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St. Louis for the Convention

The decision of the executive committee of the American Street Railway Association to hold the annual convention of that body at St. Louis this fall, will meet with general satisfaction. This decision was reached only after a very careful consideration of all the circumstances of the situation. At the meeting of the executive committee held in New York on Feb. 29, and mentioned in our issue of March 5, the St. Louis situation was thoroughly discussed. It was agreed that St. Louis, especially this year, with the Louisiana Purchase Exposition, presented a great many advantages as a convention city. The only question was in regard to hotel accommodations, and it was decided that this could not be satisfactorily determined without a personal visit. A meeting of the executive committee was accordingly held in St. Louis on March 26, and the decision to hold the convention in that city on

October 12 and 13, next, was reached. The headquarters of the Association will be at the Southern Hotel. The other details in regard to the meeting which have been decided upon are printed elsewhere in this issue. The secretary of the Association will also issue a circular in a few days announcing the arrangements for hotel and other accommodations.

We have strongly advocated the selection of St. Louis as the meeting place in 1904, ever since the Saratoga convention, and a return to October as the date of the annual meeting, believing both to be the wishes of a large majority of the members of the American Street Railway Association. An attempt to hold the convention in the same city at which a World's Fair is in progress is an experiment on the part of the American Street Railway Association. At the time of the Chicago World's Fair the objections to this course were considered so great that the 1893 convention was held in Milwaukee. While this was probably a wise course to pursue at that time, the example could not be followed this year of holding the convention in a neighboring city, because there is no city in the vicinity of St. Louis corresponding to Milwaukee which could accommodate the American Street Railway Association at one of its annual conventions. To hold the convention in a distant city would have defeated the object of the executive committee, which was to afford an opportunity to visit the World's Fair and also attend the annual convention to those members of the Association who could not very well absent themselves from their business for two extended trips. Again it is believed that the street railway system of St. Louis will itself repay a visit to that city, as it has been brought to a high state of efficiency, and under the experienced management of Capt. McCulloch will afford, during the present summer and fall, an object lesson in the handling of large amounts of traffic which will be worthy of study. The time selected for the convention, that is, October, will be a very attractive month in St. Louis, and one well suited for the meeting of the Association.

Of course, the principal, and really the only argument which can be urged against St. Louis is the supposedly crowded condition of the hotels, but this, we believe, will be found more of a sentiment than a reality. During its trip to St. Louis this question was carefully investigated by the executive committee, and assurances were secured that there were sufficient provisions for accommodating the attendants. A number of new hotels have been and are being erected in the city; many of these are now ready, and all will certainly be completed long before the date set for the convention. Indeed, the American Street Railway Association is by no means the only large body which will hold a convention this year in St. Louis, and that the question of hotel accommodations has been considered satisfactory is evidenced by the decision of other bodies to meet this summer and fall in or near the Exposition Grounds. To mention no other, the Electrical Congress, with which many of the members of the American Street Railway Association are connected, especially those who are also members of the American Institute of Electrical Engineers, will hold its sessions in St. Louis during September. In addi-

tion the National Electric Light Association, the Engineering Congress, the American Institute of Electrical Engineers and other bodies have also decided to meet this year in St. Louis.

Fire Risks and Remedies

An Institute discussion, particularly if it waxes a bit fervid, generally brings to the surface facts which do not otherwise transpire. The discussion last week was no exception to the rule, and the information regarding danger to station apparatus, particularly the transformers, from fire, which was made public, will bear careful consideration. It has been pretty well understood that oil, such as is used in the transformers and oil switches, is far from easily inflammable, but few, even among engineers, have fully comprehended how far this immunity from danger extends. Of course, oil under which an arc can be broken with impunity is decidedly different from oils of the ordinary sort, and although even this can be set on fire, it becomes a real element of danger only under very unusual conditions. The general opinion seemed to be that oil insulated transformers, when properly installed, were considerably safer than those of the air-blast type, although there were wide differences of opinion as to what constitutes proper installation. Transformer oil generates explosive vapor only with very great heat, and probably would not generate it in any ordinary fire to an extent which would cause serious results. Yet several speakers were decidedly in favor of making the transformer cases solid enough to stand, in case of the ignition of explosive vapor, an internal pressure of 100 lbs. per square inch or so. This seems to us like an excess of caution, for it forces the use of water-cooling or other forced system of circulation, and after all, an ample relief valve at the top of the case, even a hinged lid which would fall back by its own weight, would afford ample protection against the trivial explosions possible. The self-cooling form of transformer case, especially in the medium sizes, is too valuable to be put aside for the less simple and more troublesome water-cooling, good as the latter may sometimes be.

In very high voltage work, the oil-insulated transformer is a necessity, as is the oil-switch, and cannot be put aside. The general opinion, as expressed at the meeting referred to seemed to be that oil transformers should be installed in such wise that their contents, even if set free by melting the solder of the cases, could not flow anywhere to meet inflammable material. This means installation either in a separate room or in a space set apart by a wall or by depression of the floor, so as to keep leaking oil out of the rest of the plant. Drainage from this transformer space to the outside of the building would certainly be desirable. As between a separate room and a protected space there is little to choose in large stations, but in those of more moderate size, it seems to us that the advantage lies with the latter alternative. For the wiring is thereby naturally simplified, and what is more, the whole equipment can come under the eye of the regular attendants without setting a man apart to watch the transformers. One instance mentioned in the debate, in which an attendant let a short-circuited transformer go on burning until the superintendent could be telephoned for and come down on his bicycle, deserves particular comment. A management that will put so helpless an attendant in charge of a sub-station richly deserves to be burned out, and has no claim for sympathy. The time has not yet come in which sub-stations can be left to run themselves, and when anything happens, it is likely to be serious. Therefore, the man in charge must know his business thoroughly and have full power to act on the in-

stant. In most cases of trouble with heavy apparatus seconds count, and if an attendant has to telephone or even to ask questions, the mischief is already done. There is altogether too much dependence placed on cheap and incompetent men in a good many recent plants, and the result of this sort of negligence is pretty certain to be serious.

Another horrible example brought to light in the discussion was a serious fire caused by the installation of a wooden framework to support high-tension wires over the transformers. The amount of work cut out for the fool-killer about high-voltage electrical plants is something shocking. We have seen over and over again 10,000 volt wiring laid out in a wooden station almost as one would wire for an annunciator, simply from sheer shiftlessness. Even in supposedly fireproof construction there may usually be found danger points which have entirely escaped attention. In electric railway work in particular where sub-stations are freely used, complete continuity of service is of the utmost importance, and it behooves the engineer to get down to business and to see to it that the stations are safe from danger of fire from sources within and without. Brick, cement and iron are safe things to fall back upon, and when arcs find only these to feed upon short-circuits lose their terror. There is no excuse for anything but the most limited use of wood in the construction of high-voltage sub-stations, and a management too parsimonious to use fireproof construction had better go out of business. We would not dare to say how many small stations and sub-stations have oil-soaked wooden floors, and are finished in oiled or varnished sheathing, but one does not have to look far to find them. It is high time to inaugurate a campaign against these needless and reckless fire risks. The dangers are mostly preventable by simply following the precedents long since set in fireproof construction for general purposes. Apparatus which may become involved in short-circuits, is, of course, a fire risk of a somewhat uncertain character, but when it is installed with ordinary regard for common sense, it becomes relatively harmless. At any rate, a station built with a view to safety, is a far better risk than it is often supposed to be, and may be made as effectively fireproof as a building for any other purpose.

The Gas Turbine

In line with the rapid and promising development of the gas engine as a prime mover, the gas turbine is now offering many attractions for investigation and research. That the success of the steam turbine is practically revolutionizing the status of the steam engine for power generation is well known, and tends to indicate the possibility of developments of even greater importance in the elimination of some of the difficulties met in gas engine practice. The steam turbine has been an important step in freeing us from many of the mechanical limitations of the reciprocating engine, but it still entails the use of that wasteful factor in the thermal-transfer process—the steam boiler. This is, of course, entirely avoided by the gas engine process, and it is with a hope of being able to combine the advantageous features of the steam turbine with the ideal thermal conditions met in the gas engine that the gas turbine has been considered. For several reasons the turbine form of engine appears particularly well adapted to the use of gas, among them the absence of exposed packing and surfaces which require lubrication.

