

Electric Railway Journal

A CONSOLIDATION OF

Street Railway Journal and Electric Railway Review

VOL. XXXII

NEW YORK, SATURDAY, JULY 25, 1908

No. 8

PUBLISHED EVERY SATURDAY BY THE

McGraw Publishing Company

James H. McGraw, President. J. M. Wakeman, 1st Vice-president.
A. E. Clifford, 2d Vice-president. C. E. Whittlesey, Sec. and Treas.

Henry W. Blake, Editor.
L. E. Gould, Western Editor, Rodney Hitt, Associate Editor.
Frederic Nicholas, Associate Editor.

NEW YORK, 239 WEST THIRTY-NINTH STREET.

Chicago: Old Colony Building.
Philadelphia: Real Estate Trust Building.
Cleveland: Schofield Building.
London: Hastings House, Norfolk St., Strand.

Cable Address, Stryjourn, New York; Stryjourn, London—Lieber's Code.
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TERMS OF SUBSCRIPTION

United States, Hawaii, Puerto Rico, Philippines, Cuba, Mexico and Canal Zone.

ELECTRIC RAILWAY JOURNAL (52 weekly issues and also special daily convention issues published from time to time in New York City or elsewhere), postage prepaid...\$3.00 per annum
Single copies.....10 cents
Combination Rate, with Electric Railway Directory and Buyer's Manual (3 issues—Feb., Aug. and Nov.).....\$4.00 per annum
Both of the above, in connection with American Street Railway Investments (The "Red Book"—Published annually in May; regular price, \$5.00 per copy).....\$6.50 per annum
CANADA: extra postage.....\$1.50 per annum

To All Countries Other Than Those Mentioned Above.

ELECTRIC RAILWAY JOURNAL (52 weekly issues and also daily editions as above), postage prepaid.....\$6.00 per annum
25 shillings. 25 marks. 31 francs.
Single copies.....20 cents
Foreign subscribers may remit through our London office.

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DATE ON WRAPPER shows the month at the end of which the subscription expires. The sending of remittances for renewal prior to that date will be much appreciated by the publishers.

Of this issue of the ELECTRIC RAILWAY JOURNAL 9100 copies are printed.

Saving Scrap on the Right-of-Way

About this time of year the section men begin their annual cleaning up of the right-of-way, mowing grass, trimming brush and clearing out ditches. The scrap of all kinds that they uncover is surprising. An order issued to bring in every piece of company material that they find hidden in the grass or buried in the ditches will produce a collection of miscellaneous supplies that will open the eyes of the purchasing agent. On one interurban road about 100 miles long such an order issued last year resulted in turning in at

at the end of two weeks scrap to the value of more than \$1,000. Over 200 trolley wheels alone were found where they had dropped off or were thrown away. Most of them were worthless for service, it is true, but they had a scrap value of 30 cents apiece. Linemen are the worst offenders in throwing away material. Copper wire, trolley splices, hangers, insulators and pins can usually be found in large numbers alongside of the track. Most of these parts cannot be used again, but they have considerable value in the aggregate as scrap. In these times of close economy it will pay to rake the right-of-way with a fine-tooth comb.

Burning Ashes

In its budget for 1909 the Board of Education of New York asks for no larger appropriation for coal to be used in heating the schools than during the current year, notwithstanding the fact that a number of new schools will be opened in the fall. The explanation is given in the report which accompanies the budget and which says that the Board last year "compelled the janitors to use a solution of oxalic acid and rock salt, which enabled them to burn all the waste coal that forms part of what is commonly known as ashes and that has been thrown out as such in the past." The Board adds, in connection with this experiment, that while its "committee on supplies did not receive the cooperation it expected, nevertheless a considerable saving of coal has been effected, in the aggregate between \$40,000 and \$50,000, while the oxalic acid and rock salt used cost only \$2,800." This theory was first exploited about two years ago when it was said to have been discovered by a Pittsburg man and received considerable attention in the daily papers, as well as some quiet scientific investigation by individual engineers. The proper proportions, as then reported, were 1 lb. of salt, ½ oz. of oxalic acid, 100 lb. of ashes and several gallons of water to reduce the mass to a pasty mixture which was then to be thrown on a hot coal fire. Although some experimenters claimed that considerable heat was secured, all agreed that it was not intense, that a large grate surface, strong draft and considerable stoking were required and that the residue formed large clinkers which were difficult to remove. All of these circumstances fit very closely with the theory that the combustion produced comes not from the ashes, but from the particles of unconsumed coal which have passed through the grate bars. In fact, we do not consider that any more complex reason for the phenomenon is needed. Applying this explanation to the New York schools situation, where janitors have charge of the furnaces, it is not difficult to imagine that ashes, especially if screened and used in small quantities at a time, might make satisfactory "fuel," particularly on warm days and in banking for the night.

The Gas Engine and the Metallurgist

The demand for gas engines has been growing enormously during the past few years. Likewise the success of the manufacturers in building small engines has spurred them on to the designing of larger units. Gas-engine units are now driving direct-connected generators of 5000-hp rated capacity. As with steam-engine design, sharp competition coupled with a natural desire for economy of manufacture has seen the capacity of the engines increase without a corresponding increase in weight. Higher speeds and greater unit pressures could alone have served to answer this demand. The pressures which a gas-engine cylinder must withstand are far above those which strain the steam-engine cylinder. Gas-engine pressures are the results of explosions. The pressure curve of a gas engine working stroke is very steep. For this reason alone, if no other were to be shown, a gas-engine cylinder must be a most perfect casting, otherwise it would have to be designed with an impractical thickness. Cast as a part of the cylinder is the cooling jacket. The two cylinders are coaxial and made in one piece. Here is the task for the metallurgist and the foundry man. If the metal in the cylinder wall is made hard enough to give the ultimate available strength of the metal, then the thinner outer shell of the water jacket will be so hard that it cannot be machined. Likewise, if the metal mixture is made softer, favoring the outer shell, then the cylinder walls must be so thick as to make the casting unduly heavy. It may be that a cylinder with a steel jacket shrunk on can be built so that the expansion strains can be taken care of, but until this or some other scheme for gas-engine cylinder construction is evolved, the foundry experts will play an important part in controlling the maximum size of gas engines.

A Weak Spot in Interurban Service

When one figures the total time spent in entering or leaving a city on a through interurban run, the percentage that this time bears to the total running period will often be surprising. It is usually impossible to avoid delays in this part of a trip, compared with the schedule possible in the country outside, but where steam railroad competition is keen for the interurban business it will pay to make every possible effort to reduce the operating time in city streets. In one case recently noted the time required for operation in the city portions of the line was over 30 per cent of the total schedule between termini, or an extension of over 45 minutes on a run of 100 minutes over the private right-of-way section of the line. The time by steam between the two cities is one hour. At one of the terminal cities the interurban cars are brought in by a roundabout route which adds possibly 10 minutes to the length of the trip, in order that the cars may handle a certain amount of suburban traffic existing at one side of the more direct route up a new boulevard into the city. Whether it is possible at the present time to operate the interurban cars over the shorter route is undetermined, but when the boulevard is completed the proper consideration of the requirements of the through service should absolutely prohibit the circuitous routing of the high speed cars. A mistaken zeal to handle all the local traffic by the first car that happens to enter the territory should not be allowed to impede the schedules of long distance trains. It is a good plan where possible

to stop outgoing cars only to receive passengers and incoming cars to discharge within the limits of slow speed city sections.

Instruction in Chicago

The rehabilitation of the Chicago lines has given the street railway managers in that city an opportunity to bring many features of their practice up to the latest date so that special interest attaches to anything undertaken there. The foundation of good service is a proper performance of their duties by trainmen, combined with the possession by them of a proper spirit of emulation and pride in their work. To secure these objects, education and training under proper surroundings are by far the most effective means, if they are not essential to the results sought. Based upon this theory, the schoolrooms of the Chicago City Railway, described last week, are similar to those of a high school or college. The same cleanliness and order prevail. Pains are taken to impress upon the men the importance of asking questions regarding any part of the equipment or instructions of operation which they do not understand. It is an absolute rule that an employee shall not suffer humiliation from lack of knowledge displayed during these inquiries. An apparently foolish question will often serve the instructor as a text for clearing up in the minds of the rest of the class some point which they previously but dimly understood. The methods followed are not new, but are mentioned because of the importance of instructing the platform men so they will know the right thing to do in regular practice and in emergencies.

The Value of Sound Inspection Methods

A street railway company which maintains systematic records of car inspections may run along for months, indeed, for years, and experience no especial need for them other than that of checking up the different departments. A time will always arrive, however, when the existence and production of such records are of the greatest value to the company which possesses them and more than repay the labor spent upon their up-keep. An instance of this truth was afforded in the case of the peculiar accident on the Chicago & Oak Park Railway last spring, when a car fell partly off the elevated structure. A searching inquiry was at once instituted by the city authorities, who are now very watchful of Chicago traction service, and, as stated last week, the cause was found to be a hidden flaw in the axle of the disabled car. No amount of care on the part of the company would have detected this defect and this was clearly stated by the investigator. In fact, he outlined to the City Council the methods of equipment inspection practised by the company and complimented it on the thoroughness with which the inspection was being done. Thus the lesson is easily read. If the wreck was known to have been caused by a defective car part, would not the "gray wolves" have had a fine chance to make trouble? The report from the city representative comes at a time when it can do the most good in protecting the road's interests from unreasonable damage claims. There also is the added gain in the fact that the relations existing between the public and the road are not so liable to be strained unduly when a company's operating methods are known and approved by the city officials.

The C. E. T. A. Mileage Book

The recently formed Central Electric Traffic Association is having some difficulty in gathering into the fold a sufficient number of roads to make effective its first effort toward harmonious traffic arrangements, namely, the issue of an interchangeable 1000-mile book. Most of the large roads in Indiana and Ohio have given prompt and hearty support to the movement inaugurated at the Toledo meeting in May, but some of the smaller roads are holding back. The objection which they raise is against conferring power of attorney on the chairman of the association to file with the Interstate Commerce Commission and the State Commissions of Indiana, Ohio and Michigan, joint tariffs covering the use of the proposed mileage book. They prefer to reserve the right to their own officers to file all tariffs. It is not fair to say that this reservation implies distrust of the objects of the association or the integrity of the chairman. It is simply a matter of policy with the individual roads and is probably due to a misconception of the powers of the chairman and ignorance of the specific requirements of that section of the Interstate Commerce law covering the issuance of and filing of tariffs for such interchangeable books.

The power of attorney asked for confers the right to file only such joint tariffs as are needed to cover the use of the particular form of transportation represented by the mileage coupons. It does not include the right to file local passenger tariffs, joint or local freight tariffs, nor does it in any way restrict the right of individual roads to file such tariffs or to modify them at any time in any particular after due notice. Furthermore, the joint tariffs filed by the chairman are subject to revision by the individual roads on notice of protest and in an emergency the power of attorney may be canceled and the tariffs recalled immediately by mail or telegraph. This certainly is ample protection against intentional or unintentional unfairness or discrimination.

The clause of the Interstate law was framed primarily to provide for the steam road traffic associations and requires that joint tariffs for an interchangeable mileage book shall be filed by the chairman of a traffic association or other duly authorized common agent of all the roads honoring the mileage coupons for transportation. The Interstate Commerce Commission cannot recognize joint tariffs covering an interchangeable mileage book when filed by an individual road separately from the tariffs filed by the chairman of the association under whose name the book is issued. Subscription to the mileage book agreement must carry with it the right of the chairman to file joint tariffs for all roads in the agreement. The electric railways which are holding out and have any desire to share in the benefits of an interchangeable mileage book, must waive their exclusive right to file tariffs and put their faith in the association and its chairman for a square deal. The Central Electric Traffic Association should not be allowed to wither away and die in its infancy for lack of support from the small roads. They will benefit equally with the larger roads if the association can be put firmly on its feet in the beginning. Small questions of policy can well be overlooked in the concerted effort to get together for the general good.

Coal Costs in Individual Power Plants

In electric railway systems where power is supplied from more than one steam plant it sometimes happens that the operating company does not possess exact knowledge of its coal cost at each individual station. The coal consumption per kw-hour may be figured out carefully from the station records and the power cost apportioned on the basis of the average estimated cost per ton of the fuel delivered at some convenient point on the system, but where the conditions vary from time to time, and especially where the amount of fuel burned per day is large, it is desirable to know more than approximately what it costs to deliver coal continuously at important operating points and place it in the coal bunkers.

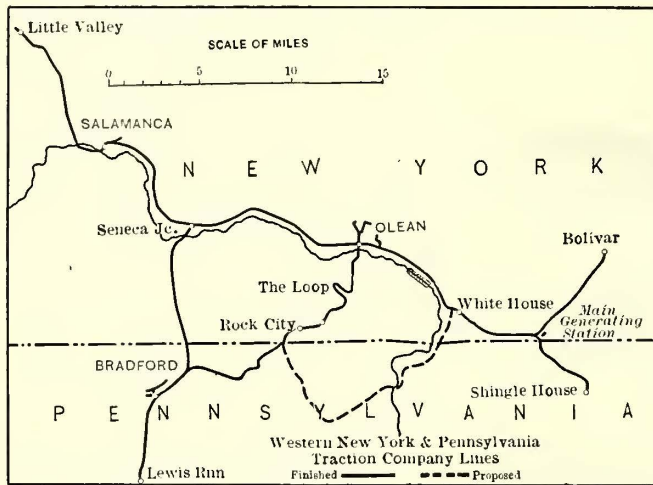
It is not a matter of serious difficulty to investigate the cost of handling coal on large systems, but it is often done in a half-hearted way, with the omission of important factors bearing upon the expense of haulage, dumping, crushing, storing and delivering. After the coal is in the yard of a well-designed power plant, it may easily be that it costs the company only from 2 cents to 5 cents per ton to transfer the fuel to the permanent pockets or bins, but unless this cost is determined often enough to enable the company to keep track of the efficiency of the crushing, hoisting and conveying mechanism, the company cannot be certain that it is doing everything possible to avoid wastes in the handling of its fuel. In cases where a choice exists between several different methods of supplying coal to different plants it is a mistake not to attempt to find out closely the cost of each in order that the least expensive may be employed.

Given the first cost of the coal-handling equipment, including docking facilities, hoisting apparatus, storage bins, conveyors, crushers and cars and the wages cost of operating locomotive or motor coal cars, the power consumption of the cars and stationary handling equipment, it ought to be a reasonably easy matter to arrive at a figure expressing the total cost of delivering any specific tonnage at any individual plant. The difference between two methods may be but 10 cents per ton, but in a year when a single station consumes 100 tons of coal per day, the difference is worth taking some trouble to find out. It would be a simple matter to attach a recording wattmeter to a coal car and secure some records, but it is seldom done, if our observation is not at fault.

More complete statistics of how each shipment of coal is handled on a multi-plant system, including the time and labor required to transfer a given tonnage from one point to another, closer estimates in detail of the repair costs of the coal-handling machinery, and occasional ammeter and voltmeter tests of the power consumption of motor-driven equipment will be found to provide a basis for broader conclusions on the subject of fuel distribution on specific systems. At times it is obviously impossible to route the fuel over the most economical part of the system from the standpoint of labor and power cost, but it should never be overlooked that apparently trivial economies in the cost of handling per ton, including fixed charges as well as operating expenses, may amount to a substantial increase in income at the end of a year.

RECONSTRUCTION AND EXTENSIONS ON THE WESTERN NEW YORK AND PENNSYLVANIA LINES

The Western New York & Pennsylvania Traction Company, of Olean, N. Y., has recently completed the reconstruction of its line and has two extensions of considerable length under way. This is in addition to other improvements in power and rolling stock equipment. The lines of this system embrace about 95 miles of track in



Western New York & Pennsylvania Traction Company—Map of Completed and Proposed Lines

southwestern New York and northwestern Pennsylvania, which radiate in three divisions from Olean, N. Y., as a center, one division, 30 miles in length, extending from Olean over a mountain range to Bradford and Lewis Run, Pa.; another, 22 miles long, westward to Salamanca, N. Y., and the third, with about 28 miles of track, eastward to Bolivar, N. Y., and to Shingle House, Pa. In addition to these interurban lines, city systems are operated in Olean and Salamanca, N. Y., and in Bradford, Pa.

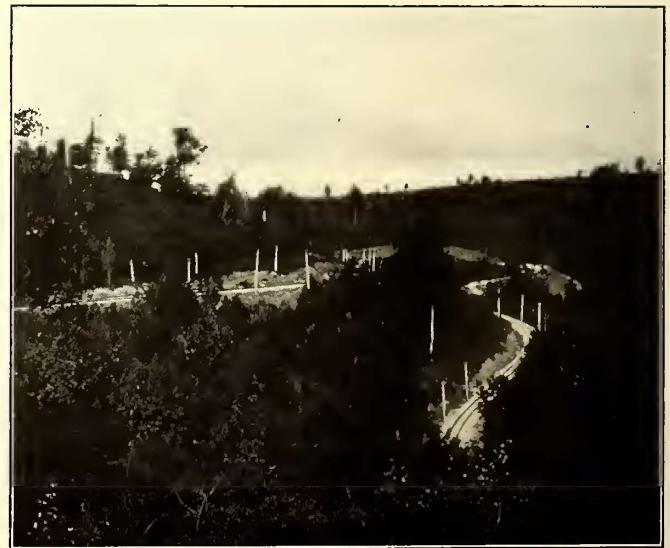
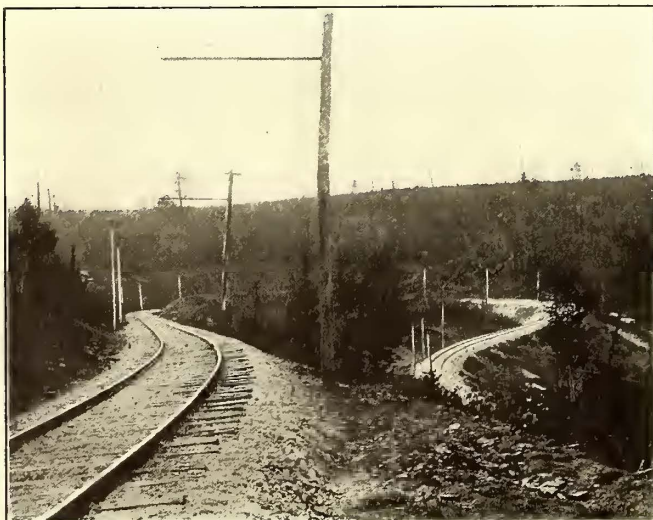
ROUTE

The line crossing the mountain to Bradford, Pa., which

route is still followed, but from Olean to the summit, which is a rise of 950 ft., the line originally left the city on the westerly side, turning southward at a point 2 miles to the west near Allegheny, N. Y., and thence crossed a high ridge before ascending the mountain to Rock City, involving an ascent, a descent and a second ascent as well as a number of trestles.

This line as first operated electrically had 38-lb. rails, an assortment of gradients ranging up to 8 per cent and curvatures as sharp as 45 ft. radius. To provide for more economical operation the ascent from the Olean side has been entirely relocated and rebuilt, while that on the Bradford side has been reconstructed with heavier rails and new overhead construction.

In the relocation on the Olean side a new route was selected which not only eliminates the double ascent, but also restricts the maximum gradient to 4 per cent. It approaches the mountain from a different direction. The line now leaves Olean directly southward upon Union Street and crosses the Allegheny River, in the outskirts of the city, upon a three-bent steel trestle 100 ft. long, over a flood channel and two 120-ft. through spans over the river. Immediately beyond the river the ascent begins with a 3.5 per cent gradient, changing shortly beyond the bridge to 4 per cent, which continues for about 2000 ft.; beyond this point the gradient is uniformly 3.3 per cent throughout the remainder of the reconstruction, a distance of slightly over 6 miles. The curves on the reconstruction are all compensated, and the maximum curvature was kept down to a 150-ft. radius, which occurs only on a loop or horseshoe curve about half-way to the summit, where the line doubles back on the side of the mountain in order to secure a uniform gradient. The ends of this loop, which is 2 miles 1300 ft. long, are but 960 ft. apart with a difference in elevation of 360 ft. The high tension and feeder lines are cut across at this point with a consequent saving of over two miles of line. The new line is laid with 70-lb. rail. For ballast advantage was taken of an unusual rock forma-



Western New York & Pennsylvania Traction Company—Views of the Long Loop Between Rock City and Olean

has recently been entirely reconstructed between Olean and a point on the top of the mountain known as Rocky City, is the electrification of what was formerly a narrow-gage steam railway line between these two cities in the days of the early oil excitement in the Allegheny River valley. For the ascent from Bradford, a rise of 975 ft., the original

tion occurring on the top of the mountain which is a conglomerate glacial formation, consisting of white pebbles of a quartz base and sand; this conglomerate, of which there is an abundant supply, is of a texture easily broken up and handled by the shovel, and was used on 18 miles of the line. The standards of roadbed adhered to are those

shown in the accompanying track sections for both embankment and excavation.

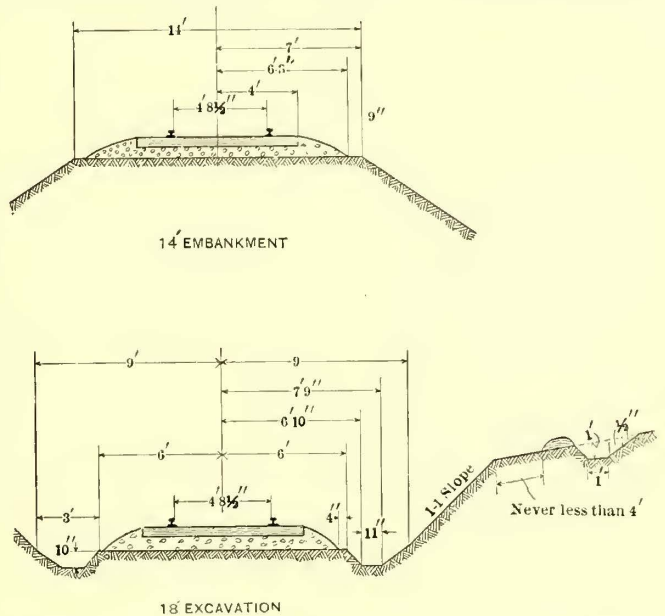
At the time of the reconstruction on the Olean side, the line between Bradford, Pa., and Rock City was relaid with 70-lb. rails, rebalasted with the conglomerate rock and the roadbed construction was brought up to the standards used on the new lines. Old wooden trestles were replaced by concrete retaining walls and steel I-beam stringers or ballast floor culverts. The overhead electrical construction was also rebuilt and thoroughly modernized, following the standards of side bracket construction adopted for the new lines, to which reference will later be made.

In addition to the above reconstruction, two new extensions are at present under construction. One of them is a low-grade cutoff 9 miles in length connecting the Salamanca line with the Bradford line, and has just been placed in operation. The other, an extension 9 miles long, from Salamanca in a northwesterly direction to the town of Little Valley, N. Y., will be ready for operation in August. The former line is of advantage in that in addition to opening up a new territory, it provides a duplicate line between the two principal cities served by the system, which is of but slightly greater length than the Rock City line, but by following closely the river level, is practically free from grades and greatly facilitates freight handling between these two points. It leaves the Salamanca line at Seneca Junction and runs thence due southward parallel to two lines of steam railroad tracks in the valley of the Tunungwant Creek to Bradford, meeting the Rock City line at Clarkdale about 1 mile northeast of Bradford. Both this line and the Little Valley extension are laid with 70-lb. rail and have the same standards of track and overhead construction as used on the reconstructed lines, but they are ballasted with gravel taken from an excellent pit that the company owns near Carrollton on the Salamanca line. The Bradford cutoff has, with exception of a 24-deg. curve near the Pennsylvania Railroad bridge, a maximum curvature of 6 deg., and the few grades on it are within the maxi-

cally all of the ballasting was done in this way, which was found much more economical than haulage over the traction company's lines.

BRADFORD CUTOFF

A difficult piece of construction was encountered on the Bradford cutoff for the first mile south of Seneca Junction



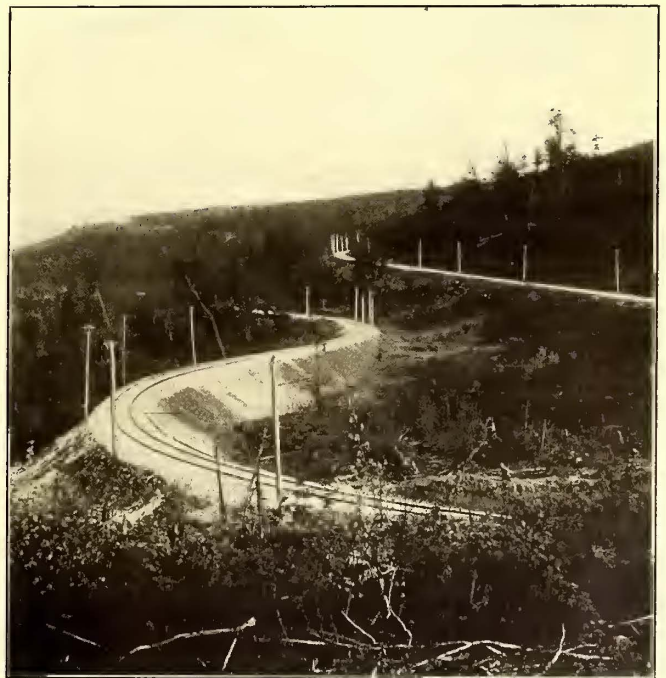
Western New York & Pennsylvania Traction Company—
Cross Sections of Roadway

in crossing the valley of the Allegheny River. After leaving the junction the line crosses the Erie Railroad tracks, drops thence down a trestle with 3 per cent grade to the



Western New York & Pennsylvania Traction Company—
High Bridge on the Carrollton-Bradford Division

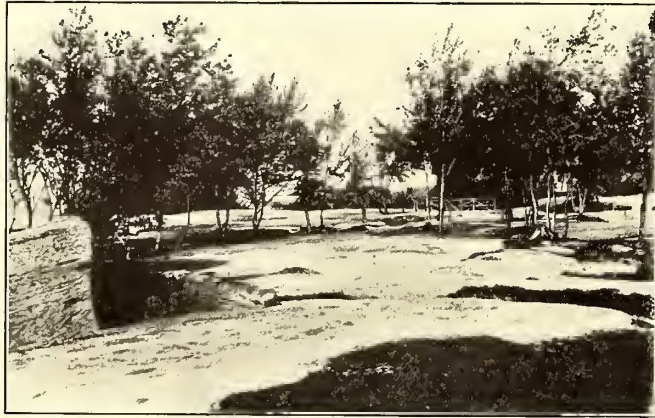
imum of 3 per cent. A unique feature of the construction of the Bradford cutoff is that arrangements were satisfactorily made with the Buffalo, Rochester & Pittsburg Railroad, which it parallels, for haulage of the ballast in Roger ballast cars from the company's gravel pit, over its line for delivery to the cutoff from the Bradford end; practi-



Western New York & Pennsylvania Traction Company—
Along the Loop on the Rock City Line

embankment in the valley, a 20-ft. fill, and on the other side rises on a trestle with a similar gradient to an elevation of 50 ft. above the main channel of the river, then crosses the latter, the tracks of the Pennsylvania Railroad and a highway. The bridge over the Erie Railroad is a 106-ft. through truss and the trestle beyond, a construction

of steel bents on concrete piers, 510 ft. in length. The trestle on the other side of the valley, which is over a flood channel adjoining the river, is 450 ft. long, and connects with two 124-ft. deck truss spans over the main channel. The span over the Pennsylvania Railroad is a 114½-ft. through truss and that over the roadway a 48½-ft. plate girder deck span. Beyond this the line turns with a 24-deg. curve sharply to the west and a short distance beyond on an easy curve to a 2-mile tangent down the valley toward Bradford. Beyond this tangent toward Bradford there are two 20-ft. span I-beam bridges and a 40-ft. pony truss bridge

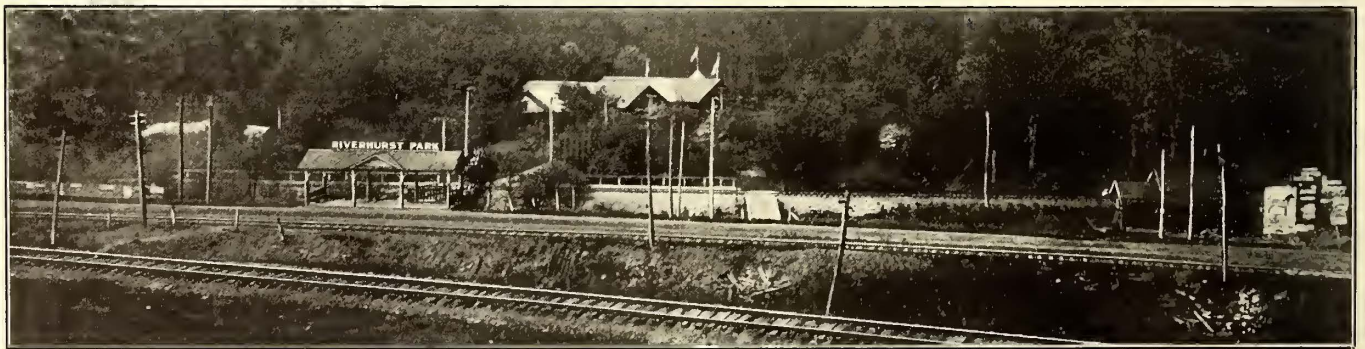


Western New York & Pennsylvania Traction Company—
"Top of the Rocks," Rock City Park

crossing creeks, while in the fill across the Allegheny River valley there are two 52-ft. span pony truss bridges crossing flood channels from the river. These bridges are all built with concrete abutments and were fabricated and erected by the Groton Bridge Company, Groton, N. Y. The standard bridge capacity that was adopted for all reconstruction of lines and new extensions is to carry two 50-ton cars with trucks at 26-ft. centers and to stand with 15 ft. between end trucks.

