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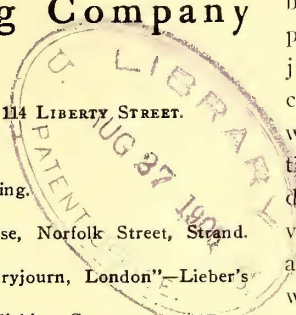
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NOTICE TO ADVERTISERS

Changes of advertising copy should reach this office by 10 a. m. Monday preceding the date of publication, except the first issue of the month, for which changes of copy should be received two weeks prior to publication date. New advertisements for any issue will be accepted up to noon of Tuesday for the paper dated the following Saturday.

Of this issue of the Street Railway Journal, 8000 copies are printed. Total circulation for 1906 to date, 277,600 copies, an average of 8164 copies per week.

Street Railway Riots in Brooklyn

A most remarkable condition of affairs was sprung upon the street railway management and people of the City of Churches on Sunday, Aug. 12, and continued in an acute form during the greater part of last week. It has now gradually subsided, partly as the result of a slight concession on the

part of the Brooklyn Rapid Transit Company, but principally because the nominal reason for the disturbance of the public peace was removed by what may be termed a reversal of a judicial decision which never was rendered. If anything could exhibit a greater disregard of law and order in a usually well-regulated community than was encouraged last week by the municipal authorities of Brooklyn and was offered by the disorderly and misguided individuals who followed their advice, we do not remember it. The results would have been amusing if they had not been so serious, and are certainly worthy of the imagination of a De Koven or a Gilbert. Any reproduction on the stage would be regarded as preposterous. Imagine, if possible, passengers declining to pay their fares but holding on to their seats like grim death; employees of the railway company forbidden by law to assault the passengers but trying to loosen their hold on the seat arms; the president and sheriff of the borough shouting to the passengers to hold on tight and denouncing anyone who paid his fare as "only half a man"; the police standing by to see that no one was hurt in the scrimmage; and finally, the orderly passengers held in long lines of cars because the law said, or was understood to have said, that a passenger could not be assaulted or arrested for refusing to pay his fare. We fail to see why such a passenger stands in any better legal position than an ordinary trespasser, or why during the controversy police protection should not be given to the railway company as it would be to the merchant or hotel keeper whose customers insisted upon taking his goods or eating his meals without paying for them. We have no doubt that the statement made by the late candidate for Mayor on the Municipal Ownership ticket of New York, that under municipal ownership the electric lines would carry passengers from the Bridge to Coney Island for 5 cents, is true. If the demands of "the people" were loud enough the fare under such a regime would undoubtedly be cut to 3 cents, or passengers might even be carried for nothing. Such a policy would prove very popular with Mr. Hearst's constituents. The great mass of them pay no taxes, at least directly, and a deficit in the city's income accounts would cause them no present anxiety.

The management of the Brooklyn Rapid Transit Company undoubtedly acted wisely in compromising on the five-cent rebate ticket and in offering to hasten the adjudication of the legal point in question. But in the meantime the company is collecting its full ten-cent fare. The incident throws an interesting side-light upon the disregard for property rights which appears to be a popular phase of the new political economy. Mob rule, however, is not always successful, and we sincerely trust that that portion of the population which was innocently led into riotous proceedings by their counselors in the Brooklyn City Hall and newspaper offices on Park Row, New York, will hereafter accept the advice of these would-be leaders of public opinion at their true worth.

Compound Motors in Repair Shops

Until very recently machine tool driving in electric railway repair shops has been almost entirely accomplished by series or shunt motors operating at trolley voltage. In the early shops the practice of utilizing an old street car motor for the driving of tools on the group plan was almost universal, but the inefficiency and lack of flexibility of this method have led to the adoption of regular shunt motors for tool operation in the later and more modern shop installations.

Thus far the repair shop drive most in evidence is the group method, but with the larger work which is coming on inter-urban and electrified steam railroads, direct-connected tools are sure to be specified in many installations. We have already pointed out the special field of usefulness of the direct drive in the repair shop, which, in brief, consists of the heavier tool operations where the idle losses are relatively high, the continuity of service a fractional part of the elapsed shop time, and the necessity of regulated and forced production imperative.

With the increase of individual driving comes the question of the type of motor best suited to the work in hand. The series motor, as every one knows, is particularly adapted to service requiring variable torque and variable speed. Hence its universal use on cars and its almost exclusive possession of the crane and hoist. The shunt motor stands for constant speed within pretty wide limits of load, and it is especially qualified for group driving or for individual driving where the speed variation required is practically negligible. The compound wound motor has thus far been very little used in street railway shops, but it is decidedly worth while to consider it in cases where large work is anticipated. Closely associated with the compound motor is the auxiliary or inter-pole machine, which has been coming to the front so rapidly during the past year or two.

The compound motor occupies half-way ground between the ordinary series and shunt motors, and according as the series or the shunt winding predominates it may be expected to conform more or less closely to the particular creed of performance represented by the plain series or the shunt motor. A wide range of service possibilities lie at the hand of the compound motor designer. In comparison with the straight series machine the speed of the compound motor varies less with a given change of load; whereas the speed variation as compared with the ordinary shunt machine is greater with the compound. A larger current is needed for a given starting torque in the case of the compound as contrasted with a series motor, and the former reaches its maximum torque more quickly. On the other hand, the compound motor will give a greater torque per ampere than the shunt type, other things being equal. Unlike the straight series motor, the compound can not run away and tear itself to pieces if the load is taken off suddenly, for the shunt winding holds down the maximum speed when running idle. The greatest usefulness of the series winding seems to be to provide a powerful starting torque at full rating or overloads. When designed by a reliable manufacturer, a compound motor will move the load under very severe conditions without injury to itself. A substantial fly-wheel can sometimes be included in the outfit to advantage. Heavy planers, shapers, punches, shears, saws and other tools requiring great power for short intervals are particularly favorable subjects for compound motor drives on the individual plan of connection, as are certain hoists where a wide speed variation is not essential. The inter-pole type

of motor also supplies many of the advantages of the simple compound, particularly as regards heavy starting torque, together with a wide range of speed control and sparkless reversal in types designed for severe intermittent variable speed work. The forcing of production by the use of special tool steels and the employment of heavier tools and faster speeds will certainly require a more extended use of the compound motor in the repair shops of the near future.

A Word of Caution

The usual crop of summer trolley accidents is in harvest and the same old explanations are in evidence. The brakes wouldn't work and the trolley came off, and the motorman disobeyed orders. Now, there are accidents of a nature that no human foresight can avert and for which no one is properly responsible, but they are very few. Get to the bottom of the facts and you will usually find that something got out of order through somebody's carelessness, or that someone who should have known better took unjustifiable chances. The fundamental fact at the root of most trolley accidents is the attempt to do a land-office business on a single track without proper safeguards. The temptation in this direction is strong, for during a large part of the year cars are running on long headway with light loads, and the most rudimentary precautions suffice. For three months in the year business is rushing and quite outgrows the methods in use. If a road has to do, as often happens on interurban lines, fast and heavy passenger traffic over a single track, it must abandon once and for all the methods of a 4-mile-an-hour horse car line and run its cars on an absolute schedule with a proper system of train despatching. No half-way methods will answer. If two cars are scheduled to meet at a certain switch they must either meet there or at some other point predetermined. Accidents come from one car leaving a siding without getting in touch with the car it is expected to meet. Telephones are cheap, and rigid discipline rigidly enforced will do the rest.

Orders are often relaxed on the supposition that time will thereby be saved, while in point of fact time is lost by permissive schedules. If car A and car B are to meet at siding 1, the car that gets there first should wait until it gets definite and positive information as to where its mate is, either by its arrival or by a message locating it. If, by negligence, it goes ahead, the chances are that it will either cause a collision or that one car or the other will have to back to a siding, thereby losing time for both. The more cars on the system the more necessary is this orderly procedure. A very simple system of line telephones will enable train despatching to go forward smoothly and regularly. It is only necessary to follow the ordinary methods that have been adopted as a result of bitter experience on single-track steam railroads. As to accidents from rear-end collisions, interurban roads at times run on headway that is necessarily short. If, however, a definite rule is in force requiring a space of at least a certain number of poles between cars, say twice the space necessary for a stop, it will be difficult to get a collision. At the present high speeds, such rules should be most rigidly adhered to if they are to be effective. Permissive running is always risky and if done at all should only be in case of a breakdown somewhere, and even then only at greatly reduced speed. The distance, in poles, required for a car to stop on any part of the road ought to be definitely ascertained and should be as familiar to the motorman as the steps on his controller, and

the spacing of the cars should be set with a good margin beyond this distance. Electric roads have at times to meet sudden exigencies of traffic and run on short headway. This can be done safely only by working on a fixed routine and keeping cars under complete control. Nothing short of regular system will answer. The "Pass number 23 at Banger's siding, and if she ain't there, slip on kind of easy and try it at the crossroads" style of train despatching is responsible for a good share of the collisions. As to brakes failing and the like, the truth in two cases out of three is that the brakes have worked as well as they ever did, but the car was running fast and the motorman underestimated the distance required for a stop. Eliminate making sidings by guess work and ignorance of the real braking distance of the cars and you have cut down the chances of accident very greatly. For the rest, extra care in inspection of track and rolling stock will do something, but, as a rule, inspection in these days is pretty good. Failure to retire a car requiring repairs on account of rush of traffic is occasionally responsible for trouble. Beyond all this there are unaccountable failures which no reasonable caution can avert. Most accidents, however, come in the season of rush traffic and are connected with it in the various ways which we have here tried to indicate.

The Program and Papers of the Columbus Convention

The detailed program of the Columbus Convention is published in this week's issue of the *STREET RAILWAY JOURNAL*, and is an excellent one. It has been carefully thought out, is arranged systematically, and indicates that the annual meetings of the association will be of more value to its members than they have been for many years past. This remark applies particularly to the American Street & Interurban Railway Association, but a glance over the programs of the Accountants' and Engineering Associations discloses lists of topics and speakers which are a credit to the executive committees of these organizations. The Claim Agents' Association has not been in existence long enough to establish a precedent, but the papers and subjects selected for its Columbus meeting seem to be of a character which should be of great assistance in solving the problems which arise in that branch of railway service.

The reports of the committees of the American Association which are scheduled for Wednesday afternoon should, and undoubtedly will, constitute a very important portion of the active work of the association during the Columbus Convention. While all of the subjects are important, we are looking with special interest to the reports of the committees on standardization of equipment and promotion of traffic. The former is on a subject upon which both the American and Engineering Association committees have been actively at work during the present summer, and the report scheduled for Wednesday afternoon will undoubtedly summarize the findings of the corresponding and co-related committee of the Engineering Association which reports to that association on the previous day. Certain of the topics to be considered by this committee have already been outlined in these columns, and the recommendations to be submitted should command attention. As this is a standing committee, the action taken at Columbus will undoubtedly be, not only upon the work already accomplished, but will direct attention to those branches of electric railway equipment which, in the opinion of the association, most demand the attention of the commit-

tee during the coming year. The promotion of traffic is of necessity one of the most vital topics which can be considered by a street railway association, as it relates directly to the best method of increasing the gross receipts, and suggestions upon this subject by practical managers should be welcomed. It is understood that this committee has been very active in securing data, and a great deal of valuable information should be secured.

The "Interurban Meeting" on Thursday includes the report of the committee on heavy electric railways, as well as six papers relating to different branches of interurban railway construction and operation. The first paper is on elevated railways and can properly be classed, we presume, as an interurban paper, owing to the tendency in some cities for interurban roads to use elevated railways in connection with their city termini. All of the papers in this section are by authors who have given special attention to the subjects to be discussed by them, and should be of the greatest value.

The "Employees' Meeting," which is scheduled for Thursday afternoon, will be opened by a report of the committee on rules, in which it is understood the rules for high-speed traffic will be taken up in a more thorough manner than ever before. The other topics to be considered during this meeting relate to the selection and discipline of trainmen, and suitable clothing for their minds and bodies.

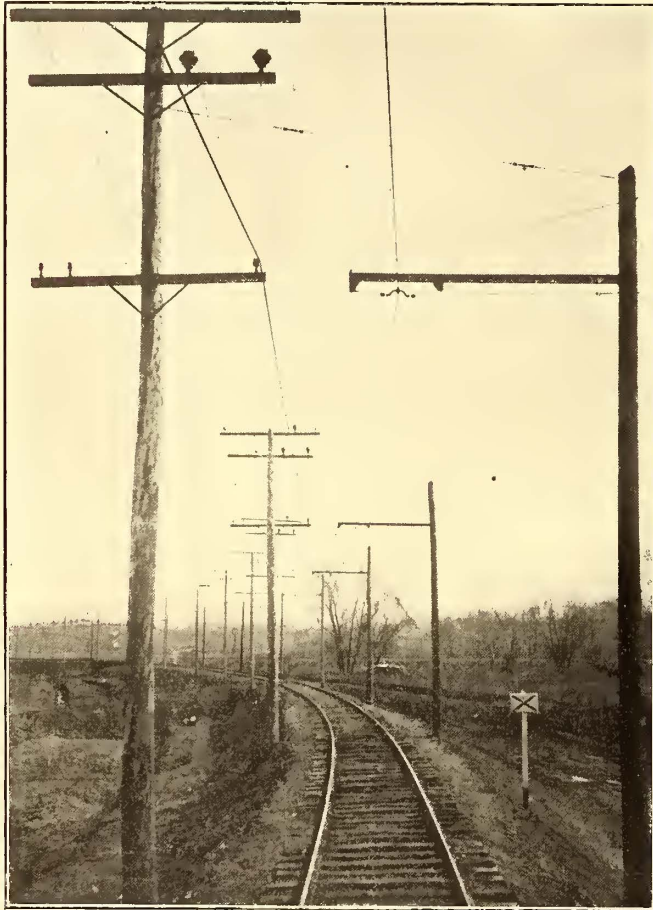
In the executive session the principal topics to be discussed are municipal ownership and the relations of the companies to the public and to its own employees. Upon these points a great deal can be said.

We shall not attempt to review the programs announced by the secretaries of the affiliated associations, except to call attention to the fact that the topics selected are most interesting and the assignments to them excellent. While all of the papers will be of value, we are looking forward with especial interest to the discussion on depreciation by the Accountants' Association; the report of the experience with gas engines in Boston, to be considered by the Engineering Association, and to the relation of statistical bureaus to the claim agents' work, which will be taken up by the Claim Agents at their meeting on Oct. 16.

A review of the program of the Columbus Convention would not be complete without a word in regard to the exhibits. For many years past there has been a gradual increase in the attention given by both manufacturers and delegates to this portion of the annual gatherings, and to many street railway managers and engineers it has been one of the principal, if not the principal, reason for attending. At no other one place or time during the year is it possible to obtain so comprehensive and accurate an idea of the progress made in the apparatus and appliances used in electric railway service. The conditions this year at Columbus for an exhibit are more favorable than ever before. Not only are the buildings at the State Fair Grounds eminently suited for the exhibition of apparatus of all kinds, but the space is practically unlimited. For this reason more manufacturers than ever are intending to be represented. The past year has been one during which many advances have been made in electric railway science, and attendants at the convention may be assured that in addition to the excellent program for the sessions of the different conventions, mentioned above, they will have an opportunity of inspecting the finest exhibit of street railway apparatus which has ever been held.

CONSTRUCTION WORK ON THE INTER-URBAN RAILWAY, DES MOINES, IOWA

In the past few years interurban railway construction has been gradually approaching that of steam roads, but in the case of the Beaver Valley division of the Inter-Urban Railway, Des Moines, Ia., it would be more exact to say that steam-road practice has been followed rather than approached. In fact in every particular the roadbed has been built in conformity with steam-road practice. The responsi-



CONSTRUCTION AT CURVES

bility for such construction rests primarily upon H. H. Polk, president and general manager of the system, through whose courtesy the main constructive features of the line are here presented, but the thorough manner in which the details, so far as steam-road practice is concerned, have been carried out, is largely due to the fact that Frank S. Cummins, chief engineer of the road, was formerly associated with a steam road. The older lines of the Inter-Urban Railway were described at some length in the *STREET RAILWAY JOURNAL* for June 20, 1903. The Beaver Valley division, which is now completed and in operation as far as Granger, about 18 miles northwest of Des Moines, will continue in a northwesterly direction to Moran Junction, 6 miles beyond Granger, and at this point will branch in a northern and western direction. The branch going west will terminate at Perry, 35 miles distant, and the northern line will reach Woodward, 27 miles from Des Moines. Construction work on these extensions is well under way and the line will be in operation to Woodward and to Perry in a short time. The whole line has been built for freight as well as for passenger traffic, as at the present time about 30 per cent of the receipts of the railway system are derived from freight traffic. This contemplated use of the line, together with the fact that a high-

speed passenger service will be inaugurated, necessitated construction heavier than that demanded by the average interurban road. This line is constructed on private right of way 100 ft. wide throughout its entire length, and through towns a right of way has been secured wide enough to permit of laying out freight yards at some future time. The steepest grade on the line, which is on the Woodward Branch, is 1 per cent. Except in the city of Des Moines, all curves are of such radius that cars can be operated around them at full speed. A three-degree curve is the smallest encountered. The road is in fact a series of long tangents connected by curves of one or two degrees radius. The track is laid with 80-lb. rails, and bonds soldered to the ball of the rail are used. The switches employed and the switch stands as well are the same as used in the best steam-road construction, the points of the switches being 15 ft. long and tied together with four tie rods. At frequent intervals along the line racks are provided for the support of extra rails in the same manner as is customary on steam lines. Underneath the ties



ONE OF THE SPECIAL POLES PLACED EVERY 1000 FT., UPON WHICH LIGHTNING ARRESTERS ARE GROUNDED, TROLLEY FEED-IN TAPS ARE MADE, AND THE HIGH-TENSION GROUND WIRES RUN TO EARTH

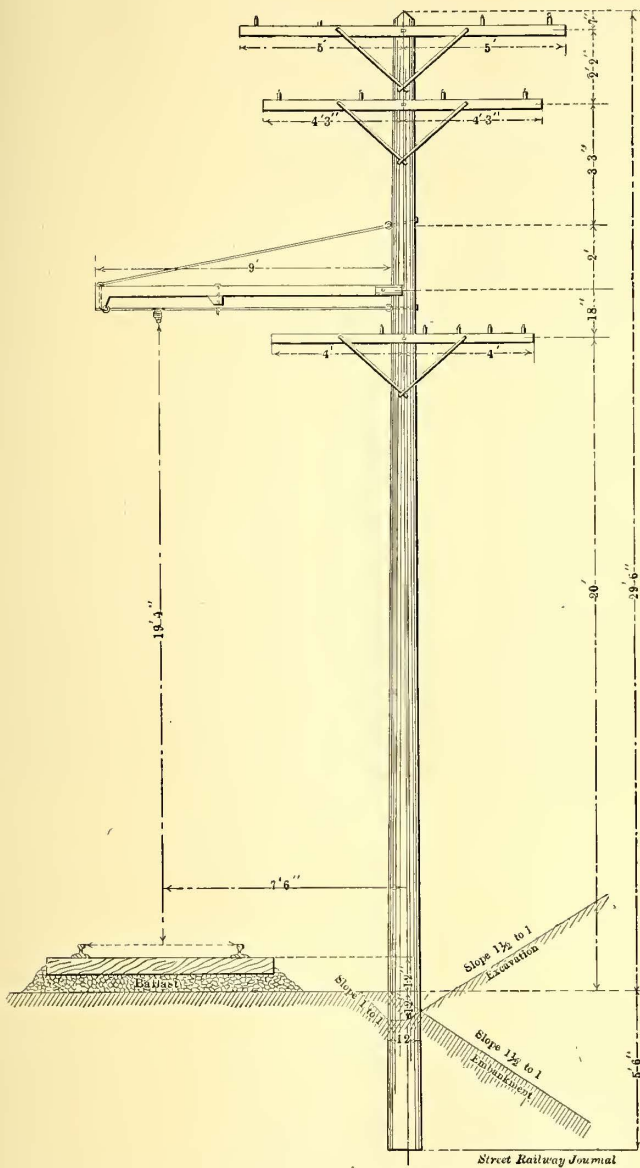
is placed 6 ins. of gravel ballast obtained from the company's pits in the outskirts of Des Moines.

The line passes through comparatively level country and no excessive grading was encountered. However, several large bridges are passed over, the largest of which are at the two points where the line crosses the Des Moines River in and near the city of Des Moines. These bridges, which are of steel construction, are each about 500 ft. long and rest on cylindrical concrete piers incased in sheet steel. One of the bridges was purchased from the Santa Fe Railway and was originally built for this road. The wood trestles are of standard steam-road construction. The largest, that over the Beaver Creek, is 300 ft. long.

OVERHEAD CONSTRUCTION

In the design and construction of the pole line and overhead, E. R. Cunningham, electrical engineer of the system, has followed original ideas and others that are departures from the usual practice. Bracket construction is employed

wire bolted to the pole a few feet above the trolley arm support. In the construction of the line the trolley arms and cross-arms were bolted to the poles while they were lying on the ground, and afterward the poles were raised in position with the aid of a 22-ft. boom mounted on a small push car. A derailing device for the push car was so built that the car could easily be run off the track to clear it for the construction train hauled by a steam locomotive, which was operated continuously over the track while construction work was going on. The poles were placed opposite the 100-ft. station stakes used by the engineers in aligning the track, and were lined up 7 feet from the center of these stakes by means of a device which permitted this to be done in a minimum amount of time. While the method of construction, that of placing all arms on the pole before its erection, was necessarily followed in order to cause less interference with the construction trains, it was found that not so much time was required to bolt the arms on when the pole was lying on the ground and to set the pole in position as is usually required simply to put the arms on after the pole is raised. The saving in time by the method was therefore the time necessary to raise the poles.