Considerable experimental work has, we understand, been done along this line, which, although not successful, indicates the possibility of overcoming certain difficulties met in the development of a practical machine. The mode of operation

that has been worked upon as being the simplest and most natural, is that of compressing both air and gas separately and independently, and then discharging them in the proper portions for an explosive mixture into a common combustion chamber, where combustion takes place in the form of an explosive blast. The kinetic energy of the blast is utilized in driving the blades or buckets of the rotating turbine wheel in a manner similar to that in which steam is used in the steam turbine. Theoretically considered the type of turbine is unimportant, and expansion is carried on until the pressure of the atmosphere is reached. This process follows the well-known Brayton cycle, which, according to the theory of the gas engine, possesses exactly the same theoretical thermal efficiency as the Carnot cycle, provided that in the latter the final compression equals that of the pressure of combustion in the Brayton cycle. The ideal gas turbine would, therefore, give the same economy as the ideal Carnot heat engine; the only question is how would the working and cooling losses compare in practice. The work of compression for the gas and the air is the same in both types of machines, and the energy for doing this is practically the same, if it be considered that although the shaft of the turbine compressor is lighter, reduction gearing is required. The other working losses which are inherent in the piston engine would, however, prove much smaller as the friction in the nozzles, vanes and rotating wheel in the gas turbine would, at the least, be equal to that of the DeLaval steam turbine. The heat radiation could probably be made less than that of the gas engine, provided that the burning chamber could be so isolated as to dispense with water cooling. However, operation of this kind would give very high final temperatures of the expansion which would seriously impair the maintenance of the wheel vanes; other than single-tier turbines, that is, those working with nozzles, cannot be used on account of the high temperatures. If vaporized water be mixed with the gas in the combustion chamber the temperature would be lowered, but the efficiency would be reduced in proportion. The use of the exhaust heat for vaporizing the injected water would be of some assistance, but in view of all the disadvantageous conditions it has been questioned by some engineers whether a gas turbine working according to the described process, has any chance to compete successfully with the piston type gas engine.

The difficulties which are presented in operating a turbine in this manner are admittedly very serious, but is it not possible in some manner to avoid them? It would seem possible to find some method of cooling the blades if the intense heat of the blast tends to cause disintegration. The possibility suggests itself of directing steam jets for cooling upon the rotating blades at points separated from the combustion nozzles, the steam for which is generated possibly by the hot waste gases of combustion exhausting from the turbine. Other means of counteracting the destructive effects upon the turbine mechanism of the intense heat may be devised in the light of experience. The advantages offered by the gas turbine in eliminating the difficulties met in the use of the steam boiler, as well as those experienced in the piston gas engine, are by far too great to be overlooked, and it is hoped that this subject will receive careful consideration. We do not believe that the method that has been suggested of operating a gas turbine in connection with a multi-cylinder gas engine, so as to utilize the high pressures of the exhausts in driving the turbine blades is the direction in which progress is tending; if the gas turbine can be made practical in any case, it would seem to be possible to carry out the entire process of trans-

formation of the heat to work in the combustion nozzle, and thus so greatly simplify and concentrate the entire operation. This is manifestly the direction toward which recent progress is now pointing to further and more reasonable economies in power generation.

Generators and Transmission Circuits for Single-Phase Railways

Among the many problems incidental to the adoption of single-phase railway systems is that of the generators to be used. This is one of the first questions to be settled after the decision to use single-phase alternating-current motors has been made. On what will probably be one of the first roads to put single-phase railway motors in operation, contracts had already been let for three-phase generators before the decision to adopt the single-phase motor was reached, and it is likely that many other roads partially completed, which are now considering single-phase equipment, will find themselves in a similar position. The discussion of the advantages of one, two and three-phase generators for single-phase railway work by W. A. Blanck in another column, is therefore most timely. On a road where new generating machinery is to be purchased, along with the adoption of the single-phase railway motor, the single-phase generator has claims which cannot be turned down off-hand. Where two or three-phase generators are used for single-phase work, it is somewhat at the expense of simplicity, since the road must be divided into two or three sections operating upon the different phases, and there is no opportunity to operate the whole generating capacity upon one section of the line. Of course, there are very few occasions when it would be necessary to do this, but in certain emergencies it might be very desirable. Furthermore, it might make a decided difference as to the number of generating units which must be kept ready for operation.

The proposition to ground one side of a single-phase transmission circuit, as advanced by Mr. Blanck, is not quite so radical as it might seem at first thought. As a matter of fact, it is now the common practice to ground the neutral wire of a high-tension transmission system when the transformers or generators are star-connected. It is now generally recognized, and has been demonstrated mathematically that the strains upon the insulation which actually rise in practice are less with such a grounded neutral than on a circuit which is entirely free from grounds. It is possible, therefore, that a single-phase circuit grounded on one side would not require forbiddingly elaborate insulation. The grounding of one side of the high-tension transmission line for a single-phase railway might result in considerable reduction in first cost, and this reduction of cost is one of the objects in the introduction of the single-phase railway system. It has already been proposed to work high-voltage direct-current transmission lines grounded, and some experiments have been tried to this end. A grounded single-phase system is equally capable of being so worked, but whether in practice such operation would be advisable, is another question, and one upon which at present we have no experimental light. If the new commutating alternating-current motors meet the present expectations of their advocates, there will certainly be a strong tendency in favor of single-phase rather than polyphase lines. How far the better utilization of the material in a polyphase generator will tend to offset its greater complication of circuits remains to be seen. The key to the whole situation is the extent to which single-phase motors for general purposes can be made to compete in general operative qualities with polyphase motors, and of this it is too early in the game to speak with certainty.

NOTES ON LOS ANGELES RAILWAY COMPANY'S SYSTEM

Detailed descriptions have just been published in these columns of many interesting features of the Pacific Electric Railway Company's system in and about Los Angeles. To describe the system of the Los Angeles Railway Company in all its de-

is president of and controls both companies, but the other stockholders and officers are not the same in both. The two systems are operated separately. The features of the similarity are the standards of track and overhead construction and the power supply. In rolling stock, car houses and methods of operating, the Los Angeles Railway Company has distinguishing features