SALAMANCA EXTENSION

This extension was opened in September, 1907, and consists of 15 miles of road between Allegheny and Salamanca,



Western New York & Pennsylvania Traction Company—General View of Riverhurst Park

N. Y. This road, built on the same standard lines as above noted, has with the exception of a short stretch in the village of Salamanca, a maximum grade of 3 per cent and curvature of 5 deg. The rails are 70-lb. A. S. C. E. section and are bonded with Chase-Shawmut soldered bonds. Some heavy work was met on this line, consisting of two cuts of 25,000 cu. yd. and 17,000 cu. yd., respectively. In connection with this line the local line in Salamanca was extended westward 1½ miles through the city and to West Salamanca, and from the latter point, the 9 mile extension in a north-westerly direction to Little Valley, above referred to, was

started. This extension, now nearly completed, follows a creek valley and has encountered little heavy work.

CITY TRACK CONSTRUCTION

Considerable reconstruction has also been accomplished recently on the city systems, the line on Union Street, Olean, having been double-tracked and laid with 70-lb., 7-in. T-rail. The track construction here used embraces ties on 5-ft. centers embedded in concrete and concrete girders under rails. The section of the Salamanca line between Olean and Allegheny, N. Y., has been relaid with 70-lb. T-rail and a division of the Olean city lines between the city and the Erie depot in North Olean, about 1 mile long, is to be reconstructed to the above standard. The local lines in Bradford and Salamanca have also been reconstructed. The standard 7-in. T-rail construction in concrete was also used here.

OVERHEAD CONSTRUCTION

The overhead line work is all of bracket construction except on main streets in cities, wooden poles and flexible bracket arms being used. The standard heights of pole are 30 ft. where only direct-current feeders are carried and 35 ft. where high-tension lines are carried in addition. They are set from 6 ft. to 9 ft. in the ground, varying with the soil and height of poles, and are spaced 100 ft. on tangents and 60 ft. to 90 ft. on curves. On curves, the poles are always placed on the outer side to secure anchorage without the use of extra poles, and where the feeders cross over from one side to the other in such cases, extra heights of pole are used to enable the low-tension cross-arms to clear the rail by 26 ft.; the purpose of this is to prevent a trolley pole hitting the telephone or other wires on the transmission line. On all the new construction No. 0000 grooved section trolley wire is used, hung with "hammered on and clamp" trolley ears.

POWER DISTRIBUTION

The power distribution to the system is by high-tension electrical transmission from a single generating station at Ceres, N. Y., on the Bolivar line, there being substations at Olean, Bradford and Seneca Junction, while a fourth is

being built at Little Valley on the extension beyond Salamanca. There is also used a portable substation which is stationed at Rock City during the heavy summer traffic to the top of the mountain, and elsewhere as required at other periods in the year. A single three-phase transmission line of No. 2 wire is at present in use to supply the substations, which extends direct from the power station at Ceres to Olean, 13 miles, and from this point, two branch lines of No. 4 wire branch off, one to the substation in Bradford (21 miles) and the other to that at Seneca Junction (13 miles). At the latter substation provision is made

for extending the line 11 miles further to the Little Valley substation under construction. The high-tension lines are all operated at 19,100 volts, three-phase, with delta connections on the transformers, and have their line wires arranged in triangular positions on 30-in. centers. They are supported on Locke 408-A porcelain insulators and have running transpositions every mile. Lightning protection is afforded by standard General Electric multigap arresters in the power station and substations, which are Y-connected with shunt resistances. The lines within the stations have also choke coils of hour-glass shape. A minimum clearance of 5 ft. is maintained between the high-tension wires and all other wires on pole lines.

SUBSTATIONS

The substations at Olean and Bradford have each two 300-kw rotary converters, three 220-kw transformers of the air-blast type and duplicate blowing outfits, while that at Seneca Junction and the future station at Little Valley, as well as the portable substation, have but one rotary of similar size and but two 220-kw transformers connected in open delta, to avoid excess capacity. There is in addition a rotary converter of 300-kw capacity operated at the main power station at Ceres, for power supply to the east-

connection with the Union telephone exchange in Olean, thus permitting long-distance connections if desired. The lines have telephones connected in all towns passed through and in substations and company buildings. There are jack boxes at every turnout, at every siding and at intervals of about every mile, in which trainmen can plug in with portable telephone sets carried in the cars for communication with Olean. By this arrangement of jack boxes the greatest distance necessary to be covered in case of accident or breakdown would be $\frac{1}{2}$ mile. The telephone lines are built of No. 12 E.B.B. double galvanized wire with running transpositions at every fourth pole, to render the line free from inductance from the high-tension lines. Holtzer-Cabot telephone apparatus is used throughout.

ORGANIZATION

W. R. Page, of Olean, is president of the road and I. W. Miller general manager. The reconstruction and new extensions were laid out under Mr. Miller. The power plant and electrical distribution equipment were designed by Mortimer Silverman, electrical engineer of the company.

JOURNAL PACKINGS AND BRASSES

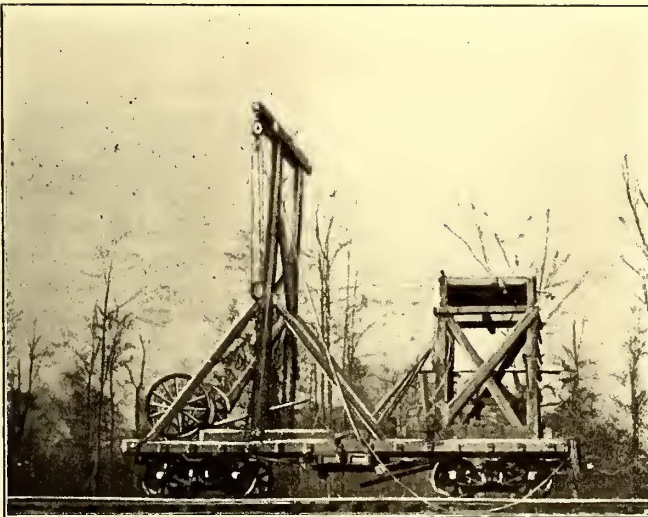
BY A LUBRICATION EXPERT

Waste, if of good quality, is better than felt for packing car journal boxes, when oil is used. A felt feeder must be fairly soft to carry the oil up and is therefore of little durability. On the other hand, hard felt rapidly glazes and becomes useless as an oil feeder. Another drawback about felt is that it cannot be changed on the road. It is necessary to wait until the car can be brought into the shop as the truck frame must be raised high enough for the removal of the journal brass and the dropping of the box to reach the felt. In a number of cases where felt-fed boxes developed hot brasses it was found that waste had been packed in on top of the felt. As the waste was not in contact with the oil, this proved to be very bad practice.

In packing a journal box, especially of the old type, cut out the two little shelves in the bottom of the box placed there to support the felt, thus making it possible to pack the waste in the proper form. Not long ago the writer saw a man packing on the floor a journal box which had previously been used with a felt-feed. He placed the waste into the box and then proceeded to jam it further with an iron bar; needless to add, poor lubrication was the result.

The results with waste-packed journal boxes depend entirely on the quality of material used, the method of soaking and draining it and the manner of packing the box. The most successful practice is to pick apart or tease the waste thoroughly and submerge it in oil for at least 48 hours, allowing about five pints of oil per pound of waste. The oil room should be kept at a uniform temperature of 70 deg. Fahr. After draining, place the packing in the box as follows: The first insertion should be in the form of a roll packed tightly around the back end of the box to retain the oil and also better to exclude the dust. Pack the waste under the journal sufficiently tight to avoid the settling caused in passing over special work. The waste between the side of the axle and the journal box should be packed more loosely to avoid the wiping effect produced when waste is packed too tight.

Babbitted brasses are undesirable in heavy service, because if the babbitt is very thick the hammer blow it receives in going over special work causes it to work out on the edges to form scrapers which cut the oil off the axle, prevent it from getting under the brasses and so create hot journals.



Western New York & Pennsylvania Traction Company—
Line Car for Erecting Poles, Stringing Wire, Etc.

ern lines, this unit taking current directly from the main generators.

An interesting feature of the transformer and rotary equipments employed is that they are standardized throughout, as is also the switching and lightning protection equipment. It will be noted that the main generating station is located some distance from the center of power distribution, but the site near Ceres was selected on account of its proximity to natural gas fields owned by the company, gas engines having been installed to utilize this fuel to best advantage. Reference to the power station was made in the July 18 issue of this paper.

TELEPHONE SYSTEM

A telephone system has been installed covering the lines of the company which centers at the main offices at Olean. There is located a 10-drop switchboard having provisions for 20 additional drops for future extensions. Of the 10 lines at present in use, three cover the main divisions of the system, one going to Bradford, another to Salamanca and the third to the power station and Bolivar. The other seven extend to the substation, car barn and residences of the officials in the city of Olean. The board has a trunk

SINGLE-PHASE LOCOMOTIVE OF THE WINDSOR, ESSEX & LAKE SHORE RAILWAY OF CANADA*

BY S. C. DEWITT, LATE ELECTRICAL ENGINEER OF THE WINDSOR, ESSEX & LAKE SHORE RAILWAY

The Windsor, Essex & Lake Shore Railway, of Kingsville, Ont., the first Canadian single-phase railway, has recently completed the interesting locomotive shown in the



Windsor, Essex & Lake Shore—End View of Locomotive

accompanying illustrations. In designing this locomotive special attention was paid to having motors, wheels, gears and axles interchangeable with those on the motor cars. The latter are equipped with two Westinghouse No. 132 100-hp motors in parallel, while in the locomotive there are four motors of the same type, the two motors on each truck being in series and the two sets in parallel.

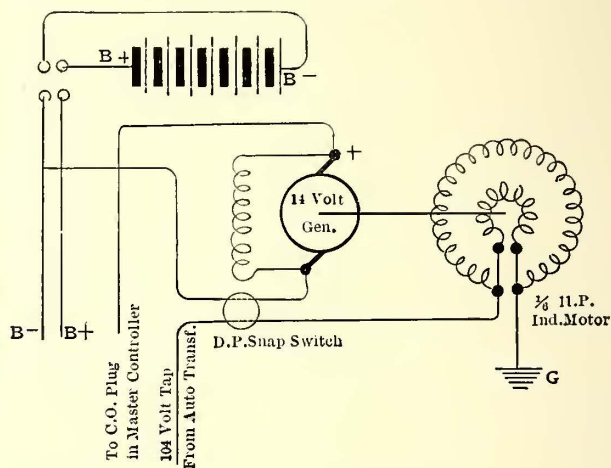
The locomotive was built for pulling gravel cars for ballasting, hauling general freight and for handling trains on excursion days. The general data on the locomotive are as follows: Approximate weight, 35 tons; length, 37 ft.; width, 8 ft.; distance between centers of trucks, 20 ft. 3 in., and weight of each motor, 4900 lb.

LOCOMOTIVE FRAMING

The main part of the frame consists of two longitudinal sills of 12-in. I-beams placed 13 in. apart, with white oak fillers and bolted together. The outside sills are 8 in. x 12 in. oak, and the end sills 12 in. x 12 in. oak. The car bolsters are 12 in. x 12 in., the center cross sill 8 in. x 12 in., with an intermediate sill of 6 in. x 12 in., all of oak. At every cross piece, including the bolsters, the two outside longitudinal sills are held together by two 1-in. bolts, one placed on each side of the cross timber. The washers and nuts are recessed in the side of the sills and covered by the V-matched siding which forms the outside finish of the car. Additional strength was given by putting in 6 in. x 12 in. oak diagonal braces, as shown in the plan. The end sills are held in place by

the two 1¼-in. truss rods, each of which is just inside the outside sills, and two straight 1¼-in. bolts which run the whole length of the car, one on each side of each of the 12-in. I-beams. The bumpers were constructed of 12 in. x 12 in. oak rounded on the outside and bolted to the end sills. These were faced with 12 in. x ¼ in. steel.

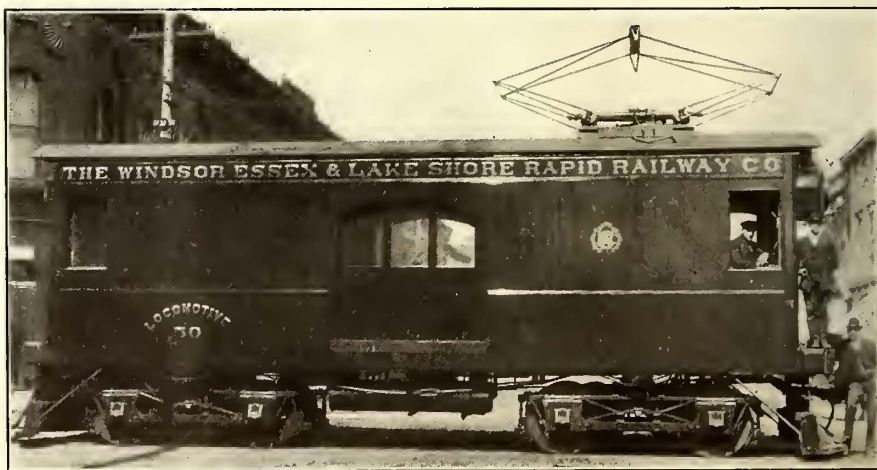
On the elevation it will be seen that the vertical supports forming the truss structure of the locomotive do not come immediately over the bolsters and needle beams.



Windsor, Essex & Lake Shore—Schematic Diagram

Owing to the length of the locomotive it was difficult to place the vertical supports in exactly these positions, and the floor frame was considered strong enough to afford rigidity under any conditions to which the locomotive is likely to be subjected. There are three 6-in. needle beams, as shown on the elevation, the truss rods passing immediately beneath two of them, while the center needle beam has a strut through which the rod passes.

Sliding doors are placed on the sides of the car so that it can carry a certain amount of freight. As the locomotive



Windsor, Essex & Lake Shore—Side View of Locomotive

is to be run in both directions a motorman's cab is built at each end. The flooring is of 2-in. pine, and space has been left under the apparatus in the car to lay a floor of steel rails if it is found that the weight of the locomotive has to be increased. The roof is of 1-in. pine boards covered with painted canvas of good quality. Van Dorn swinging draw heads are used.

The framing of the car and the general layout of the apparatus were designed by H. T. Gibbs, who represented

*For general description of this line see STREET RAILWAY JOURNAL of Jan. 11, 1908.

the Canadian Westinghouse Company in the installation of the electrical machinery at the plant.

TRUCKS

The locomotive is equipped with two trucks, manufactured by the Taylor Electric Truck Company, Troy, N. Y. The wheels are 36 in. in diameter and were furnished by the American Car Wheel Company. The distance between centers of wheels is 6 ft. 6 in. The axles are 6 in. in diameter and are the same as used on the interurban cars of the company. The motors and all other electric as well as air apparatus is of Westinghouse manufacture.

Step	Switches											
	1								9	10	11	12
1	1	2							9	10	11	12
	1	2	3						9	10	11	12
	1	2	3	4					9	10	11	12
2		2	3	4	5				9	10	11	12
3			3	4	5	6			9	10	11	12
4				4	5	6	7		9	10	11	12
5					5	6	7	8	9	10	11	12

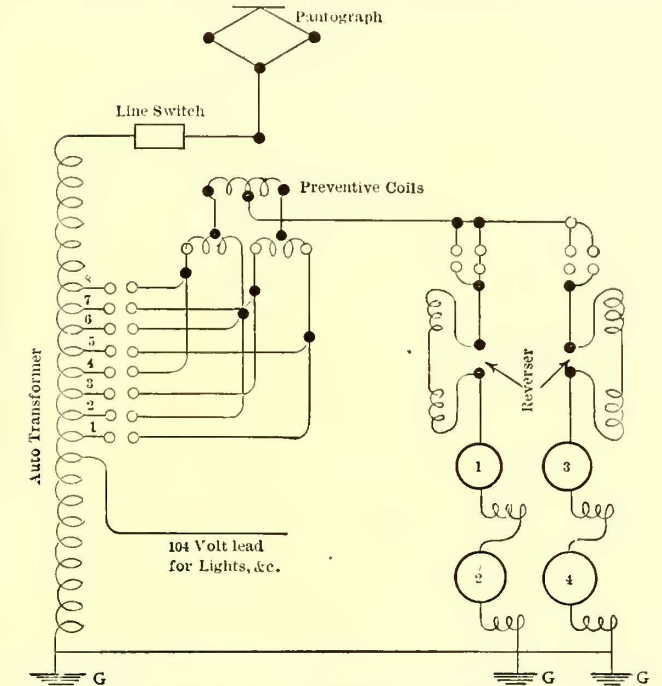
Windsor, Essex & Lake Shore—Sequence of Switches for Single-Phase Locomotive

There is one 100-hp motor on each axle, making a total of 400 hp. The weight of the truck with wheels and without motors is 9750 lb.

ELECTRICAL EQUIPMENT

The locomotive is provided with the unit switch system of control, shown in the accompanying schematic diagram. The 104-volt lead shown on this sketch is used for the lights, the compressor motor and the motor-generator set

stalled in each of the cabs, and in series with one of the interlocking wires, so that the sequence of switches could be interrupted as soon as unit switch No. 2 was closed. When either of these single-throw switches was opened, only units Nos. 1 and 2 could close, and after the locomotive had taken the strain of the cars the single-



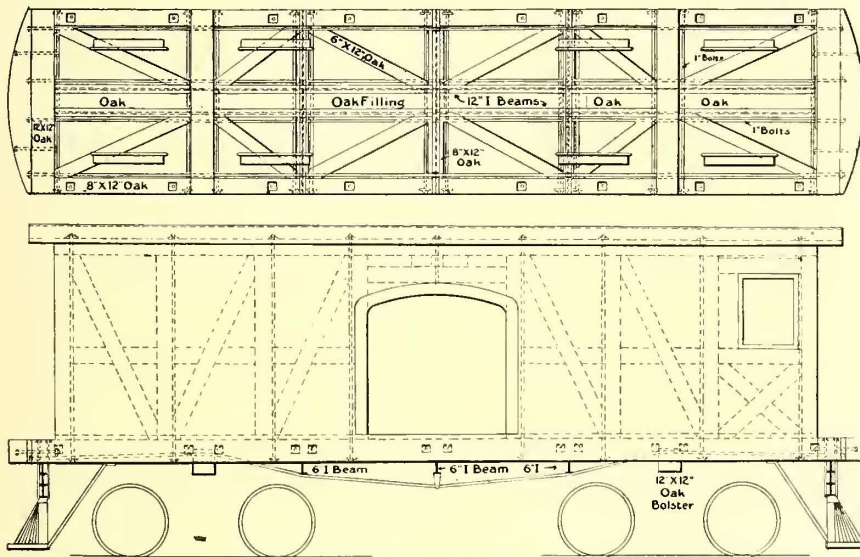
Windsor, Essex & Lake Shore—Connections to Motor Generator and Storage Battery

throw switch could be closed with the left hand and the unit switches in the group would follow in their proper order. By cutting out the switch group at switch No. 2 instead of at No. 4 the two sets of motors are operated in series at 296 volts instead of at 413 volts. This arrangement is very satisfactory.

The voltages, which are controlled by the eight unit switches, are as follows:

Unit Switch No.	Volts
1	251
2	296
3	355
4	413
5	458
6	517
7	561
8	620

A detailed diagram is presented of the connections to the motor generator and the storage battery, from which it will be noted that the double-pole snap switch breaks the motor as well as the generator circuit. All of the electrical apparatus, except the car motors, are placed inside the locomotive. The storage battery, motor generator, reverser, preventive coils and the switch group



Windsor, Essex & Lake Shore—Plan and Elevation of Locomotive Framing

for charging the storage batteries. From the table giving the sequence of switches, it will be seen that the first position of the master controller closes the four motor switches and Nos. 1, 2, 3 and 4 of the switch group. On a trial of the locomotive it was found that it started up too rapidly, which made coupling dangerous, besides starting the train with a jerk. To remedy this a single-throw switch was in-

are secured to a structure made of 4 in. x 4 in. angle iron placed in one corner of the locomotive. It was intended to use 1100 volts in Windsor and 6600 volts over the rest of the line, and the car equipment was so planned that a change to the lower voltage may be made without altering the equipment.

The auto transformer, which is oil-cooled and of 200-kw

capacity, is placed in a diagonally opposite corner from the switch group. The line switch is placed immediately above the auto transformer and is just below the pantograph collector. All the control wiring is in iron armored conduit.

AIR EQUIPMENT

All the control apparatus of the car, which includes the switch group, reverser, line switch and pantograph, is electro-pneumatically operated. The air compressor, which is driven by a single-phase motor, is placed between the switch group and one of the sliding doors on the side. The car is piped for straight and automatic air and there are two valves in each motorman's cab. The air governor is bolted to the same rack from which the switch group, etc., are supported.

PERFORMANCE OF LOCOMOTIVE AND OTHER SINGLE-PHASE APPARATUS

So far the locomotive has only been used to pull gravel trains, and up to the present not more than six loaded flat cars have been hauled at one time. From the ease with which these cars are handled it is probable that 12 flat cars loaded with gravel will make a fair load for the machine. The motors are geared to run the locomotive at a maximum speed of about 35 m.p.h., but it is found to run about 40 m.p.h. on level tangents. The single-phase equipment on this road is giving satisfaction, and as the characteristics of this apparatus are becoming more familiar, keeping up the equipment becomes easier than at first. Some minor troubles, of course, have been experienced, but none of them is an inherent fault in the system, but rather of a mechanical nature and easily remedied.

The Canadian Westinghouse Company has spared no pains in making the operation of the road a success, and as the men are now well drilled in the maintenance of the equipment and inspection is systematically followed, troubles are as few as could be expected on any new system.

A SIMPLE SPIRAL CURVE FOR CITY TRACK

The accompanying diagram and tables, prepared by M. L. Newton, chief engineer of the Waterloo, Cedar Falls & Northern Railway Company, give all of the necessary data for laying out spiral right angle curves for city street car tracks having a center radius of either 60 ft. or 70 ft. The method is so simple and the data in the tables so complete that curves can be staked and the rails bent without the use of any surveying instruments other than a tape measure. In the tables the measurements have been worked out for variations by 20 minutes up to one degree above and below an included angle of 90 deg. This makes provision for all ordinary irregularities in the intersection angles of streets. To stake out a curve project the tangents to the point of intersection *p*. Find the length *y₀* from the tables and lay it off on the tangents from the point of intersection *p*. From *s* and *s'* drop *x⁰* perpendicular to the tangents and where the two lines intersect put in a stake *k*, marking the center of the curve. From the point of intersection of the tangents measure back the length of tangent given in the table and put in a stake marking the point of curvature. Measure from the point of curvature along the tangent the successive lengths *y*, *y'*, *y''* and *yⁿ* as given in the table of easement data and from these points lay out the successive offsets *x*, *x'*, *x''* and *xⁿ*. The offset *xⁿ* marks the beginning of the circular curve *c*. Connect *c* and *k* and at the center of the chord lay out the middle ordinate *m* as given in the table. Five points on the circular curve are thus located

and five points on the spiral at each end. One of the tables gives the middle ordinates for bending rails for both the spiral and circular curves.

It should be noted that the angle *I* on which the tables are based is the complement of the actual included angle of the curve. The last two columns of Tables 1 and 2 give

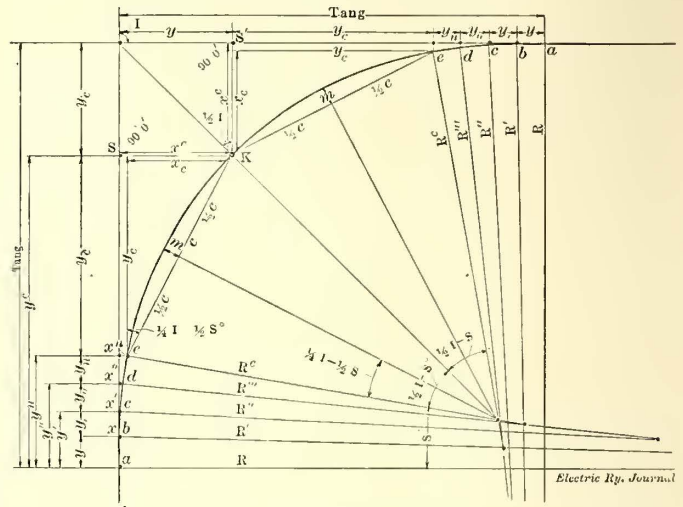


TABLE 1.—CENTER RADIUS=70 FT.

I	Xc	Yc	Ye	Ex. Sec.	C	M.=Mid. Ord. C.	Tang	Center Curve-cke	Total Curve
89° 0'	20.38	57.77	20.01	28.57	41.50	3.15	77.80	108.74	150.66
89° 20'	20.52	57.92	20.28	28.85	41.70	3.18	78.20	109.14	151.06
89° 40'	20.66	58.06	20.54	29.13	41.90	3.21	78.61	109.54	151.46
90° 0'	20.81	58.21	20.81	29.42	42.10	3.24	79.02	109.95	151.87
90° 20'	20.95	58.35	21.08	29.71	42.29	3.27	79.43	110.35	152.27
90° 40'	21.10	58.50	21.35	30.01	42.49	3.30	79.85	110.76	152.68
91° 0'	21.25	58.64	21.62	30.32	42.68	3.33	80.26	111.17	153.09

TABLE 2.—CENTER RADIUS=60 FT.

I	Xc	Yc	Ye	Ex. Sec.	C	M.=Mid. Ord. C.	Tang	Center Curve-cke	Total Curve
89° 0'	17.66	52.50	17.35	24.76	35.58	2.70	69.85	92.25	114.16
89° 20'	17.78	52.63	17.58	25.00	35.75	2.72	70.20	92.60	114.52
89° 40'	17.91	52.75	17.81	25.25	35.92	2.75	70.56	92.95	114.87
90° 0'	18.03	52.87	18.03	25.50	36.08	2.78	70.90	93.30	115.22
90° 20'	18.15	53.00	18.25	25.75	36.25	2.80	71.25	93.65	115.57
90° 40'	18.27	53.12	18.48	25.99	36.42	2.83	71.60	94.00	115.92
91° 0'	18.39	53.25	18.70	26.24	36.59	2.85	71.95	94.35	116.27

TABLE 3.—EASEMENT DATA.

Rad.	Angle	Chord	X	Y	S ⁰	Tot. Angle
300	1°	5.24	0.05	5.24	1°	
150	2°	5.24	0.23	10.47	3°	
100	3°	5.24	0.64	15.69	6°	
75	4°	5.24	1.37	20.87	10°	

TABLE 4.—MID. ORD. FOR BENDING RAILS.

Rad.	CHORD		
	5.24 ft.	10 ft.	30 ft.
300	1 1/2"	3 1/2"	4 1/2"
150	3 1/2"	1 1/2"	9 1/2"
100	5 1/2"	1 1/2"	13 1/2"
75	7 1/2"	2 1/2"	18 1/2"
60	10 1/2"	3 1/2"	19 1/2"
70	11 1/2"	2 1/2"	22 1/2"

Diagram and Tables for Laying Out Spiral Right Angle Curves on Streets

the exact length of the center curve and of the total curve from end to end of spirals. All curves of the Waterloo, Cedar Falls & Northern Railway in city streets are put down with this method of spiral easement.

PREPARATIONS FOR AN ELECTRIC RAILWAY IN SOUTHERN MANCHURIA

Roger S. Greene, United States Consul at Dalny, Manchuria, reports that plans for the electric railway which is to be built by the South Manchuria Railway are beginning to take definite shape, and tenders for the supply of materials will shortly be called for. The estimated cost will be about \$1,000,000, and the chief electrical engineer of the company is expected to visit the United States to study the latest developments in the electric railways in order that the road may be made thoroughly up to date.

CIRCUIT WIRING ON SURFACE CARS

BY A WIRING EXPERT

The tendency at present is to place all car wiring in conduit on the plea that it reduces the fire risk, but this claim should be considered carefully before it is accepted as correct. If the conduit is grounded, as is usually done, the insulation will be subjected at times to any or all of the following potential stresses:

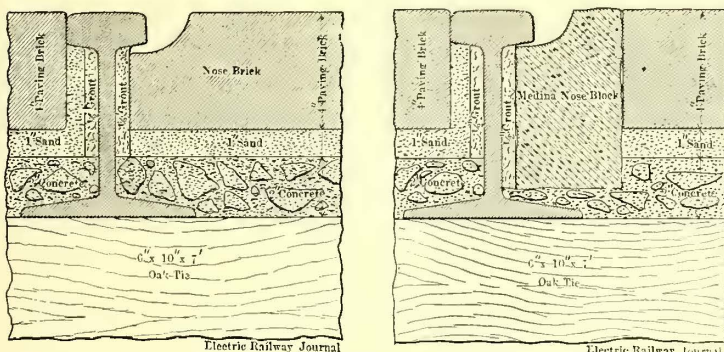
1. High potential during lightning storms.
2. High potential due to discharge of the motor fields in the event of sudden interruption of circuit.
3. High potential due to reversal of motors when at high speed.
4. Line potential during normal operation.

If the conduit is not grounded a puncture of the insulation from any cause will often allow the passage of sufficient current to ignite the woodwork of the car before the blowing point of the circuit-breaker or fuse is reached.