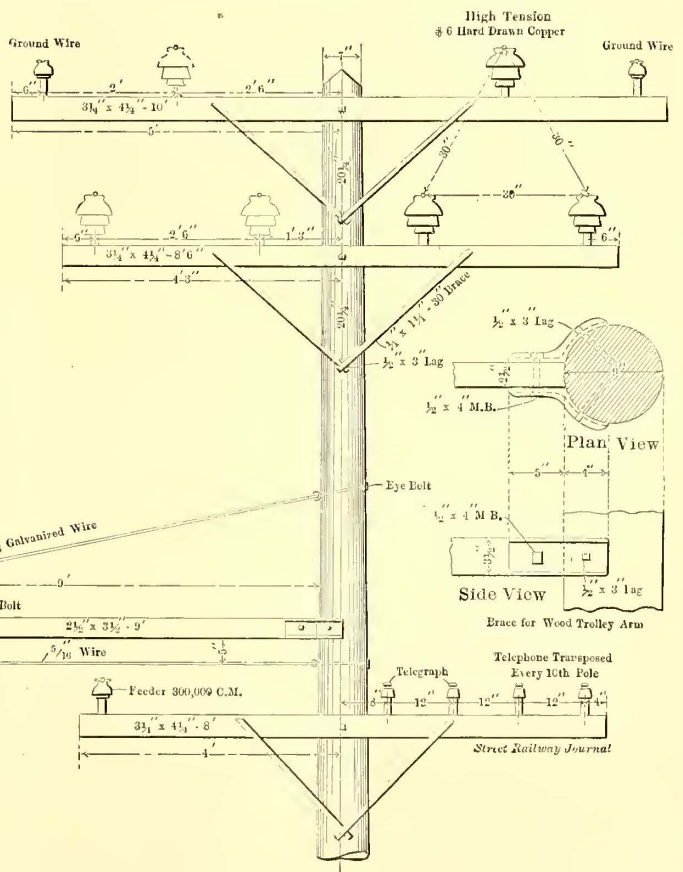


SECTIONAL VIEW OF ROADBED, POLE AND FITTINGS

throughout the length of the line. One of the accompanying drawings shows the position of the several circuits on the poles. Each of the poles, which are 35 ft. long and have 12-in. butts, carries in addition to the bracket three cross-arms. The two upper arms near the top of the pole are reserved for high-tension lines and the ground wires protecting these. The third cross-arm is located just below the trolley arm and carries the telephone lines and the feeder, and space is also reserved for telegraph lines. The trolley arm, as may be observed in the drawing, consists of a piece of wood measuring $3\frac{1}{2}$ x $2\frac{1}{2}$ ins. x 9 ft. long. It is fastened to the pole by two braces which encircle half the pole and prevent the arm from being twisted sidewise. The outer end of the trolley arm is supported by a 5-16-in. galvanized iron

HIGH-TENSION LINES

On the top cross-arm provision is made for two three-phase high-tension lines, but at the present time but one of these lines is in position. This consists of No. 6 hard-drawn copper wires supported on Locke No. 411 triple petticoat porcelain insulators with porcelain sleeves extending to the



DETAILS OF POLE AND BRACKET CONSTRUCTION

cross-arms and intended for a 40,000-volt line. In the past, considerable trouble has been experienced from lightning. To guard against this, the ground wires previously referred to are run on each end of the upper cross-arm. These consist of No. 6 iron wire and are grounded at every tenth pole by a lead which passes to the earth alongside the pole and terminates in a 10-ft. rod driven into the ground. The ground

wires are tied to the porcelain insulators supporting them in such a manner that the ends of the tie wires or "pig-tails" are twisted together and are pointed upward to serve as discharging points. The high-tension wires are tied without this upward projecting end. Those poles at which the ground wires are run to the earth are termed special poles. One of the accompanying reproductions from a photograph shows one of these poles and the method of bringing the taps from each of the ground wires over insulators on the ends of the cross-arm and immediately below the top one and together on the pole. A view of the special pole referred to shows a



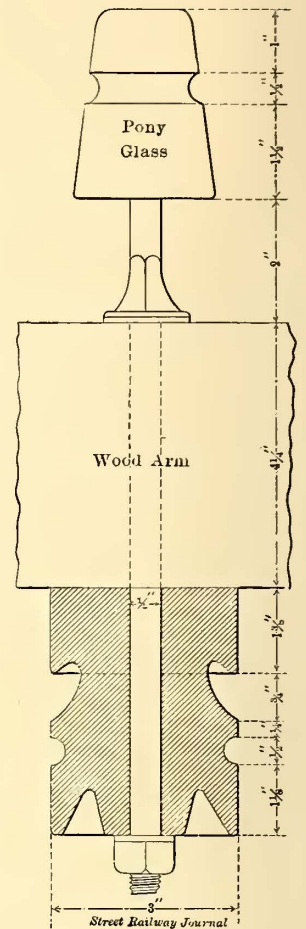
TYPE OF TELEPHONE BOOTH

lightning arrester mounted upon the pole just behind the lower cross-arm. As the arresters are placed on every special pole, and such poles are placed at 1000-ft. intervals, there are about five of them to the mile. The 300,000 circ. mil stranded aluminum feeder cable which extends through the length of the line is placed on the end of the lower cross-arm nearest the trolley wire. The supporting porcelain insulator brings the feeder to the same height as the trolley wire and immediately underneath the wire supporting the trolley hanger. The feeder is tapped in on the trolley wire at every special pole. At these points the trolley is supported by Syracuse feed-in hangers and a wood strain insulator is placed in the supporting wire near the point where it is bolted to the pole. But a very short connecting wire is therefore required between the feeder and the supporting wire of the trolley. One object in putting the feeder on the trolley side of the pole and out near the end was to facilitate the work of placing it in position. This permitted the feeder to be strung from a reel on a car in the same manner that a trolley wire is usually placed in position, and it was possible to string about 3 miles of feeder a day with one car. The telephone circuits are of No. 9 wire and are placed on the lower cross-arm at the extreme outer end. At every tenth pole they are transposed by a method somewhat out of the ordinary. The right-hand wire drops to a special insulator underneath the cross-arm, while the left-hand wire passes over to the right side. At the next pole the wire from the insulator is carried to the left side. The

insulator used underneath the cross-arm is provided with a double petticoat and was designed by Mr. Cunningham especially for this work.

In bracket-line construction, it is usually the custom to use a single line pole at curves, and to place these on the outside of the curves. In this work, however, the poles carrying the high-tension wires, feeder and telephone wires continue on one side of the track throughout the length of the line. At the curves, where the regular poles come on the inside, the construction shown in one of the illustrations on page 286 is used. A second line, consisting of 30-ft poles placed opposite those of the regular line, carries the trolley brackets, and the taller poles are braced up by guy-wires across to the tops of the shorter ones. Each one of these in turn is guyed to an anchorage in the ground.

The method of construction permitted all the wires to occupy one position on the pole with reference to the track throughout the length of the line, and one specific advantage of this was that the feeder was always carried in a position that permitted it to be strung up with greater facility. In order to have poles near at hand in case of failure of any of them, at intervals of five miles two poles are carried on a rack at the side of the track.



TELEPHONE TRANSPOSITION, SHOWING SPECIAL INSULATORS UNDER CROSS-ARM



HIGH-TENSION WIRES ENTERING HERROLL SUB-STATION

One of the illustrations shows the type of telephone booth used along the line, and in which a permanent telephone is housed. Permanently installed telephones are preferred to portable sets carried on cars, for the reason that they are

more reliable and that the expense of maintenance is much smaller. While there is nothing elaborate about the construction of the booths, they have been so designed as to harmonize with the stations at towns and other of the company's buildings along the line.

Quite a number of farmers' telephone lines and other wires cross the right of way of the railway company. To avoid the possibility of trouble from crosses with the trolley or high-tension wires, these have been carried under the track in lead conduit.

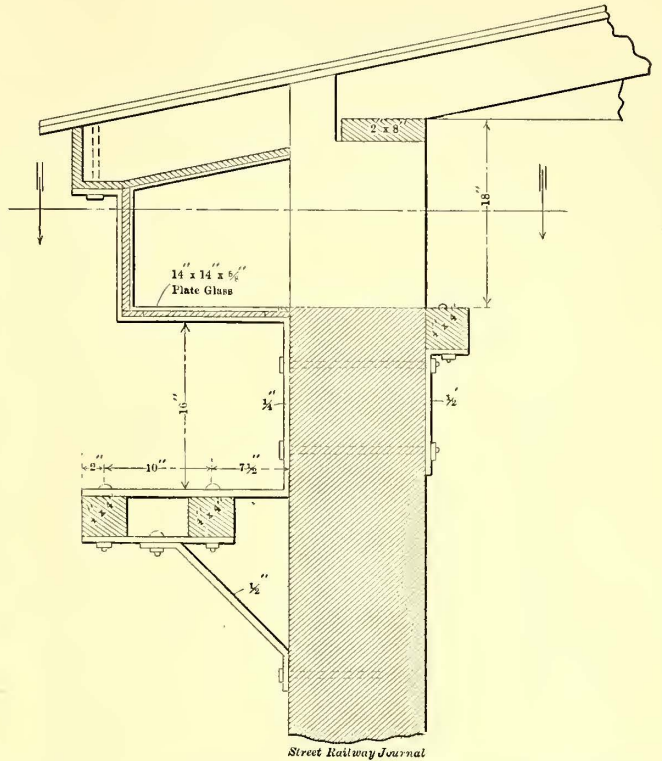
Steam-road practice has been imitated closely in the matter of warning signs. Thirty-two different kinds of signs are employed. These embrace 1000-ft. markers, 100-ft. stop signs, highway crossing signs, station signs and others usually found on steam roads.

POWER HOUSE AND SUB-STATIONS

In addition to some smaller belted units, the power house contains two 1000-kw direct-current generators and an in-

is supported on steel trusswork and consists of concrete reinforced by expanded metal and covered with 5-ply felt and gravel.

The high-tension wires pass into the building and out again on the other side to continue to the sub-stations to be built beyond. The lower right-hand illustration on the op-



Street Railway Journal

EAST SECTION OF CONSTRUCTION, PASSENGER AND FREIGHT DEPOT AND SUB-STATION, DES MOINES CONSTRUCTION

posite page shows the method of bringing these wires into the building.

The Herrold sub-station building, as it stands, is only the rear portion of the building that will eventually be erected at this point. Plans contemplate rooms for a passenger



THE STATION AT GRANGER

verted 300-kw rotary converter for furnishing alternating current to the high-tension line. It is the intention to replace the belted machinery with large direct-connected a. c. apparatus. As the 300-kw rotary converter will not be of sufficient capacity to supply the sub-stations to be built, a rotary



PRESENT SUB-STATION BUILDING AND STATION AT HERROLD

of 750-kw capacity is now being installed, and this, after the contemplated a. c. generators are in place, will be floated on the system between the alternating and the direct-current machines. The rotary converter in the power house supplies air-blast transformers which step the current up to 22,500 volts, and this is transmitted to the sub-station at Herrold, which is the only one in operation on the new division at the present time. The building housing this sub-station measures 34 ft. 2 in. x 28 ft. 2 in., and is of brick. The roof



TWO OF THE NEW 50-TON CARS

waiting room, offices and freight room in the front of the building. At the present time, a temporary partition separates the front from the rear portion of the building, and the forward portion is used as a waiting room and for freight. The sub-station machinery in the rear consists of one 300-kw General Electric rotary converter, air-blast transformers, and the necessary disconnecting switches, lightning arresters and switchboards, all installed in one room. On the completion of the building an additional 300-kw converter with necessary

auxiliary apparatus will be installed here. Plans provide for another sub-station of 300-kw capacity at Moran Junction, another of similar capacity beyond, and also at Perry.

STATIONS

In their construction the stations at the principal towns follow steam-road practice. Three styles of buildings are employed. One is a combined sub-station, passenger and freight station, and this type will ultimately be erected at Herrold and other points where sub-stations are located. The second style of station is one built for passengers and freight. The offices are located in the middle of the building. A waiting room takes up one end, while the other is used for the storage of freight. A separate waiting room is provided for ladies.

The third type of station is that built at Granger and shown in one of the accompanying illustrations. It contains a



MANNER OF COUPLING CARS, THE SPRING BUFFERS AND PROTECTING ARM RAIL PERMITTING PASSAGE BETWEEN THE CARS

freight room in one end, waiting room in the other, and an office between. The interiors of the stations are finished in Georgia pine stained mission or black. The seats are of oak and are stained in a similar manner, and the floors are of hardwood. A ceiled wainscoting extends around the rooms to a height of 5 ft. from the floor, and other than for this the walls and ceiling are plastered.

YARDS IN TOWNS

At a convenient point in each of the principal towns for a distance of several hundred feet the right of way has been secured 150 ft. wide. On one portion of each of these strips yards will be laid out after plans which have already been drawn up. These contemplate a passenger and freight station, stock yards, corn cribs, and other conveniences for carrying for freight and shipping farm produce. The remainder of the strips will be reserved for the erection of grain ele-

vators, commission warehouses, and for sites for other enterprises which ship considerable produce.

NEW PASSENGER EQUIPMENT

Recently eight new passenger cars, which were described at some length in the *STREET RAILWAY JOURNAL* for Feb. 3, 1906, have been built by the American Car Company, of St. Louis. They are equipped for multiple-unit operation, and are provided with buffers and end doors so that it is possible to pass from one car direct to another. An accompanying illustration shows the buffers and the manner in which the cars are brought together. The arm rails shown are hooked across the door of each car when the ends are not coupled together, and serve to protect the doorway. Two sets of draw-bars are provided. Those of the M. C. B. type are ordinarily used, but in passing into Des Moines several short curves necessitate these being uncoupled and the cars connected by means of the lower draw bars which allow the cars to be coupled with sufficient space between them to take the curves. The interior finish is old oak, and the bodies are painted an olive green and are comparatively free from striping or decorations. Each of the Brill 27-E-2 trucks upon which the car is mounted, together with the two GE 73 motors on it, weighs 8 tons. The car itself weighs about 50 tons and is provided with Westinghouse graduated release air equipments and General Electric type-M control.

THE OVERHEAD CONSTRUCTION OF THE ROCHESTER & MOUNT MORRIS BRANCH OF THE ERIE RAILROAD

A description of the cars to be used on the 11,000-volt, single-phase line of the Erie Railroad between Rochester and Mount Morris, now being constructed by Westinghouse, Church, Kerr & Co., was published in the *STREET RAILWAY JOURNAL* for July 14. Construction has now been commenced on the overhead line, which is to be a single-phase catenary mounted on wooden bracket poles on the main line, and on steel poles with span construction in the yards. The trolley wire is to be No. 000, carried on a single seven-strand, 7-16-in. galvanized steel messenger cable, which is to be painted. The messenger cable is tested for 22,500 lbs. The verticals which support the trolley wire from the messenger cable are spaced 10 ft. apart, and consist of 5/8-in. rods. The drop-forged hangers are made by the Electric Railway Equipment Company of Chicago. The ears which grip the trolley and messenger cable are identical except in the type of jaw. There will be six different lengths of rods. The trolley wire is to be carried at a height of 22 ft. from the rails in the clear, with a maximum height of 19 ft. under bridges. Owing to the high tension used, no feeders will be employed, and the line will be fed near its center at Avon.

The wooden poles are of chestnut, and vary in length from 35 ft. to 55 ft., with an 8-in. top. The 55-ft. poles are to be used at points where the line crosses certain deck bridges, where the poles will be carried down and attached to the abutments. The wooden poles are spaced at a maximum of 120 ft. apart, with a minimum of 80 ft. The pole brackets are T's, 3 ins. x 3 ins. x 9 ft. long. The bracket insulators are double petticoated porcelain, 5 ins. high, and were supplied by R. Thomas & Sons.

The line will be fed by Niagara Falls power at 60,000 volts, transformed at the sub-station, directly to the trolley voltage of 11,000.

The Lackawanna & Wyoming Valley Electric Railway has completed a traffic arrangement with nearly all the steam railroads in and around Wilkesbarre and will now ship freight to all points on these lines.

WEAR AND TEAR, OR DISEASES OF CAR WHEELS

Perhaps it is hardly fair to the wheel to denominate the results of wear and tear as a disease, any more than a broken bone in a man's leg may be called by that name. Still, as the latter requires a doctor for readjustment and healing, and as precautionary measures must be taken by all to avoid such accidents, it may be permitted to deal with the accidental defects of car wheels under the caption of a disease, and at the same time point to the precautions that should be taken to prevent excessive wear or breakage.

Strictly speaking, there is but one class of wear to which a car wheel is legitimately subjected and which is to be reckoned with under all conditions of service. This wear is that of the tread caused by the rolling upon the rails and the abrasion resulting from the pressure of the brake shoes. As to how rapid this may be depends upon the weight of the cars, the condition of the track in the matter of sand and other abrasives, the quality of the brake shoes and the pressures with which they are applied. With all parts of truck, track and car in good condition, the tread should wear evenly and smoothly and the wheel remain in good running condition until it has been worn nearly through the chill. The difficulty is to keep all the elements affecting the wear of the wheels in good condition either by inspection or selection of materials.

With the track in good condition one of the most prolific causes of wheel destruction is skidding. It apparently takes but little to skid a wheel, and a short movement of this sort is quite sufficient to produce a flat spot. Just how rapidly this can be done is not known, and evidently depends on the quality of the chill, the weight of the car and the condition of the rail. To produce the best braking effect, the wheel should be rolling with the full speed of the car and yet be just on the point of skidding. As this is a danger point, the brake pressures are usually limited to 70 per cent. of the weight on the wheels, so that, while the most effective braking is not obtained, there is a margin of safety to guard against skidding. So long as the wheel is rolling the coefficient of friction between the wheel and the rail is at its maximum, because it is the friction of rest, but the moment that it begins to skid it becomes the friction of motion and falls correspondingly, with the result that a lower brake-shoe pressure will maintain the skidding than was required to start it in the first place.

The hanging of the shoes is a prolific cause of excessive pressure. Ordinarily the brake hangers are given an inclination away from the wheels, so that the shoes tend to fall off by gravity. Where this inclination is made excessive, or where the parts are loose as the result of wear, the upward motion of the rim tends to buckle the hanger and cause it to crowd in against the shoe like a knee or toggle joint, thus greatly increasing the pressure above anything that can be due to the pull on the brake handle or in the brake cylinder, stopping one pair of wheels of a truck while the other is rolling freely.

As already stated, it is not known as to just how far a cast-iron wheel will skid before it is slid flat, but it is evidently not far. In experimental work it has been found that with a sufficiently heavy load a flat spot of an inch in length can be produced by sliding through the same distance. When a slid-flat spot has once been caused in a cast wheel the proper course to pursue is to take it out at once and grind it round, else the trouble will increase at each revolution, to the detriment of the truck, track and car, and to the annoyance of passengers and passers on the street.

With steel wheels the trouble is not so serious, first be-

cause flattening does not so readily occur, and secondly because a small spot is apt to roll itself out and disappear. With cast iron the peculiar granular structure of the metal prevents this rolling and the spot simply hammers itself larger. Prevention is to be secured by the proper adjustment and application of the brakes.

Next to flat spots, excessive flange wear is exceedingly troublesome, and is produced by a variety of causes. Among these may be listed trucks out of square; cars riding on the side bearings; wheels improperly put upon the axles; track out of gage on curves; badly worn rails; bad frogs and switches; improper elevation of the rail; improper shape of wheel flange; and improper shape of rail head.

The question may be asked, with no possibility of receiving an answer, as to how much a truck can be out of square and still do no harm. Theoretically, of course, the truck should be perfectly square, but perfection is difficult to attain, and the question arises of how much a truck can be out and do no harm. A truck out of square means that one side stands ahead of the other, and that the axles are not at right angles to a line connecting their ends. This turns the flanges of the wheels on the side that is back out toward the rails. It is surprising how great an angle can be caused by a very small variation in the diagonal distances between journals. On a 5-ft. wheel base, a variation of an inch will double the angle of flange to the rail on a 6-deg. curve, thus tending to crowd the wheel against the rail, increasing the flange wear and adding to the tendency to derailment. Trucks, therefore, should be so built that they are square when they are new and be of such substantial construction that ordinary or even extraordinary wear and tear will not distort or twist them.

If the cars are down on their side bearings the trucks will turn under them with difficulty and all the work of turning must be done by the flange. On any curve the side bearings on one side or the other of the car are in contact and more or less resistance is set up. The proper thing is so to adjust the weights of the car that, as it stands freely upon the trucks, the side bearings shall be free or sustaining no load, and thus cut down the truck turning resistance to a minimum. With the best of conditions it is almost impossible to get a truck to square itself with the car on a tangent, and the greater the side-bearing resistances the farther out of true will the truck remain, increasing flange wear and hauling resistances. Not only does such a condition add materially to the wear of the flange, but it will cause a very serious wear of the rail and special work. A case of this kind is shown in Fig. 1. Here the tangent on the track just behind the special work of curves was wearing in a very peculiar manner. The curves of the road were laid with grooved rails, with such a width of groove that the inside rail took all of the wear on the curve itself, as shown in Fig. 2, which represents a section of the worn rail with the contour of the new rail dotted in at a point 5 ft. from the point of tangent where the grooved rail ended. From this it appears that, though the truck is on the tangent with both wheels, it is still bearing hard outwardly and so cuts away the rail. Fig. 1 shows the section of the rail 10 ft. from the point of tangency and indicates the excessive amount of wear that was caused by the truck shooting across the track as soon as it was free from the groove of the inner rail. This wear tapered off gradually, until at 60 ft. or 70 ft. from the point of tangency the two rails were worn to essentially the same extent. Investigation showed that this wear occurred only on those portions of the road where a certain type of track with which the car body rested heavily on the side bearings was used. The raising of the body and the substitution of another truck carrying the whole load on the center plate cured the trouble.

It is evident that if the car and trucks were in shape to produce such a rail wear as that shown in Figs. 1 and 2, there must have been something corresponding to it in the wear of the flange of the wheel. As a matter of fact this was the case, and the peculiar wear so induced is shown in

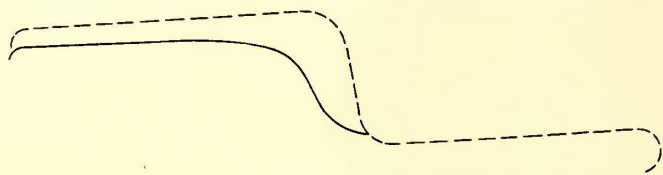


FIG. 1.

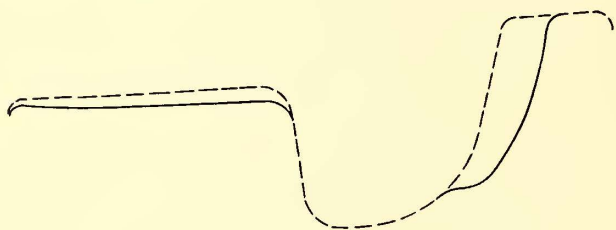
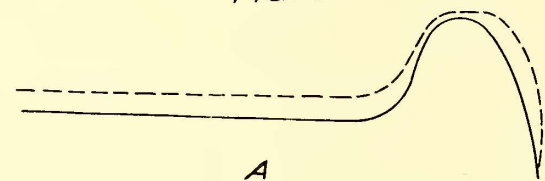
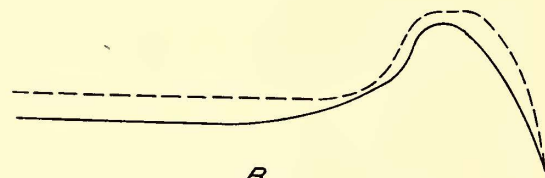


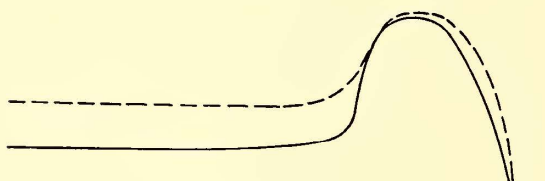
FIG. 2.



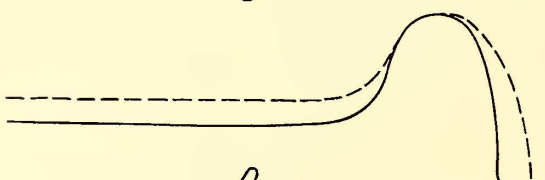
A



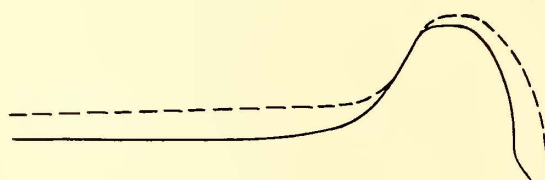
B



C



D



E

FIG. 3.

A, B, C, D and E of Fig. 3. Here we have a wear on both sides of the flange tending to cut away the gray metal at the back as well as the chill at the throat. The former is caused by the pressure of the flange against the lip of the groove on the inside rail, whose wear is shown in Fig. 2, and the throat wear by pressure against the lead-off on the tangent from the outside rail, whose wear is indicated in Fig. 1. Trucks riding

hard upon the side bearings may, therefore, be taken as a prolific cause of sharp flanges and excessive flange wear.

Trucks that rest heavily upon the side bearings are not, however, the only source of sharp flanges. Nothing is better adapted to bring about such a result than wheels improperly pressed upon the axles. If they are out of gage by being too narrow they allow the truck to cant excessively upon curves, and thus throw the flange into a sharper angle to the rail than would ordinarily occur. That is to say, the inside wheel can run ahead of the outside one so far that the flange of the latter is brought against the rail at a very sharp angle and there, acting like a knife, it cuts the rail and is itself worn away. On the other hand, if the gage is too wide both wheels are pressed against the rails at all times, causing an excessive wear and a tendency to sharpen both flanges.

But the wheels may be very accurately to gage and still be so put upon the axle that sharp flanges will inevitably result. This occurs when the wheels are nearer one end of the axle than the other. That is where they are pressed on to unequal distances from the axle ends. The results of such a condition are shown in Figs. 4, 5 and 6. In each of these figures the two contours represent the worn treads of two wheels upon the same axle, wherein the one with the sharp flange represents the one near the end of the axle. They were steel wheels, else the excessive sharpness as indicated by Figs. 5 and 6 could not have obtained. The wastefulness of such a condition of affairs is indicated by the dotted lines, which show the amount of material that would have to be removed from each wheel in order to restore the original tread and flange contour on the wheel with a sharp flange and bring them both to the same diameter. This discovery made, a careful inspection of the wheels, not only for gage but for location on the axle, put an end to the difficulty.

Mismatching of wheels also comes under this same category, and is an excessively difficult matter to avoid. It is due to the careless taping and marking of the wheels at the foundry and the careless selecting of wheels at the shop where they are put upon the axles; both dependent upon the labor employed, which is not always of the highest or most reliable type. Once under the car and worn, the dirt obliterates the marking and retaping, after a flange has worn sharp, is no evidence that the wheels were not of the same diameter at

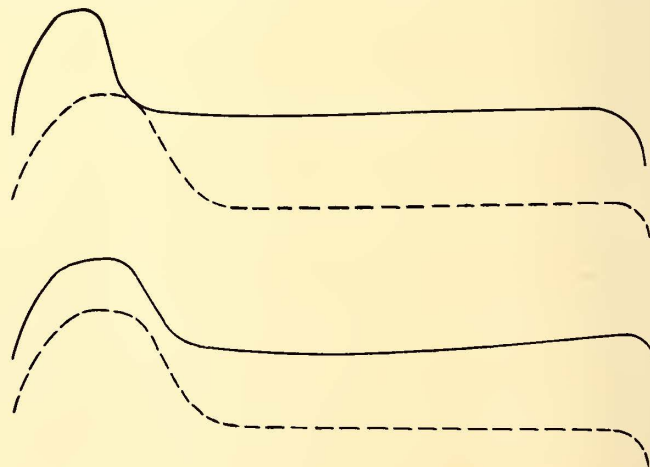


FIG. 4.

the start. Ordinarily it is the smaller wheel of a pair that should go sharp, because the larger one runs ahead and causes the flange of its mate to be turned out against the rail at all time. As in the case of the truck out of square, it is difficult to say as to just how much variation can be allowed in the circumference of a pair of wheels and do no harm. The usual limit is $\frac{1}{8}$ in. The question was asked at the recent

convention of the Master Mechanics' Association, and a member stated that it had been his practice for some time in "turning up the steel-tired wheels with sharp flanges to make the sharp wheel slightly different in diameter, about 1-32 in., and that would be approximately 3-32 in. in circumference, and in re-turning these tires it is not one time in twenty that

the ease of the car is a good thing for the wheels. So an easement approach to a curve and a uniformity to curvature on the curve itself is good for the wheels. The former is slowly creeping into practice as engineers learn, first, that it is desirable, and then how to lay it out. As for uniformity of curvature, very few men realize how really little of this there is on old track, where new rails have been put down.