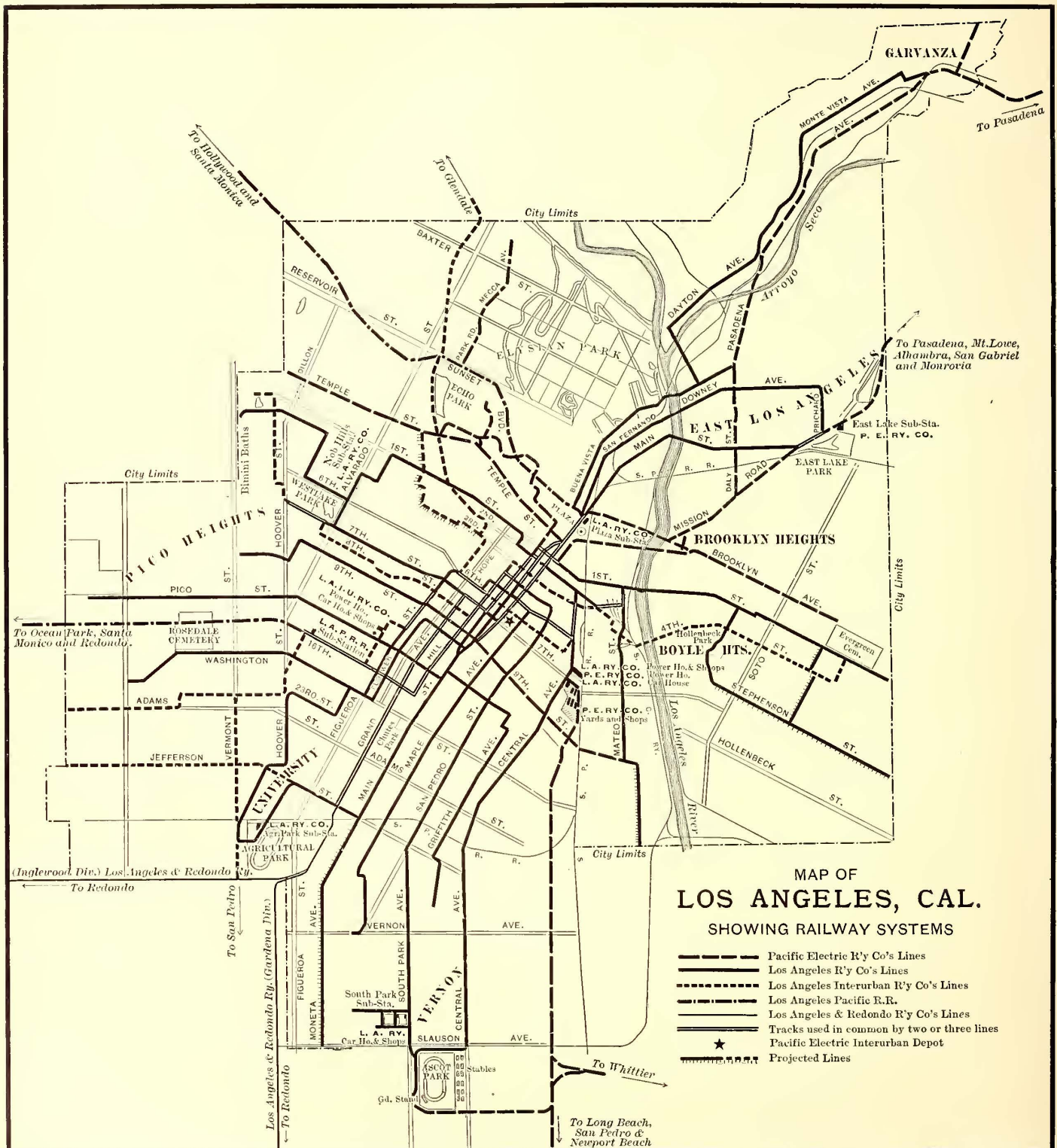


FIG. 1.—ELECTRIC RAILWAYS IN LOS ANGELES

Street Ry. Journal

partments would involve repetition of much that has been printed about the Pacific's electric system, since, in many features, the two companies have the same standards. The Los Angeles Railway Company is the older corporation, and while its lines and equipment have been steadily developed and brought up to a high state of efficiency, the Pacific Electric Railway Company has necessarily had a more phenomenal growth during its short existence of two years. Henry E. Huntington

which will be the main subject of the present article, points of similarity and identity being briefly mentioned.

The Los Angeles Railway Company was incorporated in 1895, and at that time took over the Los Angeles Consolidated Railway. A year later the Los Angeles Cable Railway Company was taken over, and soon afterward the cable system was abandoned and the lines changed for electric operation. All traces of the old cable roads have recently been removed,

both in track and rolling stock. In 1898, after being changed from animal to electric traction, the Main Street & Agricultural Park line was purchased. About the same time the Mateo Street and San Pedro Street lines were acquired.

The Los Angeles Railway Company now operates seventeen lines within the city limits, covering 127.62 miles of track, while proposed extensions will bring the trackage up to 136.6 miles. As will be noticed on the accompanying map, Fig. 1, these lines, indicated by heavy full lines, radiate from the center of the city to all parks and residence sections. The Pacific Electric Railway and the Los Angeles Interurban Railway Companies, whose lines are indicated respectively by long dash and short dash lines, operate a few city branches in connection with their interurban roads. The Los Angeles-Pacific Railway

their cars in the city indicated respectively by the dash and dot and light full lines.

