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*Of this issue of the Street Railway Journal 8000 copies are printed. Total circulation for 1905 to date, 301,750 copies, an average of 8158 copies per week.*

### The Accident Fakir

We have been pleased recently to notice a wholesome tendency to prosecute accident fakirs when detected, not for any manner of fraud, but for plain perjury. No one outside of the street railway business fully realizes the number of completely fraudulent claims that are yearly presented, and the falsity of the testimony used to bolster them up. Every little while a

new gang is unearthed, after a long series of swindles, and now and then a ringleader gets put behind bars for obtaining money under false pretenses, conspiracy, or other suitable cause. But until lately it has been rather rare for the fakir to be prosecuted for perjury, without which he has no hope of success. A series of convictions for this offense would go further toward reducing the number of fraudulent suits than any other force which could be brought into play. There are, of course, two classes of suits by which claimants endeavor to extort money from street railway companies. One consists of cases in which a genuine injury is so magnified as to secure damages all out of proportion to the most liberal construction of recompense for injuries done; the other, of cases in which there is deliberate malingering after feigned or trivial injury, backed up by perjured evidence as to the facts. The really dangerous gangs depend, of course, upon the latter procedure, which involves no real personal risk. The perjury can then be adjusted to the scope of the damages claimed.

The former class of damage suits are annoying and costly enough, but most of them can be, and usually are, forestalled by tactful and liberal treatment on the part of the claims department. The latter, however, involve dealing with criminals, and it becomes almost a public duty not to compromise, but to fight them. A shrewd claim agent can very often discriminate between the two types, but now and then even the most astute will be temporarily deceived. Our readers will remember many instances of fraud, some of them of a most sensational character. A very serious feature of the situation is that, while many cases of slight and afterwards exaggerated hurts fall into the hands of the ambulance-chasing lawyer, whose motives are so notorious as to injure his chances of success, the really worst cases of fraud are likely to get into the hands of an able lawyer, who is selected for his unscrupulous methods, or of counsel both capable and reputable, before whom the fakirs rehearse glibly their tale. There are few lawyers of reputation who have not at one time or another been completely taken in by mendacious clients, and personal injury cases furnish numerous instances of this. Likewise, while the ambulance-chasing doctor is disgracefully in evidence in some minor cases, the most distinguished practitioner may be called quite innocently into utterly fraudulent suits, having to depend, as he sometimes must, on the previous history of the case for his judgment, and being furnished with entirely erroneous premises.

The only way to put a stop to this sort of fraud is to follow up remorselessly every instance of perjury. No such case can be won by the claimant without pretty promiscuous lying upon the witness stand; and whenever there is good reason to suspect it, it ought to be pursued rigorously. It is not enough to defeat the attempt at fraud; that may be the simplest thing to do, but it is not justice to the public nor to the courts. Perjury has gone unpunished so long and so often that it has become an

open scandal in our legal procedure. It would be going too far to say that the average witness has little regard for the sanctity of an oath, but it is rare to hear a case through without the conviction that one witness at least has, while upon the stand, consciously perverted the truth. In personal injury cases, perjury may not be entirely on the side of the plaintiff, for now and then an employee may swear falsely to free himself from personal blame. But if our courts are to stand for even-handed justice, as they should, perjury must be punished; and it is for the ultimate interest of everybody that it should be. To let a fraudulent case go by after merely a defeat is not enough; in fact it is giving aid to crime. If all parties would unite in bringing perjury to prompt punishment, the tone of the courts would be greatly raised. Aside from the matter of public duty, a criminal convicted of perjury is pretty much out of the running, so far as further fraud upon railway companies is concerned, and this gain of itself is worth the effort. Put up every instance of perjury before the Grand Jury and let the law take its course. You can count on the active co-operation of the judiciary before whose very eyes the scandal of false testimony yearly grows, and you can count on the sympathy of every decent citizen who believes in the proper administration of justice and the punishment of crime.

### The Chicago City Railway Car

It is seldom that as much careful attention is given to all the details of the construction of a car, as far as these details affect operation and public comfort, as was devoted to the design of the new standard car of the Chicago City Railway Company, regarding which an extended article will be found elsewhere in these columns. The new car is not an attempt to introduce any radical features of car construction, but to perfect the semi-convertible type. Although there is nothing radical or experimental in the design of the car, there are a number of new features which, taken altogether, make the car very much worth considering. While it is of the semi-convertible type which carries its windows with it at all times, the design is such as to make it very open in the summer and easy to heat in winter. For example, the ends are capable of being thrown open by virtue of certain improvements in design. On the other hand, for winter use, storm sash are to be used, which indicate that the management of the company is fully aware of the great difficulties of heating cars in a city like Chicago, where both front and rear doors are open at almost every stop. It is also gratifying to note that the company has not, as is too frequently the case, attempted to save money on electric heater equipment by purchasing a few heaters with comparatively small radiating surface, and expecting them to heat a car under the most trying conditions that exist anywhere in the United States. As our readers are aware, we have repeatedly urged the provision of plenty of radiating surface when electric heaters are used, for the reason that it is almost impossible to get the results desired with a few heaters run at high temperature.

One novel feature of the car, which solves several problems at the same time, is the ingenious sliding step. The motor-man can, by a single turn of the handle, withdraw a step from one side of the platform and lock one in position on the other side. The operation can be quickly performed in changing ends at the end of a route, and does away with many complications with doors and gates for covering the space usually left between the door and the step. This space has always been

troublesome, because if vestibule doors are made even with the outer step, a trap door over the step must be provided, and even then there is a chance for boys and irresponsible persons to attempt to ride by getting a foothold on this step. If the vestibule doors are made to close even with the edge of the platform it is practically certain that some one will attempt to steal a ride on the step outside the door. The sliding step solves this whole problem at once without introducing apparatus which takes too much time to operate at a crowded stub terminal, out of which cars must be operated every 10 to 20 seconds.

As a city car, the inside dimensions are notable as providing unusual width of aisle and much more knee room between seats than is common on city cars. In deciding on the width of car, the management evidently considered that it was better to make one bite of the cherry than to make two bites and make a mess of it. Since the distance between the tracks in Chicago is such that, with the present cross-seat cars now in use there, persons cannot stand on the devil strip between cars without being crushed and rolled to death, it was wisely considered that the cars might as well be made wide enough to take full advantage of the distance between track centers, thus giving a car with wide aisles. There is less likelihood that persons will attempt to stand between cars with very small clearance between them than between cars with 10 ins. or 12 ins. clearance. This is a point that it is well to remember whenever increase in the width of cars in use on a road is being considered. Either the space between cars should be kept so that persons can safely stand between them or the other extreme should be adopted.

The electric lighting of these cars is to be commended from an illuminating engineering standpoint. The use of frosted bulb lamps throughout avoids the blinding glare of bare lamp filaments, which is painful in a long car plentifully supplied with lamps. Although the frosted bulbs absorb in the neighborhood of 12 per cent of the light, the car is for all practical purposes better illuminated with them than if the bulbs were of clear glass. The object of illumination is to enable us to "see things," and this is always best accomplished when a blinding glare, which causes the eye automatically to shut out part of the light, is eliminated.

The car wiring is in iron pipe conduit, and in view of the fact that this is probably the forerunner of much work of this kind on surface cars the next few years, the plans by which this work was carried out are of much practical interest just now. The introduction of kick coils in the auxiliary circuits for lighting, heating and compressor motor, as well as in the main motor circuits, is an innovation, the results of which will be watched with interest. There is apparently no good reason why the apparatus on these auxiliary circuits should be sacrificed to lightning unless it is on the principle that if the lightning is going to puncture somewhere it had better take the least expensive and important apparatus. It appears only logical, however, to offer the lightning every inducement possible to take the lightning arrester rather than any of the apparatus on the car, even if this apparatus is of minor importance.

Another feature of the car wiring of much interest is the use of a new type of connection box for connecting the motor leads to the controller cables. Connection boxes are not by any means a new feature, as those who have been in the electric railway business long enough can well remember the connection boxes used with some of the earliest equipments. The use of connection boxes was abandoned in the early days, because the possibilities of poor contact and poor insulation in

a connection box were thought to be greater than the evils of joints made with connectors and covered with tape or hose. After disappearing for a number of years, the connection box has now come back to us in a new and much improved form, in response to a decided demand on the part of master mechanics for some arrangement which will make it possible easily and quickly to disconnect motor leads from the controller wiring without going through the process of removing the insulation from and disconnecting joints of any kind. It is to be hoped that the present connection box is as far ahead of the old-fashioned ones as the present motor equipments are ahead of the motors that were used in the days of the old connection boxes. There is good reason to suppose that they are, and we hope that they have solved a troublesome problem.

In connection with the type of motor selected, the point of most interest is that the motor is one which opens from below. Much has been said against pit work the past few years, and while it is undoubtedly desirable to do away with it as far as possible, the Chicago City Railway management evidently does not consider it possible to do away with it entirely. The ease with which armatures and fields can be replaced in any car house where there are pits, without taking the car several miles to the general repair shop, decided the question in favor of motors opening from below. At the same time, when cars are brought into the general repair shop for overhauling, the crane facilities there make it possible to lift the motors out of the truck quickly and easily and turn them over for opening up when general overhauling is in progress.

#### Enlarging the Membership of the A. S. R. A.

At its annual convention in Philadelphia we believe that it would be advisable for the members of the American Street Railway Association to consider the plan of enlarging the qualifications for active members in the association so as to include others than operating street railway companies, which at present are alone eligible for membership. Such a restriction was perfectly proper at the period at which the association was established. At that time the financial interests in the street railway industry, as well as practically all the knowledge and experience extant in street railroading, were confined to the operating officials, who usually included the largest stockholders in their respective companies. This condition is gradually changing and is certain to undergo a still greater evolution. The operating officials are no longer the only ones vitally interested in the street railways of the country, nor are they working alone toward their improvement or development. At least three great classes of outside interests participate with the operating companies in knowledge of the art, contributions toward its advancement and influence in practically all that affects its future welfare. Their inclusion into the membership would not only strengthen the association but in other ways would be decidedly beneficial.

The first of these factors to which we refer is the financial interests, which are represented by the bankers. We feel confident that if a great many of these banking firms were eligible for active membership, they would take advantage of the opportunity. They would not only derive a great deal of benefit from attending the meetings, but would also be valuable additions to the association. Their presence would in part tend to direct a portion of the papers and discussion in the direction of financial questions and broad matters of policy which are now among the most important of those which confront street rail-

way companies, while, conversely, their representatives would derive considerable benefit from the discussions on practical operation in which they are not so well versed. From a personal standpoint also they would find it of benefit to become personally acquainted with the practical operators of the street railway systems of the country, as the latter are the men who will have to operate the roads which the bankers buy; while the operators will enjoy the equal advantage of meeting the men whose financial enterprises constantly require the engagement of good men in their conduct.

Of equal value as active members in the association are those large engineering firms which have given especial attention to electric railway work, and which are essentially a product of the last ten years. In horse railway days, and even in 1892, there were no firms of this kind of such importance and influence as would warrant any great effort on the part of the association to include them in its membership. At present, however, the facilities which these concerns have for the scientific investigation of electric railway problems, both technical and financial, their large corps of trained assistants who have been taken mainly from active railroading, and their opportunities for deriving knowledge and experience from diverse properties all over the world, would make them exceedingly valuable members of a national association. To many of these firms now is already committed the management of electric railway properties, while others devote themselves purely to the engineering side of the industry. We believe that many of these firms would welcome the opportunity of becoming members of the association.

The third class of firms to which we have particular reference as desirable for membership are the manufacturing corporations. There has been a sentiment in the past against the admission of these companies to any closer connection with the association than that which is provided for by their membership in the Manufacturers' Association. There are many reasons, however, why the representatives of manufacturing companies who attend the conventions should be given the same privileges of the floor as active operating officials. Electric railway engineering is so broad a subject at present that those whose attention is being devoted to operation cannot, and should not, be expected to have the same knowledge of the fine points in the construction and design of apparatus as those who make a specialty of this work, and we believe that if the experts in charge of important manufacturing interests should be permitted and encouraged to participate in the technical discussions, it would greatly assist in elucidating many of the problems which are now engaging and will engage the attention of the electric railway managers. These gentlemen have in the past been called upon by the association in many cases to present papers, and if they have been admitted to the meeting in this way, there seems no reason why they should not be given the privilege of joining the association as active members.

In other words, is it not worth while considering whether in enlarging the scope of the association it would not be advisable to so broaden it as to make an active working organization of all the interests which are devoting their energies to developing and improving the industry? Street railway companies, bankers, engineering firms, manufacturing firms, technical publishers, consulting engineers, are all working for the same end, and a union of all of these interests would necessarily be stronger and productive of more good than one confined to a single class of workers only.

## NEW STANDARD CARS OF THE CHICAGO CITY RAILWAY COMPANY

In the 200 cars purchased by the Chicago City Railway Company this year, a number of new features have been incorporated. These features were decided upon after consider-

able thought and investigation by the president, general manager and other officers of the company, in which they were ably assisted by Ford, Bacon & Davis, consulting engineers, as well as by suggestions of President Goodrich, of Minneapolis and St. Paul; President Roach, of the Chicago Union Traction Company, and other prominent railway officials. An enumeration of them, with the reasons why they were adopted, and a general description of the car, are therefore of interest.



FIG. 1.—EXTERIOR OF CAR AS ARRANGED FOR WINTER SERVICE

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### TYPE OF CAR

The climate of Chicago is such that the period of time during which an open car (unprotected by windows) can be used satisfactorily during all hours of service is usually confined to the months of July and August, and even during this period cold rain storms, driving in from the lake, make riding in cars of this type at times quite uncomfortable. During the months of June and September there are many warm days, although usually the nights are so cold as to require cars used in evening service to be completely enclosed. These climatic conditions make it necessary that such cars as are used carry windows at all times. This prevents consideration of that type of car in which the windows are entirely removed during the summer months.

The car now adopted is of the general type known as the semi-convertible, which can be completely closed for winter use and made nearly open in the summer. It is believed, however, that, as designed, this car will more nearly approach the advantages of an open car in the summer, without interfering with its being changed into a comfortable winter car, than any of the semi-convertible cars heretofore used. The particular advantage of this type lies in the readiness with which it can be changed, in case of storm, from an airy open-door car to one completely enclosed, or vice versa. This change can readily be made by the train crew without inconveniencing passengers or interrupting service. Fig. 1 shows the exterior appearance of the car arranged for winter service.

### FREEDOM FROM CONGESTION AT DOORS

An objection which has always been urged against a long car with cross-seats and center aisle is the slowness in loading and unloading, because of the congestion of passengers in the

aisle, and especially at the ends of the car. This is avoided in the car in question by the employment of an extra wide car body, wide doors and platforms (see Fig. 2), and by the use for a distance of two windows from the door at the ends of the car, of longitudinal instead of cross-seats. This gives room for an ingoing and outgoing stream of passengers on each plat-



FIG. 2.—INTERIOR OF CAR AS ARRANGED FOR WINTER SERVICE

### STORM SASH

The car, as equipped for winter use in Fig. 1, has, in addition to the ordinary windows, a set of storm sash which are held in place by the same clamping device which holds a wire netting in summer to prevent passengers from sticking arms and heads out of windows. This is believed to be the first city car in the United States in the latitude of Chicago to be equipped with storm sash for winter. Such storm sash have been used with great success in Minneapolis and St. Paul, where extreme cold weather makes the heating of cars difficult. These storm sash,

together with an unusual number of electric heaters, render possible the maintenance of a comfortable temperature in the cars, even during the coldest weather experienced in Chicago.

HEATING

On account of the great number of stops per mile in service and the opening of doors at both ends of the car, necessitated

follows: First point, 7 amps.; second point, 12 amps; third point, 19 amps.

It is a common mistake, in purchasing electric heater equipment for a car, to provide an insufficient number of heaters, thus giving too small radiating surface. This makes it necessary to work the heaters at a high temperature, which is detrimental to the life of the heater coils and does not produce as good

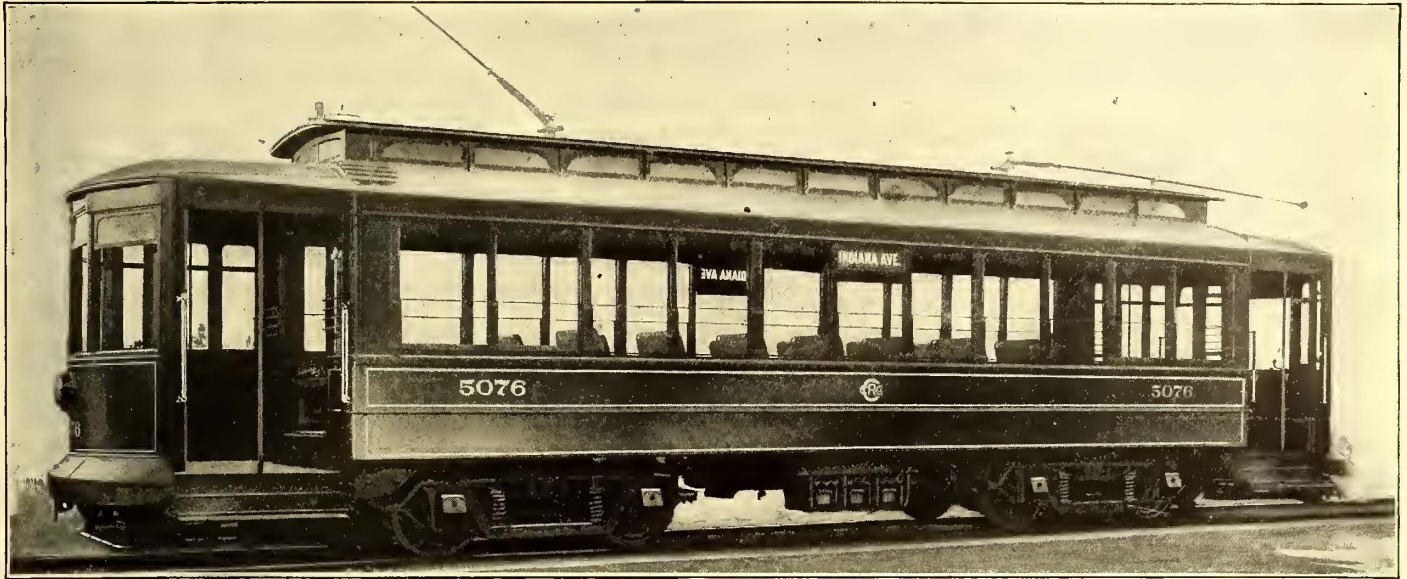


FIG. 3.—EXTERIOR OF CAR AS ARRANGED FOR SUMMER SERVICE

by the heavy traffic, the heating of Chicago cars requires more than ordinary provisions and, in fact, is probably the most difficult heating proposition to be found in the United States. Electric heaters are located along the truss plank the entire length of the car occupied by cross-seats, and panel heaters are placed under the longitudinal seats at the ends of the car. There are twelve truss-plank heaters and eight panel heaters,

results in heating the car as a larger number of heaters at lower temperature. The latter have a large radiating surface and distribute the heat well through the car instead of concentrating it at a few points under the seats, where it causes discomfort to passengers who happen to be sitting over the heaters. The manufacturer of the heaters guarantees that with this equipment a temperature of 50 degs. will be maintained inside the car in the coldest weather.

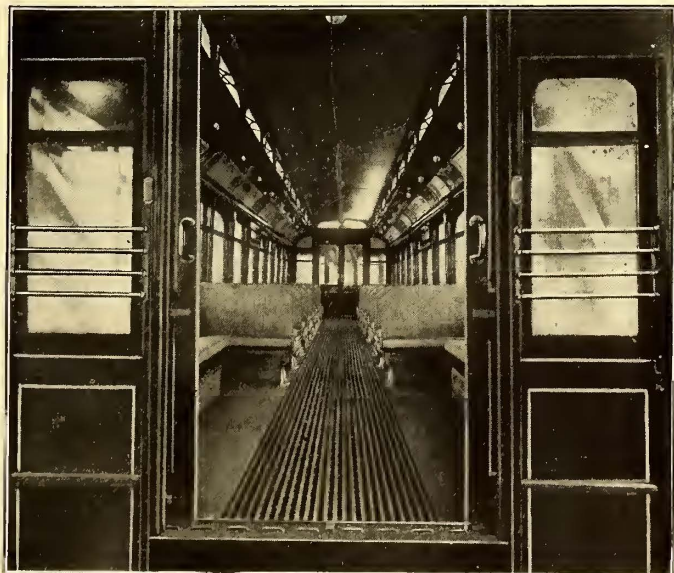


FIG. 4.—INTERIOR OF CAR AS ARRANGED FOR SUMMER SERVICE

As some roads operating large cars have been using hot-water heaters, careful consideration was given to the question of hot water versus electric heaters. By providing a sufficient capacity of electric heaters, the company considered that the heating could be accomplished at least as satisfactorily with them as with hot water, so that the question was reduced to one of cost, cleanliness and convenience.

The estimates of the company were favorable to electric heaters as to cost of operation.

There were also other considerations which the company thought favorable to the electric heater, namely, the room taken up by the hot-water heater, the dirt and ashes connected therewith, the handling of ashes, the possibility of freezing, attention required by the conductor and the possibility of additional insurance on both cars and car houses.