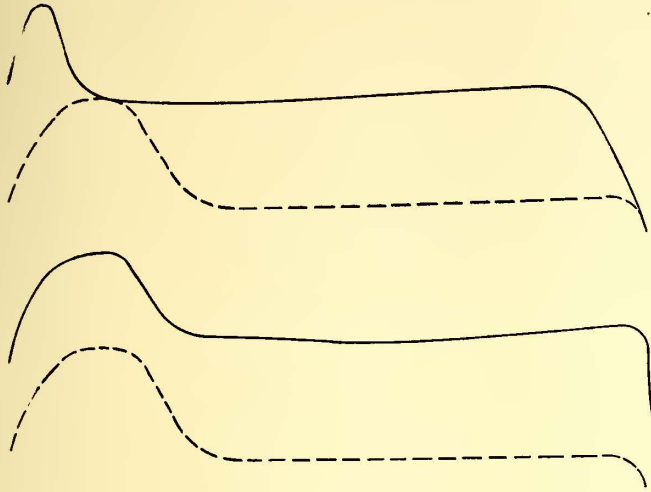


FIG. 5.

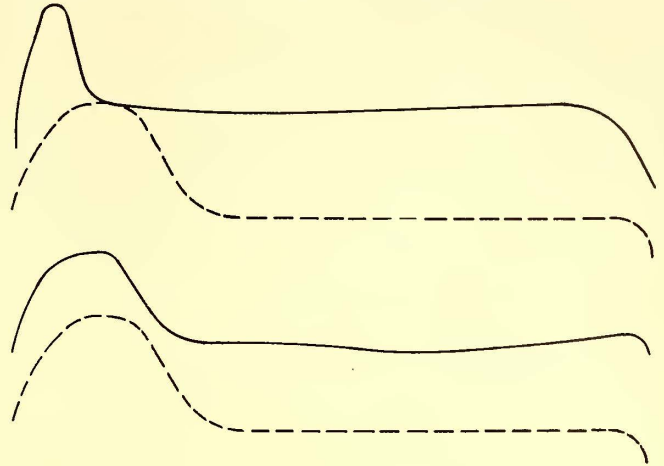


FIG. 6.

the sharp flange reappears in the same wheel, so that, perhaps, it should not be as much as 1-32 in. in diameter variation to have them run square."

Reading this strictly, it means that a variation of 1-32 in. in diameter on a pair of 33-in. wheels will cause the smaller one to run sharp. But it is not always the smaller wheel that carries the sharp flange. The other elements of trucks out of square, or stiff on the side bearings, or bad track may be more than an offset to the tendency of the larger of a pair of wheels to run ahead, and thus actually put the sharp flange on the one of greater diameter. A ease of this was found where two pairs of mismatched wheels were in the same truck, with the similar wheels on diagonal corners. The result of the combination, together with other features, was to put sharp flanges on the two wheels on the same side, which, when regarded individually as pairs one was on the large and the other on the small wheel.

The track has been laid by the eye of the gang foreman and not by the transit, with the result that variations of several degrees of curvature may occur within a few feet, vibrating back and forth on a long curve. In a way, that produces the same result as a kinky rail. It is bad for the wheel by

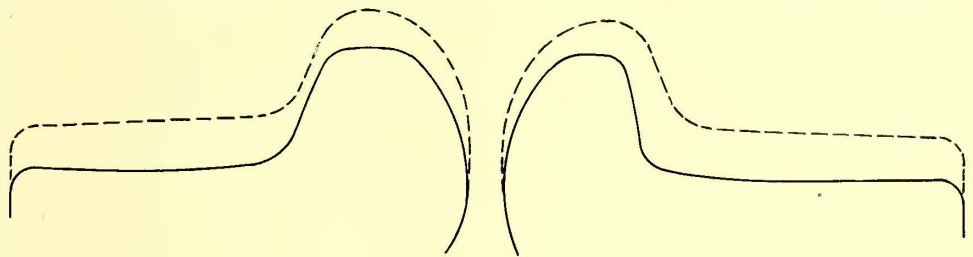


FIG. 7.

giving it a tendency to jump the track and wear sharp flanges. Inspection along these lines and a readjustment to true curvature with the transit when the pavement is up or at the first opportunity in the open country will be a paying investment.

Next to kinky curves comes a badly worn rail. In this it is a matter of dollars and cents for the management to calculate upon. If it is cheaper to run the wheels on the flanges

with the resultant chipping than to lay new rail, then let them run. Figs. 7 and 8 show the shapes into which two pairs of wheels had worn where the head of the rail had become so reduced in height that the wheels ran on their flanges with a

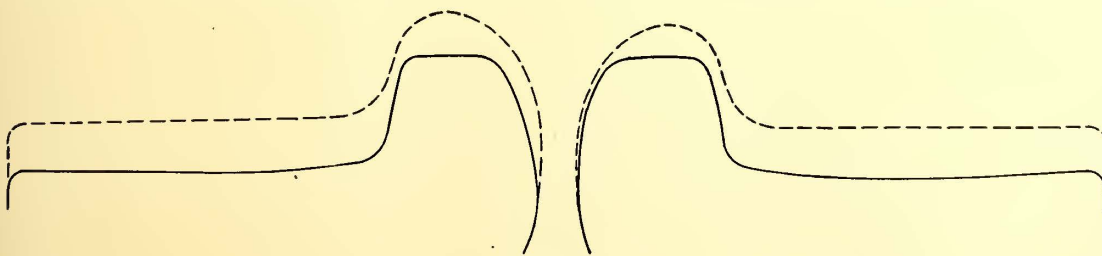


FIG. 8.

of the pair, in which case the off-hand diagnosis would be a truck that does not turn easily on the bearings. This diagnosis will not always hold, however, and a careful investigation of all of the attendant conditions should be made before reaching a conclusion.

It will probably be accepted as an axiom that the easier the riding of the car the less the stress and consequent wear and tear on the wheels. Hence anything that contributes to

bearing on the tram of the rail. The wear was good as far as amount was concerned and came well down into the tread, but the crown of the flange was made flat by the peculiar conditions of its service. Chipped flanges are apt to result from this, as wheels are not intended to carry their load on this projection.

The same statement holds in regard to special work. It is the common practice to raise the flangeway of frogs and

crossings that are made of manganese or hardened steel so that the wheel is carried across the gap on the flange until the latter has cut its way down far enough to give the tread a bearing. This undoubtedly adds to the life of the special work, which is expensive, but it is productive of chipped flanges in a way that warrants some careful reckoning to determine whether broken wheels or short-lived special work is the more expensive.

The pounding on frogs and switches means hammered-down frog points and chipped tread flanges. A great deal of trouble of this sort is experienced where narrow tread wheels are run over track designed for the use of those having broad ones. The conditions obtaining under such circumstances are shown in Fig. 9. Here the running rail and the direction of motion are indicated by the arrow. When the narrow tread wheel reaches the point *C* it drops down between the

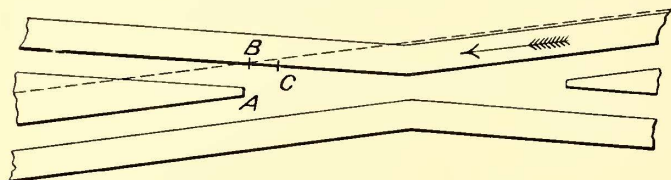


FIG. 9.

guard and the wing rail and strikes the frog point *A* such a blow that the latter is battered down until finally the wheel flange strikes the bottom of the flangeway and is broken or chipped. The remedy for this is to use a double spring frog, provided the controlling municipality will agree.

Rail elevations by which the thrust of wheel against the outer rail is regulated are difficult of adjustment on city streets to anything but very low speeds, and even then the flat curve must predominate. Usually the speed around such curves is put below the derailing point, but unless a suitable elevation is obtained the wheel stresses are very great and the wear correspondingly so, as indicated by Figs. 1, 2 and 3.

The proper shape of the tread, flange and rail head has been the subject of endless discussion for many a year, and the end is not yet. While no attempt at a final solution of the



FIG. 10.

problem will be made in this place, attention will be called to a few points that have been definitely agreed upon. Fig. 10 illustrates a case in point where a company is obliged by the municipality to use a grooved rail with an excessively narrow flangeway on both curves and tangents. The result is that these wheels take the major portion of the wear on the back. That the track conditions are bad goes without saying, and there is no help save in the conversion of the powers that be to a spirit that will permit the use of a rail suited for traffic.

As for other features of rail-head shape, the radius of the corner curve best adapted to secure a minimum wheel and rail wear has not yet been fixed, nor are we wholly agreed as to the advisability of using a head with a vertical or a sloping side; but it seems to have been pretty well proven that a sloping head gives the less wear. As for the throat of the wheel, we have the same wide variations of opinion as to the desirability of long and short radii, which it is to be hoped the present committee on standard wheel treads will be able to settle satisfactorily and establish in common practice. The same holds true regarding the taper of the tread, though the

consensus of opinion seems to be that a fairly sharp taper of about one in twenty is better than the flatter treads.

It seems strange that with all the years of experience that we have had with running wheels on rails, there should be this unsettled and lack of unanimity of opinion regarding the best forms to be used, and it only goes to show how exceedingly difficult it is to experiment along these lines and secure data from observation and experience that can be considered reliable and conclusive.

In addition to these diseases of wear and tear, there are others that require an immediate removal of the wheel. These appear in the forms of cracked spokes, brackets, and rims, broken flanges and even cracked hubs. Some of these can be referred back to excessive and long-continued brake-shoe pressure. Thus the heating of the rim by the shoe may produce stresses resulting in a crack. But very frequently this crack would not have occurred had the wheel not already been under internal stress. This is not always the case, and the difficulty of determining just how far the condition of the metal itself is responsible for its own failure under brake-shoe action is very great. Breakages due to derailments and kindred accidents are, of course, outside the pale of ordinary wear and tear, except as those derailments are caused by the defects of track or truck to which attention has been called. As for the disease of metal that manifests itself in chill cracks, shelling out and the like, that is a classification by itself and another story.

◆◆◆
ST. LOUIS AND MILWAUKEE COMPANIES TO BUILD CARS

The United Railways Company of St. Louis is planning to build its own cars in the future, and to enable it to do so the company is now greatly increasing its shop facilities at Park and Vandeventer Avenues in St. Louis. The Milwaukee Electric Railway & Light Company, which is controlled by the same interests as the United Railways Company, is also planning to build its own cars, and the company will erect in the near future at Milwaukee comprehensive shops to take care of all of the company's construction and repair work. The land for the shops at Milwaukee, about 20 acres, was acquired several years ago, along the line of the Chicago, Milwaukee & St. Paul Railway, at a very central point in the city. The management of the two companies is now working on the development of plans and specifications for new cars to be built in both cities. The cars will have an under frame of steel, and possibly other parts of the framing will likewise be of steel.

To provide for the natural growth of the system at Milwaukee and to replace equipment as it wears out, the Milwaukee company would have to build from 50 to 75 cars annually. The requirements in St. Louis would compel the construction of from three to four cars per week, or an aggregate of from 150 to 200 cars annually. This output would also take care of the equipment of the St. Louis & Suburban system, which in all probability will be taken over by the United Railways Company between now and Jan. 1 next, as the stockholders of both companies voted affirmatively on Aug. 8 on the proposition for the consolidation of the properties.

◆◆◆
 A traffic squad of mounted police has been organized for service in Philadelphia, and while it has been on duty only a few days, reports indicate that conditions at points of heavy traffic have improved considerably. There are some twenty men in the squad and they do service between the Delaware River and Fifteenth Street, giving each policeman a block and a half of patrol.

WITNESSES

BY F. W. JOHNSON

Claim Agent, Connecticut Railway & Lighting Company

The up-to-date accident man of the transportation company of to-day begins the preparations for the defense of an accident long before its actual occurrence. Experience in the past has taught him that practically every accident must be investigated, handled and prepared with the expectation that lawsuits against his concern will grow out of it. He used to hope for the best in matters of this sort. But he got bravely over that after he had seen his fondest hopes repeatedly shattered before his very eyes. He soon became intensely practical in his views, and determined to be always prepared for the worst in every accident. And so it is that we find him hard at work preparing the means of defense for an accident months and months before it actually happens.

Of course he doesn't know just when, where or how the blow will fall. But since he is a railroad man, he realizes only too well that sooner or later the lightning is bound to strike—if not in one form, then in another. And if his defense is to stand up under the strain which will be placed upon it, it must be intelligently planned and the details faithfully executed. It must be sufficiently elastic to provide for accidents of every possible description, and must cover a wide range of territory.

At the base of his foundation we find him building a tower of strength which he calls "witnesses." Without this vital support he well knows that he stands about as much chance of victory in the trial of his case at court as does the proverbial snowball out in the sun of a hot summer's day.

Witnesses to his accident he must have. He himself may be ever so well satisfied of the non-responsibility of his concern for the results of the mishap, but it will avail him nothing if he lacks the witnesses with which to combat the manufactured evidence of his opponents, and the generally disastrous consequences of the "poor man vs. rich corporation" twaddle by means of which the other side readily gains the sympathy of the honest but easily deceived jurymen. Thus it is that, foremost among other important features of his preparations, the securing of the proper witnesses to an accident takes front rank. If the case be weak in this respect, it is a fatal defect and affords the other side a vulnerable point, and one upon which it will be quick to train its heavy guns.

For the sake of brevity, it may be said that the preparations for the securing of his witnesses is composed of two parts,—the educating of his conductors, motormen and inspectors regarding the persons most desirable as witnesses, as well as when, where and how to secure them. And secondly, the means which he provides his men with which to secure their witnesses. It is with the latter portion of this part of his preparations that this article deals. In this line of business, as in all others, if satisfactory results are to be obtained, it is of vital importance that the workman should be equipped with the proper appliances with which to work. And when one stops to consider that the use of improper or inadequate equipment in work of this character often results in the needless expenditure of thousands of dollars on a single accident, the folly of such economy quickly becomes apparent. And furthermore, when the proper equipment for the conductor, motorman or inspector costs but a cent or two, it would seem that there could be no argument to the contrary.

Once the accident has happened, it immediately devolves upon the conductor and motorman to secure an adequate

number of witnesses upon which to base this defense. Therefore, we come to the question of the means by which or with which the conductor and motorman are to secure their witnesses.

The securing of witnesses under the conditions surrounding and immediately following a serious accident is invariably most difficult and well calculated to try the nerve of the best conductors and motormen. For this reason alone every possible effort should be made beforehand to assist the men in this important and highly difficult part of their work.

It may be that the car men are allowed or are supposed to jot down the names and addresses of their witnesses upon any piece of paper or note book that they may chance to have in their possession at the time of the accident. Possibly it is the back of an envelope; part of the day-card or the margin of a newspaper; any or all of which may be classed as unsuitable for this purpose.

Some concerns furnish their employees with note books for the purpose of securing witnesses to accidents. Among the best of these is a small note book some 5 ins. in length by 2½ ins. in width, designed to fit the vest pocket. On the covers are printed instructions regarding the securing of witnesses and the making out of the customary accident report.

These books are a step in advance, but still have serious drawbacks. Chief among these is the fact that the book is readily used by the employee for innumerable purposes other than that of securing witnesses, and it frequently happens that the book is about filled up before the accident happens. Again, this book leaves the employee in possession of the original list of witnesses to an accident, a fact which may afterward disturb the peace of mind of the accident man, should the employee see fit to sell out the list of witnesses to the other side. This latter defect is somewhat overcome by having the leaves of the book perforated and detachable, and by then insisting upon the employee tearing out the leaves containing the names and addresses of witnesses, and of then attaching them to the regular accident report. This latter course likewise has its bad features in that the loose leaves are liable to become detached from the report. Also, that it is difficult to overcome the tendency of a good part of the men to forget to tear out and to attach the leaves.

After experimenting for some time with this latter form of witness book, with detachable leaves, and vainly endeavoring to overcome its failings, the writer decided to cut loose from the book idea altogether. An entirely different method was adopted for the securing of witnesses. It proved a success from the start, and the results obtained have been extremely satisfactory, far beyond even our fondest expectations.

Briefly, the scheme is this:

A high-grade manila envelope selected for its wearing qualities, some 4½ ins. in length by 2½ ins. in width, was adopted. The envelope opens on one end, and resembles the average pay-envelope except that the flap to the envelope is sealed with a little metal clasp easily opened and closed. Upon the front of the envelope is this instruction.

ATTACH THIS ENVELOPE CONTAINING CARDS GIVING THE NAMES AND ADDRESSES OF YOUR WITNESSES, TO YOUR REGULAR ACCIDENT REPORT.

.....
Name of conductor or motorman.

The envelope contains nine white pasteboard cards of sufficient stiffness for the purposes of writing. The cards are 3½ ins. in length by 2¼ ins in width. The front of the witness card reads:

KINDLY WRITE YOUR NAME AND ADDRESS IN FULL, AND RETURN TO CONDUCTOR OR MOTORMAN.

.....
(Name in full)

.....
(Street and number)

.....
(Name of town)

Upon the reverse side of the card appears—

Names are requested to assist in determining responsibility for this accident.

Information thus obtained aids us in our efforts to prevent future repetitions of similar mishaps.
Supt. C. R. & L. Co.

Every conductor, motorman and inspector is obliged to have at least one of these witness packets in his possession at all times when on duty, and we encourage them to carry two packets. The packet is designed to fit the vest pocket. The envelopes of signed cards must accompany the accident report in every instance.

Some of the marked advantages possessed by this method over the old idea have proven to be:

An increase of over 40 per cent. in the average number of witnesses secured per accident.

A decrease of about 50 per cent in the total number of fictitious names and addresses secured as witnesses.

A marked decrease in the number of mistakes made by employees in understanding the names and addresses of witnesses.

One-half of the time required to secure a given number of witnesses by this method over the former.

Practically all of the witnesses signing at one and the same time, as against one at a time under the old idea.

Both conductor and motorman able to secure witnesses at the same time, each attending to his half of the car.

Inexperienced employees frequently become rattled at the time of an accident. No talking to do,—simply hand out and collect the cards. They speak for themselves.

Employees who are poor penmen or who are deficient in education have no writing to do.

A witness can write his own name and address more quickly and accurately than he can tell it to an excited conductor or motorman.

Conductor and motorman have a total of eighteen cards between them—ample for the average accident. Two packets per man doubles the number of cards per car.

The actual work of securing witnesses is placed upon the passengers themselves, thus leaving the employees free to a certain extent to assist the injured party, telephone headquarters, etc.

Unlike the witness books, the cards are suitable for no other purpose than that of securing witnesses.

The company secures the original signatures of the witnesses. Employees frequently make mistakes in transcribing names and addresses from a book to their accident report.

Employees do not retain the original list of witnesses, as the packets of signed cards have to accompany their accident reports.

At rush hours and at transfer points, employees are enabled to nail their witnesses before they scatter, by quickly handing out their cards on the spot, as opposed to writing down a single name at a time under the other method.

Accuracy in the names and addresses of foreigners, and of persons with difficult names and addresses.

No reason why employees should not sign the cards for persons so requesting.

Women passengers generally more willing to sign a clean white card bearing the company's name than to divulge their names to employees.

The witness card scheme has proven popular with the men.

Employees off duty, when present at the time of an accident, whip out their cards and assist the regular crew in securing an abundance of witnesses.

THE SPOKANE & INLAND SINGLE-PHASE RAILWAY

Some months ago announcement was made of a single-phase railway which was projected to run between Spokane, Wash., and several neighboring cities, and which has now been completed. The railway was originally incorporated under the name of the Spokane Interurban System, with a capital of \$3,500,000. The principal terminal of the road is Spokane, from which the line runs south through Waverly, Rosalia, Thornton and Colfax, which is the southern terminus at present, although the road has been surveyed and will be eventually extended to Penawawa, Wash., or Lewiston, Idaho. A branch leaves the main road approximately midway between Spokane and Colfax, and extends to Palouse City. The Y-connected system between Spokane, Colfax and Palouse City is about 106 miles in length. The roadway and overhead construction have already been completed.

In addition to its railway business the company proposes to transmit and distribute electric current for lighting and power both in Spokane and in the towns through which its lines pass. The country traversed by this road produces large quantities of wheat and fruit and is not provided with any railroad. This insures a large freight business for the new road, as the long wagon haul to the steam railroads will be avoided. For this reason the electric road is receiving the hearty support of the farming interests along its route.

There are three classes of service to be maintained—passenger, mail and express, and car-load freight. After a careful consideration of the various systems had been made, the Westinghouse single-phase, alternating-current system was adopted. As the cars of the Spokane & Inland enter Spokane over the tracks of the Spokane Traction Company, which operates a 600-volt, direct-current system, the use of both direct and alternating current is required on the interurban cars.

Power purchased from the Washington Water Power Company is used for the operation of this road. It is delivered as 4000-volt, three-phase, 60-cycle current to a frequency-changing station about 10 miles south of Spokane. This station will contain four motor-generator or frequency-changing sets, each of a normal rating of 1000 kw, consisting of a 1000-hp, 60-cycle, three-phase, 4000-volt induction motor; a 1000-kw, 25-cycle, 2200-volt, single-phase alternator of the revolving field type, and a 750-hp, 550-volt d. c. generator which is to float on a storage battery acting alternately as a motor and as a generator. These three machines will be mounted upon a single bed-plate. There are three exciter sets for the alternators, each consisting of a 75-hp, three-phase, 4000-volt induction motor and a 50-kw direct-current generator. A twenty-panel switchboard, electrically operated oil circuit breakers, and lightning protective apparatus complete the equipment of the frequency-changing station.

The 2200-volt, 25-cycle current is stepped up to 45,000 volts by four 1250-kw, oil-insulated, water-cooled transformers, and at this pressure is transmitted to fifteen static transformer sub-stations. Each sub-station is equipped with two 375-kw transformers of the oil-insulated, self-cooling type which step down the current from 45,000 volts to 6600 volts, which is the trolley line voltage. The cars and locomotives operate under three different potentials—6600 volts alternating current in the country, 700 volts alternating current in the small towns, and 600 volts direct current in the city of Spokane.

The trolley line is of the catenary construction with a No. 000 wire carrying 6600-volt alternating current. The high-tension transmission lines are No. 2 copper wires.

The electrical equipment of both the passenger and the express cars is identical and consists of four 100-hp, alternating-current railway motors per car, which will maintain a schedule speed of from 35 to 40 m. p. h. The locomotives are equipped with the same type of motors, but the latter are each of 150-hp capacity. Both the motor cars and the locomotives are operated by multiple-unit control.

These locomotives are capable of hauling seven standard freight cars fully loaded at about 30 m. p. h. on a level track. They will operate on the 6600-volt and 700-volt alternating-current lines and on the 600-volt direct-current line. Both pantagraph and wheel trolleys are used, as shown in the accompanying illustrations, the pantagraph trolley being for operation on the 6600-volt circuit and the wheel trolley for the 700-volt alternating and the 600-volt direct-current circuits. The cab of the locomotive serves to enclose the auxiliary apparatus, and is constructed entirely of steel. The locomotive weighs 49 tons and its length over bumpers is 29 ft. It has two swivel trucks with 38-in. driving wheels, and two motors are mounted on each truck and are geared to the axles. Both straight and automatic air brakes are used, the compressed air for which is supplied by two Westinghouse Air Brake Company's compressors, each driven by a 5-hp single-phase motor.