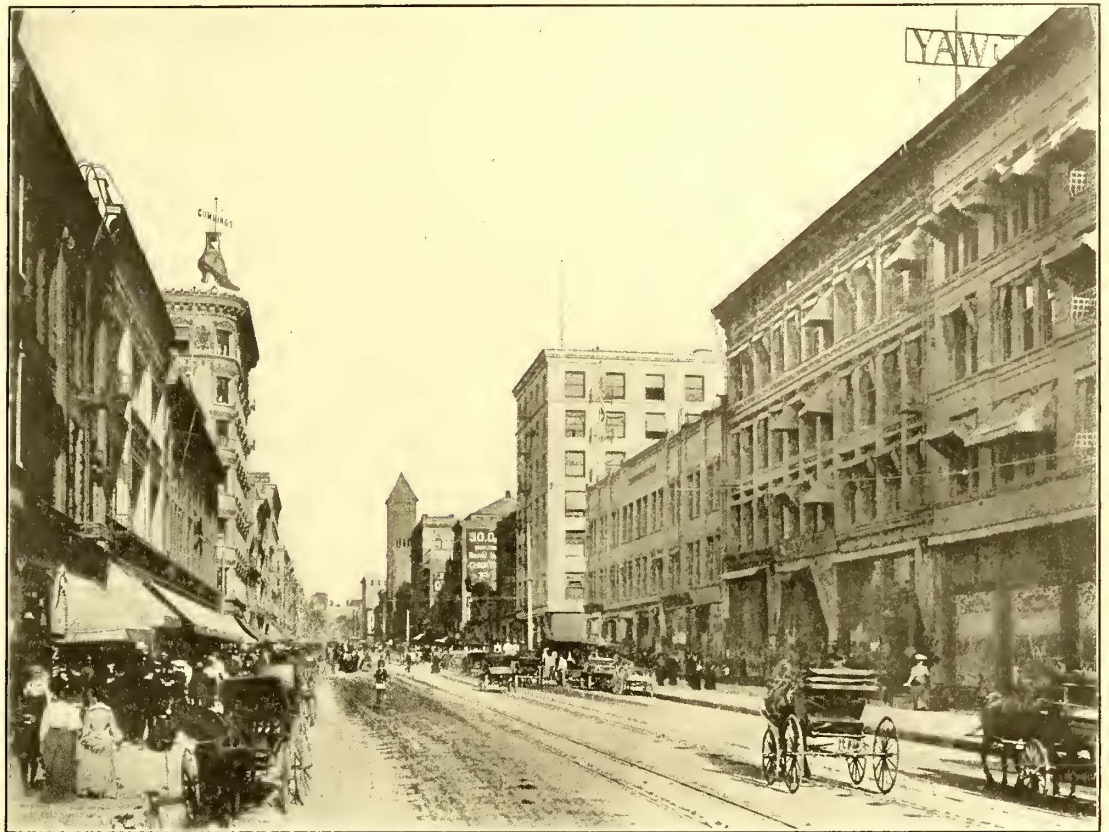


FIG. 2.—VIEW OF BROADWAY, LOS ANGELES, SHOWING STREET WITH NO TROLLEY POLES, SPAN WIRES BEING SUPPORTED FROM BUILDINGS

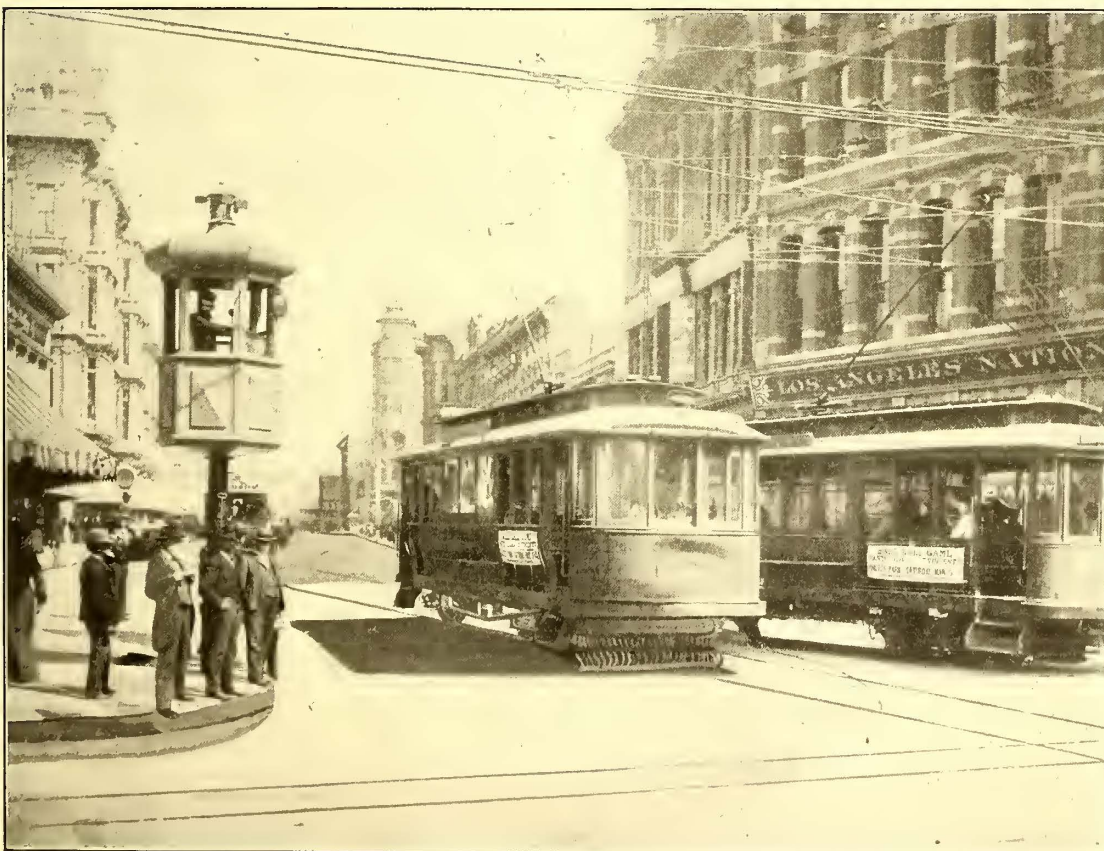


FIG. 3.—SWITCHING TOWER AT FIRST AND SPRING STREETS, LOS ANGELES, LOOKING UP NORTH SPRING STREET

Company and the Los Angeles & Redondo Railway Com-

pany, which operate interurban lines only, have the routes of pole span construction prevails on all streets, and where the company operates over a private right of way, cen-

TRACK AND OVERHEAD WORK

For paved and graveled streets the track construction is identical with that of the Pacific Electric Railway Company, described and illustrated in the STREET RAILWAY JOURNAL of Feb. 27, with the following exception: The Los Angeles Railway lines are all laid with a 3-ft. 6 in. gage. In some portions of the city, particularly in the new Garvanza extension, some unusually heavy grading was necessary for the construction of the lines. One branch running to Westlake Park on Second and First streets has a number of very heavy grades, the maximum being 11½ per cent.

In the overhead construction the Pacific Electric standards are used, all trolley wire being of No. 000 double-grooved wire. The side-

ter-poles are employed. In the business districts on Broadway, Spring and Main Streets, and the cross streets, wherever the property owners made no objection, the side-poles have been removed and the span-wires fastened to the buildings by means of strain insulators. Fig. 2 is a view on Broadway showing the street unobstructed by poles, with the exception of two or three used for arc lights at street intersections.

OIL OPERATED SWITCHING SYSTEM

A novel feature of the Los Angeles Railway Company's system is the switching apparatus and tower, located at the inter-

controlling valves, etc., are located in the tower. To each of the four switches is run a pressure pipe, 3/4 in. in diameter, and the oil cylinders of the switches are connected by one common return pipe to the oil tank in the tower. The pumping apparatus occupies one side of the tower, and its inclosing case affords a seat for the switchman. There are two double-acting plunger pumps set on a malleable casting in which is placed a 10-gallon open oil tank. Each pump is driven by a 1/2-hp slow speed series-wound Paragon motor from the 500-volt railway current. The two pumps and motor are in duplicate, so that either one or both may be operated. At each end of the pump base is an air chamber, from which pipes are brought around to the switchboard in front of the operator. This switchboard contains four three-way valves, one connecting, by means of an individual pipe, with each switch. All the switches are held in usual position, that is, for straight track, by means of springs, and for this position the valve handles are upright, indicating no pressure on the pipe line. When the operator desires to throw a switch, he pulls down the valve handle to a horizontal position, which movement opens the three-way valve and allows oil under 60 lbs. pressure to move the switch tongue over against the force of the springs. When it is necessary to throw the switch back, the valve handle is raised, thus taking the pressure off the switch-cylinder. The oil returns through the same pipe to the open tank under the pumps from which they draw their supply. The switch-cylinder, which is located in an iron box just outside the track, is 3 1/2 ins. in diameter, and, as it works constantly in oil, its wearing qualities are very good. It is not even necessary to use rings in the piston head. A thin paraffine oil, from which the solids and distillates have been removed, which therefore, is practically non-inflammable, is used in the system. The oil not only lubricates the valves and cylinders, but in colder climates would prevent freezing, as there are no moving parts exposed, except the projecting end of the piston between the guard rail and the tongue, the spring also being inclosed in the cylinder.

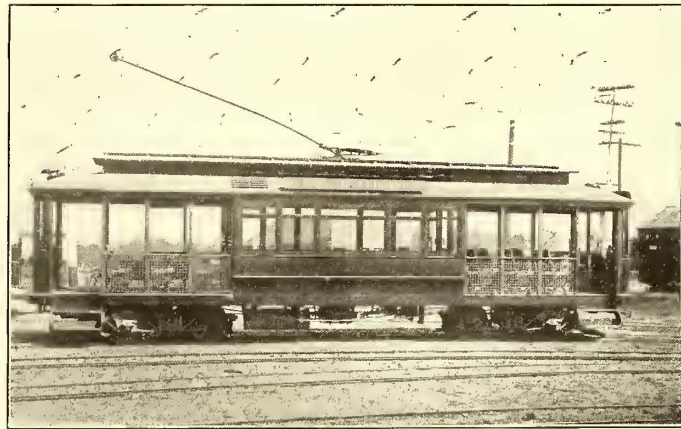


FIG. 4.—STANDARD LOS ANGELES CAR

section of First and Spring Streets. At this corner are a double-track crossing and two double-track connecting curves. The cars of eight of the fifteen lines of the Los Angeles Railway Company, of three lines of the Pacific Electric Railway Company, and all the cars of the northern division of the Los Angeles Pacific Railroad Company pass this corner, giving a regular service of 210 cars an hour, which, during rush hours, and on holidays, is increased to over 300 cars an hour..