SPRING AND FALL USE

For spring and fall use the storm sash are removed and wire netting guards placed along the windows. The windows can then be opened or closed according to the weather. The lower window sash drop into pockets in the side of the car, while the upper sash are raised into the roof pockets. By having only one sash drop, a saving of about 3 ins. is made in the available inside width of the car and at the same time the roof pockets need not be made unusually large. When the windows are closed, the covers of the pockets into which the sash drop cannot be raised by passengers, as there is a stop which prevents their being opened until the window has been raised out of its seat preparatory to lowering it into the pocket. This is to prevent passengers from raising the covers or flaps and using the window pockets as cuspidors.

all of the double-coil type, made by the Consolidated Car Heating Company. These heaters give three grades of heat. On the first point of the heater switch the smaller coils in each heater are in circuit, giving a very mild heat. On the second point the small coils are cut out and the large coil in each heater is put in circuit. On the third point, both large and small coils are in circuit in parallel, to give maximum heat. The current consumption of these heaters on 500 volts is as

SUMMER USE

For summer use (see Figs. 3 and 4), the car is made to approach more nearly an open car by removing the end doors and dropping the end windows. The doors slide between a drop sash which is outside the door and an inner sash, which is

passengers so disposed can lean without danger to themselves or disturbing the doors. The horizontal bar pivots near its center on one of the vestibule doors, so that it is swung into a vertical position when the doors are to be opened. A guide is provided at the top of the doors so that they will fold them-

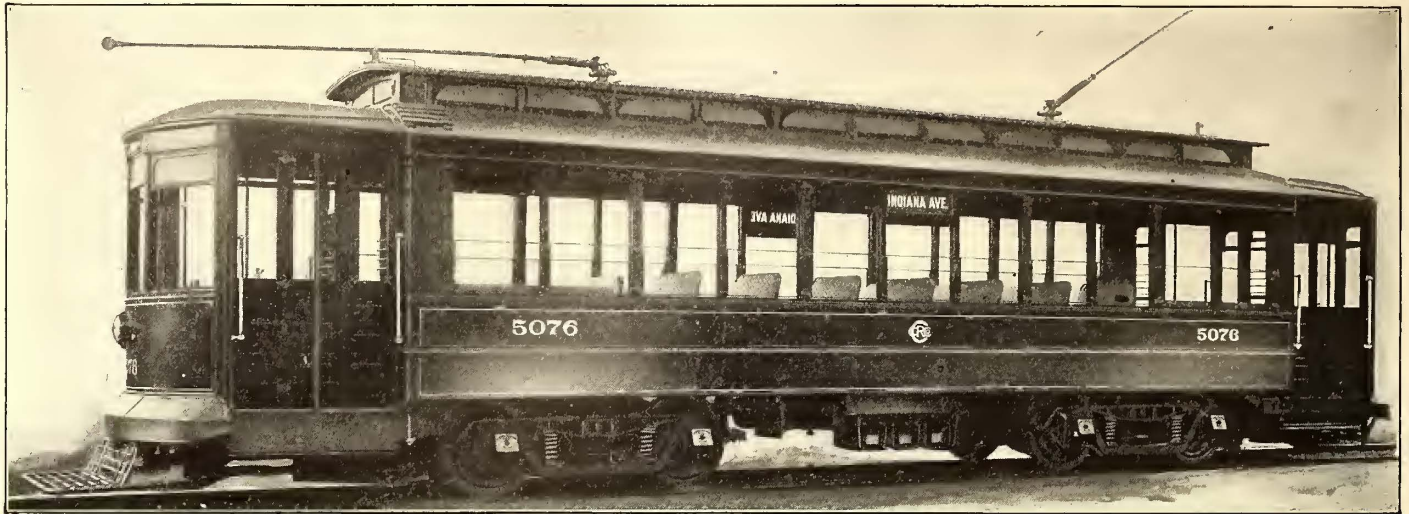


FIG. 5.—EXTERIOR OF CAR ON BLIND SIDE, SHOWING ABSENCE OF FOOTHOLDS FOR PASSENGERS

clamped on after the manner of a storm sash, and acts as a guard for the door, so that passengers cannot stick their fingers in the door pockets.

ENDS OPEN

The door being removed in the summer, this inner protecting sash can be removed also, thus doing away with the closed end, which has always been a disagreeable feature of the semi-convertible car, as it has a tendency to make a car seem close.

selves into proper position against the front of the vestibule without any attention on the part of the operator.

DISAPPEARING STEP

One of the novel and important features of the platform is the sliding, disappearing step arrangement, the invention of D. A. Faut, master mechanic of the company. The steps are mounted a fixed distance apart on guides under the platform. When the step on one side is out for use, the other one is under

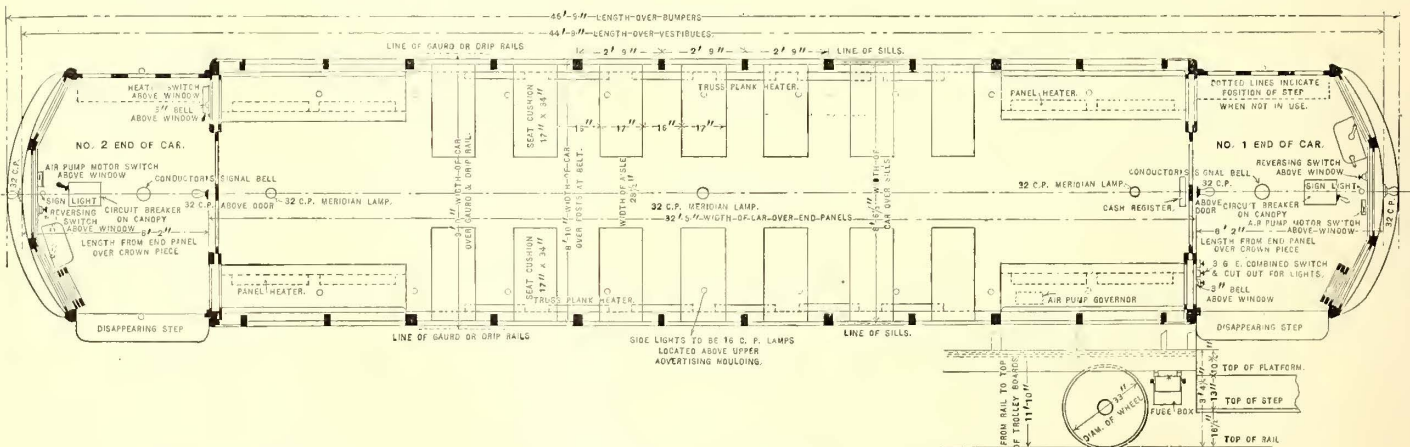


FIG. 6.—PLAN OF CAR, SHOWING DIMENSIONS AND LOCATIONS OF SEATS, HEATERS, SWITCHES, ETC.

In case of a storm the end windows can be raised to afford protection to passengers in the ends of car.

It is frequently the case in the operation of the semi-convertible car in summer that the motorman, in order to protect himself from draught, will close the car doors behind him, thus shutting off the circulation of air through the car, making a dead pocket in the end. By the removal of the doors, as explained, the motorman can have the vestibule window closed in front of him and yet a good circulation of air can be obtained through the side vestibule windows and the open end windows and doorways. The motorman's window has stops, so that he may put it at a height most comfortable for him.

VESTIBULE DOORS

The vestibule doors fold up against the front of the vestibule when open. When closed, a heavy horizontal bar serves the triple purpose of locking the doors, forming a solid support to keep them from rattling, and acting as a rail against which

the car (see Fig. 9). The changing of the step from one side to the other is very quickly and easily accomplished at the end of the run by turning a shaft located beside the brake valve inside the vestibule, the controller handle being used for that purpose. By a half-turn of this shaft the steps are slid over and automatically locked in position. The adoption of this sliding step is but one of the several precautions which have been taken to render the car absolutely "hitch-on proof," and do away with the evil which is quite prevalent in Chicago of boys, and even supposedly responsible persons, riding on dangerous places that were never intended to be so used. The disappearing step also simplifies the question of providing a vestibule door which shall close the left-hand side of the platform without leaving a space over the step. The step is extra wide, being 11½ ins. with carborundum tread, so that passengers may obtain a firm and full length foothold when entering or leaving the car.

**BUMPERS**

Sheet steel strips, or fillers, have been placed at an angle of 45 degs. above the bumpers (see Fig. 7) to prevent persons obtaining a foothold and riding thereon. This plan of covering the bumpers has been satisfactorily used by the International Railway Company in Buffalo, N. Y., where it was first suggested by its superintendent of transportation, C. A. Coons. On the whole length of the car on the "blind side," which comes next to the devil strip (see Fig. 5), there is no opportunity for "hitching on," the vestibule doors being closed and the steps withdrawn.

**WINDOWS AND SIGNS**

The windows have been so arranged that there is one window opposite each cross-seat. The top sash, having quarter oval panes, give the general appearance of a Pullman parlor car, except the middle window, where the top sash is occupied by a changeable destination sign, illuminated by the lights from the interior of the car. Fig. 1 makes this window arrangement apparent.

Besides the sign in the top of the middle window there is a similar illuminated sign in both front and rear vestibule windows, each supplied with lights placed directly back of the sign in a box provided for that purpose.

**DIMENSIONS AND SEATING CAPACITY**

Fig. 6 shows the general arrangement and dimensions of the car, which seats forty-four passengers, being eight less than the largest car previously purchased by the company. Part of this difference is caused by the shortening of the car body, and part by allowing more knee room between the cross-seats, so that the passenger next the aisle need not rise to let his neighbor get out. The cross-seats are 33 ins. center to center, instead of the usual 30 ins. Fifteen inches is allowed between the seat cushions. The aisle is of unusual width, 28 ins. The seats are also wider than ordinary, being 34 ins. in width. The dimensions of the car are: Length of body over end panels 32 ft. 5 ins. Length over all 45 ft. 9 ins. The width inside is 8 ft. 2½ ins., and outside over all 9 ft. There

**REASONS FOR HEIGHT AND WIDTH ADOPTED**

The height of the car was determined by the subways through which it must operate. As to the width, it appeared desirable either to make the cars narrow enough so that a



FIG. 7.—END VIEW OF CAR

person could stand safely between cars when passing on a street, or to make them wide enough to get the full benefit of the space available between tracks and leave no possible question as to whether there would be room for a person to stand between cars. With a distance between cars of 11 ins. or 12 ins., there is greater likelihood that persons will attempt to stand between cars and be rolled or crushed to death than if there were but little clearance. This has been demonstrated in Chicago. As the car would necessarily have to be reduced to at least 7½ ft. in width to make it possible for persons to stand safely between cars, the impracticability of following out this plan was

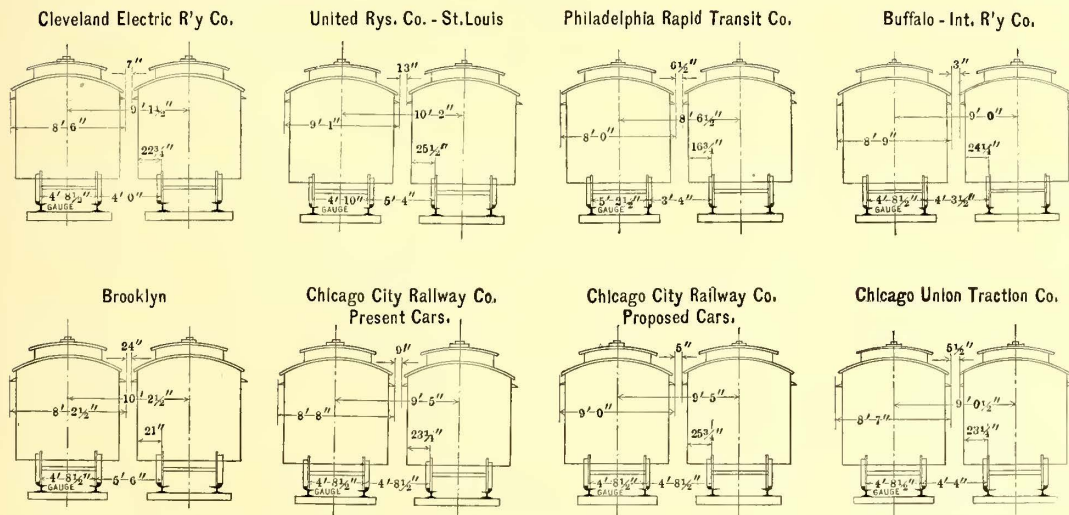


FIG. 8.—CONVENTIONAL DRAWING, SHOWING DIMENSIONS OF CARS AND CLEARANCES ON DIFFERENT ROADS

are seven cross-seats on each side of the car and longitudinal seats in each corner, with ample room for four persons.

**INVESTIGATION ON CAR DIMENSIONS**

The dimensions of the car, especially the width, were matters of special consideration. In deciding upon this, the rolling stock of a number of the principal street railway systems of the country was investigated. The drawing (see Fig. 8) shows the dimensions of cross sections of the car bodies and the distance between tracks, with the eight representative types of cars investigated.

at once seen, and the other alternative was adopted. The width decided upon for the new cars was 9 ft. over all, leaving a 5-in. clearance when passing, as shown on the accompanying drawing, Fig. 8.

**VENTILATING**

The car is ventilated by twenty-two transoms, in pairs, with half-oval sash corresponding to the half-oval top sash of the windows. Each pair of transoms is opened by means of a worm gear, which makes it possible to close the transom very tightly, or to leave it open at any desired angle. The transoms are fitted with wired glass, which reduces the possibility of

broken glass falling on passengers, and adds to the artistic effect. Rubber cushions and stops are used here and elsewhere to make the cars as noiseless as possible.

STEEL SHEATHING

The sides of the car have been given a slight curve, and present a graceful appearance. The sheathing, or side panels,



FIG. 9.—DISAPPEARING STEP (TAKEN FROM CAR-HOUSE PIT)

are of standard size sheet steel, thus making repairing easy. A rail at the bottom of the panel is so placed as to receive blows which would otherwise scratch the panel.

COLOR AND TRIMMINGS

The cars are painted dark green, the color scheme being that of the Chicago Union Traction Company. The trimmings are in orange, with the roof in light buff. As seen in the photograph, the trimmings are very plain, and the only lettering is the monogram of the company on the middle side panel and the number of the car on each end panel and on the dash boards. A simple aluminum stripe is all the decoration on the side of the car aside from the monogram and two car numbers mentioned.

SIMPLICITY OF INTERIOR FINISH

The interior woodwork of the car is cherry, the lower part of the woodwork up to the lower ventilator rail being rubbed to

simple seat pedestal selected, so that little obstruction would be presented to the cleaning of the car floor. In fact, the whole interior, including the windows, is of a character easily cleaned and least likely to collect dirt.

The hardware is of extra heavy oxidized brass, which it is believed will present a good appearance for long wear.

SEATS

The seats are rattan, the cross-seats being of the reversible type. A corner of the back of each seat next to the aisle has been cut away for a grab handle.

No straps for passengers have been provided, for the reason that when the car is crowded, it is not desirable to have pas-

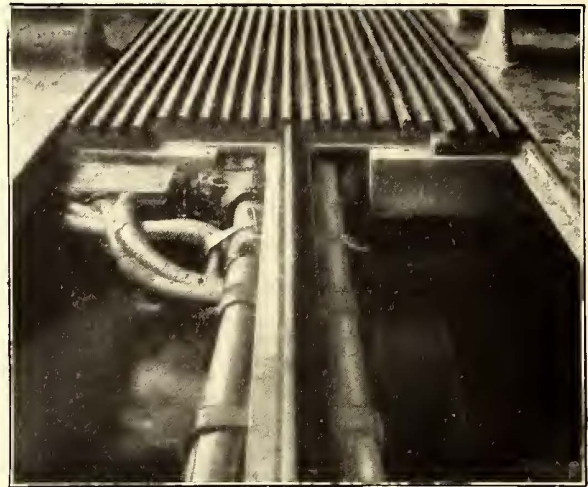


FIG. 10.—CONDUITS, JUNCTION BOX AND MOTOR LEADS

sengers stand near the ends and so obstruct the passage way. By standing in the middle they can obtain a support from the grab handles aforementioned. Furthermore, it will be the attempt of the company to keep the standing loads as low as possible by operating plenty of cars.

LIGHTING

Abundant provision has been made for artificial lighting.

GENERAL CAR WIRING.

2-K2a B Controllers; 4 Motors.

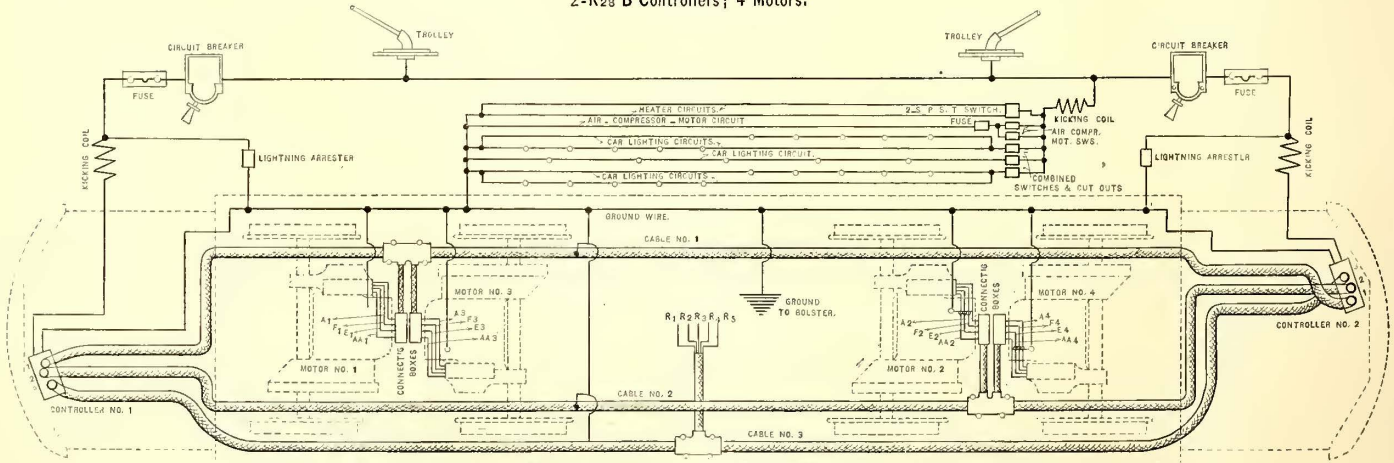


FIG. 11.—GENERAL CAR WIRING SCHEME

a dull finish, and the upper portion being left in a bright finish. In the interior design no attempt at elaborate ornamentation has been made, but, on the contrary, it shows throughout a careful deference to simplicity, harmony and dignity, in accordance with the present tendency of car building to finish a car in a manner which will look well for many years and will permit of few corners for the collection of dust. Such an interior can be kept in a presentable condition and wears well in the public eye. As can be seen in Figs. 2 and 4, all obstructions under the seats have been eliminated, and a very

Along each side, over the seats, is a row of nine 16-cp frosted lamps. Frosted bulbs were adopted partly on account of their more artistic appearance, but mainly because of the superior soft, diffused light obtained from them. The glare of the bare filaments on a row of incandescent lamps placed as these are produces a blinding effect, and makes reading in the car much more difficult than with the diffused light from the frosted lamp. Furthermore, the advertisements in the racks can be read past a frosted lamp much more readily than past a bare lamp, because of the blinding effect described. The rows of seat



lights are in circuit with the two lights used for illuminating the end signs. Three 120-watt, 32-cp Meridian lamps are placed in the ceiling, and are wired in series with a 32-cp head-light lamp and a rear platform light. Fig. 13 shows the car lighting circuits. All heat, light and compressor-motor switches and cut-outs are plainly labeled, so that the conductor and motorman do not have to experiment to learn which circuit a switch controls.

already in use on the Wentworth Avenue cars of the company, which are showing little evidence of wear after four years of extremely hard service. The truck frames, equalizers, bolsters and motor suspensions are of forged steel, all parts being machine fitted.

AXLES

A larger axle has been used than on previous cars, the dimensions now being as shown in Fig. 15, viz.: 4½ ins. at journal

CAR AIR-COMPRESSOR-MOTOR and HEATING CIRCUITS.  
1 Air-Compressor with Motor and 20 Double-Heaters.

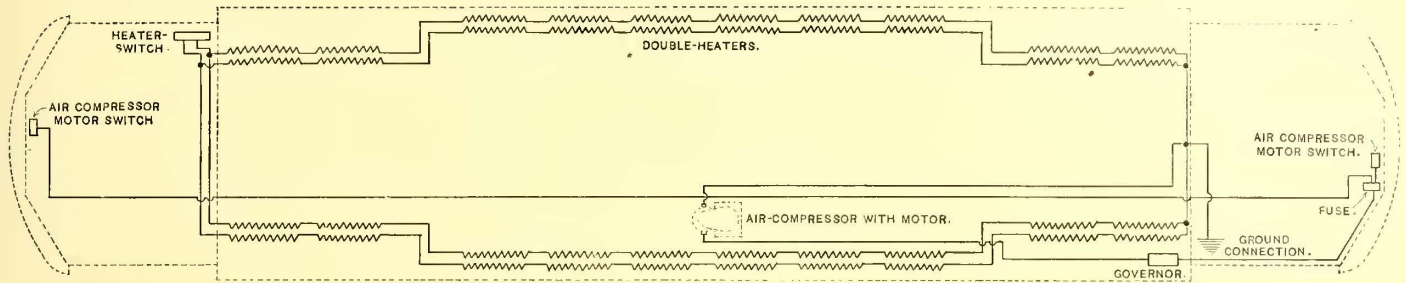


FIG. 12.—AIR COMPRESSOR AND HEATING CIRCUITS

HEADLIGHTS

The headlights have white enameled iron parabolic reflectors and bullseye glasses, mounted in a cast iron case. These headlights are believed to be as nearly indestructible as anything of the kind can be made, and project but 4 ins. beyond the line of the front vestibule.

COMPANY ANNOUNCEMENTS

Any announcements which the company may wish to make to passengers are placed in a space reserved for them in a quarter-oval frame over each end window.

REGISTERS

The International type of fare register is used. Register rods have been abandoned as being difficult to maintain in a

boxes, 5½ ins. at the wheel fit and gear, and 5 ins. at the motor bearings. A 500-lb., double-plate, 33-in. chilled cast-iron wheel is used, with ⅝-in. flange and 2 1-3-in. tread.

FENDERS

The fenders are of the Chicago Union Traction Company pattern, and are shown in Fig. 7. The upper part of the fender, which, when extended, is locked in position by the coupler, folds down on the lower part, and the whole slides back under the car when not in use. These fenders are carried at a fixed height above the track. As an additional protection, V-shaped fenders are placed in front of the wheels back of the regular fender. Attached to this V-shaped wheel fender are scrapers, which are operated from the platform, and are ar-

CAR LIGHTING CIRCUITS.

20-16 C. P. Lights and 7-32 C. P. Lights

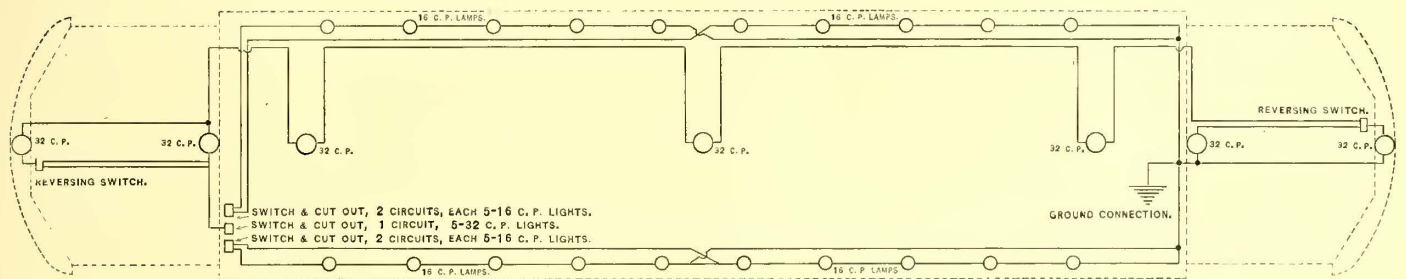


FIG. 13.—CAR-LIGHTING CIRCUITS

long car. In their place two cords are used, one on each side of the car. These cords are supported on pulleys carried in suitable brackets.

SIGNAL BELLS

Only one bell rope is used. It is hung from the center of the ceiling, and is for the use of the conductor only. Passengers signal the conductor by means of an electric bell circuit with push button at each seat.

