveled and washed into the sewers by means of water from fire hose. To do this work by carts and trucks after the snow has stopped falling would cost between \$300,000 and \$400,000 if all the snow had to be removed. Mr. Featherston does not advocate giving up the present snow-removal methods, as contracts should still be made for the employment of teams of men to remove snow after the storm is over, in the event that the snow-fighting forces have been unable to cope with the situation.

This matter of snow removal is of particular interest to electric railways where they have to do all or part of the snow removal on streets occupied by tracks. The experience in New York during the past two months should be of value to all responsible for snow disposal.

### COMMITTEES OF THE ACCOUNTANTS' ASSOCIATION

President M. W. Glover of the American Electric Railway Accountants' Association has made the following announcement regarding committees:

The committee on prepayment car accounting has been abolished and a joint committee with the Transportation & Traffic Association, entitled transportation-accounting, has been formed. The accounting members of the joint committee are M. R. Boylan, Newark, N. J., co-chairman; C. N. Huggins, Portland, Ore., and G. W. Kalweit, Milwaukee, Wis.

A. L. Linn, Jr., New York, N. Y., has resigned from the committee on overhead charges and A. R. Patterson, Boston, Mass., has been appointed to succeed him.

Mr. Linn has also resigned from the committee co-operating with the United States Bureau of the Census. W. H. Forse, Jr., Anderson, Ind., has been appointed chairman of this committee, and S. C. Stivers, New Orleans, La., has been appointed a member to take the place of Mr. Linn. The other member of this committee is M. R. Boylan, Newark, N. J.

### CONFERENCE ON INTERSTATE COMMERCE COMMISSION SYSTEM OF ACCOUNTS

The committee on a standard classification of accounts of the American Electric Railway Accountants' association and representatives of the Interstate Commerce Commission held a meeting in Washington this week for the purpose of going over suggestions and criticisms received in regard to accounting circular No. 41, the tentative system of accounts for electric tramways. All replies to the circular received during the conference were to have consideration in the preparation of the classification for authoritative issue.

No plans have been made for a public hearing and no requests for a hearing in connection with the system of accounts have been received.

# 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)

## DERAILMENTS AT FACING POINT SWITCHES

BY H. H. GEORGE, ASSISTANT ENGINEER MAINTENANCE OF WAY PUBLIC SERVICE RAILWAY, NEWARK, N. J.

In an article by "Contributor" in the *ELECTRIC RAILWAY JOURNAL* of March 21, 1914, the following statement was made: "All switch pieces must be set to neat gage when installed. In fact, great care must be

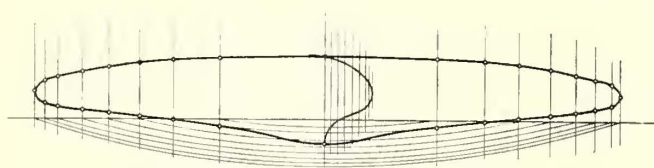


Fig. 1—Preventing Derailments at Switches—Development of Wheel Flange for Determination of Proper Gage of Track on Curves and Required Width of Groove in Guard Rails

exercised to see that this part of the special work is kept to good gage even though the rest of the layout may be laid to the  $\frac{1}{4}$ -in.-wide gage now used by some makers of special work."

The question of car derailments, the determination of the cause and the fixing of the responsibility for the same is one which during the last two years has received much attention on the Public Service Railway

analysis was made, including the development of the wheel flanges in a plane parallel to the top of the rail and tangent to the gage line of the wheel. This development of our standard flange is shown in Fig. 1. The curve was originally plotted full size and included all four wheels of a truck. As our standard switches have a radius of 100 ft. on the inside rail, this development was placed on a plot of a track of this radius. It was then found that when the track was set to the standard gage the outside flange bore against the rail while the inside flange was  $\frac{1}{4}$  in. away from the guard. Under such conditions, if the gage of the switch pieces was set exact, when the truck "took the switch" the wheels would continue in a straight line until a flange bearing was obtained against the switch tongue. If the gage was exactly 4 ft. 8 $\frac{1}{2}$  in., the outside wheel flange would then ride the point of the mate; but by setting the gage  $\frac{1}{4}$  in. wide in the curve, the full benefit of the switch tongue as a guard is derived and the foregoing condition is eliminated. It is therefore our practice to specify that the switches and mates be so designed that when the gage for the straight track is set exactly that in the curve will be  $\frac{1}{4}$  in. wide.

The same operation was repeated for curves of different radii and the results were noted. For our guard rail of 1 9/16-in. width of groove it was found that the variations in this dimension for curves of from 40-ft. to 100-ft. radius was so small that  $\frac{1}{4}$  in. was adopted as the standard increase in gage for all curves between these limits. Below 40-ft. radius, which is our stan-

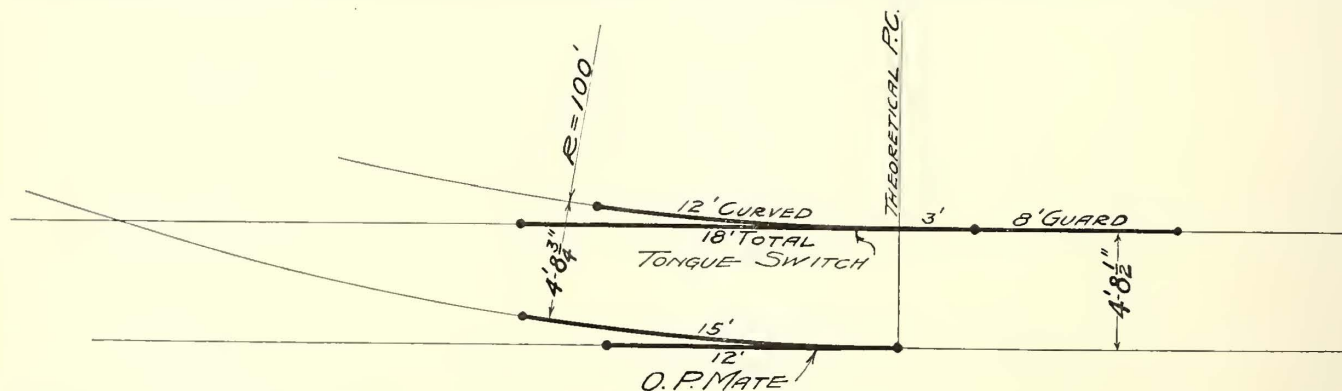


Fig. 2—Preventing Derailments at Switches—Standard Practice of Public Service Railway for Gage of Track in Curves Through Switches

property. As a result of the study of this matter, a complete set of rules was formulated, and, after much practical discussion by all departments concerned and many revisions, was adopted as standard. Rules Nos. 3 and 4 of this code read as follows:

No. 3: "Switches and mates shall be set  $\frac{1}{4}$  in. wide on the curve."

No. 4: "Track on curves of from 40 ft. to 100 ft. inside radius shall be set  $\frac{1}{4}$  in. wide, except where both rails are guarded, in which case the track shall be set and maintained to standard gage. Curves under this radius shall be set slightly full."

In deciding upon these two rules a very careful

standard minimum except in special cases, it was found that the best results were obtained by setting the gage slightly full. The exception to this rule is that shown in Rule No. 4, where both rails are guarded. Fig. 2 shows our practice in setting gage for such curves.

It might also be stated that derailments at facing point switches, caused by trucks "splitting the switch," have been very materially reduced on this property by the installation of a lock box on all facing point switches. The device is simple in construction, positive in action and costs less than \$25. The prevention of one derailment will generally more than offset this extra expenditure.

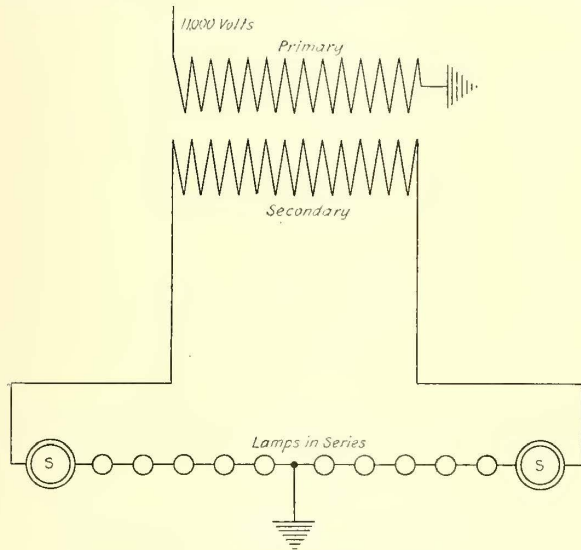
GROUND DETECTORS FOR A. C. ROLLING STOCK

BY A. LONGHURST, FOREMAN OF SHOPS NEW YORK, WEST-CHESTER & BOSTON RAILWAY

The electric locomotives of the New York, Westchester & Boston Railway, which are operated by 11,000-volt, twenty-five-cycle alternating current, are equipped with the inexpensive and absolutely reliable ground detectors hereinafter described.

The primary coils of the transformer have a ground return. The secondary is entirely separate and is not grounded. No damage occurs to the secondary winding if only one coil or circuit is grounded, but if a second ground occurs a short-circuit is caused and serious damage is done to the secondary winding. It is therefore essential that a ground on the local circuits should be detected and cleared before the transformer is damaged.

The device in use consists of a bank of ten lamps in series with a ground tap in the center. On each outside leg a switch is installed, and the whole is connected across the secondary winding of the transformer. As the voltage across the secondary is 526 volts, it is necessary to have ten lamps in series as a ground some-



Ground Detector for Car Transformers

times results from lighting only five lamps with full voltage. These are standard 110-volt lamps.

The method of testing is as follows: Each switch is turned on separately and if any of the lamps light it is an indication that there is a ground on either the secondary winding or on one of the local circuits. Then both switches are turned on, and if some of the lamps are brighter than others it again shows there is a ground on the system. If all the lamps light with equal brilliance, it shows that the transformer and local circuits are clear of grounds and also that the bank of lamps is "O. K." A daily test by the motormen insures the fact that a ground is quickly discovered, reported and cleared before any damage is done.

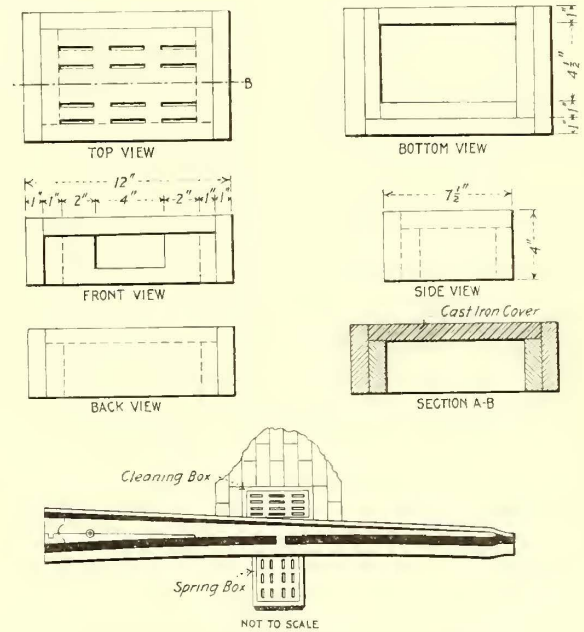
The foregoing system is also used to test for grounds in the local control circuits which are operated by 32 volts direct current. These circuits are not grounded. When only one ground occurs no trouble is experienced, but if a second ground occurs complications arise. A bank of two 32-volt lamps in series with a ground tap in the center is used. While testing, this is connected across the B+ and B- leads from the battery. If there is a ground, only one lamp will light, or one lamp will be brighter than the other. If there are no grounds, the lamps will light with equal brilliance.

MAKING A SWITCH HOLE SELF-CLEANSING

BY "CONTRIBUTOR"

The maintenance of way department of the Connecticut Company is using a small wooden box with a removable iron cover, as shown in the accompanying drawing, for the purpose of permitting the hole in the side of the switch piece to be self-cleaning. This combination is set against the switch, opposite the spring box.

We had experienced some difficulty in operating over certain switches. Upon investigation we discovered that the hole in the side of the switch piece on the side opposite to the spring box had become packed with frozen dirt, crushed stone or other material, so that the tongue could not be thrown all the way over, leaving it in a neutral position. In this case it was necessary to remove the pavement to clean the hole, thus allowing the free end of the tongue connecting-rod to enter into the hole.



Switch and Detail of Cleansing Box

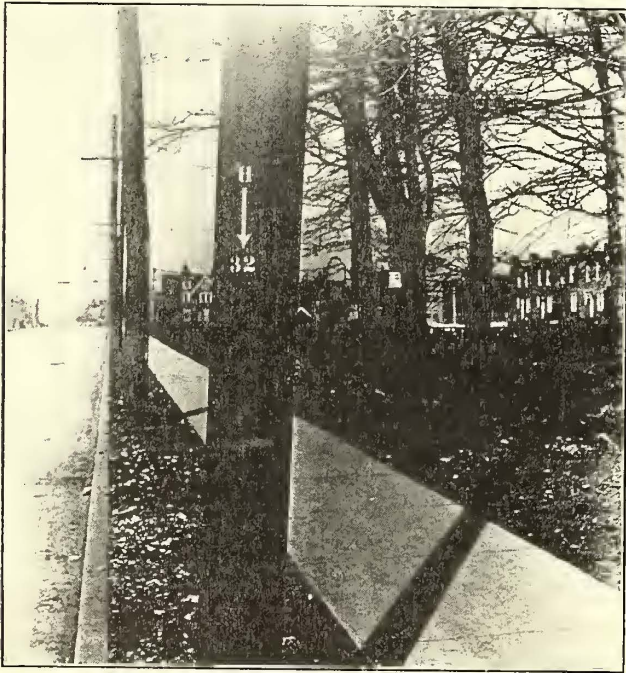
To avoid the removal of expensive pavement and the cost of replacement, a small wooden box was designed to meet these conditions. A "handy man" in the maintenance of way department makes these boxes as required from oak ties which have split while in stores and have thus been rendered unfit for track work. The iron lid or cover is simply an old cast-iron tie plate, 1 in. thick, saved from the scrap pile. The switch repair men remove the lid and clean the box as required.

The Rhode Island Company, Providence, R. I., follows the usual custom of running trippers or double-headers during the rush hours. In running these extra cars one difficulty encountered was that the public would overcrowd the first car, not knowing that there was another car of the same line immediately behind. To secure a more uniform loading of the cars, the company has adopted "Car Following" signs such as are customary on suburban and interurban single-track railways. The signs are made of sheet-iron painted red and bearing in white the words "Car Following." Prospective passengers become well acquainted with the purpose of these signs, and now when they see the dash of a crowded car so marked they are much more likely to wait for the second one.

## MARKING LOCATION OF MANHOLES

BY G. H. M'KELWAY, DISTRIBUTION ENGINEER BROOKLYN  
RAPID TRANSIT SYSTEM

After a heavy snowstorm one of the first duties of the electrical department of a street railway which has underground conduits is to clean the snow off the manhole covers and to scatter salt on them to prevent their freezing so fast that they cannot be raised. This action is necessary not only so that the holes can be entered to inspect the cables and to make whatever repairs may be required but also to prevent the manhole from becoming filled with escaping illuminating or sewer gas. Much more trouble is apt to occur from the accumulations of gas in the holes during cold weather than at any other time, for then the frozen ground offers very little opportunity for the gas to escape through it. The path of least resistance is then



Pole Marked to Show Location of Manhole

into the conduits and through them to the manholes, from which the gas escapes to the open air through either the subsidiary pipes or the holes in the ventilating covers.

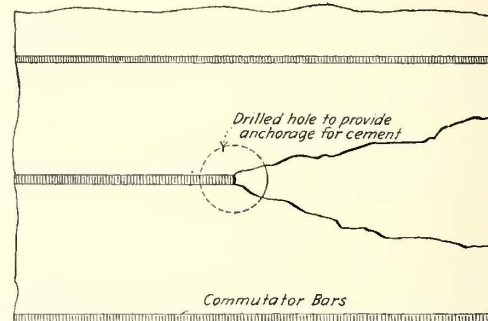
The ventilated type of cover has become almost a necessity in some of the large cities where leaks of gas are common. In New York City all electric corporations are supposed to use that type except in very wet locations where only a tight cover makes it possible to keep the holes clear from water. When the cover is hidden under the snow it is, of course, as poorly ventilated as it would be without any holes in the cover. Hence it is important to remove the snow.

At the same time it is not desirable to do any more shoveling than is necessary to locate the holes easily. In fact, the definite marking of the location of the holes is the best plan, for, however familiar the employees may be with the location of the manholes, they are not always easy to find when other neighboring objects from which the bearings might be taken are also hidden by the snow. Again, in order to clear the holes as quickly as possible, the men composing the gang are often drawn from those employees who are not usually engaged on conduit work and who are naturally unfamiliar with the location of the manholes.

For the guidance of the men it is therefore necessary that some method of marking the location of the holes be arranged. This can be done, and is done with some companies, by sketches in books supplied to the foremen which show the distance in terms of feet from the street intersections, trolley poles, etc. A better plan, however, which avoids all chance of the foreman misunderstanding the sketch or leaving the book behind, is the one adopted by the Coney Island & Brooklyn Railroad.\* As shown in the accompanying illustration, this plan consists in marking on the nearest trolley pole first the letter "H" and underneath that the number of feet to the center of the manhole cover together with an arrow pointing in the proper direction. By this means all that the men had to do was to note the location of the arrow, pace off the proper distance and begin digging directly over the manhole cover. While this plan cannot be used when the conduit lines run on streets where there are no poles, yet it can be followed to good advantage in all other cases and with a large saving in time and labor, both important items in the strenuous work of clearing up after a storm.

## DENTAL CEMENT TO FILL CAVITIES IN COMMUTATOR BARS

Frank R. Phillips, superintendent of equipment Pittsburgh Railways, has found that the cement used by dentists to fill cavities in teeth makes an excellent fill-



Dental Cement to Cure a Commutator

ing for the restoration of commutator bars that have been eaten away on account of sparking. An anchorage for the cement is provided by drilling a small hole at the inner end of the "V" which has been eaten out in successive bars. Then the necessary amount of Caulk's "Petroid Cement Improved" is mixed to the consistency of batter to fill the cavity. The cement is applied immediately, and after it has been allowed to dry for thirty minutes it is ready to be filed down flush with the surface of the commutator. This novel application is a proof that the maintenance department of the electric railway may sometimes find helpful equipment in an utterly foreign field.

A joint meeting of employers and employees was held in Kansas City recently for the purpose of deciding on a definite interpretation of the Kansas workmen's compensation law, which took effect late in 1913. The principal points discussed were whether compensation shall begin immediately after an injury, or two weeks later, and what constitutes permanent partial incapacity. In some industries the workers pay for repairs to tools, etc., and there is some doubt as to whether the law intended that the compensation should be based on gross or net wages.

\*Recently acquired by the Brooklyn Rapid Transit System.

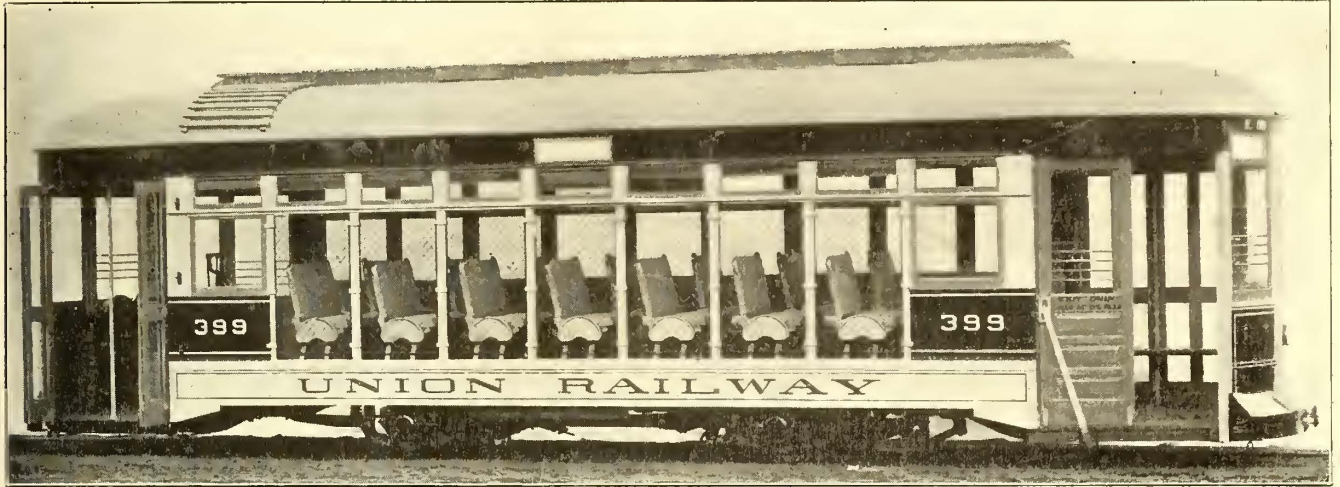


**LOW-LEVEL END-ENTRANCE CAR OF THE THIRD AVENUE RAILWAY**

The Third Avenue Railway System, New York, has just received from The J. G. Brill Company the remarkable low-level end-entrance car shown in the accompanying illustrations. Although the car is very similar to the standard convertible type of this railway, the height from the pavement to the platform level is only 12 in. and from the platform to the car-body floor 11 in. This solution of the safety step problem was ob-

caught by the wheelguard be wedged under the platform.