Until recently the switching was done by hand by a switch-

In order to signal the motorman to proceed after a switch is

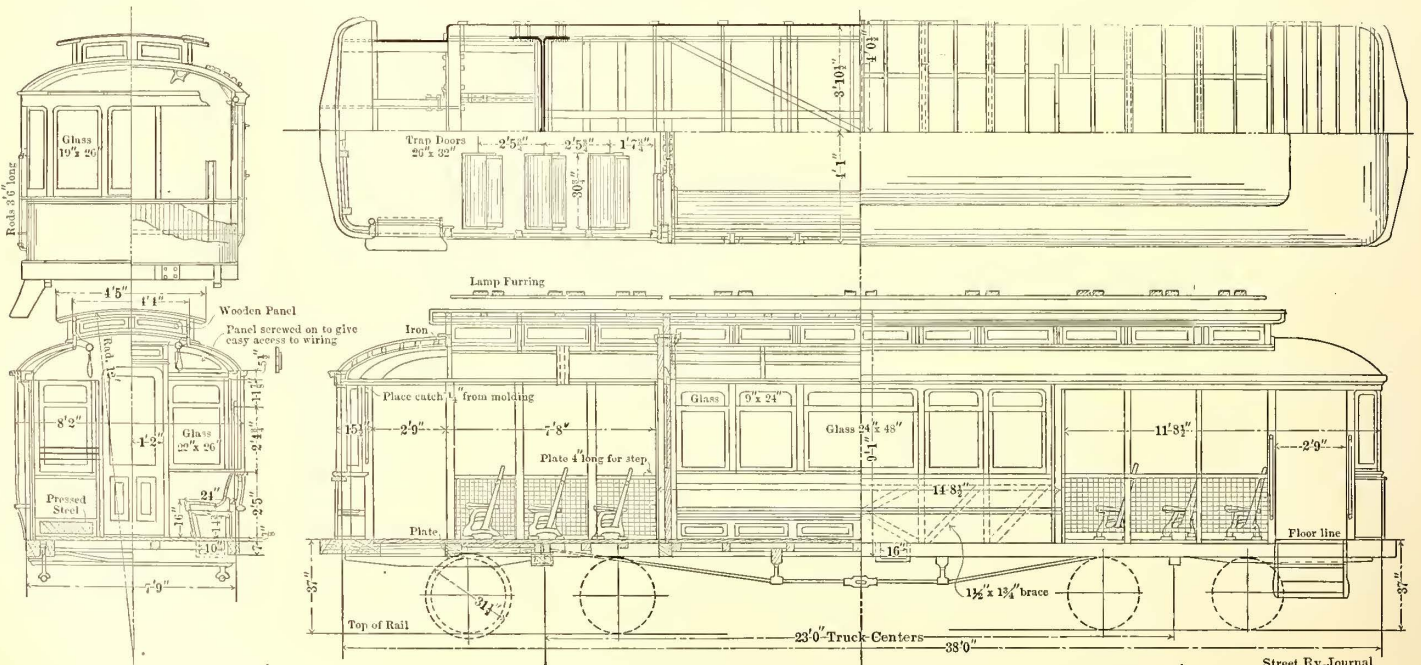


FIG. 5.—PLAN AND CROSS-SECTION OF CAR

man, whose work in operating the four switches had become quite a gymnastic feat. On Jan. 1, last, a semi-automatic switching system was installed, which is operated by a switchman located in the small tower shown at the right in Fig. 3. The system, which is the patented invention of Dr. W. J. Bell, a dentist of Los Angeles, is operated by means of liquid pressure, oil being used as the fluid. All the compressor apparatus,

set, small semaphore blades are arranged, which, when thrown to a vertical position uncover electric lamps that serve as signals at night. Each semaphore is operated by an electric solenoid switch controlled by a push button located beside the valve handle. When a car approaches, unless signaled to proceed immediately, it is brought to a stop just before reaching the switch, and the motorman gives one stroke of his gong as a

questioning signal. The tower operator then throws the switch, and when he is ready for the car to proceed gives the clearing semaphore signal, which is answered by two gongs by the motorman.

The tower is hexagonal in shape, the operating room being 3½ ft. across and 6 ft. high. It is supported 8 ft. above the sidewalk by means of a hollow steel post, the bottom of which is stayed to an iron plate embedded in concrete. The four pressure pipes and one common return pipe are carried down through the center of the post. The tower is about 16 ft. high over all, and as it is ornamental in design, does not disfigure the street or the abutting property. It is placed at the edge of the curb, so does not take any more space than an ordinary electric light or telephone pole.

There are several features which commend the use of a system of this sort. It places the control of the cars absolutely in the hands of the switchman, who can switch the cars rapidly, and still allow only one car to be on a crossing at a time, thus conforming to the rules of the company and minimizing possible danger to pedestrians and vehicles. From his elevated position he has an unobstructed view down all four streets, and in cases of blockades or unusual disturbances on the street, can move the cars as necessity demands. He has a telephone at his hand for communication with the chief dispatcher, so that he can report unusual delays or accidents. In reality the switchman is important to the public safety. At the ringing of his large gong, all cars stop, and this, indicating something un-

personal orders to a motorman or conductor on any corner. Another good feature of the oil-operated switches, is that the switch tongue moves slowly to its position, being entirely free from the quick action that characterizes the electrically-operated switches, which so often, in bad weather, slops mud and water over the cars and pedestrians.

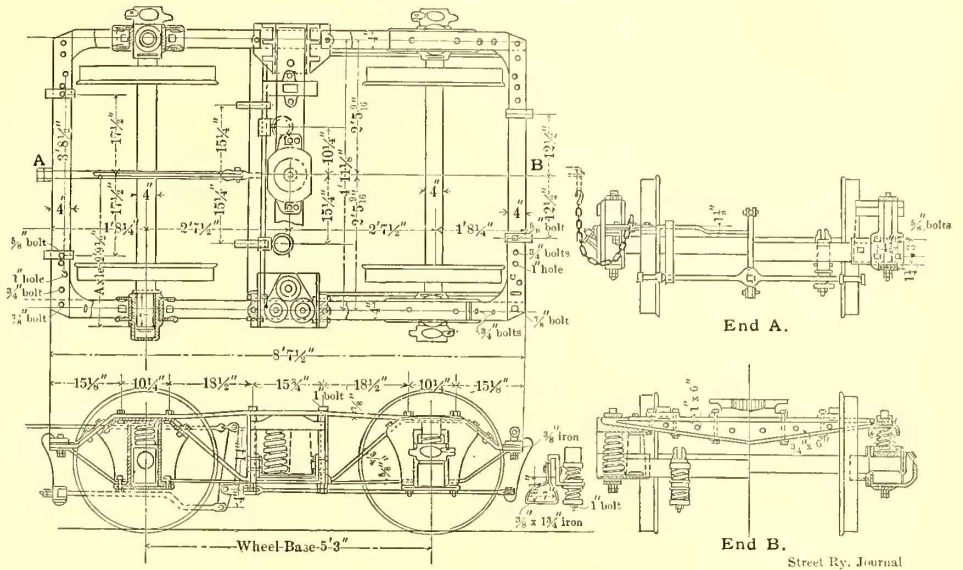


FIG. 6.—DETAILS OF STANDARD TRUCK

Plans are now being prepared for similar switching towers which will be installed at three other important intersections in

Form 390-1M-9-03

LOS ANGELES RAILWAY COMPANY

DESCRIPTION OF CAR EQUIPMENT

Initial.....	Class.....	Number.....	190.....
Builder.....		Headlight, Kind.....	
Rebuilt by.....		Interior, number and kind.....	
Length.....	Over Dash.....	Vestibule, number and kind.....	
	" Body.....	Attachment for trailers.....	
	" Buffer.....		
Width.....	Center body bolsters.....	Capacity of car.....	
	Body bolster to dash.....	Interior, cap. and kind.....	
Distance.....		Vestibule, cap. and kind.....	
Vestibule.....	Standard.....	Body.....	
	Curved.....	Trucks.....	
Trucks.....	Kind.....	Motors.....	
	Wheel center.....	Complete.....	
Wheels.....	Number.....	Whole number.....	
	Size.....	Number, one side of car.....	
Journals.....	Kind.....	Number, vestibule.....	
	Size.....	Size of glass.....	
Springs.....	Kind.....	Doors.....	
	Number.....	Kind.....	
Fenders.....	Kind.....	Size of opening.....	
	Kind.....	Register, kind.....	
Steps.....	Kind.....	Trolley catcher, kind.....	
	Number.....	Trolley base, kind.....	
Curtains.....	Kind.....	Controllers, kind.....	
	Kind.....	Motors.....	
		Kind.....	
		Make.....	
		Equipment.....	

SPECIAL APPLIANCES AND REMARKS CONCERNING REPAIRS:

Blank lines for recording special appliances and remarks concerning repairs.