LOCKERS

For carrying the trainmen's coats and packages, boxes have been provided under the longitudinal seats. A rack is also placed there for a broom, which is to be carried on every car, the intention being to keep all unsightly articles out of sight.

TRUCKS

The trucks are on the lines of what is commonly known as the M. C. B. passenger truck, being slightly modified from those

ranged to be dropped on the rail when necessary to clear away any obstruction, snow or dirt which may have gathered thereon.

COUPLINGS

The car has no permanent drawbar, and consequently there is nothing to interfere with the action of the fender. Instead of the usual drawbar a pocket has been provided under the bumper, into which a bar can be inserted in emergencies. This also serves as a lock for the fender when in use.

PROVISION FOR MINNEAPOLIS GATE

Provision has been made in the design of these cars for the adoption of what is known as the Minneapolis gate for the rear platform, should it seem advisable in the future. This is a gate opened and closed by the motorman, and is kept closed at all times except when the car is at a standstill. This gate has been used on the lines in Minneapolis and St. Paul for a num-

ber of years, and has effectually prevented a certain class of accidents. If such a gate should be adopted on these cars, it will be placed on the rear platform only, as it is thought that the motorman can easily watch the front platform. On a long car it is not always possible for a conductor to collect fares and see what is going on at the rear step. By the use of the Minneapolis gate on the rear platform, and a motorman's mirror, so

#### FUSES AND CIRCUIT BREAKERS

The controller at each end of the car is connected to the trolley lead through an automatic circuit breaker and a new type of fuse box. While the automatic circuit breaker can ordinarily be depended on, it is felt that a fuse should be provided to save the equipment when the circuit breaker sticks. This fuse box is arranged to take a copper strip fuse, the ar-

CAR BELL CIRCUITS.  
2 Batteries, 2 Bells and 24 Push-Buttons.

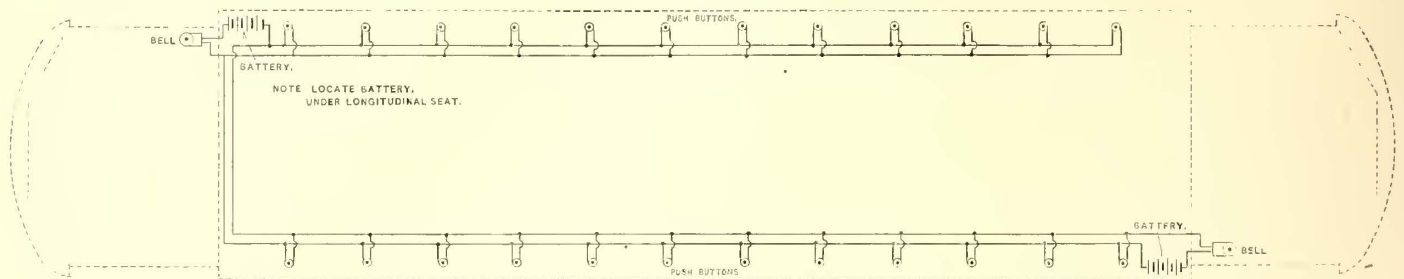


FIG. 14.—CAR-BELL CIRCUITS

placed that the motorman can see the rear step, the responsibility for this part of the operation can be shared by him. Furthermore, it is believed that after cars so equipped have been in operation a short time, it will have a tendency to cause those desiring to board cars to seek the front platform rather than await the opening of the gate. Those desiring to leave the car would, under such circumstances, naturally move to the rear, and thus avoid the incoming crowd. This would, it is thought, greatly facilitate the movement of the passengers on and off a car at crowded corners. This, however, is for the future. For the present, cars will be operated with front and rear platforms open on the right-hand side, as is customary in Chicago.

#### CAR WIRING IN CONDUITS

The car wiring has been given very careful attention by H. B. Fleming, chief engineer of the company, and is probably the finest piece of work of the kind ever put on a street railway car. It follows the practice recently adopted on a number of elevated roads of putting all wires under the car in iron pipe conduit. Fig. 11 shows the general scheme of car wiring. The motor wires between controllers are bunched into three cables. One of these cables contains the wires for motors 1 and 2, which motors are placed on one truck. The second cable contains wires for motors 3 and 4, placed on the other truck. The third cable contains wires going to the resistance grids. The compressor wiring is run in separate iron pipe conduit. The iron pipe conduit for the main cables runs along the center longitudinal sills of the car. The accompanying car wiring diagram (Fig. 11) indicates these cables and the wires leading to them, but is not intended to show the position of the conduits. Each cable conduit has all wires of different color, so there is no confusion of leads.

#### CONNECTION BOXES

Where the taps are taken off from the cable to the motor leads, a split cast-iron junction box containing the joints is bolted on the conduit. These taps are led to a connection box, which is an innovation in car wiring, and is intended to make it possible to quickly disconnect the motor leads without the inconvenience of disconnecting joints and removing joint insulation, as has been necessary heretofore when taking trucks from under a car. Fig. 10 shows a portion of the conduit and the connection box for motor leads. The taps from the cable are led into this connection box, where they terminate in switch jaws. Lugs soldered on to the terminals of the motor leads are made of such shape as to fit into these switch jaws, and when the lid of the connection box is fastened on they are secured firmly in place.

agement for clamping being very powerful and simple, so that the fuse requires no special terminals, being simply a length of copper ribbon.

#### AUXILIARY CIRCUITS

Figs. 12, 13 and 14 show the wiring of the lighting, heating, compressor and signal circuits. In addition to placing a kick coil in series with the main motor circuit, as is the usual practice, a kick coil has also been introduced in series with the auxiliary circuits for heating, light and air compressor motors, in order to prevent damage from lightning.

#### TYPE OF MOTOR

The motors are of a new type, called the GE 80, being practically of the same capacity (40 hp) as the GE 67, except that the commutator is larger and some other changes have been made, notably an increase in the size of all bolts to a standard of  $1\frac{1}{8}$  ins. These motors open from the bottom. This is another point to which much thought was given. In view of the fact that pit work is being abandoned

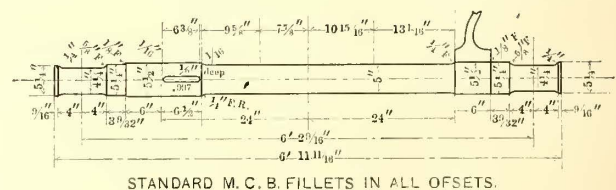


FIG. 15.—STANDARD AXLE

as far as possible by some companies, and that there has been a marked tendency in some quarters during the past few years to do all work on motors from above, the respective merits of motors that open from above and those which open from below were carefully considered. Visits were also made to some of the principal cities where motors are being handled in both ways. It was finally concluded, however, that under Chicago City Railway conditions, there were no material advantages in having a motor which would open from above and not from below, and there were some decided advantages in having it open from below. Armatures and fields can be removed and replaced through the pit at any car house without taking the car to the general repair shop if the motor opens from below. This in itself is a strong argument. On a large system, such as that of the Chicago City Railway Company, it was not considered advisable to select a type of motor which would make it necessary to take a car many miles to the general repair shops in order to remove armatures and fields. As to convenience of handling when making a general overhauling

of a car equipment, it is practically as easy to lift a motor out of the trucks with the crane at the general repair shops, and turn it over, so as to get the armature out, as it would be to take it out of the trucks and remove the armature if the motor opened from above. The only difference is that the motor must be turned over by the crane, which is the work of but a few seconds.

#### CONTROLLERS

The K-28 controller is used. Just under the controller is a cast-iron box, in which the iron pipe conduits terminate, and through which the wires are led up to the controller by a bell mouth, but in such a way as to prevent water from the platform getting into the controller wires.

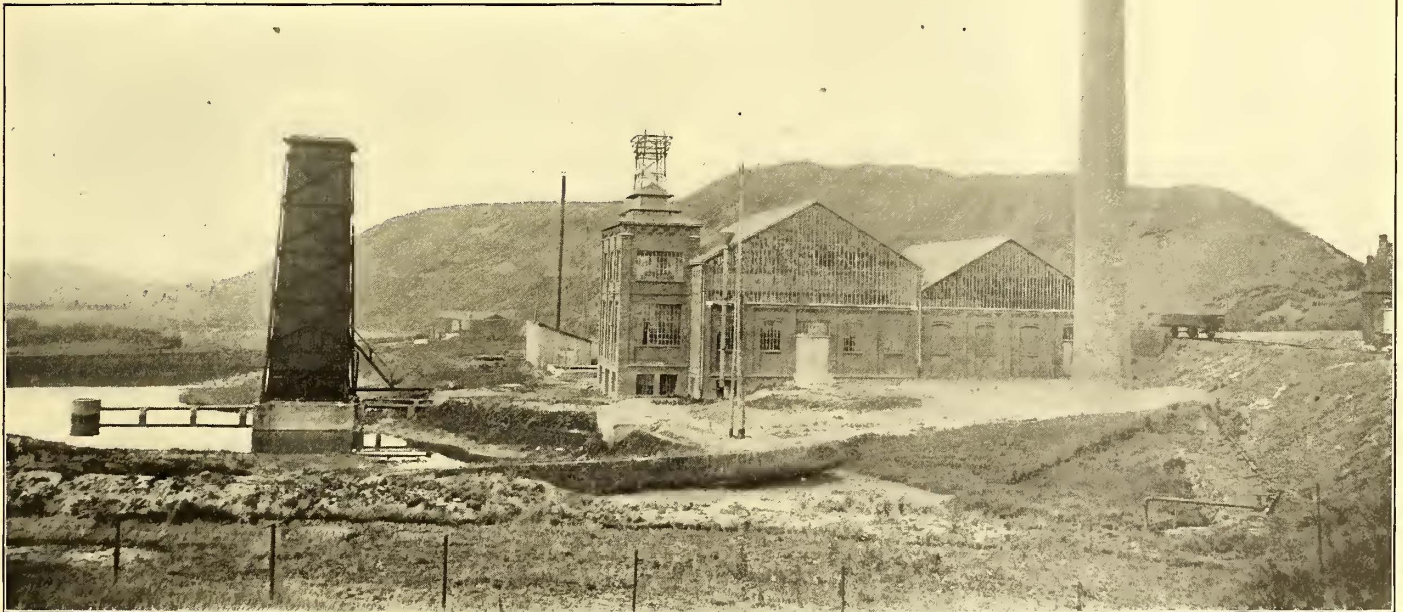
#### BRAKES AND SAND BOXES

Straight air brakes are used, supplied with a new type of Christensen AA-4 compressor, which has a capacity of 16 cu. ft. of free air per minute. Two air storage tanks are placed under the car. The governor for the air compressor is put under one of the longitudinal seats. In each corner of the car, under the longitudinal seat, is a sand-box with a Nichols-Lintern air sanding device. The valve for operating the air sander was devised by the company's engineers. It is placed directly above the stem of the air-brake valve, so that the motorman can operate the sander with his thumb while applying the brakes, making a very convenient arrangement. The hand brake, provided for emergencies, is the Peacock type, with which the car can be readily controlled should the air fail.

### THE BORINAGE (BELGIUM) SINGLE-PHASE RAILWAY

Since April 6 the great Belgian coal mining district west of Mons, known as the Borinage region, has been served by the first single-phase railway in Belgium. The road is also said to be the second commercial single-phase railway in Europe. Like the other Belgian light railways, the line is owned by the Société National des Chemins de Fer Vicinaux, which is controlled by the government, and which operates over 2200 km (1320 miles) of track.

The National company has always pursued a progressive policy, and was one of the first in Europe to adopt electric traction. This has been done only on the five lines where the



THE POWER HOUSE WHICH SUPPLIES CURRENT TO THE BORINAGE SINGLE-PHASE RAILWAY, SHOWING ALSO COOLING TOWER ON THE LEFT

The car complete without passengers weighs 26 tons.

The car bodies were built at the works of the J. G. Brill Company, at Philadelphia and St. Louis, the trucks by the McGuire-Cummings Manufacturing Company, the air braking apparatus by the National Electric Company, the Peacock brake by the National Brake Company, the seats by the Hale & Kilburn Manufacturing Company, and the illuminated signs by the Hunter Illuminated Car Sign Company.



The West Penn Railways Company, of Connellsville, Pa., has adopted the *STREET RAILWAY JOURNAL* as a text book at the regular meetings of its division superintendents. Some article is taken from a recent issue of the paper and used as a subject of discussion. At the last meeting the article considered in this way was that on accidents, by Dr. Rockwell, printed in the *STREET RAILWAY JOURNAL* for August 5.

conditions have approached those of city operation, as direct current did not appear advisable for the lines with lighter traffic. Polyphase alternating-current traction was proposed for the Borinage line, but was not adopted. Finally, in March, 1903, the single-phase system, at that time being proposed by the Union Elektricitäts-Gesellschaft, now the Allgemeine Elektricitäts-Gesellschaft, was accepted. Work was begun at once, but owing to certain difficulties in securing the right of way the construction was delayed long enough to prevent the Borinage line from being the first of its kind in Europe.

The length operated at present is about 12 miles, but this eventually will be increased to 77 miles. The transmission voltage is 6600 at 40 cycles, and through the medium of step-down transformers placed along the line this voltage is reduced to the line potential of 600 volts. It is planned to use a higher line voltage on the extensions, to secure a saving in transformers, and no hesitation is felt about this increase because of

the safety afforded by the catenary suspension to be employed.

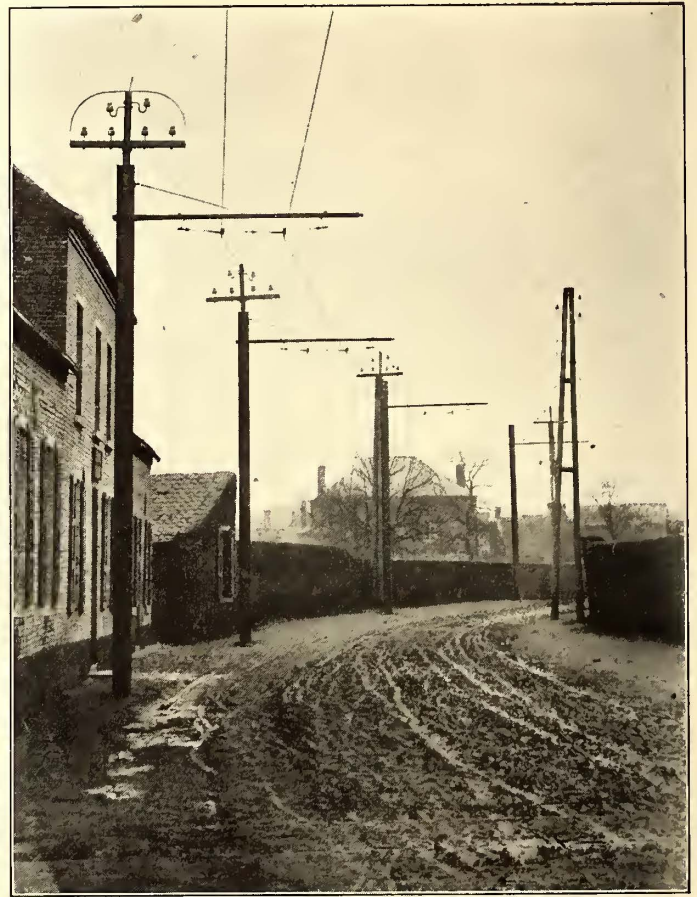
The greater part of the Borinage line is on the public streets, but part is also on the company's own right of way. The territory traversed is of a rough character, with a maximum grade of 7.1 per cent. Single track is common, with a number of turnouts of variable length. Ultimately, five lines are to be operated as follows: St. Ghislan-Frameries, 9.6 miles; St.

9.5 m. p. h. is the normal speed, but on the company's right of way trains are run at 24 m. p. h.

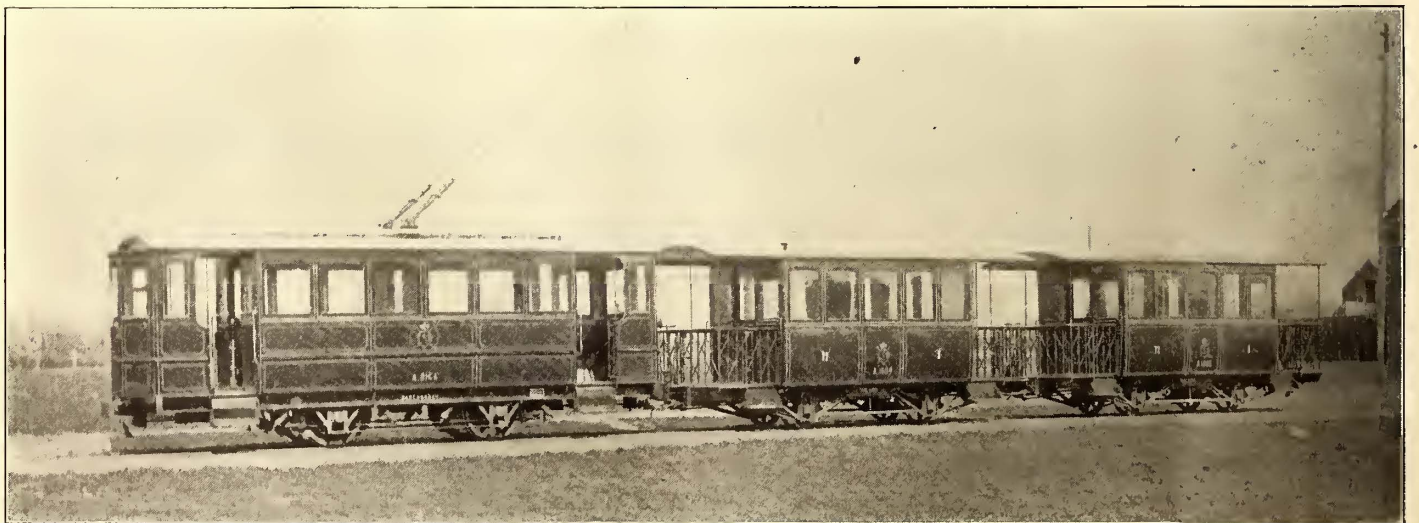
No operating troubles have developed, although cars have been running since last February. The trolley wheels have run over 2000 miles without lubrication, and the carbon brushes of the motors are still just as smooth as if direct-current motors had been used, thus proving the absence of sparking.



DOUBLE-TRACK SECTION ON THE BORINAGE SINGLE-PHASE RAILWAY



TYPE OF OVERHEAD CONSTRUCTION ADOPTED FOR THE BORINAGE SINGLE-PHASE RAILWAY



MOTOR CAR DRAWING TWO TRAILERS ON THE BORINAGE SINGLE-PHASE RAILWAY

Ghislan-Eugies, 6.3 miles; Quaregnon-Eugies, 6.4 miles; Quaregnon-Frameries, 7.4 miles; Paturage-Wasmes, 6.8 miles. On weekdays the first four lines will have an hourly service and the fifth half-hourly. One trailer will be used with each motor car during the rush hours. However, the motor cars are capable of hauling as much as two loaded passenger trailers or freight trailers weighing about 14 tons. In the urban districts

#### POWER SUPPLY

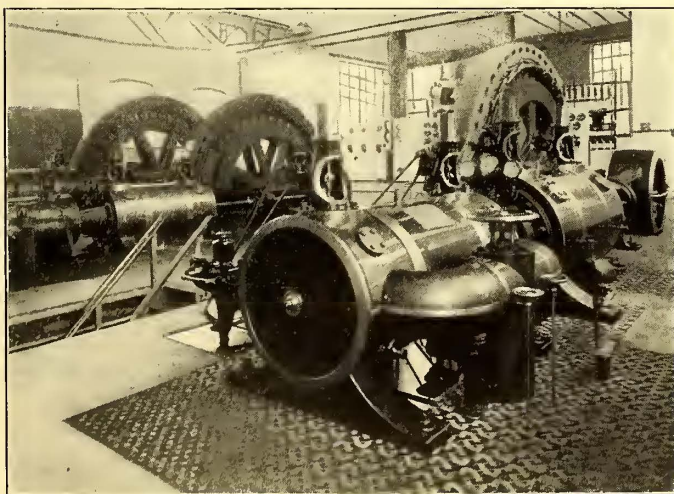
The railway company has no power station, but purchases current from the Société Intercommunale du Borinage, whose power house is located between La Bouverie and Wasmes. This generating station, which was equipped by the Allgemeine Elektrizität-Gesellschaft, also supplies power and light to industrial undertakings in Paturage, Wasmes and La Bouverie.

This fact made it possible to secure cheaper current than from a separate station, and also explains the use of so high a single-phase railway frequency current as 40 cycles, since a compromise was necessary to give satisfactory service for both lighting and power. Again, it was necessary to install polyphase generating apparatus owing to the fact that polyphase motors are used on some of the circuits.

The boiler house contains two tubular boilers, a superheater above each boiler, economizer, feed water pumps, etc. The piping is arranged in two sections, the upper half being used for emergencies only. The feed water for the boilers is not of good quality, as it is necessary to take it from a neighboring coal mine. A pond has been constructed for the condenser cooling water.

There are three generating sets; two of these are made up of a 400-hp-600-hp compound tandem engine, running at 120 r. p. m., direct connected to a 40-pole, 375-KVA star-connected alternator; the remaining set is made up of a 220-hp-350-hp engine, running at 133 r. p. m., direct connected to a 36-pole alternator. The large generators are arranged to give 375 KVA single-phase current by using any two phases of the star-connection or 375-KVA polyphase current at 40 cycles. The smaller generator is also arranged for polyphase and single-phase work. When connected in delta all of the alternators are capable of giving 6600 volts. Each machine is of the revolving-field type, has a Tirrill automatic voltage regulator and carries its exciter on the free end of the shaft.

To carry out the object of the power house, namely, to supply both polyphase and single-phase current, the switchboard consists of three distinct divisions. The left end of the board carries the railway measuring instruments and switches; the middle, the apparatus for the generators and exciters, and the right, the controlling instruments for the lighting circuits. Two phases from each generator are taken for the railway circuits without the intervention of frequency changer or other machinery. From the switchboard the high-tension (6600-volt) wires are led directly to the distributing tower after passing through an intermediate receptacle containing lightning arresters and other high-tension protective devices.



INTERIOR OF POWER STATION

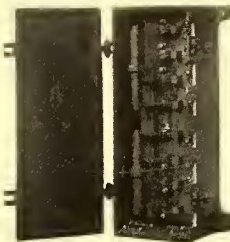
Wooden poles are used for carrying the 6600-volt transmission wires, which divide into four double lines for each of the railway sub-stations. V-shaped iron castings are screwed into every pole for carrying the insulators. It will be noted from one of the illustrations that the poles carry an iron bow, which the law prescribes to prevent wires from falling in case of insulator breakage.