With the underground trolley construction used in Washington and New York, the insulation will not be subject to strain from lightning, but the fire risk from the other causes will be greater than with the overhead trolley system because the ground is less direct. For this reason the arc at the point of puncture in the insulation is often smaller and less apt to trip the circuit breaker, but of such magnitude as to ignite the woodwork of the car by highly heating the conduit. When either feeder rail is grounded, as frequently happens in the wet season, the discharge of the motor fields and the potential stress in the conduit are equally as great in the underground as in the overhead system.

Another objection to running the wire in conduit is that there is no positive way of determining the condition of the insulation of the cables after they are in place. Although a high potential alternating current test may reveal defects it will also weaken or break down good insulation if the testing is not done with caution.

Most fires in cars are caused either by overheated resist-



Detroit Sections of 7-In. T-rail

ances; the failure of circuit breakers or fuses to extinguish an arc; the grounding of the motor leads; or the failure of the controller blowout to extinguish arcs in the controller casing.

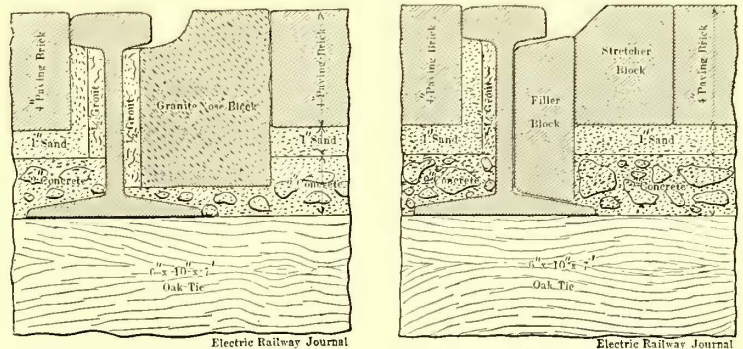
Fires from overheated resistances can be eliminated by the use of $\frac{1}{4}$ -in. fire resisting and insulating material placed above the rheostats and extending at least 6 in. beyond them. The insulation should then be removed from the leads to the rheostats for about 6 in. An excellent precaution to reduce the number of fires caused by failure of circuit breakers or fuses is to enclose the circuit breaker or fuse in a box lined with $\frac{1}{4}$ -in. fire-resisting and insulating

material. To eliminate the danger from the grounding of the motor leads, the car body directly over the leads and at least 6 in. on each side should be protected by the fire-resisting material and the leads should be cleated to prevent the insulation from becoming chafed and cut. Controller fires can be greatly reduced by care in selecting the proper sized fuse or in setting the circuit breakers if they are used.

In none of the cases mentioned is the use of a grounded conduit of benefit except that it increases the amount of current flow in case of a ground and so helps to open the circuit breaker or blow the fuse. On the other hand, if the cables are placed in a hard wood box lined with fire-resisting and insulating material, all potential stress between the cables and ground disappear. Such a system can be installed for 60 per cent of the cost of the conduit.

T-RAIL TRACK CONSTRUCTION IN DETROIT

The Detroit United Railway, which operates all of the city lines in Detroit and controls many of the interurban roads running into that city, has finally obtained from the



Detroit Sections of 7-In. T-rail

City Council permission to lay T-rails in city streets with an approved construction of roadbed and paving shown in the accompanying illustrations. The decision of the City Council of Detroit to permit T-rail construction in paved streets was reached after an exhaustive investigation of this type of construction in other cities by a committee which reported favorably. A short section of track in the public square has been rebuilt this spring with the nose brick type of construction. The granite nose block construction, however, is preferred by the company and will probably be used as standard construction on future work.

The substructure of the track is the same in all of the four types of construction. A bed of concrete 8 in. deep and 7 ft. 6 in. wide is first deposited on the subgrade. This concrete is mixed in batches containing 1 cu. yd. of stone, $\frac{1}{2}$ cu. yd. of sand and five sacks, or $1\frac{1}{4}$ bbl. of good quality Portland cement. A machine mixer having a capacity of $1\frac{1}{2}$ cu. yd. is used. It is mounted on a flat car which is worked in connection with a crane car and dump bucket. When a batch is mixed it is discharged into the dump bucket which is handled by the crane car and dumped wherever required on the subgrade. The concrete is mixed wet and thoroughly tamped to a level surface.

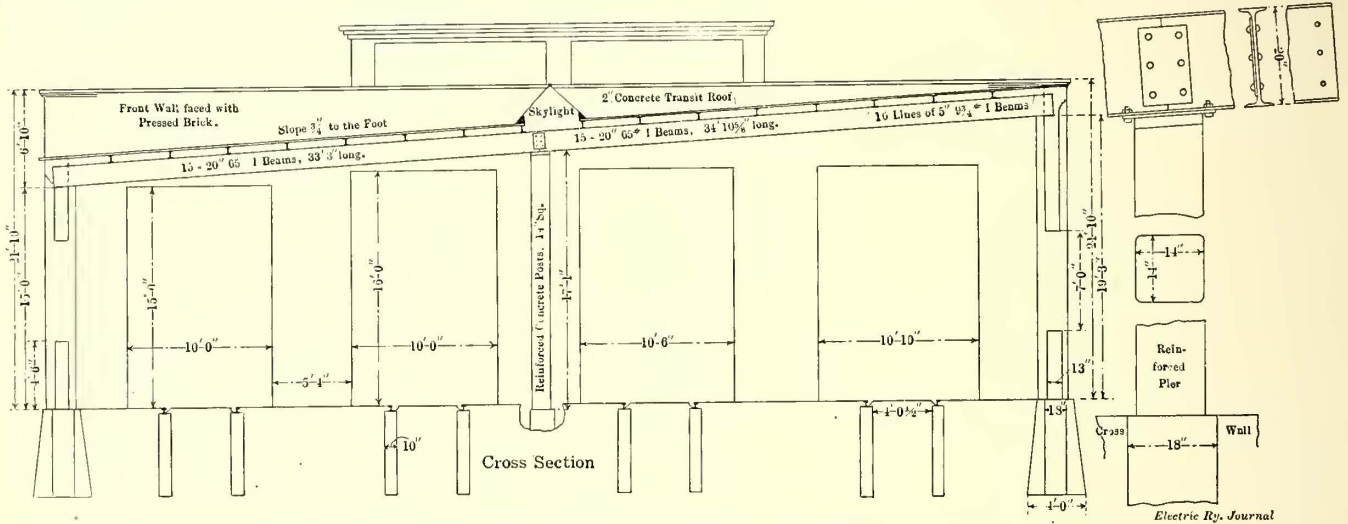
The lower bed of concrete is allowed to set for from 6 to 10 days, after which a 1-in. layer of clean sharp sand is deposited over the top. The ties, which are of oak 6 in. x 10 in. x 7 ft., are laid on this cushion of sand and spaced 24 to 30 in. apart center to center. The rails are laid down on the ties gaged and spiked with standard cut spikes, and

the track is then brought to perfect surface and alignment and the bed of sand thoroughly tamped under the ties. The concrete mixer and crane car working on the adjoining track are then used to deposit concrete solidly between the ties and over them to a thickness of 2 in., completely imbedding the sand cushion, the ties and the base of the rail. The rail section used is the Lorain Steel Company's No. 375, 7 in. high and weighing 91 lb. per yard. The base is 6 in. wide, the web 9/16 in. thick and the head 2 3/4 in. wide by 1 1/4 in. deep.

On the top bed of concrete another layer of sand 1 in.

NEW CAR HOUSE OF THE WATERLOO, CEDAR FALLS & NORTHERN AT WATERLOO, IA.

The Waterloo, Cedar Falls & Northern Railway completed during the winter one-half of a new car house at Waterloo, Ia., to replace a wood house destroyed by fire last year. The new house is used for storing all of the interurban cars of both the Cedar Falls and Denver Junction divisions as well as all of the cars of the city lines in Waterloo. It is built of reinforced concrete with brick walls and was designed so that it could be doubled in size

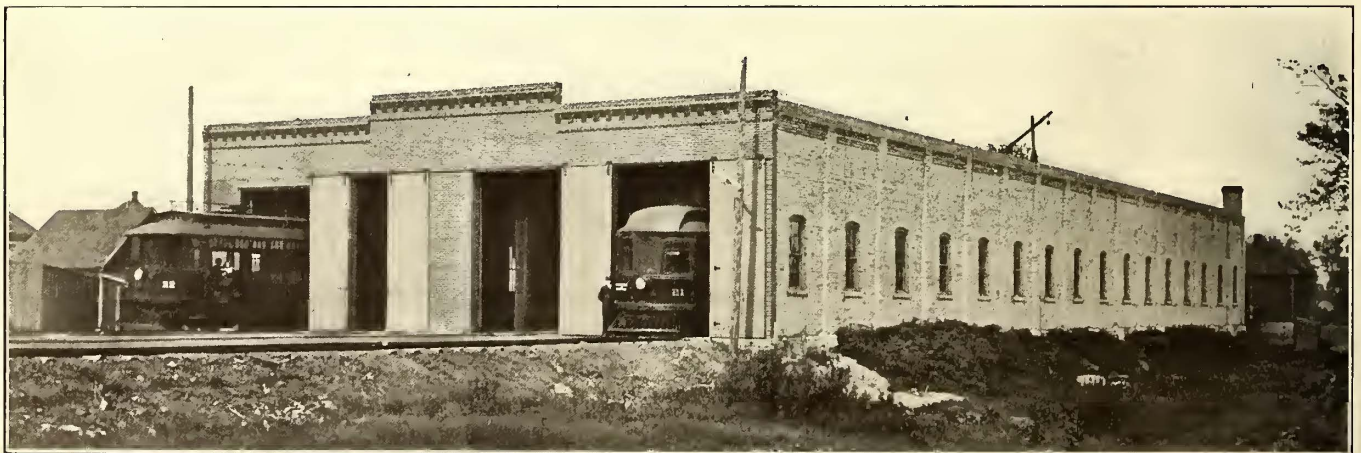


Waterloo, Cedar Falls & Northern Railway—Cross-Section of New Car House

thick is deposited and on top of this is 4-in. paving brick. Except in case of the nose brick construction, the nose blocks or filler blocks are put in place with the top layer of concrete, and are bedded in it. The web of the rail in all cases is grouted 1/2 in. thick on each side. Three rows of brick are laid longitudinally outside each rail, and the space between the rails is paved with the same size brick laid in transverse rows, with broken joints. This construction of

at any time without disturbing the walls or interfering in any way with the operation of the house while making the addition. The completed part is 68 ft. 6 in. wide by 200 ft. long and contains four tracks with pits 174 ft. 2 in. long.

Advantage was taken of the low level of the ground on which the house was built to do away with expensive excavations for pits and wall foundations. The original ground level was about 5 ft. 6 in. below the present floor level of



Waterloo, Cedar Falls & Northern Railway—New Car House at Waterloo

brick paving between the tracks and on the outside is to be used for all types of street paving, including asphalt, macadam and wood block. The surface of the brick paving is thoroughly grouted with sand mortar.

This paper is indebted to F. W. Brooks, general manager, Detroit United Railway, for the drawings and information.

The Danish Folketing has passed a bill authorizing the building of several electric lines, but without State aid.

the house and the foundations were built up from the surface. When the house was completed the space between pits and the approach from the street was filled in with cinders. The pit walls are plain concrete 10 in. thick. Cross walls are built in at intervals of 25 ft. to brace the pit walls. Between the two middle pits these cross walls are doubled in number and support a row of reinforced concrete columns 14 in. square carrying the roof beams.

The roof slopes 3/4 in. in 1 ft. from the south wall to the

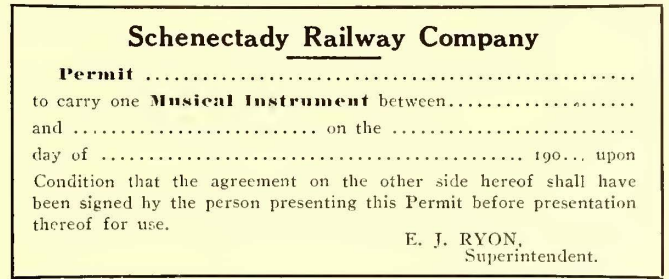
eaves along the north wall. When the contemplated addition is built to the south the roof will slope both ways from the dividing wall. The roof beams or rafters are 20-in., 65-lb. I-beams, 33 ft. 3 in. and 34 ft. 10⁵/₈ in. long, spliced in the webs over the central columns. On these rafters are laid 5-in., 9³/₄-lb. I-beam purlins spaced 4 ft. apart. A 2-in. concrete "Trussit" roof is in turn laid on the purlins. Light is admitted through seven monitor skylights 12 ft. long and 4 ft. wide built in the roof over the row of supporting columns.

The space on each side of the south track in the rear end of the house was not filled in, but is used for coal and oil storage and for a sunken boiler room where the heating plant is installed below the floor level. The house is heated by low-pressure steam circulated through pipe coils in the pits. No wall or roof coils are used.

The trolley wires inside the house are supported from span wires stretched from the center columns to the walls.

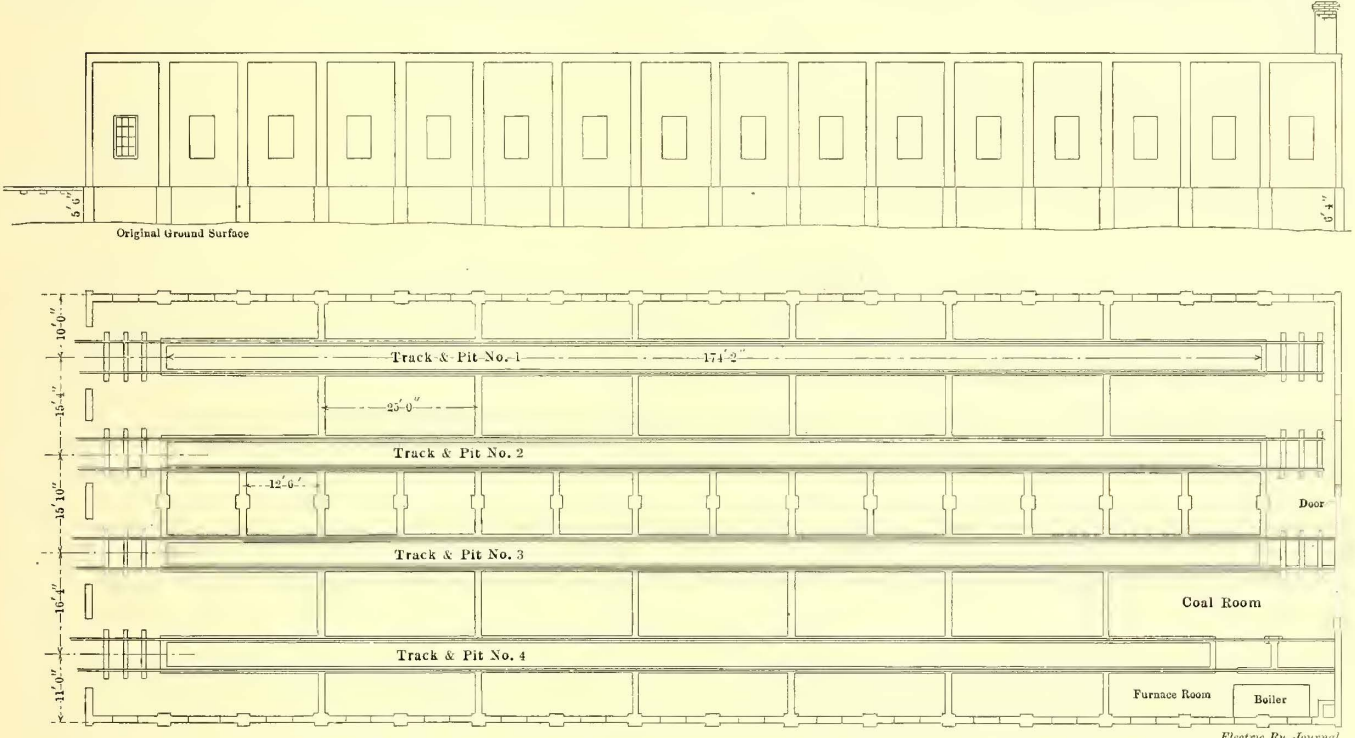
SCHENECTADY RAILWAY'S MUSICAL INSTRUMENT PERMIT

The form of permit for musicians to carry musical instruments on cars issued by the United Traction Com-



Front of Schenectady Instrument Permit

pany, of Albany, was described in the ELECTRIC RAILWAY JOURNAL of July 18, 1908. Through the courtesy of E. J.



Waterloo, Cedar Falls & Northern Railway—Plan and Side Elevation of Car House

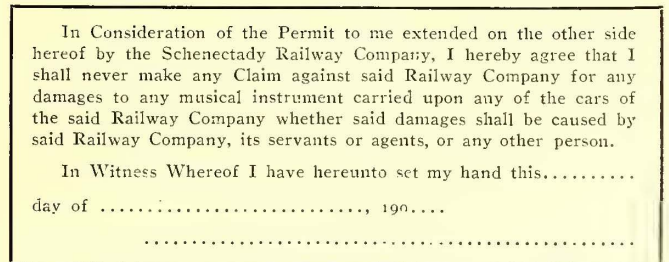
The troughs usually carried above the trolley wires are omitted.

The house is a good example of a simple and inexpensive design of fireproof construction.

CIRCULAR LETTER ON INTERURBAN FARES

The American Street & Interurban Railway Association through B. V. Swenson, secretary, has sent out a confidential circular on interurban fares containing answers to the questions given on data sheet No. 25. Replies were received from 86 companies operating a total of 650 cars on 3358 miles of track. The rates given cover both cash and ticket fares for single trips, excursions, commutation, schools and workmen together with comparisons with steam railroad fares. The restrictions applying to reduced rate tickets are mentioned, as well as the profitable minimum rate, average fares per passenger, average length of ride, population served, transfer privileges, freight and express practice, etc. A table shows receipts and expenditures per car mile and operating expenditure in percentage of gross receipts.

Ryon, superintendent of the Schenectady Railway, copies have been received of the permits issued by that company. Also the Schenectady company uses a form of release identical with that issued by the United Traction Company of



Back of Schenectady Instrument Permit Containing Release Clause

Albany, but gives also a card permit on the back of which a release in abbreviated form is printed. The obverse and reverse of the Schenectady card permit and release are produced on this page. The Public Service Railway of New Jersey has also taken up this subject.

OPERATION OF THE CLEVELAND STREET RAILWAY SYSTEM BY A NEW COMPANY—I.

A study of the Cleveland traction situation has been undertaken by the *ELECTRIC RAILWAY JOURNAL* in the endeavor to procure without prejudice the facts respecting fares, operation and ownership of the property which has agitated the Ohio city and residents of some other communities. This investigation was made because of the belief that the conditions at Cleveland are so extraordinary as to justify careful analytical treatment. The *ELECTRIC RAILWAY JOURNAL* believes that the railways and the public are equally interested in the present situation and its eventual outcome and that the facts should be ascertained and presented without bias.

In spite of the somewhat chaotic condition of affairs at present two points are especially prominent:

(1) That Municipal Traction Company is municipal only in name, and is a holding company device of an extreme type that is without a parallel in this country. On its \$10,000 of authorized capital stock but \$1,000 has been paid in. Control of this company is owned by a few individuals, who, therefore, control the property of the Cleveland Railway Company, valued at the time of its lease at \$23,989,600.

(2) That the company has not been giving 3-cent fares with universal transfers. The understanding during the campaign that the lines would couple this low fare with free transfers has been ignored up to this time without explanation. The company has established within certain limits 3-cent fares, with a charge of 1 cent each for transfers, but as routes have been changed and lines abandoned, the net cost per ride has increased with many passengers, and some fares as high as 12 and 13 cents are reported, although such figures are possible only in extreme cases. During the last week it has been announced that, notwithstanding deficits in May and June, the company, under a new plan effective on July 28, will continue the 3-cent rate of fare and will issue a transfer for which 1 cent will be charged; but as the 1 cent will be refunded when the transfer is presented for passage, the effect will be to make the transfer free.

THE MUNICIPAL TRACTION COMPANY

The recent history of the Cleveland traction situation is familiar to the readers of the *ELECTRIC RAILWAY JOURNAL*. Following a valuation of the property of the Cleveland Electric Railway Company under the plan conceived by Mayor Johnson, this property was leased by the Municipal Traction Company. On the authority of its officials, this company is "municipal" in name only. The letterheads of the corporation read: The Municipal Traction Company, City of Cleveland. The coupling of these names, if it conveys in the slightest degree the intimation that there is association at present between the corporation and the municipality, is not justified.

It is, perhaps, not remarkable that a contrary opinion should prevail outside of Cleveland when even within that city, and among its prominent citizens, there is a surprising lack of knowledge as to the exact conditions under which the stock of the Municipal Traction Company is held.

If the real control of the Cleveland traction situation lies with the ownership and control of this stock of the Municipal Traction Company, it would be the natural conclusion that the editors of the daily newspapers, prominent bankers and all the officers of the Municipal Traction Com-

pany and Cleveland Railway Company would be fully informed regarding the details. A recent inquiry, however, disclosed a different state of affairs.

"There should be no mystery concerning the holding of the Municipal Traction Company stock," was remarked by one prominent resident of Cleveland, not unfriendly to the Mayor. Yet it is possible to obtain three, possibly more, conflicting statements on this phase of the subject. It was currently reported on reasonably good authority:

(1) That the stock was deposited in a safety deposit box with three keys, and that access could be had only when all three holders were present.

(2) That the stock was held by a trust company of Cleveland, together with a trust agreement, assuring the control of the property in the interest of the people of the city.

(3) That the stock was divided into three blocks, each held by a separate trust company, with a trust agreement.

Newton D. Baker, city solicitor of Cleveland, one of the most prominent and able members of Mayor Johnson's cabinet, stated to a representative of the *ELECTRIC RAILWAY JOURNAL*: "While the authorized capital stock of the Municipal Traction Company is \$10,000, only 10 per cent has been paid in on each share. When I became a stockholder and director I drew my personal check for \$100, and was given a certificate for 10 shares of stock of a total par value of \$1,000."

When asked for details of the manner in which the stock is held, Mr. Baker made an additional statement. In fairness to him the *ELECTRIC RAILWAY JOURNAL* states that Mr. Baker said it was his recollection that the conditions were as he described them, but that he referred the inquirer for confirmation to D. C. Westenhaver, counsel for the Municipal Traction Company. Mr. Baker said:

"The papers were signed at the annual meeting of stockholders of the Municipal Traction Company, when a great deal of business was transacted, and I am not perfectly clear as to what was contained in the documents that we signed. My understanding is, however, that trust agreements were executed whereby the stock is divided into three lots, one of 40 and two of 30 shares, and that each of these blocks is deposited with a trust company. The names of the trust companies are, I think, the Citizens' Savings & Trust Company, the United Banking & Savings Company and the Cleveland Trust Company."

As stated, Mr. Baker referred the representative of this paper to the general counsel of the company, Mr. Westenhaver.

STATEMENT OF MR. WESTENHAVER

The following statement was made by Mr. Westenhaver:

"The stock of the Municipal Traction Company is in a safety deposit box which can be opened only in the presence of a majority of the directors. No trust agreement affecting the stock has been executed by the company, the directors or the stockholders. An option of purchase is drawn up each year and executed by each stockholder at the annual meeting. The execution of these options is part of the regular business awaiting transaction at each meeting. They are drawn up in regular proxy form and give the majority of the shareholders permission to purchase at any time the stock of any shareholder who may be considered undesirable. The option holds good in the event of the death or insolvency of the shareholder. Each certificate of stock is assigned in blank, and no shareholder can obtain possession of his certificate. The options are deposited in a safety deposit box in a location different from

that in which the certificates are placed. Access to the box containing the options can be obtained, also, only by a majority of the directors. Delivery of the stock can be effected easily because of the fact that the certificates are endorsed in blank.

"It was my opinion that no trust agreement should be executed until the Legislature of the State of Ohio shall have enacted a law which would enable the stock of a corporation of this character to be placed in trust for the benefit of the people of a city, and until the legality of a law of this character shall have been approved by the Ohio Supreme Court. Until that time has arrived it is best to hold the stock in its present shape and to permit any trust promises to remain in oral form and dependent upon honesty and good faith."

Mr. Westenhaver stated that the stock, although owned by private individuals, would not be misused because of various provisions in the lease, although there is no clause affecting the ownership or control of the stock. He confirmed the statement that the profits possible to holders of the stock are not legally limited in any way.

STATEMENT OF F. H. GOFF

F. H. Goff, now president of the Cleveland Trust Company, was the arbitrator on behalf of the Cleveland Electric Railway Company during the valuation of the property. He was asked whether he still believed that the arrangement made after the valuation had been concluded was a desirable one. Mr. Goff said he still felt that the settlement was the only one that it was possible to make in view of the ideas of Mayor Johnson.

"The valuation of the property of the Cleveland Electric Railway Company," he said, "fixed an average of about \$80,000 per mile of track, including equipment, power plants, etc."

Mr. Goff, when asked about the present service, said that it was not satisfactory to the public.

In speaking of Mayor Johnson, Mr. Goff reiterated his confidence in the integrity of the executive of the city. In answer to a question regarding the manner in which the stock of the Municipal Traction Company is held, Mr. Goff described his understanding of the existence of a trusteeship. He admitted that his understanding was based on rumor and that he did not know the facts concerning the manner in which the stock is held.

"I would much prefer," Mr. Goff said, "that the stock be placed in the control of a trustee in a way that would preclude the possibility that any of the directors might profit from his holdings."

DIRECTORS OF THE MUNICIPAL TRACTION COMPANY

The directors of the Municipal Traction Company are as follows: A. B. du Pont, president; Tom L. Johnson, treasurer; Newton D. Baker, city solicitor; Fred C. Howe, State Senator; Charles W. Steage, county solicitor; Edward Wiebenson, president United Banking & Savings Company, Cleveland; Frederick C. Howe, State Senator; Ben T. Cable, of Rock Island, Ill., who, it is stated in Cleveland, has also a residence in New York City. Representatives of the company say that all the stock is owned by the directors.

LEGAL POSITION OF THE COMPANIES

In view of the conflicting statements regarding important points and pending analysis of the lease and the franchises the *ELECTRIC RAILWAY JOURNAL* secured the following statement from H. J. Crawford, of Squire, Sanders &

Dempsey, attorneys for the Cleveland Railway Company:

"The Municipal Traction Company is a private corporation for profit, organized under the general incorporation laws of the State of Ohio. It has a capital stock of \$10,000, divided into 100 shares of \$100 each. The charter of the Municipal Traction Company is in no sense different from that of any other street railway corporation. The laws of the State of Ohio require that each director of such a corporation be a bona fide holder of at least one share of stock.

"It has been said that the stock of the Municipal Traction Company is held by the directors for the benefit of the City of Cleveland. Such an agreement, if there be one, has never been made public and it is all but impossible to understand how such an agreement, if one exists, could be enforced. It is contrary to the theory of a private corporation for profit. The law provides that the affairs of the corporation shall be managed entirely for the benefit of the shareholders. Any other theory is contrary to the laws of the State. In fact, the directors of such a corporation are required to take oath that they will well and faithfully serve as directors of the corporation, which means that they will do everything that can be done legitimately to advance the pecuniary interest of such a corporation.

"The Municipal Traction Company has no relation, contractual or otherwise, with the city of Cleveland. The only relation which the city of Cleveland bears to the street railway system is that to be found in the general renewal ordinance of April 27, 1908, by which the city, through its Council, granted to the Cleveland Electric Railway a franchise to maintain and operate a street railway by or over the various streets in the city of Cleveland (including territory theretofore occupied by the Forest City Railway) for and during a period of 25 years from and after the passage of the ordinance. The ordinance for the first 90 days permits a 5-cent cash fare without transfer privileges. After the passage of the 90 days, the rate of fare is 5 cents and six tickets for 25 cents with certain transfer privileges.

"After the passage of the ordinance, the Cleveland Electric Railway leased all of its property, rights, privileges and franchises to the Municipal Traction Company for a period of 50 years, renewable at the option of the Traction company at the end of the lease for a like period of 50 years and in like manner renewable in turn for 50 years forever. The Traction company is required to pay the railway company as rental 6 per cent on the reduced capital stock and 6 per cent on any additional stock that may be issued for the purpose of retiring bonds or other indebtedness, or for further extensions or betterments.

"It is provided, in section 5, article 2, 'that the Traction company shall, at all times, during the term of this lease and any renewal hereof have the full and exclusive right to use, operate, manage and control the said railways and property hereby demised, and to regulate and determine, subject to the provisions of the franchises hereby demised or that may hereafter be acquired, the rates of fares and charges for transportation or other services over the whole or any part of said railway system, and to collect and receive the same to its own use and shall have and may use and exercise all the rights, powers and authority of the Railway company in that behalf, and all rights, powers and franchises in that behalf which may hereafter be acquired by the said Railway company.'

"This means that the Traction company may charge any rate of fare that grants to the Railway company author-

ize. In other words, the Traction company may charge the full 5-cent cash fare and six tickets for 25 cents.

"The Traction company, after payment of rental and other charges fixed by the lease, may legally make such surplus as it may deem expedient. Contrary to the generally accepted notion, the city has no control over the Municipal Traction Company and cannot have a voice in saying what shall be done with the surplus earnings, if any remain after provision has been made for all expenses, interest and dividends under the lease.

"This, in brief, is the arrangement under which the Cleveland street railway system is now operated. The Council has no power whatever in the selection or removal of any directors of the Municipal Traction Company. They, like the directors of any other corporation, can be selected only by the stockholders of the corporation.