The car body in its T-iron framing and general constructional materials is very similar to the single-truck car of this company described in the *ELECTRIC RAILWAY JOURNAL* for Feb. 14, 1914. Like that car, it has been developed for service on suburban lines where a longer double-truck car would not be justified. The convertible panels also do not extend the full depth of the side but a roof-stored top sash 10 in. deep is provided to give ample extra ventilation on unseasonably warm

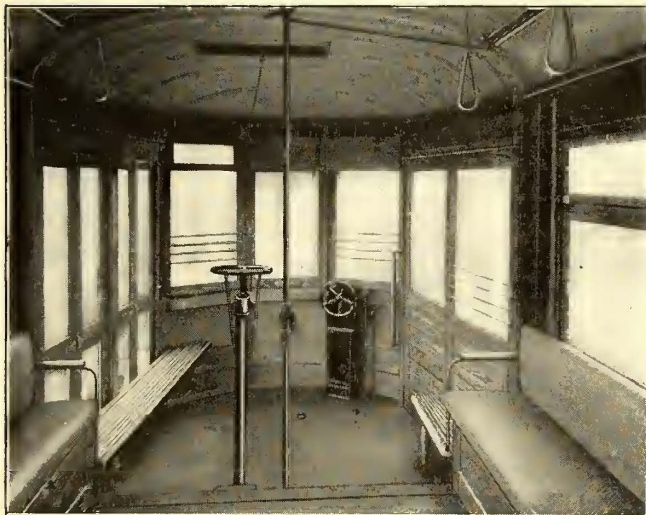


**Third Avenue Low-Level Car—View of Car for Union Railway Lines Mounted on Radial-Axle Truck, Showing Stepless Entrance and Other Features**

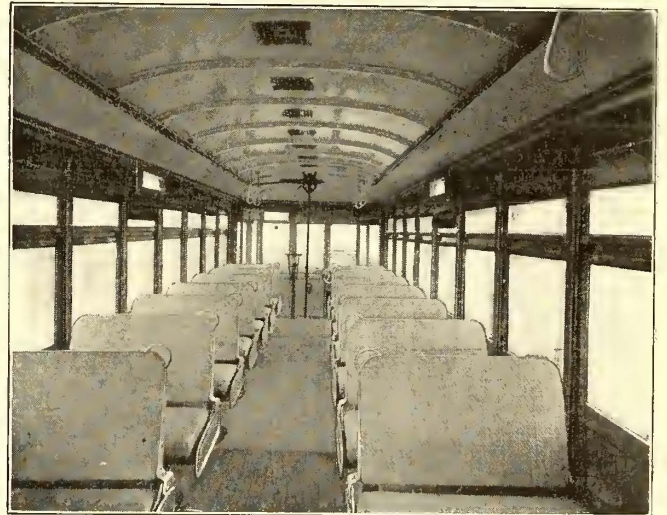
tained primarily by using a non-parallel axle truck of "Radiax" type of such low level that it could take 24-in. diameter wheels and Jones-Westinghouse "low-floor" motors. A ramp of 3 in. between the line of the corner posts and the center line of each axle is also used.

Since the lowest level of this car is at the ends instead of the center, it was necessary to dispense with

days. The main difference from the other single-truck car body is that agasote is also used for the dashers, steel having been found too cold; that five more exhaust registers have been installed in the roof and that air inlets operated on the principle of the stove damper have been placed under the seats in such fashion that they open only when the seats are occupied—in other



**Third Avenue Low-Level Car—Vestibule Showing Staffless Brake, Platform Seating and Original Cash-Box Stand**



**Third Avenue Low-Level Car—Interior, Showing Registers of Exhaust Ventilators and 10-In. Movable Top Sash**

the usual projecting brake drum and to place the foot gong, which is air-operated, behind the end sill. For the same reason, the wooden platform sub-sills shown on the car illustrated have been replaced by angle irons. The clearance between the pavement and the knee beams is fully 8 in. and between the underside of the platform floor and pavement 11 in. Hence loose paving and other obstructions will not foul the car nor will a person

words, the intake of air increases as the number of seated passengers increases.

While the prepayment arrangement is of the Prepayment Car Sales Company's pay-within type, it is planned to use as a cash-box stand the back of a folding seat. This seat, which will be placed on the platform directly in front of the conductor, will be lowered for service only at the motorman's end. Rattan transverse seats

and short longitudinal seats are used in the body of the car but slat seats are provided for use along the idle platform doors. In this way a car of 22 ft. 11½ in. body and 34 ft. 11½ in. over-all length seats thirty-seven passengers in the body and eight more on the platforms, a total of forty-five.

Reference has already been made to the low-level "Radiax" truck, the details of which are shown in the accompanying drawing. The center of this truck is reinforced in order to transmit the tractive effort through the transom instead of through the journals as is customary on rigid axle trucks. It will be noted also that ball-bearing journals are used. This equipment was furnished by the Standard Roller Bearing Company. The use of anti-friction journal bearings by this railway, which operates 160 sets on storage battery cars, is good proof that such bearings now give little maintenance trouble.

Although intended chiefly for suburban service, this car will be equipped for conduit plow operation to make it available for use in the borough of Manhattan. The principal traction equipment consists of two 30-hp, No. 328 Westinghouse motors, PK control, National A3 air brakes and a new geared, staffless hand brake which was invented especially for low-level drop-platform conditions by J. S. McWhirter, superintendent of equipment Third Avenue Railway System. The outward appearance of this brake, as installed on the platform, is shown in one of the halftone views. While it would be improper to disclose the details of construction at this time, it may be stated that the mechanism is of the geared type and that the connection under the platform of the brake shaft to the brake chain is made within a vertical distance of only 1½ in. The headlights are of depressed type, each supplied with a 2-cp lamp and a 4-in. lens.

would weigh approximately 28,000 lb. The car described in this article has the following weights: car body, truck and motors, 22,140 lb.; estimated weight plus air brakes, control and other accessories, 24,000 lb., or 533 lb. per seated passenger.

This car was designed and equipped under the direction of Mr. McWhirter. Its principles of construction are in line with the purpose of the management to develop a car which would include the most modern safety and efficiency features and at the same time not be too radical a departure from previous standards.

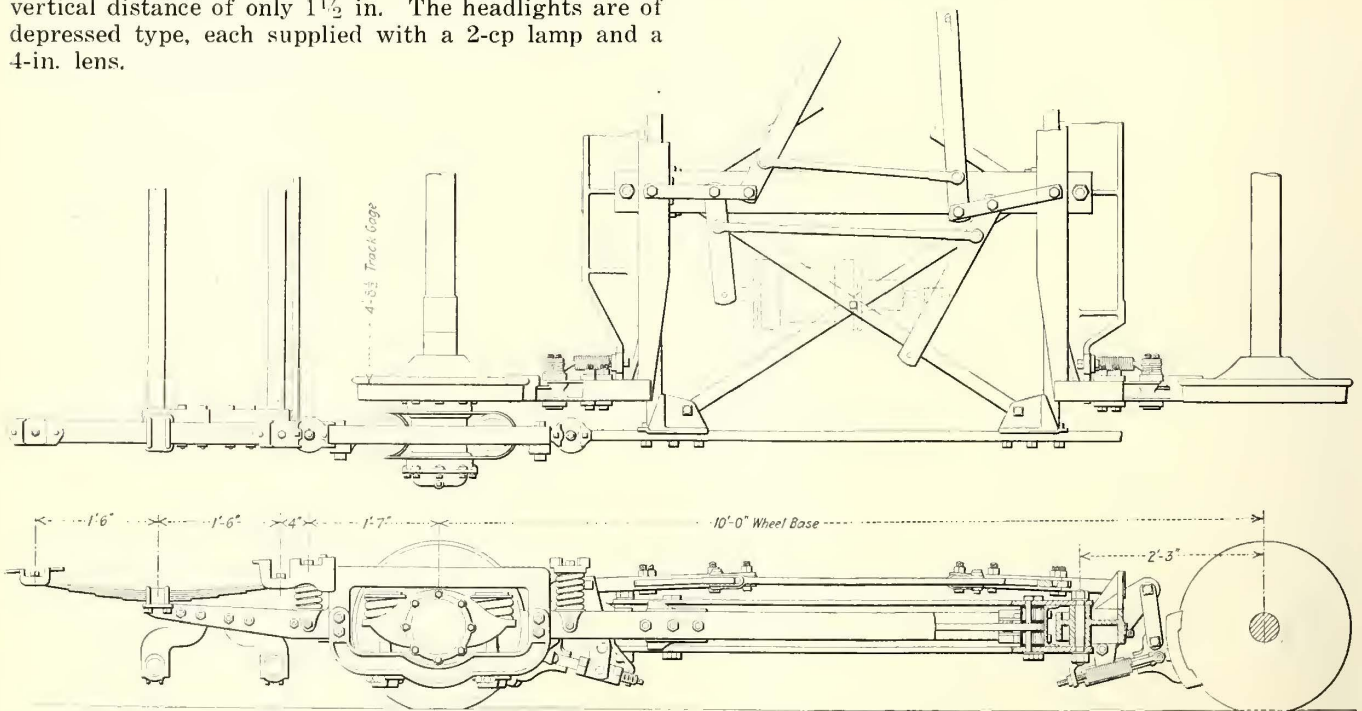
### THREE-PART STRAIGHT-LINE SUSPENSION

The type of straight-line suspension recently put on the market by the T. S. White Company, St. Louis, Mo., represents quite a departure in the design of fixtures to



Three-Part Straight-Line Suspension

perform this service. As shown in the illustration, this suspension is composed of three parts, namely, a 3¾-in. x 2-in. porcelain body insulator, a malleable iron sherardized yoke for connecting the suspension into the line,



Low-Level, Drop-Platform Car—Part Plan, Elevation and Sections of Non-Parallel Axle Truck Equipped with Ball-Bearing Journals and Wheels of 24-In. Diameter

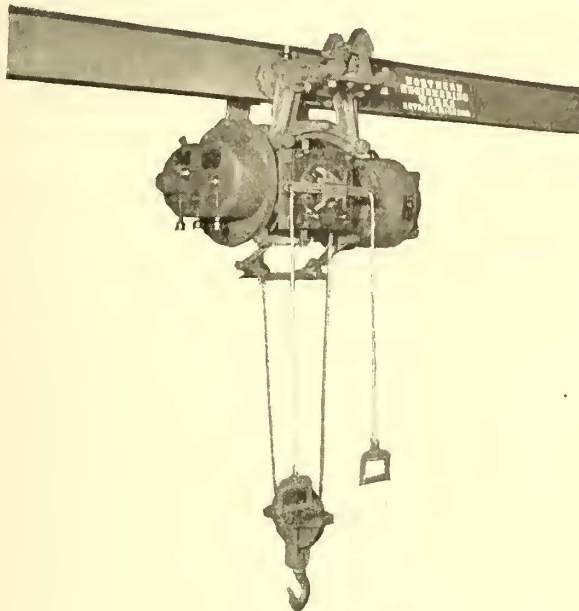
It is of interest to add that the original plan of the company was to use a double-truck car 42 ft. 2½ in. over all and 30 ft. 2½ in. over the body. The car body would have had a ramp and it would have been carried on low-wheel maximum traction trucks to get a 12-in. step from the pavement. The company is quite likely to use this type whenever more cars are needed on its heavy city lines. Such a car having ten pairs of cross seats instead of seven and the same size corner seats

and a forged steel sherardized bolt to which the trolley ear is applied. The claims for this new device are that it eliminates the expensive and troublesome insulated bolts now commonly used in straight-line suspensions and that it also provides a better and more economical insulation. On the other hand, it adds no complications to the older types. If anything, it is somewhat simpler and easier to apply. This suspension also has the advantage of the renewable bolt in case the threads

are stripped in service, so that it is necessary to renew only this portion instead of the entire suspension.

PORTABLE ELECTRIC HOISTS

The Northern Engineering Works, Detroit, Mich., have recently brought out the type "D" spur-gear electric hoist for portable use and for locations which require the hoist to be suspended by a single hook. This hoist can be easily attached to any overhead trolley or crane and can be readily moved from place to place. It



Portable Electric Hoist

will save much labor where a hand hoist is now used as its speed is many times greater. At the same time, it does not require much more space and uses but little energy. For instance, one 2-ton hoist which lifts about forty times a day, averaging half loads and half lifts, costs only 6 cents a day for power. Where necessary, the hoist can be provided with a variable speed controller, graduating the speed to suit the character of the service. A one-speed reversing switch is used where graduated control is not required.

All gears are cut and inclosed completely for internal lubrication. The mechanical disk brake is also inclosed. An automatic limit device stops the hook at the top of the lift. All bearings are bronze-bushed. Since the necessity of portability and compactness somewhat limits the size of the gearing and moving parts, the builders have given particular attention to their strength and durability, using tough material and straight standard cut spur gears instead of planetary or worm or bevel gear combinations. The accompanying table shows the standard sizes of this hoist.

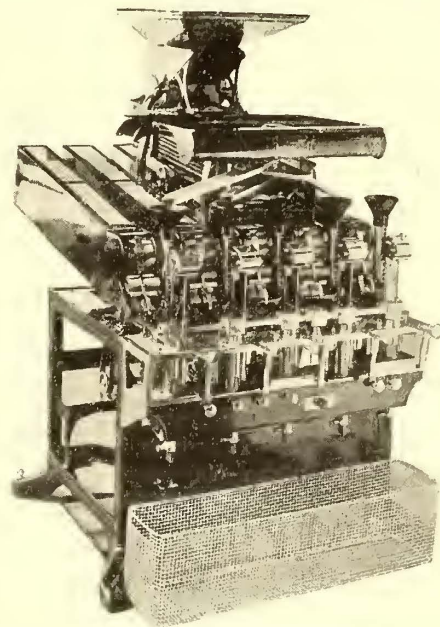
TABLE OF STANDARD SIZES OF ELECTRIC HOIST					
Frame Number	Capacity in Lb.	Horse-Power, Approx.	Maximum Lift of Hook, Ft.	Direct Current	Alternating Current
				Hoist Speed, Ft. per Min.	Hoist Speed, Ft. per Min.
F $\frac{1}{2}$	1,000	2	16	25 to 50	25 to 27
F1	2,000	2	16	20 to 50	20 to 22
F2	4,000	2	10	10 to 25	10 to 11
G2	4,000	4	25	20 to 40	18 to 19
G3	6,000	4	25	17 to 40	17 to 18
G5	10,000	4	12	9 to 20	9 to 9 $\frac{1}{2}$
G6	12,000	4	12	8 to 20	8 to 8 $\frac{1}{2}$

Standard trolleys can be furnished for either single or double beams for these hoists—free traveling or geared for hand travel.

COIN-HANDLING MACHINE

The Sattley Coin Handling Machine Company, Detroit, Mich., has brought out a machine which, through the time saved in counting coins and the reduced cost of counting, should prove of value to electric railways. This machine makes possible a quick calculation of the receipts of individual conductors or lines and eliminates disputes and discussions in regard to the correct amount of coins turned in by conductors or given them for change. The machine sorts pennies, nickels, dimes, quarters and half dollars, counts them in separate denominations and packages or sacks them as desired. All the coins may be sacked by the machine, all may be packaged, or any combination of these operations may be made as desired. The machine detects and throws out mutilated coins without counting them. Money of different denominations from different parties may be placed in the machine and a count will be registered in dollars and cents, showing accurately the amount of each denomination and the grand total of all denominations.

The coins are first examined for counterfeit matter, slugs, etc., and then placed in a hopper at the top of the machine. From here they are fed down through a hopper spider into five inclined trays which sort them through gravity. A sorting chute runs from each tray to a coin tube with which is connected a counting device. After being counted the coins pass down into a package automatically fed into the package cylinder from the magazine. The open end is closed by a



Coin-Sorting, Counting and Packing Machine

crimping plunger, and the completed package drops into the basket on the next quarter turn of the four package cylinders. The mechanism is so arranged that if it is desired to count only one denomination the four other compartments may be turned out of operation.

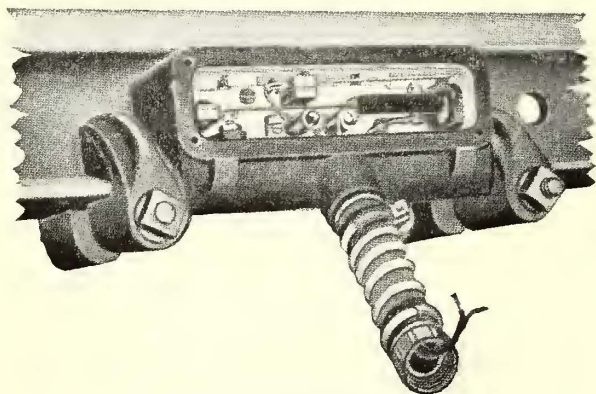
The empty packages that are used in the machine come packed in cartons which are inserted bodily into the package magazines, care being taken that the open ends of the packages come on the proper side. If it is desired to use sacks instead of packages for the money, by a simple device the coins are made to flow automatically into the sacks and stop when a certain amount has been counted. These amounts are 1000 coins in the case of all denominations except quarters, of which 2000 are counted at one time.

The registers on the coin tubes are double. The top register is a sub-totalizer for registering the separate amount of coins in each run and must be set back after each separate count has been recorded. The bottom register is a totalizer for keeping count of the total of all of the separate amounts taken from the sub-totalizer. This has to be set back only after all the separate counts have been taken off.

The capacity of the machine is 800 coins per minute. It is impossible to make a miscount through having a coin go down the wrong coin tube because the counting device becomes automatically locked as soon as the coin of smaller denomination reaches it. Under such conditions the coin may be removed through the ejector slide inserted in the proper funnel. The machine illustrated is run by a Westinghouse motor.

### IMPROVED OSCILLATOR OF HIGHWAY CROSSING SIGNAL

The Protective Signal Manufacturing Company, Denver, Col., announces that it has made a further improvement in its oscillator or vibrating contactor. This



Oscillator Clamped to Rail

device is designed to close a control circuit to the crossing signal wherever vibrations in the rail are set up by a passing train. The original oscillator was designed for attachment to the underside of the rail, but the new type C, as illustrated, is attached to the outside web of the rail. It is held in place by clamps, which are installed under the base of the rail, thus obviating all need for drilling through the web.

### LABORATORY PORTABLE METER

To meet the demand for laboratory instruments, approaching in accuracy the meters of the precision type and suitable particularly for d.c. measurements, the Westinghouse Electric & Manufacturing Company has brought out the type "PL" laboratory portable meters as illustrated. These meters are similar to the type "PL" portable meters, which are adapted to general testing work, except that their extra long scale and strong magnets make them especially suitable for use as semi-portable laboratory meters. They operate on the D'Arsonval principle, namely, a moving coil and permanent magnet, which renders them free from all errors due to residual magnetism.

The new meter, however, has a single air gap through which the moving coil, pivoted at one edge, swings. The single gap permits maximum torque per unit weight for the following reasons:

The magnet will retain a higher permanent strength

because the total air gap is relatively narrow and need never be disturbed. The complete movement can be taken out for inspection or repairs without removing any part of the magnetic circuit. Magnets in which the coil surrounds a cylindrical core forming part of the magnetic circuit, as in the usual double-gap movements, are subject to change in field strength if the coil is removed, because the cylindrical core has to be taken out in order to remove the coil.

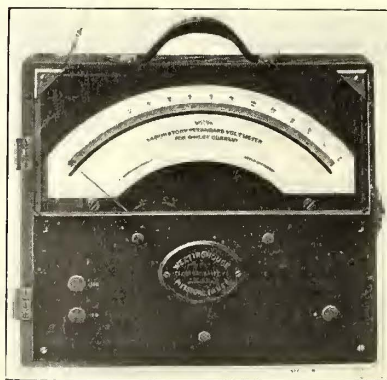
The strength of the magnet can be higher in the single-gap than in the double-gap movement for the magnets of the latter can be only as strong as they would be when the core is out; otherwise they would lose part of their strength the first time the core and coil were removed.

Since the coil when pivoted at one side counterbalances to some extent the weight of the pointer and thus reduces the counter-weight necessary when the coil is pivoted in the middle, as with the double-gap movement, the single-gap movement allows a minimum total weight of movement.

The strong magnets produce a high torque, which, with the light weight of the moving element, gives a high ratio of torque to weight, thus reducing friction errors to a minimum.

The accuracy of these meters is further assured by treating, magnetizing and artificially aging the magnets with their pole pieces complete according to the process originally developed by Madame Curie, the discoverer of radium. Further, the magnets after treating are stored for six months. If they show a decrease in strength after this time they are rejected. The moving coil and pointer are then assembled in the magnetic structure and the manufacture is completed without disturbing the magnetic circuit, an arrangement impossible in the bi-polar D'Arsonval instruments.