The motors are arranged in two groups, each group con-

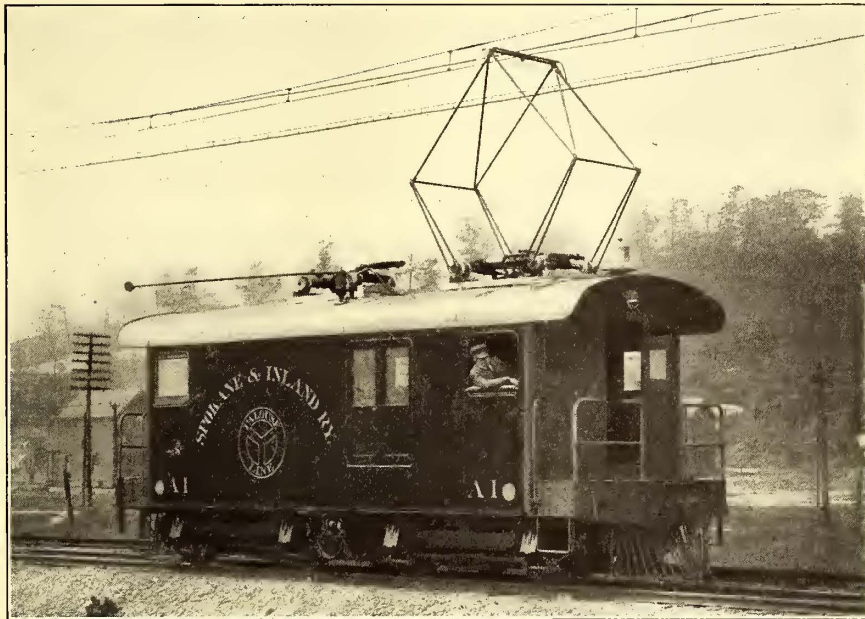
sisting of two motors connected permanently in series; so for the purpose of control these groups may be considered as single units in a two-motor equipment. Two auto-transformers are used on the locomotives, and an automatic overload and no-voltage circuit breaker is placed between the

trolley and the transformers, which operates on either overload or no-voltage by breaking the current supply to the control magnets, thus automatically opening all the switches. This circuit breaker must always be closed by hand, and it will not stay closed unless the trolley is up and current is on the line. When the circuit breaker is thrown in the circuit is completed through the auto-transformers to ground. A commutating switch is automatically shifted to the alternating-current position and the small transformer furnishing current to the control system is cut into circuit, leaving the locomotives ready to start.

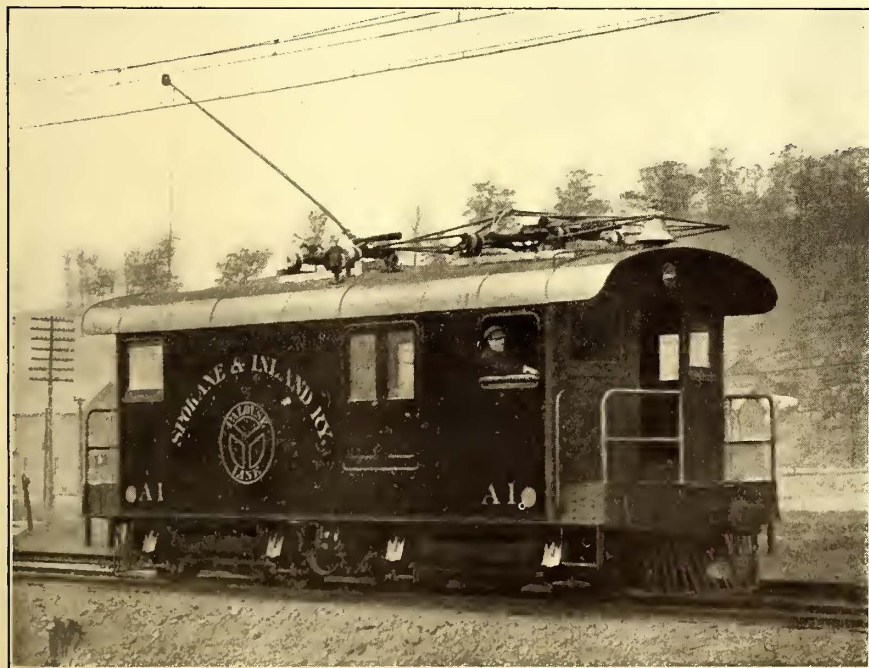
The unit switches are essentially similar to those used on direct-current systems. The control magnets are of the alternating-current type wound for 200 volts, and operate on about 80 volts direct current, but in both cases will operate down to about one-half voltage. These magnets serve to admit air under heavy pressure to the cylinders which operate the unit switches. These switches are assembled into a compact group, protected from exposure by the iron case in which it is mounted. Interlock contact blocks are provided which make it impossible for a switch to close or remain closed unless all the other switches operate according to their predetermined cycle.

The alternating current for the operation of the magnets by the master controller is obtained from the secondary of a small transformer which is connected to the 500-volt point of the main auto-transformer. When operating on direct current a resistance is placed in series with this auxiliary transformer across the 600-volt mains, and direct current is taken

from a suitable tap on this resistance. This dispenses with the use of a storage battery for direct-current operation. The only mechanical operation in changing from alternating current to direct current is to change the trolleys; the control is changed automatically by the commutating switch, which is



ELECTRIC LOCOMOTIVES USING PANTAGRAPH TROLLEY ON HIGH-TENSION, ALTERNATING-CURRENT CIRCUIT



ORDINARY TROLLEY WHEEL TAKING EITHER A. C. OR D. C. LOW-TENSION CURRENT

sisting of two motors connected permanently in series; so for the purpose of control these groups may be considered as single units in a two-motor equipment. Two auto-transformers are used on the locomotives, and an automatic overload and no-voltage circuit breaker is placed between the

a small pneumatically operated drum for shifting the control circuits. This drum is operated by a magnet connected directly to a 200-volt tap on the main auto-transformer, and has no direct-current connection. The switch has one position for direct-current operation and another for alternating-current operation, and it cannot be thrown to the alternating-current position unless alternating current is flowing through the magnet coil. If it should remain in the direct-current position no harm would be done. The reversing switch is similar to the commutating switch in its operation, but is furnished with two magnets and air cylinders, one for each position.

The preliminary order on this contract specified fifteen passenger cars, six express cars and six locomotives.

THE BOSTON-NEW YORK TROLLEY-BOAT TRIP POPULAR

An experiment in street railroading in the East that is attracting considerable attention because of the success which has attended the movement is the operation by the Old Colony Street Railway Company of a service from Boston to Fall River as part of a trip from Boston to New York, the journey from Fall River to New York being completed by boat under the direction of the Enterprise Transportation Company. As previously noted in the *STREET RAILWAY JOURNAL*, the service was started last fall with one car. While it attracted a fair amount of travel from the outset, it was not noticeably popular until spring opened. Then business began to increase, and by the time summer was well advanced it became necessary to run two, and sometimes three cars, to handle the traffic. Thirty-five was a goodly number of passengers previous to this spring; but during the summer the company has been forced to provide for eighty or a hundred passengers, day after day; and on several occasions 130 or more have demanded passage.

The Old Colony's own trackage runs no nearer to Boston than Mattapan Square on this line, but through an arrangement with the Boston Elevated Railway it has been enabled to use Post Office Square as the terminus for this Boston-New York service. At the square there is ample street surface in the area behind the big Post Office building, and the Boston Elevated has had a siding there which had been little used for some time, and which offered a very acceptable stand for the Old Colony car, out of the direct line of street traffic and close to a broad sidewalk that could serve as a waiting room. From this stand is it that the car or cars are started every afternoon promptly at 2:30 p. m., and make the run out of the city by way of Milk Street, Federal Street, Dorchester Avenue, Boston Street, Columbia Road and Blue Hill Avenue—the last three being virtually parkways—to Mattapan Square. The run then is past the Blue Hills of Milton, and through Randolph to Brockton, whence the route is over the short line to Taunton, and so on to Fall River, which is reached at 5:30 p. m. The boat leaves at 6:30 p. m. and gets its passengers into New York next morning, as a rule, at about 7 a. m.

The Old Colony sells through tickets over this route for \$1.75, of which \$1 goes to the boat company. Most of the tickets are sold through agents' offices, and an attempt is made to ascertain the number of passengers that will have to be accommodated on any given day by requiring the agent to check off the number of tickets sold for each day in advance, and then date each ticket for the day on which it is intended to be used. But this plan has not proved alto-

gether successful. Passengers who announce that they intend to make the trip on one day may change their minds after buying their tickets and present themselves unexpectedly a day beforehand. Still the difficulties which such a situation presents are not unsurmountable. Of greater moment is the handling of baggage, which has recently assumed considerable proportions. In the present situation, the carrying of so many suit cases and valises is often a serious problem, especially when open cars are used, and it is apparent that if the line would accept trunks for transportation it would draw heavily from the regular steam railroad patronage. Some of the trolley patrons at present are known to check their trunks through on a railroad mileage ticket and then buy a trolley ticket for their personal use, but more would travel by trolley if the trolley would take their trunks as well as their hand baggage. Traffic to Boston on the return run is not quite so heavy as the other way, but it has been large. The car leaves Fall River on arrival of the boat from New York and makes the run so as to arrive in Post Office Square, Boston, soon after half-past ten in the forenoon.

STREET AND ELEVATED RAILWAY MILEAGE—CARS AND CAPITALIZATION IN THE UNITED STATES, CANADA, CUBA AND THE INSULAR POSSESSIONS OF THE UNITED STATES

The accompanying table shows the mileage, number of cars and capitalization of the street and elevated railway companies in the United States and its insular possessions, Puerto Rico, Hawaii and the Philippines; also in Canada (including Newfoundland) and Cuba. The figures are given for the last two years, and are compiled from the last two editions of the Red Book of American Street Railway Investments. The dates of the reports from the different companies as given in the Red Book vary, but practically all of those in the 1906 edition are within the limits of June 30, 1905, and May 1, 1906. The average is believed to be not far from Dec. 30, 1905, so that for this reason the figures given in the table for 1905 may be considered as fairly representing the condition of the industry at the close of that year. In the same way the 1904 figures represent the condition at the close of 1904.

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

It will be noticed that the cars used in electric railway service form 96 per cent of the total number of cars. The greater part of the horse, cable and steam mileage is confined to a few cities, notably New York, Chicago, Kansas City, San Francisco, Denver, Seattle and Tacoma. The miscellaneous power cars which make up the totals given in the Southern States are mostly isolated dummy lines. The total capital liabilities have increased 4.5 per cent during the year for the United States; 5.7 per cent for the U. S. Insular possessions; 6.0 per cent for Canada, and 34.3 per cent for Cuba.

STREET AND ELE

CARS AND CAPITALIZATION IN UN

PROPERTIES CONTAINED IN "AMERICAN STREET RAILWAY INVESTMENTS," EDITION

| STATES. | NO. OF ROADS. | TRACK MILEAGE. | | TOTAL RAILWAYS. | | | | CAPITAL STOCK. | | | FUNDED DEBT. | |
|----------------------------|---------------|----------------|---------------|-----------------|---------------|--------------|--------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| | | 1904 | 1905 | TRACK MILEAGE. | | CARS. | | TOTAL. | | INCREASE FOR YEAR. | TOTAL. | |
| | | | | 1904 | 1905 | 1904 | 1905 | 1904 | 1905 | | 1904 | 1905 |
| New England States. | | | | | | | | | | | | |
| Maine | 22 | 378 | 457 | | | | | | | | | |
| New Hampshire | 18 | 392 | 291 | | | | | | | | | |
| Vermont | 10 | 112 | 12 | 381 | 460 | 675 | 726 | \$5,933,013 | \$6,614,713 | \$681,700 | \$6,772,732 | \$7,770,500 |
| Massachusetts | 82 | 2,734 | 2,776 | 292 | 292 | 396 | 422 | 6,904,900 | 7,077,660 | 172,760 | 11,363,000 | 6,296,000 |
| Rhode Island | 13 | 403 | 445 | 112 | 121 | 125 | 125 | 2,191,100 | 2,365,600 | 174,500 | 1,533,000 | 1,533,000 |
| Connecticut | 21 | 687 | 687 | 2,734 | 2,778 | 8,540 | 9,036 | 90,339,065 | 97,386,000 | 7,046,935 | 44,061,000 | 44,950,000 |
| TOTAL | 166 | 4,606 | 4,780 | 687 | 687 | 1,620 | 1,708 | 16,557,700 | 17,357,100 | 799,400 | 19,221,031 | 20,847,957 |
| Eastern States. | | | | | | | | | | | | |
| New York | 113 | 3,192 | 3,304 | | | | | | | | | |
| New Jersey | 33 | 1,108 | 1,123 | | | | | | | | | |
| Pennsylvania | 132 | 3,319 | 3,469 | 3,329 | 3,423 | 15,942 | 16,620 | 336,032,395 | 347,156,970 | 11,124,575 | 299,637,590 | 301,480,926 |
| Delaware | 7 | 137 | 146 | 1,116 | 1,129 | 2,158 | 2,350 | 87,828,290 | 89,697,880 | 1,869,590 | 78,477,600 | 80,925,501 |
| District of Columbia | 8 | 308 | 326 | 3,319 | 3,479 | 8,142 | 9,000 | 231,355,495 | 236,002,144 | 4,646,649 | 163,117,714 | 174,545,800 |
| Maryland | 12 | 454 | 496 | 137 | 146 | 258 | 268 | 4,900,000 | 4,970,000 | 70,000 | 7,074,000 | 7,084,000 |
| Virginia | 25 | 414 | 481 | 308 | 326 | 1,287 | 1,315 | 30,605,000 | 33,205,000 | 2,600,000 | 20,460,000 | 24,162,100 |
| West Virginia | 12 | 224 | 225 | 454 | 506 | 1,724 | 1,950 | 17,779,006 | 17,818,000 | 38,994 | 52,401,000 | 52,559,000 |
| TOTAL | 342 | 9,156 | 9,570 | 414 | 481 | 667 | 779 | 27,025,100 | 27,473,950 | 448,850 | 29,146,500 | 29,856,500 |
| Central States. | | | | | | | | | | | | |
| Michigan | 42 | 1,203 | 1,509 | | | | | | | | | |
| Ohio | 99 | 3,437 | 3,832 | | | | | | | | | |
| Indiana | 51 | 1,360 | 1,695 | 1,203 | 1,509 | 2,090 | 2,288 | 39,987,000 | 40,556,000 | 569,000 | 44,139,500 | 45,893,000 |
| Kentucky | 12 | 292 | 296 | 3,439 | 3,839 | 5,130 | 5,156 | 178,959,000 | 184,264,450 | 5,305,450 | 106,434,500 | 115,319,000 |
| Wisconsin | 21 | 540 | 543 | 1,367 | 1,702 | 1,625 | 1,934 | 54,532,500 | 55,585,417 | 1,052,917 | 50,182,500 | 52,441,100 |
| Illinois | 59 | 2,080 | 2,293 | 292 | 296 | 860 | 872 | 10,890,900 | 17,890,900 | 7,000,000 | 10,491,000 | 11,680,300 |
| Minnesota | 7 | 360 | 413 | 540 | 543 | 873 | 882 | 20,618,500 | 21,518,300 | 898,800 | 18,823,850 | 19,928,000 |
| Iowa | 27 | 554 | 578 | 2,177 | 2,387 | 8,358 | 8,274 | 174,059,650 | 180,654,200 | 6,594,550 | 112,639,500 | 119,072,000 |
| Missouri | 22 | 902 | 1,097 | 360 | 413 | 1,116 | 1,210 | 25,591,495 | 26,453,000 | 861,505 | 17,794,000 | 19,554,000 |
| TOTAL | 340 | 10,728 | 12,256 | 556 | 580 | 833 | 940 | 16,860,000 | 17,507,000 | 861,505 | 10,159,000 | 11,193,000 |
| Southern States. | | | | | | | | | | | | |
| North Carolina | 10 | 73 | 94 | | | | | | | | | |
| South Carolina | 8 | 89 | 129 | | | | | | | | | |
| Georgia | 13 | 356 | 364 | 75 | 94 | 143 | 162 | 2,465,600 | 2,577,100 | 111,500 | 2,736,000 | 2,762,250 |
| Florida | 9 | 85 | 101 | 94 | 134 | 146 | 158 | 2,784,000 | 2,848,000 | 64,000 | 3,916,000 | 5,180,000 |
| Alabama | 11 | 246 | 246 | 363 | 371 | 542 | 558 | 19,588,000 | 20,229,894 | 641,894 | 16,988,000 | 18,322,000 |
| Mississippi | 8 | 48 | 55 | 98 | 114 | 146 | 137 | 2,316,000 | 2,666,000 | 350,000 | 1,919,000 | 1,958,000 |
| Tennessee | 10 | 292 | 309 | 255 | 255 | 426 | 475 | 10,240,900 | 10,256,700 | 15,800 | 10,850,000 | 11,821,000 |
| Louisiana | 8 | 214 | 229 | 48 | 55 | 84 | 113 | 1,963,200 | 2,527,700 | 564,500 | 1,661,000 | 2,533,000 |
| Arkansas | 9 | 92 | 100 | 299 | 315 | 632 | 649 | 9,778,500 | 14,543,500 | 4,765,000 | 10,460,500 | 11,357,500 |
| TOTAL | 86 | 1,495 | 1,627 | 219 | 234 | 694 | 709 | 36,767,800 | 36,856,500 | 88,700 | 30,880,000 | 31,389,000 |
| Western States. | | | | | | | | | | | | |
| North Dakota | 2 | 12 | 12 | | | | | | | | | |
| South Dakota | 2 | 4 | 39 | | | | | | | | | |
| Nebraska | 8 | 198 | 255 | 12 | 12 | 15 | 32 | 300,000 | 350,000 | 50,000 | 260,000 | 300,000 |
| Nevada | 1 | 5 | 5 | 4 | 39 | 5 | 32 | | 50,000 | 50,000 | | |
| Kansas | 16 | 120 | 182 | 211 | 268 | 450 | 459 | 10,587,500 | 10,592,500 | 5,000 | 7,875,000 | 8,375,000 |
| Indian Territory | 2 | 27 | 27 | 5 | 5 | 5 | 5 | 100,000 | 100,000 | | 75,000 | 300,000 |
| Oklahoma | 5 | 22 | 150 | 137 | 192 | 206 | 217 | 2,990,000 | 3,615,000 | 625,000 | 2,266,000 | 2,578,000 |
| Texas | 19 | 400 | 446 | 27 | 27 | 18 | 30 | 312,500 | 600,000 | 287,500 | 266,000 | 608,000 |
| Colorado | 12 | 334 | 334 | 22 | 150 | 29 | 46 | 1,200,000 | 1,500,000 | 300,000 | 550,000 | 750,000 |
| Montana | 5 | 64 | 74 | 411 | 454 | 732 | 741 | 15,884,500 | 15,966,305 | 81,805 | 14,693,000 | 16,277,000 |
| New Mexico | 2 | 15 | 19 | 353 | 391 | 630 | 655 | 18,900,000 | 19,312,000 | 412,000 | 17,759,000 | 20,538,000 |
| Idaho | 3 | 23 | 94 | 64 | 74 | 106 | 106 | 1,695,613 | 2,455,613 | 760,000 | 1,240,000 | 1,500,000 |
| Utah | 3 | 96 | 104 | 15 | 19 | 12 | 15 | 350,000 | 350,000 | | 300,000 | 350,000 |
| Washington | 13 | 355 | 461 | 44 | 115 | 22 | 26 | 538,400 | 588,400 | 50,000 | 440,000 | 640,000 |
| Oregon | 9 | 208 | 228 | 104 | 104 | 153 | 153 | 6,150,000 | 10,150,000 | 4,000,000 | 5,458,000 | 7,293,000 |
| California | 42 | 1,668 | 1,840 | 388 | 482 | 745 | 741 | 22,549,100 | 25,850,400 | 3,301,300 | 13,877,000 | 15,629,000 |
| Arizona | 3 | 12 | 14 | 224 | 235 | 502 | 512 | 6,665,000 | 9,035,000 | 2,370,000 | 9,978,000 | 12,345,000 |
| TOTAL | 147 | 3,563 | 4,284 | 1,928 | 2,014 | 2,600 | 2,695 | 92,761,750 | 100,003,500 | 7,241,750 | 79,498,000 | 80,886,000 |
| United States | 1,081 | 29,548 | 32,517 | 50,899 | 50,899 | 3,862 | 4,605 | 181,321,463 | 200,855,818 | 19,534,355 | 154,655,000 | 168,469,000 |

PROGRAM OF THE COLUMBUS CONVENTION

The final program and list of papers for the Columbus Convention has just been made public. The convention will be held, as already announced, in the State Fair Buildings, and the following days have been assigned to the meetings of the different bodies:

Monday, Oct. 15, Morning and Afternoon—Engineering Association, Claim Agents' Association.

Tuesday, Oct. 16, Morning and Afternoon—Engineering Association, Accountants' Association, Claim Agents' Association.

Wednesday, Oct. 17, Morning—First meeting of the "American" Association at which the members of the other associations will be present. Afternoon—Separate meetings of all of the associations.

Thursday, Oct. 18, Morning and Afternoon—American Association, Accountants' Association.

Friday, Oct. 19, Morning and Afternoon—American Association.

The committees on subjects of the four associations have been actively engaged for several months past on this portion of the convention, and the list below shows that there will be an unusual number of valuable papers and reports presented. Each of the four associations will have a program which in itself will amply repay those in attendance. While the list below is practically complete, it is expected that a later bulletin to be issued by the secretary will show several additional papers bearing upon subjects of more than usual interest. The official program follows:

AMERICAN STREET AND INTERURBAN RAILWAY ASSOCIATION

WEDNESDAY, OCTOBER 17, 1906—10:00 A. M. TO 12:30 P. M.

Convention called to order.
Address of welcome.
President's address.
Report of executive committee.
Report of secretary and treasurer.
Addresses by presidents of affiliated and allied associations.
Announcements.
New business.

WEDNESDAY, OCTOBER 17, 1906—2:00 P. M. TO 4:30 P. M.

Reports of committees.
(a) Membership.
(b) Compensation for carrying mail.
(c) Subjects.
(d) Car wiring.
(e) Standardization of equipment.
(f) Insurance.
(g) Promotion of traffic.

THURSDAY, OCTOBER 18, 1906—10:00 A. M. TO 12:30 P. M.
(Interurban Meeting)

Report of committee on heavy electric railroads.
Paper, "Elevated Railways and Their Bearing on Heavy Electric Traction," by H. M. Brinckerhoff, consulting engineer, New York City.

Paper, "Electric Railways in Sparsely Settled Communities," by E. P. Roberts, of the Roberts & Abbott Company, Cleveland, Ohio.

Paper, "Interurban Limited Trains," by Harrie P. Clegg, president, Dayton & Troy Electric Railway Company, Dayton, Ohio.

Paper, "Interurban Freight and Express," by E. C. Spring, general manager, Dayton, Covington & Piqua Traction Company, West Milton, Ohio.

Paper, "Tickets and Rates," by F. W. Coen, secretary and treasurer, Lake Shore Electric Railway Company, Cleveland, Ohio.

Paper, "Some Distinctions Between City, Suburban, Interurban and Railroad Traffic," by Theo. Stebbins, expert, National Civic Federation, Cohasset, Mass.

Appointment of nominating committee.

THURSDAY, OCTOBER 18, 1906—2:00 P. M. TO 4:30 P. M.
(Employees Meeting)

Report of committee on rules.

Paper, "Young Men's Christian Association Branches," by E. M. Willis, railroad secretary, international committee of Young Men's Christian Association, New York City.

Paper, "Selection of Trainmen," by C. E. Learned, superintendent of inspection, Boston Elevated Railway Company, Boston, Mass.

Paper, "Discipline of Trainmen," by F. W. Brooks, assistant general manager, Detroit United Railway, Detroit, Mich.

Paper, "Uniforms and Badges," by John R. McGivney, purchasing agent, New Orleans Railway & Light Company, New Orleans, La.

FRIDAY, OCTOBER 19, 1906—10:00 A. M. TO 12:30 P. M.
(Executive Session)

Report of committee on municipal ownership.
Report of committee on public relations.
Paper, "Handling Public Complaints," by John A. Beeler, vice-president and general manager, Denver City Tramway Company, Denver, Col.

Paper, "Leaks Between Passenger and Treasurer," by A. H. Stanley, general superintendent, Public Service Corporation of New Jersey, Newark, N. J.

FRIDAY, OCTOBER 19, 1906—2:00 P. M. TO 4:30 P. M.

Report of nominating committee.
Election of officers.
Resolutions.
Unfinished business.
Adjournment.

AMERICAN STREET AND INTERURBAN RAILWAY ACCOUNTANTS' ASSOCIATION

TUESDAY, OCTOBER 16, 1906—10:00 A. M. TO 12:30 P. M.

Convention called to order.
Address of welcome, by P. V. Burington, secretary, Columbus Railway & Light Company, Columbus, Ohio.

Address, Hon. W. Caryl Ely, president, American Street and Interurban Railway Association.

Address, Prof. Bernard V. Swenson, secretary, American Street and Interurban Railway Association.