"The Municipal Traction Company has no financial responsibility outside of its \$10,000 capital stock and such earnings as it may make under the lease."

(To be continued.)

CLASSIFICATION OF ACCOUNTS FOR INTERSTATE STEAM ROADS

Classifications of operating revenues and expenses and construction expenditures, prescribed by the Interstate Commerce Commission for steam railways, as of July 1, 1908, have been promulgated. The new classifications are entitled supplements to the revised issues prescribed for the fiscal year beginning July 1, 1907. The classification of operating expenses contains 116 primary accounts, but provision is made for an abbreviated classification.

Prof. H. C. Adams, in charge of statistics and accounts for the commission, states in his introductory letter in the classification of operating expenses that the following are the important changes in the classifications:

CHANGES IN CLASSIFICATION OF OPERATING EXPENSES

(a) The three accounts "Work Equipment—Repairs," "Work Equipment—Renewals," and "Work Equipment—Depreciation," which, in the third revised issue, are included as primary accounts under the general account "Maintenance of Way and Structures," are transferred to the general account "Maintenance of Equipment."

(b) The two accounts "Equipment Borrowed—Dr." and "Equipment Loaned—Cr.," being primary accounts under the general account "Maintenance of Equipment," are eliminated. This eliminates, also, the clearing account—hire of equipment. The elimination of these accounts means that the separation of the per diem for interchanged cars, and of the rental charge for hire of equipment, between operating expenses and income accounts will no longer be required, the entire amounts of payments and receipts for equipment interchanged or otherwise acquired or let out for use being carried directly to the income account.

(c) The insurance accounts formerly appearing as primary accounts under the general accounts now appear as a consolidated account under "General Expenses."

(d) The account "Stock Yards and Grain Elevators" under "Transportation Expenses" has been eliminated, as the expense which might be classified under that head is covered by the transportation expense accounts "Station Employees" and "Station Supplies and Expenses."

CORRESPONDING STEAM AND ELECTRIC PRIMARY ACCOUNTS

(e) A note has been added to the accounts applying to the operation of electric divisions stating that carriers that wish to subdivide those accounts should use appropriate accounts as prescribed in the classification of operating expenses for electric railroads, which becomes effective

on Oct. 1, 1908. The accounts in the steam road classification and in the corresponding accounts in the electric road classification are as follows:

STEAM.	ELECTRIC.
5. Other track material.	5. Rail fastenings and joints. 6. Special work.
6. Roadway and track.	8. Roadway and track labor. 9. Paving. 10. Miscellaneous roadway and track expenses. 11. Cleaning and sanding track.
9. Bridges, trestles and culverts.	14. Elevated structures and foundations. 15. Bridges, trestles and culverts.
15. Electric power transmission.	20. Poles and fixtures. 21. Underground conduits. 22. Transmission system. 23. Distribution system. 24. Miscellaneous electric line expenses.
47. Power plant equipment.	30. Power plant equipment. 31. Substation equipment.
79. Motormen. 88. Road trainmen.	60. Passenger conductors, motormen and trainmen. 61. Freight and express conductors, motormen and trainmen.
86. Operating power plants.	49. Power plant employees. 50. Substation employees. 51. Fuel for power. 52. Water for power. 53. Lubricants for power. 54. Miscellaneous power plant supplies and expenses. 55. Substation supplies and expenses.

Correspondence with this office during the past year has indicated a desire, on the part of a large number of carriers doing a relatively small business, for a condensed classification of operating expenses. A condensed classification has accordingly been provided under the title "Third Revised Issue, Condensed," containing 44 accounts. Inasmuch, however, as this classification is designed for switching and terminal roads, as well as for small commercial roads not forming parts of large operating systems, and inasmuch as, further, many of these roads will have no use for the joint-facilities accounts, the actual number of primary accounts which this class of roads will be obliged to keep will, in many cases, not exceed 25 or 30.

Per diem and mileage payments between carriers will be handled hereafter through the income account.

* CLASSIFICATION OF OPERATING REVENUES

Regarding the classification of operating revenues, Prof. Adams states:

An important modification of the present classification of operating revenues was made necessary by the promulgation of accounting rules for outside operations. Thus, in the case of the account "Parlor and Chair Car Revenue," attention is called to the fact that this account should be interpreted consistently with the introductory letter to the classification of revenues and expenses for outside operations. When this classification of operating revenues was issued no rules had been provided for the assignment of expenses of the operation of parlor and chair cars; such rules have now been promulgated, and consequently the language in the text of this primary account as originally issued is no longer pertinent. A similar explanation pertains to the modification of the text descriptive of "Express Revenue."

No question has received greater attention during the past year than the treatment of switching and terminal revenues, and especial attention is called to the change in the definition of switching revenue promulgated by this supplement.

It will be further noted that two new primary accounts, namely, "Joint Facilities Revenue—Dr." and "Joint Facilities Revenue—Cr.," have been added.

Prof. Adams says that the only important change in the classification of construction expenditures is the addition of the account "Injuries to Persons," being an account to cover the expenses incident to injuries when caused directly in connection with the construction of new road.

TENTATIVE CLASSIFICATION OF ACCOUNTS PREPARED BY NEW YORK PUBLIC SERVICE COMMISSIONS

A circular outlining a proposed uniform system of accounts for street and electric railways has been issued by the Public Service Commissions, First and Second Districts, New York. The classification, which is tentative, was prepared by the division of statistics and accounts of the commissions for introduction as of July 1, 1908.

An introductory note states that "the operating expense accounts, which are nearly identical with those proposed by the Interstate Commerce Commission, will be the primary accounts for corporations earning not less than \$500,000 annually from street railway operations. Corporations of less magnitude will be permitted to combine certain of these accounts if desired." The lines of division between the various classes of companies are tentatively drawn as follows:

Class	Annual gross revenue
A.....	\$500,000 and over
B.....	\$100,000 to \$500,000
C.....	Under \$100,000

The commission of the First District has announced a hearing on the system, to be held on July 23 at its office in New York City. The Second District Commission will hold its hearing at Albany on August 4.

The classification provides for two accounts to cover depreciation, one under maintenance of way and structures and the other under maintenance of equipment. The text accompanying these accounts is as follows:

Depreciation of Way and Structures.—To this account shall be charged month by month the amount estimated to be necessary to cover such accruing wear and tear as is economically incapable of repair, and such obsolescence and inadequacy as have accrued during the month on all way and structures of the accounting company. Amounts charged to this account shall be concurrently credited to an account called "Accrued Amortization of Capital." When any capital is retired from service, the amount, estimated if not known, originally charged to a capital account in respect thereof shall be credited to such capital account and such amount less salvage, if any, shall be charged to the account "Accrued Amortization of Capital." Where capital is substantially continuous, such as track, and cannot be satisfactorily individualized, the capital shall be kept in efficient operating condition through repair, and the charges to this account in respect thereof shall be only such as are necessary to cover such wear and tear as is economically irreparable; *e. g.*, in the case of ties, the average condition after the road has reached a substantially uniform going condition will be practically 50 per cent of new, and economical repair will keep the average condition at this point, so that the charges to this account should in respect of ties be sufficient to accumulate during the average life of the ties in service 50 per cent of the cost of ties in service, and thereafter the reserve in respect of ties need only be maintained at this point, and the average condition of ties must be maintained through charges to the operating expense account "Ties." Similarly for rails, rail fastenings, poles and fixtures and the like. In the case of buildings, towers, bridges, trestles and other separate structures capable of being readily individualized, charges to this account must be sufficient to provide (in respect of such capital) in the account "Accrued Amortization of Capital" by the time such structures go out of service a reserve equal to the original cost thereof, less salvage, to which account such original cost, less salvage, may be charged.

Depreciation of Equipment.—To this account shall be charged, month by month, the amount estimated to be necessary to cover such accruing wear and tear as is economically incapable of repair, and such obsolescence and inadequacy as have accrued during the month on all equipment of the accounting company. Amounts charged to this account shall be concurrently credited to the reserve account "Accrued Amortization of Capital," and must be sufficient to

provide in that account, in respect of the several items of equipment by the time such items go out of service, a reserve equal to the original cost thereof, less salvage. When any capital is retired from service, the amount (estimated if not known) originally charged to a capital account in respect thereof shall be credited to such capital account and such amount less salvage, if any, shall be charged to the account "Accrued Amortization of Capital."

The various accounts contained in the complete scheme submitted by the commissions are as follows:

SCHEDULE A—BALANCE SHEET ACCOUNTS.

- Fixed Capital:
 - 1. Fixed capital account June 30, 1908.
 - Land.
 - 2. Right of way.
 - 3. Other street railway land.
 - Intangible street railway capital.
 - 4. Organization.
 - 5. Franchises.
 - 6. Patent rights.
 - 7. Other intangible street railway capital.
 - Roadway.
 - 8. Grading.
 - 9. Ballast.
 - 10. Ties.
 - 11. Rails, rail fastenings and joints.
 - 12. Special work.
 - 13. Underground construction.
 - 14. Track laying and surfacing.
 - 15. Paving.
 - 16. Roadway tools.
 - 17. Tunnels.
 - 18. Elevated structures and foundations.
 - 19. Bridges, trestles and culverts.
 - 20. Crossings, fences, cattle guards and signs.
 - 21. Interlocking and other signal apparatus.
 - 22. Telegraph and telephone lines.
 - Electric line.
 - 23. Poles and fixtures.
 - 24. Underground conduits.
 - 25. Transmission system.
 - 26. Distribution system.
 - Buildings and structures.
 - 27. Dams, canals and pipe lines.
 - 28. Power plant buildings.
 - 29. Substation buildings.
 - 30. General office buildings and equipment.
 - 31. Shops and carhouses.
 - 32. Stations, waiting rooms and miscellaneous buildings.
 - 33. Docks and wharves.
 - Power plant equipment.
 - 34. Furnaces and boilers.
 - 35. Steam engines.
 - 36. Accessory steam equipment.
 - 37. Hydraulic engines.
 - 38. Gas power equipment.
 - 39. Electrical equipment.
 - 40. Miscellaneous power plant equipment.
 - 41. Special high-tension structures at stations.
 - 42. Special high-tension transmission equipment.
 - 43. Substation equipment.
 - 44. Cable power equipment.
 - Rolling stock and miscellaneous equipment.
 - 45. Shop equipment.
 - 46. Revenue cars.
 - 47. Locomotives.
 - 48. Electric equipment of cars and locomotives.
 - 49. Other rail equipment.
 - 50. Miscellaneous equipment.
 - Undistributed construction expenditures.
 - 51. Law expenses during construction.
 - 52. Injuries and damages during construction.
 - 53. Taxes during construction.
 - 54. Engineering and superintendence.
 - 55. Miscellaneous construction expenses.
 - 56. Interest during construction.
 - 57. Cost of road purchased.
 - 58. Park and resort properties.
 - Fixed capital in other departments.
 - 59. Electric capital.
 - 60. Gas capital.
 - 61. Railroad capital.
 - 62. Land in other departments.
 - 63. Franchises in other departments.
 - 64. Patent rights in other departments.
 - 65. Other intangible capital in other departments.
 - 66. Tangible capital in other departments.
- Floating Capital:
 - Materials and supplies.
 - Cash Assets.
 - Bills receivable.
 - Accounts receivable.
 - Interest and dividends receivable.
 - Other current assets.
- Treasury Holdings.
- Investments.
- Special Deposits.
 - Coupon special deposits.
 - Dividend special deposits.
 - Other special deposits.
- Prepayments:
 - Prepaid taxes.
 - Prepaid insurance.
 - Prepaid rents.
 - Other prepayments.

Suspense Accounts.
 Unamortized debt discount and expense.
 Unamortized discount on stocks outstanding.
 Other suspense.

Debt:
 Funded.
 Unfunded.
 Taxes accrued.
 Receivers' certificates.
 Judgments unpaid.
 Interest accrued.
 Dividends declared.
 Bills payable.
 Accounts payable.
 Other unfunded debt.

Reserves:
 Permanent.
 Premiums on stocks outstanding.
 Other permanent reserves.

Temporary.
 Contractual.
 Required.
 Unvouchered items.
 Accrued amortization of capital.
 Unamortized premium on debt.
 Casualties reserve.
 Repairs reserve.
 Self-insurance reserve.
 Other required reserves.

Optional.

SCHEDULE B—INCOME ACCOUNT.

Street Railway Operating Revenues:

I. Revenue from transportation.

1. Passenger revenue.
2. Baggage revenue.
- 3A. Chartered car revenue.
- 3B. Parlor and chair car revenue.
4. Mail revenue.
5. Express revenue.
6. Milk revenue.
7. Freight revenue.
8. Switching revenue.
9. Miscellaneous transportation revenue.

II. Other street railway revenues.

10. Station and car privileges
11. Parcel-room receipts.
12. Storage.
13. Car service.
14. Park and resort terminals.
15. Rent of tracks and terminals.
16. Rent of equipment.
17. Rent of buildings and other property.
- 18A. Sale of power.
- 18B. Joint Electric power revenue.
19. Miscellaneous.

Revenue from Outside Operations.

STREET RAILWAY OPERATING EXPENSES:*

I. Maintenance of way and structures.

1. Superintendence of way and structures. A B C
- Maintenance of way (Accounts Nos. 2-19) C
- Maintenance of roadway and track (Accounts Nos. 2-12) B
2. Ballast A
3. Ties A
4. Rails A
5. Rail fastenings and joints A
6. Special work A
7. Underground construction A
8. Roadway and track labor A
9. Paving A
10. Cleaning and sanding track A
11. Removal of snow, ice and sand A
12. Miscellaneous roadway and track expenses A
- Other maintenance of way (Accounts Nos. 13-19) B
13. Repairs of tunnels A
14. Repairs of elevated structures and foundations A
15. Repairs of bridges, trestles and culverts A
16. Repairs of crossings, fences, cattle guards and signs A
17. Repairs of signal and interlocking systems A
18. Telephone and telegraph systems A
19. Other miscellaneous way expenses A
- Maintenance of electric line. (Accounts Nos. 20-24) C
20. Poles and fixtures A
21. Underground conduits A
22. Transmission system A
23. Distribution system A
24. Miscellaneous electric line expenses A
25. Repairs of buildings and structures A
26. Other operations, Dr. A B C
- 26.1. Joint way and structures, Dr. A B C
- 27A. Other operations, Cr. A B C
- 27B. Joint way and structures, Cr. A B C
28. Depreciation of way and structures A B C

II. Maintenance of equipment.

29. Superintendence of equipment A B C
- Repairs of power plant equipment (Accounts Nos. 30-30 I) C
- 30A. Repairs of furnaces and boilers A B
- 30B. Repairs of Steam Engines A B
- 30C. Repairs of accessory steam equipment A B
- 30D. Repairs of Hydraulic power plant A B
- 30E. Repairs of gas power equipment A B
- 30F. Repairs of electrical equipment A B
- 30G. Repairs of special high-tension transmission equipment A B
- 30H. Repairs of miscellaneous power plant equipment A B

- 30I. Repairs of cable power equipment A B C
31. Repairs of substation equipment A B C
- Repairs of rolling stock (Accounts Nos. 32-35) B
32. Repairs of passenger and combination cars A
33. Repairs of freight, express and mail cars A
34. Repairs of locomotives A
35. Repairs of service cars A
- Repairs of electrical equipment of cars and locomotives (Accounts Nos. 36-37) B C
36. Repairs of electrical equipment of cars A
37. Repairs of electrical equipment of locomotives A
- Miscellaneous equipment expenses (Accounts Nos. 38-41) B C
38. Repairs of shop machinery and tools A
39. Shop expenses A
40. Repairs of vehicles A
41. Other miscellaneous equipment expenses A
42. Other operations, Dr. A B C C C
- 42.1. Maintaining joint equipment, Dr. A B C C C
- 43A. Other operations, Cr. A B C C C
- 43B. Maintaining joint equipment, Cr. A B C C C
44. Depreciation of equipment A B C

III. Traffic.

Traffic expenses (Accounts Nos. 45-47) B C

45. Superintendence and solicitation A
- 46A. Advertising A
- 46B. Parks and other attractions A
47. Miscellaneous traffic expenses A

IV. Conducting transportation.

48. Superintendence of transportation A B C

Group 1.—Power.

Power plant employees (Accounts Nos. 49A-49F) C

- 49A. Power plant superintendence and care A B
- 49B. Boiler room labor A B
- 49C. Producer labor A B
- 49D. Engine labor A B
- 49E. Electric labor A B
- 49F. Cable power plant labor A B
50. Substation employees A B C C
51. Fuel for power A B C
- Other power supplies and expenses (Accounts Nos. 52-55) C
52. Water and power A B
53. Lubricants for power A B
54. Miscellaneous power plant supplies and expenses A B
55. Substation supplies and expenses A B
- Horse car stable expenses (Accounts Nos. 55.1-55.5) C
- 55.1. Wages of stablemen A B
- 55.2. Provender A B
- 55.3. Horse shoeing A B
- 55.4. Harness and other horse equipment A B
- 55.5. Stable supplies and expenses A B
56. Power purchased A B C
- 56.1. Jointly produced power, Dr. A B C C C
57. Power exchanged—balance A B C C C
58. Other operations, Dr. A B C C C
- 59A. Other operations, Cr. A B C C C
- 59B. Jointly produced power, Cr. A B C C C

Group 2.—Operation of cars.

Conductors, motormen and trainmen (Accounts Nos. 60-61) C

Passenger conductors, motormen and trainmen (Accounts Nos. 60a-60d) B

- 60A. Passenger motormen A
- 60B. Passenger conductors A
- 60C. Horse car drivers A
- 60D. Other passenger trainmen A
61. Freight and express motormen and trainmen A B
- Miscellaneous transportation expenses (Accounts Nos. 62-72) C
62. Miscellaneous car service employees A B
63. Miscellaneous car service expenses A B
64. Station employees A B
65. Station expenses A B
66. Car house employees A B
67. Car house expenses A B
68. Operation of signal and interlocking systems A B
69. Operation of telephone and telegraph systems A B
70. Express and freight collections and delivery A B
71. Loss and damage A B
72. Other transportation expenses A B
- 72.1. Joint operation of cars, Dr. A B C C
- 72.2. Joint operation of cars, Cr. A B C C

V. General and miscellaneous.

General expenses (Accounts Nos. 73-79) C

73. Salaries and expenses of general officers A B
74. Salaries and expenses of general office clerks A B
75. General office supplies and expenses A B
76. General law expenses A B
77. Relief department expenses A B
78. Pensions A B
79. Miscellaneous general expenses A B
80. Other operations—Dr. A B C C
- 80.1. Joint general expenses, Dr. A B C C
- 81A. Other operations—Dr. A B C C
- 81B. Joint general expense, Cr. A B C C

Undistributed Expenses.

- 82A. Injuries to employes A B C C
- 82B. Other injuries and damages A B C C
83. Insurance A B C C
84. Stationery and printing A B C C
85. Store and stable expenses (Accounts Nos. 85-86) A B
86. Stable expenses A B

Expenses of Outside Operations.

Taxes.

Non-operating Revenues:

Rents accrued from lease of road.
 Miscellaneous rent revenues.
 Interest revenues.
 Dividend revenues.
 Profits from operations of others.
 Miscellaneous non-operating revenues.
 Uncollectible non-operating revenues.

*The letters A, B and C designate the expense accounts to be kept by corporations of three grades or classes, as follows: A—Corporations that receive street railway revenues of not less than \$500,000 a year; B—Corporations with an annual revenue of not less than \$100,000 and under \$500,000; C—Corporations with an annual revenue of less than \$100,000.

- Non-operating Expenses:
 - Rent expense.
 - Interest expense.
 - Dividend expense.
 - Others' operations expense.
 - Miscellaneous non-operating expense.
- Non-operating Taxes.
- Income Deductions:
 - Interest accrued on debt and stocks.
 - Rent for lease of other road and equipment.
- Other rent deductions:
 - A. Track and terminal privileges.
 - B. Hire of equipment.
 - C. Joint facility rents.
 - D. Miscellaneous rent deductions.
- Sinking-fund accruals.
- Guaranties of payments by or for others.
- Loss on operations of others.
- Other contractual deductions from income.
- Amortization of landed capital.
- Amortization of debt discount and expense.
- Appropriation Accounts:
 - Amortization of premium on debt—Cr.
 - Bad debts collected.
 - Other additions to surplus.
 - Expenses elsewhere unprovided for.
 - Dividends on outstanding stocks.
 - Amortization elsewhere unprovided for.
 - Appropriations to reserves.
 - Gifts to controlled corporations.
 - Other appropriations.
 - Bad debts written off.
 - Other deductions from surplus.
- SCHEDULE C—CLASSIFICATION OF CAR-MILES, CAR SEAT MILES AND CAR HOURS.
- Car miles and Seat Miles:
 - Passenger car miles—active.
 - Passenger car miles—idle.
 - Special passenger car miles.
 - Mail car miles.
 - Express car miles.
 - Freight car miles.
 - Mixed car miles.
 - Non-revenue car miles.
- Car Hours.

COMMUNICATIONS

ISSUING TRAIN ORDERS

ROCHESTER RAILWAY LINES

ROCHESTER, N. Y., July 15, 1908.

To the Editors:

I have read with a great deal of interest the rules adopted for the Indiana interurban roads, as printed in your issue of June 27, but do not agree with the desirability of all of them.

Thus I must take exception to Rule 151, which, according to my interpretation, means that where orders are sent directly to train crews the member of the train crew who receives the order writes and repeats it and then completes it. I do not believe this practice should be allowed, but prefer that described under Rule 151b, because at least three persons must handle the order before it is completed. This gives greater chance of checking a possible mistake in the written order.

Neither can I agree with the plan described in Rule 152. I believe it is far safer, on an interurban road, not to use an order board at a station where operators are maintained. It is much better to designate such a station as always positive block and allow no trains to pass such a station without either a clearance or train-movement order, the clearance order to be under a number issued by the dispatcher. The chief difference between giving this clearance order to the train crew, instead of a train-movement order, would be that the completion of the clearance order would be done by one member of the train crew reading it to the operator instead of reading it to the dispatcher, as he always should do in the case of a train-movement order.

Again, the form of train-order blank, as shown in the rules, is susceptible of improvement, as it contains stereotyped blank spaces in which numbers are to be written. These numbers are apt to be placed one above the other, and the great danger with a blank of this description is that

the men become so accustomed to the stereotyped form that they read it at a glance and are apt to read the wrong figure for the correct one, thereby causing trouble. I am a firm believer in the American Railway Association Standard "31" train order, on which the entire movement must be written. This form affords no opportunity of being read in a parrot fashion, and as each operator has a distinctive hand writing, the man who has to read the order to the dispatcher for the completion must know thoroughly everything that is upon the blank.

I know that this blank has been criticized in the past as being "too slow" and the claim has been made that it is impossible to get over a road if this long hand-written blank is used. In this connection, however, I might state that the Rochester & Eastern Rapid Railway Company has been using this form of blank, together with the train-clearance order and positive block, since June 1, 1905, and that its local trains operate, counting out the time spent in villages that they traverse at a schedule of 26½ m.p.h., and that the limited trains on the same road operate on a schedule of 37½ m.p.h. Nevertheless, no delay has been caused by the handling of this dispatching system.

The graphical layout of the Rochester & Eastern, using letters to represent stations where operators are maintained and figures to represent sidings where there are no operators, would be practically as follows:

A 1 2, B 3 4 5 6, C 7 8 9, D 10 11 12 13, E 14 15, F.

One of the rules of operation is that trains of the same class in either direction have no superior right over trains in the opposite direction, but will meet as per timetable unless otherwise ordered by the dispatcher. No trains can leave the terminal or pass any station where an operator is maintained without a clearance or a train order.

During 1907 over 81,000 orders were issued and of this number between 7000 and 8000 were "31" orders. When it is realized that less than 2 per cent of all the trains were over five minutes late it can be seen very clearly that the handling of orders has very little to do in retarding train movements and with the block as used the road does not have to depend on any one operator to throw or forget to throw a train order board. A copy of the form of the train-clearance order is presented herewith.

Form 299

Rochester and Eastern Rapid Railway Co.

TRAIN CLEARANCE ORDER.

Order No. Station. Date. 190..

To Conductor and Motorman of Train No. Car No.

Have no orders for you.

Received by. Time. } Train.

Operator Conductor } Time.

O. K. ed by. Dispatcher.

This order must always be obtained by all train crews at the following stations: ROCHESTER, PITTSFORD, VICTOR, CANANDAIGUA, GATES SUB-STATION and GENEVA.

Referring again to the Indiana rules, I believe that the examples of orders, given under No. 177, should be increased to cover an order to call for orders at an isolated siding as follows:

FORM J. HOLDING OR CALLING-UP ORDERS

Hold at
 call for orders at

EXAMPLES

- (1) Hold No. 2 at A.
 - (2) Hold all eastbound trains at B.
 - (3) No. 2 call for orders at Siding 235.
- This order when transmitted as Examples 1 and 2 will

be addressed to the operator and acknowledged in the usual manner. It must be respected by conductors and motormen of trains thereby directed to be held, as if addressed to them. Whenever transmitted as per Example 3, it must be completed in the same manner as any other telephone train order.

When a train has been so held, or ordered to call for orders at any specified place, it must not proceed until the order to "hold" or "call" is annulled or an order given in the form "..... may go."

Form J will only be used when necessary to hold trains until orders can be given or in case of emergency.

In case train is ordered to call for orders at any specified place and train cannot get in communication with the dispatcher it must stay until communication is established or orders sent to them.

The reason for this order is that it is a common practice among many dispatchers to tell their crews to call up at such and such a siding. If the crew should forget to do this, or fail by design, the dispatcher is left with no record of what he has told the crew and if damage results, there is very little chance of definitely placing the responsibility.

Referring again to the methods of receiving and completing an order, I think it well to consider very thoroughly the idea of always having the second trainman read the order to the dispatcher for the completion. Of course, with train orders sent by telegraph this is impossible, as the order must be received, written and repeated back by the same party for the O. K. It is then completed by the conductor of the train signing his name and train number and reading the order to the operator who wrote it, and is finally made complete by the operator reporting to the dispatcher this name and train number. The report of an accident that happened on the Rome, Watertown & Ogdensburg Railroad recently, printed below, shows how this plan may be dangerous. Assuming that the statement is correct, it can clearly be seen that had the third party read the order to the dispatcher he would have read the figures as written upon the order and the dispatcher would have checked the mistake.

Clipping from the *Post-Express*, Rochester, N. Y., July 7, 1908:

Albany, July 6.—Superintendent Christie, of the Rome, Watertown & Ogdensburg Railroad Company, to-day filed with the Public Service Commission in the Second District an official report of the accident on the Rome, Watertown & Ogdensburg, near Boonville last Saturday, which resulted in the death of six persons and serious injuries to ten others. In his report Superintendent Christie says that the accident was evidently due to an error made by Mrs. E. R. McLean, operator at Lyons Falls, in copying an order. Mrs. McLean has only been in the service since July 1. According to the report, orders were issued for trains 55 and 90 to meet at Boonville at 5:15 a. m. The report says that the order received by those in charge of train 90 read 5:55 a. m., instead of 5:15, the substitution of the figure "5" instead of "1" having been made accidentally.

During the past three years I have personally known three or four instances in which the operator received an order and repeated it back to the dispatcher for the O. K. just as it was given by the dispatcher, but when the order was picked up and read by the conductor of the train, it was found to be written differently than it was given. Had these orders been acted upon as they were written trouble would have resulted.

W. R. W. GRIFFIN,

General Superintendent Transportation.

William Whittam, Jr., formerly a special agent of the United States Department of Commerce and Labor, says that an excellent opportunity exists in Great Britain and Europe for the export of the American type of brake shoe. In Europe the solid shoe is in common use.

AMERICAN STREET & INTERURBAN RAILWAY ENGINEERING ASSOCIATION'S QUESTION BOX

J. W. Corning, secretary of the American Street & Interurban Railway Engineering Association, forwarded from Boston on July 15 to the general manager and engineers of a number of companies a list of 52 questions constituting the question box to be presented at the meeting of the association at Atlantic City during the week Oct. 12 to 17, with the request that replies be mailed to him not later than July 30. The letter and the questions follow:

BOSTON, Mass., July 15, 1908.

TO THE GENERAL MANAGERS AND ENGINEERS OF MEMBER COMPANIES:

GENTLEMEN: The accompanying list of questions constitutes the question box which will be presented at the convention of the Engineering Association to be held at Atlantic City, N. J., during the week Oct. 12 to 17, 1908.

You will note that the questions asked cover a wide range and that many of them are of great interest to you at the present time. No doubt you are in a position, through your own personal experience covering a period of years, to answer a number of these questions in a way which would be of great value to the engineers of other companies. We do not wish to burden you unduly in this matter, however, and while we would appreciate your views relative to any and all questions, we would prefer that you select those which your experience places you in a position best to reply. As a wide expression of opinion on any of the subjects contained in the question box is of great value to the member companies, we will ask you to answer at least five questions.

It is the desire of the executive committee of our association to have the question box printed and distributed to the engineers of member companies well in advance of the convention. This can only be accomplished through prompt attention to this communication. As much work will have to be done after your communication is received, please send your reply to John W. Corning, secretary, 552 Harrison avenue, Boston, Mass., not later than July 30.

In making replies, kindly give the number of the question in each case and follow this with your answer. Also, please give your name in full, together with your title and the name of the company with which you are connected.

Thanking you for your prompt attention to this matter, I remain,

Yours very truly,

JOHN W. CORNING, Secretary.