All of the four sub-stations, which step down the voltage from 6600 to 600, work in parallel on the system, consequently the stations do not form separate feeder sections, which would

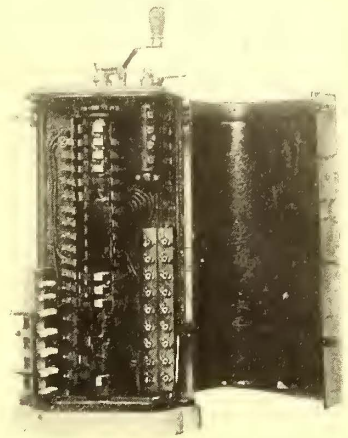
have required more stations than the parallel method. The standard size transformer adopted is 75 KVA, of which the Horny station contains one, Wasmes two, Frameries three and Quaregnon two. All of the stations are built of masonry, approximately 10 ft. 6 ins. x 7 ft. 10 ins. in area, and contain the necessary controlling apparatus in addition to the transformers. The entering high-tension wires are first led to a pair of hand switches and then through an oil switch to the primary bus-bars, whence they pass to the transformers. In



AUTOMATIC CUT-OUT



DOUBLE-POLE MOTOR SWITCH

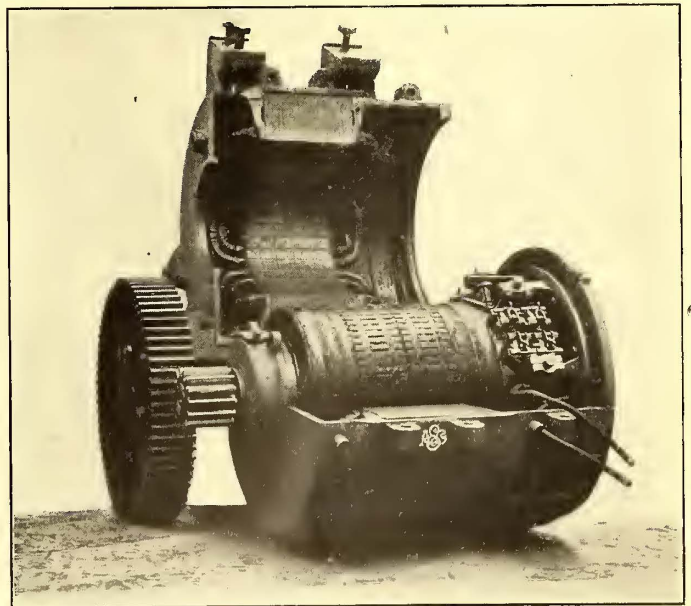


RAILWAY CONTROLLER FOR SINGLE-PHASE SERVICE

each station wattmeters are placed at the entering side, so that the exact energy used, including transformer losses, is easily determined.

THE RAILWAY LINE

Although one overhead wire is sufficient in single-phase operation, the company uses an additional wire for the return



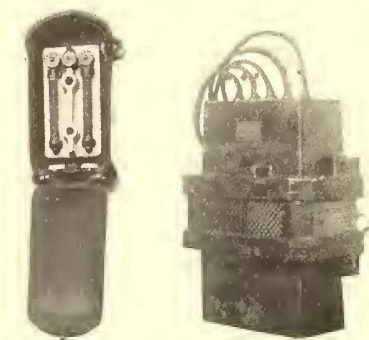
SINGLE-PHASE RAILWAY MOTOR, OPEN

circuit, as a track return might have seriously disturbed adjoining grounded telephone and telegraph circuits. Earthed single-phase currents appear to disturb grounded telephone circuits, even when the former have as low a frequency as 15 cycles, and such disturbances can be avoided only by abolishing a grounded return for one of the two circuits. The two grooved overhead wires are kept 3 ft. apart, and usually about 19 ft. 8 ins. over the rails.

Channel beams are used for the poles, wood being too short-lived and lattice or tube poles too expensive. Side-pole con-

struction is used wherever possible. The side arms are double V-shaped castings fastened to the poles by clamping. For single track these arms are 9 ft. 8 ins. long, and for double track 21 ft. For the latter length two guy wires are used instead of one, to avoid bending.

As the operating voltage is only 600, the wires are suspended in the usual manner. The wires are all clamped in. To provide the best possible insulation between the power and return wire, ball insulators are employed in addition to the regular bolt



DOUBLE-  
POLE  
LIGHTNING  
ARRESTER

REGULATING  
TRANSFORMER

insulators. The section insulators are placed every 1640 ft., and are furnished with double-pole lightning arresters. Any section, however, may be cut out of circuit, leaving the others alive. At one undergrade crossing with a steam line the operating-current wire is only 11 ft. above the track—hence to avoid accidents to teamsters it is necessary to have this section dead except when a car passes

through the tunnel. The special switch for this purpose is located on the car. On entering the motorman places the upper wire in circuit, and on leaving cuts it out.

#### ROLLING STOCK AND EQUIPMENT

At present the rolling stock consists of twenty motor cars and an equal number of trailers. The cars are plainly fur-



STANDARD MOTOR CAR USED ON THE BORINAGE SINGLE-PHASE RAILWAY SYSTEM

nished, as the great majority of passengers is made up of miners and other workingmen. Each car body is a little over 15 ft. long, has a seating capacity of twenty and standing room for about twenty passengers more. The seats are longitudinal. The cars have no particular style of truck, but are mounted on double axles, which have leaf and elliptic springs. The wheel

base is 8 ft., diameter of wheels 31½ ins., and truck gage 1 m (39.37 ins.)

Every motor car carries two Winter-Eichberg, type WE 31B motors, each capable of giving 40 hp for one hour's run without undue heating. They have six poles, and are built for single-phase, 40-cycle, 550-volt current. The gear ratio is 1:5.07. The motor casing has removable covers on top and bottoms, so that the commutator is made easily accessible. The two-part laminated stator has a side-pole, single-phase winding distributed in slots; there are two systems of short-circuiting and exciter brushes, whose position varies 90 electrical degrees. In all there are six brush spindles, four of which carry short-circuiting brushes and two carry exciter brushes. The efficiency and service curves of this motor are not so favorable as those obtained from a 25-cycle motor, but show that a 40-cycle, single-phase current satisfies all the usual railway conditions.

The motors are operated in series-parallel in connection with a regulating transformer. The only changes made take place in the stator windings, the rotor windings remaining permanently in series. Resistances are not used except in passing from series to parallel. The regulating transformer is air-cooled, and is placed under the center of the car body.

The controller employed is of the type B-19. The larger of the two controller handles serves for running and braking; has two series and three parallel positions for changing the connections of the regulating transformer; five positions for short circuiting, which leave the regulating transformer unaffected, but cause the motors to run as generators, and a sixth position for braking against the current. The smaller handle is used for reversing. The controller has no magnetic blow-outs, as these were found unnecessary.

Owing to the use of a return wire, every car carries two trolley poles. Both are mounted in the center of the roof, 3 ft. apart. The upper part of every pole is insulated with leather to prevent short circuits between adjacent poles should they come in contact. Each pole is protected from atmospheric discharges by the use of a lightning arrester and choke coil. The car is illuminated by six incandescent lamps, arranged in series. The weight of the standard car and equipment is about 10 tons. The motors weigh 1385 kg (3047 lbs.), and the regulating transformers 200 kg (440 lbs.) each.

#### CAR HOUSES

The present car house, which is temporary, is located on the Quaregnon-Eugies division, near the Paturage railway station. It consists of a wooden building for twelve motor cars, and a workshop containing the stock room and offices; the trailers are stored in the open air. The permanent car house is to be erected at the junction of the Quaregnon-Eugies and Eugies-Ghislain lines. It will have a room for twenty motor cars and twenty trailers, besides containing a repair shop, stock room and offices.

The Philadelphia & West Chester Traction Company's new station at Ardmore, Pa., has been opened to the public. It is one of the handsomest electric railroad stations in the country, and is situated on Lancaster Avenue, directly opposite the Pennsylvania Railroad station. The site has a frontage of 100 ft. on the avenue. Of this, 30 ft. is occupied by the building and the remainder will be laid out in lawns and walks. The building, which has previously been described in the *STREET RAILWAY JOURNAL*, is of Pompeian brick, with Indiana limestone trimmings. The waiting room is finished in quartered oak, and the floor of the entire building is concrete. The train shed, which accommodates two tracks at present, is 40 ft. x 95 ft., with cement and concrete platforms running the entire length on each side. It is expected that the present running time of 24 minutes to Sixty-Third and Market Streets, Philadelphia, will be reduced to 17 minutes when the improvements are completed.

**ATLANTA NORTHERN RAILWAY THE FIRST SINGLE-PHASE RAILWAY IN THE SOUTH**

On July 17, 1905, the Atlanta Northern Railway Company opened its line between Atlanta and Marietta, Ga., and the largest interurban electric railway in the South was added to the steadily growing list of roads employing the single-phase alternating-current system developed by the Westinghouse Electric & Manufacturing Company. Since the commencement of service exceptionally large crowds have at times been transported, and the successful operation of the line is assured.

The company operates some 15 miles of track between the terminal cities of Marietta and Atlanta, and enters the latter city over the track of the Georgia Railway & Electric Company. The interurban line, however, is operated entirely independently and makes no attempt to conduct a local service.

Marietta, the northern terminus of the line, is located at the foot of the Kenesaw Mountain, made famous during the Civil War by one of the battles of Gen. Sherman, and now the site of a national cemetery. The intervening country is rolling, and is devoted largely to the raising of cotton. The line crosses the Chattahoochee River at Iceville, and passes through the villages of Smyrna, Gilmore and Butler. It is constructed over a private right of way which runs parallel to the track of the Western & Atlantic Railroad.

The track construction is exceptionally good, consisting of 70-lb. T-rails, laid on ties which are ballasted with slag shipped

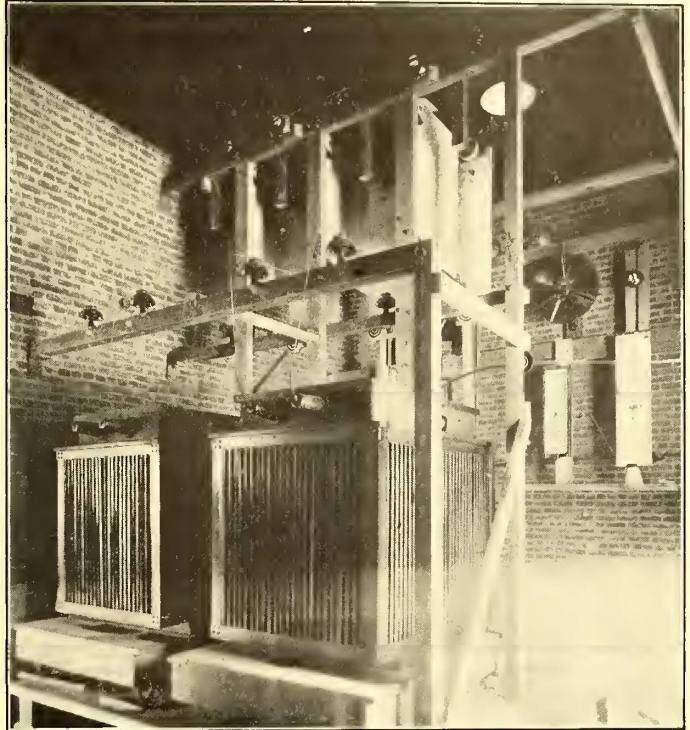


A CUT ON THE MAIN LINE, SHOWING TRACK CONSTRUCTION AND OVERHEAD WORK

from the iron furnaces of the Birmingham district. The maximum grade is 3 per cent, and the shortest curve has a radius of 574 ft. The gage is standard, i. e., 4 ft. 8½ ins. Within the limits of Atlanta girder rails are used.

Except within the city limits of Atlanta a single No. 000 trolley wire forms the entire low-tension distributing system. This is fed with 25-cycle, single-phase alternating current, at a potential of 2200 volts. The trolley wire is suspended from cross spans secured to wooden poles, set 90 ft. apart on straight track, and about 45 ft. apart on curves. The construction is similar in general to that ordinarily used in direct-current practice, except that specially heavy insulators, suitable for the higher voltage, are employed.

The current supply for the new railway is obtained from the water-power station of the Atlanta Water & Electric Power Company, about 18 miles from Atlanta, and is transmitted at a potential of 22,000 volts. The power equipment at the water-power station includes Westinghouse three-phase, 25-cycle alternators, with an aggregate capacity of 10,500 kw. In case of accident to the water-power station, current may be obtained from a thoroughly equipped steam power plant which the Georgia Railway & Electric Company, which also obtains power from the water-power station ordinarily, has in reserve for the operation of its lines in the city of Atlanta in



TRANSFORMER STATION AT CAR HOUSE, WITH TWO 150-KW TRANSFORMERS

emergencies. Few railways in any part of the country are so well provided with duplicate power apparatus for maintaining the operation of the road at all times.

The trolley line is divided into three sections, each fed from one leg of the three-phase transmission system through oil-insulated, self-cooling transformers. There are two transformer stations in each section connected to the same phase, making a total of six stations, located approximately 3½ miles apart. One of these is in Atlanta, one in the car house near the limits of Atlanta, and the remainder at the towns of Bolton, Gilmore, Smyrna and Butler.

The transformer stations are well constructed of brick, and each is equipped with one 150-kw Westinghouse oil-insulated, self-cooling transformer, together with the necessary lightning arresters, choke coils, switches and fuses. The transformer in Atlanta and one of those in the car houses supply the 550-volt section of the trolley, and in order that all transformers may be interchangeable, all are wound so the secondary voltage of either 2200 or 550 may be used. Since these stations contain no moving machinery, no attendants are required. An occasional inspection of the stations is all that is necessary.

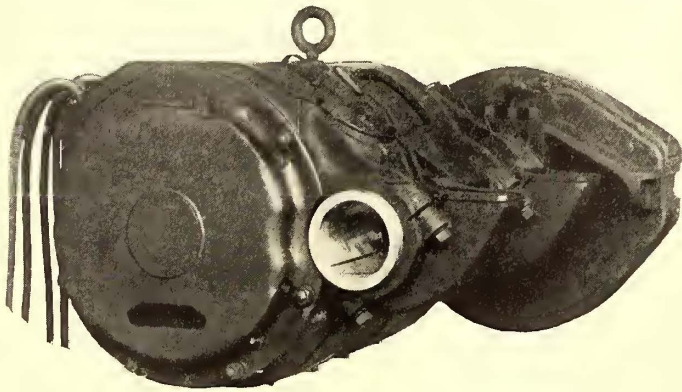
To insure regularity of service with a minimum of reserve capacity, each transformer is mounted on a low truck and is installed in the transformer station on a platform at the height of a standard flat car. A reserve transformer is held in the car house, mounted on a similar truck, and loaded upon a flat car, ready for instant transportation to any part of the line. This outfit serves as a reserve unit for all of the stations. In

case of a breakdown or other trouble at any station, the crew of the first car discovering the difficulty would notify the car house force, who would then have the flat car hauled to this point, and on arriving would roll the damaged transformer and its platform on to the flat car and replace it by the reserve unit. The arrangement is ingenious and well thought out, and indicates the ability of the engineers of the Atlanta Northern Railway Company, who have planned and constructed the system in so thoroughly modern a manner. As each transformer station is capable of carrying the entire load of its section, practically a duplicate installation has been made. With this arrangement and the reserve unit described above, there is little likelihood of cessation of service because of failure of the power supply.

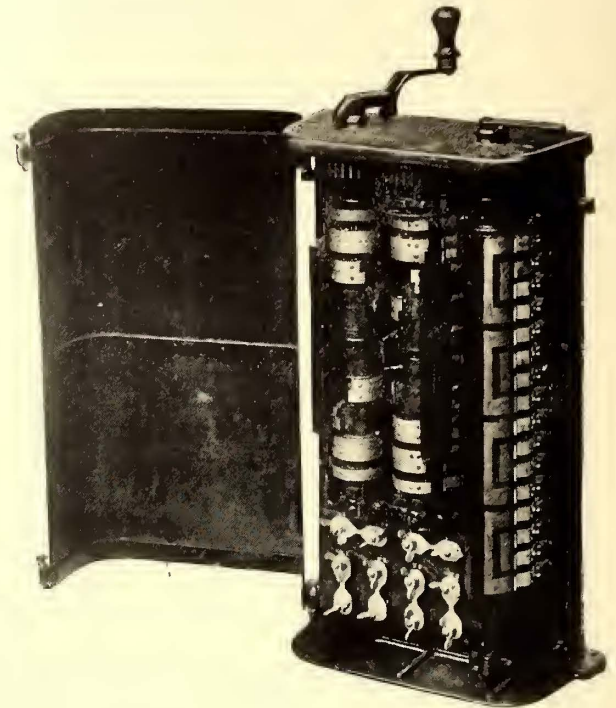
The rolling stock comprises six passenger and one freight car, four cars being employed in regular service to maintain a half-hourly schedule between terminal points. The running

volts or 550 volts is used on the trolley. After leaving the auto-transformer the circuit passes directly to the ground. The motors may be connected to various taps on the low-tension winding of this transformer, giving five different running points.

The connections are made by a drum-type controller, one controller being mounted on each platform. Each controller



SINGLE-PHASE 50-HP RAILWAY MOTOR USED ON THE ATLANTA NORTHERN RAILWAY

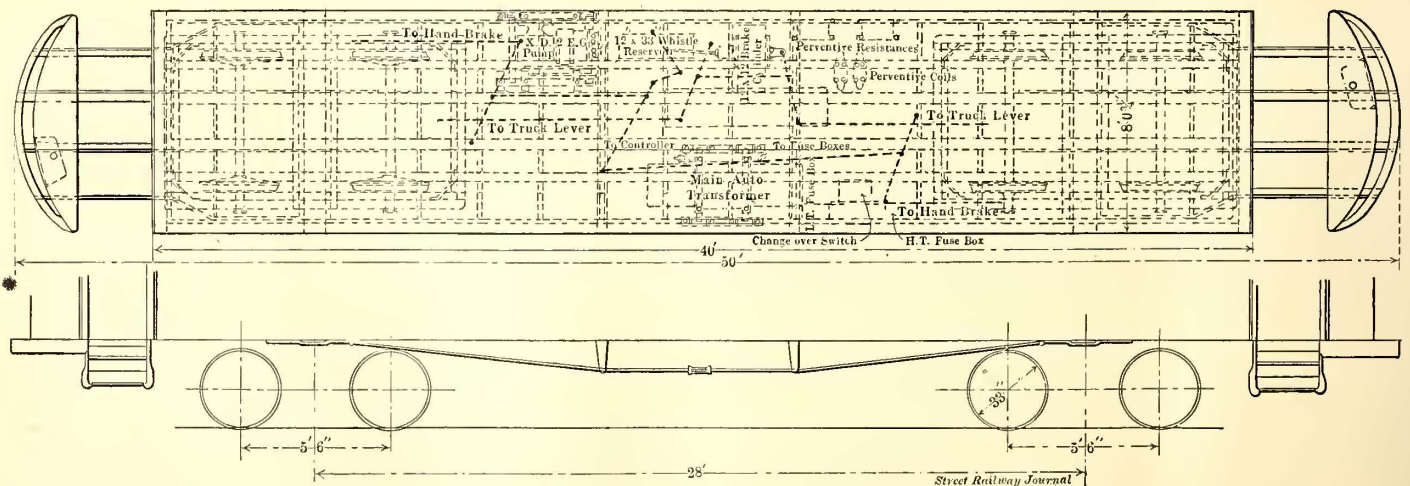


CONTROLLER FOR SINGLE-PHASE RAILWAY OPERATION

time is 45 minutes each way, including some twenty stops. During the heavy rush hours 189 passengers have been carried on a single car.

The passenger cars measure 50 ft. 6 ins. over all and weigh about 30 tons each. They have a seating capacity of fifty-six persons. The cars were built by the Cincinnati Car Company, and are mounted upon Brill 27-E trucks. The freight car was also constructed by the Cincinnati Car Company, and is

consists of three drums, one for reversing the relative connections of the field and armature coils of each motor, and the other two, which are directly geared together and operated simultaneously, for varying the voltage impressed upon the motors. The motors are of the conductively compensated type, and are connected permanently two in parallel, the voltage impressed upon each pair of motors being regulated by one of the controller drums mentioned above.



PLAN OF CAR, SHOWING POSITION OF ELECTRICAL APPARATUS

mounted upon standard trucks of the manufacturers. All cars are of the double-truck type with 28 ft. between truck centers.

The passenger cars are equipped with quadruple Westinghouse No. 108 (50 hp) motors. The equipment of these cars is remarkable for its simplicity. The circuit from the trolley passes to an auto-transformer through a double-throw oil switch, which connects it to either one of two taps on the high-tension winding of the transformer according to whether 2200

The feature of particular interest in connection with the operation of the controller resides in the means employed for preventing sparking in the controller when the connections are changed from one tap to another on the auto-transformer. There are on this transformer six intermediate taps corresponding to voltages 144, 174, 204, 234, 266 and 288, respectively. There are, however, only five running points corresponding to voltages 159, 189, 219, 240 and 277, respectively.



It will be noted that these voltages are in each case midway between the ones of the transformer taps. The running voltages are obtained from the neutral point of a so-called "preventive coil"—an inductive coil—which is connected across adjacent taps of the auto-transformer. The segments on the controller drums are so arranged that, in changing the preventive coil from one pair of transformer taps to the next adjacent pair, the circuit is never opened simultaneously at both ends of the coil. In parallel with the preventive coil is connected a preventive resistance through one-half of which flows the major portion of the current to the motor when the controller is being moved from one running position to another. The preventive resistance is so designed that it takes but little current when subjected to the small voltage between adjacent transformer taps (30 volts), and yet absorbs but little voltage when carrying the full current of the motor. It is evident, therefore, that the motor circuits are never completely opened during operation, and yet there is no direct short circuit produced between adjacent transformer taps. On the highest running notch of the controller the preventive resistance is cut completely out of circuit, so as to eliminate entirely the loss occasioned by the current due to the low voltage between adjacent transformer taps.

The freight car is equipped with four No. 108 motors similar to those used on the four passenger cars with hand control, but in order that this car may be operated on any part of the city system as well as over the company's own tracks, the control is arranged for operation on either direct or alternating current. There are, therefore, three operating conditions which can be met by this car. It can be run from a standard 550-volt, direct-current trolley, the 550-volt alternating-current trolley in Atlanta and the 2200-volt alternating-current trolley between Atlanta and Marietta. To meet these widely different conditions, a combination of rheostatic and voltage control is used instead of pure voltage control as on the passenger cars. The motors are connected permanently, two in series, and the two groups thus formed may be connected to any of three different taps on the transformer. In starting the car, the motors are connected first to the lowest tap, then to the middle tap through a resistance, next to the middle tap without the resistance, then to the highest tap with the resistance in circuit, and, finally, to the highest tap with the resistance short circuited. With this equipment three different running points are obtained.