Annual address of president.
Annual report of executive committee.
Annual report of secretary and treasurer.
Appointment of convention committees.

TUESDAY, OCTOBER 16, 1906—2:00 P. M. TO 5:00 P. M.

Paper, "The Accounting of Capital Expenditures," by P. S. Young, comptroller, "Public Service Corporation of New Jersey, Newark, N. J.

Question Box.
Convention photograph.

WEDNESDAY, OCTOBER 17, 1906—10:00 A. M. TO 12:30 P. M.

Joint meeting with "American" Association.

WEDNESDAY, OCTOBER 17, 1906—2:00 P. M. TO 5:00 P. M.

Paper, "The Use of Curves in Statistics," by A. Stuart Pratt, general auditor and treasurer, Stone & Webster, Boston, Mass.

Report, committee on standard classification of accounts.
Election of officers.

WEDNESDAY, OCTOBER 17, 1906—8:00 P. M.

Informal reunion and dinner.

THURSDAY, OCTOBER 18, 1906—10:00 A. M. TO 12:30 P. M.; 2:00 P. M. TO 5:00 P. M.

Review, "Depreciation as Applicable to Electric Railways," by Robert N. Wallis, treasurer, Fitchburg & Leominster Street Railway, Fitchburg, Mass.

To be followed by discussion. This meeting will be an executive session.

Installation of officers.

AMERICAN STREET AND INTERURBAN RAILWAY ENGINEERING ASSOCIATION

MONDAY, OCTOBER 15, 1906—10:00 A. M. TO 12:30 P. M.

Registration.
Convention called to order.
Address of welcome.
Address, Hon. W. Caryl Ely, president, American Street and Interurban Railway Association.
Address, Prof. Bernard V. Swenson, secretary and treasurer, American Street and Interurban Railway Association.
Reading of the minutes of the last meeting.
Address of the president.

Annual report of the executive committee.
Annual report of the secretary and treasurer.
Appointment of convention committees.

MONDAY, OCTOBER 15, 1906—2:00 P. M. TO 5:00 P. M.

Report of special committees.
Report of committee on control apparatus.
Report of committee on maintenance and inspection of electrical equipments.

Paper, "Ballast," by Chas. H. Clark, engineer maintenance of way, Cleveland Electric Railway Company, Cleveland, Ohio.

Report of committee on way matters.

Paper, "Ties, Poles and Posts," by C. A. Alderman, chief engineer, Cincinnati Traction Company, Cincinnati, Ohio.

TUESDAY, OCTOBER 16, 1906—10:00 A. M. TO 12:30 P. M.

Report of the committee on standardization.

Paper, "Gas Engines," by Paul Winsor, chief engineer motive power and rolling stock, Boston Elevated Railway Company, Boston, Mass.

Paper, "Underground Cables," by H. G. Stott, superintendent, motive power, Interborough Rapid Transit Company, New York, N. Y.

TUESDAY, OCTOBER 16, 1906—2:00 P. M. TO 5:00 P. M.

Paper, "Economy of Car Equipment, Weights and Schedules," by E. H. Anderson, Schenectady, N. Y.

Discussion of the Question Box.

TUESDAY, OCTOBER 16, 1906—8:00 P. M.

Informal reunion and dinner.

WEDNESDAY, OCTOBER 17, 1906—10:00 A. M. TO 12:30 P. M.

Joint meeting with "American" Association.

WEDNESDAY, OCTOBER 17, 1906—2:00 P. M. TO 5:00 P. M.

General business.

Election of officers.

AMERICAN STREET AND INTERURBAN RAILWAY CLAIM AGENTS' ASSOCIATION

MONDAY, OCTOBER 15, 1906—10:00 A. M. TO 12:30 P. M.

Registration and badges at Ohio State Fair Grounds.

Secretary Davis at Fair Grounds.

President Rhoades at Southern Hotel.

MONDAY, OCTOBER 15, 1906—2:00 P. M. TO 4:30 P. M.

Convention called to order.

Address of welcome, by B. B. Davis, claim agent, Columbus Railway & Light Company, Columbus, Ohio.

Address, Hon. W. Caryl Ely, president, American Street and Interurban Railway Association.

Address, Prof. Bernard V. Swenson, secretary, American Street & Interurban Railway Association.

Minutes of last meeting.

Address of the president.

Annual report of executive committee.

Annual report of secretary and treasurer.

Appointment of convention committees.

TUESDAY, OCTOBER 16, 1906—10:00 A. M. TO 12:30 P. M.

Paper, "Which is the Better Policy, Quick or Delayed Settlements?" by A. J. Farrell, claim agent, International Railway Company, Buffalo, N. Y.

Paper, "The Policy of the Claim Department Toward the Public," by W. F. Weh, Cleveland Electric Railway Company, Cleveland, Ohio.

TUESDAY, OCTOBER 16, 1906—2:00 P. M. TO 4:30 P. M.

Paper, "The Claim Agent's Work of the Future," by C. Willis Hare, United Gas Improvement Company, Philadelphia, Pa.

Discussion, "The Relation of Statistical Bureaus to the Claim Agent's Work," by Russell A. Sears, C. S. S. Miller, Bayard P. Holmes and William DeMilt Hooper.

WEDNESDAY, OCTOBER 17, 1906—10:00 A. M. TO 12:30 P. M.

Joint meeting with "American" Association.

WEDNESDAY, OCTOBER 17, 1906—2 P. M. TO 4:30 P. M.

Paper, "Methods of Management," by H. C. Bradley, Union Traction Company, Chicago, Ill.

Question Box.

General business.

Election of officers.

The address of welcome at the Wednesday morning session to all of the associations will be delivered by Gov. Andrew L. Harris, of Ohio. In addition, Col. John Y. Bassell, secretary of the Columbus Board of Trade, will speak for that body and for the Columbus convention committee.

ENTERTAINMENTS

The entertainment program has not been fully decided upon. It will be announced later. It is expected, however, that there will be a theater party on Wednesday evening, and that the annual banquet will be held on Thursday evening. In addition, there will be interurban trolley parties, automobile rides, golfing and a number of other forms of amusement, most of which will be especially arranged for the ladies of the convention. This portion of the program is being actively and efficiently cared for by the entertainment committee of the Manufacturers' Association, in consultation with the executive committee of the American Street and Interurban Railway Association. While the social side and entertainments of the convention will not be allowed to conflict with the more serious work to be done, these features of the program will receive adequate attention.

HOTELS

A list of the hotels in Columbus, with their rates, was published in the STREET RAILWAY JOURNAL for May 26. Of these the four leading hotels are the Southern, Chittenden, Hartman and Neil. The executive committee will be at the Southern, and the Hartman will probably be the headquarters for the ladies of the convention. The Chittenden is an excellent hotel, while the Neil is possibly the best known of the Columbus hotels. All of the hotels are in the center of the city and within a short distance of the Southern. The hotel rates will be \$2 a day and upwards on the American plan and \$1 a day and upwards on the European plan. There will be no advance in the regular hotel rates during the convention week. Those who are intending to be in Columbus for the convention and have not engaged accommodations should address Ben H. Harmon, secretary of the Columbus Board of Trade, Columbus, Ohio, stating the number of rooms desired, whether with or without bath, number of people who will probably occupy rooms, and whether or not any ladies will be in the party. For the benefit of those who cannot engage hotel accommodation before reaching Columbus, the Columbus Board of Trade will have an information bureau located at the Southern Hotel, in charge of M. P. Nye. Those reaching Columbus without having secured definite hotel accommodations should consult Mr. Nye immediately upon their arrival in Columbus. All hotel assignments will be made through this bureau.

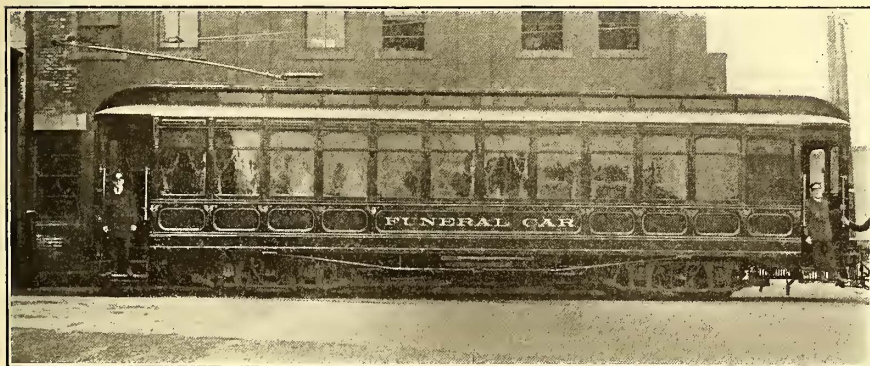
EXHIBITS

The exhibit halls* at Columbus are larger and the space available is better fitted for exhibit purposes than with any other hall or halls used at previous conventions of the association. These advantages have been realized by the manufacturers of street railway apparatus, and reports already received indicate that this portion of the convention will form by far the largest and most complete display of street railway apparatus which has ever been gathered together. The total amount of floor space, for which application has been made already largely exceeds that of the 1905 convention exhibit at Philadelphia and represents assignments for 135 different companies. A list of exhibitors and plan of the exhibit hall were published in the STREET RAILWAY JOURNAL for Aug. 11.

Arrangements have been made at the exhibit hall for promptly and effectively caring for the needs of both delegates and exhibitors. The information and registration bureaus will be just inside the main entrance. They will include the exhibit hall headquarters for the four street railway associations, and the registration booth and headquarters of the Manufacturers' Association. A local postoffice, telephone booths and telegraph stations will also be located in the exhibition hall adjoining the place of registration.

NEW FUNERAL CAR IN CLEVELAND

For several years past the Cleveland Electric Railway Company has been operating a special car for funerals. It has proved such a convenient and economical method of handling interments that the car has been busy practically all the time, and recently it was decided to build another car for this service. From its experience with the first car, the company gained a number of ideas as to desirable improvements, and



CLEVELAND FUNERAL CAR READY FOR A TRIP

it was decided to carry these out in its own shops. The new car was placed in operation a few weeks ago.

The first car was rebuilt from a combination suburban car, and in order not to change the bulkhead between the passenger and baggage compartments, the latter was left the same size as before, thus giving space for four caskets. It has never been found necessary to handle this number of caskets, so that the new car was built with less room for this purpose, thus materially increasing the seating capacity.

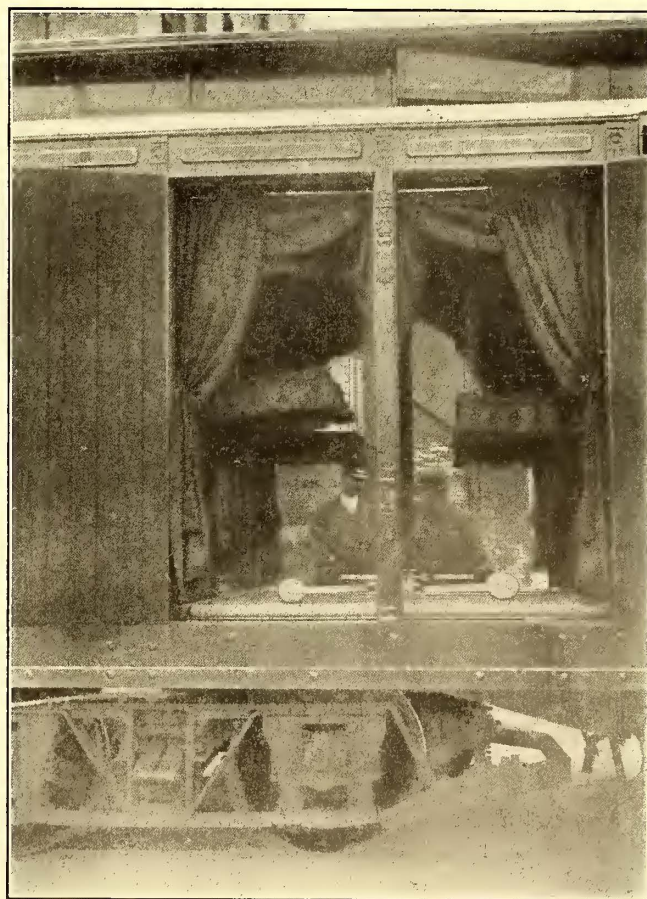
The length of the new car over all is 45 ft. 3 ins., and the car body is 36 ft. 3 ins. x 8 ft. 6 ins. The height from the top of the trolley stand to the floor is 13 ft. 1 in., and from the floor to the rail, 33½ ins. There are two steps. The rear and front vestibules are made to enter from either side, and there is no entrance to the car from the front vestibule. The passenger compartment is divided into two sections. The front compartment is used by the immediate family of the deceased, while the friends occupy the rear compartment. The front compartment is fitted with ten willow chairs, upholstered in leather, while the rear one contains twelve leather upholstered Hale & Kilburn high-back coach seats. The windows in the passenger compartments have elaborate draperies of royal purple broadcloth, with black satin facing. Electroliers, hat hooks, and trimmings throughout are of oxidized brass of special design, furnished by the Dayton Manufacturing Company, of Dayton, Ohio. The floor in the family compartment is covered with linoleum and that of the rear with rubber matting. The aisle in the passenger compartment is 20½ ins. wide. The front, or hearse, compartment of the car is arranged to accommodate two caskets, which may be put in from either side, through doors opening to the top of the windows. The floor of the compartment is fitted with six heavy rubber rollers, permitting easy handling of the casket. To prevent any side motion of a casket, and to hold it firmly in place, there are rubber-padded metal brackets, which are quickly adjustable to accommodate any length of casket. This compartment is draped in black broadcloth, and there are several folding shelves, for carrying flowers, draped with the same material.

The interior finish of the passenger compartment is of cherry, with hand-carved floral designs over end panels and doors. The ceiling is painted deep blue, with gold ornamentations. The toilet rooms, which are located between the front

and rear compartments, are fitted with a folding lavatory and a Hart sanitary closet, with all necessary appliances, and having a tank in the roof for supplying water for both purposes. The exterior of the car is finished in dead black, with hand-carved ornamentations and gold striping and lettering.

The car is mounted on two Peckham No. 25 trucks, with 4-ft. 8-in. wheel base, and equipped with four Westinghouse No. 101 motors and K-6 controller. It is also equipped with Eclipse life guard, Imperial arc and incandescent head light, Nichols-Lintern air sander with Cleveland Electric Railway Company's improved sand box, Christensen air brakes and Lintern tail lights. The ventilator glass is bevel-chipped plate glass with ornamental design. The side windows are of standard steam coach type, the top section being made of ornamental glass. The car has a National air whistle, and is heated by Consolidated Car Heating Company's heaters.

Practically every one of Cleveland's cemeteries is accessible from the car lines of the Cleveland Electric Railway Company, and in two instances there are spur lines into the cemeteries; new burial grounds are being



SIDE DOOR OF CAR OPENED TO SHOW THE HEARSE COMPARTMENT

designed with this in view. Near some of the other cemeteries, loops have been built, so that the car can lay up. The charge for the service is very reasonable. That for the older car is \$10 for the round trip to and from any cemetery on the lines of the company, that for the new car is \$15. The lower price will be retained for the older car, as this is a great boon to the thousands of poorer people of the city. As the new car is much more elaborate, it will be used largely by the wealthier people, thus giving the

service a much broader field than has been possible with but one car. One crew is retained exclusively in this service. The men are old employees who have been with the company for years, and who were selected because of their courteous and accommodating qualities. When both cars are out at the same time, extra crews are delegated for the service. The permanent crew has charge of both cars, and sees that they are kept in the best of order.

The cars are also used on all the interurban lines out of Cleveland, either for burials to points on these lines, or from such points to Cleveland cemeteries. Thus far the company has not permitted their use exclusively on foreign roads, but it is possible that this may be done now that the company has two cars. The cars have been as far west as Norwalk, east as far as Ashtabula, and south as far as Canton; in other words, within a circle of about 60 miles from Cleveland, which is about the limit of distance that they are available for a single day's trip. For such interline service, the interurban company receives its chartered car rate, and in cases of long trips the city company makes an extra charge to compensate for the car being away for more than the usual length of time.

Although the cars are in constant use, it is seldom that they hold up the schedules on the city lines. When an engagement is made the car is usually sent to the car house nearest the point of funeral an hour or so before the appointed time, and then they gage their time so as to be at the proper street on the dot. The company has the friendship of a great majority of the funeral directors, and they almost invariably cooperate with the company in the matter of having services gaged so that there will be no delays. It is seldom that a hearse is used in connection with the service, and where houses and churches are some distance from the car line the funeral director transfers the casket to the car in his burial wagon.

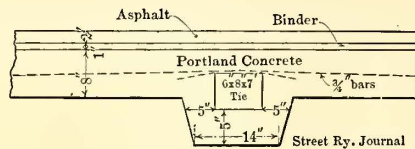
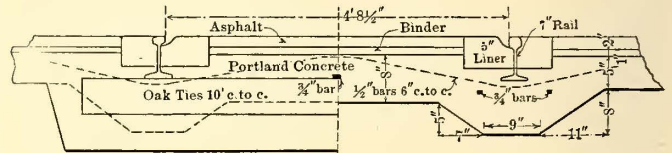
Considering the convenience, carrying capacity and economy of the service, the cars are a great boon to the public. They have been quite profitable to the company, and they are growing more so as the public becomes acquainted with their advantages.

TRACK WORK AND GAGE WIDENING AT SIOUX CITY

During the past few years extensive improvements have been made on the street railway system of Sioux City, Ia. The several street railway properties in the city were consolidated in 1899, and about half of the track mileage taken over was standard, while the remainder was 4-ft. 4-in. gage. When the Armour and Swift interests acquired the consolidated properties a few years ago, in view of the fact that operating difficulties were materially increased by the two gages, the work of changing the narrow-gage track to standard was begun. Up to the present time about 10 miles or 12 miles have been changed over, and during this year about 4 miles additional will be rebuilt. The narrow-gage track was originally constructed differently in different parts of the city. Some of it was laid on concrete beams, while in other portions the rails were embedded in concrete and rested on corrugated steel ties of the Daniel type, placed with centers 3 ft. apart.

The accompanying drawings show the methods used in reconstructing some of the track originally built without the metal ties. This method of construction was designed by J. M. Lewis, city engineer of Sioux City, in conjunction with E. L. Kirk, manager of the railway company. The oak ties placed with the centers 10 ft. apart are embedded in concrete, and concrete beams under the rails extend to a depth

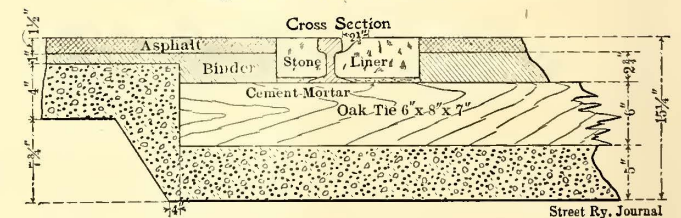
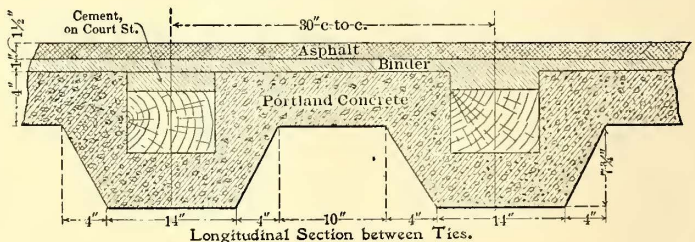
of 9 ins. below the base of the rail. This beam is reinforced with two 3/4-in. square steel rods which pass over the ties, one on each side of the rail, and between ties drop about 2 ins. below the base of the rail. An additional longitudinal bar of the same size is embedded in the concrete equidistant between the rails. Transverse bars are placed with centers 6 ft. apart. These, which extend beyond the ends of the ties, pass under the base of the rail and rise almost to the top of the concrete at the center of the track. A 7-in. 80-lb. T-rail in 60-ft. lengths is employed, and paving blocks are placed on either side. Two ins. of asphalt on 1 in. of binder covers the concrete. In another form of construction which is employed on Pierce and Court Streets, the ties are embedded



DETAILS OF SIOUX CITY TRACK WORK ON ASPHALTED STREETS

in concrete, but are placed 30 ins. apart. In this construction not so much concrete is placed under the rail and the steel bar reinforcement is not employed.

A novel method of widening the gage will be on that por-



TRACK WORK ON PIERCE AND COURT STREETS, SIOUX CITY

tion of the track laid with corrugated ties. The ties are laid on concrete and the clamps, one on either side of the rail holding it in place, are bolted to the tie with the nut on the under side. The gage will be widened by simply setting one of the rails 4 1/2 ins. out nearer the end of the tie. To avoid disturbing the tie and the concrete underneath it, those clamps originally on the outer side of the rail will be turned and utilized as the new inside clamps. A new outside clamp will be fastened to the tie by threading a newly drilled hole in the tie and employing a cap screw to bolt the lug to the rail. The tie rods will be lengthened by attaching to them a short length of rod by means of a long threaded nut or sleeve.

A few blocks of the track laid on the steel ties have been widened simply by setting the rail out nearer the end of the

tie and embedding it in concrete to a depth sufficient to hold it without the clamps. The total cost for the reconstruction of 17 miles of track that will eventually be changed will be

ELECTRIC FLOAT PARADE IN LOS ANGELES

It is doubtful whether any other factor has had such influence in developing Mardi Gras and similar celebrations to their present magnificence as the electric railway. Instead of poorly illuminated floats drawn by horses, it is now the custom to have the local railway adapt its flat cars for this purpose, and by the use of electricity the decorative effects need be limited only by the ingenuity of the artist. More than twenty years ago some Los Angeles business men took up the scheme of giving an annual flower show, and several of these were held in the spring-time when the floral display was best. These were so successful they attracted much attention. About a dozen years ago the flower show held in doors was expanded into the Fiesta which could be given out doors and thus be seen by all eyes. For four or five successive years beautiful street displays in which flowers played the prin-

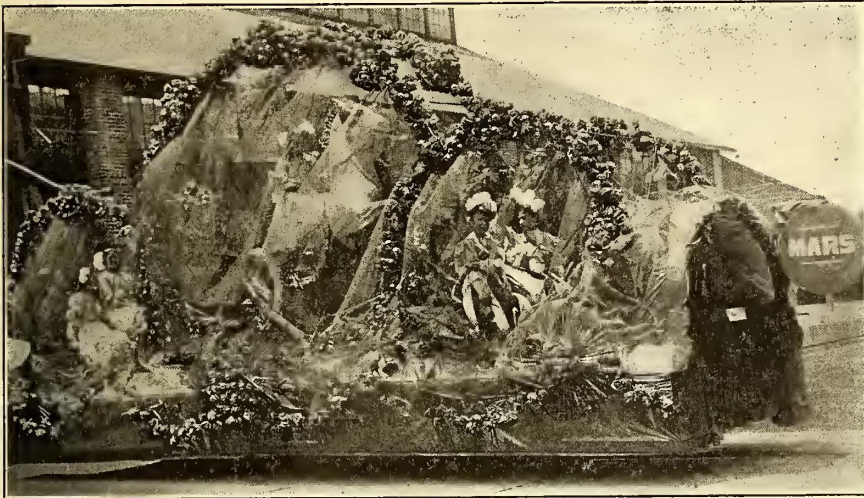


FIG. 1.—ELECTRIC FLOAT "MARS," READY TO LEAVE THE CAR HOUSE

about \$200,000. All of it, however, is not laid in paved streets, as some is on gravel roads and others on dirt.