QUESTIONS.

POWER HOUSES.

1. Does it pay to install a synchronous motor, running with or without load, to raise power factor? If so, when should it be installed and what ratio should its rated capacity bear to the connected load?
2. How can the power factor of a mixed load of rotaries and induction motors be profitably improved?
3. Have any of the association's members had experience with plants where superheaters were operated in some of their boilers, while the other boilers in the same plant were delivering saturated steam into the same pipe system? If so, was any trouble experienced with cast iron valves, fittings or engine cylinders? Kindly state nature of trouble.

TRACK.

4. Will the cost of maintaining track be greater with single truck or double truck cars of approximately the same seating capacity?
5. What is the average cost per square yard and annual cost of maintenance of brick paving between and outside of rails?
6. Have you any tee rail in use in city streets; what is the type of tee rail used, also paving, and how many miles are in use? Is your tee rail laid on ties or on concrete stringer? Do you find tee rail objectionable from the city point of view?
7. What is the shortest radius curve you use, and type of rail, where M. C. B. freight cars are moved through city streets?
8. What is the best paving for street railway tracks in city streets under heavy vehicular traffic?
9. What are some of the types of pavement in use along and in tracks on city streets?
10. What is the best method of caring for excessive expansion in open track with numerous curves and hills?
11. What is the relative efficiency of tie rods and rail braces in 7-in. girder construction? Give spacing and details.
12. Is it advisable to use portable crossovers and divert traffic from one track in reconstruction?

13. To what extent does it pay to grease curves on city streets paved or unpaved?
14. What is the best foundation for special work at intersections?
15. What is the value of a degree of curvature per car (single and double trucks)?
16. Does this value depend on the radius or curvature, or is it the same for any given central angle regardless of the degree of curve?
17. What is the best form and best mixture for concrete ties?
18. What type of trolley wire hanger is most economical, the solid body type or that type in which the insulated bolt is renewable? Give cost of renewals of hangers and parts per year per mile of single track.
19. Give some methods of protection of telephone instruments when telephone lines are carried on same poles with high tension wires?
20. Under what circumstances is the star method of transmission to be preferred to the delta?
21. Which is preferable on step-up systems of high potential—to depend upon the transformers for the step-up, say from 1,100 volts to 20,000, or depend on the generator for the higher voltage?

CAR BODIES.

22. What length of time should a car be out of service to change to pay-as-you-enter type car; also what is cost of labor and material, including painting and varnish?
23. What is the heaviest passenger car used on city streets?
24. When a car body is mounted for clearance on city tracks, say 3 in. off center, ought distance be divided between body center and truck center and balanced, or the 3 in. obtained by moving the car body over and balancing?
25. Where is the best place to locate baggage compartment on interurban cars, in the center or at the end?
26. Is there any way of connecting an excessive cost of maintenance of rolling stock equipment with a relatively poor condition of track and special work, particularly at crossings with steam railroads?

CAR EQUIPMENT.

27. Is it good practice to depend on car circuit breakers, doing away wholly with the fuse?
28. Are there any specifications for carbon brushes for car motors?
29. Is there a perfectly reliable field tester on the market which requires little adjustment?
30. What effect does single-end operation have on motors and trucks and wheels in regard to wear?
31. What is the relative cost of maintenance of different sizes and weights of cars with various schedule speed?
32. What objections can be offered against use of H. B. ball bearings for motor bearings?
33. What is the best shop method for determining short-circuited and defective field coils? Methods of inspection, test, etc.
34. What are the results of slotting mica out of G. E. 1,000 commutators?
35. Are there any proper specifications covering the steel to be used in the manufacture of gears and pinions? If so, what are they?
36. Is it advisable to use semi-automatic or automatic air brakes for single-car interurban operation?
37. Why is it that, when a K-28-F controller is thrown off quickly the arc breaks in the controller instead of at the contactor? What remedy can be applied?
38. What is the best material to refill controller cylinders?
39. What is the best babbitt metal for armature bearings—a metal with a lead base or a metal with a tin base, taking cost of lead at from 18c. to 20c. per lb. and cost of tin at from 30c. to 35c. per lb.?
40. Which is the more profitable form of control, considering both maintenance and accidents, for single-car operation of 75 to 100-hp equipments—platform control or multiple-unit control?
41. Refined iron. What grade should be bought for general blacksmith work in carhouses and shops?
42. Can you suggest a simple test for railway motor carbon brushes to insure uniformity?
43. What percentage of increase in the cost of maintenance should be added per year as railway motor equipments increase in age, and at what age should it begin?
44. When should a railway motor be scrapped on account of excessive maintenance, to be replaced with a modern motor?

WHEELS AND AXLES.

45. What factors determine the limit of life of car axles or when should axles be scrapped?
46. What type of brake shoe, insert or gray iron, gives best results on hand brake cars?
47. What is the maximum allowable difference in diameter between steel wheels on the same car?
48. Arc cast iron wheels safe to use on interurban cars run at a speed not to exceed 40 m.p.h.?

LUBRICATION.

49. What design of oil cup can you recommend for use in motors designed for grease lubrication? Wanted, sketch of cup and figures showing oil consumption per car hour or car mile, also hot bearing record.
50. What are considered proper specifications for a good motor grease, and also a good gear grease?
51. Is there any advantage or saving in changing from the use of grease to the use of oil in old motors designed for the use of grease? If so, what are they?

MISCELLANEOUS.

52. Under what specifications should rubber-covered wire be bought for general use, both car and lighting? "Code wire," at least most of it, is much too poor.

OKLAHOMA MILEAGE FIGURES

The total mileage of interurban and street railways in Oklahoma, as returned to the State Auditor, is 70.26 miles, and the total valuation \$642,541. The companies reporting are the Oklahoma Street Railway, Guthrie Street Railway, Enid Railway, Tulsa Street Railway, El Reno Railway, Muskogee Traction Company, Sapulpa Interurban Railway, Shawnee-Tecumseh Company, Oklahoma Interurban Company and Bartlesville Interurban Electric Company.

GASOLINE MOTOR CAR FOR THE WATERLOO, CEDAR FALLS & NORTHERN RAILWAY COMPANY

The Waterloo, Cedar Falls & Northern Railway Company has put into service on the Waverly-Summer branch a 20-passenger, 60-hp gasoline motor car built by the Stover Motor Car Company of Freeport, Ill., which is shown in the accompanying engraving. The Waverly-Summer branch is 22 miles long and was formerly operated by the Chicago Great Western. In 1904 it was leased to the Waterloo, Cedar Falls & Northern, together with trackage rights over the main line of the Chicago Great Western from Denver Junction west to Waverly, 6 miles. The interurban electric line of the Waterloo, Cedar Falls & Northern extends from Waterloo north to Denver Junction, 16 miles. Up to the present time, passenger and freight traffic on the Waverly-Summer branch and between Waverly and Denver Junction has been handled by steam locomotives. Between Denver Junction and Waterloo passenger traffic and package express has been handled by electric interurban cars and freight by steam and electric locomotives. The new gasoline motor car will run between Summer and Denver Junction, through Waverly, connecting at Denver Junction with the electric line and displacing the three steam passenger



20-hp Gasoline Car Used by the Waterloo, Cedar Falls & Northern Railway

trains each way a day which are now run between these two points. The traffic is not yet heavy enough to warrant electrification.

The car body is divided by a glass partition into an operator's cab in front with two seats and a passenger compartment seating 18 persons in the rear. Entrance doors are provided on each side of both compartments. The interior is finished in quarter sawed oak with brass trimmings and the seats are upholstered with black leather. The floor is laid with two thicknesses of boards with heavy felt between to keep out dirt and cold and to deaden the noise. It is covered with linoleum. On the rear of the car body a stout rack is provided on which an ordinary amount of baggage can be carried.

Radiators are placed under the seats in the rear compartment and are connected to the water circulating system of the engine through a by-pass valve. The heated water from the cylinder jackets passes through the radiators and returns to the storage tank from which the circulating pump on the engine draws its supply. This provides an ample and efficient means for heating the car in winter and aids in keeping the engine jacket water cool. A large radiator under the engine hood is used in warm weather when the body radiators are cut out.

The body is mounted on a framework of heavy steel channels, securely braced with cross pieces riveted in. This frame is supported by pedestal coil springs over the journal boxes. The axles are of 3-in. locomotive steel and run in Hyatt roller bearings lubricated with grease cups. Cast steel spoke wheels, 22 in. in diameter, are mounted on both axles. These wheels combine lightness with durability and are ground perfectly true. Cast-iron brake shoes are fitted to all four wheels and are applied through powerful leverage by a brake hand wheel mounted on top of a vertical shaft in front of the operator's seat.

The car is driven by a Stover six-cylinder, 60-hp gasoline engine mounted under a hood at the front end. The engine has cylinders $4\frac{1}{2}$ in. in diameter and 5 in. stroke which are water-cooled with forced circulation. All bearings are lubricated with a Hill precision oiler, driven mechanically by the engine. Two separate sources of ignition current are furnished: a high-tension magneto, gear driven from the engine shaft, and a storage battery with spark coil which is attached to an independent set of spark plugs and can be used in case of emergency.

The transmission is of the friction type, designed so that the car can be driven in either direction at any speed. The main transmission shaft, which is connected to the engine shaft, carries two steel disks, machined perfectly smooth. Two friction wheels, carried on counter shafts, are thrown in and out of contact with the disks on the transmission shaft by means of a foot lever in the operator's cab. The speed of the counter shafts is controlled by moving the friction wheels in or out on the disks and the direction of rotation is reversed by shifting the contacts from one disk to the other. Both of these operations are accomplished through a hand lever at the right of the operator's seat.

The friction counter shafts drive a jack shaft by means of sprockets and Morse silent chain and this jack shaft, through the same form of transmission, drives the rear axle. The speed of the car can also be regulated by changing the speed of the engine through manipulation of the small levers controlling the mixture of gas and the time of ignition. The transmission system is designed to give a maximum speed in either direction of 30 miles an hour with full load on level track. The consumption of gasoline averages about one gallon for each 10 miles run.

TRUCKS FOR THE MILWAUKEE NORTHERN RAILWAY

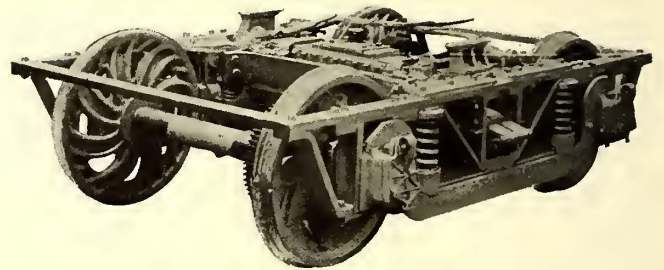
The accompanying illustration shows one of 20 four-wheel motor trucks recently built by the American Locomotive Company for the Milwaukee Northern Railway, of Cedarburg, Wis. The cars carried by these trucks are of the combination smoking and passenger type with a seating capacity of 52 passengers. They are 50 ft. 4 in. long over all, 40 ft. 2 in. long over the body, and are operated from one end only and at a maximum speed of 56 m.p.h. Two of these cars as built by the Niles Car Works, were described in the *ELECTRIC RAILWAY JOURNAL* of June 27. The trucks were especially designed to meet the service requirements and follow the most approved practice for high-speed interurban operation.

The principal features are the solid wrought-iron top frame, swinging bolster of the built-up type with channel iron top member and pressed-steel bottom member, channel iron transoms, cast-steel transom gussets and wrought-iron equalizers. Following the builder's standard practice for this type, the cast-steel transom gussets include bearings for swing link pins and brake hanger lugs, thus dispensing

with several small parts which otherwise would be bolted or riveted to the truck frames and transoms.

The gussets have liberal bearings on the frame and each is secured to it by four vertical bolts, tapered for a driving fit, thus making a very rigid connection between the frames and transoms. The transom channels are carried on shoulders provided on the frame center braces, reducing the strain on the rivets through the brace and transom. The rubbing pieces provided between bolsters and transoms prevent the bolsters from cramping or stopping and transmit the strains on the bolster through the transoms to the truck side frames without interfering with the free action of the bolster and springs. The spring system is in accordance with M. C. B. standard practice.

The wrought-iron pedestals are tied together at the bottom by caps and are provided with steel plate wear pieces covering all rubbing surfaces. Safety straps are provided over the top of the bolster, under the spring plank and



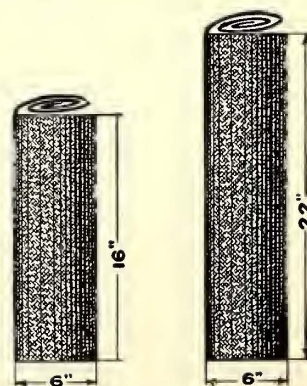
Motor Truck for Milwaukee Northern Railway

brake bottom connections. Each truck is equipped with two 75-hp Westinghouse, No. 112 motors.

The following are the principal data of the truck: Gage, 4 ft. $8\frac{1}{2}$ in.; wheel base, 6 ft. 8 in.; length over all, 10 ft. 6 in.; load carried at center plate, 25,000 lb.; weight without motors, 10,000 lb.; weight without motors, wheels or axles, 6250 lb.; diameter of wheels, 36 in.; diameter of axles, $5\frac{1}{2}$ in.; journals, $4\frac{1}{4}$ in. x 8 in.; frames, 4 in. x $1\frac{1}{4}$ in.; transom channels, 8 in. and 16.25 lb.

ELECTRIC RAILWAY GROUND PLATE

A ground plate in standard sizes with a specified area of plate and size of ground wire especially adapted* for telephone, street railway or electric lighting work is being made by the Federal Electric Company, Chicago. The copper



Ground Plates for Lightning Protection

surface is covered with charcoal for securing the best ground and the plate and the charcoal are incased in a netting which holds the charcoal securely in place while handling, but disintegrates rapidly when installed, allowing the earth to mix with the finely divided charcoal. The heavy copper ground wire is firmly secured to the copper plate through its entire length so that there is no chance for a loose or loose connection. Each complete plate is put up in a cylindrical cardboard case for transport. The plates can be made easily with a standard netting machine so that the labor of installing is light. The manufacturers

suggest that a piece of fiber conduit be used to protect the wire from the ground plate to a point well above the surface of the ground. A rope drain fitted on the post or wall will lead considerable rainwater into this fiber conduit and so direct to the ground plate, insuring moist earth around the plate.

A CROSS-SHAPED METAL TIE

The cross-shaped steel ties and accessories shown in the accompanying illustration were invented for steam and electric railways by John D. Hazlet and Geo. W. Haight, of Franklin, Pa.

Separate ties are used for each side of the track. The ties are held together by through rods inserted in U-shaped slots in the ties below the rails. This construction allows the ties to settle freely in the ballast on each side of the roadbed, as the rods are sufficiently resilient to permit this. Hence the springing customary at the ends of full transverse ties does not occur, as the weight imposed on the cross-formed tie bears equally on the ballast at all points.

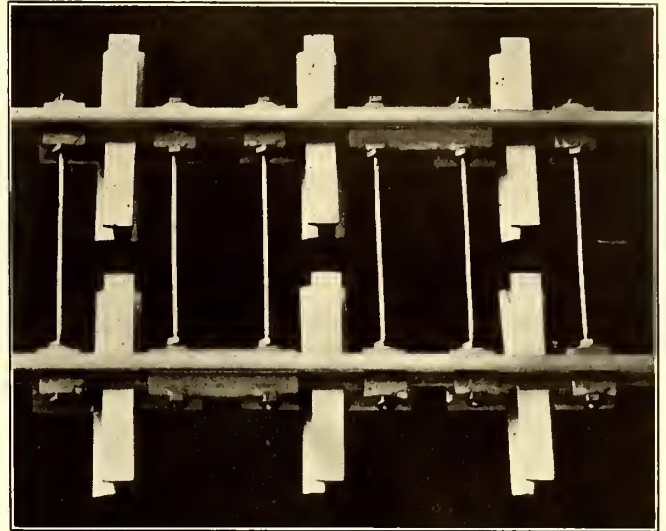
As the ties are firmly ballasted, no longitudinal movement of track can occur to swerve the rods from their position at right angles with the rails and thus change the gage. The lugs or clamps on the inner and outer sides of the rails are V-shaped to conform with the bevel of the rails and ties, so that when the tie rod nuts are screwed rigidly to place, the lugs are forced against the upper (rail) and lower (tie) beveled flanges. The tie rods are far stronger than the usual forms employed.

The cross-form of the ties furnishes a 30-in. support beneath the rails, and as there is a space of only 6 in. between that part of the ties parallel to the rails, the breaking of the latter must necessarily be reduced to a minimum. From this it would appear that this form of construction permits a lighter rail than needed with ordinary ties spaced, say, 24 in.

It is asserted that 1760 of these cross-shaped ties can take the place of 3000 regular steel ties for one mile.

fish plates and avoid creeping. If desired an emboss in the center of fish plates can be employed and a half hole in the ends of rails for a short bolt, thus more rigidly holding the rails at joint without weakening the rails.

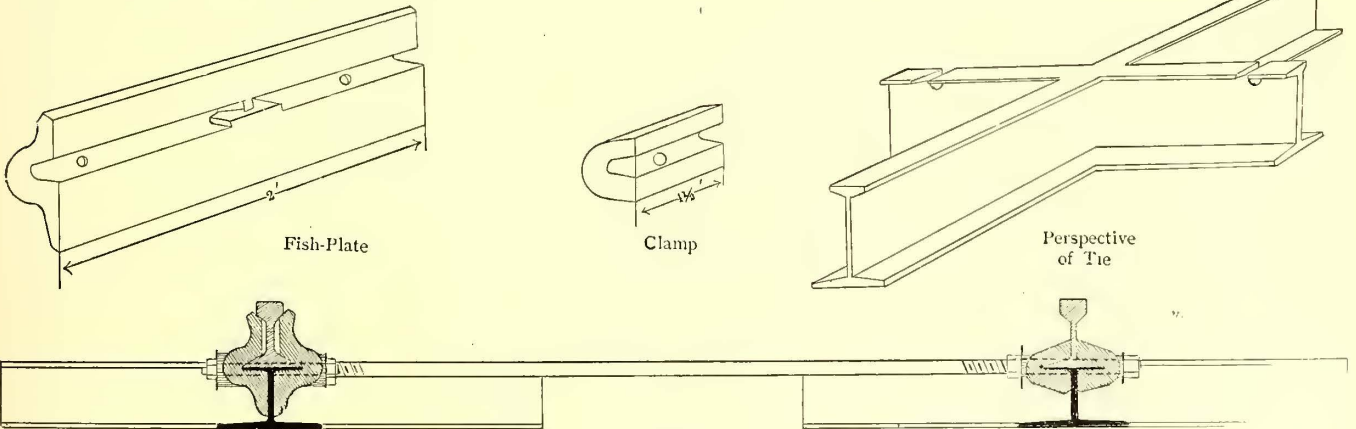
The rails are square notched at the ends so that the notch may fit into the corresponding shoulder in the fish plate. As clamps are used no holes are needed in the ends



View of Rails on Cross-Shaped Ties

of rails for fish plates. The fish plates fit tight between the rail flanges and thus reinforce the rails. The lower side of the rail flanges also has a bearing on the inner central sides of the fish plates. Another advantage of this fish plate over the present style is in repairing. If it is found necessary to use a short section of rail, it can be placed in position much more readily than with the form of fish plate now in use, as no holes need be drilled.

To widen the gage of the road, as at curves, it is necessary only to slack the nuts on the inside of the rails and



Details of Cross-Shaped Tie and Auxiliary Appliances

While the new tie costs more singly, the actual tie cost per mile is less since fewer ties are needed. In fact, the estimated saving in metal over the plain steel tie is figured to be 60 tons per mile. Track creeping is overcome by fish plates, which have an inside shoulder midway between the ends, on which the rail ends impinge. The fish-plate rods are similar to the lug tie rods, and are inserted in U-shaped slots in the ties, thus keeping the fish plates stationary. In expanding and contracting, or from other causes, the rails must abut against the shoulders on the

tighten the nuts on the outside. A special nut lock is used with the tie rods.

The Portland Railway, Light & Power Company, of Portland, Ore., is now running in the daily press of that city a series of bulletins addressed to the public. They are short and to the point and tell about the problems with which the company is confronted and the efforts that are being made to solve them and to furnish service consistent with the public demand.

News of Electric Railways

Chicago Railways Rehabilitation Progress

In a letter addressed to the chairman of the local transportation committee of the Chicago City Council, John M. Roach, president Chicago Railways Company, has presented a concise statement of the work of rehabilitation completed and in progress on the lines of his company. The letter in part is presented:

"Under the new ordinance we constructed, in 1907, 20.428 miles of new track. This track was constructed in accordance with the specifications of the ordinance, using the 120-lb. grooved rail, and No. 1 granite block.

"During the present year, 1908, we have already constructed or now have under construction, 36.302 miles of new track, using 120-lb. grooved rails, and No. 1 granite block.

"Our plans at the beginning of this year contemplated the construction of something more than 65 miles of single track, and up to July 1 we had met our schedule for the accomplishment of this work, but the inability to get granite now seems likely to cut down the season's mileage.

"We have contracts covering sufficient granite, but are unable to get it as fast as our plans called for, and it does not seem likely that the situation will be improved this year.

"The new ordinance requires that in a large territory the electric cables and feeders shall be placed underground during the rehabilitation period. During the present season we have done a large amount of this work, and before the season ends we expect to complete the work of placing 90 miles of underground duct.

"In car station improvement and car shop fitting we have done the following work:

"Armitage Avenue Station—In 1907 and 1908 we have completed seven bays with a capacity of about 77 large double-truck cars.

"Lincoln Avenue Station—The former cable power house at this location, which adjoined a large car barn, has been torn down and plans have been made for a new station covering the entire site. We expect to complete this station this year. It will have a capacity of 95 double-truck cars.

"Leavitt Street Station—The large two-story brick car barn and stable at this location have been torn down. Plans for new buildings have been made and we expect to complete the reconstruction during the present season. The capacity of the new buildings will be 141 double-truck cars.

"Limits Station—We expect to remove all old buildings and build new during the present season. The new station will have a capacity of 85 double-truck cars.

"Madison Street and Fortieth Avenue—The large car barn at this location, having an area of about 106,000 square feet, is being temporarily rebuilt to accommodate the new cars as soon as they are ready for service on Madison Street.

"Car Shops, Located at Fortieth Avenue, between West End Avenue and Park Avenue—A two-story brick shop building 124 ft. x 114 ft. has been raised and in its place on adjoining ground there will be built this season a large, modern car shop of about 165 ft. x 332 ft. The present blacksmith shop and brass foundry will be enlarged and a large storeroom will be erected west of the car shop.

"All of the new buildings are to be fireproof and arranged and equipped in the most approved modern way for storing, cleaning and handling cars.

"New Cars—Six hundred and fifty new "pay-as-you-enter" cars will be added to the system during 1908 and the early part of 1909. Six hundred of these cars are of wood construction and 50 are of steel.

"These cars are to be of the best type and to be equipped with GE-216 A interpole motors. These are the most modern motors now used under cars in city service.

"Several new tools have been placed in the car shops."

After reading Mr. Roach's report the Mayor declared that with the changes made by the Chicago City Railway Company on the South Side, the new through routes and transfers, Chicago would have one of the best street car systems in the world.

The Chicago City Railway has constructed so far this year about 28 miles of track, has completed two car barns and has awarded contracts for the erection of two more. The barns completed are located at Thirty-eighth Street and Langley Avenue and Seventy-seventh Street and Vincennes Road, and those to be built this year are to be at Sixty-ninth and Ashland Avenues and Thirty-eighth and Rockwell Streets. The completed car house has been described in these pages.

Under the ordinances the company is required to reconstruct 60 miles of electric line and 35 miles of cable lines

inside of the rehabilitation period. More than half the work has been completed, but the difficulty to obtain granite blocks has necessitated cutting down of the reconstruction force.

During the year 1907 the City Railway Company expended approximately \$6,000,000, of which amount more than \$2,000,000 was spent for new cars and equipment. The company now has all the new cars required under the ordinances. The rehabilitation work planned for this year will cost about as much as last year, as the estimate for tracks and paving for this year is about \$3,000,000.

The estimate of the expenditures to be made for this year by the Chicago Railways Company is \$7,500,000, of which sum about \$3,000,000 is for new tracks and paving. New cars and equipment will cost about \$3,000,000 more.

Stub-end Terminal for Northwestern Elevated Railroad

On July 17 the Chicago City Council approved an ordinance granting the Northwestern Elevated Railroad Company permission to build a stub-end terminal passenger station on North Water Street with an entrance on Clark Street. Construction work will be started immediately after the acceptance of the ordinance by the railway company. The cost of the proposed structure will be about \$100,000. The ordinance requires the completion of the terminal by December, 1908.

An amendment to the ordinance obliges the Northwestern elevated road to give and receive transfers from all other elevated railroads and to through-route its cars whenever the other roads are required to do so.

The new terminal will make possible an increase in the rush-hour schedule of 15 trains per hour. The company has new equipment under contract and orders, it is said, will be placed for additional cars prior to Jan. 1, 1909.

The effect of added service from this terminal has been discussed by George Weston, consulting engineer in traction matters, as follows: "The company now is entirely dependent on the Wells Street bridge to land its passengers in the downtown district. Should anything happen to the bridge passengers are compelled to get off at the Kinzie Street station. With the proposed stub-end terminal passengers are landed at the end of the Clark Street bridge. They could reload at that station and so cause little inconvenience to patrons.

"In the matter of through routing of trains a terminal such as is proposed is essential. The subway problem is away in the future, and I am of the opinion that by the time it is built the transportation traffic of the city will have increased to such an extent that both the subway and the elevated roads will be needed to take care of it. It is undesirable to build more elevated structures in the downtown district, and I do not think it ever will be permitted."

The Situation in Cleveland

On July 17 Judge Chapman of the Common Pleas Court decided that the Schmidt street railway referendum law is constitutional. The decision was the result of an effort on the part of Frank J. Smith, a broker, to prevent by injunction a vote on the security franchise given to the Cleveland Electric Railway. His attorneys argued that the power to enact legislation was vested in the legislative body, and that the terms of the Schmidt statute are so vague that they cannot be carried out. Reference was made to the fact that the law does not provide specifically for the payment of expenses of an investigation of names on a petition and does not define clearly what is meant by the 15 per cent of the voters required for an election on a franchise question. The court held that the people have a right to vote upon such questions as this, that it is clearly implied that the Council may provide for expenses incurred and that the bill means that 15 per cent of the total number of voters at the last preceding mayoralty election shall be represented on the petition, whether it expressly states this fact or not. Mr. Smith's attorneys have reserved the right to appeal to the higher courts, but Mr. Smith has not defined his course as yet.

A resolution was adopted by the City Council at its meeting last week to the effect that the vote on the security franchise should be taken immediately after the higher courts had rendered a decision as to the validity of the Schmidt referendum law and the Smith suit attacking the

legality of the lease of the property to the Municipal Traction Company.

On July 28 the Municipal Traction Company will begin to issue free universal transfers. No authentic information has been given to the public as to what plans are favored. Conditions indicate a deficit for June, but the amount is a matter of conjecture. With this before them the members of the board hesitate in inaugurating a system that will reduce the income more than \$1,000 a day. On the other hand, they do not want to prevent Mayor Johnson from carrying out his promise of a 3-cent fare and universal transfers.

Councilman E. B. Haserodt is the author of a resolution to reduce the fare to 2½ cents and have all lines end at the Public Square. He stated that the company's normal annual profit, operating at 3-cent fare, is \$300,000 and that as only 15 per cent of the people use transfers the profits should be shared with those who do not use the transfers.

All stops on Euclid Avenue have been numbered. The figures have been hung upon the trolley poles from arms of strap iron, and white bands are painted around the poles above the numbers. Many stops have been abandoned in the city and in East Cleveland. As a result of complaints regarding these and other changes, the Council recently adopted a resolution instructing the company to report all proposed changes to that body.

Arrangements have been completed for convenient collection of fares at Euclid Beach Park. The space where people board the cars has been enclosed and three turnstiles have been placed in position. When passengers enter the cars they hand the conductors their fare as they pass through the stiles. In case they wish to transfer at 105th Street they pay the conductor a penny additional on the car and receive a transfer. The fare from the West Side to Euclid Beach has been reduced from 9 to 6 cents. Under the old management it was 5 cents or a ticket, the same as from any other portion of the city.

Affairs in New York

The Interborough Rapid Transit Company will comply with the order of the Public Service Commission of the First District of New York to install two trial trains made up of side-door cars. They will be running by October 15 and will be composed of eight cars each, of which two in each train will be motor cars. They will be run during the rush hours.

The Public Service Commission of the First District of New York has approved the modification of the lease of the Central Crosstown Railroad, to which that concern and the receivers for the Metropolitan Street Railway have agreed. By the terms of the new lease, which is to last for one year, the receivers will pay the interest on outstanding bonds of the Central Crosstown Railroad, amounting to \$114,600 yearly, as rental, but will be relieved from payment of \$90,000 a year interest on the outstanding stock.

Gen. Benjamin F. Tracy, ex-Secretary of the Navy, has been appointed referee to determine the debt limit of the city. He is directed by Justice Blanchard, of the Supreme Court, to take proof and report in detail what, in his opinion, were the amounts in which the city was indebted on June 30. The appointment was made in the suit brought by Jefferson M. Levy, acting indirectly for Controller Metz, to restrain the Board of Estimate and Apportionment from approving the contracts for the construction of the Fourth Avenue subway, Brooklyn, amounting to some \$15,000,000. Controller Metz declared that the city did not have the money or the borrowing power to certify these contracts.