The light metal frame on which the moving coil is wound moves through the air-gap of the magnets and makes the reading inherently dead-beat. This important feature enables readings to be taken quickly and prevents violent fluctuations from injuring the pointer or the moving element. The scale, which is 11½ in. long, subtends an arc of 100 deg., giving large open divisions which are of uniform length throughout. The



Standard Laboratory Voltmeter

scale has diagonal markings which facilitate accurate readings of fractions of divisions. A mirror which extends the entire length of the scale enables the prevention of parallax in reading.

For use with the millivolt meters, combination laboratory portable shunts are supplied. These combination shunts include three shunts of any desired capacity up to 200 amp mounted in a single box with suitable terminals. These meters are supplied as voltmeters or as millivoltmeters. The millivoltmeters can be used as ammeters in connection with high accuracy.

The Columbus Street Railway & Light Company, Columbus, Ind., recently burned five cars which had been in use in that city for twenty years. The cars were taken out of service not long ago when new rolling stock was secured for the company's lines.

# News of Electric Railways

## New York, New Haven & Hartford Railroad Segregation Terms

The Department of Justice at Washington announced on March 21, 1914, that an agreement for the dissolution of the New York, New Haven & Hartford Railroad and its subsidiary railroads, electric railways and water transportation lines had been reached. The official announcement as authorized by Attorney-General McReynolds follows:

"The Attorney-General has indicated to the representatives of the New York, New Haven & Hartford Railroad the arrangements which he thinks would result in bringing the affairs of that company into harmony with law. The representatives of the railroad are willing to accept the requirements indicated and to endeavor to put them into effect without delay if approved by the stockholders in a meeting to be called at once. The indicated arrangements, stated in general terms, follow:

"1. The Boston Railroad Holding Company is a Massachusetts corporation, holding a majority of the stock of the Boston & Maine Railroad, and 90 per cent of the former's stock, in turn, is owned by the New Haven Railroad. The charter of the holding company prohibits it from disposing of the Boston & Maine stock. The Legislature of Massachusetts will be asked to remove this prohibition, and, if this is done, the stock of the holding company will be transferred at once to five trustees and, after arrangements have been made to protect the minority stock of the holding company, they shall sell the Boston & Maine stock prior to Jan. 1, 1917.

"2. The stocks of the companies which control the Connecticut and Rhode Island electric railways will be placed in the hands of trustees—five for each State—and shall be sold within five years from July 1, 1914.

"3. The majority stock of the Merchants & Miners' Transportation Company, now held by the New Haven Railroad, will be placed in the hands of three trustees, and shall be sold within three years from July 1, 1914.

"4. The minority stock in the Eastern Steamship Corporation, held by the New Haven Railroad, shall be sold within three years from July 1, 1914, and in the meantime shall be deprived of voting power.

"5. Whether the New Haven Railroad shall be permitted to retain the Sound lines will be submitted to the Interstate Commerce Commission for determination under the provisions of the Panama Canal act.

"6. The Berkshire electric railways shall be sold within five years from July 1, 1914.

"7. A decree embodying the foregoing shall be entered in the United States District Court for the Southern District of New York. The decree shall further provide that upon application of the New Haven Railroad or the trustees and for good cause shown the time within which any of the above-mentioned stocks shall be sold may be extended by the court.

"Trustees satisfactory to all parties have been suggested. Those proposed in connection with the Boston & Maine stock have signified their willingness to serve, and their names are: Marcus P. Knowlton and James L. Doherty, Springfield, Mass.; James L. Richards and Charles P. Hall, Boston, and Frank P. Carpenter, Manchester, N. H. Names of the others will not be made public until acceptance by them is fully assured.

"The essential reason for placing the properties in the hands of trustees is to secure their immediate independent managements.

"The outlines of the proposed decree and trust agreements have been discussed and are understood. Their verbiage remains to be worked out, but no difficulty is anticipated in that respect.

"This statement has the approval of both the Attorney-General and representatives of the railroad."

Howard Elliott, chairman of the board of directors of the New York, New Haven & Hartford Railroad, was quoted in part as follows:

"New England needs peace and a chance for constructive

work. If that condition could be obtained by an amicable adjustment under which ample time was allowed for the protection of the company's property, the directors felt that such an adjustment would be helpful to New England and to the stockholders of the company. The directors felt that the time allowed, with the right in the courts to extend it upon application of the company or of the liquidators, gave an opportunity for disposing of the various properties to the best advantage possible and with the least disturbance to general business conditions. The financial conditions confronting the company are most difficult, but the proposed adjustment agreement with the government increases the probability of handling the matter successfully, and this very vital question will be taken in hand by the directors at once. The directors felt that the disposition of these properties was a transaction of such importance that the stockholders must pass upon it, to which the department assented. A meeting will be called in the near future for that purpose. Prior to that meeting a statement will be submitted to each stockholder outlining the situation."

The directors of the company met in New York on March 25 and approved the proposed dissolution plan. They will recommend similar action by the stockholders and have set April 21, 1914, as the date on which the dissolution plan will be submitted to the stockholders for their approval.

## Apparent Crisis in Toledo Negotiations

The Schreiber ordinance, which requires the Toledo Railways & Light Company, Toledo, Ohio, to operate at a straight 3-cent fare, was scheduled to go into effect on March 27. On the other hand, suit is pending against the company in the United States Court and this may be pushed to the appointment of a receiver.

Henry L. Doherty, of Henry L. Doherty & Company, New York, N. Y., and Thomas H. Tracy, attorney for the firm, spent a portion of the week ended March 21, 1914, in Toledo, in conference with the city officials. At a meeting on the evening of March 19 Mr. Doherty asked that the operation of the Schreiber ordinance be suspended for a certain length of time and that the city appoint an expert street railway man to operate the property as a test. He proposed that such a man take full charge, even to having the books audited, and that the results of his tests be tabulated and the information used as a basis for a new contract. Mr. Doherty explained to the committee that without knowing what will be required in regard to paving, extensions, renewals, etc., it would be difficult to determine upon a rate of fare. With these details known the company could prepare a proposition on the rate of fare and submit it to the city within seven days.

Mr. Doherty said the company would be willing to start with a fare of 3 cents, if provision for a sliding scale was placed in the contract, but that the road could not be operated with profit at a flat rate of 3 cents.

The members of the Council committee on franchises were not disposed to act on any of the suggestions made by Mr. Doherty or his attorney. They insist that the company shall furnish service at a 3-cent fare.

Mr. Doherty made no statement as to what would be done if the ordinance were allowed to go into operation.

City Solicitor Thurstin was instructed to prepare two tentative ordinances to be presented at a meeting of the committee on March 21, in the hope that they may form the basis for negotiations. Mr. Doherty and Mr. Tracy were invited to be present and take part in the deliberations.

On the evening of March 23, 1914, the City Council disregarded the request of Henry L. Doherty for an extension in time of thirty days in which to negotiate a new franchise, and voted to put the 3-cent-fare ordinance into operation on March 27, on which date, it is claimed, all the principal franchises expire. The low-fare ordinance was enacted under the administration of Brand Whitlock.

Mr. Doherty made no statement after the Council acted on March 23, except to say that the company could not operate its property at a profit with a fare of 3 cents.

T. H. Tracy, attorney for the company, said that it would be willing to continue to operate under the agreement in force since July 1, 1912, and also would agree to the city naming an expert to take over the management of the property in the interval pending a settlement on a permanent basis. At present the company is carrying passengers at the rate of six tickets for 25 cents, with a fare of 3 cents and universal transfers between 5.30 a. m. and 7.30 a. m., and 4.30 p. m. and 6.30 p. m.

#### James Campbell on Depreciation

Under the heading of "General" in the annual report of the North American Company for the fiscal year ended Dec. 31, 1913, James Campbell, formerly president of the company and now chairman of the board, says in discussing the question of depreciation:

"The fact that the subsidiary companies in which your company is interested appropriate large reserves each year for the present maintenance and future preservation of their physical properties should not be without its influence on the value of your equities. Many other public utilities are at present operated under the assumption that a provision for ordinary maintenance is sufficient to arrest depreciation. Examination, however, of the causes leading to the abandonment of various items of physical property shows that in the majority of instances the replacement becomes necessary before the item has been worn out. Maintenance will do little other than permit the realization of the expected life, whereas depreciation is designed to insure the replacement which will increase the useful life of the property.

"The determination of the proper allowances for maintenance and depreciation of properties is not without its difficulties. In fact, it calls for the exercise of conservative judgment and possibly modification from time to time as the necessity therefor develops. The estimates made by regulating commissions in cases involving the regulation of rates are at best crude guesses, and are rarely substantiated by accurate statistical information. That the principle of providing for depreciation is sound appears evident when it is recognized that it is necessary to provide to-day replacements to be made in later years in order that to-day's users of service may bear the cost thereof."

During the year the companies controlled by the North American Company expended \$10,528,891, which was charged to capital account, and provided out of earnings reserves for depreciation aggregating \$3,401,029, and in addition thereto expended \$3,116,082 on maintenance. The proportion of gross revenues expended on maintenance and appropriated for depreciation during the year 1913 by the railways controlled by the company are shown by the following tabulation:

Total	Per Cent of Gross Revenue	
	Expended for Maintenance	Appropriated for Depreciation
The Milwaukee Electric Railway & Light Company:		
Railway department.....22.00	11.16	10.84
Milwaukee Light, Heat & Traction Company:		
Railway department.....22.00	19.00	3.00
Wisconsin Gas & Electric Company:		
Railway department.....15.00	5.54	9.46
United Railways, St. Louis.....24.88	13.32	11.56

#### Arbitration Board Question Settled in Indiana

The matter of an arbitration board to serve during the three years of the award recently made by the Public Service Commission of Indiana in the matter of grievances of employees of the Indianapolis Traction & Terminal Company was settled on March 16, 1914, when Governor Ralston announced that at his request the Public Service Commission would act as a board of arbitration in the adjustment of any matters, such as the reinstatement of discharged employees, not settled in conferences between the company and its employees' committees. In the award, the commission had provided for an arbitration board of three members to be appointed by the judges of the Federal Court, Indiana Supreme Court and Indiana Appellate Court. The judges declined to appoint such arbiters. The

employees, acting under advice of labor leaders, then insisted on a board composed of three members, one selected by the company, one by the employees, and the third member to be chosen by the two thus selected. This form of arbitration board the company refused to accede to on the ground that it could not by virtue of its nature be impartial; that it could not administer oaths, and that it would have no authority to enforce any awards it might make. The labor attorneys stated that they considered the award of the commission as closed and that they would not accept any board appointed by the commission until they knew who the members of the board were.

Upon the announcement that the commission would itself continue to act as a board of arbitration, a committee of employees called on the Governor and protested against this plan. The Governor told them that the commission had consented to act as a board of arbitration upon his request, and that on account of the responsibility of the commission for the safe operation of the street railway properties the plan was a most wise one. The Governor told the committee of employees that the only man who had vilified and abused the commission for its decision was J. J. Thorpe, vice-president of the Amalgamated Association. He informed the members of the committee that they could either agree to the plan of having the Public Service Commission as a permanent board of arbitration or accept the responsibility of declining.

#### Three Tickets for 10 Cents Suggested in Cleveland

The official labor organ at Cleveland in its issue of March 20, 1914, urges that when an increase in the fare of the Cleveland (Ohio) Railway becomes necessary three tickets be sold for 10 cents instead of making a charge of 1 cent for a transfer. The paper claims that, in making a transfer charge, the burden of the increase falls largely upon the laboring people of the city, whereas under its suggestion all will pay alike. It is estimated that 250,000 persons, or about 40 per cent of the street railway patrons, use transfers daily.

Mayor Baker will consider the suggestion. J. J. Stanley, president of the company, said that three tickets for 10 cents would be much better for the working people, but that the returns to the company would not be so large as under the transfer charge. Figures furnished by the company show that its receipts for February, with a transfer charge, would have been \$578,838, while at the rate of three tickets for 10 cents the receipts would have aggregated \$568,229.

The City Council enacted legislation recently authorizing the Cleveland Railway to construct what are known as the East Seventy-ninth Street and the East Thirtieth Street crosstown lines. Much opposition has developed to the East Seventy-ninth Street line, which will traverse a private right-of-way for a short distance, and an attempt is being made to secure a referendum vote in regard to the construction of the lines.

Peter Witt, street railway commissioner, reported to the Cleveland Council on March 23, 1914, that the Cleveland Railway contemplated installing motor buses for service in the sparsely settled districts as an experiment. Three buses, to cost \$16,251, will be purchased. Each will seat twenty-six people. It has been planned to put the first one in service at the end of the St. Clair Avenue line to operate to the eastern limits of Nottingham. A resolution authorizing the purchase of the buses has been presented to the Council.

W. R. Hopkins of the Cleveland Underground Rapid Transit Company was present at the meeting of the Council on March 23 to report on plans for the proposed subways. Mr. Hopkins said that the lines of the company were planned to take care of both city and interurban cars. He said that financial conditions were improving and that the proposition can be financed. Mr. Hopkins requested that several changes be made in the grant, one of them a higher price for the property in case the city should conclude to take the line over. He also desires the privilege of making a contract with the Cleveland Railway on the long-haul business and authority to bring cars to the surface at certain points.

### Municipal Ownership of Public Utilities

The speaker before the finance forum of the West Side Branch of the Young Men's Christian Association of New York, March 23, 1914, was Arthur Williams, of the New York Edison Company, whose subject was "Municipal Ownership of Public Utilities." In opening his address Mr. Williams referred to the misconception of the average non-property-owning citizen who entertained the conviction, consciously or subconsciously, that the enjoyments of the various activities of the municipality in which he lived were paid for largely, if not entirely, by others. There were few enterprises conducted by public officials from which the service could not be obtained more cheaply and efficiently under the methods prevailing under properly conducted private corporations. In other than most exceptional instances men could not be found to administer municipal public service properties properly on account of the accidental character of selection which prevails in the political service of the country. He said that the construction of the Panama Canal and the great reclamation improvements of the West which were often pointed to as indicating the incorrectness of this assertion were not true criteria. The men who so ably conducted these works were free from political control and had years of continuous education and training in the military and naval service in addition to personal qualifications of high executive and administrative order.

Municipal activities of a technical nature failed on account of the absence of continuity of training and practical experience. Public service throttled personal initiative. The elimination of personal interest and incentive took away the most potent stimulus in the rendering of creative and progressive service. For illustration Mr. Williams quoted from a recent work, "Where and Why Public Ownership Has Failed," by Yves Guyot. Even the *New York World*, a paper which could not be said to favor private corporations or to be antagonistic to any of the best interests of labor, concluded an editorial on March 21 as follows: "New York has a written charter, but it is only a matter of form. The real charter of New York is to be found in the decrees of 60,000 and more civil service employees, all organized against their employers, the people of New York. They are the despots of our democracy."

Mr. Williams referred to the failure of the efforts of both Texas and North Carolina to operate steam railroads successfully and to the findings of the investigating committee which inquired into the national transcontinental railway undertaking in Canada. He cited the examples of government ownership of railroads in France and in Germany. In this connection he said: "If Germany with its advanced and highly developed public service can offer in the conduct of its railroads no substantial advantages over private ownership and management, it would be difficult to find justification anywhere, other than as appealing to a political régime seeking to protect itself and perpetuate its existence or to a political party seeking office, for a radical change from our American to these foreign methods."

Referring to municipal failures in general, Mr. Williams said:

"No less than 211 examples of municipal lighting plants exist, each carefully verified, in which municipal ownership or its near equivalent, municipal operation, has been abandoned. This statement is made upon detailed information secured in every case from the mayors, the town clerks or other city officials of each municipality in which the abandonment of public and the substitution of private service has taken place."

The general public was entitled to good service at fair prices and the stock-owning public to a proper degree of protection in its investments. Two recent instances of mismanagement of steam railroad properties offered an example of the fact that the public possessed adequate remedies for the cure of corporate wrongs other than the purchase or investment in and the operation of the various utilities. He referred to the excessive operating costs and the indifferent service of the telephones in Europe which were operated and controlled by municipalities. He also reviewed briefly the movement which resulted in the municipalization of English electric railways and in speaking

of Glasgow quoted from the remarks made by James Dalrymple, general manager of the Glasgow Corporation Tramways, in his report to the Council reviewing American practice, an abstract of which was published in the *ELECTRIC RAILWAY JOURNAL* of Feb. 28, 1914, page 490. Mr. Williams also referred to New York's experiment with a municipal lighting plant and to the municipal ferry. As a result of a comparative study of the municipal lighting plant originated by the officials of the city it was found that the service of the private corporation was more satisfactory and cheaper and after a loss of \$108,933, as reported by the experts, the municipal project was abandoned in favor of a private corporation. In regard to the municipal ferries, he asked how the money provided from general taxation for the ferries was of any moral or civic advantage. This investment was now threatened with large depreciation and a greatly increased deficit through the construction of a subway across the Narrows to Staten Island.

In conclusion, Mr. Williams said:

"It is to be greatly hoped that our country, in its national, state and municipal policies, will not adopt European methods, which have been found to be mostly destructive of the best in public and private life, but rather will continue a course in which our great utility industries will be absolutely divorced from politics; that they will continue to give the largest incentive to individual and collective advancement, and that our people may secure at lowest cost the best which science and invention have developed and placed at our service for bettering human conditions."

### Chicago Subway Situation

At a recent meeting of the board of election commissioners, the request of the Chicago City Council to eliminate the initial subway proposition from the ballot at the April election was considered. In view of the fact that the Council had notified the board that the necessary enabling ordinance could not be passed in time to make the proposal effective, the board decided to omit the initial subway proposition. The ballot, however, will still contain a proposition in the form of a comprehensive subway ordinance. A strenuous effort is being made by certain newspapers and the Cook County Real Estate Board to defeat this measure. Arrangements have been made to use billboards and moving-picture shows in the campaign against the construction of a subway.

### Anniversary of Signing of Dual Subway Contracts

March 19 was the first anniversary of the signing of the dual system subway contracts. At the meeting of the Public Service Commission for the First District of New York on March 18 Chairman Edward E. McCall took occasion to note the work done under those contracts in the first year and expressed himself as gratified at the progress made. He stated that there is now under contract nearly \$100,000,000 worth of work on behalf of the city—about two-thirds of the amount which the city will be called upon to do under the dual system agreements. Of this amount more than \$27,000,000 worth has been placed under contract during the last year. In addition, the Centre Street loop subway has been placed in operation and the contract let for the reconstruction of the Steinway tunnel for temporary operation.

The Public Service Commission has called for bids for the construction of two more sections of the new subways in New York, one on the Whitehall-Montague Street line in Manhattan, to be operated by the New York Municipal Railway Corporation, and one on the Seventh Avenue line in Manhattan, to be operated by the Interborough Rapid Transit Company. Bids for the former will be opened on April 14 and on the latter on April 17. The section of the Whitehall-Montague Street line runs mainly through Whitehall Street and connects the southern end of the Broadway subway in Manhattan with the proposed tunnel under the East River from Whitehall Street to Montague Street, Brooklyn. The section of the Seventh Avenue line runs from Vesey Street south through Greenwich Street to the Battery, where the Seventh Avenue line will connect with the existing subway.

### Plans for Extending New Haven Electrification

The New York, New Haven & Hartford Railroad expects to start preliminary test train operation with electricity between Stamford and Westport, Conn., about April 1, 1914. As soon as this section has been tried out the electric zone will be extended toward Stratford. This will probably be during the latter part of April. Probably by the latter part of May electric operation will be extended to New Haven, thus completing electrification between New York and New Haven, a distance of 73 miles. In this connection W. S. Murray, consulting engineer of the New York, New Haven & Hartford Railroad, in general charge of all electrical engineering and construction, has authorized the following statement:

"The system for electrifying the main line of the New Haven from Stamford to New Haven, which has been under construction for about a year and a half, will in all probability be sufficiently completed so that it may be energized and made use of before the end of May this year. As soon as the current is introduced into the system all regular scheduled trains will be run by electric power. After the entire completion of the electrical equipment is reached, all trains, passenger, freight and switching, will be operated electrically. For the present the change from steam to electricity will not involve any alteration of the timetable, although it is quite possible that later on the electric service will enable a change in the schedule in the addition to it of one or two new trains. Present plans contemplate New Haven as the terminal of the electric system on the east."

### Injunction to Prevent Enforcement of Omaha Low-Fare Ordinance

The ordinance requiring the Omaha & Council Bluffs Street Railway, Omaha, Neb., to sell seven tickets for 25 cents, which was passed at the election on March 10, 1914, was initiated by the socialist party in Omaha under the initiative and referendum law. Many of the addresses given by signers of the petition filed with the city clerk were found to be vacant lots, and at other addresses given by signers it was learned that no such party resided there or had resided there. In other cases a number of signatures were all in the same handwriting, and some signers were not even naturalized citizens. Eliminating all of the fraudulent signatures, there was, according to the company's showing, an insufficient number of names to the petition. The city clerk, however, held that, according to his check, the number of signers to the petition was sufficient and the City Commission of Omaha accordingly submitted the question to the voters at the special election on March 10. The company applied for an injunction to prevent the election from being held, but the Circuit Court held that the city clerk was the sole judge of the sufficiency of the petition, and on that ground refused an injunction. The company made no campaign against the measure and the ordinance carried by a vote of only 4709 to 3910. The company is preparing to apply for an injunction to restrain the city from enforcing the ordinance.