FIG. 8.—FORM USED BY MASTER CAR BUILDER TO KEEP RECORD OF ALL CARS

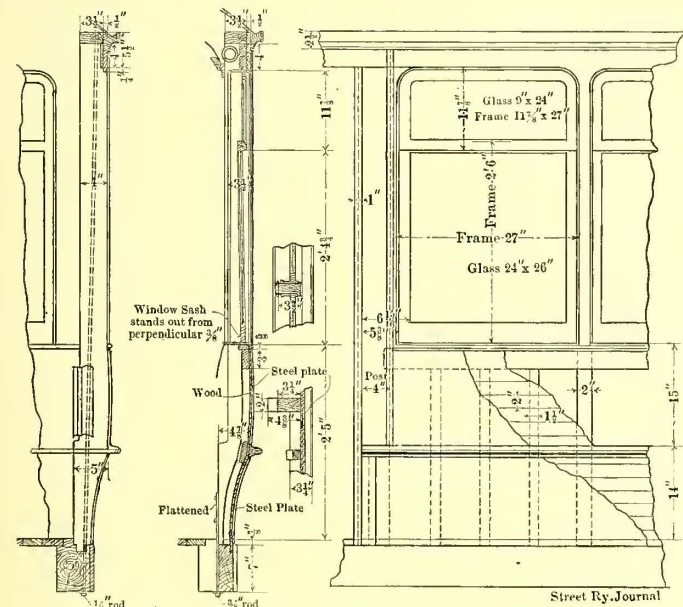


FIG. 7.—CAR WINDOW DETAILS

usual, warns the pedestrians to seek safety on the sidewalk. This alarm has served its purpose excellently several times during the running away of teams on the approach of fire engines. In case of an accident or of disobedience of orders on the part of a motorman, the operator can throw, and thereby stop a car by switching the rear truck over to the other track after the front truck has passed the switch point. Of course, this prerogative is only to be exercised in extreme emergencies, but it illustrates the control which the switchman has over the cars. With the aid of a megaphone, the operator can give

the down-town district. For a single track switch Dr. Bell has devised an apparatus that can be operated by the motorman,

and such a switch has been in successful operation for some time at Fifth Street and Maple Avenue. The track part of the switch is identical with that used at the First and Spring Street installation, being operated by oil. The switch is thrown by the car-controller closing a circuit through an insulated section of the trolley wire which is connected with the electrical

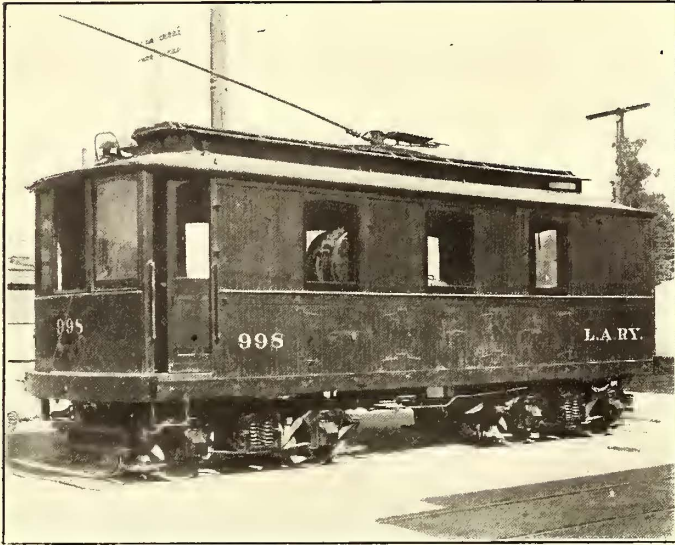


FIG. 9.—EMERGENCY CAR

operating device, located at the side of the street on a pole. No electrical wires or apparatus are necessary under this street, a feature which tends to insure the reliability of the switch.

ROLLING STOCK

The company has a total of 284 cars on its system, the majority of which are of the standard type illustrated in Fig. 4. Some forty odd Pullman cars that were about to be discarded, have been rebuilt to conform with the adopted standard, and the remaining cars are of the open cross-bench type, and are used only as extras. A brief description follows of the standard cars and of results accomplished in standardizing the equipment and construction of the rolling stock in general.



FIG. 10.—EMERGENCY CAR WITH COMPARTMENTS OPEN

The standard car, Fig. 4, is of the combination open and closed type, which has proved so popular in California, and has come to be known as the Los Angeles type. The length over bumpers is 39 ft. 2 in., and over the dash 38 ft. The closed compartment has a length of 14 ft. 6 ins., and the car is 8 ft. 3 ins. wide. The bottom framing comprises side sills of yellow pine, plated with 7 in. x ½ in. steel and cross sills of oak.

Ash is used for the posts and longitudinal rails, and the closed compartment has paneled sides of yellow poplar. The roof is of the monitor, full-ventilator pattern, covered with canvas, and is thoroughly reinforced with steel carlines over the posts. Fig. 5 shows a plan of the car and a cross section. The seats in the longitudinal part are arranged longitudinally, and in each open section are six walkover seats. The total seating capacity of the car is forty-two. Pantasote curtains are provided, and in the open section, they extend to the floor line. The steps are of the Stanwood pattern.

Anderson and Smith arc headlights are employed, but without the interior arc light. Instead of the wire resistance that is generally used with the headlight, incandescent lamps have recently been employed to serve as resistance. When the interior arc was used ten incandescents were depended upon for the rest of the illumination. C. A. Henderson, the auditor of the company, realized that there was considerable waste of current through the arc resistance, so decided it would be more economical to do away with the interior arc, substituting incandescents, which could also act as resistance. Consequently, under the direction of the chief electrician, J. L. Clarke, the following arrangement was made: Five 4-light bunches of incandescents, mounted in Benjamin wireless fixtures were placed in series, with the headlights as resistance. Three of these bunches are in the closed compartment and one in each of the open sections. In addition there are four panel lights in the inclosed portion, and a fifth on the outside over one of the doors, forming a series of five, which is connected directly to the car circuit, and is useful in lighting the car when the headlight is being changed or when it is out of order. This gives twenty-five lights in the car instead of ten incandescents and one arc, and besides saving the current of five lamps, gives a very good illumination and one that is more pleasing than that from the combination lighting. Another improvement in the electrical management of the cars has been the placing of all fuses on the compressor and light circuits under the car-sill, thus minimizing the risk from fire.

The trucks of the car are known as the Los Angeles Railway standard, and are of the design illustrated in Fig. 6, and also shown on the car in Fig. 4. Each truck is formed of 4-



FIG. 11.—INTERIOR OF EMERGENCY CAR

in. forgings, varying in thickness from ⅝ in. to 1 in. The bolster is built up of 1 in. x 6 in., and ¾ in. x 6 in. steel plates, with a solid oak center. Bracket wheels, 30 ins. in diameter are mounted on 4 in. axles, with 3½ in. x 7 in. journals. The wheel base is 5 ft. 3 ins., and the bolster centers of the two trucks of each car are 23 ft. apart. The equipment comprise two 38-B Westinghouse motors and K-11 controllers.

Christensen and Westinghouse air brakes are used, the latter being the standard. The total weight of the car is 29,000 lbs.

The Pullman cars mentioned above were originally 25-ft. cars, and have been lengthened to 33 ft. 9 ins., the closed part being 10 ft. 6. ins. The vestibules were changed to the standard, and walkover seats installed, the seating capacity being increased

As a means of maintaining a detailed record of every car, Mr. Stephens keeps a file of descriptions of car equipment made out for each car on the blank form shown in Fig. 8. This gives a complete description of the entire equipment, and space is left at the bottom for note of special appliances and remarks concerning repairs. Every time a car goes through the shop,