When operating on direct current, the motors are connected all four in series and rheostatic control only is used. There are thus four resistance points in addition to the "full-on" position.

Current is collected from the trolley wire by means of wheel trolleys of the ordinary type except that these trolleys are mounted on porcelain insulators on account of the high voltage which is used. Each car carries two trolleys, one at each end, and is equipped with Westinghouse straight air brakes, the compressors for which are operated by series-wound motors similar in general to the main car motors. Nothing necessary to an equipment of the highest grade and to enable the company to maintain a safe and reliable high-speed service has been omitted. Great credit is due to the management of this company, which consists of P. S. Arkwright, president; T. K. Glenn, vice-president; G. W. Brine, secretary and treasurer, and A. Balsley, chief engineer, for the successful entrance of alternating current into the Southern railway field and for

their pioneer work in this important development of electric transportation. The work of installation and construction has been done almost entirely by the company itself, including the track and overhead construction, which was conducted under the management of William Glenn, engineer of maintenance of way.

### AUTOMOBILE BUSES FOR SMALL COUNTRY LINES

Many who have given the matter careful consideration are inclined to the belief that the automobile in some form will soon bear the same relation in the transportation game to the electric railways that the traction lines are now occupying toward the steam trunk lines; that is, they will take care of



A STOP AT A FARM HOUSE

small business which cannot be profitably handled by the more costly conveyance, and will serve as feeders to the larger systems. Almost every electric railway operator can point to small towns and hamlets at distances anywhere from 5 to 20 miles off from his main line that would furnish considerable business if it could be brought in a cheaper manner. It would not pay to build a spur line, because the cost of building the road and operating even a single car would be so great that the returns would be unprofitable, hence this business cannot be taken care of under present conditions.

Throughout the farming districts, particularly in the Middle West, there are thousands of hamlets and villages that would not support even the cheapest forms of traction lines or trackless trolleys, but which are begging for a better means of communication with neighboring cities and towns than is now afforded by horse-drawn vehicles. The question is, can these classes of business be handled satisfactorily and profitably by automobiles? Recent improvements have brought the gasoline vehicle up to quite a high degree of reliability, and the cost of operating such cars, when in good condition, is known to be very small. The great drawback is the deplorable condition of the majority of country roads, particularly in winter. Fortunately, these conditions are rapidly improving, and in some sections the main highways are in very fair condition all the year around. Grades and curves have but little effect upon the cost of operation, and such expenses as track and overhead maintenance, despatching systems, etc., are, of course, eliminated.

One of the first experiments with a project of this kind is being made at Springfield, Ohio, and it is interesting to note that the promoters are old electric railway builders and opera-

tors. John S. Harshman, who is at the head of the company, was instrumental in promoting two of the most important traction lines centering at Springfield. There are several routes out of Springfield over which traction lines have been projected, but the plans have fallen through owing to the insufficient population, which rendered it impractical to build a trolley road. The fine highways in this district prompted Mr. Harshman to try the automobile on these routes.

A company, which is known as the Commercial Transit

on road improvements, the Commissioners to do the same. This was purely voluntary on the company's part, as there is no law in Ohio to prohibit the use of the highway for such purposes or to compel them to make any special payment for the use of the road. It is believed that the only restrictions that can be placed against a project of this kind under present laws would be the special license in cities for automobiles. The State speed ordinance of 18 m. p. h. on highways and 8 m. p. h. on business streets of cities of course applies and will be regarded.

The cars were furnished by the Olds Motor Works, of



LEAVING SPRINGFIELD



THE JAMESTOWN TERMINUS



SOME LONG GRADES, SHOWING REPAIR WORK DONE BY THE COMPANY



A PASSING POINT, NO SWITCHES TO TURN

Company, was formed in a modest way. It has a capital stock of \$50,000, of which \$20,000 has been paid in for preferred stock. It was decided to experiment with very small cars at first over the route from Springfield to Clifton, Cedarville and Jamestown, having populations respectively of about 500, 1500 and 2500. The distance from Springfield to Jamestown is 22 miles, along a fairly level highway, which is in excellent condition and built up with a good farming population. Service was started about six weeks ago. The original investment was for three cars at \$2,200 each, a garage building and repair shop, for which an old building was remodeled at an expense of \$1,000. In addition, the company spent about \$1,200 in improving the highway, filling in holes and low places with broken stone and leveling and rolling the entire road. It made an agreement with the County Commissioners of the two counties through which the route passes to spend \$100 per mile per year

Lansing, Mich. They are of this company's standard type, have double vertical cylinder motors rated at 16 hp, water radiating system, two speeds forward and reverse with maximum speed of 18 m. p. h., 30-in. wheels with 4½-in. solid rubber tires. There are two side seats, each seating five passengers, and space for two in front besides the operator. There is a canopy top with side curtains and swinging window in front. In stormy weather the car can be made perfectly tight. The company has made one or two changes in the cars, including the installing of small electric lamps in the body and electric headlight, the current being furnished by an Apple generator and storage battery, which also furnishes current for engine ignition. Windows will be placed in the curtains so that the interior will not be dark in stormy weather, and it is planned to run the engine exhaust line under the seats for heating in winter; it is believed the cars can be kept amply warm

by this method. Two cars at present handle the service with one for spare. On alternate days one makes 110 miles, or two and one-half round trips, while the other makes 88 miles, or two round trips. Cars leave either terminus at 6 a. m., 9 a. m., 12 m., 2 p. m., 4 p. m. and 6 p. m. Rates of fare are practically  $2\frac{1}{2}$  cents per mile, with rate of 50 cents from Springfield to Jamestown, 22 miles. The scheduled time is 1 hour and 45 minutes, or about  $12\frac{1}{2}$  m. p. h. There is a layover of 15 minutes at either terminal, so that if cars are late they can still start out on time.

Thus far there has been no difficulty in maintaining the schedule, despite the fact that unusual precautions are necessary to prevent scaring horses. The State law provides that an automobile must give a team two-thirds of the road, and if a driver raises his hand, the machine must be brought to a stop; if the horses are still fractious the motor must be stopped, which necessitates getting out to crank it again. A great deal of time is lost in this way. The farmers in many instances have been antagonistic to the venture, due to the scaring of horses, so that the company has issued orders to its men to spare no precautions to avoid accidents. This difficulty is being rapidly overcome, however.

It is, of course, too early to determine anything about the financial success of this proposition, although it looks very encouraging. The receipts thus far have been more than enough to pay operating expenses and interest, and allow for a reserve fund of 2 cents per car mile for repairs, which, of course, has been practically nothing up to the present time. Operators are paid 25 cents an hour. The operator collects the fares and records them on a register, and it is believed that a good operator can make a better showing in the way of wear and tear on the machine and saving in fuel than can be done by the operator of an electric car. On a round trip of 44 miles the cars average  $4\frac{1}{2}$  gals. to 5 gals. of gasoline, which in quantity costs  $10\frac{1}{2}$  cents per gallon; also  $2\frac{1}{2}$  to 3 pints of lubricating oil. This, of course, is in fair weather with good roads; what they will do on heavy roads and deep snow remains to be seen. It is believed, however, that they can be operated for from  $4\frac{1}{2}$  to 5 cents per car mile, everything included.

This is not the only project the company has in mind. As soon as possible it will start a similar line between Springfield, Catawba, Mechanicsburg, Milford and Marysville, a distance of about 35 miles. It has also ordered two cars of a larger type, having cross-seats for eighteen passengers, which will be used for 'bus service about Springfield. There are three large institutions near the city—the Knights of Pythias Home, Odd Fellows' Home and the Masonic Home—and these cars will be used for special parties with a rate of \$5 per hour, and it is believed they will be very profitable.

The garage and repair shop has been fitted up in a very complete manner, and as it is the only one of any consequence in Springfield, it is thought there will be outside repair work enough to make the shop self-sustaining.

The results of this experiment will be watched with considerable interest, as it is known that there are a number of similar projects in Ohio and neighboring States.

During the month just past the motormen, conductors, guards and inspectors of the Brooklyn Rapid Transit Company, whose cars run into the Culver terminal at Coney Island, have been given free by the company more than \$2,000 in lunches. These lunches are furnished the men during periods of heavy travel, and the company thereby is able easily to maintain its rush schedules, and the men to make considerable extra time. At the Culver terminal during the past month the company furnished the following immense amount of food: 46,965 sandwiches, 32,890 rolls, 5705 quarts of milk, 3860 quarts of coffee, 2000 crullers, 710 quarts of iced tea. This general bill of fare has also been served at the West End and other terminals.

## PROGRAM OF THE AMERICAN RAILWAY MECHANICAL AND ELECTRICAL ASSOCIATION

The following program has been issued of the third annual convention of the American Railway Mechanical and Electrical Association, Philadelphia, Pa., Sept. 25-26:

MONDAY MORNING, SEPT. 25

Registration will commence at Convention Hall (South Building, Philadelphia Museum) at 8:45 o'clock.

Ten o'clock sharp, address of welcome, Hon. John Weaver, mayor of Philadelphia.

Address by Hon. W. Caryl Ely, president, the American Street Railway Association.

President's annual address.

Report of the executive committee.

Report of the secretary and treasurer.

MONDAY AFTERNOON, SEPT. 25 (1:30 O'CLOCK SHARP)

Paper, "Power Distribution," C. H. Hile, superintendent of wires, Boston Elevated Railway Company, Boston, Mass.; "The Power Station Load Factor as a Factor in the Cost of Operation," by L. P. Crecelius, chief electrician, the United Railways Company, St. Louis, Mo.; report of the committee on "Controlling Apparatus," chairman, J. S. Doyle, master mechanic, Interborough Rapid Transit Company, New York, N. Y.

TUESDAY MORNING, SEPT. 26 (9 O'CLOCK SHARP)

Report of the committee on Way Matters,—"Welding of Rail Joints," chairman, F. G. Simmons, superintendent of construction and maintenance of way, the Milwaukee Electric Railway & Light Company, Milwaukee, Wis.

Report of the committee on "Maintenance and Inspection of Electrical Equipment," chairman, William Pestell, New York, N. Y.

Paper, "The Power House," Fred N. Bushnell, chief engineer, the Rhode Island Company, Providence, R. I.

TUESDAY AFTERNOON, SEPT. 26 (1:30 O'CLOCK SHARP)

Paper, "The Track Brake," F. F. Bodler, master mechanic, the United Railroads, of San Francisco, Cal.

Discussion of the question box.

Reports of special committees.

Election of officers.

## PROGRAM OF THE ACCOUNTANTS' CONVENTION

The following program of the ninth annual convention of the Street Railway Accountants' Association of America has been issued by the secretary:

THURSDAY, SEPT. 28, 2 P. M.

Annual address of president, W. G. Ross, Montreal, Canada. Annual report of the executive committee. Annual report of the secretary-treasurer. Appointment of convention committee on nominations. Appointment of convention committee on resolutions. Report on proposed reorganization of the American Street Railway Association.

FRIDAY, SEPT. 29, 10 A. M.

Annual report of standing committee on standard classifications of accounts, C. N. Duffy, secretary and auditor, Chicago City Railway Company, chairman. Annual report of standing committee on standard form of report, W. F. Ham, comptroller, Washington Railway & Electric Company, chairman. Report of committee on international form of report, C. N. Duffy, secretary and auditor, Chicago City Railway Company, chairman. Report of committee to attend convention of National Association of Railway Commissioners, held at Birmingham, Ala., Nov. 15, 16, 17, 1904, C. N. Duffy, secretary and auditor, Chicago City Railway Company, chairman. Report of committee to attend convention of National Association of Railway Commissioners, held at Deadwood, South Dakota, Aug. 15, 16, 17, 1905, W. F. Ham comptroller, Washington Railway & Electric Company, chairman. Reading and discussion of questions and answers in the question box. This includes those published and any other that may be presented.

2 P. M.

Paper—"The Cost of Carrying a Passenger," C. L. S. Tingley, second vice-president, American Railways Company, Philadelphia, Pa. Paper—"Interurban Fare Collections," Irwin Fullerton, auditor, Detroit United Railway, Detroit, Mich. Paper—"Interurban Ticket Accounting," J. H. Pardee, general manager, Rochester & Eastern Rapid Railway, Canandaigua, N. Y. Paper—"Accounting with Four Departments," H. M. Beardsley, secretary and treasurer, Elmira Water, Light & Railway Company, Elmira, N. Y.

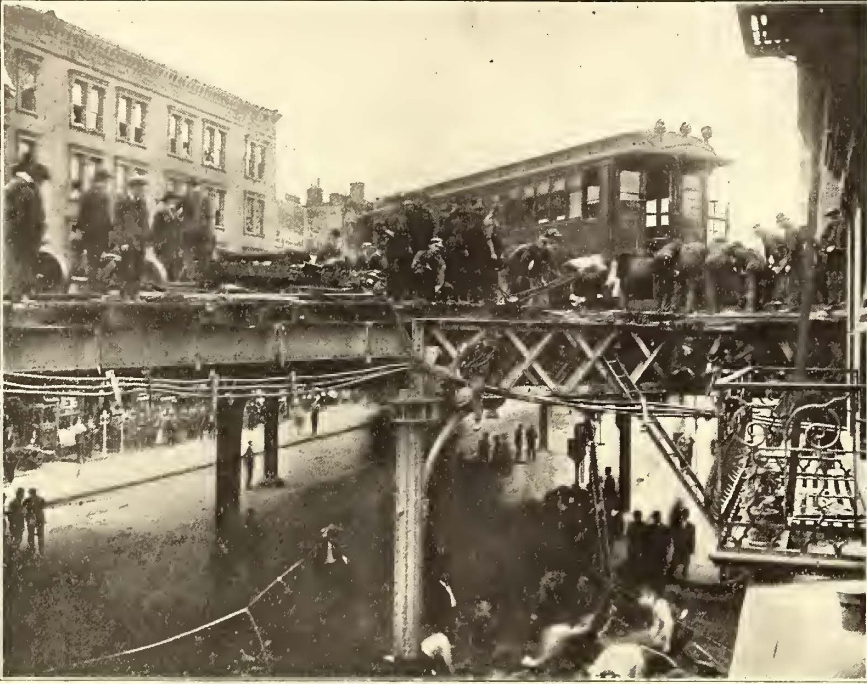
SATURDAY, SEPT. 30, 9:30 A. M.

Unfinished business. Report of convention committee on resolutions. Report of convention committee on nominations. Election and installation of officers.

### SERIOUS ACCIDENT ON THE NEW YORK ELEVATED

Twelve persons were killed and forty-two injured, five of them mortally, a few minutes after 7 o'clock Monday morning, Sept. 11, by the plunging of a car of a southbound Ninth Avenue train of the Interborough Rapid Transit Company, of New York, from the elevated railroad structure, at the curve at

with a crash. The rear platform remained suspended against the framework of the elevated road. The trucks of the third car were hurled from the track through the bottom of the second car, adding to the havoc, and the bodies of the first and third cars came together with a crash. The car which had been thrown from the structure remained suspended at an angle of 45 degs., and the passengers in it were hurled to the forward end, which rested on the sidewalk. The third car of the train, hurled forward by the weight of those behind it, was shoved over the elevated structure and its forward end was forced through the window of the dwelling on the corner. This car finally settled, its forward end held by the sill of the window and the fire escape, and hung suspended like a bridge across the street.



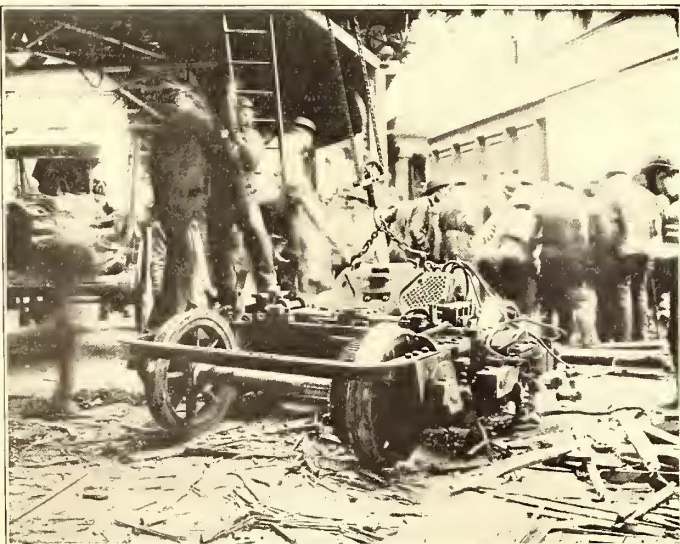
THE SCENE OF THE ACCIDENT

Fifty-Third Street and Ninth Avenue, where the Sixth and Ninth Avenue lines diverge. The train that was wrecked consisted of six cars, all well filled with passengers. It left the Fifty-Ninth Street station about 7 o'clock. Speeding up, as all Ninth Avenue trains do at this point, so as to gain momentum for the grade to the next station, the train took the switch at Fifty-Third Street, which it seems by mistake was set for a Sixth Avenue train. The first car cleared the curve.

An examination was made by the officials of the company soon after the disaster, and it was found that on the first car of the train the signals were set for Ninth Avenue. In the switch tower the signal was set for the approach of a Sixth Avenue train. The corner and the officials of the road are said to agree that Motorman Kelly should have seen that the tower signals were set for Sixth Avenue, and as he was running a Ninth Avenue train should have stopped until he got the proper signals to proceed down Ninth Avenue. That the signals were set for Ninth Avenue when the officials and the coroner reached the first car is not significant, according to Vice-President Bryan and General Manager Hedley. They said that

Kelly might have turned the signals to Ninth Avenue when he saw his error. Both officials are said to stamp as nonsense a report that when the man in the switch tower saw that the train was making the curve at full speed, and knowing that an error had been made, he threw the switch, thus derailing the cars. They said that it would have been impossible for the towerman to throw the switch while the cars were on the track.

The towerman surrendered to the authorities soon after



REMOVING THE TRUCKS THAT FELL TO THE STREET



CLEARING AWAY THE WRECK

Then there was a grinding and crunching of timbers, and the second car slewed around and was torn off its trucks. The third car, with the weight of the remaining two behind it, bumped with full force into the one ahead and sent it flying from the tracks into the street below. As the car fell it turned completely over, and its forward platform struck the sidewalk

the accident, but the motorman fled and up to the time of going to press had not been located. Until the motorman is apprehended and gives his version of the accident, there is only the testimony of the towerman as to the facts in the case. He says positively that the destination of the train as shown by the signals it displayed was Sixth Avenue..

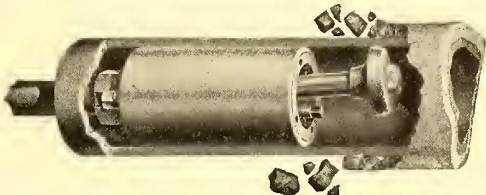
**AN EFFICIENT BOILER-TUBE CLEANER**

Although the Dean boiler tube cleaner has been in wide use for some time it may not be amiss to present an illustrated description of the constructional features and methods of operation of this device, which is manufactured by the William B. Pierce Company, of Buffalo, N. Y.



BOILER-TUBE CLEANER FOR WATER-TUBE BOILERS

The cleaner is remarkably simple in construction, and is worked either by steam or compressed air. In the type used for return tubular boilers the hammer head, vibrating with a pressure of 40 lbs. to 70 lbs., strikes the tubes 3500 to 4500 times a



BOILER-TUBE CLEANER FOR RETURN TUBULAR BOILER

minute, thus setting up a vibratory motion through the steel and dislodging the scale on the outside. In the water-tube boiler the hammer head is changed slightly, and as the cleaner is forced through the tube it breaks the scale up into small pieces, which are blown out of the tube in front of the cleaner. Since the cleaner fits snugly into the tube, it must remove all scale before it can pass any point.

One might imagine that with a stroke of 4000 times a minute there must be a considerable blow struck against the tube, but tests performed by the well-known engineer, Prof. W. H. Kavanaugh, of the University of Minnesota, show that the blow is very slight, and that it is the rapidity of the blow rather than its force which accomplishes such satisfactory results.

**INTERESTING TYPE OF STEAM CAR FOR COLOMBIA**

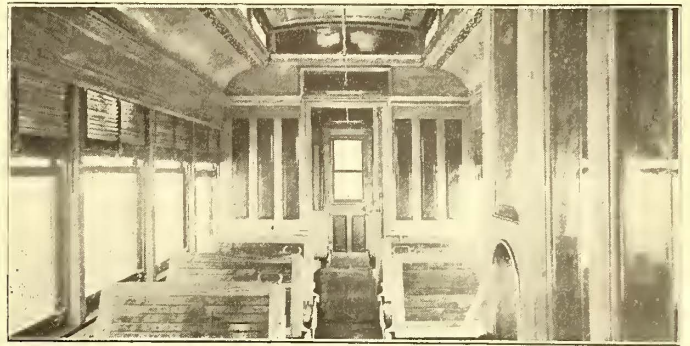
The interesting type of steam car illustrated has just been completed by the J. G. Brill Company for the Ferro Carril de Antioquia, of Colombian Republic. There are two compartments to the car, one for first-class passengers and one for those traveling second-class. A hardwood partition with a single sliding door 24 ins. wide, separates the compartments.



STEAM CAR FOR THE FERRO CARRIL DE ANTIOQUIA

A toilet room is provided at the end of the second-class compartment, and in an alcove is a water cooler. Thirty passengers may be comfortably seated, the seats being of spring cane in the first-class compartment while slat seats are used in the second-class compartment. In the first-class compartment,

only the middle seat is reversible, the seats next to the partition being stationary and the corner seats also stationary. The windows have double sashes, the lower sash to raise and



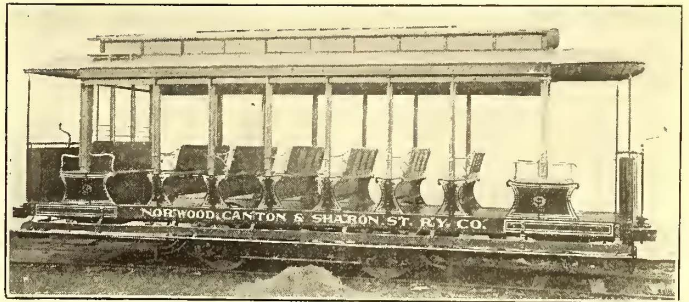
INTERIOR OF COLOMBIAN CAR

the upper sash stationary. Blinds are also used. The interior finish is of cherry and ash with birch ceilings.

The length over the end panels is 21 ft., and over the crown pieces 28 ft. The distance from the panel over the crown piece is 3 ft. 6 ins. The width over the sills and the sheathing is 7 ft. 10 ins. The width over all is 8 ft. Distance between the centers of the posts is 2 ft. 5 ins. The trucks are the company's No. 420 type, with 4-ft. wheel base and 24-in. wheels.