Changing the width of the gage necessitated, of course, some changes in the cars. The company was fortunate in that the majority of the trucks were built with frames of standard width, in which the narrow gage was taken care of by a reverse dished wheel, and with these trucks it was simply necessary to put on the axles wheels dished in an opposite direction and to rearrange the brake rigging. In ordering trucks with narrow frames within the past few years, the specifications have required these to be so built that the frames could be widened without difficulty. All bolt holes required in the change were drilled and other provisions were made, and this precaution facilitated greatly the

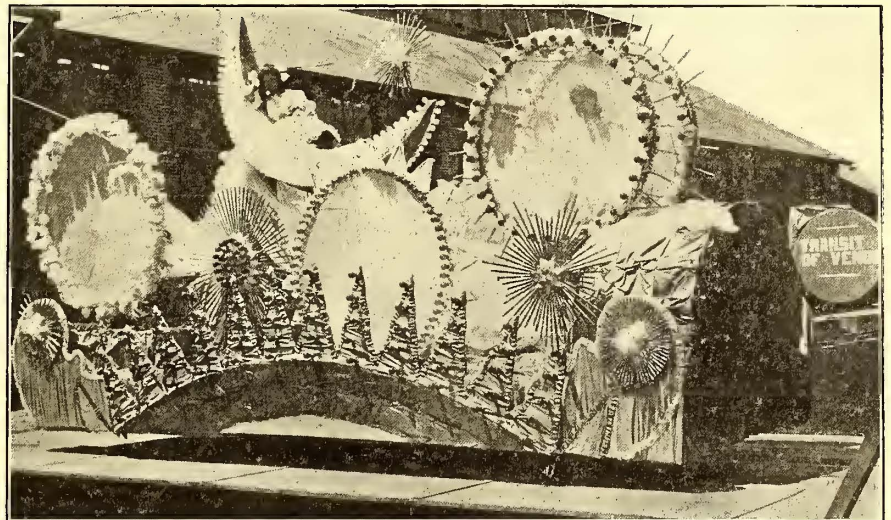


FIG. 2.—THE SPLENDIDLY ILLUMINATED FLOAT REPRESENTING THE TRANSIT OF VENUS

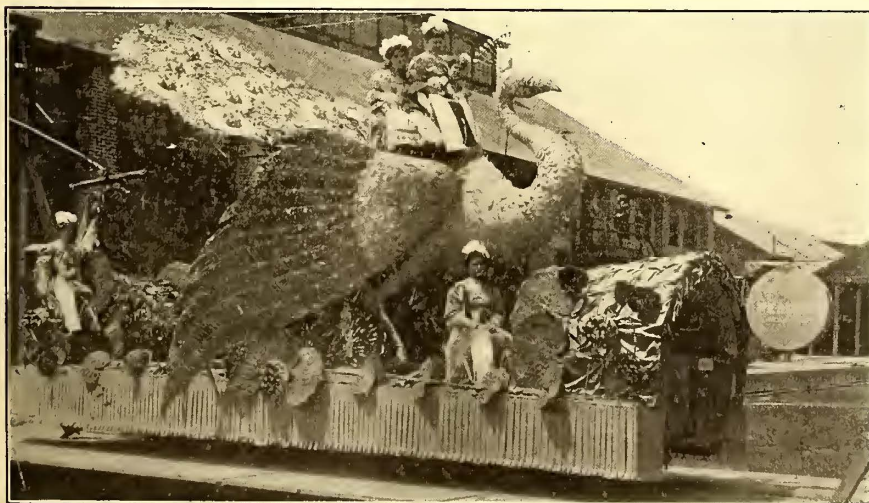


FIG. 3.—THE GIANT ELECTRIC PEACOCK IN THE LOS ANGELES PARADE

work of changing the trucks. With these careful provisions made in advance, the work of gage widening was facilitated.

admirer. Four of these floats are shown in the accompanying illustrations, which give a fair idea of their daylight appearance, but of course can give no ad-

principal part were held, and attracted the attention of people in all parts of the United States. Tourists put off their visits to the season when the Fiesta would be given.

Then for a few years the Fiesta was allowed to lapse until revived by the Merchants' and Manufacturers' Associations and other civic bodies, who conceived the idea that the Fiesta with its gorgeous street displays day and night, of floral combination with electrical effects at night, would afford much amusement and entertainment to the thousands of tourists who come here from all parts of the world. Last year the Fiesta was omitted in honor of the Exposition at St. Louis, but this year the Fiesta was grander than ever before. It was made up of six steel allegorical floats whose tasteful and liberal illumination was greatly

quate conception of their gorgeous showing when illuminated. The photographs were taken just as the floats were preparing to leave the car house. Fig. 1, entitled "Mars," shows a warlike charger garlanded with roses, accompanied by an escort of rather peaceful-looking, pretty girls. Fig. 2, which was called "The Transit of Venus," proved especially effective from a lighting standpoint, while Figs. 3 and 4 are rather imposing representations of "The Peacock" and "Eagle." All of these floats were mounted on trucks designed by Fawcett Robinson of the Los Angeles Railway Company, which takes great interest in the Fiesta.

PARK IMPROVEMENTS AND NEW CARS FOR THE JOLIET, PLAINFIELD & AURORA RAILROAD

A number of handsome combination passenger and baggage cars, like the one illustrated, are now being shipped from the works of the American Car Company to the Joliet, Plainfield & Aurora Railroad. Four trailer cars of the same design and dimensions are also included in the shipment for handling this company's growing traffic.

Chief among the improvements made by this interurban



BAGGAGE COMPARTMENT OF JOLIET CAR

road is the extending and beautifying of Electric Park, situated on the banks of the Du Page River at Plainfield. The charming surroundings and many attractions to be found at this popular resort were described in the *STREET RAILWAY JOURNAL* of Dec. 24, 1904, and when the new features are added, Electric Park will be as attractive as any to be found in that section. Some distance down the river, the dam has been rebuilt, making nearly a mile of perfect boating, and all the usual amusements, including a summer theater, can be had. A unique feature of this park will be the camp grounds for the accommodation of those who wish to spend one week or the entire season on the grounds. On the eight acres of land reserved for the campers trees and shrubs have been planted and graveled walks laid out. On this site will be erected from seventy-five to one hundred canvas cottages which may be leased from the street railroad company for a

nominal sum. These cottages have a permanent board and composition roof; board floor one foot above the ground; two feet of the side walls planked at the bottom and the balance



FIG. 4.—THE EAGLE FLOAT WITH THE STARS AND STRIPES

of the side walls and gables heavy canvas, thus affording all of the open-air advantages of living in a tent without any of the disadvantages. Canvas-covered porches are provided and every facility offered in the way of gas for cooking and lighting, and as far as water and sanitary sewerage is concerned, people living in these tents will be as well off as their neighbors in the city. An immense dining hall is being erected for those who desire to escape the worries of the culinary department. On the west side of the river a large steel circular auditorium is being built with a seating capacity for 3000 people. A stage at the south end of the building will be fitted with every convenience for musical and other entertainments, and in addition a pipe organ is being installed. The lower floor of the building will be used for administration headquarters and the upper floor as a dining room and cafe. The auditorium has been designed with special reference to Chautauqua purposes, and will be utilized as a mercantile exhibition hall for the Plainfield township fair.

To facilitate the handling of the heavy traffic at the park, the company has installed a loop switch and additional side-track and platform, with a subway under the tracks into the park, so that all the loading can be handled on the one platform and all the unloading on another, which will result in no passengers being obliged to cross the tracks at grade. In addition to the features mentioned, the company will expend between \$20,000 and \$30,000 for other ornamental and decorative purposes. About 8 miles of new 400,000-circ. mil



COMBINATION CAR FOR THE JOLIET, PLAINFIELD & AURORA RAILROAD

feeder cable has been installed to enable the company to satisfactorily handle the new equipment, and this season traffic returns are expected to double those of last year. Since last season the company has placed in operation a complete

United States electrical signal system to insure the safety of passengers.

Aside from the new cars now being delivered by the American Car Company, the regular equipment of the Joliet, Aurora & Plainfield Railroad is of a very high standard and of the same builder's manufacture. The railroad company is especially enthusiastic over the parlor car "Louisiana," which was purchased from the American Car Company at the World's Fair, and which is of the Brill semi-convertible type. This car has been of great value in working up a class of traffic that they otherwise would not have had. Owing to the luxurious cars, the company's lines running out of Joliet and Aurora are the most popular for trolley parties. The company has made a special feature of excursion rates, and parties of ten or more can be carried very economically on the regular cars, and the rates are correspondingly low in chartering a private car. The company states that the public has given marked approval to the smooth flush panel, the inside finish of golden oak, and the attractive treatment of the ceilings, and in the ordering of additional equipment these specifications will be adhered to. These cars have carried as many as 186 passengers each without breakage or damage.

The new cars are fully up to the high standard set by their predecessors, and are the embodiment of elegance and comfort. Luxurious high roll-back seats with spring backs covered in leather are provided. The finish is the company's standard quartered golden oak, inlaid with white holly. The ceilings are of three-ply poplar tinted a light green and delicately traced. The etching on the glass of the top sash lends an added touch of luxury. The end transoms have removable frames in which is set flashed glass of a deep blue shade, bearing the name of the railroad company in white etched letters. Continuous basket racks of bronze are installed, and there are additional fittings such as hot-water heaters, a thermometer to insure an even temperature in winter, and a saloon with dry hopper and water cooler. The folding doors in the vestibules are operated by the Brill system of control. The baggage compartments in the cars embodying this feature present a very substantial interior. Two high-roll back seats of rattan are provided at the end next to the passenger compartment, and the longitudinal seats are arranged to fold up when not in use.

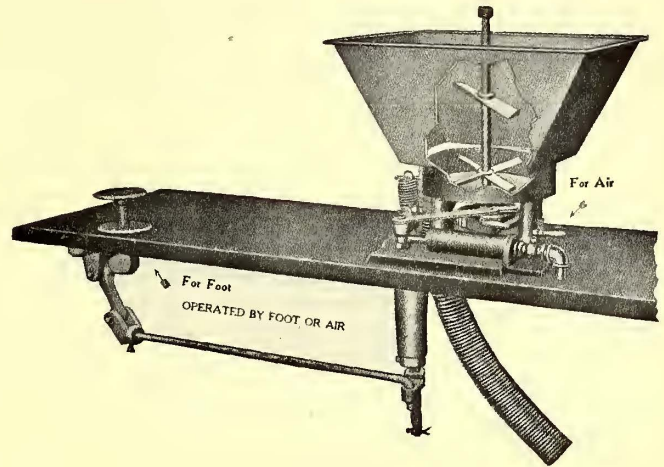
The chief dimensions in each type of car are identical and are as follows: Length over the end panels, 36 ft., and over the vestibules, 46 ft.; width over the sills, 8 ft. 8 ins.; width over posts at the belt, 8 ft. 9¼ ins.; centers of the posts, 2 ft. 8 ins.; height from the floor to the ceiling, 8 ft. 4¾ ins.; height from the track to the under side of the sills, 2 ft. 10¼ ins.; height from the under side of the sills over the trolley board, 9 ft. 5¼ ins.; height from the track to the platform step, 1 ft. 6¾ ins.; size of the side sills, 5 ins. x 8 ins.; size of the end sill, 5 ins. x 7 ins.; width of aisle, 36 ins. Both types of cars are mounted on No. 27-E1 trucks having a wheel base of 6 ft. and an axle diameter of 4½ ins. Four 40-hp motors per car are installed. Numerous of the builder's specialties are employed, such as angle-iron bumpers, "Dumpit" sand boxes, "Retriever" bells, "Dedenda" alarm gongs. The weight of the passenger and baggage car without motors is approximately 31,500 lbs.; that of the trail car, 30,000 lbs.

The Canton Board of Public Service has decided to make a test case of the law requiring street railway companies to sprinkle their tracks in municipalities. The Canton authorities have decided to do the sprinkling themselves, and will then attempt to place the amount on the tax list of the Canton-Akron Railway Company. In this way the effectiveness of the law will be tested.

AN EFFICIENT SANDER

Many attempts have been made to produce a satisfactory device for sanding rails, and many failures have been recorded in the past as the sanders proved able to work only in sunny weather and with dry sand. Unfortunately these ideal conditions do not always exist.

The accompanying illustration shows the Simmons-Moore sander manufactured by the Dayton Manufacturing Company, of Dayton, Ohio, which believes that this sander will prove equally reliable under all weather conditions. A metal hopper of any size to suit the space for holding the sand is placed beneath the car seat or other convenient place inside



PART OF SAND-BOX BROKEN AWAY TO SHOW OPERATING MECHANISM

of the car. The sander can be easily operated by hand, foot or air. By the first two methods motion is transmitted from the vestibule to the sander by means of the iron rod which extends underneath the floor line of the car to the sander.

If operated by air, an air-pipe line is run from the vestibule back to the sanding machine and connected to the air valve as shown in the illustration. When the air is applied the pressure causes the small piston to travel across the length of the cylinder placed at the base of the machine and the piston is connected to the mechanism to allow the sand valve to open and permit the sand to flow. The sand will then be emitted in a continuous stream as long as the air valve remains open. If dry sand cannot be obtained, then it is well, when using air, to open and shut frequently the air valve which causes the blades to revolve, stirring and aerating the sand as they turn around. At the same time that the valve opens, a metal finger reaches up through the opening and pokes the sand which lies nearest the opening, forcing the same to feed. Similar results are obtained when raising and lowering the foot when the foot pedal is used. The sand is conducted to the rails through a heavy wire hose.

Since the sander and the sand-box are located under a seat on the inside of the car, freezing weather in no way affects its operation. Also when cars are scrubbed out, water cannot run into the hopper and wet the sand. The sand cannot pack, as the revolving blades and the finger above mentioned effectually prevent it from packing or sticking and permit the use of comparatively damp sand. The mechanism is very positive in its action so that no sand is wasted between applications, and the quantity to be delivered can be regulated to have a large or small stream of sand flow as required.

Since the entire equipment is shipped ready for use, it can be installed by an ordinary workman in a short time, without in any way marring or injuring the car. All the various

parts are exceptionally strong and durable so that after once installed, the equipment requires little or no attention and it will deliver the sand as long as sand remains in the hopper. Among the railway companies which are using this sander with good results are: The Columbus, Urbana & Western Electric Railway; the Scioto Valley Traction Company; the Columbus, New Albany & Johnstown Traction Company, and the Columbus, Delaware & Marion Railway.

AUTOMATIC DEVICE FOR FILLING ROTARY BROOMS

The Columbia Machine Works & Malleable Iron Company, of Brooklyn, N. Y., is manufacturing an improved table for automatically inserting reeds in rotary brooms, sweepers, brushes and the like. The top of this table is divided lengthwise in two hinged portions. One of these is fastened securely to the table supports while the other is left free to tip over the stationary part as shown in one of the accompanying illustrations. Each table leaf has at its outer edge a flange upon which is placed a wider strip of sheet metal. These

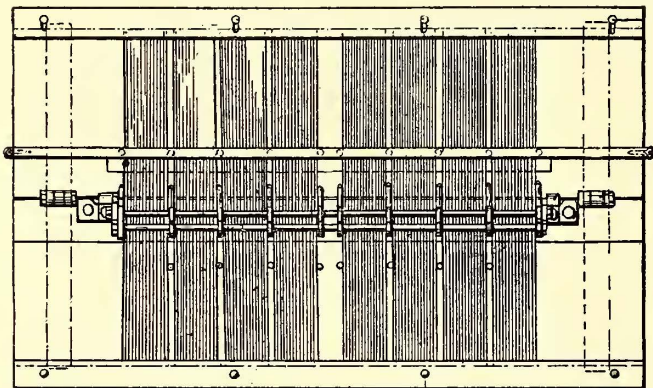


FIG. 1.—SECTION FRAME AND REEDS IN POSITION ON TABLE

strips are slotted transversely to receive nutted bolts which extend through the flange and table top. By loosening these bolts, the metal strips can be slid to project inward from the flanges or they can be slid outward to coincide at their inner edge with the inner edge of the flanges.

The reeds are first laid across the table, the metal strips being slid outward to facilitate this step and then afterward slid over the ends to hold them in place. A section frame of a broom is then laid along the table upon the reeds and is secured at opposite ends outside of the reeds. The section frame, as shown on the table in Fig. 1, consists of transverse

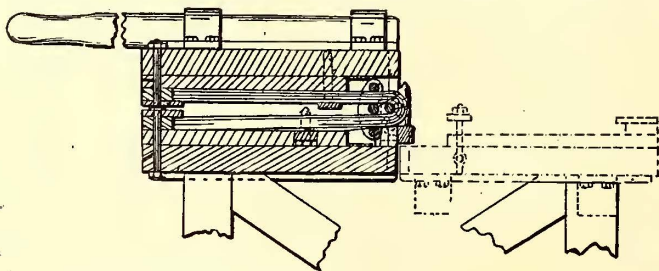


FIG. 2.—TABLE SWUNG TO BEND THE REEDS

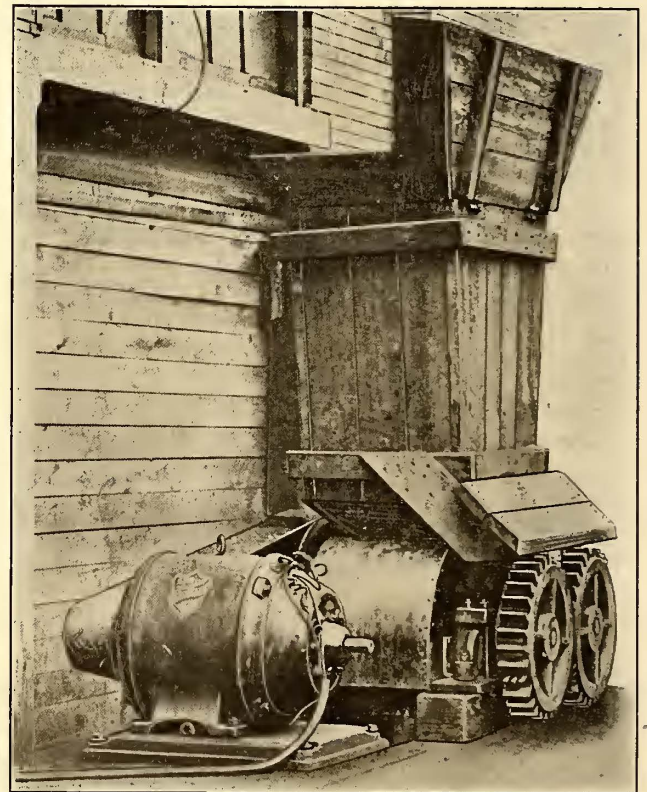
plates arranged at suitable intervals upon connecting rods threaded at their ends to receive nuts. When placed upon the table the side rods are removed, and of the remaining two rods, one is adapted upon the removal of its end nut to be inserted in adjustable brackets upon the table top to hold the section frame in place. The frame having been locked and its plates separated the reeds into groups, an auxiliary holding-strip is applied to the swinging section of the table. This

strip has teeth placed at distances equal to the distances between the plates of the section frame, and in applying the holding-strip the teeth are inserted into the divisions between the groups of reeds close to the frame plates. The entire holding-strip is then drawn outward upon the swinging section of the table to where the latter is provided with a series of sockets for receiving the teeth. The ends of the holding-strip project beyond the ends of the table and are locked to fastening bolts thereon.

The stationary section of the table has also a fixed row of teeth, spaced like those in the holding-strip and the plates of the brush-section frame, which serve to divide the reeds in groups as they lie on the table at the beginning of the operation. The swinging section of the table is next turned over as shown in Fig. 2. This naturally bends the reeds around the rods of the broom-section frame into their proper relative positions. The side rods of this frame are then pushed endwise into place in the perforated plates and afterward the metal strip of the swinging section of the table is released from the ends of the reeds and the swinging section returned to its original position, leaving the broom section properly filled upon the stationary table.

MOTOR DRIVE FOR COAL CRUSHING ROLLS

The accompanying illustration shows a set of 24-in. x 30-in. Allis-Chalmers coal crushing rolls, belted to an electric motor. In connection with furnaces at which automatic stokers are used, or where for other reasons it is desirable



MOTOR DRIVING COAL CRUSHER

to have the coal crushed to a uniform size, the advantages of such an arrangement will be readily apparent. The coal, as it is unloaded from the car, is passed through these rolls and drops to the hopper which feeds the stokers. Where it is possible to secure coal in hopper cars at all times a further improvement is made by placing the crushing rolls beneath the track, allowing the coal to drop from the car into the

rolls, and falling from there to the stoker supply hopper. Motor drive is the most satisfactory for an equipment of this character, as such rolls are in operation for a limited time only each day; there is therefore no waste of power and no idle belts or extra shafting to be cared for while the rolls are not in operation.

The Allis-Chalmers Company is now manufacturing a full line of these rolls, which are used not only for crushing coal, but also rock salt, phosphate rock and other similar materials that do not require the heavy machinery furnished by this company for mining work and the crushing of harder materials. It also builds the motors by which the rolls are driven.

SEMI-CONVERTIBLE CARS FOR THE BOSTON SUBWAY

The Old Colony Street Railway Company of Boston has placed on its elevated and subway lines forty cars of the grooveless post, semi-convertible type built by the J. G. Brill



END VIEW OF BOSTON SUBWAY CAR

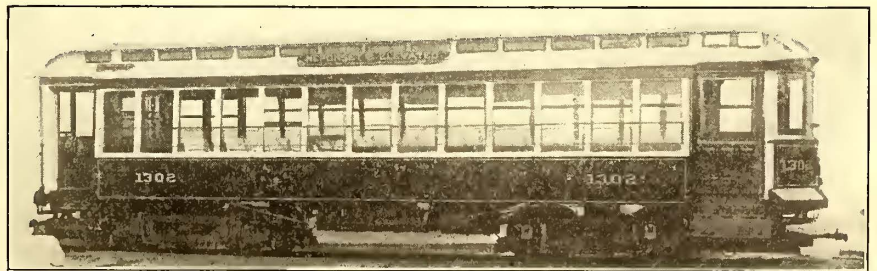
Company. These cars are seated for fifty-two passengers, and the interiors have the usual appearance of cars of this type, with the exception that the posts are inclined a trifle to give the necessary clearance for the upper part of the car when in the subway and at the same time preserve the maximum interior width allowed. The width over the sides below the belt rail is 8 ft. 4 $\frac{3}{4}$ ins., while over the letter panels the width is 8 ft. 1 $\frac{3}{4}$ ins. The interior width available for seats and aisle is 8 ft. 1 $\frac{3}{4}$ ins., which, with 35-in. seats, leaves the aisle 27 $\frac{3}{4}$ ins. wide. A considerable number of passengers may therefore stand in these wide aisles without obstructing the passage, and in addition extra standing space is afforded at the ends, as longitudinal seats at the corners occupy the space of two windows each. The vestibules and entrances have a number of novel and interesting features. Reference

to the interior view will show that the doors in the body ends are omitted. This arrangement allows a wide opening, and the width between posts being 50 ins., facilitates passage in and out but without weakening the construction. The windows between the door posts and corner posts have bronze vertical bar guards. The platforms are flush with the car floor and are 5 ft. 6 ins. from the end panels over vestibule



INTERIOR OF BOSTON CAR, SHOWING LONGITUDINAL SEATS AT THE ENTRANCE

sheathing. The entrance doors are arranged to slide into pockets provided for them in the car body and are operated by air. The width of the door opening, measured between the vestibule corner post and the body corner post, is 38 $\frac{3}{4}$ ins. Access may be had to the door pockets by the window sashes back of the longitudinal seats. These sash are hinged, while the outer sash are stationary, the doors having double-sash windows with upper sash arranged to be lowered. A wire screen is provided to guard the opening. An interesting arrangement has been devised for the entrance steps, and consists of a pair of steps on each side of the platform, with the lower steps arranged to fold up; this is plainly shown in the view of the end of the car. The steps are folded in unison with the closing of the doors, and no foothold can be obtained on the upper step because the grab handles are inside the door. The grab handle against the vestibule corner post is the ordinary straight type except that it is extra long, while the handle against the body is curved from the



SEMI-CONVERTIBLE CAR FOR THE BOSTON SUBWAY

top of the step to the body door post. It will be seen that the bumper is provided with a shield to prevent persons from gaining a foothold thereon. The sliding doors and folding steps are operated by the motorman by means of a valve located near the air-brake valve, the power being furnished from an auxiliary tank connected with the air-brake tank. A compartment for the motorman is formed by the conjunc-

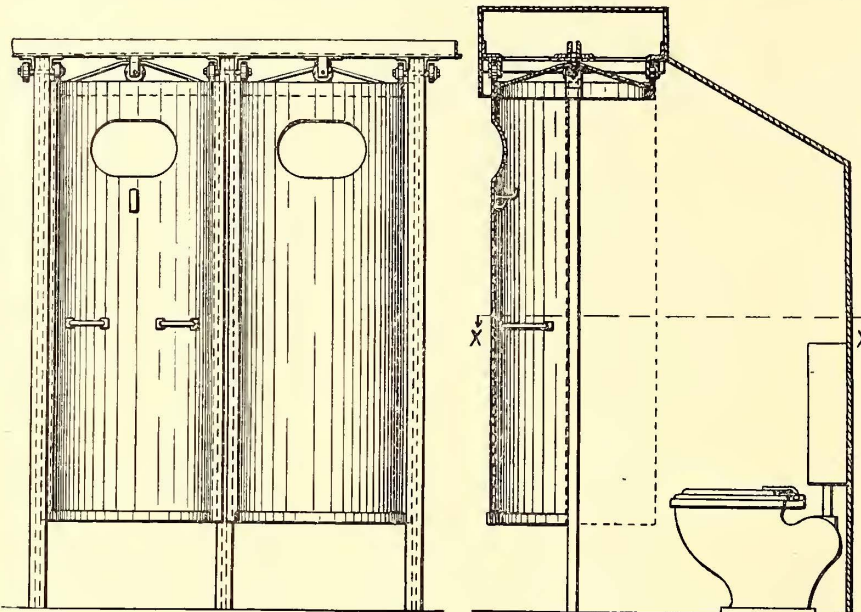
tion of two pairs of hinged doors which operate on roller bearings in a V-shaped runway. When not required to form this compartment, each pair of doors is snugly folded and secured to the vestibule corner posts of the platform. Suitable curtains for preventing the reflection of light from the

SANITARY CLOSET SHIELD

The Brown Hoisting Machinery Company, of Cleveland, has begun to manufacture for general sale a novel sanitary closet shield, devised by Alexander E. Brown. The set installed in the company's shops created so much favorable comment from visitors, that the company feels justified in expecting a wide sale for this important invention.