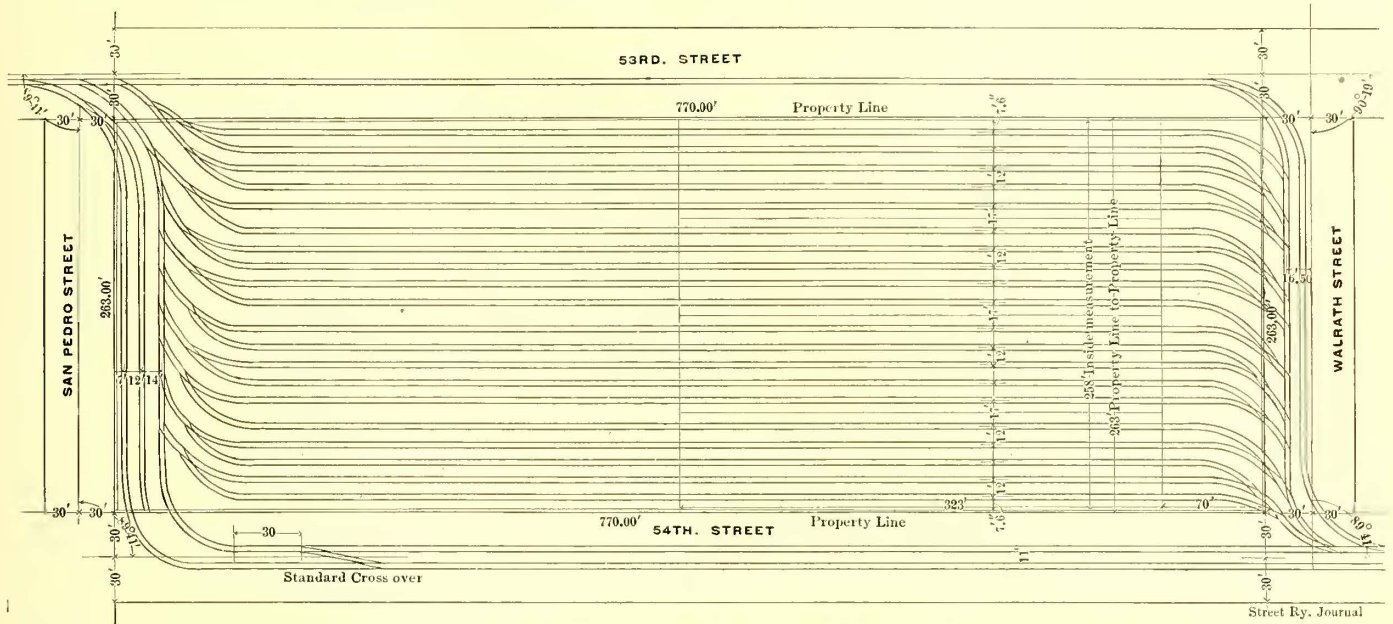


FIG. 13.—SOUTH PARK CAR HOUSE TRACK ARRANGEMENT

to thirty-eight. These cars are 8 ft. wide and weigh 25,000 lbs. They are equipped with No. 49 Westinghouse motors.

Several important improvements in the line of standardizing the rolling stock of the Los Angeles Railway Company have recently been effected under the direction of the master car builder, E. L. Stephens. One of these was the reducing of the number of car axles from nineteen varieties to two types,

is repaired, or has its equipment changed, record is made on a new blank, so that the description is kept up to date.

For ready reference for the master car builder, a record of the car is kept in a wall-rack. A small card, about 1 in. x 2 ins., is made out for each car, containing its number, the class of brake equipment and the date when the car was last varnished or painted. At one side of the rack are placed the

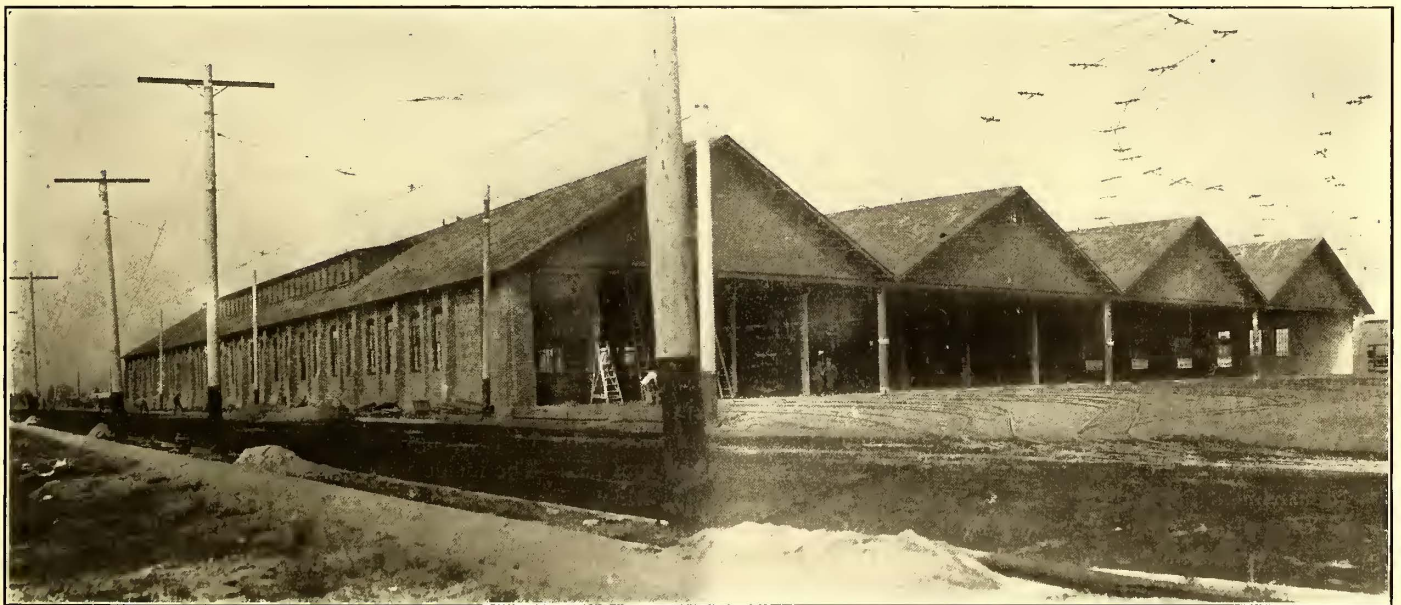


FIG. 12.—SOUTH PARK CAR HOUSE

one of these being the standard 4-in. axle, with 3½ in. x 7 in. journals. The motor equipment has also been standardized, so that instead of six types, but four are now used, and the majority of them are of the 38-B type. All destination sash for the end transoms have been reduced to one standard size, so that the sash fit all cars on the system. Other improvements have been carried on in the way of standardizing the fixtures, windows, and in fact, every part of the car that can be reduced to a standard.

cards of the cars in the shop, and when they are placed in service new cards are made out and placed in their proper numerical position in the main portion of the rack. Similar car records made up of blue-printed designation blocks are maintained in the offices of the general manager and superintendent, these being described in the STREET RAILWAY JOURNAL of Dec. 5, 1903.

EMERGENCY CARS

The company has recently fitted up an old car for emergency

work in case of accidents. It possesses several useful features. The car, which is illustrated in Fig. 9, is 26 ft. 2 ins. long and 7 ft. wide, and is mounted on Los Angeles Railway trucks, with a quadruple equipment of 12-A motors. It is provided with an arc headlight and interior incandescents. A special feature of the car is that of the three compartments built in above the floor of the car, with door opening on the outside. These compartments are about 20 ins. high and 4 ft. long, and in them, as shown in Fig. 10, are stored all tools and appliances necessary in blocking up and taking care of a damaged car. In the compartment shown on the left are kept the heavy tools, such as saws, axes, chisels, hammers, jacks, etc. In the middle part is a dolly-truck, for use in case of racked gear, block and tackle, chains, etc. The third compartment contains timbers and blocking materials. The compartments have doors on both sides of the car, and are lighted by incandescent lamps, so that at night the materials may be quickly found. Within the car, as shown in Fig. 11, are a reel of 500 ft. of $1\frac{1}{4}$ in. hemp

Avenue, where are located the power house and three car houses, the repair work also being done there at present. The offices of the superintendent and chief dispatcher are temporarily situated at this point, but will be removed to the new Pacific Electric terminal station at Sixth and Main Streets upon its completion.