### Terminal and Viaduct Questions in Kansas City

The Kansas City Terminal Railway asked an injunction in the Circuit Court in Kansas City recently to prevent Mayor Jost and the City Council from passing pending ordinances giving the Metropolitan Street Railway, Kansas City, the right to use the McGee Street and Broadway viaducts over the Belt line until the street railway has paid half the cost of the two crossings. Evidence was heard in the case on March 10, 1914, by Judge Bird. The Terminal company, a steam road, alleges the Metropolitan Street Railway agreed to pay half the cost of all viaducts used by it, with the exception of two. The steam company estimates the cost of the McGee Street viaduct at \$174,000 and of the Broadway viaduct at \$365,000. On this valuation the terminal railway wishes the Metropolitan company to pay it \$269,500. The steam company alleges that the Metropolitan has not secured the consent of a majority of the adjacent property owners on the streets over which the Metropolitan tracks will run. It is charged also that the Mayor and Council refused to compel the street car com-

pany to pay its share of the cost of the two viaducts before granting franchises permitting the company to run cars over them.

R. J. Dunham, one of the receivers for the Metropolitan Street Railway, stated in Kansas City on March 9 that the Kealy-Ash plan of routing cars to the new Union Depot was still favored by the receivers. He said:

"The Metropolitan Street Railway will not put cars on either the Broadway or the McGee Street viaducts if such action necessitates its paying half the cost of the structures. The ordinance now pending extending the Broadway line from Fourteenth to Twenty-fourth Street will not be accepted unless the city provides a way for using the Broadway viaduct without requiring the Metropolitan Street Railway to pay half the cost."

The Kansas City Council has passed an ordinance authorizing the Metropolitan Street Railway to lay tracks on Twenty-fourth Street, from Broadway to Main, to supply the west and southwestern sections of the city with street car service to the new Union Depot. The ordinance provides that the tracks are not to be laid until the consent of a majority of property owners is secured. The passage of the ordinance probably means that no tracks will be allowed on the plaza of the new depot. Mayor Jost has ten days in which to sign the measure.

### Valuation of Los Angeles Railway

According to the complete report just received of the valuation of the street and interurban railways in Los Angeles, a preliminary résumé of which was published in the *ELECTRIC RAILWAY JOURNAL* of Jan. 17, 1914, the cost of reproduction new of the system as of Jan. 1, 1913, would mean an investment of approximately \$19,800,000. This is an engineer's estimate, based upon a physical inventory, and does not include any allowance for general contractor's profit, for early losses in building up the business or for other "development expenses," such as discount on securities, cost of consolidation or investment in superseded property. The report states that the valuation figure is well within the limit of 10 per cent of any figure which might be arrived at by a more elaborate method of appraisal, but that in case of the purchase of the railways, the figures should be further checked.

It was estimated that the development expenses would amount to more than \$5,000,000 for a system of the kind examined, but inasmuch as the original records of the actual cost of developing the lines were not available, no estimate was included. A study was made of the depreciation due to obsolescence, age and inadequacy as of Jan. 1, 1913, and it was estimated that \$4,980,000 should be deducted from the figures of the cost to reproduce new in order to show the depreciated value of the physical plant. If the development expenses had been allowed, the cost to reproduce the physical plant would become approximately the actual value of the physical property.

The two most important items in the cost of reproduction were \$990,359 for real estate, for power houses, substations and shops, and \$1,065,642 for private right-of-way. The system was given the benefit of appreciation in real estate values as determined by contiguous property. Although the original right-of-way was often a strip of land 60 ft. to 80 ft. wide located in advance of street platting, the valuation figure was based on a 30-ft. strip, the remainder of the land having been in many cases donated to the city. No multiplying factor was employed by the valuation board.

On a basis of the earnings for the year from June 30, 1912, to June 30, 1913, the earnings, according to a 10 per cent yearly rate of growth, were estimated at from \$7,480,000 in 1914 to \$17,737,146 in 1923. The operating ratio was estimated at 74 per cent, including the following amounts: maintenance of way and structures, 12.46 per cent; depreciation of way and structures, 3.83 per cent; maintenance of equipment, 6 per cent; depreciation of equipment, 1.92 per cent; traffic, 0.32 per cent; conducting transportation, 38.51 per cent; general and miscellaneous, 3.21 per cent; injuries and damages, 3.11 per cent, and taxes, 4.54 per cent. The report stated that this record was higher than ordinarily found in the case of an urban system but that it would be difficult to reduce the figures. Some economy in



maintenance of both way and equipment might be shown, but the reserve for depreciation should be larger. The return on the investment for interest and dividends is estimated at 7.7 per cent upon the present actual tangible value of the property.

#### Northampton (Mass.) Arbitration

The representatives of the employees' union on the Northampton (Mass.) Street Railway completed the evidence on behalf of the men at the arbitration hearing on March 23, 1914. The concluding testimony chiefly concerned the working conditions of conductors and motormen, the time required to make out reports of the day's car operations and the absence of compensation for such tasks. The point was brought out in cross-examination that the representatives of the union knew of no company in which the maximum wage is paid at the end of the first year.

E. L. Shaw opened the case for the company. He contended that the best relations exist between the road and its employees; that the management desired to pay the men good wages, but that these should be regulated by the laws of supply and demand. The demands upon the company by the public and by the authorities of the State and municipalities were onerous and must be met. The speaker advanced the proposition that the cost of living has not increased as much as advocates of higher pay contended, and stated that on Feb. 23 Bradstreet's index number of commodity prices as quoted in the *Springfield Republican* for the month was 8.86 compared with 9.459 a year ago. This was the lowest index number published since Oct. 1, 1911. Mr. Shaw also quoted from a speech made by Secretary Redfield of the Department of Commerce and Industry, at Wheeling, W. Va., about Feb. 23, in which reductions in the cost of living were predicted. The point was also made that the skill required to operate a car and collect fares was not unusual, according to the recent finding of the Indianapolis board of arbitration, which maintained that the work of a motorman was not much more exacting than that of an ordinary laborer. Extended reference was made to the report of the Boston arbitration board. The hearing was continued to March 26.

#### Measure in Interest of Minority Holders

Senator Kenyon has introduced a bill providing that the government may bring suit in equity on behalf of minority stockholders of public service companies who have been deprived of their rights. The measure would permit either the Interstate Commerce Commission or the Attorney-General to investigate the affairs of a corporation suspected of financial mismanagement, and to bring suit if such mismanagement is discovered. The taking over of a corporation's funds for the benefit of stockholders who have sold their holdings at a loss or who have lost by continued holdings is also authorized, and the measure would give stockholders three years after a decision has been tendered to file their claims.

#### Proposed Westinghouse Memorial

A plan for a memorial to the late George Westinghouse has been suggested. Among the tentative features are that it take the form of a statue and that this be erected in some open space in Washington, D. C., where Mr. Westinghouse spent some of his later years. A fund of \$25,000 or \$30,000 will probably be required. This movement will receive the hearty support of members of the engineering and allied professions who owe so much to Mr. Westinghouse's work.

**Decision in Wisconsin Paving Case.**—According to a decision rendered by the Supreme Court of Wisconsin at Madison on March 17, 1914, not only does a reasonable construction of the franchise of the Southern Wisconsin Railway Company, operating in Madison, require that corporation to pay for the pavement between its tracks and 1 ft. on each side, but that, even if it did not, the Common Council could, by ordinance, make such regulation effective. The company contended that it had to pay only half of the cost.

**New Interurban Line Proposed in Ohio.**—A contract for the lease of 33 miles of abandoned canal between Lancaster

and Nelsonville, Ohio, to James M. Dollison and James Sharp has been approved by Attorney-General Hogan of that State. A company will be organized to build an electric railway on this land. The lines of the Scioto Valley Traction Company connect Columbus and Lancaster and a road is under construction between Nelsonville and Athens. The lease is for twenty-five years and the aggregate rental for the period is \$180,000.

**Enforcement of Memphis Ordinance Enjoined.**—On March 13, 1914, Counsel Francis Fentress granted an injunction restraining the city of Memphis from enforcing an ordinance against the Memphis (Tenn.) Street Railway which was to have gone into effect on March 14. This ordinance provided that the company was to furnish each passenger a minimum of 40 cu. ft. of space, to supply a sufficient number of cars on each line to be run on a "proper and reasonable schedule," to require each car on each separate line to run to the terminus designated on such car after leaving the starting point, to number each car distinctly inside and outside and to place conspicuous signs upon the sides and ends outside, indicating both day and night the route and destination of the cars.

**Progress on Boston Subways.**—The Boylston Street Subway, at Boston, Mass., has been completed except for a small portion of the Massachusetts Avenue station, the Dartmouth Street lobby of the Copley Square station and the connection with the Tremont Street subway near Park Square. Work is in progress at these points, and interior finish is being applied at the stations. The Boston Elevated Railway, which will operate surface cars through the subway upon its completion, is now installing power and lighting conduit in the subway and tracklaying will begin in the near future. Steady progress is being made in the construction of the Dorchester tunnel at the Boston end and in the building of the East Boston tunnel extension from Scollay Square into the West End.

**Jacks on Philadelphia Cars.**—The cars of the Philadelphia (Pa.) Rapid Transit Company are all to be equipped with lifting jacks. According to the company, none of the jacks now on the market was found to be sufficiently reliable in emergencies, and the management after many experiments and tests has succeeded in developing a type of jack which has received the indorsement of the coroner and the representatives of the Civic Club. This jack will be submitted to the Public Service Commission, and, when approved, will be installed upon the cars as rapidly as the manufacturers can deliver the necessary quantities. The conductors and motormen will be instructed in the use of the jacks so as to insure the quickest possible action in raising a car in an emergency.

**New York Subway Operating Problems Reviewed.**—The *New York Evening Post* of March 24, 1914, published in its department "News of the Railroads" an article "Biggest Traffic Problem," in which it gave some of the little known facts in regard to the underground railroad system of the Interborough Rapid Transit Company. Reference was made to the fact that the subway lines are now carrying approximately 1,200,000 passengers daily, whereas the original capacity of the subway was fixed at 600,000. The purposes of the electro-pneumatic brake equipment, the automatic block signal system, the speed-control system and the dispatching system in use in the tunnel under the East River between Manhattan and Brooklyn were all reviewed. The article was concluded with a description of the methods followed by the company in training men for duty in the subway.

**Action in Regard to Proposed Providence Subway.**—The Board of Aldermen of Providence, R. I., has passed the resolution recommended by the special committee on subways, directing the city solicitor to appear before the General Assembly and apply for legislation for the city to take up the matter of a subway system, in accordance with the draft act prepared by the committee. Sent to the Common Council for action in concurrence, the resolution was adopted after an amendment to the draft act, providing that the commission created by the act should spend no money until authorized by the City Council. Previous to presenting its report to the City Council the subway committee added a clause to the draft act providing that mem-

bers of the transit commission created should serve without pay. The report of the subway committee, explaining the changes it had made in the act and commenting upon the results of its public hearing, was presented and read in both branches. The plans for the subway were described briefly in the *ELECTRIC RAILWAY JOURNAL* of March 14, 1914, page 601.

**Utility Board Approves Newark Terminal Grants.**—The ordinances authorizing the re-routing of the lines of the Public Service Railway and the provision of terminal facilities in Newark were approved by the Board of Public Utility Commissioners on New Jersey in a report submitted on March 20, 1914. The approval is given subject to the terms of the blanket agreement between the city and the Public Service Railway. The report makes clear that the board does not believe that the carrying out of the provisions of the ordinances in question offers a permanent solution of the traffic problem in Newark and vicinity or even that it will eliminate temporarily the congestion from which the public now suffers. Adequate terminal and looping facilities may improve conditions, but, as expressed by the board, "permanent relief can come only through the creation and use in street railway service of thoroughfares parallel to Broad and to Market Streets through the congested district." In summing up its conclusions the board says: "Careful consideration of all this material leads the board to the conclusion that the several grants made by the ordinances submitted are necessary and proper for the public convenience; that the public interest is thereby properly conserved, and that the ordinances should be approved."

**Increase in Pay in Indiana.**—The Terre Haute, Indianapolis & Eastern Traction Company, Indianapolis, Ind., has entered into a new working agreement with the trainmen of its interurban lines for a period of three years to March 31, 1917, whereby it increases the rates of pay of the men to the following schedules for the period from April 1, 1914, to Sept. 30, 1915: First year, 22 cents an hour; second year, 24 cents; third year, 25 cents; fourth year, 26 cents; fifth year, 27 cents; sixth year, 28 cents; seventh year, 29 cents; eighth year, 30 cents; ninth year, 31 cents. From Oct. 1, 1915, to March 31, 1917, the rate from the first to ninth years remains the same as above, but for the tenth year's service the rate is increased to 32 cents an hour. The agreement also provides that men shall be paid for actual time consumed on train in deadheading to and from points where they are sent for runs. Men called for a run or held for a run and not used are to be paid a minimum of one hour. If held more than one hour they are to be paid for actual time held. Three hours is to be the minimum time for which any man is to be paid who takes out any run; men who are paid the minimum of three hours for a run are to remain at head of the extra list unless they have had a previous run the same day. Nine hours is to be the minimum time paid for any regular schedule run. No regular schedule run is to be more than twelve hours and fifteen minutes. Regular men who are taken off runs and placed on some extra runs for the day are to be paid not less than the regular pay of the run. The Union Traction Company of Indiana and the Indianapolis, Columbus & Southern Traction Company have also entered into agreements with their interurban trainmen whereby a new scale of wages is effective on April 1, 1914, giving the men the same rates of pay as shown in the agreement of the Terre Haute, Indianapolis & Eastern Traction Company.

## LEGISLATION AFFECTING ELECTRIC RAILWAYS

### NEW YORK

The Public Service Commission for the First District has sent to the Legislature a bill to amend the rapid transit act so as to give the city of New York, through the commission, the power to build rapid transit lines directly through men employed by the city. As the law now stands the commission has the power to lay out routes and let contracts, subject to the approval of the Board of Estimate and Apportionment, but has not the power to do the actual construction work. In case of emergency such a power might become necessary to the completion of parts of the new subway system.

The following measures have been introduced recently in the Assembly: An act making an appropriation for the elimination of certain grade crossings; an act to amend the railroad law in relation to street surface railroads in cities of the first class; an act to amend the railroad law in relation to rates of fare on certain railroads; an act to amend the public service commissions law in relation to the free transportation by common carriers of mail carriers in uniform.

The following measures have been introduced recently in the Senate: An act making an appropriation for the elimination of certain grade crossings; an act to amend the public service commissions law in relation to the free transportation by common carriers of mail carriers in uniform; an act to amend the public service commissions law in relation to the issue of stock by railroads and street railroad corporations; an act to amend the railroad law in relation to the alteration of existing crossings of highways and steam surface railroads; an act to amend the railroad law in relation to street surface railroads in cities of the first class; an act to amend the railroad law in relation to when corporate powers of a railroad corporation shall cease and also to provide for the transfer of property when the existence of a railroad corporation ceases; an act further to provide for the formation and regulation of corporations for the exercise, transaction and conduct of public franchises and business subject to the jurisdiction and supervision of the public service commission, and an act for the further regulation of corporations under the supervision of the Public Service Commission.

### RHODE ISLAND

An act requiring street railways in Rhode Island to equip the end of all cars in which the motorman stands with proper heating apparatus has been introduced in the lower branch of the Rhode Island General Assembly. A penalty of \$25 for each offence against the provisions of the bill is provided. The act is now pending before the House judiciary committee.

A. E. Potter, president of the Rhode Island Company, Providence, R. I., and other electric railway officials appeared on March 26, 1914, at the hearing before the Rhode Island Senate judiciary committee upon the so-called carmen's bill, which would make it compulsory for men seeking employment as motormen in Rhode Island to have been residents of the State for at least sixty days prior to their employment. Frank W. Tillinghast, attorney for the Rhode Island Company, contended that the bill was unconstitutional. Mr. Potter's remarks at the hearing were few, but the following day he amplified his statement made at the State House. He said:

"In case demands were made upon this company which it did not feel it could grant, the passage of this bill would prevent the company from employing experienced employees from outside the State and interfere seriously with the operation of cars, even though a majority of the employees of the company were not in sympathy with the demands. Many of our most efficient employees are recruited in Massachusetts and Maine, particularly when all the local industries are active. Every year we employ experienced men from other cities who are well recommended. Another reason why the bill should not be passed is that we have lines running into Rhode Island from Massachusetts operated under agreement by men who live in Massachusetts. If this bill became a law and the cars of these lines were off time for any reason, the cars would have to stop at the State line and the passengers would be required to wait until the cars coming in the opposite direction arrived. In regard to the second section of the bill, all men are required to break in practically fifteen days. Some men take a day or two less, while it is necessary for many to take more than fifteen days. It has been stated that a man new to the business is preferable to one who has operated cars in other cities for the reason that a man with experience elsewhere would be inclined to follow the rules of the other companies by which he had been employed rather than those in use on the Providence lines. This is not so. The standard code of rules in use in Providence is practically the same as the code in every other large city, except that a few special orders relate wholly to local operating conditions."

# Financial and Corporate

## ANNUAL REPORTS

### Stock and Money Markets

### The North American Company

March 25, 1914.

In the early trading on the New York Stock Exchange to-day the general list was not affected to any material extent by the weakness in the Corn Products and the Pan-handle issues, but in the trading in the afternoon the market was extremely dull and at times business was almost at a standstill. Pennsylvania was made the center of an attack late in the afternoon and that issue closed down one point over yesterday. Rates in the money market to-day were: Call, 2 per cent; sixty days, 2 3/4 @ 3 per cent; four months, 3 @ 3 1/4 per cent; six months, 3 1/4 @ 4 per cent.

Small dealing characterized the stock market in Philadelphia to-day. Union Traction stock sold off to 44 1/4 at the close.

The Boston market was dull to-day with an easier tendency. The local railroads sold off.

The stock transactions in Chicago totaled 1111 shares to-day, well distributed. The bulk of the bond transactions was in Chicago Railways 5s.

The Baltimore market was quite active to-day. The bond transactions totaled \$47,300, par value.

Quotations of traction and manufacturing securities as compared with last week follow:

	Mar. 18	Mar. 25
American Brake Shoe & Foundry (com.)	91 1/2	90 1/2
American Brake Shoe & Foundry (pref.)	140	138 1/2
American Cities Company (com.)	36	36
American Cities Company (pref.)	64	65
American Light & Traction Company (com.)	365	365
American Light & Traction Company (pref.)	107	107
American Railways Company	*38	38 1/4
Aurora, Elgin & Chicago Railroad (com.)	35	42
Aurora, Elgin & Chicago Railroad (pref.)	77 1/4	77 1/2
Boston Elevated Railway	\$2	\$2
Boston Suburban Electric Companies (com.)	7	7
Boston Suburban Electric Companies (pref.)	60	a63
Boston & Worcester Electric Companies (com.)	*6 1/4	*6 1/4
Boston & Worcester Electric Companies (pref.)	38	37
Brooklyn Rapid Transit Company	92	92 1/8
Capital Traction Company, Washington	108	107 1/2
Chicago City Railway	170	170
Chicago Elevated Railways (com.)	20	20
Chicago Elevated Railways (pref.)	65	65
Chicago Railways, pteptg., ctf. 1	91	91
Chicago Railways, pteptg., ctf. 2	30 3/4	30
Chicago Railways, pteptg., ctf. 3	6 1/2	6
Chicago Railways, pteptg., ctf. 4	3	2 1/2
Cincinnati Street Railway	105	105
Cleveland Railway	103 1/2	103 3/4
Cleveland, Southwestern & Columbus Ry. (com.)	4	*4
Cleveland, Southwestern & Columbus Ry. (pref.)	23	*23
Columbus Railway & Light Company	13	13
Columbus Railway (com.)	53	53
Columbus Railway (pref.)	79 1/2	79 1/2
Denver & Northwestern Railway	71	71
Detroit United Railway	a85	a80
General Electric Company	147 1/4	146 3/4
Georgia Railway & Electric Company (com.)	121	120 1/2
Georgia Railway & Electric Company (pref.)	87	86 1/4
Interborough-Metropolitan Company (com.)	14 5/8	14 3/4
Interborough-Metropolitan Company (pref.)	60	60 1/8
International Traction Company (com.)	*30	*30
International Traction Company (pref.)	*85	*85
Kansas City Railway & Light Company (com.)	10	10
Kansas City Railway & Light Company (pref.)	25	25
Lake Shore Electric Railway (com.)	*5 1/2	*5 1/2
Lake Shore Electric Railway (1st pref.)	*85	*85
Lake Shore Electric Railway (2d pref.)	*22	*22
Mauhattan Railway	129	130
Massachusetts Electric Companies (com.)	11	11
Massachusetts Electric Companies (pref.)	61	61 1/2
Milwaukee Electric Ry. & Light Co. (pref.)	95	*95
Norfolk Railway & Light Company	25 1/4	25 1/4
North American Company	76 1/8	75 1/2
Northern Ohio Traction & Light Co. (com.)	70	70
Northern Ohio Traction & Light Co. (pref.)	98 1/4	98 1/4
Philadelphia Company, Pittsburgh (com.)	42	43
Philadelphia Company, Pittsburgh (pref.)	42	42
Portland Rapid Transit Company	18 1/4	18 1/4
Portland Railway, Light & Power Company	54	54
Public Service Corporation	111	112
Third Avenue Railway, New York	43 3/4	43 1/2
Toledo Traction, Light & Power Co. (com.)	20	15
Toledo Traction, Light & Power Co. (pref.)	75	70
Twin City Rapid Transit Co., Minneapolis (com.)	105 3/4	105
Union Traction Company of Indiana (com.)	11 1/2	*11 1/2
Union Traction Company of Indiana (1st pref.)	80	*80
Union Traction Company of Indiana (2d pref.)	14	*14
United Rys. & Electric Company (Baltimore)	26 1/2	27 1/4
United Rys. Inv. Company (com.)	18	21 1/2
United Rys. Inv. Company (pref.)	42 1/2	47 1/2
Virginia Railway & Power Company (com.)	53	51
Virginia Railway & Power Company (pref.)	95	96
Washington Ry. & Electric Company (com.)	87	89 1/2
Washington Ry. & Electric Company (pref.)	86 3/4	87
West End Street Railway, Boston (com.)	73	70 1/2
West End Street Railway, Boston (pref.)	93 1/2	89 1/2
Westinghouse Elec. & Mfg. Company	76 3/4	76
Westinghouse Elec. & Mfg. Co. (1st pref.)	118	118

\* Last sale. a Asked.