Theodore P. Shonts, president of the Interborough-Metropolitan Company, denied on July 18 that hereafter August Belmont, chairman of the board of directors of both the Interborough Rapid Transit Company and the Interborough-Metropolitan Company, would no longer be active in the affairs of these companies and that Thomas F. Ryan was likely to succeed him in these positions. These rumors followed the appointment of David W. Ross and Frank Hedley as vice-presidents of the Interborough Rapid Transit Company and the sailing for Europe of E. P. Bryan, president of the company, as noted in the *ELECTRIC RAILWAY JOURNAL* for July 11. Mr. Shonts says that the changes in the personnel of the company have been contemplated for some time, and are made for the purpose of avoiding the duplication of the work. Under the old organization August Belmont was president of the Interborough Rapid Transit Company, Mr. Bryan, vice-president and general manager, and Frank Hedley, superintendent. This, substantially, was the organization in the days of construction and initial operation. Following the Interborough-Metropolitan merger, Mr. Belmont took the chairmanship of the finance committee, Mr. Bryan became president, and Mr. Hedley gen-

eral manager of the Interborough Rapid Transit Company. When Mr. Shonts assumed the presidency of the Interborough-Metropolitan Company the position of chairman of the executive committee of the Interborough Rapid Transit Company was created so that he might obtain direct authority in the Interborough Rapid Transit Company's affairs. This left the executive management of the company with Mr. Shonts, the financial management with Mr. Belmont, and the operating management divided between Mr. Bryan and Mr. Hedley. It is said that it is probable that Mr. Bryan's formal resignation will not be handed to the company for several months. George W. Wickersham, who has been general counsel for the company, has resigned, but his successor has not yet been chosen. A. A. Gardner is retained as general solicitor, and his office has been moved to 115 Broadway, where the Interborough-Metropolitan Company's offices are, and it is said that in the future all the legal business of the company will be handled by its own department.

Southern Pacific Electrification Work Begun.—Work has been begun on the electrification of the ferry lines of the Southern Pacific Railroad at Alameda, Cal.

Pay-as-You-Enter Service Begun in Kansas City.—The new service with pay-as-you-enter cars on the Troost Avenue line of the Kansas City Railway & Light Company, Kansas City, Mo., was begun on July 13.

New Texas Line Opened.—The Texas Traction Company, Dallas, Tex., has placed its line in operation. It extends from Dallas to Sherman, a distance of more than 60 miles, and by its connection with the lines of the Northern Texas Traction Company at Dallas and the Denison & Sherman Railway in Sherman affords a through line 100 miles long.

Pittsburg & Lake Erie Railroad to Electrify Line Out of Pittsburg.—Plans are being prepared by the Pittsburg & Lake Erie Railroad for electrifying its local service in the Beaver Valley. The electric trains will use the regular passenger tracks and, as now contemplated, will stop only at Coraopolis, Monaca, Beaver, Beaver Falls and College.

Ohio State Board of Appraisers of Interurban Railways.—On July 15 the members of the State Board of Appraisers and Assessors of Interurban Railways of Ohio met and organized at Columbus under the statute creating the board, by selecting State Auditor Guilbert as chairman and George Taylor, chief clerk in the auditor's office, as secretary. The board is made up of the State Auditor, State Treasurer and Attorney General.

Girder Rails Ordered for Columbus, Ohio.—The Director of Public Safety of Columbus, Ohio, has adopted a resolution requiring that girder rails be laid on Mohawk Street, between Livingston Avenue and Frankfort Street, and on Fourth Street, between Southwood and Innis Avenues. The streets are now being paved, and this action is taken in accordance with the policy that has been adopted by the city in regard to the type of rail to be used within the city.

Wreck on New York, New Haven & Hartford in Electric Zone.—The White Mountain Express of the New York, New Haven & Hartford Railroad, which left the Grand Central Station at 8:40 on July 16, was wrecked at Greenwich, Conn. The second and third coaches left the tracks, because of a spreading rail, and struck the ties on the bridge over Greenwich Street. The train was drawn by two electric locomotives, but they are in no way held to be responsible for the accident. One person was killed and 26 were injured.

New Tramways Opened in Vera Cruz, Mex.—The Vera Cruz Electric Light, Power & Traction Company, Limited, placed in operation on July 5 its new electric railway in Vera Cruz. S. Pearson & Son, London, Eng., are interested in the property. A feature of the plant is that the generators are operated by six 4-cycle Diesel oil engines supplied with oil from the oil fields of the Pierson firm in Vera Cruz. Three-phase current at 60 cycles and 2300 volts is generated for transmission to the substations. Part of the station is set apart for a storage-battery installation with a capacity of 1000 amp-hours.

Memphis Tax Case Settled.—The Tennessee State Board of Equalization reached a decision on July 16 in the Memphis Street Railway back tax case. Under the decision of the board the company's assessment for 1902 was raised \$200,000, for 1903 it was raised \$500,000, and for 1904 it was raised \$500,000. The case was originally brought by the State revenue agent for West Tennessee, before the trustee of Shelby County, in an effort to back assess the properties of the Memphis Street Railway for the three years indicated. The trustee rendered a decision against the company and in favor of the State, whereupon the defendant company appealed to the State Board of Equalization.

Financial and Corporate

New York Stock and Money Markets

July 22, 1908.

For the week ended July 3, total sales of stocks on the New York Exchange were 861,328 shares; for Tuesday, July 21, the sales were 871,197 shares, and for the day previous almost 1,000,000 shares. This tells the story of the awakening of the stock market. It brings hope to the bullish traders and indicates that public confidence is again beginning to assert itself in the stability of railroad and industrial securities. This activity is accompanied by an advance in prices that is gradual in most cases, but sensational in a few. There is no rush to buy throughout the list, but there appears to be a quiet absorption by investors of stocks that have been cheap. Such a condition is healthy. It is far better for Wall Street than the reckless plunging and manipulation which have been responsible for many active markets with high price records. Dividend paying and dividend promising securities are being bought, but in small blocks. During the week ended July 21 little happened in the financial world to affect securities one way or the other. Crop news continued to be of a very satisfactory character and money was abundant in this country and Europe. Demand funds were quoted at 1¼ and 1½ per cent. The call of the Government for cash and the July dividend disbursements caused no disturbance and there was optimistic feeling in all lines of trade. These factors tended to a betterment of conditions generally. Westinghouse common, which was inactive at about 55 on July 14, touched 75½ on July 21 with sales of 12,170 shares. The preferred, while much less active, recorded an advance of 13 points. This, of course, is taken to mean that there is no longer any question of the harmonious reorganization of the company with sufficient capital for all of its requirements. Steel common continued to move upward.

Other Markets

While there was limited trading in traction stocks in the Boston market, prices were well maintained and more interest was developed. Boston Suburban Electric preferred sold at about 56. Boston & Worcester preferred was about 53 and Massachusetts Electric preferred 48. In the Philadelphia market Philadelphia Rapid Transit and Union Traction displayed a tendency to sag during the week ended July 21 on rather free selling by local holders. Rapid Transit sold as low as 13¾ and closed at 14, a decline of 1⅛ points from the week previous. Union Traction closed at 48¾.

In Chicago City Railway shares sold at 182 and Chicago Subway at 21. Other issues were quiet. Among the bonds Chicago Railway firsts were quoted at 90.

In Baltimore the most active issue was Baltimore Electric 5s, of which 35,000 were sold on July 21 with the closing price at 88. United Railways stock was nominal at 11, while there was some trading in the bonds, the 4s being quoted at 87 and the funding 5s at 78¾.

Washington, Baltimore & Annapolis pooling certificates furnished a large part of the trading on the Cleveland Stock Exchange, the bid price increasing from 9½ on Wednesday to 10¾ on Friday. Cleveland Railway reached 92¾, but only one or two trades were made. Small lots of Aurora, Elgin & Chicago preferred changed hands at 75.

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

	July 14.	July 21.
American Railways Company, Philadelphia.....	a44¾	a44½
Boston Elevated Railway.....	133¾	135
Brooklyn Rapid Transit Company.....	49¾	51¾
Chicago City Railway.....	a185	a180
Cleveland Railway.....	a93	a92¾
Consolidated Traction Company of New Jersey.....	a70	68
Consolidated Traction Company of New Jersey, 5 per cent bonds.....	a103	103½
Detroit United Railway.....	38	39½
Interborough-Metropolitan Company.....	11	11¾
Interborough-Metropolitan Company (preferred).....	30	32
Manhattan Railway.....	a138	a139
Massachusetts Electric Companies (common).....	9½	9
Massachusetts Electric Companies (preferred).....	46	47
Metropolitan West Side Elevated Railway, Chicago (common).....	a13½	a15
Metropolitan West Side Elevated Railway, Chicago (preferred).....	a48	a50
Metropolitan Street Railway.....	25	26
North American Company.....	63¾	64¾
Philadelphia Company, Pittsburg (common).....	39½	39
Philadelphia Company, Pittsburg (preferred).....	40½	41
Philadelphia Rapid Transit Company.....	15½	14
Philadelphia Traction Company.....	89	89½
Public Service Corporation, 5 per cent collateral notes.....	a98	a96¾
Public Service Corporation, certificates.....	a70	a70
Twin City Rapid Transit Company, Minneapolis (common).....	a90½	a91½
Union Traction Company, Philadelphia.....	50	48¾

a Asked.

Proposed Mortgages of Brooklyn Rapid Transit Subsidiary Lines Disapproved

The New York Public Service Commission, First District, has declined to approve the creation of mortgages by two subsidiary roads of the Brooklyn Rapid Transit Company. The report was written by Commissioner McCarroll and states in part:

"These proceedings come before the commission upon the request for consent of the commission to the issue of mortgages as follows:

"(1) By the Nassau Electric Railroad of a mortgage to the Central Trust Company, as trustee, dated March 29, 1907, to secure \$5,000,000 of demand certificates issued and to be issued by said Nassau company, bearing 6 per cent interest, proceeds being applied to improvement of the property of the Nassau company; the petition is verified June 12, 1907, and was presented to the former Board of Railroad Commissioners.

"(2) By the Brooklyn Union Elevated Railroad of a mortgage to the Central Trust Company, as trustee, dated March 29, 1907, to secure \$20,000,000 of demand certificates of that company issued and to be issued, bearing 6 per cent interest, proceeds being applied to payment of debts of said company and the improvement of its property; this petition is verified June 12, 1907, and was presented to the former Board of Railroad Commissioners.

"The proposed mortgages were submitted with the petitions to the former Board of Railroad Commissioners; the applications were not acted upon by that board, and by the operation of the Public Service Commissions Law the proceedings have been continued and hearings had before this commission. The Brooklyn Rapid Transit Company, by Exhibit No. 4, in evidence Aug. 14, 1907, in the investigation by this commission of the Interborough-Metropolitan Company and the Brooklyn Rapid Transit Company, was shown to be the holder of securities of the two companies herein *as follows:

	Amount issued	Brooklyn Rapid Transit Co. holds
<i>The Nassau Electric Railroad:</i>		
Common stock.....	\$8,500,000.00	\$8,499,700.00
Preferred Stock.....	6,500,000.00	6,367,075.00
Bonds.....	15,000,040.00	379,000.00
Certificates of indebtedness.....	3,129,808.89	3,129,808.89
<i>Brooklyn Union Elevated Railroad:</i>		
Common stock.....	13,000,000.00	12,530,030.63
Preferred stock.....	5,000,000.00	4,785,485.39
Bonds.....	23,000,000.00
Certificates of indebtedness.....	7,206,802.21	7,206,802.21

"It appears from the proposed mortgages which, upon these applications, the commission is asked to approve, and from other information herein, that the Brooklyn Rapid Transit Company, on or about July 1, 1902, executed to the Central Trust Company, as trustee, its 100-year mortgage to secure \$150,000,000 of its bonds, and that in connection with the mortgages, which the commission is now asked to approve, the Brooklyn Rapid Transit Company, the Nassau Electric and the Brooklyn Union have entered into an agreement of even date, which is recited in the mortgages, by the terms of which demand certificates, to be secured by these mortgages, have been issued by the Nassau Electric to the amount of \$716,489, and by the Brooklyn Union to the amount of \$267,170, both of which amounts of these certificates have been already taken by the Brooklyn Rapid Transit, and that the total amount already issued and to be issued of these demand certificates by the Nassau Electric is \$5,000,000 and by the Brooklyn Union is \$20,000,000; that the Nassau Electric and the Brooklyn Union undertake to sell the entire issue of their certificates to the Brooklyn Rapid Transit, and the latter company undertakes to purchase the same at any time within 10 years, the purchase price of each such certificate to be the principal amount thereof; that the Brooklyn Rapid Transit is then to deliver the demand certificates so taken to the Central Trust Company and receive from that trust company authentication and delivery to it of 100-year bonds of the Brooklyn Rapid Transit Company secured by its \$150,000,000 mortgage, the principal amount of which bonds are not to be greater than the demand certificates of the Nassau company and the Brooklyn Union Elevated Company so delivered to it.

"The control of this commission, under Section 55 of the Public Service Commissions Laws, does not extend to the issuing of notes or evidences of indebtedness payable at periods of not more than 12 months after their date. It seems to me that the issue of demand certificates, if secured by the mortgages above mentioned and the pledging of such certificates as security for the issuing of 100-year

bonds of the Brooklyn Rapid Transit Company, is an evasion of the provisions of Section 55 of the Public Service Commissions Law, and that as it is the duty of the commission to carry out the provisions of that law according to their true intent, and to supervise the capitalization of all public service corporations subject to its jurisdiction, the commission should refuse its consent to these mortgages. The plan of mortgaging a street railroad to secure demand certificates and pledging the same for long-time bonds may easily be availed of to nullify or seriously impair the power of the commission to supervise the capitalization of public service corporations."

The following statement was given out at the office of the Brooklyn Rapid Transit Company after the refusal of the commission to grant the application:

"We have not seen a copy of the commission's opinion, but we are advised that their decision is based not on any doubt as to the propriety of the expenditures heretofore made or proposed to be made nor upon any question involving the amount, character or necessity of the mortgages, but solely upon the consideration that the certificates of indebtedness which the mortgages are proposed to secure should not be payable on demand, but should run for a term of years. The significance of this is that if the certificates of indebtedness did run for more than one year they would come under the direct and specific jurisdiction of the Public Service Commission for the First District from month to month as they are issued.

"We volunteered to afford the commission every opportunity to examine our books and vouchers and to inspect the certificates from time to time as they are issued so that it might keep in touch with the purposes for which money was expended and the character of the charges on our books, but we refused to change the time of maturity of the certificates of indebtedness for financial reasons, which were fully set forth before the commission.

"In order that these reasons may be appreciated, it is necessary to describe the method of financing employed by the Brooklyn Rapid Transit Company and its constituent companies since July 1, 1902 (the date of its new refunding mortgage), which is as follows:

"As the constituent companies require money from time to time for additions and improvements, the expenditures are made by funds borrowed from the Brooklyn Rapid Transit Company, the latter company taking the certificates of indebtedness of the railroad companies as acknowledgment of their obligation. The Brooklyn Rapid Transit Company, on the other hand, having purchased these certificates of indebtedness, deposits them with the Central Trust Company of New York, as trustee of its first refunding mortgage, and receives Brooklyn Rapid Transit 4 per cent bonds in exchange therefor. As opportunity presents itself from time to time these bonds are sold and the proceeds are used in making further advances of the kind hereinabove outlined to the constituent companies. It is provided in the first place in the certificate of indebtedness that they should not be sold at less than par and that they should represent the actual cost of all additions and improvements. The Brooklyn Rapid Transit Company's mortgage provides that in case the bonds are sold for less than par the discount must be made up out of the earnings of the company. For the Brooklyn Rapid Transit Company has, therefore, for several years been in the position of purchasing at par certificates of indebtedness of its constituent companies representing expenditures at par and of selling its own 4 per cent bonds at considerably less than par, making up the difference as required by the mortgage out of its earnings. This system of financing, while a burden on the Brooklyn Rapid Transit stockholder, is particularly conservative from the point of view of the bondholder and the public.

"The 4 per cent bonds of the company not only represent at par an actual investment of that amount, but an additional amount equivalent to the discount.

"Five years before the Public Service Commission was created, this system was adopted and the interest of the bondholder was further protected by making the certificates of indebtedness payable on demand so that any time in case of financial trouble overtaking the companies to which advances had been made, the trustee of the bonds would be able immediately to enforce payment, or at least to command, so far as possible, the financial situation of those companies; whereas, if the certificates were payable at some future time no remedy or redress would be possible until the maturity of the notes. In addition, and largely at the suggestion of the committee on Stock List of the New York Stock Exchange, it was proposed to have each railroad company mortgage its property to the Central Trust Company of New York, as trustee, in order to secure the payment of its certificates of indebtedness, and such mortgages have been issued with the approval of the former

railroad commission where it was required, except in the case of the Nassau and Brooklyn Union Elevated companies, the applications of which were made to the former board of railroad commissioners near the end of their official term and were referred to the present Public Service Commission for the First District.

"So far as the railroad companies themselves are concerned, the relation which the Brooklyn Rapid Transit Company bears to those companies as stockholder is the best guarantee that the demand feature of the obligations would not be used unreasonably to embarrass the borrowing company. The demand character of the notes permits of a reduction of rates of interest from time to time as money may be easier, leaving the companies free to borrow money elsewhere at lower rates of interest should the Brooklyn Rapid Transit Company not be willing to reduce the rate on outstanding certificates. Moreover, each of the companies in question has considerable real estate and other property which from time to time is likely to be sold, and the proceeds of which, under the elastic arrangement which prevails, may be immediately applied in paying off outstanding certificates of indebtedness without necessitating the tying up of money until the certificates might mature in case they were issued for a specified term. As a matter of fact, considerable money from such sources has already from time to time been credited upon the certificates of indebtedness.

"Inasmuch as the commission has given the entire year to the consideration of these applications, it is to be presumed that it has not reached any hasty conclusion, but the decision would appear to be based more upon the desire to enforce jurisdiction beyond the point where it is now limited by law than from a regard for the best interests of the public and the bondholders. What the effect will be it is impossible now to predict. If it should embarrass the companies in procuring money for necessary improvements, the public and not the stock and bondholders will be the immediate sufferers. The commission had before it an opportunity to approve a method of financing unusually conservative in the safeguards which it established against the issue of obligations for less than par or for any capital expenditures other than purely construction purposes and it has chosen to discourage that method for reasons which may be satisfactory to it, but will hardly be satisfactory to investors and the public. The best evidence that the method devised was not intended as an evasion of the Public Service Commissions Law is the fact that it was put into effect after very careful consideration several years before that law was enacted or even suggested.

"The applications to the commission were not made under the new Public Service Commissions Law, but under Section 4 of the Railroad Law, and in the opinion of the company's counsel the commission has no authority to base its refusal to approve mortgages upon the grounds set forth."

Separate Receiver for New York City Railway

Adrian H. Joline and Douglas Robinson, receivers of the New York City Railway and the Metropolitan Street Railway, were appointed on July 16 by Judge Lacombe independent receivers of the Metropolitan Street Railway, and at the same time the court appointed William W. Ladd receiver of the New York City Railway. The court directs Messrs. Joline and Robinson, as receivers of both companies, to file by Aug. 1 an epitome of receipts and expenditures up to July 1. They are also directed to turn over at midnight of July 31 all the property of the Metropolitan Street Railway to themselves and that of the New York City Railway to Mr. Ladd.

On the subject of creditors' claims Judge Lacombe says: "In order to relieve apprehension on the part of receivers' creditors it may be proper here to state some elementary propositions. The entire system as a going concern was placed in the hands of this court on the application of a creditor of the lessee, but with the assent of both companies and the subsequent approval of the representatives under lessor's mortgages. Its possession of the property was confirmed by the United States Supreme Court. Since that date it has been absolutely necessary for the court to operate the road as an instrumentality of public service. In order to do so it was necessary to make purchases of equipment, materials, supplies, etc., some of which were on credit. In the course of operation accidents have occurred through the negligence of employees, and those injured thereby in person or property have a cause of action against the receivers. Future operation will produce like results.

"All indebtedness incurred and all damages sustained by reason of the operation of the property by the court will be paid or secured before the court parts with the property,

and it need make no difference to the creditor or claimant which receiver was operating the road at the time. The receivers of the Metropolitan Street Railway will adopt and affirm all contracts concerned with the operation of the system which were adopted or entered into by receivers of the New York City Railway and the court reserves the right to impose a lien upon the property itself for any obligations incurred by the court in its operation; and also for the expenses of court proceedings. An obligation incurred or damage inflicted by receivers when operating under the New York City Railway lease must, of course, be paid from its income or property, but in the event of these proving insufficient then out of the income of the Metropolitan Street Railway receivers and failing that out of the property itself. Presumably the income of each will be sufficient to pay its own expenses, but all creditors of and claimants against the court's officers may be satisfied that whatever may be found to be rightly due them will be paid."

Referring to the foreclosure suits instituted by the Morton Trust Company and the Guaranty Trust Company, Judge Lacombe says: "It is fitting that the property covered by that mortgage (the Morton Trust) should be taken over by receivers under that suit, who will thereafter operate the Metropolitan Street Railway." He says in addition that the loss of the Third Avenue Railroad disrupts the whole system covered by the lease, and "surely the 'deferred payment' clause cannot survive under such conditions."

Chicago & Milwaukee Electric Railroad Receivership

On July 11, in a letter addressed to the stockholders, bondholders and creditors of the Chicago & Milwaukee Electric Railroad, A. C. Frost, former president, replied to criticisms made in a report of Arthur Young & Company, receivers' accountants, addressed to Judge Grossep, of the United States Circuit Court. Mr. Frost said in part:

"The financial and industrial conditions have been such as seriously to affect the earnings of all transportation companies, and this property has suffered greatly from that source in common with others. Yet with all this, the actual receipts from the date of the receivership—Jan. 28, 1908—to May 31, 1908, were \$150,851. Mr. Young's report shows a net income of only \$9,809.

"The statement that the freight was charged at twice the price it should be is false. All freight was charged at regular established tariffs, and gravel, including freight, was sold to the public at from \$1 to \$1.10, and to the construction company at 70 cents a cubic yard.

"The statement that the floating indebtedness of the company is \$2,169,100 is incorrect and misleading.

"The receivers are charging and receiving a minimum of 60 cents per cubic yard for freight on gravel, and the freight rate of the steam roads is considerably higher. It is the practice of practically all the railroads in the country to charge the regular tariffs for transporting construction material—and, in fact, compulsory under the Interstate Commerce Act.

"Regarding the passenger earnings, the checks sent from my office were for transportation given away and sold at the Chicago office, and for the purpose of assisting the property during its construction stages, and I believe I was justified in giving the company every benefit during that period.

"The report omits the interest charges for the capital invested in carrying on the construction work until the sections were turned over to the railroad company for operation, which is a legitimate and just charge, taken into account by every contractor doing large construction work. It also omits about \$2,000,000 of other equally just charges. An honest investigation of the cost of construction and of acquiring the rights and franchises will disclose the fact that every dollar of the proceeds from the sale of bonds is accounted for."

Mr. Frost is also quoted as saying that the report discredits and belittles the property and that he will answer the report in detail later.

Boston & Worcester Electric Companies, Boston, Mass.—The stockholders of the Boston & Worcester Electric Companies at a special meeting on July 15 authorized the directors to issue \$600,000 three-year 6 per cent notes, to be secured by a deposit of a majority of the shares of the Boston & Worcester Street Railway now in the treasury of the Boston & Worcester Electric Companies.

Cincinnati (Ohio) Traction Company.—The city auditor has examined the books of the Cincinnati Traction Company to ascertain the amount of taxes due the City of Cincinnati for April, May and June. He found that there had

been a decrease of \$12,661 in the gross earnings of the company for the time as compared with the same period last year. The rate of tax paid to the city is 6 per cent. The figures reported are as follows:

	Gross Earnings	Amount of Tax
April	\$359,112	\$21,547
May	392,497	23,549
June	386,364	23,182

Total \$1,137,973 \$68,278

The gross earnings for the three months in 1907 were \$1,150,634, and the amount received by the city was \$69,038.

Delaware & Hudson Company, New York.—Allotments were made last week to the subscribers to the \$13,000,000 4 per cent bonds of the Delaware & Hudson Company purchased by Kuhn, Loeb & Company and the First National Bank, New York. Many subscribers received but 10 per cent of their allotments, but a larger proportion than this is understood to have been allotted on subscriptions which were regarded as strictly for investment. The entire issue, it was said in banking circles, was six times oversubscribed.

Fulton Street Railway, New York.—Gilbert H. Montague was appointed receiver for the Fulton Street Railway by Justice Blanchard in the Supreme Court on July 15. The suit was brought by the Guaranty Trust Company through Davies, Stone & Auerbach, to foreclose a mortgage made Nov. 1, 1895, on which had been issued \$500,000 first mortgage 4 per cent gold bonds.

Michigan United Railways, Lansing, Mich.—Sperling & Company received subscriptions in London from July 6 to 8, inclusive, at the price of £98 per \$500 bond, for \$1,000,000 first and refunding mortgage 30-year 5 per cent gold bonds, dated May 1, 1906, and due May 1, 1936, total authorized amount \$12,500,000; heretofore issued, \$1,900,000. Denominations, \$1,000, \$500 and \$250. Interest payable by coupon May 1 and Nov. 1 in New York or in London at the National Provincial Bank of England, at the rate of exchange, \$4.86. The company has sold this \$1,000,000 additional bonds for the purpose of providing the necessary funds to build an extension from Lansing to Jackson.

Philadelphia Company, Pittsburg, Pa., has placed with the Union Trust Company, Pittsburg, an issue of \$2,500,000 10-year notes. The proceeds of this issue are to be used for improvements which the company has undertaken. The Philadelphia Company is controlled through stock ownership by the United Railways Investment Company, which also owns the United Railroads of San Francisco.

Rochester, Charlotte & Manitou Railroad, of Rochester, N. Y., was sold at auction on July 21 for \$12,000, to Kendall B. Castle, a local lawyer, on a foreclosure action brought by bondholders. It is generally supposed that Mr. Castle represents the Mohawk Valley Company.

Tarrytown, White Plains & Mamaroneck Railway, New York.—Sutro Brothers & Company, New York City, representing the largest interest in the company's first-mortgage bonds, urge the bondholders to deposit their bonds at once. They say: "In view of the court's authorization of receivers' certificates to take precedence over the first-mortgage bonds, also statements by the receivers' attorney in court of the property's operation at great loss, and of the early necessity for additional receivers' certificates for defraying operating expenses, also the large amount of unpaid accumulated taxes, which already possibly take precedence over the mortgage, and in view of the fact that on July 15, 1908, a motion was made before the Supreme Court to give up certain important franchises (included under the mortgage) of the railway company on the Boston Post Road, covering a gross distance of about 4 miles, the undersigned, representing the largest interest in these bonds, urgently request the immediate deposit of the above bonds." The Knickerbocker Trust Company, as trustee of the mortgage, also requests to be advised without delay of the wishes of the bondholders.

Toledo Railways & Light Company, Toledo, Ohio.—This company in an answer to a suit filed by the German National Bank of Ft. Wayne to collect \$5,000 on a promissory note, asks \$7,000 damages for the conversion of the company's bonds to that amount, which had been given the bank for an extension of time on the \$5,000 loan.

Tri-City Railway & Light Company, Davenport, Ia.—This company has filed for record at Hartford, Conn., a certificate of an increase in its preferred stock \$215,000.

Washington, Frederick & Gettysburg Railway, Frederick, Md.—This company has purchased the Monocacy Valley Railroad, and Chas. Wertheimer and A. C. McBride, of the Washington, Frederick & Gettysburg Railway, have been elected directors of the Monocacy road.

Traffic and Transportation

Creation of District Railway Commission Not Approved

The creation of a District Railway Commission by the Interstate Commerce Commission has not met with the approval of the companies operating in Washington, D. C. The Interstate Commerce Commission has been given jurisdiction over the street railways of the District of Columbia by a law passed by Congress and approved on May 23, 1908. The Interstate Commission, however, has created a subsidiary board to act in matters affecting street railways within the district, holding that it has the right to do so under the law.

It appears that the companies have taken the position that when notified by the Interstate Commerce Commission of a specific complaint they will act as required by law. This position has been announced by the Capital Traction Company and the Washington Railway & Electric Company.

The electric railway companies in the district have been notified by the District Railway Commission of the appointment of H. C. Eddy as executive officer, and asked to have him recognized in the investigation of all complaints placed before the commission. Mr. Eddy will take up each complaint with the railway companies involved, and if a satisfactory arrangement can be made without a public hearing, he will report to the commission, and it will take the necessary action to bring the matter to a conclusion.

Recommendation by Massachusetts Commission to Lessen Accidents

As a result of street railway accidents during the past few months, which have resulted in a loss of life, owing to the absence of signals, the Massachusetts Railroad Commission has issued the following recommendation which will be sent to all street railways operating in the State:

"The board recommends that every car followed by another car having the same rights over opposing cars to specified meeting points shall carry upon the front end conspicuously displayed signals of proper design and character to indicate that fact and that the crew of every such car carrying these signals should direct the attention of the crew of every opposing car to such signals, to the end that the crews of opposing cars may have full and complete information of a clear track before proceeding.

"Regarding the disastrous accident at Williamstown on June 30, 1908, which was investigated by the board, the commission finds an inexcusable disregard of the safety of the public on the part of the officials and recommends immediate and thorough action by the management that all cars be properly equipped, and to provide the requisite supplies to keep the equipment up to the standard of Massachusetts laws."