An installation consists of a series of stalls, or compartments, separated by concrete steel partitions (of the Ferroinclave construction), attached to light angle supports and covered by one concrete steel hood (also of the Ferroinclave construction), which runs to an apex about equidistant from either end partition. At this apex is a ventilating pipe. With the exception of the two ends, the partitions do not extend up to the hood, thus giving sufficient air circulation. As will be seen in the cross-section, the hood extends out over the doors.

The doors are hung from light angles, which extend across the partitions. These doors are steel plates, rolled in the form of semi-cylindrical shells. They are hung from the top, instead of from the side, and are so adjusted that in rotating on rollers they describe the path of a cylindrical shell about



FRONT ELEVATION AND SECTION OF SANITARY CLOSET

inside of the car are provided. The vestibule ceiling is divided into two compartments for carrying auxiliary switches and train control device. The platform hoods are slightly curved up at the ends to make room for the destination signs and other lighting arrangements.

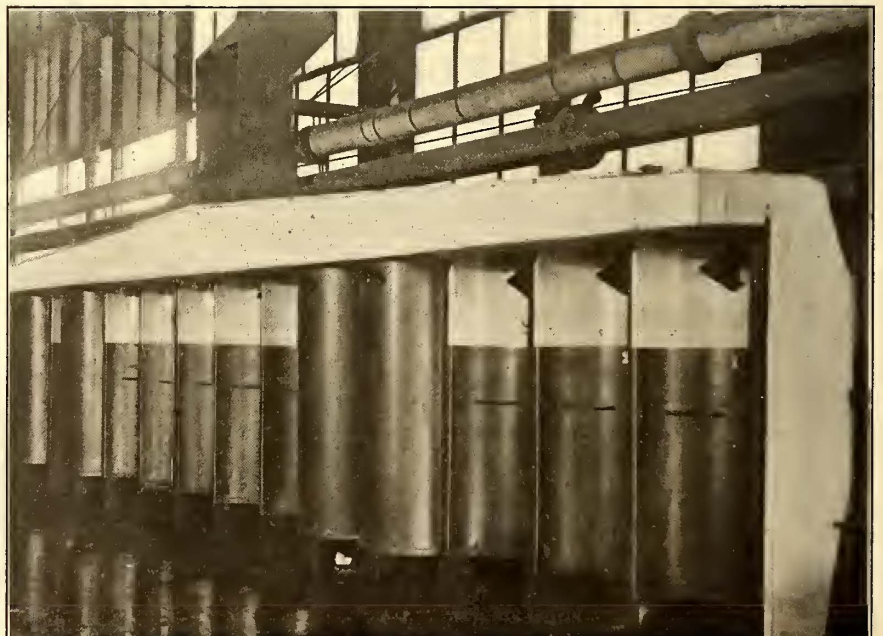
The framing of the cars is very substantial, and includes 4-in. x 7 $\frac{3}{4}$ -in. side sills with 15-in. x $\frac{3}{8}$ -in. sill plates. The corner posts are 3 $\frac{5}{8}$ ins. and the side posts 3 $\frac{1}{4}$ ins. thick. The radial drawbars are carried unusually low because of the step arrangements. The bar slide and draw plates are substantially attached and braced to the platform timbers. Other features will be seen in the engravings and need not be described. The general dimensions are as follows: Length over the end panels, 33 ft. 11 ins., and over the vestibules, 44 ft. 11 ins. The cars are all mounted on trucks of the No. 27-E1 $\frac{1}{2}$ type, which have solid forged side frames with transoms secured to the side frames by forged double-corner brackets and heavy gusset plates. The ends of the frame extensions are bent around for extra clearance. The wheel base of the trucks is 6 ft. 4 ins., and the wheels are 34 ins. in diameter. Four 40-hp motors are used per car.

REAVES PARK IMPROVEMENTS

W. H. Schooley, manager of Reaves Park, on the line of and owned by the Toledo, Fostoria & Findlay Railway Company, in Ohio, is laying plans for the complete transformation of that resort this winter. The park has had a splendid run this summer, and the improvements planned for include a large figure-eight roller coaster, erection of dancing pavilion, a bowling alley and a number of other popular attractions.

its vertical axis.

Among the advantages claimed for this type of construction are the following: A saving of space, practically 3 ft. being saved by this door, over the ordinary side-hinged style; the hood or ventilating system, taking away all odors, and the concrete walls, allowing easy cleaning with a hose; interior at all times closed to the outside view, thereby making it practicable to erect the closets at points in a building that



AN INSTALLATION OF SANITARY CLOSET SHIELDS, SHOWING VENTILATION AT THE TOP

would be too exposed for the ordinary types of closet in ordinary use. It can readily be seen by the door whether a closet is occupied, as in that case the door would be out. Another feature is that the semi-darkness of the compartments eliminates loafing.

FINANCIAL INTELLIGENCE

WALL STREET, Aug. 22, 1906.

The Money Market

The money market developed a decidedly firmer tendency during the past week, rates for all maturities reaching the highest points attained for several months. Money on call, after loaning at 3 per cent early in the week advanced to 6 per cent, the average rate for the week being about 4 per cent. In some instances banks marked up the rate to 5 per cent on standing call loans. In the time money department rates ruled fully $\frac{1}{4}$ to $\frac{1}{2}$ per cent above those prevailing at the close of last week, sixty-day money commanding $5\frac{3}{4}$ per cent, ninety-day $5\frac{1}{2}$ per cent, four months' $5\frac{3}{4}$ per cent and five and six months at 6 per cent. For the longer maturities 6 per cent was freely bid, and while some small loans were made at that figure it was difficult to obtain any considerable amount at that rate. The higher charges are due to the increasing demand for money both in connection with the enormous dealings in and higher prices for stocks, and in connection with the general business requirements. The demand upon the banks at the inland cities for funds for crop moving purposes has also been larger, and although the outward movement from this center has so far been small, there is no disposition on the part of bankers to offer time money with any degree of freedom. The local institutions are losing substantial amounts of cash to the Sub-Treasury, these losses amounting to upward of \$4,250,000 since Aug. 17, and the surplus reserves of the banks are lower than at any corresponding period for the past six years. It is not expected, however, that money rates will go materially higher in the near future. There may be fractional advances in both call and time loans, as a result of the extensive operations in stocks, but such advances would doubtless be followed by a fall in sterling exchange rates to a point where gold could be readily secured in the European markets. Sterling exchange has already begun to reflect the higher rates for money, prime demand sterling declining to $4.84\frac{1}{2}$, a rate which makes gold imports permissible. At the current rates of exchange, however, local bankers are compelled to restrict their purchases of gold to the open market in London, and it is considered quite likely that they will be bidders for the \$5,000,000 gold arriving at that center from South Africa early next week. Relief may also be expected from the Secretary of the Treasury in some form, should the situation require such assistance. The European markets have been about steady without material change in rates for money or discount.

The bank statement published on last Saturday showed a contraction in loans of \$5,175,900. Cash decreased \$3,457,100, or considerably more than the preliminary estimates. The reserve required was \$2,287,075 less than in the previous week, which, deducted from the loss in cash, shows a decrease in the surplus of \$1,170,025. The surplus now stands at \$7,101,500, as compared with \$9,355,675 in the corresponding week of 1905, \$58,613,075 in 1904, \$21,058,300 in 1903, \$9,743,350 in 1902, \$18,148,100 in 1901 and \$20,557,050 in 1900.

The Stock Market

The sensational feature of the stock market during the week was the upward movement in the Harriman stocks, influenced by the announcement that the dividend on Union Pacific had been increased to 5 per cent semi-annually, and by the declaration of an initial semi-annual dividend on Southern Pacific of $2\frac{1}{2}$ per cent, which places this stock on a 5 per cent basis. Other favorable influences included rumors of a probable increase in the dividend rate on Atchison, Louisville & Nashville, Pennsylvania, Amalgamated Copper, Chesapeake & Ohio and Norfolk & Western, and the resumption of dividends by some of the industrial companies, especially the railway equipment concerns, all of which are doing an enormous business and making large profits. Overshadowing all, however, was the movement in the Harriman stocks, and this resulted in a broadening of the speculation and an increase in the volume of trading. There was much unfavorable comment based on the increase in the Union Pacific dividend rate, on the ground that no official announcement was made until after the opening on Saturday. This was explained by the man-

agement as due to a desire to prevent London from benefiting marketwise from such information. The dividend on Southern Pacific was larger than had been expected, but the earnings of the company fully justify the payment of 5 per cent, and there does not appear to be any reason why such payment should not be continued. The stimulating influence of increased dividends was helped by announcements that the St. Paul will issue \$23,000,000 of new stock to which stockholders may subscribe at par; the Northwestern will issue \$100,000,000 of new stock, and the Norfolk & Western also will increase its capital. As all these new issues will carry "rights" for the stockholders, they influenced considerable buying, and this broadening of the market has already attracted a large outside interest, and commission house business has increased. It has been demonstrated that the controlling interests can create a bull market and advance prices in the face of what had been regarded as unfavorable political and monetary conditions. These, however, are offset by the unprecedented activity in general trade, by the outlook for large crops of grain and cotton, the enormous demand for iron and steel, activity in building operations, and the general prosperity of the country. Railroad earnings are simply enormous, and the annual reports now coming to hand all reflect this in largely increased earnings.

The local traction stocks developed no special feature. There was active trading in Brooklyn Rapid Transit at higher prices, and the rebate fare tickets now being issued to Coney Island passengers have had a beneficial effect. The disturbances have ceased, and what threatened to cause a very serious decrease in the earnings of the company has been averted. The question of the legality of the 10-cent fare will now go to the higher court, but no decision can be expected until late in the year.

Philadelphia

The local market for traction issues was somewhat broader during the past week, and although the dealings did not develop large proportions, the tone was decidedly firm. Philadelphia Rapid Transit was the only issue to display activity, upwards of 3000 shares changing hands at prices ranging from 30 to 31 and back to $30\frac{3}{4}$. Philadelphia Traction held firm at 99, and Union Traction brought 64 and $64\frac{1}{4}$. There was a better inquiry for the investment issues. A small lot of Thirteenth and Fifteenth Street sold at 304, and United Companies of New Jersey brought $256\frac{1}{2}$. United Traction of Pittsburg preferred sold at 51, and 150 shares Consolidated Traction of New Jersey changed hands at $78\frac{3}{4}$ and $78\frac{1}{2}$. Other transactions included 400 Philadelphia Company common at $50\frac{1}{2}$ and $50\frac{1}{8}$, the preferred stock at 50, United Railway Investment at $68\frac{7}{8}$, American Railways at $53\frac{7}{8}$ and 54, and Fairmount Park Transportation at $15\frac{7}{8}$ and $16\frac{7}{8}$.

Baltimore

The market for tractions at Baltimore was quiet but firm. Dealings were principally in the United Railway issues, all advancing fractionally. The free stock sold to the extent of 700 shares at 15, while the certificates representing stock deposited sold at $15\frac{1}{4}$ for about 900 shares. The 4 per cent bonds were fractionally higher, \$25,000 selling at $91\frac{3}{4}$ and 92. The free incomes brought prices ranging from 70 to $71\frac{1}{2}$ for \$40,000, and \$1000 deposited incomes brought 71. The new funding 5s were very quiet but higher, \$5800 selling at $88\frac{3}{4}$ and $88\frac{3}{4}$. Other sales were: Lexington Street Railway 5s at $101\frac{1}{2}$, Macon Street Railway 5s at $99\frac{3}{4}$, and Charleston Consolidated Electric 5s at 96.

Other Traction Securities

Dealings in the Chicago railway issues were extremely quiet during the past week, but prices generally held firm. Metropolitan Elevated displayed strength, 510 shares selling at 28 and $28\frac{1}{2}$. Northwestern Elevated sold at 26, and the preferred at 66. Union Traction brought 5 for 300 shares, and the preferred sold at $16\frac{1}{2}$ for 250 shares. North Chicago changed hands at 40. The unusual activity and sharp price fluctuations in Boston & Worcester stocks constituted the overshadowing feature of the Boston market during the past week. At the opening of the week the common stock sold at $30\frac{1}{2}$ and later advanced to 33 on rather active buying, but at the close there was a reaction to 32. Up-

wards of 600 shares changed hands. The preferred was considerably more active, upwards of 7000 shares changing hands. There was strong buying during the first half of the week, which lifted the price from 81½ to 84½, but toward the close there was a reaction to 83¾ on profit taking. Massachusetts Electric issues also displayed considerable activity and strength, 1400 shares of the common selling from 20 to 20⅞ and back to 20⅝, while 2000 shares of the preferred sold from 70 to 72. Boston Elevated was quiet and practically unchanged, sales taking place at 149½ and 150. West End common sold at 95½ to 96½, and sales of the preferred were made at 109¾.

The appearance of the stock of the Forest City Railway Company, the new low-fare company, on the local exchange, was the feature of the week in Cleveland. The stock is a 6 per cent preferred, and it was put out at 90, and immediately upon listing was bid for at 93 with 95 offered. No transactions were announced and it was thought that the bidding was by insiders. Cleveland Electric sold steadily at 69½. Cleveland & Southwestern preferred sold at 58½ for a small lot, nearly 10 points below last sale. Lake Shore Electric sold at 16, also a fractional decline. Northern Ohio Traction & Light sold at 29¾, a trifle lower than last week.

There was little activity in Cincinnati. Cincinnati, Dayton & Toledo declined to 26¾. Toledo Railways & Light was active at 32½. Cincinnati, Newport & Covington common sold at 73½, a fractional advance.

Security Quotations

The following table shows the present bid quotations for the leading traction stocks, and the active bonds, as compared with last week:

| | Aug. 15 | Aug. 22 |
|--|---------|---------|
| American Railways | 54 | 54 |
| Boston Elevated | *149 | 150 |
| Brooklyn Rapid Transit | 76⅞ | 78 |
| Chicago City | 160 | 160 |
| Chicago Union Traction (common)..... | 4¾ | 4 |
| Chicago Union Traction (preferred)..... | 15 | 15½ |
| Cleveland Electric | 70 | 70 |
| Consolidated Traction of New Jersey | 78 | 78 |
| Detroit United | 92 | 95 |
| Interborough-Metropolitan, W. I..... | 36½ | 37¼ |
| Interborough-Metropolitan (preferred), W. I..... | 78¼ | 78 |
| International Traction (common)..... | a55 | 54 |
| International Traction (preferred), 4s..... | 78 | 78½ |
| Manhattan Railway | — | 148 |
| Massachusetts Electric Cos. (common)..... | 19½ | 20 |
| Massachusetts Elec. Cos. (preferred)..... | 69 | 71 |
| Metropolitan Elevated, Chicago (common)..... | 28 | 26 |
| Metropolitan Elevated, Chicago (preferred)..... | 68 | 66½ |
| Metropolitan Street | 106 | 106 |
| North American | 95¼ | 94¼ |
| North Jersey Street Railway | 27 | 27 |
| Philadelphia Company (common)..... | 50¼ | 50 |
| Philadelphia Rapid Transit..... | 30 | 30¼ |
| Philadelphia Traction | 98¾ | 99 |
| Public Service Corporation certificates | 68 | 69½ |
| Public Service Corporation 5 per cent notes..... | 95½ | 95 |
| South Side Elevated (Chicago)..... | 96 | 96 |
| Third Avenue | 126 | 124 |
| Twin City, Minneapolis (common)..... | 112½ | 114 |
| Union Traction (Philadelphia)..... | 63½ | 64 |
| West End (common)..... | — | — |
| West End (preferred) | — | — |

a Asked. * Ex dividend.

Metals

According to the "Iron Age," the iron markets continue to outdo all August records, and in some lines all records for whatever month. The advance in pig iron prices has been carried farther in the past week, and the buying for 1907 has broadened. Steel-making irons for 1906 cannot be had in the Central West, though it is not certain that all Eastern producers are completely sold up. Rail orders are again coming in on a liberal scale, and structural mills are filling up. Wire mills, in spite of unprecedented sales, are in no hurry to mark up prices.

Copper metal continues firm at 18¾c. for lake, 18½c. for electrolytic, and 18¼c. for castings.

EARNINGS OF THE PORTLAND COMPANY FOR 1905

For the year ending Dec. 31, 1905, the Portland Railway Company, of Portland, Ore., earned a surplus equal to 10 per cent of the common stock. This good showing was largely due to the Lewis & Clark Exposition. However, it is reported that so far this year the earnings have fallen but little under last year, and it is believed the end of the present year will find the company's earnings nearly on a par with last year's. Under the new consolidation of the Portland utilities a great many economies will be effected, and it is stated that the management expressed itself as confident that 6 per cent will be shown for the Portland Railway Light & Power common stock this year. The 1905 statement of the Portland Railway Company is as follows:

| | |
|--------------------------|-------------|
| Gross earnings | \$1,843,563 |
| Operating expenses | 1,021,448 |
| Net earnings | \$822,115 |
| Fixed charges | 215,211 |
| Balance | \$606,904 |
| Preferred dividend | 125,000 |
| Surplus | 481,904 |

THE SAN FRANCISCO SITUATION

After several unavoidable delays the McAllister Street line has been placed in operation, and is carrying passengers from the ferry as far as the car house at Lyon and McAllister Streets.

The labor situation is showing signs of improvement, and the officials of the United Railroads say that there are now over 200 men at work and many others are expected in the city in a short time. The men who have been employed on the McAllister Street line will be at once put to work on the Sutter Street line, and it is expected to have the west-bound track of that line in order in a week at least. The opening of the McAllister line has afforded a great relief to the traffic to the new business section of the city, and the other track of the Sutter Street line will help still more. It is the plan of the officials to open all the lines possible running to the business section of the city. If the strike of the laborers engaged in the reconstruction work had not taken place, these lines would have been finished by this time. Work will also be started in the near future on the Sacramento and Jackson Street lines.

Howard Street, which has been closed for some time to traffic while the old tracks are being removed, and the regular street car tracks are being put in order, is being rushed for the use of the debris. It is now considerably over a week since any debris has been removed from the city, and the delay has been caused by the block on Howard Street. As soon as that is opened the work will at once start again, and the debris will be taken from the city in larger amounts than before.

The report of the Underwriters' Adjusting Bureau in the case of the United Railroads places the insurance loss sustained by the street railroad corporation at \$437,067.64, of which the corporation itself contributes, under its coinsurance contract, \$33,530.57, while the balance of \$403,517.07 is distributed among eighty-eight insurance companies.

At a recent meeting of the Thirty-Ninth District Improvement Club resolutions were unanimously adopted calling for the installation of an overhead trolley on the Geary Street cable road. This action is significant, when it is considered that before the fire this club was strongly in favor of the underground conduit system. The earthquake and fire, however, changed the views of the members as to the desirability of such a system. Municipal ownership was also recommended. As both these propositions are favored by Mayor Schmitz, it is thought that the road will soon be changed over for electrical operation.

A trial trip has been made over the California Street cable line, and the road will soon be placed in operation. Cars will start at the ferry and go out California Street to Presidio Avenue, where transfer will be made to the lines of the United Railroads.

The new ferryboat "Contra Costa," of the Key Route line, has been taken from Dickie's yard at Alameda to the Union Iron Works to have her engines installed. As the machinery has been ready for some time, it is expected that the boat, which is to be a counterpart of the San Francisco, will be ready for service within a few weeks.

THE CONEY ISLAND SITUATION—EFFORTS OF PUBLIC OFFICIALS TO BENEFIT BY POSING

The truce that was declared last Wednesday in the Coney Island double-fare matter, which provided for the issuance by the Brooklyn Rapid Transit Company of rebate coupons pending the final decision of the courts in the matter, has relieved the situation, refusals to pay the second fare now being confined to a rapidly diminishing number of isolated cases. The arrangements for issuing the slips were perfected quickly, and on Saturday the company began to give out the coupons. On the same day service was resumed on the surface lines to the Island, cars having been stopped early in the week because of disorder.

As regards the question of carrying the cases to the courts, Attorney-General Mayer announced Tuesday, in Albany, through Deputy Attorney-General James S. Graham, that he had decided to apply for a permanent injunction restraining the company from charging more than a 5-cent fare on its Coney Island lines. This procedure is the one agreed upon by the company's attorneys and Borough President Coler, of Brooklyn. It is expected that a final determination of the fare question will be had at the October term of the Court of Appeals. For the purpose of preparing for the test case, George D. Yeomans, general counsel to the company, and Frederick B. Martyn, partner of Stephen C. Baldwin, Mr. Coler's attorney, met Tuesday afternoon in the offices of the company. After discussion the conference was adjourned without a decision. Mr. Martyn believed that as what was wanted was a decision as to the application of the railroad law to the situation, a single case, involving one of the roads controlled by the Brooklyn Rapid Transit Company, would be sufficient. Mr. Yeomans is said to have been of the opinion that an omnibus case, involving all the lines in the company's system, would have more satisfactory results. It is expected that the papers will be ready for the Attorney-General in a few days.

A distressing but humorous incident of the controversy was the anxiety of public officials "to get into the public eye." From Mr. Coler, the Brooklyn borough president, down to the police magistrates, this has been true with one or two exceptions. Mr. Coler has won for himself in the papers the title of the commoner. Police Court Justice E. Gaston Higginbotham also vied for public favor by committing Dow S. Smith, general superintendent, and A. W. Newbury, general inspector of the company, without bail, on the charge of inciting riot. After Mr. Smith and Mr. Newbury had been locked up in a cell of the court for three-quarters of an hour, they were taken by Sheriff Flaherty down to the County Courthouse, where a writ of mandamus, returnable forthwith, had been issued by Supreme Court Justice Jaycox, who released the prisoners in \$2,500 bail each.

As for Mr. Coler, he became so frantic that Comptroller Metz felt called upon publicly to say that the Brooklyn Borough President should be put into the hands of a receiver. The Comptroller insists that Mr. Coler did urge him to "get into the band wagon," and become a popular hero like himself, and he intimates very broadly that the Borough President's passion for notoriety has degenerated into a craze. The Brooklyn "Times" says it must be admitted that many of the recent acts of Mr. Coler give some color to this assumption, and even said some of his acts and speeches during the late unpleasantness have been scarcely compatible with the presumption of sobriety and sanity. On Friday last the "Times" said:

"But, come to think of it, there has been a sort of epidemic of insanity in Brooklyn during the past week; there has been madness in the air ever since last Sunday. There is reason to believe that the wave of lunacy is subsiding, and that next week will see us all back to our normal condition, and wondering what insane root held our reason prisoner so long. Bird S. Coler was not the only victim. He had other distinguished companions in his frenzy. Justice Gaynor and Magistrate E. Gaston Higginbotham were among them, as well as the funny chap, Van Something, we think his name was, who tried to run the stalled trolley cars with a monkey wrench. Probably they are all properly ashamed of themselves now, and we may all decide to let bygones be bygones. If the Borough President does not develop any new and dangerous symptoms, the Brooklyn 'Times' would advise Comptroller Metz to give him another chance before moving for the appointment of a commission to inquire into his sanity."

The Brooklyn Rapid Transit Company has issued a statement warning the concerns that are accepting the rebate slips as equivalent to a nickel each that they are marked "not transfer-

able," and that the restriction on the circulation of the slips will be adhered to if the Court of Appeals decides that a trip from Brooklyn to Coney Island is worth only a nickel. The company says that it will refuse to honor the demands of slip holders who appear with an unreasonable number after the court is heard from. "The Brooklyn Eagle," however, announced that it would continue to accept the rebate checks in payment for the "Eagle." If the courts decide against the Brooklyn Rapid Transit Company, the "Eagle" will give the extra 2 cents from each slip to the Newsboys' Home, of Brooklyn.

THE NEW YORK, NEW HAVEN & HARTFORD RAILROAD DISPOSES OF ITS MASSACHUSETTS TROLLEY HOLDINGS

The New York, New Haven & Hartford Railroad has disposed of practically all of its Massachusetts trolley companies to several individuals, who have formed a voluntary association. The transaction includes the Springfield Street Railway Company, which was purchased by the New Haven road a year ago this spring. An important letter from President Mellen says that neither the New Haven road nor the Consolidated Railway Company holds any shares in the newly-formed voluntary association. This letter says:

All the stocks and interests of every description heretofore held by the Consolidated Railway Company of Connecticut in Massachusetts street railways have been sold and delivered to a voluntary association, except the Worcester and Webster and the Webster and Dudley Street Railway Companies, whose lines are now and have been for some time, leased to the Consolidated Railway Company of Connecticut, by virtue of special authority granted by the Legislature of Massachusetts. The action of the Consolidated Railway Company in disposing of its holdings has been under consideration for some time. Neither the New York, New Haven & Hartford Railroad Company nor the Consolidated Railway Company is the holder of any of the shares of the voluntary association, to which the stocks and interests before referred to have been sold. The shares have been placed in the hands of a banking house for sale, and it is the hope and belief that they will in time become widely distributed.