The statement of income, profit and loss of the North American Company, New York, N. Y., for the fiscal year ended Dec. 31, 1913, according to the twenty-fourth annual report just issued, is as follows, as compared with 1912:

	1913	1912
Interest received and accrued	\$476,695	\$537,327
Dividends received	1,814,424	1,517,953
Profits and compensation for services	78,623	289,189
Total	\$2,369,742	\$2,344,469
Salaries, legal expenses, net rentals and all other expenses of administration	\$77,514	\$76,217
Taxes	26,159	11,654
Interest and commissions paid and accrued	166,968	107,674
Sundry accounts written off and reserves	11,539	17,697
Total	\$282,180	\$213,242
Net income	\$2,087,562	\$2,131,227
Dividends paid and accrued during year	1,489,665	1,489,665
Balance carried to undivided profits account	\$597,897	\$641,562

The statement of income, profit and loss of The Milwaukee Electric Railway & Light Company, Milwaukee, Wis., a subsidiary of the North American Company, follows:

Operating revenues	\$6,016,916
Operating expenses	\$3,167,365
Depreciation (reserve credit)	633,359
Contingencies (reserve credit)	15,043
Taxes (reserve credit)	390,668
Net operating revenues	\$1,810,481
Non-operating revenues	45,178
Gross income	\$1,855,659
Interest charges	733,322
Net income	\$1,122,337
Dividends on preferred stock	270,000
Dividends on common stock	788,000
Surplus	\$64,337

The operating revenues of The Milwaukee Electric Railway & Light Company increased 5.9 per cent during 1913. Operating expenses, taxes and reserves increased 7 per cent, gross income 2.3 per cent and net income 2.2 per cent. As between the various departments the operating revenues of the railway department increased 2.12 per cent, and of the light and power and the steam heating departments, 13.65 per cent. The revenues of the railway department reflected the effect of the reduction of fares for passengers ordered by the Railroad Commission of Wisconsin on August 23, 1912, in the case now on appeal to the United States Supreme Court.

During the year there was expended on additions to physical property the sum of \$2,377,113. In arriving at the net operating revenues there were deducted for maintenance and depreciation of physical property amounts equal to the following percentages of the operating revenues: railway department, 22 per cent; electric light and power department, 16 per cent, and steam-heating department, 6 per cent. The balances remaining after providing for the maintenance in ordinary operating expenses were carried to the credit of the depreciation reserve.

The progress of the Milwaukee Light, Heat & Traction Company, Milwaukee, Wis., during 1913 is shown by the following statement:

Operating revenues	\$1,443,250
Operating expenses	\$710,982
Depreciation (reserve credit)	76,896
Taxes (reserve credit)	101,027
Net operating revenues	\$554,346
Non-operating revenues	721,699
Gross income	\$1,276,045
Interest charges	614,677
Balance	\$661,368

The operating revenues of The Milwaukee Light, Heat & Traction Company increased 16.6 per cent over those of the year 1912. The operating expenses, taxes and reserves increased 13.7 per cent, and the net income increased 22.7 per cent. During the year 1913 \$613,962 was expended on

additions to physical property and the company charged off 3 per cent of the operating revenue for depreciation and 19 per cent for maintenance.

The remarks of James Campbell, president of the company, on the subject of depreciation, contained in the report, are referred to at length on page 736 of this issue.

The results of operation of the United Railways Company of St. Louis, St. Louis, Mo., for 1913 were as follows:

Gross earnings:		
Revenue from transportation.....	\$12,612,787	
Revenue from operation other than transportation .....	89,857	
Total .....	\$12,702,644	
Operating expenses (including depreciation).....	8,573,617	
Surplus over operating expenses.....	\$4,129,027	
Taxes .....	653,674	
Income from operation.....	\$3,475,353	
Income from other sources.....	84,349	
Gross income from all sources.....	\$3,559,703	
Deductions from income:		
Interest on funded debt.....	\$2,651,013	
Interest on notes payable.....	9,661	2,660,674
Surplus .....		\$899,029

The passenger revenue of the United Railways Company of St. Louis for the year 1913 showed an increase over the year 1912 of \$443,292, or 3.67 per cent. Other revenue from transportation increased \$12,727. Revenue from operation other than transportation decreased \$4,465, and income from other sources increased \$19,433. The gross earnings and other income for the year 1913 increased \$470,986 over the year 1912, or 3.82 per cent. Total operating expenses (including depreciation) and taxes increased during the year \$746,568. The percentage of operating revenue charged off for depreciation during the year amounted to 11.56 and that for maintenance to 13.22.

The total number of passengers carried during the year was 376,425,241. The percentage of revenue passengers using transfers during the year 1913 was 48.69. The car mileage amounted to 42,790,086 car miles. During 1913 there was expended and charged to capital account for added property the sum of \$697,066. During the year 1.10 miles of track were added and 0.80 mile was removed.

#### Washington Water Power Company

The statement of income, profit and loss of the Washington Water Power Company, Spokane, Wash., for the year ended Dec. 31, 1913, follows:

Gross receipts .....	\$2,909,147
Receipts from interest on current balances.....	5,803
	\$2,914,950
Operating expenses, including taxes.....	1,291,673
	\$1,623,277
Interest on bonds, July 1, 1913, and Jan. 1, 1914.....	\$259,219
Premium on \$104,000 bonds bought for sinking fund.....	2,666
Annual credit to amortization fund for discount on first refunding mortgage bonds .....	8,000
Interest on consumers' deposits, etc.....	2,975
Depreciation of plant and sinking fund.....	325,000
Uncollectible accounts, etc.....	8,572
Total .....	\$606,432
	\$1,016,845
Interest at 5 per cent on work under construction.....	92,346
	\$1,109,191
Dividends paid at the rate of 8 per cent per annum:	
April 1, July 1, Oct. 1, 1913, and Jan. 2, 1914.....	1,126,552
Deficit for 1913.....	\$17,360
Surplus from 1912.....	1,136,466
Surplus, Dec. 31, 1913.....	\$1,119,106

The gross earnings for 1913 were \$2,914,950 as compared to \$3,170,245 in 1912, an apparent decrease of \$255,295. This figure is without meaning, however, for prior to 1913 the system of accounts, continued from the time when the electric light and street railway departments were separate corporations, included in the gross earnings and expenses charges for services rendered by one department to the other. The Public Service Commission of Washington, however, prescribed a system of accounts, effective in 1913, abolishing these charges. Hence in 1913 the gross earnings and expenses were each reduced by \$353,783. On the old accounting basis the gross earnings for 1913 would be

\$3,268,734, an increase of 3.1 per cent. On the same basis the operating expenses (including taxes) were \$1,645,457 in 1913 as compared to \$1,602,353 in 1912, an increase of 2.6 per cent. The gross income from operations increased from \$1,567,892 in 1912 to \$1,623,277, or 3.5 per cent. The amount applicable to dividends in 1913 was \$1,109,191, while the dividends declared were \$1,126,552, causing an appropriation from the 1912 surplus of \$17,360 as compared with the 1912 deficit of \$49,575. The total surplus as of Dec. 31, 1913, was \$1,119,106 as compared to \$1,136,466 the year previous, a decrease of 1.5 per cent.

The number of passengers carried decreased from 20,726,062 in 1912 to 19,437,009 in 1913; car miles from 3,698,584 in 1912 to 3,650,692 in 1913, and car hours from 432,213 in 1912 to 423,455 in 1913. The total amount of depreciation, which is carried on the balance sheet as a deduction from the original cost of the assets, amounts to \$2,411,989 for the past ten years. The sum of \$123,599 was expended in 1913 for betterments and extensions. It is stated that no extensions of importance or increases of equipment are now contemplated.

#### Terre Haute, Indianapolis & Eastern Traction Company

The Terre Haute, Indianapolis & Eastern Traction Company, Indianapolis, Ind., has issued a notice to the stockholders of the company that the board of directors has decided to pass the usual quarterly dividend of 1¼ per cent on the preferred stock of the company, due on April 1, 1914. The statement of earnings of the properties controlled by the company follows:

	1913.	1912.
Gross earnings .....	\$6,533,013	\$6,432,059
Operating expenses and taxes .....	3,964,863	3,814,427
Net earnings .....	\$2,568,149	\$2,617,631
Rentals and other deductions, subsidiary companies .....	1,594,732	1,532,672
Interest on divisional bonds of this company .....	15,000	15,000
Balance .....	\$958,417	\$1,069,959
Interest on T. H., I. & E. bonds .....	325,000	325,000
Balance available for sinking funds and dividends .....	\$633,417	\$744,959
Sinking funds, subsidiary companies .....	150,813	145,730
Sinking fund on divisional bonds of this company .....	12,500	12,500
Sinking fund on T. H., I. & E. bonds.....	55,000	55,000
Total sinking fund.....	*\$218,313	*\$213,230
Balance .....	\$415,104	\$531,729

In addition to the sinking fund as shown in the financial statement there was paid as interest on bonds already held by trustees in sinking fund, which was applied to the purchase of additional bonds by the trustees, the sum of \$60,540 in 1913 and \$49,255 in 1912, making a total of moneys received for sinking fund accounts by the trustees of \$278,853 in 1913 and \$262,485 in 1912.

The notice in regard to the suspension of the dividend refers to the losses of the company due to the floods early in 1913, the losses incident to the recent strike of the employees and the expenditure of \$300,000 for extensions, improvements and betterments in excess of the returns from securities sold during the year and in addition to the regular maintenance allowance of 18 per cent.

#### American Light & Traction Company

The statement of earnings of the American Light & Traction Company, New York, N. Y., for the years ended Dec. 31, 1912 and 1913, follows:

	1913	1912
Earnings on stocks of owned companies.....	\$3,751,976	\$3,688,867
Miscellaneous earnings .....	714,257	567,993
Gross earnings .....	\$4,466,233	\$4,256,860
Expenses .....	123,107	117,657
Net earnings .....	\$4,343,126	\$4,139,204
Surplus and reserve Dec. 31, 1912.....	8,689,293	7,835,726
Total surplus earnings.....	\$13,032,419	\$11,974,930
Less dividends:		
Cash dividends on preferred stock.....	\$854,172	\$854,172
Cash dividends on common stock.....	1,341,182	1,215,732
Stock dividends on common stock.....	1,341,183	1,215,733
Total dividends .....	\$3,536,537	\$3,285,637
Surplus balance on Dec. 31.....	\$9,495,882	\$8,689,293

**American Light & Traction Company, New York, N. Y.**—The American Light & Traction Company is offering to holders of the \$1,968,000 of collateral trust bonds of the Southern Light & Traction Company an exchange for these securities of the first mortgage bonds of the San Antonio Traction Company and the San Antonio Gas & Electric Company, deposited as collateral for the Southern Light & Traction Company bonds. Each holder of a \$1,000 bond of Southern Light & Traction Company will receive in exchange a \$500 bond of the San Antonio Gas & Electric Company and a \$500 bond of the San Antonio Traction Company.

**Charleston Consolidated Railway, Gas & Electric Company, Charleston, S. C.**—At the annual meeting on March 18, 1914, of the Charleston Consolidated Railway, Gas & Electric Company, which is operated by the Charleston Railway & Lighting Company, the stockholders voted to increase the common capital stock from \$2,500,000 to \$3,000,000. The proceeds of this additional issue are to be used to pay for additions and betterments as made from year to year.

**Chicago (Ill.) City Railway.**—The Chicago City Railway has applied to the Public Utilities Commission of Illinois for authority to issue \$3,000,000 of additional first mortgage 5 per cent bonds.

**Chicago (Ill.) Elevated Railways.**—It is reported that the Chicago Elevated Railways will execute a first and refunding mortgage to provide for the \$500,000 of expense being incurred in lengthening platforms on the union loop and the different lines and for the purchase of new cars at a cost of about \$1,250,000. Owing to the fact that the \$25,000,000 of 5 per cent first mortgage bonds of the Northwestern Elevated Railroad have not been sold to the public, but are held as collateral for the \$30,000,000 three-year 5 per cent notes which mature on July 1, it will be possible to arrange with the National City Bank, New York, to withdraw this mortgage and issue in its stead a first and refunding issue covering not only the Northwestern Elevated Railroad but the other properties controlled by the Chicago Elevated Railways.

**Chicago (Ill.) Railways.**—Application has been made by the Chicago Railways to the Public Utilities Commission of Illinois for permission to issue \$4,244,000 of additional first mortgage twenty-year bonds.

**City Service Company, New York, N. Y.**—The stockholders of the City Service Company are to vote on April 7, 1914, on the question of increasing the authorized capital stock from \$50,000,000 (\$30,000,000 of 6 per cent preferred stock and \$20,000,000 of common stock) to \$65,000,000 (\$40,000,000 of 6 per cent preferred stock and \$25,000,000 of common stock). It is stated that the new stock is for future use and none is to be issued at present. Of the present authorized capitalization \$15,718,380 of the common stock and \$27,368,426 of the preferred stock have been issued.

**Cleveland (Ohio) Interurban Railroad.**—On March 16, 1914, the Public Utilities Commission of Ohio authorized the Cleveland Interurban Railroad to issue common capital stock in the amount of \$150,000 to be sold for the highest price obtainable but for not less than the par value. The proceeds from the sale of this stock are to be applied on the payment of outstanding obligations now due, amounting to \$293,738.

**Georgia Light, Power & Railways Company, Macon, Ga.**—The London Stock Exchange has listed \$981,000 of additional first lien 5 per cent thirty-year gold bonds of the Georgia Light, Power & Railways Company. This makes the total amount listed \$3,211,000.

**New York, New Haven & Hartford Railroad, New Haven, Conn.**—The directors of the New York, New Haven & Hartford Railroad have authorized an issue of \$2,490,000 of 5 per cent equipment notes maturing serially in from one to fifteen years. The notes cover some of the new steel passenger cars and electric equipment of the company.

**New York State Railways, Rochester, N. Y.**—Harris, Forbes & Company, New York, N. Y., and associated houses are offering at 90 and interest to yield more than 5 per cent an additional \$5,621,000 of fifty-year first con-

solidated mortgage 4½ per cent gold bonds of the New York State Railways. These bonds are tax exempt in New York State. The total authorized issue is \$50,000,000, of which \$12,546,000 are outstanding, including the present issue. The amount of \$11,486,000 is reserved to retire divisional bonds and the remainder is applicable to future requirements.

**North American Company, New York, N. Y.**—The North American Company, at a meeting of its directors held on March 19, 1914, elected the following officers: chairman of the board of directors, James Campbell; president, James D. Mortimer; vice-president and treasurer, George R. Sheldon; assistant to the president, Edwin Gruhl; secretary and assistant treasurer, James F. Fogarty; assistant treasurer, Robert Sealy; assistant secretary, Robert Randall. James F. Fogarty, Edwin Gruhl and William T. Graham have been elected directors during the last year to fill the vacancies.

**Omaha & Lincoln Railway & Light Company, Ralston, Neb.**—The Omaha & Lincoln Railway & Light Company has filed a mortgage with the Central Trust Company of Illinois, Chicago, Ill., as trustee, to secure an issue of 5 per cent twenty-five year bonds of an authorized amount stated to be \$2,250,000. It is reported that the proceeds of the issue are to be devoted largely to extending the company's lines from Omaha to Lincoln.

**Pacific Gas & Electric Company, San Francisco, Cal.**—Byrne & McDonnell, New York, N. Y., announce that the directors of the Pacific Gas & Electric Company have authorized, subject to the approval of the stockholders, an issue of \$12,000,000 of additional preferred stock to be offered to stockholders at 80 on the basis of six shares of the new issue to five of their present holdings. This issue will bring the total outstanding preferred stock of the company up to \$22,000,000.

**Portland Railway, Light & Power Company, Portland, Ore.**—The Portland Railway, Light & Power Company has purchased the property of the Yamhill Electric Company, serving Newberg, Carlton, Dayton and other towns in Yamhill County, Ore., with a total population of about 5000. The Yamhill system has been connected with the high-tension transmission lines of the Portland Railway, Light & Power Company.

**San Francisco-Oakland Terminal Railways, Oakland, Cal.**—The board of directors of the San Francisco-Oakland Terminal Railways, as reorganized on March 3, 1914, includes the following: J. F. Carlson, president of the Central National Bank of Ohio, W. I. Brobeck, W. A. Bissell, F. V. Whipple, J. K. Moffett, W. R. Alberger, and F. W. Frost. The membership on the board has been increased to nine, two places remaining to be filled.

**Southern Traction Company of Illinois, East St. Louis, Ill.**—Federal Judge Francis M. Wright, Danville, Ill., has authorized an issue of \$500,000 of receivers' certificates, par \$500 and \$1,000, to provide for completing the construction of the Southern Traction Company of Illinois. The appointment of the receivers for this road was noted in the *ELECTRIC RAILWAY JOURNAL* of March 14, 1914.

**Southwestern Electric Railway, Light & Power Company, Paducah, Ky.**—The Kentucky Southwestern Electric Railway, Light & Power Company has filed at Paducah, Ky., a trust deed to secure a bond issue of \$2,000,000, with the proceeds of which the company's line from Henderson to Hickman, Ky., will be built.

**Underground Electric Railways Company, Ltd., London, Eng.**—The London Stock Exchange has listed an additional issue of £21,400 of 4½ per cent bonds of the Underground Electric Railways of London, Ltd., due in 1933, par value £100. The total amount now listed is increased to £1,827,400.

#### Dividends Declared

California Railway & Power Company, San Francisco, Cal., quarterly, 1¼ per cent, prior preferred.

Capital Traction Company, Washington, D. C., quarterly, 1½ per cent.

Cincinnati & Hamilton Traction Company, Cincinnati, Ohio, quarterly, 1¼ per cent, preferred; quarterly, 1 per cent, common.

# Traffic and Transportation

## Passenger Traffic Out of Indianapolis

Statistics which have been made public by E. B. Peck, vice-president of the Indianapolis Traction & Terminal Company and the Terre Haute, Indianapolis & Eastern Traction Company, showing the operation of interurban cars and the passenger traffic in and out of the traction terminal station at Indianapolis, Ind., for the year 1913, bring out the fact that despite interruptions of service caused by the floods in March and April of last year, and as a result of labor difficulties in Indianapolis and vicinity during the fall, there was an increase of approximately 100,000 passengers carried in 1913 as compared with 1912. The following tables show the dates on which the various interurban lines entering Indianapolis commenced operation.

Indianapolis, Columbus & Southern Traction Company, Jan. 1, 1900	Terre Haute, Indianapolis & Eastern Traction Company, Eastern Division .....	June 17, 1900
Indiana Union Traction, Muncie Division .....	Terre Haute, Indianapolis & Eastern Traction Company, Martinsville Division .....	Jan. 1, 1901
Terre Haute, Indianapolis & Eastern Traction Company, Brazil Division .....	Indianapolis & Cincinnati Traction Company, Shelbyville Division .....	Aug. 2, 1902
Terre Haute, Indianapolis & Eastern Traction Company, Northwestern Division .....	Indiana Union Traction, Logansport Division .....	Sept. 12, 1902
Indianapolis & Cincinnati Traction Company, Rushville Division .....	Terre Haute, Indianapolis & Eastern Traction Company, Danville Division .....	Oct. 9, 1903
Terre Haute, Indianapolis & Eastern Traction Company, Indianapolis, Newcastle & Toledo .....	Indianapolis, Newcastle & Toledo .....	Dec. 3, 1903
Beech Grove Traction Company .....	Terre Haute, Indianapolis & Eastern Traction Company, Danville Division .....	July, 1905
	Indianapolis, Crawfordsville & Western .....	Sept. 1, 1906
	Indianapolis, Newcastle & Toledo .....	July 4, 1907
	Beech Grove Traction Company .....	June 29, 1910
	Beech Grove Traction Company .....	March, 1911

The total number of passengers carried since 1900 is as follows: 1900, 377,761; 1901, 955,554; 1902, 1,523,411; 1903, 2,347,936; 1904, 3,274,654; 1905, 3,881,332; 1906, 4,469,982; 1907, 5,032,677; 1908, 4,979,371; 1909, 5,156,906; 1910, 5,736,272; 1911, 6,279,822; 1912, 6,431,714; 1913, 6,524,366.