Transfer Decision in Shreveport, La.

A decision involving the right of a city to require the issue of transfers was recently decided by the Louisiana Supreme Court in the case of the city of Shreveport vs. the Shreveport Traction Company. The case originated in an ordinance passed by the city to compel the street railway company to grant transfers from one line to another, and in which the city was enjoined from an enforcement. The case was finally appealed to the Supreme Court, which rendered its report June 29. The following extract from the syllabus states the position taken by the court:

"The city of Shreveport had the power to grant the street railway franchise and to fix the rates of fare by agreement with the railroad company, and this contract precluded the municipality from lowering the rates during the life of the franchise. A contrary theory would leave the street car company at the mercy of every successive council and would render the construction of street car lines impracticable as a business investment."

This is the final adjudication of the case, as the Supreme Court refused a rehearing on the application of the City Attorney.

Freight Right Granted in Richmond, Ind.—The Indiana, Columbus & Eastern Traction Company, Cincinnati, Ohio, has been granted permission to operate freight cars over its Dayton & Western division in Richmond, Ind.

Destination Lights in Milwaukee.—John I. Beggs, president of the Milwaukee Electric Railway & Light Com-

pany, Milwaukee, Wis., has approved of the suggestion that the cars on the different lines of the company be distinguished by colored destination lights.

Train Operation Out of Los Angeles.—The Los Angeles & Redondo Railway has completed the first of the six new multiple unit passenger coaches and has also equipped two of its regular cars with the multiple-unit system and is preparing to operate trains on the Pacific Electric Railway and Los Angeles-Pacific Railway.

Excursion for Children at Ft. Wayne.—The Ft. Wayne & Wabash Valley Traction Company on July 15 gave the children free transportation to and from the company's Robinson Park. This is an annual event. Children to be carried free were required to board cars at the transfer corner in the center of the city between 9 a. m. and 2 p. m., and in returning to leave the park between 2 and 6 p. m. All adults were required to pay the regular fare.

Ban on Big Bundles in New Jersey.—Cellos, French horns, drums, bass viols and other bulky musical instruments will be included in the same class with dogs after Aug. 1 on the cars of the Public Service Corporation of New Jersey, and their owners will be obliged to take out permits for them in order to carry them upon the cars of the company. None of these instruments will be allowed on the trolleys in rush hours. Newark and Hoboken, which support many bands and orchestras, are said to be the cities responsible for this ruling by the company.

Special Committee of Youngstown (Ohio) City Council and Local Railway Agree on Fares.—In return for an extension of its franchise for 25 years, the Mahoning & Shenango Valley Railway & Light Company has agreed with a committee of the Youngstown Council to sell 25 tickets for \$1, with universal transfers, to improve the service within the city, extend some of its lines and pay half the cost of the proposed viaduct over Spring common. The topography of the city makes the operation of cars costly and difficult and the officers of the company felt that this should be taken into consideration in the requirements for a reduced fare. The matter has been before the public for more than a year.

Steam Railway Meets Fares of Electric Roads.—The Cincinnati, Hamilton & Dayton Railroad has made a round trip rate of 50 cents between Findlay and Toledo, Ohio, in competition with the electric railways, and has put a special train into service which leaves Findlay at 6:15 a. m. and reaches Toledo in time for the outgoing boats and excursion steamers. There are now four lines between Toledo and Findlay—the Cincinnati, Hamilton & Dayton Railroad, the Ohio Central Railroad, the Toledo Urban & Interurban Railway or Toledo, Bowling Green & Southern Traction Company and the Toledo, Fostoria & Findlay Railway, the last having been opened a few days ago. It is believed that the other three lines will make rates equally as favorable as that announced by the Cincinnati, Hamilton & Dayton Railroad.

Accident on South Side Elevated Railroad.—On the morning of July 18 a train on the South Side Elevated Railroad in Chicago became unmanageable and ran into, demolished and passed partly over a bumping post at the Jackson Park terminal. The accident took place about 4 o'clock. There were about 30 passengers on the train, which had three cars. The motorman has since confessed that he fell asleep and therefore did not apply the brakes in time. On examination the brakes were found to be in good order. The front truck of the first car, the smoker, was ripped from its fastenings and derailed. The truck then was driven back almost to the center of the smoker, and the front platform of the car was practically demolished. The front part of the car slid over the bumper and rested with about 10 feet projecting into air. The brakes had been in good condition at a station just a few blocks away. Seven passengers were injured, none fatally.

Interstate Commerce Decision in New Jersey Case.—The Interstate Commerce Commission has handed down a decision regarding the complaint of the Rahway Valley Railroad, operating 12 miles of track between Summit and Elizabeth, N. J. This company complained that the Delaware, Lackawanna & Western Railroad would not grant the smaller line proper connections at Summit for passenger and freight facilities. The decision states: "It is ordered that the defendant, the Delaware, Lackawanna & Western Railroad, be and is hereby notified and required to construct on or before Dec. 1, 1908, and maintain and operate during a period of not less than two years a connection with the transfer of freight, from the existing siding leading to the ice house and the coal dock thereon of said Delaware, Lackawanna & Western Railroad to the line of the complainant, the Rahway Valley Railroad, in Summit, N. J.,

and in the opposite direction, but the expenses of such connections shall be borne by said complainant."

Reported Change of Route of Dayton-Toledo Limiteds.—F. W. Adams, general manager of the Toledo, Fostoria & Findlay Railway, states that he is not aware of any plan of the Western Ohio Railway to operate the through Dayton-Toledo limited trains over the Toledo, Fostoria & Findlay Railway instead of the Toledo, Bowling Green & Southern Traction Company's line, as has been reported. Since the establishment of the through fast line the Toledo, Bowling Green & Southern Traction Company has been used as the northern end and has served as a Toledo terminal. A report was circulated a few days ago to the effect that arrangements had been made to use the new Toledo, Fostoria & Findlay line and that plans were under way for the construction of a road from Fostoria to Fremont, so that a through line could be established between Cleveland and Dayton, the Lake Shore Electric being utilized between Cleveland and Fremont. The right of way for the Fostoria-Fremont portion of the line was secured some time ago, but the financial depression caused action to be suspended for the present.

New York Company Given Right to Increase Fare.—Owing to the failure of the town and village authorities to agree with J. Addison Young, receiver of the Tarrytown, White Plains & Mamaroneck Railway, Justice Morschauer, at Mamaroneck, N. Y., on July 15, announced that he would probably grant the application of Mr. Young for permission to increase the fare to 10 cents. This means that the fare will be 5 cents to the Mamaroneck village line and that after the cars leave that point the company will collect 5 cents more. The increased fare will go into effect as soon as the order is signed. Justice Morschauer said, however, that he would stipulate that the company must issue coupons good for 5 cents to each passenger paying a 10-cent fare so that if the case should be decided against the company on appeal the passengers can get back the extra 5 cents. The application for the increase was based on the report of a referee who found that the company was bankrupt and was running from \$800 to \$1,000 a month behind. It was stated that if the increase was not granted, traffic would probably be suspended, to the detriment of all concerned.

East Boston Service Declared Satisfactory.—The Massachusetts Railroad Commission has issued the following finding in regard to the service upon the Boston Elevated Railway in East Boston: "Complaints of service upon the Boston Elevated Railway in East Boston were made to the board on three occasions in 1907, and a thorough investigation of street railway conditions in that section of Boston was made. The board has kept a careful oversight of conditions since, and in connection with the present petition has again investigated the entire situation. It appears that for a season after the conflagration at Chelsea the service of the company in and through East Boston was seriously disarranged by congestion of travel. This in considerable measure accounts for the complaints made at the last hearing. Apart from these extraordinary conditions there have been delays which must necessarily attach as a contingency of operation. Viewing the situation as a whole, and having in mind the fact that the Chelsea travel is now normalized, the board is of the opinion that the company is now rendering a reasonably satisfactory service in this section of the city."

Massachusetts Railroad Commission Issues Findings in Northampton and Williamstown Accident Cases.—The Massachusetts Railroad Commission has issued two findings in regard to the collisions which occurred on the Northampton Street Railway on May 17, and on the Berkshire Street Railway on June 20, 1908. In the former case the board finds that the crew of a regular car which passed another regular car at a turnout without notifying the second car that a work car was following were to blame for the collision of the second regular car and the work car, and that the company was at fault in the failure to provide front end signals on a car followed by another car having the same rights over opposing cars, to the end that the crews of opposing cars should have full and complete information as to the track before proceeding. In regard to the Berkshire accident, which was a rear end collision of a regular and a following extra car during a period of darkness in which the crew of the first car were trying to repair a broken trolley rope, the board finds that the crew of the first car were at fault through failure to obey the company's rule requiring the motorman and conductor to go in opposite directions and signal approaching cars to stop, in the event of a collision being possible, and that the company was at fault through the failure to provide markers or marker hangers and lamps lighted by other than electric current, on the rear ends of its interurban cars.

Personal Mention

Mr. Moritz Thompson has been elected president of the United Railways Company, Portland, Ore., to succeed Mr. W. L. Benham.

Mr. T. G. Seixas, Philadelphia, Pa., has been appointed general manager of the Pacific Traction Company, Tacoma, Wash., to succeed Mr. B. S. Weeks, who resigned from the company about a year ago.

Mr. Joseph Seep, Titusville, Pa., has been elected president of the Citizens' Traction Company, Oil City, Pa., to succeed Mr. J. F. Heyward, who, as noted elsewhere in this column, has been appointed vice-president and general manager of the Maryland Electric Railways, Baltimore, Md.

Mr. John Powers has been appointed chief engineer of the Winnibago Traction Company, Oshkosh, Wis. Mr. Powers was for five years superintendent of the Sterling, Dixon & Eastern Electric Railway, Sterling, Ill., and later took charge of overhead construction for the Milwaukee Electric Railway & Light Company. Subsequently he became superintendent of overhead construction for the Illinois Traction Company at Galesburg, Ill.

Mr. Paul E. Mitchell, whose appointment as superintendent of power of the Birmingham (Ala.) Railway, Light & Power Company was noted in the issue of the *ELECTRIC RAILWAY JOURNAL* for July 18, for the last four years was general superintendent of the Knoxville Railway & Light Company, Knoxville, Tenn. Mr. Mitchell has been in the employ of the Newman interests for 12 years, six of which he was chief engineer of power stations of the New Orleans Railway & Light Company, and two in charge of their oil fields interests.

Mr. Hugo Fuchs has resigned as assistant engineer of electric designs of the New York Central & Hudson River Railroad, to take effect Sept. 1. Mr. Fuchs was on the electrical engineering staff of the New York Central & Hudson River Railroad the last four years in charge of power station, railway and lighting engineering and construction work. For about one year he was in charge of the research corps with special reference to the Croton-Albany electrification. Mr. Fuchs was graduated from the Francis Joseph University of Budapest in 1900. He spent six years in the United States and will return to his native country, Hungary, in September. His future plans are not fully matured, but he will engage as consultant for electric power, lighting and railway developments and industrial plants. He will also represent some important American interests abroad.

Mr. F. D. Shaffer, who has been associated with Mr. J. F. Heyward, president and general manager of the Citizens' Traction Company, Oil City, Pa., in the management of that property, but not in an official capacity, has been appointed general manager of the company to succeed Mr. Heyward. Mr. Shaffer was assistant to Mr. Heyward when he was general manager of the City & Suburban Railway, Baltimore. After the consolidation of the City & Suburban Railway and the Baltimore Traction Company, he became connected with the consolidated company under Mr. W. A. House in the claim department. Mr. Shaffer returned to his home in Cincinnati from Baltimore and was one of the promoters of the Cincinnati, Lawrenceburg & Aurora Electric Railway, of which he subsequently became secretary. For the last four or five years Mr. Shaffer has been managing his gas and oil interests in Kansas. As noted elsewhere in this column, Mr. Heyward retires from the Citizens' Traction Company to become vice-president and general manager of the Maryland Electric Railways Company.

Mr. James F. Heyward has resigned as president and general manager of the Citizens' Traction Company, Oil City, Pa., to become vice-president and general manager of the Maryland Electric Railways Company, Baltimore, which is controlled by the United Railways & Electric Company, of Baltimore, and operates the Baltimore & Annapolis Short Line. Mr. Heyward will also act in an advisory capacity with Brown Brothers & Company, Baltimore. Mr. Heyward is well acquainted in Baltimore, having entered street railway service in that city in 1874 with the City Passenger Railway, of which he eventually became superintendent. Later he became general manager of the City and Suburban Railway, and upon the consolidation of that company with the Baltimore Traction Company was elected secretary of the consolidated company. The Maryland Electric Railways Company will build important extensions and make improvements, and the details of this work will be entrusted to Mr. Heyward. Mr. Heyward will be succeeded in the Citizens' Traction Company by Mr. F. D. Shaffer.

Construction News

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

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

FRANCHISES

Riverside, Cal.—The City Council has granted the Riverside & Arlington Railway a 48-year franchise to build an extension to Corona. According to the terms of the franchise the company must begin work within four months.

San Diego, Cal.—The San Diego Electric Railway has applied to the City Council for an extension of one year's time in which to complete its line from the corner of Ivy and State Streets to Old Town.

Wilmington, Cal.—The Pacific Electric Railway has applied for a franchise for an electric railway in Wilmington to run east from the line just north of Seventh Street, past the Consolidated lumber yards, and around to Long Beach.

Chicago, Ill.—The Illinois Central Railroad has obtained a temporary permit from the Chicago City Council to continue construction on its proposed line known as the Kensington & Eastern Railroad. This line will serve as a connecting link between the electric roads of Indiana and Chicago by way of the Illinois Central suburban tracks.

Manhattan, Kan.—E. S. Alnutt, of Salina, Kan., has applied for a franchise to build a street railway from the Union Pacific station to the college.

Plainwell, Mich.—The Grand Rapids Electric Railway has been granted a franchise to construct an electric railway through this town. The company intends to construct a line from Kalamazoo to Grand Rapids by way of Plainwell. A spur may be built from Plainwell to Otsego and Allegan.

Grand Forks, N. D.—An ordinance has been passed granting E. J. Lander and others a franchise to operate a street railway in Grand Forks. [E. R. J., June 27, '08.]

West Haverstraw, N. Y.—The Rockland Railroad has been granted a franchise to construct a street railway upon the highways of that village.

Forest Grove, Ore.—The City Council has granted the Oregon Electric Railway a franchise to build and operate its lines in this city. The franchise calls for a 25-year grant and the company agrees to have the road in operation by Dec. 31, 1908; it also gives a bond of \$5,000, which will be forfeited if the provisions of the agreement are not carried out.

Pendleton, Ore.—James H. Gwinn has applied for a franchise to build a street railway on certain streets of Pendleton.

Brookings, S. D.—The Brookings & Sioux Falls Electric Railway has applied for a franchise to build a line in to the city. The application asks for right of way from the Pond place to a point near the Northwestern subway, also asking permission to go under the Northwestern tracks at that point. From there the road will run west along Front Street to First Avenue and then north past the fair grounds. Neil Stewart, Brookings, manager. [E. R. J., June 27, '08.]

Vancouver, Wash.—The Vancouver Traction Company has applied to the County Commissioners for a franchise which will permit the extension of the road through Vancouver Heights. The route asked for will extend over Twenty-sixth Street, at the northern city limits, to Connecticut Street, and thence north to Harrison Street and east to St. John Road. [E. R. J., June 13, '08.]

Thermopolis, Wyo.—The Hot Springs Street Railway has been granted a 25-year franchise to build an electric railway from Thermopolis to the hot springs in the State reserve. S. A. Broadwell, Omaha, Neb., president. [S. R. J., March 21, '08.]

RECENT INCORPORATIONS

***Point Loma Railroad, San Diego, Cal.**—This company has been incorporated to take over all the holdings of the Point Loma Electric Railway which was formed about a year ago for the purpose of building an electric railway connecting with the San Diego Electric Railway Company's lines and extending along Point Loma to Roseville and Ocean Beach. Capital stock, \$250,000. Directors: D. C. Collier, Harry Alexander, Sam Ferry Smith, George D. Easton and C. O. Reinbold. All the needful rights of way have been secured; the entire route has been graded, a large quantity of supplies secured and an important construction and operating contract has been entered into with the San Diego Electric Railway.

***Elwood & Swayzee Traction Company, Elwood, Ind.**—Incorporated in Indiana to construct and operate an electric railway between Elwood and Swayzee, a distance of 12

miles. Capital stock, \$10,000. Office, Elwood. Directors: E. C. Gwinn, A. H. Curtis, N. A. Coleman, C. C. Hill and John Hume.

***Southmont Street Railway, Johnstown, Pa.**—Incorporated to construct an electric railway to connect Johnstown with Southmont and Westmont, a distance of 2 miles. Capital stock, \$100,000. Incorporators: Frank W. Otto, T. Coleman du Pont, Wilmington, Del., president of the Johnstown Passenger Railway.

***Nashville & Lewisburg Railway, Nashville, Tenn.**—This company has been incorporated to build and operate a standard-gage road from Nashville to Lewisburg. Capital stock, \$25,000. Incorporators: E. R. Richardson, Edgar Jones.

TRACK AND ROADWAY

Connecticut Company, New Haven, Conn.—It is announced that this company will, within a week, award contracts for the construction of 17½ miles of new lines at an aggregate expenditure of \$1,000,000. The contracts call for the construction of 11 miles of road between Wethersfield and Middletown, 3½ miles from Hartford and Bloomfield and 6 miles from Willimantic and South Coventry. Work will begin as soon as the contracts are awarded.

Windsor Locks & Western Street Railway, Windsor Locks, Conn.—It is reported that a company of Boston capitalists is considering a proposal to acquire the franchise of this company. Preliminary negotiations looking toward the sale of the charter have been undertaken. The franchise, which authorizes the company to build an electric railway from Windsor Locks to Rainbow, in the town of Windsor, where connections may be made with a suburban branch of the Hartford Street Railway system, is now owned by local people who are anxious to have the road constructed. Capital stock \$100,000. [S. R. J., April 20, '07.]

Washington (D. C.) Railway & Electric Company.—This company is replacing decayed trolley poles with new standards along Brightwood Avenue from Park Road to the terminus of the Brightwood line at Takoma Park. The roadbed is also being improved, new ties replacing old timber between Cedar Street and Takoma Junction on Brightwood Avenue, opposite the new Army General Hospital.

St. Johns Light & Power Company, St. Augustine, Fla.—It is stated that this company is preparing to make a number of repairs and betterments to its electric railway, roadbed and bridge here. The South Beach Railway bed is being overhauled and the line extended on Malaga Street to a point opposite the exit to the Florida East Coast Railway depot.

Tampa & Sulphur Springs Traction Company, Tampa, Fla.—It is announced that this company will immediately begin work on its Nineteenth Street extension and also on the West Tampa extension. The West Tampa line is to be completed within 90 days. Satisfactory arrangements have been made with the city of Tampa about building a bridge to West Tampa and the steel work has been ordered and is on the way. The order has been placed with the Virginia Bridge & Iron Works, of Roanoke. It is estimated that the company will spend about \$150,000 on the contemplated improvements.

Tampa (Fla.) Electric Company.—This company expects to extend its Michigan Avenue line across the Hillsborough River and into the Drew subdivision, West Tampa. The West Tampa line will also be extended several blocks farther east on Seventh Avenue in order to reach the large factories at Gary. Besides this, there will be a number of new switches to be added, new double tracking to be laid in many places and heavier rails to be put down where needed. J. A. Trawick, manager.

***American Falls, Idaho.**—G. W. Atwood recently submitted a proposal to the Commercial Club to build a railroad from American Falls to Aberdeen. He proposed to operate the road with steam for two or three years, and then to convert it into an electric line, and sought to secure \$30,000, for which stock would be issued, to aid in construction. The Commercial Club endorsed the proposal, pledging all material aid possible, provided the road shall be operated by electric power from the beginning.

***Chicago, Ill.**—At a recent meeting in Austin four local improvement associations leagued themselves together and decided to take immediate steps to procure franchises and construct a street railway on Division Street from Kedzie Avenue to Harlem Avenue. The organizations joining in the movement are the Oak Park North End Improvement Association, the Oak Park East End Improvement Association, the North Austin Improvement Association and the Prairie Improvement Association.

Illinois Traction System, Decatur, Ill.—It is announced

that this company expects to build a spur line from Clinton to the Weldon Springs chautauqua grounds near that city.

Joliet & Southern Traction Company, Joliet, Ill.—This company has placed an order with the Carnegie Steel Company for 700 tons of steel rails.

Evansville Terminal Railway, Evansville, Ind.—Work on the construction of this line between Evansville and Newburg was commenced on July 14. This road will be laid with 70-lb. rails. [S. R. J., April 25, '08.]

Berkshire Street Railway, Pittsfield, Mass.—Work was begun some days ago on the rebuilding of this company's line between North Adams and Williamstown. The overhead work on the Williamstown line will be overhauled and new poles are to be set along the entire line.

Chihuahua (Chia.), Mex.—The Compania Ferrocarriles Electricos, of Chihuahua, expects to have its new electric street railway system which it is constructing in that city completed by Sept. 16. C. A. Malau is the engineer in charge of the construction work.

Guaymas, Sonora, Mex.—A. A. Dudley and H. E. Stone, of Douglas, Ariz., have obtained an option from Mrs. Rosa Viosca, of Guaymas, to purchase the street railway system in Guaymas. The proposed consideration is \$100,000, but the prospective purchasers have planned to expend a large sum in electrifying the system and in building extensions of the railway to neighboring towns.

Matamoros, Tamaulipas, Mex.—It is reported that S. W. Fordyce, of St. Louis, Mo., and associates who purchased the Matamoros & Santa Cruz Street Railway, which connects the town of Matamoros with the ferry landing on the Rio Grande, opposite Brownsville, Tex., have adopted plans for rebuilding the existing horse-car line and for extending it to various parts of Matamoros. The owners of this road are also building a bridge across the Rio Grande at Brownsville and it is their purpose to extend the line across this bridge and to traverse the principal streets of Brownsville with it. They also own the steam railroad which runs between Brownsville and the pleasure resort of Point Isabel, on the Gulf coast, a distance of 20 miles. This road is to be electrified and made a part of the new Matamoros & Santa Cruz system. The work of constructing the power plant for the proposed electric railway system will be started in a short time.

***Helena, Mont.**—It is reported that H. W. Savage is interested in a project to construct an electric railway from Columbus to Cooke. The work of surveying the right of way for the line has been started. The surveys are practically completed, as lines have been run from Cooke City through the mountains and only that part lying in the Stillwater Valley remains unsurveyed.

Dover, Somersworth & Rochester Street Railway, Rochester, N. H.—This company has been given permission to take up the rails of the loop extending from Strafford Square through Washington, Cleveland, Pine and Chestnut Streets and Waldron Avenue, and to use them on the line which is to be built to East Rochester. Work will commence immediately. The new line will be 3 miles in extent and cars will run hourly, according to the present plan. A 6-cent fare will be charged.

Interborough Rapid Transit Company, New York, has placed an order with the Lackawanna Steel Company for 1000 tons of 100-lb. T-section Bessemer rails.

Niagara, St. Catharines & Toronto Electric Railway, St. Catharines, Ont.—Surveyors are at work for the extension of this road to connect with the Toronto, Hamilton & Buffalo and Michigan Central Railways at Welland. Cars are now running to the Welland River, but a bridge will have to be built at this point.

St. Thomas, Ont.—City Engineer Bell submitted an estimate of the cost of extending the city electric railway line to Port Stanley. His figures did not include equipment, and the power to be used would be utilized from the Niagara power line. The roadbed would cost \$6,638 per mile for 7 miles, which would total \$46,466; \$3,000 added for bridges and \$1,500 for turnouts would bring the total cost to \$51,200. The overhead construction would amount to \$11,690 for 7 miles at the rate of \$1,670 per mile, and adding \$5,000 for incidentals the total outlay would be \$67,950.

***Clatskanie, Ore.**—It is stated that a company, to be known as the Clatskanie & Nehalem Valley Electric Railway, will be organized shortly to promote the building of an electric railway from Clatskanie to Jewell, a distance of about 33 miles. It is said that the preliminary surveys will be made immediately. D. R. Nelson, Portland, Ore., promoter.

***Grant's Pass, Ore.**—It is reported that G. E. Collins is interested in a plan to build an electric railway from

Grant's Pass to the Illinois Valley, a distance of about 30 miles. The proposition has been placed before the Commercial Club and a committee of five members of that body was appointed as a special committee to wait upon the County Court with a view to securing right of way along the county road from here to the Illinois Valley. The promoters also contemplate building the bridge across Rogue River at this point. The company has a corps of surveyors ready to take the field.

Oregon Coast Railway, Astoria, Ore.—The stockholders of this company recently held a meeting in Astoria and organized by electing officers as follows: President, E. Z. Ferguson; vice-president, Norris Staples; secretary, F. L. Warren; treasurer, J. M. Anderson; directors, T. L. Ball, H. G. Van Dusen, Alex. Gilbert, F. L. Warren, E. Z. Ferguson, Norris Staples, C. S. Brown, J. M. Anderson, P. J. Brix, W. E. Buffum and George H. George. Arrangements have already been made for the surveys for the proposed electric railway between Astoria and Seaside. [E. R. J., June 20, '08.]

Bloomsburg & Millville Street Railway, Bloomsburg, Pa.—A contract was closed on July 18 with Lawrence & Company, of Chicago, for the construction of this line. Work will begin next week and completed by Nov. 1. Ten miles of track will be required. The road will be operated by Strang gasoline motor cars.

Lancaster-York Furnace Street Railway, Millersville, Pa., M. H. Bochow, president, writes that the company will build an extension to Lancaster, a distance of approximately 5 miles. The company expects to let the contract for this work within a few weeks.

Pittsburg (Pa.) Railways.—A contract has been given to the McClintic-Marshall Construction Company by this company for the erection of a viaduct involving 200 tons of steel at Rankin, Pa.

Titusville (Pa.) Street Railway.—It is stated that this company has plans under consideration for extending its line to Union City. The company has planned to utilize the roadbed of the old Union & Titusville Railroad, which was abandoned several years ago, as far as Lake Canadohta, 7 miles south of here, by the Pennsylvania Railroad, and will on Aug. 1 be abandoned over the remainder of the route through Lincolnville and Centerville. W. J. Smith, president.

Spartansburg (S. C.) Railway, Gas & Electric Company.—We are advised that this company will add 10 or 12 miles of additional track to its system. F. D. McEowen, president.

San Antonio (Tex.) Traction Company.—This company is at work putting in some new turnouts and about 1500 ft. of double track on Houston Street of this city.

Temple & Martin Electric Railway, Temple, Tex.—W. C. Knight writes this company is being organized to construct an electric railway from Temple through Owensville, Bel-falls, Salada to Marlin. The proposed system will comprise 50 miles of track and will be operated by electricity. It is the intention to start construction work within 90 days. Capital stock will be \$30,000. The promoters also contemplate operating a number of amusement parks along the route. [E. R. J., July 11, '08.]

Prosser (Wash.) Traction Company.—It is said that this company will begin immediately obtaining right of way for the proposed lines which will connect Prosser with Patterson, Wash., on the Columbia River, and Bickleton. Frederick Finn, president, states that the company already has secured its water rights, the proposed site of the dam being at a series of rapids in the river about 5 miles east of Prosser. The line, as proposed, will make a double horseshoe turn from Sixth Street to Horse Heaven. The average grade will be 2½ per cent and the line will traverse the principal part of the rich Horse Heaven country, and in its entirety will be about 60 miles in length. One branch of the road will extend from Prosser south and then west to Bickleton, a distance of 38 miles, while the other branch will run almost directly south to Patterson, 22 miles from Prosser. [S. R. J., Feb. 29, '08.]

Spokane-Pend d'Oreille Rapid Transit Company, Spokane, Wash.—It is reported that this company has abandoned the project to build an electric railway from Spokane to Squaw Bay, and will not attempt to renew its city franchises. The terminal grounds in this city may be sold within the next few months. Officers: C. H. Reeves, president; J. J. Brown, first vice-president; D. K. McDonald, second vice-president; Mark F. Mendenhall, secretary, and J. Grier Long, treasurer.

Tacoma (Wash.) Railway & Power Company.—It is reported that this company has begun construction work on its interurban line from Tacoma to Puyallup, Sumner, Mc-

Millan, Alderton and Orting. The company now has all its right of way between Tacoma and Puyallup. Beyond Puyallup the right of way is not all secured, and in some places the route of the road is not definitely settled. The new road will cross Wapato Creek three times and the Puyallup River once between Brookville and Puyallup. The material for bridge construction and the rails are here, and the entire line from Tacoma to Orting will be completed before the commencement of the A.-Y.-P. exposition.

Sheboygan (Wis.) Light, Power & Railway Company.—The ELECTRIC RAILWAY JOURNAL is informed that this company expects to purchase during the next few months the following material: 5000 ties, 300 poles and about 2000 tons of new rails. W. B. Voth, superintendent.

Cheyenne (Wyo.) Street Railway.—It is said that this company has begun surveying the route for its proposed street railway, work upon which is to be begun in a few days. The line will run up from Capitol Avenue from the Union depot to the capitol building, thence on Twenty-fourth Street to Ferguson Street, to Randall Avenue, to Fort Russell. A branch will be run from this line to the new Frontier Park on Lake Absaraka. Thomas A. Cosgriff, president. [E. R. J., June 13, '08.]