**EQUIPMENT FOR THE NORWOOD, CANTON & SHARON STREET RAILWAY**

A number of ten-bench open cars have lately been delivered to the Norwood, Canton & Sharon Street Railway Company, Massachusetts, by the American Car Company. The cars will be used on the line connecting the three towns, and which also reaches Massapoag Lake. The new cars measure 21 ft. over the end panels and 7 ft. 1/2 in. over the posts at belt. The seating capacity is fifty passengers, and the seats are re-



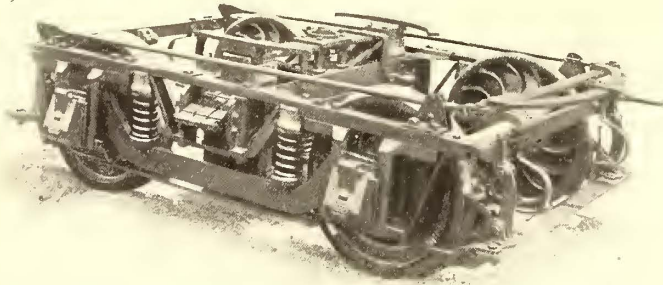
OPEN CAR FOR THE NORWOOD, CANTON & SHARON STREET RAILWAY COMPANY

versible with the exception of two at each end. The sashes in the bulkheads are arranged to drop into pockets between the seats. Curtains are provided which may be drawn to the floor, the Brill round-corner seat-end panels, which are used, being so arranged in connection with the grooves in the posts as to permit the curtains to come down over the post outside of the panels, a continuation of the grooves of the posts being formed in the exterior surface of the panel. The panel also provides for easy entrance, as there are no sharp projecting corners. The interiors are in ash, with ceilings of three-ply birch veneer.

The length over the crown pieces is 28 ft. 8 3/4 ins., and from the panel over the crown, 3 ft. 10 3/16 ins. The width over the sills, including the facing, is 6 ft. 3 ins. The sweep of the posts is 5 ins. Distance between the centers of the posts, 2 ft. 8 ins. The side sill size is 3 3/4 ins. x 7 ins. The sill plates are 7 ins. x 1/2 in. The thickness of the corner posts is 3 5/8 ins., and of the side posts, 2 3/4 ins. The height of the steps is 15 1/2 ins., and of the risers, 18 1/4 ins.

### A NEW MOTOR TRUCK

The Dorner Manufacturing Company, of Chicago, Ill., and Logansport, Ind., is just bringing out its improved M. C. B. motor truck No. 20, which follows the lines of the so-called M. C. B. passenger trucks commonly used on steam roads, with



NEW MOTOR TRUCK FOR HIGH-SPEED SERVICE

the necessary improvements and changes to suit it to electric traction. This truck is specially designed and adapted for high speed, interurban and elevated railroad service. The top frame is one continuous welded piece of  $3\frac{1}{2}$ -in. x  $1\frac{3}{4}$ -in. steel, machine fitted like a locomotive frame and with ends half turned, making them vertical like a joint in a floor, and much better adapted to the vertical strain caused when the brakes are applied than if the ends were not thus turned. The arch bars which carry the bolster are 3-in. x  $1\frac{1}{8}$ -in. steel, and run the full length of the frame over the pedestals, with braces from the end of the truck frame to the bottom of the pedestal. The pedestals are cast steel with machine-faced tops and sides.

The journal boxes make a fairly tight fit in the pedestal, so that there is little lost motion horizontally. The equalizer bars are 6-in. x 2-in. forged steel, with the ends flattened and grooved to fit well on the journal boxes. On the equalizer bars rest the spring seats for double spiral springs. The journal boxes are made to M. C. B. standards, of malleable iron, McCord pattern. The springs, which are graduated according to the weight of car body to be carried, are double spiral on the equalizers and triple elliptical on the bolster. The latter are carried on a swinging spring plank. The bolster is of forged steel, 8 in. x  $1\frac{1}{8}$  in., in the form of a truss, the ends being turned with a boss to prevent sagging and take the strain off the bolts. The transoms are of 10-in. x  $\frac{3}{4}$ -in. steel,  $11\frac{3}{4}$  ins. wide, fastened to the top frame and arch bars by a combined malleable corner post and swing-hanger casting, which is reinforced by  $\frac{1}{2}$ -in. shear steel plates, securely riveted to the transoms and the top frame. The stiffness of the transoms and corner plates keeps the frames from getting out of square and causing sharp flanges on the wheels.

The spring plank is suspended from the sides of the transom by steel hangers, held up by 2-in. turned steel pins. The steel plank has a lateral swing of  $1\frac{1}{4}$  ins. The top seats of the elliptic springs are of cast steel with the sides machine faced to the exact width of the transoms, thus eliminating lost motion at this point. The brake beams are  $4\frac{1}{4}$ -in. x  $1\frac{1}{8}$ -in. steel, and the rods  $1\frac{1}{4}$ -in. round steel. The adjustment is by turnbuckles

in the center. The Christie brake-shoe head and standard flanged brake-shoe are used. The side bearings, which are raised and riveted to the top of the elliptic spring seat, are made of forged steel, 3 ins. x 1 in., 30 ins. long, with the ends turned. The axles are hammered steel with standard M. C. B. journals, and the journal boxes are fitted with standard M. C. B. brasses. In fact, all wearing parts are interchangeable with steam railroad trucks of the same capacity.

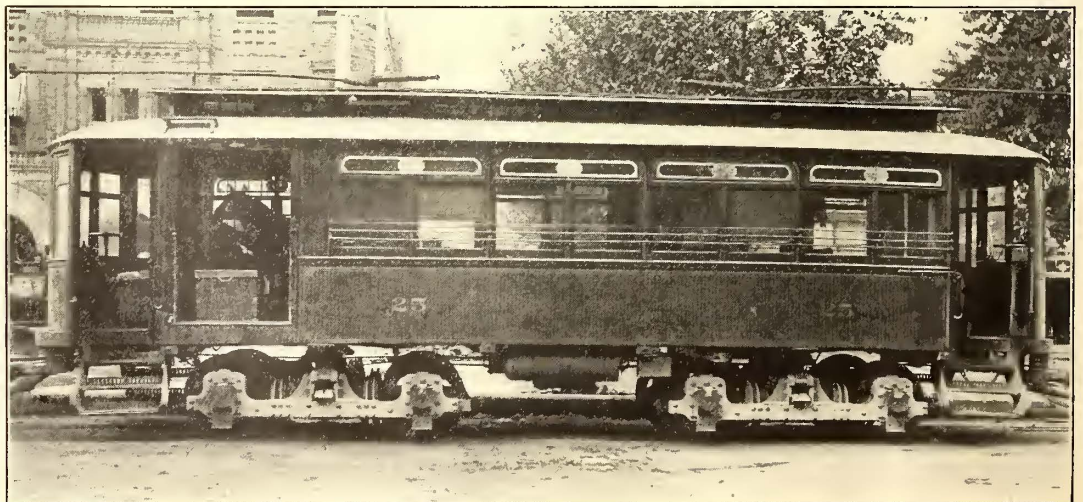
As stated before, this truck is built for the heaviest electric service, including that under electric locomotives. The whole design of the truck is such as to avoid as far as possible any shearing strain on bolts or rivets. All the holes are reamed and the bolts turned, so as to make a driving fit. These points make it adapted to heavy service and prevent rattling after they are put in service.

### OUTING OF ST. LOUIS STREET RAILWAY MEN

One of the largest picnics ever held in the neighborhood of St. Louis was the outing of the employees of the United Railways Company, at Creve Coeur Lake, Aug. 30 and Sept. 1. That every conductor and motorman might have a good time it was made a progressive picnic, one set of men running double time, taking out the regular cars on the regular runs, besides the extra cars that conveyed the picnickers to the lake where the big outing was held. The next day the pleasure-seekers changed places with the men who were on duty. The United Railways Company made arrangements to give transportation to the car men and their families. The men received badges which entitled them to transportation and picnic privileges. A white badge was recognized the first day and a yellow badge the second. Thirty events were arranged for during the two days' carnival and many handsome prizes were awarded to the winners. Capt. Robert McCulloch provided an ox for an old-fashioned barbecue each day of the picnic.

### TRANSPORTING HORSES BY ELECTRIC CARS ON THE SPRINGFIELD & URBANA RAILWAY

One of the possibilities for shipping freight over traction lines is shown in the accompanying illustration. The Dayton,



CARRYING A HORSE IN COMBINATION CAR ON THE SPRINGFIELD & URBANA RAILWAY

Springfield & Urbana Railway, of Springfield, Ohio, the other day accepted for shipment a small horse, destined for Akron, Ohio. It was crated in a good stout crate, and was handled in a combination car without any difficulty, except that it took several good, strong men to get it in and out of the car.

Several of the Ohio roads have done quite a business in transporting horses in this way.

## FINANCIAL INTELLIGENCE

WALL STREET, Sept. 13, 1905.

**The Money Market**

The feature of the money market this week has been the decided weakness in the sterling exchange market. The heavy offerings of bankers' bills, together with a liberal supply of exchange against the shipments of cotton, carried the rate for prime demand sterling off about a cent on the pound to 4.8505, a point which permits the importation of gold from Europe at a profit. So far only \$1,200,000 gold has been engaged in London for shipment to New York, but the opinion appears to be quite general among foreign bankers that additional consignments of the yellow metal will be received at this center from Europe. The importation of gold, however, has not had the slightest influence upon rates for money. The outflow of funds to interior points for crop-moving purposes continues on a large scale, which, together with an increased demand for all classes of accommodations, has held the market decidedly strong. Money on call loaned at  $2\frac{1}{4}$  to 3 per cent, the average rate being about  $2\frac{3}{4}$  per cent. Lenders reported a better inquiry for time money, especially for the short maturities, which command 4 per cent, as against  $3\frac{1}{2}$  per cent a week ago. The demand for over the year maturities has not been urgent, but bankers generally are holding the rate firm at  $4\frac{1}{2}$  per cent. Specialists in commercial paper report an increasing supply of good names at the ruling rate of  $4\frac{1}{2}$  per cent for the best names. The European markets have displayed a firmer tendency, the Bank of England advancing its discount rate to 3 per cent, while the Imperial Bank of Germany's rate was raised to 4 per cent. The bank statement, published last Saturday, showed a decrease in cash of \$10,958,800, which was much larger than had been generally expected. The decrease in loans of \$30,237,300 resulted from the shifting of loans from the banks to other institutions. Deposits were smaller by \$41,165,100. The reserve required decreased \$10,291,275, resulting in a decline in the surplus reserve of only \$667,525. The surplus now amounts to \$4,831,350, as against \$38,438,250 in 1904, \$15,372,200 in 1903, \$715,050 in 1902, \$7,110,550 in 1901, and \$26,056,250 in 1900.

**The Stock Market**

Trading in the stock market has been upon a somewhat smaller scale this week, and although prices continued to show decided irregularity, the general tone of the market was considerably stronger. In the early dealings the market was under heavy selling pressure, both from local and foreign account, which carried prices off sharply, but toward the close the market grew stronger and in many instances sharp recoveries were recorded. The early selling was caused largely by the uncertainty regarding the immediate future of the money markets both here and abroad. The local banks continue to ship large amounts of funds to the West and South for crop-moving purposes, but the opinion prevails in banking circles that while rates for both call and time loans may work a little higher, there is not the slightest danger of a money stringency. The foreign money markets have displayed a hardening tendency, the Bank of England and the Imperial Bank of Germany both raising their discount rates to 3 and 4 per cent, respectively. During the latter part of the week, the market responded to the continued activity in iron and steel, and to the continued improvement in general trade conditions. Railroad earnings with few exceptions were extremely favorable, and reports from the Western traffic managers were very encouraging for a continuation of the heavy movement of freight. The government crop report, which was extremely favorable, predicted record-breaking crops for both wheat and corn. The sharp decline in the price of sterling exchange to 4.85 for prime demand bills, and the subsequent engagement in the London market of \$2,000,000 gold for shipment to this side, also imparted a decidedly better feeling. This is the first engagement of gold for import this year, and it is generally believed that the movement of the yellow metal in this direction will assume larger proportions in the near future.

At the beginning of the week, the steel stocks and amalgamated copper were under pressure and declined sharply, but in later dealings there were sharp recoveries in all of their issues. Other strong issues at the close were Great Northern, Northern Pacific, St. Paul, Chicago & Northwestern, St. Paul, Reading, and Missouri Pacific, and in the specialties, Tennessee Coal & Iron, and American Smelters. Erie ruled decidedly strong throughout the week, upon

rumor that the company was to secure control of the C., H. & D., Pere Marquette system, but no official confirmation of the report was forthcoming.

The local traction stocks ruled quiet and generally lower.

**Philadelphia**

Dealings in the traction stocks continued upon an extremely small scale this week, but prices, with one or two exceptions, have displayed decided firmness, notwithstanding the irregularity in other quarters of the market. Philadelphia Company common furnished the principal feature, both as regards activity and price movements. From  $45\frac{3}{4}$  at the opening the price sagged off to  $45\frac{1}{2}$ , but later advanced to  $46\frac{1}{8}$ , and closed at the highest. About 2300 shares changed hands. Of the preferred stock 100 shares were traded in at  $47\frac{1}{2}$ . Philadelphia Traction displayed strength early in the week, about 400 shares selling at 101, but toward the close sales of odd lots were recorded at 99 ex the dividend. Consolidated Traction of New Jersey held firm, upwards of 900 shares selling at  $83\frac{7}{8}$  to  $83\frac{3}{4}$ . Philadelphia Rapid Transit opened at  $28\frac{1}{2}$ , and on the exchange of several hundred shares the price eased off to  $28\frac{1}{8}$ . Fairmount Park Transportation sold at 17 to  $16\frac{3}{4}$  for 200 shares. American Railways brought  $53\frac{1}{4}$  and 180, Rochester Railway & Light preferred brought  $104\frac{1}{2}$ .

**Baltimore**

The United Railway issues continued to furnish the principal feature of the Baltimore market. Dealings in the stock and the incomes have been upon a much larger scale, and the impression prevails that more than one interest is seeking control of the company. The free stock sold to the extent of about 4500 shares, at prices ranging from 16 to  $16\frac{3}{4}$ , while upwards of 4000 shares of the deposited stock brought from  $16\frac{1}{2}$  to 17. The free incomes were in good demand, and about \$150,000 sold at from  $65\frac{7}{8}$  to  $66\frac{1}{2}$ . The trust receipts, representing income bonds deposited, brought 65 for \$28,000. The 4 per cent bonds ruled quiet but steady, \$40,000 of them changing hands at 93 and  $92\frac{3}{4}$ . Virginia Electric Railway 5s were fairly active and strong, \$12,000 bringing  $99\frac{3}{4}$ . Washington City & Suburban 5s sold at  $105\frac{1}{4}$  to  $105\frac{1}{2}$  for \$5,000. Other transactions included \$2,000 Norfolk Railway & Light 5s at 94, \$1,000 Baltimore City Passenger 5s at  $106\frac{3}{4}$ , \$9,000 Macon Railway & Light 5s at  $99\frac{5}{8}$  and  $99\frac{1}{4}$ .

**Other Traction Securities**

The Chicago market has been quiet and absolutely featureless. Metropolitan Elevated common sold at 25 and  $24\frac{1}{2}$  for 200 shares, while 270 of the preferred stock brought from 68 to 67, the final transaction taking place at  $67\frac{1}{2}$ . South Side Elevated ruled steady, with a sale of 150 shares at 98. Chicago & Oak Park brought 5, and the preferred sold at 18. Northwestern common changed hands at  $21\frac{1}{2}$  and  $21\frac{3}{8}$ , and the preferred at  $61\frac{1}{2}$  and 61. The Boston market has been dull and heavy, the feature being a drop in the price of Massachusetts Electric from  $17\frac{1}{2}$  to 16 on the exchange of a little more than 500 shares. The preferred stock was relatively firm, with sales at  $59\frac{1}{2}$  and 60. Boston Elevated sold at the opening at  $154\frac{1}{2}$ , and later broke to 153, but at the close there was a recovery to  $153\frac{7}{8}$ . Other sales recorded were Boston & Worcester at  $24\frac{1}{2}$ , the preferred at 74. Boston & Suburban at 21 and the preferred at 67. West End common held firm, 250 shares changing hands at 99, while small amounts of the preferred sold at  $113\frac{1}{2}$  and 113. In the New York curb market, Interborough Rapid Transit displayed early strength, sales taking place at between 220 and  $218\frac{1}{2}$ , but later there was a drop to  $213\frac{1}{2}$ , caused by the accident on the Ninth Avenue Elevated line. At the close there was a recovery, 216. Upward of 5700 shares were traded in. New Orleans Railway stocks ruled strong, the common bringing  $37\frac{1}{2}$  and 37 for about 900 shares, while 800 shares of the preferred brought from  $78\frac{1}{2}$  to  $80\frac{1}{4}$ . The  $4\frac{1}{2}$  per cent bonds brought 91 and  $90\frac{7}{8}$  for \$22,000. Washington Railway & Electric common sold at  $42\frac{1}{2}$  and 43 for 300 shares, and \$25,000 of the 4s brought  $90\frac{1}{2}$  and 91. Other sales included \$28,000 Jersey City, Hoboken & Paterson 4s at 76½ and interest, \$50,000 Public Service certificates at  $69\frac{3}{4}$  to  $70\frac{1}{4}$  flat, and \$25,000 public Service 5 per cent notes at  $97\frac{1}{8}$  and interest.

Aurora, Elgin & Chicago common had another pronounced gain last week. Early in the week it declined to  $24\frac{7}{8}$ , and since then it has been in strong demand, with a steady upward climb, reaching  $28\frac{1}{2}$  the fore part of this week. It is understood that certain Cleveland interests are endeavoring to buy sufficient of this stock to

secure a place on the board. The fine increases in earnings, however, and the prospects of a freight contract for business in Chicago are causing it to be tipped for further increase. Lake Shore Electric voting trust certificates were firm at 12½ to 13. Cleveland & Southwestern common is showing an upward tendency, and advanced from 9¾ to 11, Northern Texas Traction has moved up to 73, on reports of an increased dividend. Cleveland Electric was firm at 79¾.

Cincinnati Street Railway was active at Cincinnati, and made a fractional gain to 147. Cincinnati, Dayton & Toledo sold at 23¾, and was in good demand on the statement that dividends are soon to commence. Cincinnati, Dayton & Toledo 5s, to the amount of \$63,000, sold at 96 to 97¼. Detroit United sold at 94. Toledo Railway & Light at 34½.

### Security Quotations

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

	Sept. 6	Sept. 13
American Railways .....	53½	52½
Boston Elevated .....	154	153½
Brooklyn Rapid Transit .....	69¼	67½
Chicago City .....	190	a197
Chicago Union Traction (common).....	8¾	8
Chicago Union Traction (preferred).....	—	—
Cleveland Electric .....	80	79
Consolidated Traction of New Jersey.....	—	82
Consolidated Traction of New Jersey 5s.....	109½	109
Detroit United .....	93¾	93¼
Interborough Rapid Transit .....	219	215¾
International Traction (common).....	34	32½
International Traction (preferred) 4s.....	73½	73
Manhattan Railway .....	164	165
Massachusetts Electric Cos. (common).....	17	15½
Massachusetts Electric Cos. (preferred).....	60	59½
Metropolitan Elevated, Chicago (common).....	24½	22½
Metropolitan Elevated, Chicago (preferred).....	67	68
Metropolitan Street .....	129½	127
Metropolitan Securities .....	82¾	81
New Orleans Railways (common), W. I.....	36½	37
New Orleans Railways (preferred), W. I.....	78¾	80
New Orleans Railways, 4½s.....	90½	90½
North American .....	98¾	98¼
North Jersey Street Railway .....	—	28
Philadelphia Company (common).....	45¾	46¼
Philadelphia Rapid Transit .....	28¼	28
Philadelphia Traction .....	101	—
Public Service Corporation 5 per cent notes.....	96¾	96½
Public Service Corporation certificates.....	69¼	69¼
South Side Elevated (Chicago).....	298	299
Third Avenue .....	127	127½
Twin City, Minneapolis (common).....	115½	117½
Union Traction (Philadelphia) .....	61¼	61¾
West End (common) .....	99	99
West End (preferred) .....	113	113

a Asked. W. I., when issued.

### Iron and Steel

The "Iron Age" says a review of the whole iron industry justifies the general statement that it is enjoying great present activity and a brilliant promise for the future. The usual doubts as to an adequate amount of work for the winter months have not even arisen this year, and the outlook is for work at high pressure well into next spring. Added to this come reports of a distinct improvement in England, whose business has been lagging until lately, the Continent having sent cheerful reports since the summer. There have been further heavy purchases of steel rails, the Pennsylvania Company leading with over 170,000 tons distributed among the mills on the line of the road. It is understood that the New York Central is negotiating for 160,000 tons, and there are besides in the market one system for 35,000 tons, and another for 50,000 tons. It is reported that negotiations will be closed for the sale to the Steel Corporation of from 10,000 to 15,000 tons of Bessemer pig iron for September delivery. During the past week smaller interests have taken moderate amounts at the range of \$14.85 to \$14.90 valley furnace, and some fair sized lots of basic pig have also been placed.

The City Council has offered to grant the Toledo Railways & Light Company a five-year franchise over the route which it desires to build to connect with the new line to Ottawa Park, which has been built by John Kumler. The city company is not inclined to accept this grant.

### BUFFALONIANS SECURE OPTIONS ON OHIO PROPERTIES

W. Caryl Ely, formerly president of the International Railway Company, of Buffalo, and president of the American Street Railway Association, has secured options on the electric railways of East Liverpool, Wellsville and Rock Springs, Ohio, and Chester, W. Va., together with the electric lighting plants of all these places. The East Liverpool system on which Mr. Ely has secured an option has the right to construct an additional line from Wellsville to Steubenville, Ohio. The road that he has optioned running from East Liverpool to Chester, W. Va., owns the suspension bridge across the Ohio River at this point, which is included in the option. Along with the other options secured are an application for a charter for a new line from East Liverpool to Beaver, Pa., and a very fine summer park at Chester. The properties on which options have been secured are owned by divergent interests. In the event of their purchase Mr. Ely will combine them all into one company.

### STONE & WEBSTER GET NORTHERN TEXAS TRACTION

From Cleveland comes the statement that Stone & Webster, of Boston, have arranged to purchase the Northern Texas Traction Company from the Ohio interests that are in control of the property. The terms of the sale are said to provide that the Northern Texas Traction Company turn over to the syndicate enough stock to give it control. This majority of stock is to be paid for on the basis of \$75 a share. The syndicate also agrees to buy the balance of the stock at the same figure when it is put on the market. The capital stock of the company is \$2,500,000. The authorized bond issue is \$2,500,000. The company owns 27½ miles of line in Fort Worth and a line of 30 miles from Fort Worth to Dallas, and a pleasure resort half way between the two places.