The total number of interurban and suburban passengers arriving and departing from the station of the Indianapolis Traction & Terminal Company, Indianapolis, for 1913 and 1912, together with the total passenger cars and the total freight trains, follows:

Month	1913			1912		
	Passengers	Pas-senger Cars	Freight Trains	Passengers	Pas-senger Cars	Freight Trains
January ..	479,855	20,058	2,057	390,261	18,391	1,965
February ..	448,686	18,434	1,832	375,964	17,298	1,725
March .....	*411,531	16,442	1,554	439,727	19,540	1,932
April .....	438,073	16,260	1,503	464,193	19,444	1,969
May .....	645,432	22,499	2,107	586,930	22,192	2,066
June .....	672,562	22,683	2,132	629,421	22,478	2,015
July .....	710,220	24,120	2,302	644,119	23,631	2,092
August .....	†659,443	23,506	2,058	648,349	23,002	2,139
September ..	584,804	22,742	2,155	621,341	22,091	2,000
October .....	555,272	22,053	2,320	563,576	20,473	2,125
November ..	††381,853	15,962	1,480	520,445	19,736	1,922
December ..	536,635	22,064	1,951	547,388	20,741	1,946
Totals .....	6,524,366	246,823	23,501	6,431,714	249,017	23,896
Average per day .....	17,875	676	64	17,573	680	65

\*Flood March 25, 1913. †Interurban strike of Aug. 23, 1913. ††Indianapolis strike of Oct. 31, 1913.

Through limited trains are operated between Indianapolis and the following cities, the number of trains each way daily being shown in the last column:

City	Miles	Time		Trains
		Hours	Minutes	
Fort Wayne, Ind. ....	136	4	35	10
Goshen, Ind. ....	160	5		2
Louisville, Ky. ....	117	4		6
Dayton, Ohio .....	110	4	10	6
Terre Haute, Ind. ....	72	2	15	7
Marion, Ind. ....	72	2	35	2
Lafayette, Ind. ....	70	2	10	10
Richmond, Ind. ....	70	2	35	7
Muncie, Ind. ....	57	1	45	2
Connersville, Ind. ....	58	1	30	6
Greensburg, Ind. ....	49	1	30	7

The tables show that during 1913, owing to the interruptions in service on account of the floods and labor troubles, there was a slight decrease in the number of passenger and freight cars operating in and out of the Indianapolis terminals.

It is estimated that while the population of Indianapolis is about 250,000, the actual trading population of the city, due to the interurbans, is approximately 500,000. Of the 6,524,366 passengers handled during 1913, each one is theo-

## ELECTRIC RAILWAY MONTHLY EARNINGS

ATLANTIC SHORE RAILWAY, SANFORD, MAINE						
Period	Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus	
1m., Feb., '14	\$18,835	\$21,478	\$2,644	\$660	\$3,304	
1 " " '13	20,087	17,640	2,447	466	1,981	

BATON ROUGE (LA.) ELECTRIC COMPANY						
1m., Jan., '14	\$15,020	*\$10,230	\$4,791	\$2,105	\$2,686	
1 " " '13	13,427	*8,472	4,955	1,734	3,221	
12 " " '14	164,722	*104,140	60,582	25,147	35,435	
12 " " '13	148,647	*96,065	58,582	20,772	37,810	

BROCKTON & PLYMOUTH STREET RAILWAY, PLYMOUTH, MASS.						
1m., Jan., '14	\$7,333	*7,261	\$72	\$1,066	†\$994	
1 " " '13	7,873	*7,190	683	1,091	748	
12 " " '14	123,864	*98,799	25,065	13,019	12,046	
12 " " '13	120,718	*91,184	29,534	12,590	16,944	

CAPE BRETON ELECTRIC COMPANY, LTD., SYDNEY, N. S.						
1m., Jan., '14	\$29,798	*\$18,563	\$11,235	\$6,437	\$4,798	
1 " " '13	31,836	*17,761	14,075	5,823	8,252	
12 " " '14	378,915	*210,756	168,159	73,527	94,632	
12 " " '13	363,685	*195,146	168,539	68,292	100,247	

GRAND RAPIDS (MICH.) RAILWAY						
1m., Jan., '14	\$102,585	*\$65,143	\$37,442	\$13,615	\$23,827	
1 " " '13	104,563	*59,931	44,632	14,736	29,896	
12 " " '14	1,299,426	*98,819	490,607	165,512	325,095	
12 " " '13	1,246,432	*711,230	535,202	175,171	360,031	

JOPLIN & PITTSBURG RAILWAY, PITTSBURG, KAN.						
1m., Feb., '14	\$40,673	*\$26,956	\$13,717	\$12,542	\$1,175	
1 " " '13	40,667	*25,849	14,818	12,542	2,276	
12 " " '14	580,201	*351,787	228,414	150,500	77,914	
12 " " '13	544,091	*322,035	222,056	152,014	70,042	

NEW ORLEANS RAILWAY & LIGHT COMPANY, NEW ORLEANS, LA.						
1m., Jan., '14	\$634,422	\$320,594	\$313,828	\$205,020	\$108,808	
1 " " '13	607,494	309,596	297,898	191,380	106,518	

NORTHERN TEXAS ELECTRIC COMPANY, FORT WORTH, TEXAS						
1m., Jan., '14	\$173,094	*\$106,248	\$66,846	\$24,227	\$42,618	
1 " " '13	157,048	*93,973	63,075	24,837	38,238	
12 " " '14	2,148,246	*1,192,216	956,031	286,310	669,722	
12 " " '13	1,833,115	*964,820	868,295	270,065	598,230	

PORTLAND RAILWAY, LIGHT & POWER COMPANY, PORTLAND, ORE.						
1m., Jan., '14	\$582,610	*\$277,286	\$305,324	\$173,282	\$132,042	
1 " " '13	553,598	*270,209	283,389	153,021	130,368	
12 " " '14	6,752,754	*3,305,387	3,447,367	2,028,862	1,418,505	
12 " " '13	6,664,693	*3,326,159	3,338,534	1,777,317	1,561,217	

TAMPA (FLA.) ELECTRIC COMPANY						
1m., Jan., '14	\$80,158	*\$43,855	\$36,303	\$5,062	\$31,241	
1 " " '13	68,157	*34,738	33,419	4,794	28,625	
12 " " '14	856,941	*475,616	381,326	56,216	325,310	
12 " " '13	761,241	*396,920	364,320	53,999	310,321	

\*Includes taxes.  
†Deficit.

retically counted twice, representing a round trip, in estimating the number of people who visit Indianapolis, which brings the actual number of visitors to the city to approximately 3,250,000. The population of Indianapolis according to the United States census of 1900, when the first inter-urban line was operating into the city, was 169,164; the census of 1910 fixed the population at 233,650, an increase of 38.1 per cent.

**Traffic Interruptions of New York State Railways**

The New York State Railways, Rochester lines, has compiled in advertisement form an interesting statement concerning the loss of time and causes of interruption to its traffic during the past fourteen months. This statement appeared in the *Labor Herald*, the official paper of the Central Trades and Labor Council of Rochester, as follows:

**WHY WE ASK FOR CO-OPERATION**

Following is a list of interruptions to service during the past fourteen months:

Date	Interruption
January, 1913	9 hours 56 minutes
February, 1913	4 hours 55 minutes
March, 1913	8 hours 25 minutes
April, 1913	2 hours 41 minutes
May, 1913	1 hour 9 minutes
June, 1913	9 hours 53 minutes
July, 1913	8 hours 46 minutes
August, 1913	4 hours 11 minutes
September, 1913	10 hours 15 minutes
October, 1913	6 hours 29 minutes
November, 1913	4 hours 47 minutes
December, 1913	6 hours 10 minutes
January, 1914	9 hours 22 minutes
February, 1914	3 hours 51 minutes
Total for 14 months	93 hours 51 minutes

These interruptions, which total almost four days, were caused by wagons and autos breaking down or becoming stalled in the car tracks.

Every interruption results in twofold inconvenience to our fellow citizens: They cannot reach their destinations on time, nor can they be sure of riding in comfort because of the crowding which invariably follows when cars are bunched.

These are the reasons why we ask drivers of vehicles to co-operate with us in an effort to bring the number of interruptions down to the minimum.

This does not mean that the car tracks should never be used by drivers of vehicles.

We know there are times when drivers cannot reasonably be expected to drive elsewhere.

The motorman, who is himself a driver, knows this, too. He doesn't ring his gong for the purpose of annoying a fellow driver. He rings his gong simply because it's the only way he has of asking you to co-operate with him so he can land his passengers on time.

If drivers of vehicles will use the car tracks only when necessary and will turn out for cars to pass whenever they can do so without risk of damage to their vehicles, we will appreciate their co-operation because it will reduce the number of interruptions and enable us to give the people of Rochester better service.

**NEW YORK STATE RAILWAYS  
(Rochester Lines).**

**Results in El Paso Safety Competition**

The results obtained by the El Paso (Tex.) Electric Railway in the competition between two equally divided teams of train crews to lessen accidents are regarded as highly satisfactory. While the percentage of decrease for the first two months was small, the company says that this is not a true criterion, as the fundamental consideration was to obtain a report of all accidents, however small or insignificant. The records of the company actually show that for the period of the sixty-day contest few serious accidents came to the attention of the officers. Alves Dixon, superintendent of the safety first division, said:

"Actually totaling the accidents that were recorded for January and February, 1914, the first period of the competition, the decrease as against the accidents recorded for the same period of 1913 was slight. We are anxious, of course, to reduce accidents to the minimum, but we are more anxious to decrease serious accidents and to get the train-

men to report all accidents. Our principal concern was over the unreported accident. In a period of sixty days only two accidents were unreported. They were of little consequence, but they resulted in the defeat of the 'Red' team. The unreported accident is penalized most heavily, and so anxious are the trainmen to avoid being assessed this heavy penalty that they report things that are not really accidents. The unreported accident is the bugbear of the claim department."

The competition will be continued throughout the year without material change. Each day the score is posted at the carhouses showing the relative standing of each team. The inauguration of the contest was referred to in the *ELECTRIC RAILWAY JOURNAL* of Feb. 28, 1914, page 498.

**Hearing on Needham Fares**

The Massachusetts Public Service Commission held a hearing at Boston on March 11, 1914, upon the petition of the selectmen of Needham for the establishment of a single fare between Needham and Newton Highlands, on the Middlesex & Boston Street Railway. William G. Moseley, for the petitioners, contended that the company ought to issue a fifty-ride book for \$2.50, corresponding to a similar book in use on the company's Needham-Natick line. Emphasis was laid upon the industrial travel between Needham and points on the Needham-Watertown line and counsel urged the establishment of a 5-cent fare at morning and night at least. It was pointed out that 12 cents in fares is collected at present between Needham and Newton Highlands, while passengers holding ticket books can ride from Needham to Natick, 7 miles, for 5 cents per trip.

George M. Cox, general manager of the Middlesex & Boston Street Railway, reviewed the early history of the lines involved. He pointed out that at one time a ride of about 15 miles could be taken for a 5-cent fare between Needham and Union Square, Brighton. In 1908, when the properties of the Boston Suburban Electric Companies were on the verge of a receivership, despite the addition of fare limits, a campaign for 6-cent fares was conducted with success, and to accommodate industrial travel the fare limit on the Needham-Newton Highlands line was set at Elliot and High Streets, Newton Upper Falls, northbound, instead of at the Needham-Newton boundary. Mr. Cox contended that the owners of industrial plants should pay their employees enough to cover their carfare without asking the street railway to accept less than a fair return on its investment. The company paid a 4 per cent dividend in 1913 and had a surplus of \$446 without making any charge for depreciation. The Needham-Wellesley line, which is used by Natick passengers, earned only 9.45 cents per car-mile in 1913 and its operating expenses were 19.1 cents. Only 849 passengers were carried in Needham on Jan. 26. Two extra cars were run to carry 155 of these to and from the mills, and the extra cars have to be run empty half of each round trip between Needham and the Auburndale carhouse. The Needham traffic as a whole was carried at a loss, and the company was in no position, particularly in view of the demands of its employees with regard to a wage increase, to reduce its fares. The case was taken under advisement.

**"Safety First" Conference in San Francisco**

Under the auspices of the Industrial Accident Commission of the State of California, a "safety first" conference was held in San Francisco on March 13, 1914, for the purpose of discussing the effects of the recently enacted workmen's compensation act, as well as other state measures which may be enacted in the future for preventing accidents or adjudicating the loss they occasion. Among the speakers were Governor Johnson, State Senator A. E. Boynton, J. W. Lilienthal, president of the United Railroads, San Francisco, and John A. McGregor, president of the Union Iron Works. Perhaps the most important action taken was the decision to appoint a state commission whose duty it would be to study the cause of accidents in industrial plants, mills, etc., in connection with the means and devices which might be used to prevent such accidents, and also to draft from time to time legislation designed to make it illegal to use certain manufacturing processes without the use of safety appliances of a specified character.

Mr. Lilienthal pointed out that the keynote of future legislation along this line should be prevention and not compensation. He said that he had taken the year 1913 as a basis for rating accidents on the lines of the United Railroads and that he had offered to add to the wages of the platform men the amount by which the total accident cost in 1913 was reduced in succeeding years.

A representative of the Southern Pacific Railroad, in reviewing the "safety first" work on that road, pointed out that all employees were urged to suggest means of lessening the danger in methods and equipment used by the company. Steps were taken to facilitate the handing in of such suggestions and special committees were appointed to pass upon them. Of the many suggestions which were received from employees about 71 per cent were adopted or used. A greater number of accidents was recorded in 1913 than 1912, it was stated, because of the strict enforcement of the rule that every accident, whether trivial or not, be reported. Largely to the "safety first" campaign was accredited the better mortality record in the year just passed, there having been thirty-one more fatalities in 1912 than in 1913.

Mr. McGregor thought that the feature of the new law which gives the employee no compensation for the first two weeks of time lost on account of injury by accident was a wise means of preventing false claims for minor injuries. He referred to the high employer's liability insurance rates and said that part of the \$75,000 to \$90,000 a year which the Union Iron Works would have to pay in premiums for such policies was used to much better advantage in an endeavor to prevent accidents.

Ira B. Cross, Underwood Building, San Francisco, Cal., is secretary of the Industrial Accident Commission of the State of California.

**Signs on the Sides of Kansas City Cars.**—The Kansas City Council has passed an ordinance requiring the Metropolitan Street Railway to place the names of lines on the sides of street cars, as well as the front and rear. Many of the company's cars already have the required signs, and the additions will be made to those which have not. The ordinance has been signed by Mayor Jost.

**Performance for New York Transportation Men.**—H. H. Vreeland, in charge of the welfare department of the Interborough-Metropolitan Company, arranged with the Hippodrome in New York so that the members of the benefit associations of the Interborough and Metropolitan Railways companies could attend the evening performances at the Hippodrome on March 23, 24 and 25, at half price. The privilege was extended to the families of the members. A great many took advantage of this arrangement.

**Ventilating the Near-Side Cars in Philadelphia.**—The management of the Philadelphia (Pa.) Rapid Transit Company has developed a method of ventilation for its near-side cars based on foreign practice wherein by means of hinging the upper sash of every alternate window in the car any desired supply of fresh air may be admitted without causing a direct draft upon the passengers. The sample cars equipped with this ventilating device have been in experimental operation during the last two months and have been indorsed by the health authorities and the passengers.

**Social Feature Added to Kansas City Meetings.**—A social feature has been added to the division superintendents' association of the Metropolitan Street Railway, Kansas City. The officers of the company recently decided that more good would result if there were some sort of stimulant added. Accordingly, one of the semi-monthly meetings will be featured in the future by a dinner at a local hotel or restaurant. The division superintendents' association was organized about two years ago to allow the heads of divisions to exchange information and ideas. Twelve superintendents and nine assistants comprise the membership of the association. The meetings are held on the first and third Wednesdays of each month. Heretofore the sessions have been held at the general offices, but, as indicated, one of the meetings each month will take place at a local hotel in the future.

**Cuspidors for Motormen.**—Finding it impossible to prevent its motormen from chewing tobacco, a street railway in a tobacco-growing section has devoted its recent efforts

to minimizing the discomforts and danger to passengers arising from this habit. Hitherto the motormen, practically all of whom chew tobacco, have spit either through the door, where possible, or on the floor of the cab in cars where they do not have access to the exit. The mechanical department of the company has devised a cuspidor, which has been installed in many of the cars and will be put in others as rapidly as possible. The device consists of a funnel-shaped receptacle of cast iron, white enameled, the stem of which runs through the floor of the cab toward the track below. A feature is the lid, added for sanitary reasons. A lug, operated by the motorman's foot, controls the lid. As soon as the pressure of the foot is removed, the lid readjusts itself over the cuspidor. The spittoons are flushed by dashing water into them.

**Employees' Magazine in San Francisco.**—*The United Railroads Magazine*, the first issue of which will appear this month, will be a publication devoted to the interests of all employees of the United Railroads, San Francisco, Cal. The first issue is to have eight pages and the subject heads or departments under which the contents will be arranged include "Safety First"; "Commendable Records," where mention will be made of long service terms and especially creditable work; "Contributions," which will be open to stories, poems, suggestions or complaints from the men, and "Trolley Sparks," which will be devoted to personal notes and announcements of social events. The magazine will carry no advertising, and the expense of publication will be borne by the company. Although it will be distributed among employees gratis, they will be depended upon, it is announced, to furnish the major portion of the matter published so that the magazine may be representative of all ranks and departments. The publication will be edited by Noble Hamilton, assistant to J. W. Lilienthal, the president of the company.

**Organizing to Meet the Emergency of the Snowstorm.**—In the article which was published in the *ELECTRIC RAILWAY JOURNAL* of March 7, 1914, page 552, reviewing the work of the electric railways in the East in the recent severe storm, mention was made of the excellent record made by the Philadelphia (Pa.) Rapid Transit Company in keeping its lines open. It will be recalled that the Philadelphia papers were unstinted in their praise of the officers and the men for the service which they performed at the time of the storm. According to *Co-operative Bulletin* No. 26, issued by the Stotesbury management of the Philadelphia Rapid Transit Company under date of March 21, 1914, the first steps toward meeting the emergency of the storm were taken in July and August, 1913, when numerous conferences were held at the headquarters of the company attended by all of the operating officials, at which equipment and other matters of importance were considered in detail and the most careful preparation made for snow fighting during the winter. Subsequent conferences with the officials of the way, electric and rolling stock departments served still further to amalgamate the various interests into a compact, efficient, snow-fighting unit.

**Denver Safety League.**—At a recent meeting held in the auditorium of the Denver (Col.) City Tramway building a safety league was organized, which will embrace every official and employee of the company. The purpose of the league is to engage in and promote the work of accident prevention, with a view to safeguarding the company's employees and also the general public against injury arising from any act or failure to act on the part of the company, its employees, or any of its agencies. It is proposed to make the central safety committee a general clearing house for the prevention of accidents and for the correction of all unsafe conditions or improper methods out of which accidents might arise. The regular monthly meeting of the Denver City Tramway Section of the American Electric Railway Association was held on Feb. 19, 1914. Charles B. Wells, superintendent of transportation of the company, presented a paper, "A Safety Millennium." One of the suggestions which was made during the discussion was that the companies in several cities unite on the subject of moving pictures and illustrate in one city at a time all of the pictures which are collected. It was pointed out that this would reduce the cost materially and greatly increase the efficiency of the campaign.



## Personal Mention

Mr. William B. McKinley, president of the Illinois Traction System, Peoria, Ill., and formerly a member of Congress, has announced himself as a candidate for election to Congress as a Republican from the Nineteenth district in Illinois.

Mr. Howard W. Irwin has been appointed investigating engineer of the Bay State Street Railway, with headquarters in Boston. He will report directly to Mr. C. F. Bancroft, superintendent of motive power and machinery, and will continue to have general charge of the work of the instruction department, but will relinquish his duties as assistant superintendent of equipment.

Mr. Emil Huber-Stockar, president of the electrotechnical committee of Switzerland and permanent consulting engineer on electric traction to the board of general managers of the Federal Railways of Switzerland, sailed for home on the *Kronprinzessin Cecilie*, on March 24, 1914. Mr. Huber-Stockar devoted all of his stay to a study of the steam railroad electrifications at New York and also to the Hoosac tunnel. His impressions in regard to American practice are presented elsewhere in this issue.

Mr. F. Herbert Snow, hitherto chief engineer of the Pennsylvania State Department of Health, has been appointed chief engineer of the Pennsylvania Public Service Commission and will organize a bureau of engineering. Mr. Snow is a graduate of Harvard University and Massachusetts Institute of Technology, and was a member of the firm of Snow & Barbour, Boston and New York. He was in general engineering practice from 1890 to 1905, and was engaged in work connected with the abolition of grade crossings in Boston.