According to information obtained at Boston, the transfer is said to involve the lines owned by the New Haven road in both Massachusetts and Connecticut, with connecting lines to Rhode Island and New York. A report from New Haven, however, indicated the probability that the Connecticut lines might not figure in the transfer, due, it was said, to the fact that under the charter of the Consolidated Railway Company, the holding company of the New York, New Haven & Hartford Railroad Company, such a transfer would be unnecessary.

For over three years the New York, New Haven & Hartford Railroad Company has been acquiring street railways in the State of Massachusetts, and recently the holdings of the company reached such proportions that the matter was made the subject of a special message by Governor Guild to the Legislature on the eve of its adjournment last June. Attorney-General Malone also interested himself in the matter and, acting in accord with the views of the Governor, he drafted and submitted to the Legislature a bill intended to prevent a continuance in this State of the control of the trolley car companies by steam railroad systems. A brief consideration of the matter by the legislative committee on street railways brought about the suggestion that a test case be made, and the Attorney-General set about preparing a case which would eventually receive a ruling from the Massachusetts Supreme Court. While this case was being prepared the Attorney-General, desiring certain information in connection with the car lines owned by the railroad, asked President Mellen, through Chairman Jackson, of the State Railroad Commission, to furnish it to him.

The information asked for by Mr. Malone was transmitted to him last Wednesday, and almost simultaneously the fact that the railroad company had transferred its holdings became known. Attorney-General Malone, when asked about the matter, said: "The facts are, that under the statute, I asked the Railroad Commissioners to get certain information from the New York, New Haven & Hartford Railroad as a preliminary to beginning proceedings against that company. The railroad company subsequently sent a communication to the Railroad Commission stating that the company had never held any stock in street railway companies, and that the Consolidated had disposed of the street railway stock which it had held. The Commission notified me of this reply."

THE NEW YORK, BOSTON & CHICAGO COMPANY OPENS OFFICE IN NEW YORK

The scene of action of the operations of the New York, Boston & Chicago Electric Railway, of which mention was first made in the *STREET RAILWAY JOURNAL* several weeks ago, has been changed to New York. At least an office has been opened by the company at 20 Broad Street, in charge of Judge A. H. McVey, of the District Court of Des Moines, Ia., who as temporary vice-president of the company is looking after the affairs of the "most advanced project of modern times." Judge McVey was not discovered to be in the city accidentally by the daily press. His coming was heralded in an advertisement in the Sunday papers outlying the project substantially as had previously been done in Chicago. On Monday, judging from the daily press reports, his time was given mainly to entertaining newspaper men. As a result there appeared in the papers on Tuesday morning long accounts of the project, written in anything but a serious strain. The questions put to the judge about capital and terminal facilities evoked evasive replies. The judge did say, however, that the problem of terminals in New York and Boston are difficult of solution. As for the Chicago terminal that would seem to be all arranged from what was said.

EARNINGS OF THE UNITED RAILWAYS OF ST. LOUIS

The comparative statement of the earnings of the United Railways Company shows an increase of \$367,177 in the net income for the period from Jan. 1 to July 31 over the net income for the corresponding period of last year. The net income of July, 1906, shows an increase of \$26,085 over that of July, 1905. The statement for the period from Jan. 1 to July 31 is: Gross earnings and other income, \$5,194,488 in 1906, as compared to \$4,772,949 in 1905, an increase of \$421,539; expenses, taxes and depreciation, \$3,218,045 in 1906, as compared with \$3,150,853 in 1905, an increase of \$67,192; net earnings, \$1,976,443 in 1906, as compared with \$1,622,096 in 1905, an increase of \$354,347; charges, \$1,387,347 in 1906, as compared with \$1,394,177 in 1905, a decrease of \$6,830; and net income, \$589,096 in 1906, as compared with \$227,919 in 1905, an increase of \$361,177. The statement for July is: Gross earnings and other income, \$794,220 in 1906, as compared with \$726,861 in 1905, an increase of \$67,359; expenses, taxes and depreciation, \$493,762 in 1906, as compared with \$451,674 in 1905, an increase of \$42,088; net earnings, \$300,485 in 1906, as compared with \$227,919 in 1905, an increase of \$361,177; charges, \$198,026 in 1906, as compared with \$198,840 in 1905, a decrease of \$814, and net income, \$102,432 in 1906, as compared with \$76,347 in 1905, an increase of \$26,085.

THE SITUATION IN CLEVELAND

The Cleveland Electric Railway Company and Councilman Hitchins, who introduced the recent low-fare ordinance for that company, but who later announced that he would not advocate the passage of the ordinance, have again come to an agreement, and a new ordinance was introduced for the company at the Council meeting Monday, Aug. 20. The company declined to accede to the Councilman's request for a reduction of fares under the plan adopted in Detroit of giving workingmen's tickets during certain hours, and the new ordinance continues as originally introduced, providing for seven tickets for 25 cents and 5-cent cash fares. Transfer privileges are more liberal than at first, giving passengers on cross-town lines the right to a transfer on a transfer, thus making the transfer privileges practically wide open. The company believes that this will increase the number of transfers asked for from 5 to 10 per cent. The new ordinance gives the city broader rights than the regulating of operation of cars, the compelling of proper ventilation and heating of cars and the sprinkling of tracks, and it also contains the clause giving the city the right to purchase the property at the expiration of the franchise term, providing the law at that time gives the authority to own and operate street railways. The most important change in the ordinance is that it provides for an extension of only twenty years instead of twenty-five years, as in the ordinance first proposed.

Other Councilmen now hope to gain fame through the settlement of the street car controversy, and are introducing new and ridiculous ordinances. One Councilman has a twelve-ticket for a quarter and no transfer ordinance, and having a ten-year re-

vision clause in it, also a clause requiring the company to pay a percentage of its gross receipts to the city. Another ordinance would have the city lease the lines of both companies, permitting the old management to operate them and have them maintained from general taxes, everybody riding free. Still another Councilman will demand that the overhead trolley system be abandoned and an underground system adopted.

The Forest City Company will introduce a number of new ordinances at the Council meeting this week, and will endeavor to get them pushed through under the suspension of the rules. The Forest City Company is negotiating with the Cleveland Electric for a working agreement for the operation of cars through the Public Square and around a loop of one corner of the Square, where it is claimed free territory exists. If an agreement cannot be speedily reached the city will be asked to arbitrate the matter.

The Municipal Traction Company is now frankly announcing that it is opposed to the plan of submitting the franchise proposition to the vote of the people on the excuse that it aims to open up new territory not now developed, and with the assistance of Mayor Johnson it is sparing no efforts to have its ordinances pushed through the Council at the earliest possible moment, under the guise of extensions of existing franchises.

The Cleveland Electric Railway Company has declined to accede to the low-fare company's request for the joint use of the tracks to be laid on Fulton Street, the old company owning one track, while the new company owns the other. The old company operates cars only in one direction on this street, and has no need for a joint arrangement, while the new company expects to make it one of its main lines, and having no turn-outs it will be impossible for the low-fare company to operate in both directions on this street unless it can force the old company to make some concession.

The stock of the Forest City Railway Company was listed on the Cleveland Stock Exchange last week. The information furnished the exchange by officers of the low-fare company showed that a total of \$750,000 was now outstanding. Of this, \$100,000 was originally sold at par, the balance has been sold under the recent offering at 90, but of 6500 shares sold on this basis only 2900 shares have been paid for in full and issued, the balance were sold on the installment plan, and will be paid for at the rate of 20 per cent every sixty days. This makes the total fully paid up \$300,000 par value, and \$450,000 par value sold and partly paid for. The directors of the company are M. A. Fanning, R. A. Brown, C. H. Miller, John E. O'Brien, Thomas P. Schmidt, A. M. Willard, Otto Leisy and Leopold Einstein. The last two named directors, who are wealthy liquor men, are said to be the heaviest stockholders in the company.

THE BOONE, WEBSTER CITY & INTERURBAN RAILWAY ORGANIZED

The organization of the Boone, Webster City & Interurban Railway Company, of this city, was completed Aug. 15, 1906, by the filing of articles of incorporation with the Secretary of State of the State of Iowa. The articles state that the general nature of the business to be transacted by the company shall be the acquisition by construction, purchase or lease of a railway or railways connecting the city of Boone, Boone County, with Webster City, Hamilton County, Ia. The company begins business with a capital stock of \$10,000, which will be used in making the necessary surveys and paying for other preliminary expenses. The capital will be increased as soon as the preliminary work is completed. The parties backing this new enterprise have already made arrangements with the officials of the Fort Dodge, Des Moines & Southern Railway Company for connections at Boone, both to Fort Dodge and Des Moines. E. E. Hughes, John S. Crook, J. H. Herman, J. C. Regan, John L. Goepfinger, Frank E. Sackett and M. J. Reilly constitute the board of directors. The officers are: E. E. Hughes, president; J. C. Regan, vice-president; John S. Crooks, secretary; J. H. Herman, treasurer. A preliminary survey has already been made. The final survey will be commenced in a few days. The officials want to have everything in shape for the letting of contracts for work sometime in the next two months. They desire to have a large part of the grading done this year. It is announced that bonds have already been placed.

E. E. Hughes, president of the company, has had much experience in railroad construction work. He was connected with the Northwestern Railroad Company at one time. Later, he was with the Davenport, Rock Island & Northwestern and the

Ozark & Cherokee Central. John C. Regan, vice-president, is president of the Regan Construction Company, of Des Moines, and has been building railroads for the past thirty years. John S. Crooks, the secretary, has had large experience in the buying of right of ways. The officers are, therefore, all experienced men in railroad building, and intend to push the work to an early completion.

SAN JOSE & SANTA CLARA COUNTY ELECTRIC RAILROAD

A prospectus of the San Jose & Santa Clara County Electric Railroad, of San Jose, Cal., recently issued, states that the system begins at Santa Clara, runs through the main business street to San Jose on the Alameda, the main residence avenue connecting the two cities. In San Jose the company has recently secured valuable additional franchises, all of which run for fifty years. The main additions will be immediately constructed in the city limits, insuring a very much better service than is now given. Leaving San Jose, the road runs through private right of way (recently purchased) to Alum Rock Park, via Berryessa, which is a very large fruit section with three canneries, employing over 1500 men. Alum Rock Park is a city park of the city of San Jose, situated about 7½ miles from the city limits. It is the only natural park with mineral waters, etc., in the Santa Clara Valley; an ideal resort. This line operates from Alum Rock Park canyon into the park, and effectually blocks the only feasible entrance into it. The proceeds of the bonds recently sold are to be used to standard-gage the entire property and rebuild it with 60-lb. T-rails, excepting in the city of San Jose, in which case the grooved or Trilby rails will be used. It is intended to give a double-track service to Alum Rock Park, which has now but a single track; also to thoroughly equip the property with the most modern and up-to-date cars.

REPORT OF THE KANSAS CITY COMPANY

The pamphlet report of the Kansas City Railway & Light Company for the year ended May 31, 1906, has just been made public. As compared with the previous year the earnings show as follows:

| | 1906 | 1905 |
|--------------------------------------|-------------|-------------|
| Gross receipts | \$5,153,168 | \$4,449,134 |
| Operating expenses | 2,596,539 | 2,235,260 |
| Net earnings | \$2,556,629 | \$2,213,874 |
| Other income | 9,671 | 16,588 |
| Total income | \$2,566,300 | \$2,230,462 |
| Charges, etc. | 1,644,524 | 1,501,862 |
| Surplus over charges..... | \$921,776 | \$728,600 |
| Bond retirement | 55,000 | 55,000 |
| Balance | \$866,776 | \$673,600 |
| Dividends | 476,105 | 476,105 |
| Surplus for year..... | \$390,671 | \$197,495 |
| Previous surplus | 266,680 | 69,185 |
| Profit and loss surplus, May 31..... | \$657,351 | \$266,680 |

General Manager Charles N. Black, in submitting his report to President Corrigan, made the following interesting summary of work completed during the season and the needs of the future:

"With the completion in March of the James Street viaduct, crossing the tracks of the Missouri Pacific and the Union Pacific Railroads, the last of the franchise obligations covering the construction of viaducts, bridges and extensions were complied with. This viaduct gives a direct connection between the business center of Kansas City, Kansas and the stock yards. Its full value, however, will not be realized until the electrification of the Twelfth Street cable line, when it will be possible and desirable to route part of the Minnesota Avenue cars, via the new viaduct, and the proposed Twelfth Street viaduct and tunnel, into the business center of Kansas City, Mo., and thus avoid all of the steam railroad crossings in the West Bottoms.

In Independence, Mo., a line running approximately 1 mile

north and south of the public square, was completed and put into operation. This line acts not only as a feeder to the Kansas City & Independence line, but also takes care of a large amount of local travel in Independence.

"During the past year we have given careful consideration to our fire hazards, especially in connection with our car storage, and by the installation of sprinkler equipments in two of our largest car houses, have succeeded in reducing insurance premiums on our car risks more than 50 per cent. The completion of the new car house and storage yard at Forty-Eighth Street and Troost Avenue has enabled us to dispense with two of the old car houses, and in consequence we will be able to effect a further saving in our insurance premiums. Further improvements along these lines are contemplated for the ensuing year.

"In the fall of 1905 the company acquired the properties of the Kansas City & Westport Belt Railway Company, a steam railroad operating between Westport and Dodson. At the latter point connections are had with the Missouri Pacific, the Kansas City Southern, and the Frisco systems, from which railroads large quantities of freight, more especially coal and lumber, are delivered, consigned to parties in the southern part of this city. This road runs through a beautiful country, destined to be filled with handsome residences. All of the material for the electrification of the railroad has been ordered, and we expect to complete the work this fall. We will then be enabled to give a first-class passenger suburban service, and can reasonably expect a very large increase in the revenue from this property.

"During the past winter a franchise for a steam heating plant was secured from the city. Steam heating boilers were installed in the old Edison power house, located at Sixth and Wall Streets, and distributing mains were laid, covering practically the entire downtown retail district. Although the construction work was completed too late in the season to enable us to derive very much revenue from this enterprise during the past winter, it has enabled us to secure a considerable amount of lighting business, which, before we were able to furnish steam heat, was unattainable. We do not anticipate that this property will be very much more than self-supporting, but we do expect that it will be of material assistance to our lighting company in securing the lighting business of several of the large stores, which now have their own plants.

"Owing to the large increase in business of both the railway and lighting companies, additional power house and sub-station machinery was required. First among these additions was the installation of a 5000-kw Curtis steam turbine in the Missouri River power house, bringing up the capacity of this station at the present time to 15,000 kw. In our sub-stations we have installed during the past year two 100-kw rotary converters for the railway system, and one 750-kw rotary converter for the lighting company, and, in addition, a storage battery for the latter company, having a capacity of 750 kw for 1 hour. The value of this storage battery lies not so much in the additional capacity added to the system, as in the protection it affords against an interruption to the service.

"The enormous increase in the buildings, especially in the residential portion of the city, has necessitated the erection of 286.5 miles of additional overhead lines. Our street railway mileage has increased 4.92 miles of single track, exclusive of approximately 9 miles of single track of the Kansas City & Westport Belt Railway Company, in addition to which we have reconstructed 11.58 miles of single track.

"About the first of the year we placed an order for thirty new cars. Owing to delays on the part of the contractors for the electrical equipment, these cars, which we expected to receive by June 1, are only just arriving. In our own shops we have rebuilt seventeen old cable trail cars, which we are using for trail cars in connection with our heavy electrical equipment to handle our morning and evening service. These have proven most acceptable to the public, and will materially facilitate the handling of the travel during the congested hours.

"Early in the spring we discontinued the cable on East Twelfth Street, and are now operating this electrically. This leaves the west half of the Twelfth Street line as the only cable-operated road on the system.

"The large rate of increase in both the lighting and railway systems will necessitate considerable additional machinery to handle the business during the ensuing year, and in order to take care of this increase, orders have been placed for one additional 5000-kw Curtis turbine to be installed by Jan. 1, 1907, and one 1500-kw rotary converter for the lighting company. In addition, we will be obliged to order one 1000-kw rotary converter for the railway company, and from twenty-five to thirty new cars, to be delivery in the spring of 1907."

STREET RAILWAY PATENTS

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

UNITED STATES PATENTS ISSUED AUG. 14, 1906

828,322. Electric Railway; Charles J. Kintner, New York, N. Y. App. filed Jan. 11, 1906. A system for energizing the third rail sectionally during the passage of the train. A metallic blade is displaced by the wheel flange to close a relay circuit for energizing the rail section while the train is passing.

828,442. Brake-Shoe; James S. Thompson, Chicago, Ill. App. filed April 6, 1904. A brake-shoe having a supporting back and a wearing face composed of asphaltum and comminuted iron and expanded sheet metal embedded therein.

828,442. Brake-Shoe; James S. Thompson, Chicago, Ill. App. filed Dec. 22, 1905. The brake-shoe has a cast iron body with a reinforced skeleton of wrought iron or sheet metal, which projects through the wearing face of the shoe.

828,347. Brake Shoe; William P. Taylor, Buffalo, N. Y. App. filed Dec. 23, 1905. Relates to modifications of the above and particularly to a construction of sheet metal inserts, which project through the wearing face of the brake-shoe at intervals thereof.

828,348. Brake-Shoe; William O. Taylor, Buffalo, N. Y. App. filed Dec. 22, 1905. A brake-shoe having a cast body and a series of separate inserts wedge-locked in said body.

828,386. Automatic Train Stop for Block Signal Systems; Fred. B. Corey, Schenectady, N. Y. App. filed March 10, 1904. In order to obtain a train stop which is effective at high, but not effective at low speeds, of the train, the patentee has provided an arm with considerable weight or inertia which is moved aside when the train is proceeding slowly, but which has sufficient inertia to set the air brakes when the train is going above a certain speed.

828,409. Roller Skate for Narrow Tracks; Adalbert Kazubek, Berlin, Germany. App. filed Nov. 30, 1904. A means of transportation over a single rail. Employs a pair of roller skates flexibly connected together and separated a distance corresponding to an ordinary step.

828,446. Electric Signaling Apparatus; George W. Watkins and Walter C. Bethel, Seattle, Wash. App. filed Jan. 23, 1906. The trolley pole carries a laterally projecting arm which makes contact with a number of depending blades, so that said blades are charged from the power circuit when the car passes. These blades are connected to signal circuits.

828,461. Switch Point Thrower; Henry T. Cline, Colorado Springs, Col. App. filed April 26, 1906. A swiveled blade is carried by the front platform of the car, and can be depressed into the groove of the rail when desired. The blade is then directed so as to throw the switch point.

828,489. Trolley Pole Controller; Milner Lidster and Joseph Hoellig, Los Angeles, Cal. App. filed Dec. 4, 1905. The trolley wheel is carried on a movable section at the upper end of the pole, and a rod connection is effective to operate a retriever cylinder whenever the upper section has an independent movement by reason of the trolley wheel accidentally leaving the wire.

828,518. Signaling System for Electric Railways; Charles E. Scribner, Jericho, Vt. App. filed Dec. 1, 1905. Relates to testing system for trolley road signals of that type having step by step actuated parts. The device is adapted to be positioned for the test circuit and for the signal circuits alternately.

828,536. Emergency Railway Brake; Phillip W. Counselman and Leroy M. Crockett, Toledo, Ohio. App. filed March 28, 1906. The ordinary brake-shoe is longitudinally channeled, and has a rod depending therethrough which can be manually depressed, when desired, to engage the track, thereby furnishing an emergency brake.

828,572. Snow and Ice Removing Apparatus; Joseph F. E. Rose, Montreal, Can. App. filed Oct. 9, 1905. Complete plan for a snow-plow car with a revolving cutter in front of each wheel, the blades of which are capable of being removed and resharpened whenever desired.

828,585. Circuit Closer for Trolley Signals; Horace Thurston, Providence, R. I. App. filed Jan. 2, 1906. A trolley signal of that type in which the trolley wheel strikes a tappet adjacent the trolley wire. Has a dash pot which provides for the prolonging of the signal when the car is moving at high speeds.

828,747. Sectional Third-Rail System of Electric Railways; Charles J. Kintner, New York, N. Y. App. filed Jan. 24, 1906. A system by which the third rail is sectionally energized during the passage of the car. Has a common current feeder or main connected to one pole of the power house generator, and switches operated by the electrical currents passing through the track rails

and the axles of the car for connecting the common current feeder temporarily to the third-rail section.

PERSONAL MENTION

MR. MICHAEL McCORMACK, organizer and former president of the Sea Beach Railroad, died Friday, Aug. 17, in Brooklyn. Mr. McCormack retired from business twenty-five years ago to devote himself to railroad building. The Sea Beach road, the third steam road to Coney Island, was one of his first enterprises. He was one of the organizers of the New York Cotton Exchange.

MR. A. C. DENMAN, JR., has returned to San Bernardino, Cal., from an Eastern trip, and says he will again take up the active direction of the San Bernardino Valley Traction lines in a few days. It was reported that Mr. Denman had relinquished his position as manager of this system, after selling a controlling interest to Mr. H. E. Huntington. During the absence of Mr. Denman, Acting Manager Smith, of Los Angeles, was in charge of the system. Mr. Denman denies any connection with Mr. Huntington in any way whatever.

MR. H. C. REAGAN, superintending the erection and installation of electrical and steam machinery, also of sub-stations of the Pittsburg & Butler Street Railway, a Westinghouse single-phase road, over part of which three-phase is to be used, has been appointed electrical engineer of the company. Mr. Reagan will be in charge of main and sub-stations and the car equipment. Mr. Reagan held the position of chief and electrical engineer for several electric railroads, interurban and city, constructing engineer for the Appleyard lines, building the main power station and installing machinery at Medway, Ohio, three-phase, 26,000-volt transmission. Mr. Reagan also was chief engineer for the Cleveland, Painesville & Ashtabula Electric Railroad.

MR. A. W. JORDAN, who has been division passenger and freight agent of the Indiana, Columbus & Eastern Company, has been appointed acting general passenger and freight agent of the company, with jurisdiction extending over the traffic department of all the Schoepf lines in Ohio, except the Lima & Toledo. Mr. Jordan's duties will be the same as those of Mr. Walter Hurd, resigned. He will report direct to Mr. D. G. Edwards, vice-president and traffic manager of the company, with headquarters at Cincinnati. Mr. Jordan has had many years' experience in traction line work. He came to Columbus Jan. 1, 1905, and entered the service of the old Appleyard lines when they passed into the hands of the receivers and Theodore Stebbins was general manager. He has been connected with the lines ever since, and was one of the few men that were retained when the Schoepf syndicate took charge.

MR. GEORGE C. BLAKESLEE, general manager of the Albany & Hudson Railroad, will sever his connection with the third-rail system on Sept. 1. He will be succeeded by Mr. William Darbee, who is at present the gas expert of the New York State Commission of Gas and Electricity. Mr. Darbee is a graduate of the Stevens Institute, and was appointed gas expert of the State Commission in December, 1905. During the hearing of the Commission in New York and Syracuse he acted as the technical expert. Mr. Darbee was formerly the assistant general superintendent of the Connecticut Railway & Lighting Company, at Bridgeport, Conn. Previous to that time he had been superintendent of the Norwalk division. Mr. Blakeslee, the retiring general manager, has been connected with the Albany & Hudson for about seven years. He was at one time the vice-president of the road. He resides at Kinderhook, and will take a vacation before entering upon any other active railroad duties.

MR. W. R. DUNHAM, JR., of Providence, R. I., recently was appointed assistant engineer of the Consolidated Railway Company, which controls the electric lines acquired by the New York, New Haven & Hartford. Mr. Dunham's office is in New Haven, and he has supervision of reconstruction and maintenance in the territory east of New Haven as far as Worcester, and north of New Haven to Springfield. His railway experience was gained under the three chief engineers of the lines now operated by the Rhode Island Company—Mr. George C. Tingley, Mr. George B. Francis and Mr. Fred. N. Bushnell. Mr. Dunham was born in Providence in 1871, and after entering the Providence High School he spent two years in the office of Mr. J. A. Latham, from which he went to the office of S. B. Cushing & Company. In 1892 he was attracted by the possibilities of the electric railway, and obtained a position with the Union Railroad Company, of which Mr. George C. Tingley then was chief engineer. In 1902 he was taken from the engineering department to work out a system of transfer tickets, and in 1904 resumed his former position as engineer.