### TROLLEYS AND FINANCES

The continuous and striking development of trolley systems, etc., and the need for new money in their development, is thus noted by the "Wall Street Journal:"

Fourteen corporations, either operating street railways or connected therewith directly, have taken from the Wall Street market in the four months ending Sept. 1, nearly \$48,000,000 of cash. The total does not include the dozens of small railways in various districts which have come to the New York underwriters for small amounts of cash for extensions, etc.

The list is bigger than for the four months ending May 1. While the steam railways have checked their financing, the street railway industry seems to have taken a new lease of life. There was but one item of importance in the street railway underwriting of the first third of the year, while the second third brought four items of \$5,000,000 or over. The list is as follows:

Brooklyn Rapid Transit.....	\$1,000,000
Consolidated Railways of Connecticut.....	1,000,000
Detroit United .....	6,585,000
Havana Electric .....	5,000,000
Interborough .....	10,000,000
International Traction .....	1,000,000
Indianapolis & Southeastern .....	1,000,000
Philadelphia & Western .....	1,600,000
St. Louis Transit .....	1,000,000
Street Car Consolidation .....	11,000,000
South Side Elevated .....	2,500,000
Toledo & Western .....	2,500,000
United Railways of Baltimore.....	1,000,000
West Penn .....	2,500,000
Total street railways .....	\$47,685,000

It will be noted that the largest item is the \$11,000,000 for the organization of the street car trust. This is but part of a bigger capitalization in stock. The underwriters have supplied the cash to combine practically all the big manufacturers of street cars, along the lines followed by the steam railroad equipment consolidations in 1900-1903. This is an important development, with its principal bearing, so far as Wall Street is concerned, in the fact that the street car business is now regarded by financiers as so far assured that it warrants a combination of this kind. It is but a few years since the electric street railway industry in this country was experimental.

Brooklyn Rapid Transit is credited unofficially with an additional \$2,000,000 of bonds. The item listed is official. In the first quarter the company issued nearly \$6,000,000 of its refunding bonds to the \$1,000,000 in the second period. The Interborough kept up the reputation of New York City tractions for spending money by the issue and sale of the \$10,000,000 of notes to pay for extensions. The big issue of Detroit United bonds was largely in the nature of refunding.



**MODIFIED PLAN FOR CAR MERGER**

The syndicate, of which Kean, Van Cortlandt & Company, of New York, are managers, formed to finance the merger of the street car manufacturing companies, has virtually acquiesced to the demand of G. Martin Brill, who will be the president of the new company, to provide about \$2,000,000 more cash for working capital than was provided by the original plan. In consequence, the syndicate managers will issue a modified plan in about a week. The plan promulgated early in August held in reserve \$2,000,000 of 5 per cent bonds out of the total issue of \$13,000,000.

It is understood that under the new plan this \$2,000,000 will be sold at once, the proceeds to be appropriated as working capital. The new arrangement will give the company more than \$4,000,000 working capital as against about \$2,000,000 under the original plan. The various companies that are to make up the new combine are preparing detailed reports of their affairs, to complete which will require some time. These companies are conducting their business in such a way as to facilitate, as much as possible, the carrying out of the merger. Orders are being taken subject to execution by the combine, if it is consummated before the independent concern can execute them.

The new company has not yet been incorporated, but it will be just as soon as the details in connection with the merger are all worked out.

**ANNUAL REPORT OF THE BROOKLYN RAPID TRANSIT COMPANY**

The annual report of the Brooklyn Rapid Transit Company for the year ending June 30, 1905, has just been made public. It reviews briefly the general condition of the property and notes additions and improvements that have been made during the past year. The record of earnings of the company for the year follows:

	1905	1904
Gross Earnings		
Passenger .....	\$15,649,400	\$14,429,546
Freight, mail and express.....	219,640	127,260
Advertising .....	123,510	132,655
American Railway Traffic Company.....	340,892	65,696
Total earnings from operation....	\$16,333,444	\$14,755,158
Operating Expenses		
Maintenance of way and structure.....	\$816,275	\$615,669
Maintenance of equipment .....	1,655,622	1,206,325
Operation of power plant.....	1,356,620	1,501,745
Operation of cars—trainmen's wages....	2,768,860	2,673,863
Operation of cars—other expenses.....	1,213,708	1,129,711
Damages and legal expenses.....	999,526	987,634
General expenses .....	552,068	537,264
Freight, mail and express—expenses....	139,515	45,893
American Railway Traffic Co.—expenses	301,672	62,330
Total operating expenses .....	\$9,803,870	\$8,760,438
Net earnings from operations.....	\$6,529,574	\$5,994,719
Income From Other Sources		
Rent of land and buildings.....	\$59,741	\$56,711
Rent of track and structure.....	101,504	103,071
Miscellaneous .....	90,890	35,620
Total income .....	\$6,781,709	\$6,190,122
Deductions		
Taxes .....	\$827,951	\$748,258
Interest and rentals—net .....	4,350,540	4,052,956
Total deductions .....	\$5,178,491	\$4,801,214
Net income .....	\$1,603,218	\$1,388,907
Special appropriations .....	453,284	383,706
Surplus .....	\$1,149,933	\$1,005,201
Surplus June 30, 1904.....	\$1,594,189	
Total surplus .....	\$2,744,123	
Of this amount there has been appropriated in adjustment supply accounts....	\$12,600	
For discount on bonds sold.....	1,746,800	
Total .....	\$1,759,400	
Balance surplus .....	\$984,728	

**CONSOLIDATED GENERAL BALANCE SHEET, JUNE 30, 1905**

ASSETS	
Cost of road and equipment (properties owned in whole or in part by Brooklyn Rapid Transit Company).....	\$103,360,104
Advances account of construction for leased companies .....	6,974,817
Brooklyn City Railroad Company.....	\$6,496,140
Prospect Park & Coney Island Railroad Company .....	478,676
Construction expenditures, constituent companies (to be reimbursed by issuance of Brooklyn Rapid Transit 1st refunding gold mortgage 4 per cent bonds, upon deposit with Central Trust Company, trustee, of certificates of indebtedness to cover).....	2,154,924
Guaranty fund (securities and cash)....	4,005,755
Treasury bonds .....	2,417,000
Brooklyn Rapid Transit first refunding gold mortgage 4 per cent.....	\$2,307,000
Other issues .....	110,000
Treasury stock .....	146,228
Current assets .....	2,831,047
Cash on hand .....	\$1,430,495
Due from companies and individuals ...	445,557
Construction material and general supplies on hand .....	804,137
Real estate mortgages .....	6,500
Prepaid accounts .....	144,357
	<u>\$121,889,876</u>

Note.—The certificates of indebtedness issued by constituent companies, aggregating \$12,964,989.24, against which Brooklyn Rapid Transit bonds have been issued, do not appear separately on this consolidated balance sheet, as the property purchased appears as an asset under the head of "Cost of Road and Equipment," and "Advances Account Construction for Leased Companies," and the liability is represented by the bonds of the Brooklyn Rapid Transit Company, issued from time to time as such certificates of indebtedness are acquired and deposited with the Central Trust Company, trustee.

LIABILITIES	
Capital stock .....	\$45,956,605
Brooklyn Rapid Transit Company.....	\$45,000,000
Outstanding capital stock of constituent companies .....	956,605
Bonded debt and real estate mortgages..	72,160,680
Brooklyn Rapid Transit Company.....	\$26,307,000
Bonded Debt of Constituent Companies	
Brooklyn Heights Railroad Company..	250,000
Brooklyn, Queens County & Suburban Railroad Company .....	6,624,000
The Nassau Electric Railroad Company..	15,000,040
Sea Beach Railway Company.....	650,000
Brooklyn Union Elevated Railroad Company .....	23,000,000
Real estate mortgages .....	329,640
Current liabilities .....	2,713,589
Audited vouchers .....	\$1,239,905
Due companies and individuals .....	88,658
Taxes accrued and not due .....	694,906
Interest and rentals accrued and not due	636,713
Interest accrued on real estate mortgages and not due .....	1,977
Insurance reserve fund .....	51,428
Contractors' deposits .....	37,500
Long Island Traction Trust Fund.....	9,440
Accounts to be adjusted .....	27,337
Surplus .....	984,723
	<u>\$121,889,876</u>

President Winter in presenting the report reviewed briefly the condition of the property and noted additions and improvements that have been made during the past year. The latter extend to all departments of the company. President Winter said in part: During the year the increase in maintenance of way and structure item amounted to \$200,606.07, or 32.58 per cent, and was prin-

cipally due to repaving between tracks, bonding rails and the renewal of a large amount of wornout track and special work.

Maintenance of equipment shows an increase for the year of \$149,296.92, or 37.25 per cent. in part attributable to radical power station machinery overhauling, but principally on account of standardizing and fire-proofing the elevated cars and partially rebuilding surface cars.

The work of rebuilding and fitting the elevated steam cars from electric operation, since the use of locomotives was abolished, has been delayed by tardy delivery of materials. This work will, however, be completed within the present year.

There have been added to the equipment 100 new elevated motor cars and 87 convertible surface cars. In further addition, 100 elevated and 114 convertible surface cars are to be received during the present summer. The surface cars have a seating capacity for 48 passengers, are convertible to winter or summer service, and are fitted with air brakes and four 40-hp motors.

The new Williamsburg power station building is approaching completion. One 7500-kw turbo unit and one 5500-kw unit, will be installed about the end of this year, and a third unit of 7500-kw capacity during the summer of 1906. Additional units will be installed from time to time according to the requirements of the company's business. This station is designed for an ultimate capacity of 100,000 kw or 130,000 hp.

The work of reinforcement of various sections of the elevated structure is progressing satisfactorily. Myrtle Avenue structure, between Hudson Avenue and Adams Street, is completed, and the Adams Street structure, between Myrtle Avenue and Brooklyn Bridge, is more than half finished.

The bonding of the elevated structures to enable their use for return circuit has been completed.

All platforms on the Fifth Avenue and Lexington Avenue lines have been lengthened to accommodate six-car trains. The same will be done with the balance of the elevated system.

The general rearrangement of the elevated station, storage yard shops, and shop yard at Thirty-Sixth Street and Fifth Avenue, was commenced by the construction of a four-track station, the laying of new side-tracks, and new tracks connecting with surface lines leading to Coney Island and other outlying districts.

On the site of the yard at Thirty-Sixth Street, heretofore used for storage of track materials, and on adjoining land of the company, construction of a yard of large capacity for elevated cars was commenced, and eight concrete inspection pits put in in advance of the repair shop, for which plans are now in preparation.

A new elevated yard, with capacity for 327 cars, has been well advanced, together with elevated car repair shop under construction at East New York. This plant, consisting of tracks divided into sections by fire walls, shops, inspection sheds, with a capacity for 48 cars, storehouse and appurtenances, will be ready for service by the close of the present year, or shortly thereafter.

Under the act for elimination of grade crossing on the Brighton Beach line, the elevated structure has been extended from St. Marks Avenue to Sterling Place, abolishing grade crossings at Prospect Place and Park Place. A station at Park Place has been built.

A new line constructed through Wyckoff Avenue and McKibbin Street, from the intersection of Myrtle and Wyckoff Avenues, at Ridgewood, to Broadway, 3.41 miles of single track—opening a new section to Williamsburg Bridge; the extension of the double-track Kingston Avenue line, from Douglass to Carroll Street; of the Union Street line, by single track, from Court to Hamilton, and the construction of a new single-track line through Varick Avenue, from Metropolitan Avenue to the company's Newtown creek dock, .264 miles, were completed during the year. A number of new spurs and side tracks were also laid, the total representing 8.982 miles of single track. In various parts of the city thirty new pieces of special work were installed. At power stations, shops and depots, 6300 ft. of single track were laid for the better handling of supplies and equipment.

A large amount of track re-bonding was done, fifty pieces of old special work were replaced with new, and 4½ miles of single track relaid with standard girder rail. There were welded by electricity 14,851 joints, and tracks thoroughly repaired. Upwards of 93,000 square yards of first-class pavement was laid, covering about 50,000 ft. of double track.

Car storage yards were constructed at the following points, of the capacity indicated:

Wyckoff Avenue, Ridgewood.....	52 cars.
Fifth Avenue and Twenty-Third Street.....	89 "
Flatbush Avenue and Duryea Place .....	222 "

The surface car yard, covering the block between Ninth and Tenth Avenues and Nineteenth and Twentieth Street, is partly completed. It is intended to cover this yard as early as practicable, and provide facilities for light repairs.

The Brighton Beach Hotel property was overhauled and repainted, the bulkhead partly rebuilt, and material changes and additions made in the track arrangement of the terminal yard in order to meet the requirements arising out of new developments at that point.

An instruction room has been provided in the Fifty-Eighth Street depot, fitted with apparatus necessary for the thorough schooling of trolley men, and a school car equipped for the instruction of elevated trainmen.

The ten-story addition to the general office building is completed. With the interior rearrangement of the old building now nearly finished, all departments heretofore occupying leased quarters in different parts of the city will be brought under one roof.

With an increase of upwards of \$500,000 insurance carried by this company, an annual saving in premiums of \$12,000 was effected through the institution of improvements, and by the systematic exercise of protective measures, at a comparatively light cost.

Trolley service over the Williamsburg Bridge to Delancey Street, Manhattan, was inaugurated in November last, and has been continued up to the limit of the capacity afforded by the wholly inadequate terminal provided by the city of New York at the Manhattan end of the bridge.

Within the last fiscal year the aggregate bonded debt and real estate mortgages show an increase of \$4,836,500, represented by the issuance of \$4,849,000 Brooklyn Rapid Transit first refunding gold mortgage 4 per cent bonds, and the payment of \$12,500 real estate mortgages.

As shown in the previous year's report, there were outstanding June 30, 1904, Brooklyn Rapid Transit bonds to the amount of \$21,458,000, with \$5,724,000 bonds in treasury; while June 30, 1905, the total of these issues is \$26,307,000, with \$2,417,000 bonds in the treasury.

The sales during the year consist of \$8,156,000 Brooklyn Rapid Transit refunding gold mortgage 4 per cent bonds.

Since our last report, the validity of the special franchise tax has been established, although there remains for final adjudication the question of offsets, which our counsel advise the company is entitled to under the special franchise tax law, but which the city has thus far refused to allow. Pending determination of this question, payment has been made of all past years' taxes, less such offsets, except in the borough of Queens for the years 1901 to 1904, where the assessments are grossly excessive and being contested on that ground. The amounts paid have been charged against the tax reservation fund set aside for this purpose.

## THE PENNSYLVANIA AND OHIO CONSOLIDATION

The date of the plan and agreement of merger of the Youngstown-Sharon Railway & Light Company and the Pennsylvania & Mahoning Valley Railway Company, as the Mahoning & Shenango Railway & Light Company, announced by Sanderson & Porter, of New York, was extended until Sept. 6, at which time it is understood that a large majority of the owners of the stock of the Youngstown & Sharon and the Pennsylvania & Mahoning Valley Companies had given formal assent to the plan of consolidation.

As stated in the STREET RAILWAY JOURNAL of Sept. 2, in which the plan of the merger was fully outlined, the Mahoning & Shenango Railway & Light Company, capitalized at \$10,000,000, of which \$4,000,000 is 5 per cent cumulative preferred, and \$6,000,000 common, has been formed under the laws of Pennsylvania to effect the consolidation. Of the capital stock of the new company, \$1,600,000 par value of the preferred stock and \$2,400,000 par value of the common stock are set aside for the acquisition of the Youngstown-Sharon Railway & Light Company, and \$2,400,000 par value preferred stock and \$3,600,000 par value common stock are set aside, for the acquisition of the Pennsylvania & Mahoning Valley Railway Company.

The new company will also authorize and provide for an issue of \$10,000,000 of ten-year first consolidated refunding 5 per cent gold bonds, of which bonds to the par value of \$3,000,000 are to be made available for extensions, betterments and improvements of the properties of the new company, and the acquisition of new properties. Two million eight hundred thousand dollars par value of the said bonds will be reserved by the trustee under the mortgage for the purpose of taking up and retiring a like amount of underlying bonds of the Youngstown-Sharon Railway & Light Company. One million three hundred and twenty-five thousand dollars of the bonds will be used in the acquisition of the Pennsylvania & Mahoning Valley Railway Company, and \$2,875,000 will be reserved by the trustee under the mortgage for the purpose of taking up and retiring a like amount of underlying bonds of the Pennsylvania & Mahoning Valley Railway Company.

## ROCK ISLAND MAY HAVE TO ABANDON INTERURBAN SERVICE

It now develops that the Rock Island Railroad, which has established suburban service between Iowa City and Cedar Rapids, Ia., in order to compete for passenger traffic with interurban lines connecting those cities, and also between Des Moines and Indianola with the idea of shutting off the construction of a proposed interurban line connecting these two points, may be compelled to abandon its plan of competing with interurbans which touch points within its territory. A few weeks ago the Rock Island established a half-fare round trip rate between Cedar Rapids and Iowa City, and also put on several extra suburban trains, in order to regain some of the passenger traffic which had been diverted to the interurban line connecting those points. The company at the same time also put on several extra trains and made a cheap round-trip rate on the branch line from Des Moines to Indianola, Iowa. The question has arisen, can the Rock Island or any other steam railroad under the laws of Iowa establish a lower rate on a part of its system than upon the whole? The law provides one exception to the provision prohibiting a lower rate per mile on a part of its system, and that is in cases of excursions. The Rock Island, of course, now maintains that the rates provided for the section of the line between Iowa City and Cedar Rapids, and between Des Moines and Indianola are excursion rates, although the rates are maintained constantly from day to day. The matter will no doubt be decided in the courts, as parties living in Cedar Rapids have decided to make a test case of the matter. They have demanded the same rates per mile for passenger fare over the road for points beyond Iowa City, and having been refused have brought suit against the company to compel it to give the same rates per mile. While the matter is in the courts, the Rock Island will maintain the cheap rates.

## NEW HAVEN PLANS TROLLEY LINE

The New York, New Haven & Hartford Railroad Company, which recently purchased the New York & Stamford Electric Railway, is negotiating for right of way for an electric railway extension from Port Chester to White Plains. When completed this link will be the most important of the entire system of Westchester County, as it will shorten the distance between Port Chester, Rye Beach and the county seat at White Plains, 40 minutes to an hour. It is proposed to construct a double-track road, which will guarantee a high-speed schedule. One of the chief obstacles to the road was the opposition of Whitelaw Reid, whose large estate, Ophir Farms, abuts on nearly a mile of the highways of the town of Harrison. Ambassador Reid held that an electric railway in front of his place would depreciate its value, and refused to give his consent. Another large interest which blocked the way was the estate of the late Joseph Park, head of the firm of Park & Tilford. It is said that by the recent purchase of the electric railway by the New Haven railroad corporation, these interests have been placated and the extension made possible. The extension will be about 7 miles in length, and will connect with the Union Railway, of New York, at White Plains for Tarrytown and the Hudson River towns, giving them a quick route to Rye Beach. A large part of the route will be over private right of way.

## TRANSFER SWINDLE IN PENNSYLVANIA

A scheme has been unearthed at Allegheny, Pa., by which the Pittsburg Railway Company is understood to have been swindled out of considerable money through the manipulation of transfers. Postoffice clerks, letter carriers and small trades people are implicated. Already one letter carrier has been formally dismissed from the service and more are likely soon to go. Arrests, it is said, may even follow where there is hope of convicting the culprits. Postal inspectors discovered that in Allegheny it is not an unusual thing for men to carry their own street car punches for transfers. It was found that a barber shop was giving a transfer with every shave. The patron indicated to what point and at what hour he wanted to use the free transportation, and the barber made the necessary punch marks. In some way the letter carriers secured a large number of transfers and some of them were equipped with punches similar to the ones used by street car conductors. There was also a system of exchanges among the carriers. The Allegheny postoffice is located near a general transfer point of the railway company. A carrier coming off his route would exchange transfers good for a line on which some other carrier lived, the exchange taking place at the postoffice. If the time limit had expired a new punch mark would be made. In case the conductor lifting the transfer complained, he was told the conductor issuing the slip had made a mistake and had to use his punch a second time.

## DECISION AFFECTING STONE & WEBSTER WASHINGTON INTERESTS

The Supreme Court of the State of Washington has just handed down a decision in favor of the Tacoma Industrial Company, a Stone & Webster property, and adverse to the Baker interests of Seattle in the White River Company, an adjunct of the Snoqualmie Power Company—now the Seattle-Tacoma Power Company. This decision, after prolonged litigation, gives the Stone & Webster interests practical control of ample sources of water supply to provide all the electric power that can be used in Seattle and Tacoma for many years to come in connection with the electric railway and lighting properties in which they are largely interested, as well as for general power purposes.

## THE TROLLEY IN A POLITICAL CAMPAIGN

Governor Myron T. Herrick, who is prominently identified with some of the traction interests of Ohio, will use the electric railway almost exclusively in his campaign for re-election this fall. Arrangements have been made with the manager of practically every electric railway in the State to handle the Governor's special car. The start will be made Monday, Sept. 25, and meetings will be held in every town on the Cleveland & Southwestern. Then the Lake Shore Electric system will be worked, and so on over the roads out of Toledo and the numerous roads in the western and southern portions of the State, finishing with trips through the central and eastern portions of the State. Over two-thirds of the county seats, and hundreds of small towns are accessible by electric railways. An ordinary trolley car will be used with no suggestion of palace or parlor car effects. The seats will be removed and tables and chairs installed. Only in cases of emergency will meals be served on the car, and no sleeping accommodations will be provided. The car will be plentifully stocked with campaign literature, and wherever possible, in small hamlets and villages, stops will be made and platform speeches made. In this campaign the Governor aims to touch elbows with the people, and he thinks he can do it better this way than by any other means.

## AN ATTRACTIVE WALL TIME-TABLE

An unusually attractive street railway time-table is in use this summer by the lines of the New Hampshire Traction Company. The poster form was adopted, so that the time-table could be used on walls at hotels, resorts and other public places along the company's lines. The time-table is, roughly, 3 ft. high and 2 ft. wide, and in very readable form it gives all the important facts about the system which the traveler desires to know. The quality of the paper is far ahead of the ordinary poster, and the typography and arrangement of the information printed are excellent. The design was made under the direction of E. P. Hulsc, advertising manager of the company. The central feature of the time-table is a map of the system, which appears in the middle of the poster. The company's lines are known as the "Gilt Edge Lines," and they comprise 135 miles of track in the Merrimac Valley and along the New Hampshire coast. The routes are shown in a heavy gilt line on the wall map, and connecting lines are shown in dotted gilt. There are three divisions on the system—the Eastern, Western and Northern. The cities and towns of Haverhill, Lowell, Lawrence, Nashua, Portsmouth, Exeter, Hampton, Rye, Seaboard, Salisbury and Hampton Beaches and other centers are connected.