Mr. Thomas Beauchamp, formerly foreman with the Coney Island & Brooklyn Railroad, Brooklyn, N. Y., has been appointed superintendent of shops of the Yonkers (N. Y.) Railroad. Mr. Beauchamp was previously with the United Railways & Electric Company, Baltimore, Md., for ten years as foreman, but resigned from that company to take a similar position with the Cincinnati (Ohio) Traction Company. He resigned from the Cincinnati Traction Company to become connected with the Coney Island & Brooklyn Railroad, by which he has been employed for five years.

Mr. Louis C. Fritch has been appointed assistant to the president of the Canadian Northern Railway. Mr. Fritch was born on Aug. 11, 1868, at Springfield, Ill., and was educated at the University of Cincinnati, where he studied both civil engineering and law. He entered railroad service in 1884 and in 1904 went to the Illinois Central with the title of assistant to the general manager. In 1906 he was made assistant to the president, and in 1909, as consulting engineer for the company, he made a special study of the electrification of the Chicago terminals. He is a member of the committees on rail and electricity of the American Railway Engineering Association. He is also a member of the American Society of Civil Engineers and other technical societies.

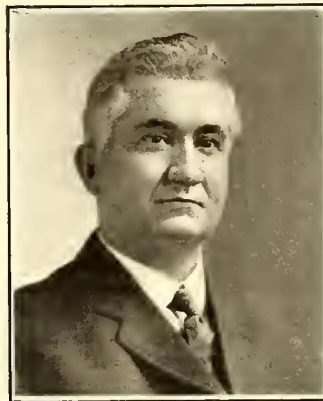
Mr. P. J. Kearny has been appointed electrical engineer of the New York, New Haven & Hartford Railroad, New Haven, Conn., reporting to Mr. W. S. Murray, consulting engineer, with duties as assigned. Mr. Kearny was graduated from the Massachusetts Institute of Technology in mechanical engineering in 1903. In 1904 he did post-graduate work in electrical engineering at that institute. He next served as an engineering apprentice with the Westinghouse Electric & Manufacturing Company. In 1906 he was appointed assistant to the electrical engineer of the New York, New Haven & Hartford Railroad, and in 1910 was appointed engineer of electric traction by the New York, New Haven & Hartford Railroad on the New York, Westchester & Boston Railway electrification. Since 1913 he has been with the firm of McHenry & Murray, engineers, New Haven, Conn., acting as consultants to the New York, New Haven & Hartford Railroad.

Mr. C. M. Clark, of E. W. Clark & Company, Philadelphia, Pa., chairman of the board of directors of the Portland Railway, Light & Power Company, Portland, Ore., was the guest at a luncheon of railway and steamship officials held on March 17, 1914, at the Multnomah Hotel, Portland. Mr.

Clark spoke about public relations and said that it was the duty of the employees of all public service companies to preach and live up to the "public-be-pleased" policy of the companies. Mr. Franklin T. Griffith, president of the Portland Railway, Light & Power Company, acted as chairman. Other speakers were Mr. R. A. Leiter, attorney for the Portland Railway, Light & Power Company; Mr. A. C. Spencer, general attorney for the Oregon-Washington Railway & Navigation Company; Mr. W. P. Bartlett, chief dispatcher for the Oregon Water Power lines, and Mr. G. C. Fields, superintendent of interurban transportation of the Portland Railway, Light & Power Company.

Mr. Ray W. Reynolds, general manager of the Springfield (Mass.) Street Railway, had a complimentary dinner tendered to him recently at the Highland Hotel, Springfield, by the employees of the Hartford & Springfield Street Railway, of which he was formerly general manager. Mr. Reynolds was presented with a diamond ring by his former associates as a token of esteem. Those present at the dinner in addition to Mr. Reynolds were Mr. Joseph S. Goodwin, superintendent of the Hartford & Springfield Street Railway; Mr. Frederick M. Dubois, master mechanic, representing the carhouse employees; Mr. John E. Thompson, chief engineer, representing employees of the power station; Mr. John F. Hannon, chief dispatcher, representing the transportation department; Mr. James Furey, roadmaster, representing the track and roads department; Mr. Robert H. Frew, superintendent of overhead lines, representing the linemen; Mr. Frank Seward, cashier and chief clerk, representing the accounting department, and Mr. Robert F. Kelly, Mr. Frank W. Lovejoy and Mr. Edward O'Donnell, representing trainmen.

Mr. John T. Conway, who was elected president of the New England Street Railway Club at the fourteenth annual meeting on March 26, 1914, is one of the most widely



J. T. Conway

known operating men in New England. He was born in 1860 at Stonington, Conn., and after spending his boyhood on the farm entered the Mystic Valley Institute at Mystic, Conn., in 1879. In 1881 he joined the staff of the Singer Sewing Machine Company at Meriden, Conn., and later attended East Greenwich Academy. Mr. Conway's street railway career began in 1885, when he entered the service of the Brockton (Mass.) Street Railway as a horse-car conductor. He was appointed carhouse foreman at Brockton in 1890 and division master in 1891. In 1900 he was made assistant superintendent of the Brockton lines of the Old Colony Street Railway and with the development of the southern lines of the Bay State Railway he became superintendent of Division 1, South, his jurisdiction embracing the lines centering in Brockton, Quincy and Hyde Park and covering about 300 miles of track. Mr. Conway is an Odd Fellow and a Knight Templar and is a member of the Boston City Club, the boards of trade of Brockton and Quincy, Mass., and other organizations.

Mr. William B. Storey, Jr., for the last year first vice-president of the American Railway Engineering Association, was elected president for the coming year at the recent convention in Chicago. Mr. Storey was born on Nov. 17, 1857, at San Francisco, was graduated from the University of California in 1881, and entered the employ of the Central Pacific Railway as rodman. When the Southern Pacific Company took over the Central Pacific he remained in the service, and when he left in 1893 he had advanced through the rank of leveler and transitman to that of assistant engineer, in charge first of location and afterward of construction and reconstruction. During part of 1894 and 1895 he was assistant engineer with the federal Débris Commission. In the latter year he entered the service of the San Francisco & San Joaquin Valley Railroad as engineer, later becoming also general superin-

tendent. Upon the completion of that road in 1900 it was purchased by the Atchison, Topeka & Santa Fé, and Mr. Storey was taken to Topeka as chief engineer in charge of both maintenance and engineering. In 1906 he was made chief engineer of the entire Santa Fé system, in charge of construction, at the same time acting as consulting engineer on maintenance. Two years later he was made vice-president in charge of construction, and at the close of 1910 his jurisdiction was extended over operation. Mr. Storey is a charter member of the American Railway Engineering Association. He is also a member of the American Society of Civil Engineers, the American Society for Testing Materials, the Western Society of Engineers and the Technical Society of the Pacific Coast.

#### OBITUARY

**W. A. Dutton**, one of the founders of the Van Dorn & Dutton Company, Cleveland, Ohio, which was organized more than twenty years ago, died in St. Augustine, Fla., on March 21, 1914. Mr. Dutton was actively connected with the Van Dorn & Dutton Company from the time of its formation until his retirement about four years ago from the position of secretary and treasurer of the company. Prior to his connection with the Van Dorn & Dutton Company Mr. Dutton was secretary and superintendent of the St. Clair Street line in Cleveland. Following his retirement from the Van Dorn & Dutton Company Mr. Dutton took up his residence in St. Augustine. He recently returned North and underwent an operation at the Lakeside Hospital, Cleveland, and returned to the South about six weeks ago apparently greatly improved. His death followed a second operation performed at St. Augustine on March 14. Mr. Dutton was sixty years of age and is survived by his widow and one daughter.

**James Sheldon Cummins**, one of the original partners of H. M. Byllesby & Company, Chicago, Ill., and continuously and closely associated with the firm for many years, died in Chicago on March 25, 1914. Mr. Cummins was the senior member of the law firm of Cummins, Stearns & Milkewitch and vice-president, director and senior counsel of H. M. Byllesby & Company. He was also a director and officer in a number of public utility companies. He was born on March 22, 1857, in Upper Province Township, Delaware County, Pa., and was educated at Swarthmore College. He was admitted to the Pennsylvania bar in 1882 and practised law at Media, Pa., where he was married in February, 1889, to Alice Charlotte Byllesby, the daughter of Rev. DeWitt Clinton Byllesby. In 1891 Mr. Cummins was appointed counsel for the Thomson-Houston Electric Company in Chicago and continued with that company until it was consolidated with the General Electric Company in 1893, after which date he served the latter company in a similar capacity.

**H. C. Patterson**, formerly mechanical and electrical engineer of the Illinois Traction System, Peoria, Ill., and recently engaged in consulting engineer work, died at his home in Decatur, Ill., on March 13, 1914. Mr. Patterson had been actively engaged in the mechanical, electrical and hydraulic engineering work since 1880, at which time he became connected with the engineering department of the New York Edison Company. In 1882 he was sent to Europe by the Edison interests to assist in constructing the first lighting stations there. In 1883 he became connected with the sales department of the Brush Electric Company, Cleveland, Ohio, and in 1885 entered the employ of the engineering department of the Thomson-Houston Company, Boston, where he organized the engineering department and subsequently was appointed chief engineer of the company. When the Thomson-Houston Company was succeeded by the General Electric Company, Mr. Patterson continued with that company and engaged in the construction and design of more than seventy-five railway and lighting plants. About 1895 Mr. Patterson was appointed receiver of the Consolidated Lighting Company, Dover, N. H. From 1896 to 1902 he was manager of the municipal lighting and water plant of Austin, Tex., and from 1902 to 1909 he engaged in consulting engineering work with offices in Boston. In 1909 Mr. Patterson was appointed mechanical and electrical engineer of the Illinois Traction system, which position he held for two years, resigning to engage in consulting engineering work.

## Construction News

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

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

#### RECENT INCORPORATIONS

\*Mississippi Electric Railway, Columbus, Miss.—Incorporated in Mississippi to build an electric railway. Capital stock, \$5,000,000. Incorporators: Charles F. Sherrod, F. W. Crosby, G. T. Banks, and others.

\*Carbon & Stillwater Electric Railway, Red Lodge, Mont.—Incorporated in Montana to build a 40-mile interurban electric railway between Red Lodge and Columbus. Capital stock, \$750,000. Incorporators: William Larkin, Red Lodge; James Herington, Stillwater; W. H. Reber, Absarokee; O. O. Anderson, West Rosebud; L. C. Piper, East Rosebud; C. W. Selleck, Roscoe; John Shaw, Luther; Thomas Hogan, A. N. Whittington, E. D. Draper and Marcus McKay.

#### FRANCHISES

**Birmingham, Ala.**—The Birmingham, Ensley & Bessemer Electric Railway has received a franchise from the Council in Birmingham.

**Santa Clara, Cal.**—The Peninsula Railway, San José, has asked the Council for a three months' extension of time on its franchise on Saratoga Avenue in Santa Clara.

**Jacksonville, Fla.**—Following a protest from property owners of South Jacksonville, the City Council has passed an amendment to the franchise changing the route of the proposed new line from Myrtle Avenue to Hendricks Avenue. The original franchise was granted to Thomas R. Osmond, representing the Jacksonville & St. Augustine Public Service Corporation. [E. R. J., Jan. 3, '14.]

**Atlanta, Ga.**—The Georgia Railway & Power Company has received a franchise from the Council in Atlanta to build a loop for its College Park line in Alabama Street, and also to extend its tracks into Butler Street for its suburban express station. The franchise for the Alabama Street extension was granted for an indeterminate period, and the Butler Street franchise was made a part of the Gilmer Street franchise, which is for a period of thirty-nine years.

**East St. Louis, Ill.**—The receivers of the Southern Traction Company, an interurban line which it is planned will extend from St. Louis into southern Illinois, will accept a modification of the fifty-year loop franchise. The company has a permit to enter St. Louis over the municipal bridge and a fifty-year franchise for a downtown loop.

**Keokuk, Ia.**—The Keokuk Electric Railway has received a franchise to extend its lines in Keokuk along McKinley Avenue to the baseball park, a distance of 1 mile.

**Pascagoula, Miss.**—The Pascagoula Street Railway has received a twenty-five-year extension of time on its franchise in Pascagoula.

**Kansas City, Mo.**—Among the ordinances passed by the Council that will go to Mayor Jost at once for his approval are the two authorizing the Metropolitan Street Railway to lay tracks in Broadway from Fourteenth Street to Southwest Boulevard and in Twenty-fourth Street, from Broadway to Main Street, to provide street car facilities to the new union passenger station from the west and southwest sections of Kansas City.

**Cleveland, Ohio.**—The Lake Shore Electric Railway has asked the Council for an extension of time on its franchise in Cleveland and for an extension of its lines to the Public Square.

**Dayton, Ohio.**—The Dayton & Troy Electric Railway has asked the Council for an extension of twenty years on its franchise in Dayton. In its new application the company agrees to pave within its tracks if it obtains the extension asked.

**Sharon, Ohio.**—The Valley Street Railway, Lemoyne, Pa., has asked the Council for a franchise for an extension over the East Hill in Sharon.

**Sarnia, Ont.**—The Sarnia Street Railway has asked the Council for a franchise to extend its lines in Sarnia.

**New Hope, Pa.**—The Bucks County Electric Railway has asked the Council for a franchise for an extension on North Main Street in New Hope.

## TRACK AND ROADWAY

**Northwest Arkansas Railway, Bentonville, Ark.**—Plans are being made by this company to finance the interurban line to connect Bentonville and Rogers. The company has leased the branch line of the St. Louis-San Francisco Railroad from Rogers to Grove, Okla. C. E. McClure, president.

**Pacific Electric Railway, Los Angeles, Cal.**—Plans are being made by this company to extend its line from Pomona into the Chino district and into Corona, where it will complete a loop which will include San Bernardino, Riverside, Corona, Chino, Pomona, Ontario and towns west. It is stated that the Chino extension is under consideration, as is also a direct line between Ontario and Pomona. Work has been begun by the company on the construction of new cement bridges on its line between Arlington and Corona. This company has placed in operation its new Riverside-Bloomington-Rialto extension.

**San Diego (Cal.) Electric Railway.**—All sections of track construction, additions of equipment and general improvements on this company's lines in San Diego and in Balboa Park will cost about \$1,500,000 and will be completed within a year. New work just begun is the re-railing and ballasting of the Fifth Street line. Grading has been begun in Balboa Park for the new park line. In connection with the new park line a loop encircling thirty-six blocks of the business district will be constructed. This will be double-track and 114-lb. rails will be used. The Adams Avenue line from Mission Cliff Park to Kensington Park bridge will be double-tracked.

**Geary Street Municipal Railway, San Francisco, Cal.**—The Board of Public Works has awarded a contract to H. S. Tittle for the concrete poles for the Van Ness Avenue line and the contract for furnishing underground conduit materials was awarded to Pierson, Roeding & Company.

\***San Francisco, Cal.**—Plans are being considered for the private construction of an electric railway to Hunter's Point to connect with the projected Potrero extension of the Municipal Railway and to be operated by the syndicate of capitalists. It is planned to build a line about 1½ miles long from Hunter's Point to the Twenty-fifth Street terminal of the municipal line, and to turn the line over to the city for operation as a part of the Municipal Railway. It will run principally over a private right-of-way. Among those interested are A. Schilling, H. T. McCloskey, C. O. Miller, F. W. Van Sicklen and F. Morgan.

**Groton & Stonington Street Railroad, New London, Conn.**—Plans for the improvements of this company's lines include the expenditure of \$50,000. New ties will be laid all the way from Groton to Westerly. There are also contemplated improvements in reducing several of the sharper curves along the route.

**St. John's Electric Company, St. Augustine, Fla.**—This company is asked to consider plans to extend its line north from its present terminus at the north end of the city.

**Alton, Granite & St. Louis Traction Company, Alton, Ill.**—Engineers of this company and the Chicago & Alton Railroad are making plans to build an electric railway under the Chicago & Alton Railroad tracks at Upper Alton. Each company will bear part of the expense, which will be about \$70,000. The crossing will permit the extension of the traction company to the new asylum.

**Southern Illinois & St. Louis Railway Company, Chicago, Ill.**—W. H. Schott, president of this company, announces that financial arrangements for the construction of this new line have been made through the F. R. McMullin & Company, Chicago. This new line is an extension of the Southern Illinois Railway & Power Company's line between Eldorado and Carrier Mills in Saline County, Ill. The extension will include approximately 60 miles connecting Harrisburg, Johnson City, Marion, Benton, Herrin and West Frankfort. Franchises have been secured by this new company in all the cities mentioned, and the contract for grading the first 25-mile section out of Harrisburg has been let to M. C. Connors & Company, Chicago. [E. R. J., March 7, '14.]

**Indianapolis & Frankfort Railroad, Indianapolis, Ind.**—This company states that its proposed 55-mile line between Indianapolis and Frankfort will not be operated as an electric railway. J. J. Turner, president, Philadelphia, Pa.

**Tri-City Railway, Davenport, Ia.**—To spend \$20,000 in rebuilding the old Rockingham line from the Davenport Locomotive Works to Elsie Avenue, a distance of 1 mile, is planned by this company. The improvements will consist of paving the track and laying new rails where it is required. The construction of the new line to Bettendorf will begin about the middle of April. The rails for this extension will be ordered at once.

**Keokuk (Ia.) Electric Company.**—An extension of its McKinley Avenue line through Rand Park and out to the new baseball park in Keokuk is being planned by this company.

**Kansas City, Kaw Valley & Western Electric Railway, Bonner Springs, Kan.**—Appraisers for this railway filed their report with the Wyandotte County officials recently, completing the right-of-way work on the line between Kansas City, Mo., and Bonner Springs, Kan. The line will enter Kansas City, Kan., over the right-of-way of the Kansas City, Mexico & Oriental Railway, later connecting with the Metropolitan Street Railway's tracks at Central Avenue. It will gain entrance to Kansas City, Mo., over the Metropolitan's tracks.

\***Garden City, Kan.**—Officials of the United States Sugar & Land Company have announced that the company will build an interurban electric line to connect its numerous irrigated ranches. The company is installing a large electric power plant.

**Anthony & Northern Railway, Hutchinson, Kan.**—Plans are being made by this company to extend its line from the present terminus north of Pratt to Larned. This is part of a plan to build a line from Anthony northwest to Pratt, Larned, Lacrosse, Hays City, Stockton and Smith Center to Hastings, Neb. R. A. Cox, Hutchinson, is interested. [E. R. J., Dec. 21, '13.]

\***Hutchinson, Kan.**—Plans are being considered to build an electric railway from Hutchinson through the Arkansas Valley, via Kingsley and Larned, to Dodge City. Among those who are interested in the project are Levi S. Smith, Larned; E. E. Frizell and the Hutchinson Commercial Club, Hutchinson.

**Frontenac, Mulberry & Arcadia Electric Railway, Pittsburg, Kan.**—More than \$20,000 in stock has been subscribed to build this 15-mile electric railway to connect Frontenac, Mulberry, Arcadia and Pittsburg. J. S. Patton, Pittsburg, president. [E. R. J., Feb. 14, '14.]

**Topeka (Kan.) Railway.**—This company has been asked to co-operate with the municipal authorities in a plan for parking the space between the street-car tracks on several thoroughfares. The plan was outlined recently by C. M. Robinson, city expert, and approved by the commercial club and other organizations. The proposed improvements, except on Kansas Avenue, the chief business street, will be made when it is necessary to repave the thoroughfares, according to the plans. Among the streets included in the plans are Harrison, Van Buren, Topeka Avenue, Quincy, Monroe and others.

**Kentucky Southwestern Electric Railway, Light & Power Company, Paducah, Ky.**—Surveys have been completed by this company for its line between Paducah and Henderson, Ky. Surveys have also been completed for a line to Cairo and another line to Hickman, Ky. The company intends to enter into an agreement with the officers of the Illinois Traction System to build a bridge over the Mississippi River at Cairo. E. F. Wheaton, general manager. [E. R. J., Feb. 3, '12.]

**Bay State Street Railway, Boston, Mass.**—Final plans for the general track work during the year have been shown to the Council by this company. These plans include a number of propositions, among which are the double-tracking of Chestnut Street from Essex Street to Wenuchus Square and on Chatham Street from Essex Street to Maple Street in Boston.

**Worcester (Mass.) Consolidated Street Railway.**—This company is asked to consider plans to extend its Clinton & Fitchburg tracks in Lincoln Street across the lake at the old Lincoln Street bridge and construct a new line in North Quinsigamond Avenue, on the east shore of the lake, that would join the present line at the Causeway.

**Michigan & Chicago Railway, Lansing, Mich.**—The State Railroad Commission has authorized this company to change its name to the Michigan Railway Company. The company plans to build an electric line which will eventually circle the State. [E. R. J., Dec. 13, '14.]

**Helena, Mo.**—Preliminary surveys are being made to build an electric line from St. Joseph to Pattonsburg. J. H. Kimmet, Helena, is interested. [E. R. J., Jan. 31, '14.]

**Big Horn Canyon Irrigation & Power Company, Billings, Mont.**—Arrangements are being made by this company to begin work soon on its electric railway from Custer on the Northern Pacific Railway to Hardin. Power will be generated by a dam in Big Horn Canyon. It will also furnish power for lighting purposes. Capital stock authorized, \$5,000,000. Capital stock issued, \$500,000. Officers: J. J. Harris, Hardin, president; A. Becker, Hardin, vice-president; Edward Lawlor, Hardin, secretary and treasurer, and B. C. Lillis, Billings, general manager and chief engineer. [E. R. J., March 7, '14.]