SHOPS AND BUILDINGS

Illinois Traction System.—The ELECTRIC RAILWAY JOURNAL is advised that this company has begun the construction of two buildings (a station and a shop) on property formerly occupied by shops of the Springfield Consolidated Railway, at Springfield, Ill. The property is one-half of a block in size and is well located to serve as an interurban terminal. The old repair shop is being remodeled so that it will serve as an excellent passenger station with three loading tracks and a generous amount of office room. A new repair shop is being built at the end of the station and storage tracks will be laid.

Fort Wayne & Springfield Traction Company, Decatur, Ind.—It is announced that this company and the Decatur *Daily News* will unite in the erection of a \$40,000 building at Decatur, Ind. The building will be used for offices and for a passenger station for the interurban.

Lexington & Interurban Railways, Lexington, Ky.—This company is to build a new car house on Loudon Avenue, Lexington. The structure will be 100 ft. x 200 ft. and will contain a thoroughly equipped repair shop. On one side of the center of the building will be a large paint shop and a carpenter shop. On the opposite side will be a modern blacksmith shop, machine shop and armature room. In the rear of the building will be a store room. Large doors will separate this portion from the front of the building. These will be so hung that freight cars loaded with supplies can be run through into the store room and unloaded.

Boston & Northern Street Railway, Boston, Mass.—This company will rebuild the car house burned on the Marblehead Road a few weeks ago. The road's surveyors have just completed a survey of the property and it is understood that plans are under way for a building capable of storing 20 cars besides providing for a workshop, etc.

Sheboygan (Wis.) Light, Power & Railway Company.—We are advised that this company expects to build a new car house and repair shop.

POWER HOUSES AND SUBSTATIONS

Lexington & Interurban Railways, Lexington, Ky.—This company, it is announced, expects to build a new power station in the near future.

Portland (Ore.) Railway, Light & Power Company.—A contract has been awarded to the engineering firm of William S. Barstow & Company, of New York, for the building of an underground system of conduits and cables in the business district. Estimates and plans are now being prepared and the work will be started within a short time. It is estimated that this work will require an expenditure of over \$1,000,000.

West Penn Railways, Pittsburg, Pa.—This company expects to build a switchhouse on its transmission line at Arana and will remodel three substations in high-tension apparatus.

Wausau (Wis.) Street Railway.—This company will erect a new power station. The Allis-Chalmers Company, of Milwaukee, has been awarded the contract for two pairs of turbine water wheels, developing 1700 hp. and generators.

AMUSEMENT PARKS

Lancaster & York Furnace Street Railway, Millersville, Pa.—The ELECTRIC RAILWAY JOURNAL is advised that this company expects to purchase a number of amusement attractions for a park which is to be established at Pequea. M. H. Bochow, president.

Manufactures & Supplies

ROLLING STOCK

Sheboygan (Wis.) Light, Power & Railway Company is in the market for a snow plow. W. B. Voth, superintendent.

Lancaster & York Furnace Street Railway, Millersville, Pa., expects to purchase five new cars. M. H. Bochow, president.

Oregon Electric Railway, Portland, Ore., has awarded contracts for 25 box cars, 20 flat cars, 2 stock cars, 6 passenger cars and 2 baggage cars.

Northwestern Elevated Railroad, Chicago, is receiving bids for 20 car bodies of its standard design, the motors for which are now on order. It was expected that the car body order would be placed during the present week.

Illinois Traction System, the ELECTRIC RAILWAY JOURNAL is advised, has placed an order with the American Car Company for 10 passenger car bodies to be operated as trailers. The construction of these bodies will conform to the company's standards for 53-ft. cars.

Chicago & Milwaukee Electric Railway, Chicago, Ill., has placed an order with the Jewett Car Company, Newark, Ohio, for nine large cars. Three of these are to be parlor cars, three straight passenger coaches and the other three combination passenger and baggage cars.

Public Service Corporation, Newark, N. J., has placed an order with the John Stephenson Company to rebuild 150 cars, changing them to the pay-as-you-enter type. It is stated that the Public Service Corporation has been licensed by the Pay-as-You-Enter Car Company to convert 300 cars to this type and that the balance of the cars (150) will be converted in its own shops.

Yonkers (N. Y.) Railroad has placed an order with the St. Louis Car Company for 15 closed vestibule car bodies to be mounted on St. Louis No. 47 trucks. The cars are to measure 30 ft. over the body, 40 ft. over all, 8 ft. wide over posts and 7 ft. 9 in. inside over sills. They are to have longitudinal seats covered with canvas-lined rattan and the equipment is to include the Curtin Supply Company's No. 88 ring fixtures, General Electric No. 210 motors, Allis-Chalmers air brakes and Peacock hand brakes.

West Penn Railways, Pittsburg, Pa., has placed an order with the Cincinnati Car Company for seven interurban cars to measure 53 ft. 4 in. over bumpers and 8 ft. 6 in. over sills. They will have a passenger compartment which will seat 34 people and a smoking and baggage compartment which will seat 20 people. The cars are designed to secure the maximum strength with minimum weight. They are to be finished throughout in cherry with rattan Walkover seats and will be provided with toilet room. The platform will be 5 ft. 6 in. in length. The company says that the contracts for trucks, motors and brake equipment are not now in such shape that it can advise concerning them.

TRADE NOTES

Lord Electric Company, New York, N. Y., announces the appointment of John S. Black, 223 Hennen Building, New Orleans, La., and Frank E. Harmar Company, 429 Mohawk Building, Portland, Ore., as its agents. The Lord Electric Company has established representatives all over the United States and in many foreign countries prepared to enlighten intelligently the prospective purchaser of Lord products.

Dearborn Drug & Chemical Works, Chicago, Ill., at a meeting of the directors held on July 8 elected W. A. Converse, assistant secretary and chemical director, to the position of secretary and chemical director, and Ralph R. Browning, assistant treasurer, to the position of treasurer of the company. Both Mr. Converse and Mr. Browning have been connected with the Dearborn Drug & Chemical Works for many years.

Massachusetts Chemical Company, Walpole, Mass., has entered into a contract with an insulated wire and cable manufacturer to supply its entire requirements of cable cloth. The wire and cable company has for many years made its own cable cloth, but has been convinced that by securing all its cable cloth from a manufacturer whose exclusive specialty is insulating compounds and the impregnating of fabrics, it is assured of a better and more uniform product at a lower cost per yard than that at which it can manufacture the material itself.

McKeen Motor Car Company is being organized at Omaha, Neb. W. R. McKeen, Jr., who has been superintendent of motive power and machinery for the Union Pacific Railroad at Omaha, is engaged in carrying on the organization of the company. It is stated that the company will build a large plant where it will manufacture

gasoline motor cars similar to those that have given such satisfactory service on the branch lines of the Union Pacific Railroad. There are now 41 such cars in service on the Union Pacific Road, the designs for all of which were superintended by Mr. McKeen.

Railway Specialty & Supply Company, Chicago, reports that Winslow hydro-clad concrete battery vaults and chutes are being manufactured with better facilities than ever before. N. J. Winslow, the manufacturer, has moved from his old plant at Grand Crossing, Ill., to a much larger and better equipped factory at Blue Island, Ill., the old plant being too small to handle the rapidly increasing demand for his product. The Railway Specialty & Supply Company, which is selling this material, calls attention to the change as it says the impression seems to obtain in some quarters that the original "Hydro-Clad" output is no longer on the market. Vaults may be had promptly and in many cases directly from stock.

Scully Steel & Iron Company, Chicago, has absorbed the plants and the business of Kelley, Maus & Company, Chicago, thus adding to its holdings beside a large stock of iron and steel merchandise, a plot of ground at Ashland Avenue, Twenty-fourth Street and the Chicago River, 700 ft. x 250 ft., including two modern warehouses, each 300 ft. x 100 ft. To this tract the company has added 700 ft. adjoining and upon it will erect new warehouses of steel construction equipped with all modern appliances for handling heavy iron and steel. All the heavier classes of merchandise carried by Kelley, Maus & Company have been added to the Scully Steel & Iron Company's stock, but the wagon and carriage makers' and blacksmiths' supplies carried by that firm will hereafter be handled by the Chicago Iron Store, owned jointly by A. B. Scully, president, and W. M. Thompson, formerly secretary and general manager of the Kelley, Maus & Company.

Baldwin Locomotive Works, Philadelphia, Pa., has built a Baldwin-Westinghouse electric locomotive for the Carlisle Brick & Tile Company for industrial switching service. The locomotive is of the mine type, with a cab at the operating end, and is designed for a track gage of 3 ft. The over-all dimensions are as follows: Length, 10 ft. 2 in.; width, 4 ft. 4½ in.; height to top of cab, 7 ft. 6 in. The approximate weight of the locomotive is 12,000 lb. The frames are of cast iron, placed outside the wheels and fitted with bumpers of the same material. The wheels are of cast iron with chilled treads, are 28 in. in diameter and are spaced 3 ft. 8 in. apart. Each axle is driven by a No. 60 motor wound for 250 volts. The motors are tandem hung, so as to provide a balance for the overhang at the front end. The cab is of wood, provided with glazed windows on all sides. The trolley pole is mounted on the cab roof. The equipment includes a hand brake with shoes on all the wheels, sand boxes front and back, one gong and two electric headlights.

ADVERTISING LITERATURE

Kalamazoo Railway Supply Company, Kalamazoo, Mich.—This company has issued catalog No. 20, bound in cloth, which covers all the company's track and railway supplies. At the back of the catalog are tables of weights and measures and other useful information.

Harry De Steese, New York.—"Tape Talk" is the title of a folder issued by Mr. De Steese to call attention to his Destic tape and compounds. Electric insulating tape in general is the subject of brief consideration, followed by descriptions, including their advantages, of black tape, Dryfield tape, splicing compound, insulating compound, friction tape, etc., and several of the Destic paints prepared by Mr. De Steese.

National Railroad Trolley Guard Company, New York.—This company has issued an artistic and interesting pamphlet describing its patented type of woven galvanized and copper wire trolley guard which contains some very important information for prospective purchasers of trolley guard covering, including approved methods of installation and instructions for determining the amount of guard necessary for properly and safely protecting any type of grade crossing.

Arthur S. Partridge, St. Louis, Mo.—Under date of July 11 Mr. Partridge has issued Schedule 22 of apparatus which he has for sale. The list includes direct-connected alternating-current generators, belted alternators, transformers, direct-connected railway generators, belted railway generators, railway motors, controllers, a number of motor generators and other apparatus. The car equipment includes three Brill open cars and a Baldwin electric locomotive.

Bristol Company, Waterbury, Conn.—A new catalog describing its staggered point steel belt lacing has just been issued by this company to bring to the notice of the trade a

condensed illustrated description and price list of its lacing, which has been developed after many years of experience. The lacing is manufactured in 10 different sizes and lengths, suitable for every width and thickness of belting. Free samples will be sent upon application to the company by any one interested who is not familiar with its merits.

Truscott Boat Manufacturing Company, St. Joseph, Mich.—The June issue of "The Launch," published quarterly by this company, is being distributed. It has 48 pages, exclusive of the cover, and besides narratives of experience with launches and motor boats, contains valuable advice about the care of boats in and out of the water, also descriptions of several Truscott motors. It is a publication that should prove of interest to all managers of street railway parks where there is a lake available for water sports.

Allis-Chalmers Company, Milwaukee, Wis.—To meet the demand for information about small generating sets this company has prepared Bulletin No. 1042A describing in detail an American blower vertical engine direct connected to an Allis-Chalmers "N1" generator. The many points of the generator which make it a desirable machine are all pointed out. The vertical engine is guaranteed against defects and parts will be replaced within one year without charge should they show any defects. The engine is equipped with a patent oiling system which is said to insure thorough lubrication at all times.

General Electric Company, Schenectady, N. Y.—This company has issued a new bulletin on Thomson astatic instruments for continuous-current switchboards. These instruments are used extensively, and have a reputation for reliability and accuracy regardless of external influence. They have no controlling springs, and their accuracy is said not to be affected by changes in magnet strength. The damping effect is produced by an aluminum disk moving in a magnetic field. The indications are dead beat. The bulletin describes voltmeters and ammeters of the feeder board and illuminated dial types, and gives complete dimension diagrams.

Le Valley Vitae Carbon Brush Company, New York.—This company has issued a booklet entitled "A Little Story of a Big Success." The story is that of Darius A. Le Valley, who in the early days of commutation troubles worked at night in the garret of his home in White Plains, which had been fitted up as a laboratory, in an effort to overcome the difficulties with which he saw station operatives beset. The result is a brush of many years' use that is said to be permanently and perfectly self-lubricating and that will not cut or scratch the commutator or crumble to dust. The company says its brush is used in countries in all parts of the world.

Ohio Brass Company, Mansfield, Ohio.—The bulletin of the Ohio Brass Company for July contains the article, continued from the June issue, "The Insulation of the High Tension Transmission Lines," abstracted from the paper read before the Central Electric Railway Association at Toledo, Ohio, May 26, by F. S. Denneen, assistant chief engineer of the Ohio Brass Company. The monthly also contains an article on the electric haulage versus compressed air and on the improved Nichols-Lintern air sander. The advantages of the sander over others of the same type are pointed out and the details of the device are shown in half-tone illustrations. The sand trap is said to be absolutely moisture proof.

Landis Machine Company, Waynesboro, Pa.—This company has issued an illustrated catalog of its bolt-threading, piping and nipple-threading and nut-tapping machines and its special threading machines. The Landis cutters are of recent design and it is said that they never have to be hobbled or retempered and that as the lead is positive within the die, the correct pitch is always assured. The head is made entirely of steel and the same head will cut right or left-hand threads, as the same chasers will cut right or left-hand threads. Different holders, however, must be used. Chasers can be interchanged readily and any one of the set can be replaced without disturbing the others. One set of dies will cut any diameter so long as the pitch remains the same.

Lord Electric Company, New York, N. Y.—This company has issued Bulletin H, which goes into the subjects of lightning arresters, grounding devices, choke coils, disconnecting switches and protection against static charges generally. Lightning phenomena are considered first, followed by a review of the principles governing the design of Shaw arresters and descriptions of the different types of Shaw apparatus. Under the heading "Grounds and How to Secure Them," advice is given and the various plates and contacts the company has devised to secure a simple and durable ground are described. The bulletin describes the com-

pany's various choke coils and its high-tension disconnecting switches. Diagrams show the method of installing lightning arresters and other protective devices, one of which illustrates direct-current and alternating-current railway arrester and choke coil connections.

Carbolineum Wood Preserving Company, New York.—Bulletin No. 30 of this company describes open tank and brush treatment. The publication reprints from the STREET RAILWAY JOURNAL of April 4 an article on "The Open Tank Treatment for Preserving Ties and Cross-Arms." This article appeared in the special maintenance number of this paper, and was written especially to show that plants for treating timber by this method can be erected to meet the requirements of both large and small companies. The immersion method is frequently impractical, however, for various reasons; the application by brush of the preservative to timber for marine use, bridges and railway cars receives particular attention. The work meets the objections sometimes raised by those unfamiliar with the details of the process.

General Fire Extinguisher Company, Providence, R. I.—The United States Sprinkler Bulletin for June has been issued by the General Fire Extinguisher Company. It contains as its leading article a description of the Grinnell automatic sprinklers installed in the Secondary Industrial School at Columbus, Ga. It also contains the details of a number of fires in different parts of the country, one of them in the works of the Allis-Chalmers Company, where four automatic sprinklers opened and extinguished a fire without the occupants knowing about it until the water soaked through the floor below. The fire was of incendiary origin and was started among dry inflammable patterns and assisted by a gallon of kerosene oil. The reports of 285 fires under the Grinnell sprinklers for the three months ended June 30, 1908, are tabulated.

R. Woodman Manufacturing Supply Company, Boston, Mass.—This company has issued a catalog in which are listed and illustrated a number of supplies which are manufactured and handled for use in railways and stations. The company makes a specialty of ticket punches and illustrates them in full size together with different interchangeable dies for them. It also illustrates its printers' and stationers' punchers, hand-embossing stamp, patent embossing and ticket punches combined, cancelling machines, corporation seals, stub cutters and ticket-dating stamps, together with a number of rubber stamps, railways and express seals, baggage checks and uniform badges. Embroidered collar ornaments and hat and coat badges are shown. Among the other articles listed are sealing presses, revolution counters, hand tally registers and easy car pushers.

Hess Bright Manufacturing Company, Philadelphia, Pa.—This company has published a catalog on its bearings which transcends the ordinary trade publication and rises to the dignity of a treatise on the subject with which it has to do. The development of the ball bearing is briefly reviewed and its advantages pointed out to the machine designer, machine user and machine builder. Such subjects are considered as the reduction of friction following the use of bearings, their durability and the permissible loading. General directions for the correct application of bearings and a description of the various types of bearings make up a goodly part of the publication. The number, bore in millimeters and inches, diameter in millimeters and inches, width in millimeters and inches, load in pounds and weight of the radial bearings are all tabulated, similar information being given for the adapter and thrust bearings, thrust collars, etc.

Asbestos Protected Metal Company, Canton, Mass.—This company has recently issued a catalog which deals with the application of its asbestos protected metal to the manufacturing world in general. The material is for roofing, siding and ceiling and is said to be fireproof, water-proof and fume-proof. The components of the material are sheet steel, pure asphalt and asbestos combined to protect each other. It is manufactured in flat sheets, corrugated sheets, curved corrugated sheets, headed sheets, self-capping seamed sheets, flat flashings, corrugated side-wall flashings, corrugated end-wall flashings, flat ridge roll and corrugated ridge roll. The gage of the steel core and the weights of the material are tabulated and thorough instructions are given for applying it. The metal is coming into use in car work, especially for protecting the inside of freight cars.

Arthur D. Little, Boston, Mass.—Mr. Little, in accordance with his practice of reprinting papers presented before engineering societies by members of his staff, has issued in pamphlet form the paper "Some Things a Manufacturer Should Know About Coal," presented by E. G. Bailey, of

Mr. Little's office, at the annual meeting of the National Association of Cotton Manufacturers on April 16 and 17, 1908. In this paper some excellent advice is given about the storing of coal. The paper gives different coals arranged in the order of cost for equal amounts of heat generated and equal evaporation. The question of smoke prevention is also discussed by Mr. Bailey. In regard to storing coal, Mr. Bailey says that the hottest part of the pile is within 3 ft. of the surface and that in one case a pile of coal 100 ft. deep took fire about 6 ft. below the surface and in another part of the same pile the coal was 55 ft. deep with no difference of heating. He says that the successful storing of coal is dependent upon the physical structure of the coal rather than its chemical composition and that the method of circulating air through the coal has more to do with the question than anything else.

Pay-as-You-Enter Car Company, New York.—This company has issued a booklet which has for its subject the pay-as-you-enter car. The booklet is printed in two colors on coated paper and is illustrated with half-tone engravings of the pay-as-you-enter cars on the Chicago City Railway, the International Railway of Buffalo, the New York City Railway, the Montreal Street Railway and the Public Service Corporation of New Jersey. Line cuts showing the plans of the different cars accompany the text. The booklet describes the introduction of the cars in Montreal in 1905 and reviews briefly their adoption in Chicago, Buffalo, New York, New Jersey and elsewhere. The subjects discussed are "The Success of the Pay-as-You-Enter System," "The Complete Solution of the Fare Collection Problem," "The Possibility of Accidents Practically Eliminated" and the "Improvement of Service." The chapters on the "Possibility of Accidents Practically Eliminated" and the "Improvement of Service" bring out forcibly the results which have followed the introduction of the pay-as-you-enter system in the different cities mentioned. The booklet is bound in brown with an embossed headpiece, "Pay-as-You-Enter," in buff.

Vulcan Steam Shovel Company, Toledo, Ohio.—The July issue of the "Steam Shovel News," which is published in the interest of this company, contains an article entitled "Economy in Steam Shovel Plants," by Wilmer Waldo, as its feature. Mr. Waldo says that one of the occasional mistakes is in putting shovels to work upon jobs too small to justify the expense of proper installation. He says that the shovel cannot work economically without a large amount of auxiliary equipment and that it is often the case that a poor showing is due to the insufficiency or inefficiency of the auxiliaries, on which account the shovel is estimated very low as a money maker by the owner. On account of the predominance of the shovel, the contractor frequently makes the mistake of thinking that it is the whole plant instead of part of it, whereas if the work were called "car job," the cars would receive the burden of the ignominy which the shovel is apt to come in for on the losing contract. Among the equipment shown in the publication is an extra heavy 2½-cu. yd. dredge dipper built for the Boone Contracting Company for its work at the Soo. The shell of this dipper is ¾ in. thick, the mouthpiece 2½ in. thick with a flange steel band 1¾ in. thick by 8 in. wide. The hinges, arm lugs and catch plate are of extra heavy cast steel. The plate and the hinges are of wrought iron and the pin holes are bushed with steel.

Cutler-Hammer Manufacturing Company, Milwaukee, Wis.—This company is placing on the market a number of new electrical specialties which are illustrated and described in a little booklet which the company is sending out with a vest-pocket model of the mechanism of the switch to make clear the simplicity of the switch. A price list contains other illustrations and further information concerning the new line of apparatus, which consists of porcelain pendant switches, porcelain surface switches and sub-bases for use with same and porcelain push-button lamp sockets. The push-button mechanism used in these devices can be adapted to almost any use where a quick make and break is desired. It consists of three moving parts, a push bar extending through the switch, a coiled steel spring, a moving contact piece and fixed contacts. The principle is that of a coiled spring contracting on a tapering surface. The action is positive and gives a quick "make" as well as a quick "break," the movement of the contact piece being the same whether the push bar is moved fast or slow. Some of the advantages claimed for these specialties are set forth in the booklet entitled "Push Button Switch Mechanism." The pendant switches, surface switches, lamp socket and the switch mechanism itself are also illustrated. Other illustrations and additional data and the various applications of these devices are given in the price list. The devices have been approved by the underwriters.

ELECTRIC RAILWAY PATENTS

UNITED STATES PATENTS ISSUED JULY 7, 1908.

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

Controller, 892,464; Emmett W. Stull, Norwood, Ohio. App. filed June 30, 1906. Provides means for preventing flashing at the contacts of railway controllers, especially when the car is being "notched along." Comprises the combination with a motor controller of a magnetically operated switch arranged to be opened when the controller is moved backward into its first operative position.

Device for Preventing Rails Shifting or Creeping, 892,505; Anton Damcris, Cologne, Germany. App. filed Dec. 18, 1907. A pair of like clamps provided with a hook at each side adapted to clasp the foot of the rail and having one end sloped off laterally and the other end bent downward, whereby said clamps are attached to the foot of the rail oppositely, contacting one another with their sloped ends and the bent end of one clamp abutting against the sleeper.

Metallic Railway Tie and Means for Securing the Rails Thereto, 892,541; George H. McConvill and Charles E. McConvill, Cleveland, Ohio. App. filed Sept. 12, 1907. Relates more particularly to the fastening device for fastening the rail to the metallic cross-tie; designed not only to securely hold and maintain the rail in proper position on the cross-tie, but provides means whereby the rails may be readily and quickly removed and replaced.

Rail-Joint, 892,557; Howard S. Shafer, Nazareth, Pa. App. filed July 11, 1907. The abutting ends of the rails have registering holes drilled therein for the reception of a pin or plug which has coiled wire connections with the inner ends of the respective holes.

Automatic Air-Brake Pressure Adjuster, 892,561; Ulysses S. Smith, Sacramento, Cal. App. filed Sept. 18, 1907. Means for adjusting the air pressure in the brake cylinder according to the weight of the car and means for locking and releasing the adjusting means as the brakes are set or released.

Combined Tie and Rail-Fastening, 892,568; James T. Tonry, Zanesville, Ohio. App. filed Nov. 4, 1907. Provides a novel form of metallic tie in combination with means for attaching the rails thereto without the use of bolts and nuts.

Safety Appliance for Railway Switches, 892,591; James D. Guilfoyle, Jacksonville, Fla. App. filed July 26, 1907. In an automatic compressed-air safety appliance for railway switches, the combination with a switch, and means for manually operating the same, of pneumatically operated means connected with the manually operable means for holding the switch tightly in either position.

Controlling Apparatus for Railway Appliances, 892,636; Hiram C. Williams, Utica, and Francis B. Harrington, Albany, N. Y. App. filed Nov. 4, 1907. Relates to the control of interlocked levers for controlling railway appliances. Provides a time-limit device for insuring a certain interval between the operation of certain of the levers in order that the switch may not be thrown without giving sufficient warning to an approaching train.

Controlling Means for Railway Apparatus, 892,637; Hiram C. Williams and Francis B. Harrington, Albany, N. Y. App. filed March 25, 1908. Relates to modifications of the above.

Convertible Car, 892,671; Bedrich Mazanek, New York, N. Y. App. filed Aug. 25, 1906. Has seats adapted to contain the windows and be turned to any desired position, either singly or as a whole, whereby in summer they may be arranged longitudinally or transversely of the car and have the windows lowered therein, and in winter, or when a storm comes up in summer, they may be turned longitudinally of the car so that their backs will close in the lower parts of the spaces between the roof supporting posts and the windows raised to fill in the upper parts of the spaces between the posts and entirely exclude the weather.

Safety Appliance for Electric Railway Trains, 892,677; Edwin T. Munger, Chicago, Ill. App. filed Dec. 2, 1907. Means for preventing the application of current to the motor or motors of a train until the brake-operating devices have been placed in proper position for the exercise of the motor control.

Safety Appliance for Electric Railway Trains, 892,712; Adolph H. Daus, Chicago, Ill. App. filed Dec. 2, 1907. Covers modifications of the above.

Safety Device for Electric Trains, 892,713; Adolph H. Daus, Chicago, Ill. App. filed Dec. 30, 1907. Additional modifications.

Safety Appliance for Electric Railway Trains, 892,734; Harley A. Johnson, La Grange, Ill. App. filed Dec. 2, 1907.

Relates to the same general subject-matter as Patent 892,712.

Railway Tie, 892,762; Roger S. Pease, Allegheny, Pa. App. filed April 25, 1907. Consists in the combination with a trough-shaped plate metal body having a bottom, sides and rail supporting flanges, of rail-retaining means secured to the bottom of the tie having rail-embracing terminals and uplift-preventing devices engaging the flanges.

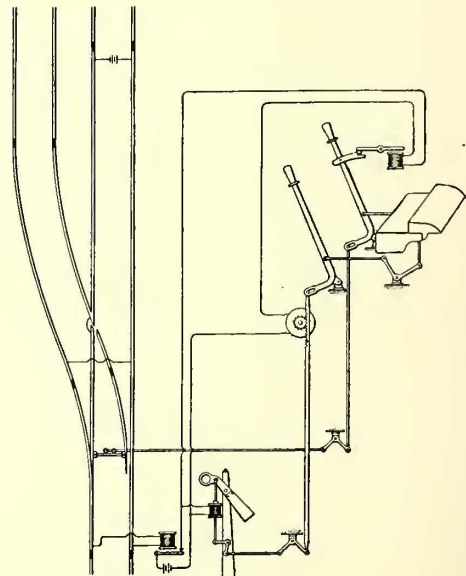
Metallic Cross-Tie and Rail-Fastener, 892,789; George Williams, Shirley, Ind. App. filed Feb. 27, 1908. The outer ends of the tie have overhanging projections for engaging the outer face of the rail base and adjustable plates between the rails for locking them in position. Cushioning material surrounds the rail base.

Splice-Bar, 892,809; Ulysses G. Cassady, Indianapolis, Ind. App. filed Aug. 23, 1907. Details of construction.

Electric Indicating System for Railways, 892,814; Herbert G. Dorsey, Ithaca, N. Y. App. filed Nov. 5, 1907. A block signal system having a special track rail and specially constructed indicators on the locomotive and located in the motor circuit so as to provide a mutual indication on the trains as to the speed of other adjacent trains.

Switch-Operating Mechanism, 892,838; Henry F. Hyman and G. H. Hay, Houston, Tex. App. filed Aug. 19, 1907. Has a releasable latch interposed between the switch stand and the switch, which is retracted from a distance by the approaching car or train, permitting the switch to close, if it has been left open, under the influence of a spring.

Guard-Rail Appliance for Railroads, 892,869; Edward Muir, Springfield, Ill. App. filed Sept. 17, 1907. Provides a filling block of novel form for spacing the guard rail from an adjacent track rail, said filling blocks also serving as foot guards. Has a clamp which coacts with the improved filling block for retaining the block in operative position between a main track rail and a guard rail.



Patent No. 892,636

Overhead Trolley Wire Crossing, 892,874; Richard V. McKiliget, New Orleans, La. App. filed June 18, 1907. A trolley wire crossing designed to insulate the lines from one another. The separate trolley wires are interrupted and hook-over lugs forming part of the cross-arm fixture.

Ticket Issuing and Recording Machine, 892,876; John F. Ohmer & Elmer H. Bridenbaugh, Dayton, Ohio. App. filed Feb. 12, 1906. Means whereby it is impossible to issue a ticket for a specific fare or value paid and to register that of another specific fare or one of a different value.

Brake Shoe, 892,883; Clifton D. Pettis, Chicago, Ill. App. filed March 30, 1908. Comprises a cast metal body having embedded therein inwardly projecting, longitudinal strips, said strips being nearest each other at the central portion of the shoe and diverging thence toward the ends of the shoe.

Fare Register, 892,877; John F. Ohmer, Dayton, Ohio. App. filed May 28, 1906. Comprises a single-fare register, or a register adapted to take care of a single denomination of fare in duplicate; indicates such fare by means of a permanent indicator; furnishes separate records from the duplicate printing counters and records and indicates the total fares or passengers upon a separate bank of counters which are actuated simultaneously with each operation of the duplicate printing counters.