An interesting feature is the comparison of running times with those of other parallel roads. The regular time between the various cities is given, and stress is laid upon the accessibility of these great seacoast resorts of New England by the company's tracks. Another interesting point is the outline of the system's physical and operating characteristics, shown in a telling paragraph at the right of the map. Among the features mentioned are the character of roadbed and track, rolling stock and power stations, equipment, use of arc headlights, block signals, despatching and telephone system, etc. Travelers are reminded that they can escape the smoke, noise and cinders of the steam roads by taking the comfortable cars of the New Hampshire Traction Company, passing through beautiful scenery with greater frequency than the steam roads, and in almost as quick time, as well as at a lower rate of fare. The lower half of the poster is devoted to clearly printed time-tables of the Hampton Beach and Canobie Lake Park lines, while at the top and bottom several photographs of the scenery en route are shown. Perhaps the most striking point about the time-table as a whole is the sectional presentation of a great variety of information in such a manner that one can quickly find the desired fact and yet escape nothing of importance on the balance of the poster. Possibly a tabulation of fares and transfer points would add still greater usefulness to the time-table, but aside from that there is little to suggest in the way of improvement.

## NO STRIKE IN NEW HAVEN

After a careful discussion, extending over a period of nearly 2 hours, the employees of the Consolidated Railway in New Haven, at 4 o'clock Thursday morning, Sept. 7, voted to accept the increase in wages offered by the company, which is much smaller than that demanded. The increase really ranges from half a cent an hour to a cent and one-half, according to length of service. New men will be paid 20½ cents an hour, second-year men will receive 21 cents, third-year men 22 cents and older employees 22½ cents. Overtime and snowplow work will be paid for at the rate of 25 cents an hour, as at present. The men asked for 50 cents an hour for overtime work and 25 cents for regular work. In discussing the probability of a strike, one of the men declared before the meeting opened that the action of the road in sending supplies to the various car houses unnerved most of the men, the majority of whom are married and could ill afford a strike.

## INCREASING THE MEMBERSHIP OF THE A. S. R. A.

The membership committee of the American Street Railway Association, which was appointed by President Ely at the last convention of the American Street Railway Association, and of which H. H. Vreeland, president of the New York City Railway Company, is chairman, has been and is taking active measures to increase the membership of the association. It is thought by the committee that if most of the companies which are outside of the association at present thoroughly understood the plans of the association and the advantages which are now available, a large increase in membership would follow. For this reason the chairman of the committee is sending a personal appeal to all non-member companies, and is enclosing a copy of the proposed constitution and by-laws of the American Street & Interurban Railway Association. Attention is called in Mr. Vreeland's letter to the advantages to companies of large mileage of having a central bureau of information from which technical and other data can be secured. This will relieve many of the companies of large mileage of supplying the same information of this kind at frequent intervals, and will insure the receipt of prompt and complete information by companies of smaller mileage. A cordial invitation is also extended to all non-member companies to attend the meeting at Philadelphia on Sept. 27 and 28, to become better acquainted with the proposed plans of the association.

## SPRINKLER FIRE LOSSES

In view of the growing interest in automatic sprinkler protection, the experience of the Manufacturers' Mutual Fire Insurance Company, of Boston, during ten years, will be interesting. In reporting on fires in sprinkler-equipped plants, this company gives its experience as follows: "In the ten years ending June 1, 1905, this company has paid 1652 claims for loss, averaging \$500.23 each, amounting to a total of \$826,389.03. Of this number 1622 claims averaged \$183.60 each, amounting to a total of \$296,888.51, thirty claims in excess of \$5,000 each averaged \$17,650, making a total of \$529,500.52. In thirty claims in excess of \$5,000 each, eight fires originated in parts of mills or works over which sprinkler protection had not been extended, with a loss of \$200,759.70. Thirteen claims were for losses on unsprinkled storehouses, amounting to \$183,486.99. When the average loss of \$17,650 on risks partially protected or without sprinklers is compared with the average loss on fully protected risks of only \$182.60, the attention of members whose works or storehouses still need sprinklers will be called to the necessity of taking immediate action thereon. This experience of ten years sustains the only safe rule: Wherever a sprinkler can be put, put one, especially in the places where fire may be the least likely to originate. It was in such a place that most of the fires registered above occurred, and especially the case in the one in which we met the largest loss."

## THE NEW YORK ELECTRICAL SHOW

The announcement has just been made that an electrical show is to be held at the Madison Square Garden, New York, Dec. 11 to 23, inclusive. When one stops to consider how every show that is given in the Garden attracts bigger and bigger crowds each year, the chances of large public patronage are indeed bright. The directors of the show will, however, leave nothing to chance.

The date of the show itself leaves nothing to be desired. Not only is December the height of the season for New Yorkers, but

conservative estimates place the transient population at fully 750,000 for that month. With these enormous sight-seeing throngs to draw on, the only requisite to certain success is enough publicity to acquaint the public with the attractions of scientific and popular interest which are to be seen at the Garden. This phase of the work has been given elaborate attention; already a competent advertising department has been established. This department has been given an exceedingly generous appropriation for advertising, and it is certain that the Madison Square Garden Electrical Show will arouse as much public enthusiasm as has the automobile show.

From the exhibit end of the show come equally encouraging reports. Dr. George F. Sever, of the department of electricity of Columbia University, is director of exhibits, and he has already secured enough exhibitors to make the show an attractive one. While considerable space has been secured, some of the best positions are open. Any manufacturer seeking this opportunity to acquaint the public with his product would do well to get in communication at an early date with the company. The office address is 26 Cortlandt Street, New York; telephone 6190 Cortlandt.

## REPORT ON THE CHICAGO TRANSPORTATION PROBLEM

The report prepared in 1902 by B. J. Arnold on the Chicago transportation problem for the city of Chicago, has been in such wide demand from engineers, city authorities and students of transportation matters in general, that the author has decided to authorize a reprint of the report and to have it placed on general sale. This has been done by the McGraw Publishing Company. Undoubtedly this is the most important engineering report ever issued on the broad problems of street railway construction, operation and management in a large city. Originally, only a very limited edition was issued for the use of the officials of the city of Chicago, and no copies were offered for sale. An abstract of the report was printed in the STREET RAILWAY JOURNAL shortly after it was made public. The complete report as now issued is in two volumes, with 310 pages of text, fifteen folded plates and fourteen large maps. The price of the report complete is \$5.

## ELKINS-WIDENER AFTER APPELYARD PROPERTIES

It is understood on good authority that the so-called Widener-Elkins syndicate is negotiating with the bondholders of the Appleyard properties with a view to taking over these lines to form a part of the great system which the syndicate is building in Ohio and Indiana. This report is strengthened by the announcement that the syndicate has practically closed a deal for acquiring the Columbus, Newark & Zanesville and the Columbus, Buckeye Lake & Newark properties.

## EARNINGS OF EAST RIVER BRIDGES

While no equitable comparison can be made of the earnings and the cost of maintenance of the Brooklyn Bridge and the new Williamsburg Bridge, still the report of the Bridge Department of New York, covering these structures for the quarter just ended, is of interest as foreshadowing the part each plays in the transportation situation. The receipts of the Brooklyn Bridge during that period amounted to \$123,173.47, and the expenses took all but \$17,937.18 of the receipts. The Williamsburg Bridge showed expenses of \$13,915 for the same period, while the receipts were \$30,077.74. The report shows that to July 1 bonds to the amount of \$20,438,067.40 had been issued for the construction of the Williamsburg Bridge.

The report shows an average daily travel of 385,265 persons over the Brooklyn Bridge, of which the surface cars carry 156,539, and the elevated cars 194,405, with 19,434 for vehicular and foot travel. The train service on the Brooklyn Bridge averaged 570 elevated trains, or 1728 cars, with 303 bridge local trains of 1212 cars. The surface car service, the commissioner reports, has averaged 395c cars each 24 hours, varying from 30 cars per hour in the slack time, to 280 cars in the busy hours.

One interesting fact pointed out by the figures regarding traffic over the Brooklyn Bridge is that the bridge crush has driven a certain amount of traffic to the ferries. The average daily travel of passengers from Brooklyn to Manhattan was 199,920, while from Manhattan to Brooklyn it was only 170,558, a difference of more than 29,000. These 29,000 people are the ones who travel daily to Manhattan over the Brooklyn Bridge and return by other routes, whether by the ferries or by the Williamsburg Bridge, to avoid the Brooklyn Bridge crush.

**PROF. B. V. SWENSON**

As Prof. Bernard V. Swenson, of the University of Wisconsin, is being prominently mentioned for the new office of secretary of the American Street & Interurban Railway Association, his portrait and some particulars of his experience in electric railway engineering are presented in this issue.

Prof. Swenson is a native of Chicago, where he was born May 3, 1872. After a preliminary education in the public schools of Chicago and at the Chicago Manual Training School he was graduated from the latter institution in 1889. Prof. Swenson then entered the engineering school of the University of Illinois, from which he was graduated in 1893, completing both the courses in mechanical and electrical engineering, and receiving the degree of bachelor of science in each course. He then engaged in instructional work in the university from 1893 to 1898, the last three years as assistant professor of electrical engineering. During this time he spent the summer of 1894 in travel in Europe and the summer of 1895 in graduate study at Cornell.

Prof. Swenson was appointed assistant professor of electrical engineering at the University of Wisconsin in 1898, and has been connected with this institution up to the present time, although he has been on leave of absence for the past year on account of his work as assistant superintendent with the Electric Railway Test Commission. He received the master's degree in mechanical engineering from the University of Illinois in 1901, and the master's degree in electrical engineering from the University of Wisconsin in the same year.

Besides his important work with the Electric Railway Test Commission, in which he has been associated with Prof. Norris, of Cornell University, and Prof. Goldsborough, of Purdue University, Prof. Swenson was a member of the International Jury of Awards at the Louisiana Purchase Exposition, and secretary of one of the electrical sections of this jury. He is joint author of "Testing Electro-magnetic Machinery," Vol. I., by Bernard V. Swenson and Budd Frankenfeld; the Macmillan Company, 1904; 420 pages octavo. The second volume of this book is now in preparation. He is also joint editor (with Prof. H. H. Norris, of Cornell University) of the "Report of the Electric Railway Test Commission," which report is now in press. He has also been a frequent contributor of papers and articles for the technical and semi-technical press. Prof. Swenson has also acted as consulting engineer in the design and on the superintendence of construction and testing of electric light and power plants and of electric railways, during the past ten years, when not occupied with other duties.

Prof. Swenson is a full member of the American Institute of Electrical Engineers and of the American Society of Mechanical Engineers, and is an associate member of the National Electric Light Association. He has also served as chairman of the local branch of the American Institute of Electrical Engineers, at Madison, Wis., for two years, and is a member of Tau Beta Pi, an honorary engineering fraternity, and also of the Phi Delta Theta Fraternity.

Prof. Swenson's intimate acquaintance with the electric railway business, his readiness as a writer, his high standing in the electrical engineering profession and the experience derived by him in his consulting work with the commercial features of the industry, as well as its engineering aspects, render him well fitted for the office of secretary of the new association. In all the work which Prof. Swenson has undertaken he has established a reputation for hard and conscientious work as well as an ability for securing results. Personally, he is of medium height and weight, of good physique, and popular with all who know him.



B. V. SWENSON

the evening sessions in the Light Guard Armory, East Larned Street, corner Brush Street. A large number of important railroad officials from different parts of the country, as well as a number of leading association workers, will be present and address the conference. Col. John J. McCook, chairman of the International Railroad Committee, will preside at all sessions. Although no great advance has yet been made in the association work on electric railway lines, some branches have been started, and it is expected that the subject will have attention and discussion at the Detroit conference.

**STREET RAILWAY PATENTS**

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

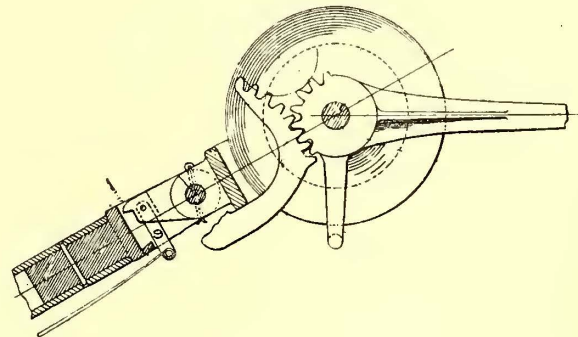
UNITED STATES PATENTS ISSUED SEPT. 5, 1905

798,593. Fender; William J. Birchell, Phoenix, Ariz. App. filed March 6, 1905. A frame comprising upper and lower spaced and substantially V-shaped bars, having cushioned rollers located between and journaled in the bars, the front portions of the rollers projecting in advance of the frame.

798,673. Trolley; Robert G. Griswold and Charles C. Willits, Quincy, Mass. App. filed Oct. 13, 1903. The trolley harp is hinged to the pole and spring-spressed to move the wheel forward in case the latter leaves the wire. A pair of guide-fingers are simultaneously thrown into position to assist in repositioning the wheel.

798,691. Trolley Finder; Jerry Morrow, Wellston, Ohio. App. filed July 6, 1904. Relates to an improvement of the above and has particular reference to the guide-fingers or horns, which in this instance are made integral with a bail or loop whereby their construction is strengthened.

798,744. Railway Crossing; Edward F. Meisner, San Francisco, Cal. App. filed April 4, 1904. Comprises sections of track at the intersections upon which the wheel flanges run, thereby raising the



PATENT NO. 798,673

wheel treads above the rails, the change from a tread bearing to a flange bearing being made gradually to prevent pounding or concussion.

798,872. Fender; Louis Carlson, Brooklyn, N. Y. App. filed April 3, 1905. By this invention the height and position of the fender may be readily adjusted to meet varying conditions.

798,891. Means for Applying Breaks to Vehicle and Other Wheels; Gustav Eisenkramer, San Francisco, Cal. App. filed May 6, 1905. Relates to that class of brake in which the braking force is derived from the movement of the vehicle wheels themselves.

798,911. Car Fender; Paul Luther, Allegheny, Pa. App. filed May 12, 1905. A counterweighted fender which tips up in front when an obstruction is encountered, thereby having a tendency to raise the object and drop it back upon the apron of the fender.

798,968. Life Guard to be Applied to Electric Tramcars; Harry Labelle, Middlesborough, England. Details of construction.

**PERSONAL MENTION**

MR. N. K. SMITH has been succeeded as superintendent of the Ft. Wayne & Wabash Valley Traction Company at Huntington, Ind., by Mr. Frank Hardy, chief dispatcher of the system.

MR. MALCOM MacDONALD, who, for a number of years has been assistant supervisor of the Camden & Suburban Street Railway Company, and later with its successor, the South Jersey division of the Public Service Corporation, has just been appointed assistant superintendent of the Northern Michigan Traction Com-

**Y. M. C. A. INTERNATIONAL CONFERENCE IN DETROIT**

The twelfth international conference of the Railroad Department of the Young Men's Christian Associations, of North America, will be held in Detroit, Mich., Sept. 28 to Oct. 1, 1905. All steam and electric railroad men, whether from organized or unorganized points, are invited to attend and participate in this conference. Beginning Thursday afternoon, Sept. 28, sessions will be held morning, afternoon and evening of each day, the day sessions in the Central Methodist Church, Woodward and Adams Avenues, and

pany, of Manistee, Mich. The control of this company has recently passed to J. G. White & Company.

MR. T. D. MacGREGOR, for four years connected with the "Syracuse Herald," has resigned to become special representative and advertising manager for the Syracuse Northern Traction Company.

MR. JAMES C. HAIN has resigned as engineer of masonry construction for the Chicago, Milwaukee & St. Paul Railroad, and is now associated with J. G. White & Company, of New York, as superintendent of masonry construction with headquarters in New York.

MR. W. KESLEY SCHOEPP has succeeded Mr. F. J. J. Sloat as president of the Southern Ohio Express Company, which operates the express business on the line of the Cincinnati, Dayton & Toledo Traction Company. Mr. C. S. Cooper has been elected secretary; Mr. A. L. Kasemeier, treasurer; Mr. J. R. Randall, general manager, and Mr. W. J. Boyle, auditor of the company.

MR. C. E. PATTEN, chief clerk of the manager of the operating department, Chicago division, of the Chicago, Burlington & Quincy Railroad, has entered the service of the Metropolitan Elevated railway as assistant to General Manager Hetzler of the company. Mr. Patten entered the employ of the Burlington seventeen years ago, and has been with it continuously ever since.

MR. D. R. COLLIN, formerly architect of the Brooklyn Rapid Transit Company, of Brooklyn, N. Y., is now architect of the New York Central Railroad Company, with headquarters in the Grand Central Station, New York. Mr. Collin was with the Brooklyn Company five years. Before that he was with the Cataract Construction Company at Niagara Falls, New York, and later was associated with Mr. George Cary, in work for the Pan American Exposition.

MR. CHARLES O. KRUGER, second vice-president and general manager of the Philadelphia Rapid Transit Company, was married last Thursday evening at Oley, Pa., to Miss Elizabeth C. Kauffman, of that place. The ceremony was performed at the home of the bride's parents and only the immediate family were present. Mr. and Mrs. Kruger are spending their honeymoon at Eagles Mere. They will be at home after Oct. 1, at Abington, Montgomery County.

MR. WILLIAM F. RABER, for the past two years manager of the Mansfield Railway, Light & Power Company, of Mansfield, Ohio, which includes the Shelby-Mansfield Interurban Railway, has resigned to go to Enid, Oklahoma, to take charge of a gas and electric lighting plant for H. M. Byllesby & Company, of Chicago, who are interested in the Mansfield property. Mr. Raber will be succeeded at Mansfield by Mr. R. L. Rand, who has been assistant to Mr. Raber at that place.

MR. WALTER H. WHITESIDE was elected president of the Allis-Chalmers Company at the directors meeting in Jersey City, succeeding Mr. Benjamin H. Warren. Mr. Henry Woodland, of Milwaukee, succeeds Mr. William L. Chalmers as treasurer. Before the directors meeting the stockholders elected Mr. Edward D. Adams, Mr. Mark T. Cox, Mr. Edmund C. Converse, Mr. Joseph S. Neafe, and Mr. Edwin Reynolds to the board. Mr. Converse is well known in connection with the National Tube interests of the United States Steel Corporation.

MR. W. S. MENDEN has been appointed general superintendent of the Metropolitan West Side Elevated Railway Company, Chicago. Mr. H. M. Brinckerhoff, general manager, having resigned, the office of general manager has been abolished, and the duties of the position will now devolve upon Mr. Menden. Mr. Menden has been for a number of years chief engineer of the company, and some of the company's most notable work recently has been of his design and carried on under his supervision, including the extension of the Garfield Park line and the moving over of the entire structure after it was completed. To his credit also is the design of the company's new all-steel car.

SIR CHARLES EUAN-SMITH, K. C. B., of London, chairman of the board of directors of the Campania Limitada de Tramvias Electricos de Mexico, of the Lisbon Electric Tramways, Ltd., of the Cape Electric Tramways, Ltd., and who also is interested in electric railway properties other than those mentioned, left New York on Monday for Boston, from which port he sailed on Tuesday en route from Mexico to England. Sir Charles is accompanied by Lady Euan-Smith. After participating in the recent International Railway Congress, in Washington, Sir Charles went to Mexico City, where he spent several weeks in conference with W. W. Wheatly, the resident manager of the tramway system there, in regard to the operation of the system. As a result of his visit it is known that several important projects are under way, in the interest of which Mr. Wheatly will visit New York the latter part

of this month. One of these has to do with increasing the power facilities of the company, and Mr. Wheatly while here will contract for considerable sub-station machinery.

MR. GUY F. KELSEY, electrical engineer and master mechanic of the Western Ohio Railway, has resigned to become electrical engineer of the Indiana Union Traction Company, succeeding Mr. A. S. Richie, who, as previously noted in the STREET RAILWAY JOURNAL, has been elected to the chair of electrical railway engineering at Worcester Polytechnic Institute, Worcester, Mass. Mr. Kelsey has long been regarded as one of the most practical men in charge of the mechanical end of a high-speed interurban property, and his activity at the meetings of the Ohio Interurban Railway Association was doubtless largely responsible for his deserved promotion to this most responsible position.

MR. BRAFTON UPTON, of Everett, Mass., has been named by the Massachusetts Railroad Commissioners as a member of their corps of railroad inspectors for the term of three years, beginning Oct. 1. This is a reappointment, as Mr. Upton has served the board as an expert inspector ever since his retirement from the position of master car builder for the old Fitchburg Railroad, from which position he came into the employ of the commonwealth. Mr. Upton has three confreres in the work of inspection, so chosen as to cover all branches of railroad and railway construction and equipment. Mr. Daniel M. Wheeler, of Worcester, whose term expires Oct. 1, 1906, is a specialist on roadbeds and the problems of surveying and civil engineering concerned with railroad and railway locations and construction. The problems of the street railways are considered in the light of the expert knowledge furnished by Mr. Lewellyn H. McLain, of Melrose, who is an old street railway man, and was superintendent of the Newton & Boston Street Railway before coming into the service of the commission. Mr. John Q. Hennigan, of East Milton, contributes special knowledge with reference to locomotive engineering and construction matters, in which department he served when in private employ some years ago. Mr. McLain's term expires at the same time as Mr. Wheeler's, and Mr. Hennigan's comes to an end on Oct. 1, 1907.

MR. W. S. DORAN, formerly associated with the British Westinghouse Electric & Manufacturing Company, Ltd., has just been appointed manager of the power department of Allis-Chalmers Company, in which capacity he will have complete charge of the company's commercial affairs pertaining to reciprocating steam engines, steam and hydraulic turbines, condensers, gas engines, blowing engines for iron and steel blast furnace service, and rolling mill engines, with headquarters at the general offices of Allis-Chalmers Company, Milwaukee, Wis. Mr. Doran started on his business career with the Southwark Foundry & Machine Company, Philadelphia, where he remained for five years in drafting and shop work. After spending some time with the United Gas Improvement Company, of Philadelphia, in the construction and management of water-gas plants for that company, he became connected with Mr. H. R. Worthington, having headquarters in New York, Chi-



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ago and Philadelphia. In addition to his engineering duties, he had charge of the branch offices, and while located at Chicago had complete charge of the entire Western business. In 1899 he joined the Worthington Pumping Engine Company, Ltd., with headquarters in London, England, where he took charge of its various branch offices and the important negotiations in Great Britain and Ireland. In 1901, Mr. Doran became associated with the British Westinghouse Electric & Manufacturing Company, Ltd., and since then has been establishing its branch offices and supervising their sales. Notable among the large contracts secured by Mr. Doran, may be mentioned the complete installation of the power and lighting plant for the Midland Railway Company at Heysham Harbor, comprising buildings, gas engines, generating plant producers, transmission lines, electric cranes, etc. The new Belfast, Ireland, tramways and several large iron and steel works plants were successfully negotiated by him. As an evidence of the high esteem with which Mr. Doran is regarded by his business associates, a banquet was tendered him on the eve of his departure from England, attended by many railway officials, manufacturers, engineers, and representatives from practically all the large electrical manufacturing concerns in England.