**Omaha & Lincoln Railway & Light Company, Lincoln, Neb.**—Plans are being made by this company to extend its lines beyond Papillion and into Lincoln.

**Elmira Water, Light & Railroad Company, Elmira, N. Y.**—During the next two weeks this company will award contracts to relay some of its tracks and have some special work done on its lines in Elmira.

**Kingston (N. Y.) Consolidated Railroad.**—This company has awarded a contract to Fred T. Ley & Company, Kingston, to reconstruct 2500 ft. of track in Kingston.

**Third Avenue Railway, New York, N. Y.**—Work has been begun by this company for the extension of the elevated railway to White Plains Avenue and 241st Street in New York City.

**Durham (N. C.) Traction Company.**—This company is asked to consider plans to extend its lines in Durham from the present terminus on Mangum Street to the Eno River.

**Northern Ohio Traction & Light Company, Akron, Ohio.**—Plans are being considered by this company and the Stark County Commissioners to build a broad paved highway between Canton and Massillon, a distance of 8 miles, and to operate a ten-minute street-car schedule over the road.

**Cleveland, Alliance & Mahoning Valley Railway, Cleveland, Ohio.**—A contract has been awarded by this company to Elmer Morgan for grading the line between Leavittsburg and Newton Falls. [E. R. J., Feb. 14, '14.]

**Cleveland (Ohio) Railway.**—This company will be enabled to make contemplated extensions and improvements as the result of the approval by the State Public Utilities Commission of a stock issue of \$2,141,100. Among the principal extensions contemplated are for a cross-town line in East Eighty-second Street, Broad Avenue and East Seventy-ninth Street, and for a cross-town line in East Thirtieth Street from St. Clair Avenue to Woodland Avenue in Cleveland.

**Tri-State Traction Company, Steubenville, Ohio.**—Plans are being made by this company to begin work soon on its 17-mile extension south from Warsaw.

**Choctaw Railway & Light Company, McAlester, Okla.**—This company has decided to extend its Second Ward line in McAlester to connect with the McAlester Country Club, a distance of 1 mile.

**\*Fort William, Ont.**—The owners of property lying along Victoria Avenue West and the western boundary of Fort William have offered to build an electric railway in that section and turn it over to the city complete, provided the city will give some specified service over the branch.

**Guelph, Ont.**—The City Council of Guelph has passed a resolution which will be presented to the Hydro-Electric Commission asking for an investigation into the cost of equipment and operation of a line from Guelph to Orangeville via Hillsburg and Erin.

**Ottawa, Ont.**—The government is considering a subsidy to the Ottawa & St. Lawrence Railway for a line passing the rifle ranges. Work is to begin this spring.

**Sandwich, Windsor & Amherstburg Railway, Windsor, Ont.**—This company is asked to consider plans to double-track Bedford Street within the village limits of Sandwich.

**Conestoga Traction Company, Lancaster, Pa.**—Plans are

being made by this company to extend its lines in Lancaster.

**Pittsburgh, Harmony, Butler & New Castle Railway, Pittsburgh, Pa.**—During the year this company plans to build 6 miles of new track between Ellwood and Beaver Valley.

**Hull (Que.) Electric Railway.**—The following extensions are proposed by this company: double-tracking Laurier Avenue, Youville to Reboul Street and Reboul Street to Brewery Creek; also the construction of a branch line to Notre Dame Cemetery in Hull.

**Valleyfield (Que.) Waterpower Company.**—This company, which has been incorporated under the Quebec companies act, is applying to the Canadian Parliament for authority to build the following railways, to be operated by electricity: From Salabery to Valleyfield southwesterly across the counties of Beauharnois and Huntingdon, along Lake St. Francis to the provincial boundary; from the same starting point southwesterly across the counties of Beauharnois, Chateaugay and Huntingdon to the international boundary, and from the same starting point northeasterly, crossing the St. Lawrence River and across the counties of Soulanges and Vaudreuil, to the Lake of Two Mountains. [E. R. J., Dec. 6, '13.]

**\*Big Rock, Tenn.**—A plan to connect the towns of Big Rock, Weaver's Store, Lafayette, New Providence and Clarksville, Tenn., by an electric interurban line is being considered by the citizens in that section. Mayor Martin of Big Rock is interested.

**Memphis (Tenn.) Street Railway.**—Representatives of this company, with city officials and representatives of the Southern Railway, have signed a contract for the immediate construction of a reinforced concrete overhead bridge at the Madison Avenue crossing of the Southern Railway.

**Texas Traction Company, Dallas, Tex.**—Extensive improvements are being made by this company to its local lines in Denison. New poles are being placed and the tracks have been overhauled. Between Denison and Sherman new ties are being placed and the roadbed improved.

**Southwestern Traction Company, Temple, Tex.**—Plans are being made by this company to extend its lines from Temple to Waco and from Temple to Austin.

**Seattle, Wash.**—The city engineering department, the office of the superintendent of public utilities, Councilman Erickson and the city utilities committee of the City Council are working on the proposed extensions and enlargement of municipally owned and operated lines in Seattle. The engineering department is working out the most feasible routes and the office of the superintendent of public utilities and the Council committees are framing an ordinance that will permit of the sale of sufficient bonds to begin actual construction. As proposed, the first extension will begin at Third Avenue and Stewart Street and extend to the Latona bridge, where four lines will branch out into different portions of the city.

**Tacoma, Wash.**—A contract between the city of Tacoma and the Puget Sound Traction, Light & Power Company for the operation of a municipally owned electric line to the tideflats has been signed by Mayor Seymour and L. H. Bean, for the company. The city will issue bonds to the amount of \$25,000 for the construction of the new line. Work cannot be begun until the bonds are sold. [E. R. J., Jan. 31, '14.]

**Baraboo, Devil's Lake & Western Railway, Madison, Wis.**—Preliminary arrangements are being made by this company to build its electric line to connect Cashton, Ontario, Baraboo, Portage, Plain and Kilbourn. It is planned to purchase power. Capital stock authorized, \$100,000. Officers: T. F. Risley, Baraboo, president; F. J. Effinger, Baraboo, vice-president; George W. Brunschweiler, secretary, and William E. Rowlands, Baraboo, treasurer. [E. R. J., March 7, '14.]

**Janesville & Madison Traction Company, Madison, Wis.**—Preliminary arrangements are being made by this company to begin work this summer on its 36-mile line to connect Janesville, Indian Ford, Edgerton, Albion, Stoughton and Madison. The company plans to do its own work. Its repair shops will be at East Madison and it will operate four cars. Officers: G. Pickhardt, Madison, president, general

manager and purchasing agent; William Peper, Madison, vice-president; Frank W. Weston, Madison, secretary; C. B. Antill, Janesville, Wis., superintendent. [E. R. J., March 7, '14.]

**SHOPS AND BUILDINGS**

**Pacific Electric Railway, Los Angeles, Cal.**—This company has purchased 20 acres in the industrial district of El Segundo for the purpose of constructing storage yards. Plans are being made to begin work at once on its new depot in El Segundo.

**San Francisco-Oakland Terminal Railways, Oakland, Cal.**—This company has made known its plan to establish its permanent office building at Twenty-second and Grove Streets in Oakland. The present depot is to be moved to some convenient spot near by. Work will begin on the new structure immediately.

**San Diego (Cal.) Electric Railway.**—Work has been begun by this company on its new carhouse on Adams Avenue in San Diego. The structure is of concrete and brick construction and will have a capacity of 125 cars. The cost is estimated to be about \$125,000.

**Rock Island Southern Railroad, Monmouth, Ill.**—This company has moved its general office from Monmouth to Rock Island.

**Illinois Traction System, Peoria, Ill.**—Work will be begun at once by this company on its seven-story office building on the site of the old National Hotel in Peoria. The cost is estimated to be about \$350,000.

**Metropolitan Street Railway, Kansas City, Mo.**—The formal opening of the new division headquarters at Ninth and Brighton Streets will be held by this company about April 1. The new structure, two stories in height, represents an expenditure of \$10,000.

**Brooklyn (N. Y.) Rapid Transit Company.**—This company is asked to consider plans to build a new passenger station on the Myrtle Avenue elevated line at Cumberland Street, Brooklyn.

**Springfield (Ohio) Railway.**—Plans have been completed by this company for its new carhouses and repair shops to be built at Clifton Street and East Street in Springfield. The buildings will be of steel frame with concrete foundation, 9-in. exterior walls and concrete roof.

**POWER HOUSES AND SUBSTATIONS**

**San Diego (Cal.) Electric Railway.**—Improvements are being planned by this company at the power plant at Broadway and Arctic Street. These improvements include new boilers, boiler-feed pumps, salt-water circulating pumps and an extension of the salt-water circulating system to the foot of E Street.

**Kansas City, Kaw Valley & Western Electric Railway, Bonner Springs, Kan.**—This company has closed an agreement whereby it will receive power from the municipal light plant at Kansas City, Kan. The electric line will spend \$25,000 in making necessary installations of transformers. The railway will pay about \$1,000 a year for power.

**Public Service Railway, Newark, N. J.**—This company expects to add a new 3000-hp unit to its Marion power station, which will include boiler and generator equipment.

**Guelph (Ont.) Radial Railway.**—Bids are being received by this company for alterations to its power house in Guelph.

**Tennessee Railway, Light & Power Company, Memphis, Tenn.**—E. W. Clark & Company, Philadelphia, managers of the Tennessee Railway, Light & Power Company, announce that the Tennessee Power Company, the principal generating subsidiary, has begun delivery of current from its development No. 2 on the Ocoee River to the plant of the Aluminum Company at Maryville, Tenn., a distance of 63 miles. The contract calls for about 20,000 hp annually and the minimum annual return will be \$225,000.

**Charlottesville & Albemarle Railway, Charlottesville, Va.**—During the next four months this company will award contracts to build a new substation in Charlottesville. It will purchase a new rotary converter with a capacity of 200 kw or 250 kw.

**Manufactures and Supplies**

**ROLLING STOCK**

**Waterbury & Milldale Tramway, Waterbury, Conn.**, expects to purchase two cars.

**Washington-Virginia Railway, Washington, D. C.**, has ordered five cars from the Southern Car Company.

**Homestead & Mifflin Street Railway, Homestead, Pa.**, expects to purchase during the next few weeks one closed car.

**Waupaca Electric Light & Railway Company, Waupaca, Wis.**, expects to purchase from two to ten coal cars, side-dump.

**Dayton, Covington & Piqua Traction Company, West Milton, Ohio**, expects to purchase two passenger trailers for interurban service.

**Birmingham, Ensley & Bessemer Electric Railway, Birmingham, Ala.**, is reported as expecting to purchase eight pay-as-you-enter cars.

**Memphis (Tenn.) Street Railway**, noted in the ELECTRIC RAILWAY JOURNAL of Feb. 21, 1914, as having issued specifications for twenty-five cars, has ordered twenty-five motor cars and ten trailers from The J. G. Brill Company.

**Jefferson Traction Company, Punxsutawney, Pa.**, noted in the ELECTRIC RAILWAY JOURNAL of March 21, 1914, as expecting to purchase one combination double-truck car, has purchased one double-truck combination passenger and baggage interurban car from the G. C. Kuhlman Car Company and two single-truck city cars from The J. G. Brill Company.

**Electric Short Line Railway, Minneapolis, Minn.**, noted in the ELECTRIC RAILWAY JOURNAL of March 14, 1914, as expecting to purchase several gasoline-electric cars, has appropriated \$268,000 for rolling-stock equipment, and has placed orders for four all-steel 73-ft. General Electric gasoline-electric cars and two 80-ton engines for construction work, costing \$120,000; fourteen 60-ft. trailers, \$10,000, and twenty-eight 40-ft. flat cars, \$38,000.

**Niagara, St. Catharines & Toronto Railway, St. Catharines, Ont.**, noted in the ELECTRIC RAILWAY JOURNAL of Feb. 7, 1914, as having ordered six interurban cars from the Preston Car & Coach Company, has specified the following details for these cars:

Seating capacity.....	66	Couplers,	
Weight of car body,		Ohio Brass automatic	
	37,000 lb.	Curtain material..	Pantastote
Bolster centers.....	33 ft.	Destination signs,	
Length of body.....	46 ft.	Elec. Serv. Sup. Co.	
Over vestibule....	56 ft. 6 in.	Gongs,..Elec. Serv. Sup. Co.	
Width over all...9 ft. 1½ in.		Hand brakes.....	Ackley
Body .....	combination	Heaters.....	Peter Smith
Underframe .....	steel	Headlights ...	Crouse-Hinds
Air brakes .....	West.	Motors .....	G.E.-233
Axles.....	Jones & Laughlin	Registers ....	International
Bumpers .....	anti-climber	Trucks .....	Taylor
Control..Gen. Elec.—	Type M	Ventilators .....	Automatic
		Wheels.....	steel-tired

**TRADE NOTES**

**Norma Company of America, New York, N. Y.**, maker of ball, roller, thrust and combination bearings, announces the removal of its offices, on April 11, from 20-24 Vesey Street to 1790 Broadway.

**Allen Bradley, Milwaukee, Wis.**, announces the removal of its Chicago representative, Frank L. Gohl, from his old quarters at 540 Commercial National Bank Building to 307 Webster Building, 327 La Salle Street, Chicago, Ill.

**Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.**, at a meeting on March 25, 1914, elected James N. Wallace, president of the Central Trust Company, New York, N. Y., and H. H. Westinghouse directors of the company to succeed Thomas W. Lamont and George Westinghouse.

**Weston Electrical Instrument Company, Newark, N. J.**, has appointed Edwin Wortham, sales agent for the Bristol Company, as district representative of the Weston Electrical Instrument Company for the states of Virginia, West Virginia and North Carolina, with offices at Suite 38, Allison Building, Richmond, Va.

Niles Car & Manufacturing Company, Cleveland, Ohio, has appointed J. A. Hanna, for several years sales manager at the general sales office, 312 Electric Building, Cleveland, Ohio, as vice-president also. Mr. Hanna in April will move his office to the Niles Car Works, Niles, Ohio, in order to be in closer touch with the work.

Henry R. Kent & Company, New York, N. Y., is the title of a new firm of engineers which has opened offices at 141 Broadway. The members of the firm are Henry R. Kent and Carl M. Vail, both for a long time connected with Westinghouse, Church, Kerr & Company. The firm will do a general engineering business.

W. W. Cole, New York, N. Y., consulting engineer, formerly with Day & Zimmerman, engineers, Philadelphia, Pa., has opened an office at 43 Exchange Place, New York, N. Y., for the practice of a general consulting engineering business, including investigation and reports of public utilities, industrial companies and advising in regard to reorganization and economic operation of railroads. Mr. Cole's first work was in the position of constructing engineer for George H. Norman, of Boston, and the New England Construction Company. Subsequently Mr. Cole became connected with the Toledo, St. Louis & Kansas City Railroad as constructing engineer. Later he became superintendent of the electrical installation of the Allston division of the West End Street Railway, Boston, Mass. After completing this work Mr. Cole became manager of the Utica (N. Y.) Belt Line. From Utica he went to Elmira and constructed the West Side Railroad. He became vice-president of the Utica Water, Light & Railroad Company. In 1908 Mr. Cole was appointed general manager of the public utilities department of Dodge & Day, engineers, Philadelphia, Pa. His next position was as general manager of the Citizens' Traction Company, Oil City, Pa. A short while ago Mr. Cole became connected with Day & Zimmerman and his time was divided largely between the New York and Philadelphia offices of this company.

Union Switch & Signal Company, Swissvale, Pa., at a meeting of its directors on March 18 elected H. G. Prout president, succeeding the late George Westinghouse. Mr. Prout graduated from the University of Michigan in 1871. In 1873 he served as major of engineers and later colonel of the general staff in the army of the Khedive of Egypt. He commanded an expedition in the Soudan and was governor of the Provinces of the Equator. After this service he became editor of the *Railroad Gazette*, which position he held for sixteen years. In 1903 he was appointed vice-president and general manager, acting in this capacity until his recent appointment as president. This company lately has received a contract for the installation of 70 miles of automatic block signaling on the Kansas City, Clay County & St. Joseph Railroad. The territory to be signaled is single track, with twenty-five sidings, extending from Kansas City to St. Joseph, and Kansas City to Excelsior Springs. A total of fifty one-arm Style B semaphores will be employed at sidings, and fifty one-way Model 13 light signals intermediate to the sidings. The T. D. B. system of signaling, similar to that installed on the Chicago, Lake Shore & South Bend Railway; the Chicago, South Bend & Northern Indiana Railway; the Indianapolis, Columbus & Southern Traction Company; the Ohio Electric Railway; the Louisville & Northern Railroad, and the Scranton & Binghamton Railway, as described in the *ELECTRIC RAILWAY JOURNAL* of Jan. 24, 1914, will be used. Alternating current at 2200 volts, 25 cycles, will be transmitted throughout the signaled territory and stepped down to 110 volts for operating the various units and feeding the track circuit transformers. A new feature to be undertaken in this work is the lighting of all switch stands and stations from the a.c. signaling mains.

#### ADVERTISING LITERATURE

S. K. F. Ball Bearing Company, New York, N. Y., has issued a catalog describing its ball bearings for railway lighting generators.

Allen-Bradley Company, Milwaukee, Wis., has issued Bulletin No. 541 describing its Type H resistance starting switch for a.c. induction motors. Graphite compression resistance is used.

S. Freeman & Sons Manufacturing Company, Racine, Wis., has issued a catalog describing and illustrating its high-power steam boilers of the horizontal return tubular, Scotch marine, internally fired and water-tube type.

Allgemeine Elektrizitäts Gesellschaft, Berlin, Germany, has issued a series of catalogs describing its meter factory, the construction of its meters, rheostats, starting controllers and electrically driven clocks.

H. W. Johns-Manville Company, New York, N. Y., prints in the *J-M Power Expert* for March, 1914, an illustration of a new 192-ft. steel stack, lined with 2-in. vitribestos, recently built for a power station of the Toledo Railway & Light Company.

G. A. Wood Preserver Company, St. Louis, Mo., has issued a circular containing two testimonial letters from Edward F. Tyler, general superintendent Greenville Traction Company. In 1905 three barrels of wood preserver were used for treating ties on this railway. Five years later, in 1910, the ties were found to be in perfect state of preservation. A re-examination about a month ago showed the nine-year-old treated ties to be in apparently as good condition as when inspected in 1905.

H. M. Byllesby & Company, Chicago, Ill., have issued circular cards illustrating hydroelectric developments at Taylor's Falls, Rapidan, Coon Rapids and Cannon Falls, owned by the Consumers' Power Company, which in turn is controlled by H. M. Byllesby & Company. The Coon Rapids development on the Mississippi River is planned for completion in 1914. The dam was finished Jan. 7. It will have an initial installation of 10,500 electrical hp in five units, operating under an average 17½-ft. head. The ultimate capacity is 15,000 hp. Power derived will be used in Minneapolis and St. Paul. The entire structure has a total length of 2070 ft., with a solid concrete spillway dam 1000 ft. long, to be surmounted by 28 Tainter gates, each 33 ft. long and 8 ft. high.

#### NEW PUBLICATIONS

Les Surtensions. (Maintenance of High-Grade Tension Lines.) By I. Van Dam. Paper, 268 pages. Librairie Gauthier-Villars, Paris. 12.5 francs (\$2.50).

This book is devoted exclusively to problems which arise in the operation of high-tension lines and describes the construction and utility of the various protective devices used in connection with them. The author calls attention to the remarkable progress made in high-tension transmission in America and states that his countrymen are now proposing a 120,000-volt line to transmit electrical energy to Paris from falls on the upper Rhone. Among the topics considered in this book are corona phenomena, high-tension insulators, self-induction and capacity of aerial and underground lines, resonance, causes of line disturbances, forms of conductors, factors of safety, specifications, etc. Lightning protection receives extended treatment.

Die Eisenbahn-Technik der Gegenwart-Fahrzeuge für Elektrische Eisenbahnen. (Electric Rolling Stock.) By E. C. Zehme, Berlin, 235 pages, illustrated. C. W. Kreidel, Wiesbaden, Germany. Paper, 10 marks (\$2.50).

This volume is the fourth in a series being prepared by experts to cover the entire field of railroading. The present one is Section E of the fourth volume and deals with electric railway rolling stock. Dr. Zehme did not confine himself to European practices in this work, as he has included many descriptions of designs and constructions followed in the United States and, particularly, in heavier multiple-unit and locomotive work. The book itself describes the theory of design and construction of direct-current and alternating-current traction motors and their systems of control. This is followed by a description of other devices, such as current collectors, resistances, transformers, compressors, lighting and heating equipment, etc. The second division of the volume takes up the mechanical features of rolling stock, such as truck and body. An unusual but extremely interesting section is the discussion on the conditions which fix the capacity and size of the various electrical features of the car. The last section is devoted to descriptions of cars built for various classes of service, such as the underground lines of London and New York, and to features of electric locomotive design.