For division No. 2, a large car house has just been erected on a tract of land in South Park, near the southern limits of the city. (See map, Fig. 1.) This car house, illustrated in Fig. 12, has a total width of 264 ft., and a total length of 323 ft. The inside dimensions are 257 ft. x 320 ft. The building is divided into four longitudinal bays, each having five tracks, the twenty tracks giving 6400 feet of trackage within the building. Room is thus provided for 160 40-ft. cars. The building is open at both ends, and has brick side walls with heavy pilasters every 20 ft., alternating with light pilasters, between which windows are placed. A wood and iron Fink truss roof, constructed with no purlins and no rafters, covers

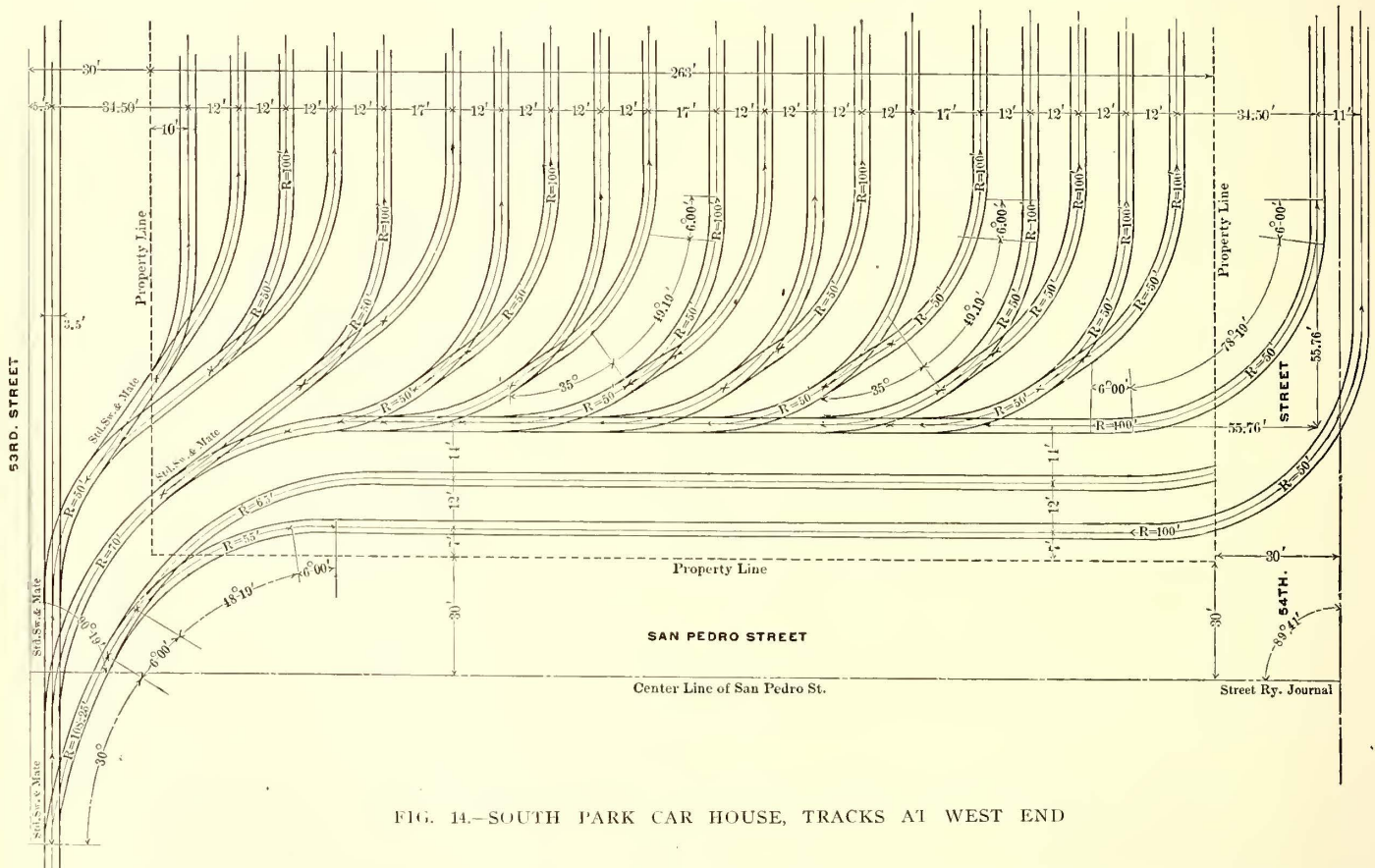


FIG. 14.—SOUTH PARK CAR HOUSE, TRACKS AT WEST END

ropes and tackles for use in moving broken wagons off the track, etc. An oil box with zinc lining is provided for the lanterns and oil cans. Separate cases contain the tools of the day and night crews. The air compressor and tank are located on the compartment floor, there being no room for them beneath the car on account of the short body. The vestibules of the car are inclosed, so the men are protected from the weather. Doors are provided in the front and rear vestibule panels, so poles or large timbers can be loaded on to the car. This car has proved a very useful addition to the wrecking equipment of the company, the outside doors of the compartment being especially valuable, as they allow the minimum amount of handling of the heavy dolly truck and tools. The car is thoroughly gone over and cleaned every day, and is kept in constant readiness for service.

CAR HOUSES

The system of the Los Angeles Railway Company has had a good steady growth during the last few years, and for operating purposes it became necessary to make it into two divisions. The headquarters of division No. 1 is at Sixth Street and Central

the building, 2-in. tongued roof-planks being spiked directly onto the trusses. Alternate louvre windows and ventilators run three-fifths of the length of the building on each side of each roof bay. The inside walls are sprayed with white magnite, which forms a hard and fire-resisting surface. The iron is painted with black asphaltum paint, and all work exposed to the weather with Princess' metallic paint. The roof is covered with P. & B. burlap roofing. A solid pit with 6-in. concrete floor, 4 ft. 6 ins. below the tracks, extends under the whole car house. The car house floor sits on posts without bracing, every post being secured to the concrete floor by an iron dowel pin. This construction allows free access to any part of the pit. All wood used in the building is of Oregon pine.

Access to the car house is had from the east end, and connection will later be made at the west end. Fig. 13 shows the arrangement of tracks in the barn and at both ends, while Fig. 14 is a detailed drawing of the switches at the west end. The company owns a block to the west of the car house, so that an extension could be made to the present building, thus

doubling the car storage capacity. The lines that will connect with this car house are the Vernon, Griffith, Maple, San Pedro, Main, Grand and University lines.

In erecting the special overhead work at the east end of the car house, instead of the ordinary goose-neck hanger, a straight iron bar about 8 ins. long was used, the insulator being bolted to the bar. This construction is less apt to be damaged when trolley poles come off. It may be noticed in Fig. 12, and also in Fig. 16, which is a view of the special overhead and track work at the east end of the car house.

NEW SHOPS

The company has been hampered for some time for lack of proper shop facilities. After the large Pacific Electric shops described in the STREET RAILWAY JOURNAL of March 19, 1904, were completed, practically all of the repair work was done there. Lately, however, those shops have been crowded, and such work as painting, armature repairs and the lighter machine work has been done in the old shops of the Los Angeles Railway Company, at Sixth Street and Central Avenue. Now it has become necessary to have better shop facilities, and plans have been drawn by the engineer of buildings for a group of three shop buildings, which will be nearly as large as those of the Pacific Electric Railway Company. They will be located on the block east of the car house just described. One building, 300 ft. long, 88 ft. wide and 22 ft. high in the clear, will be used as a car repair shop, with an armature-winding room 70 ft. wide, partitioned off one end. Parallel with the shop and 75 ft. from it will be a building 366 ft. long and 88 ft. wide, in which will be located the offices of division No. 2 and of the shops, a storeroom and paint shop. Beyond these two build-

Contracts have already been let for the erection of the first building, and this will be used for general repair work until such time as it seems necessary to complete the others.



FIG. 12.—EAST END OF CAR HOUSE, SHOWING SPECIAL TRACK AND OVERHEAD WORK

ORGANIZATION

The organization of the Los Angeles Railway Company is somewhat different from other companies of its size, so a study of the accompanying organization tree, Fig. 17, will be of interest. The officers of the company are as follows: President, Henry E. Huntington; vice-president, Ch. de Guigne; treasurer, I. W. Hellman; secretary, E. B. Holladay; general

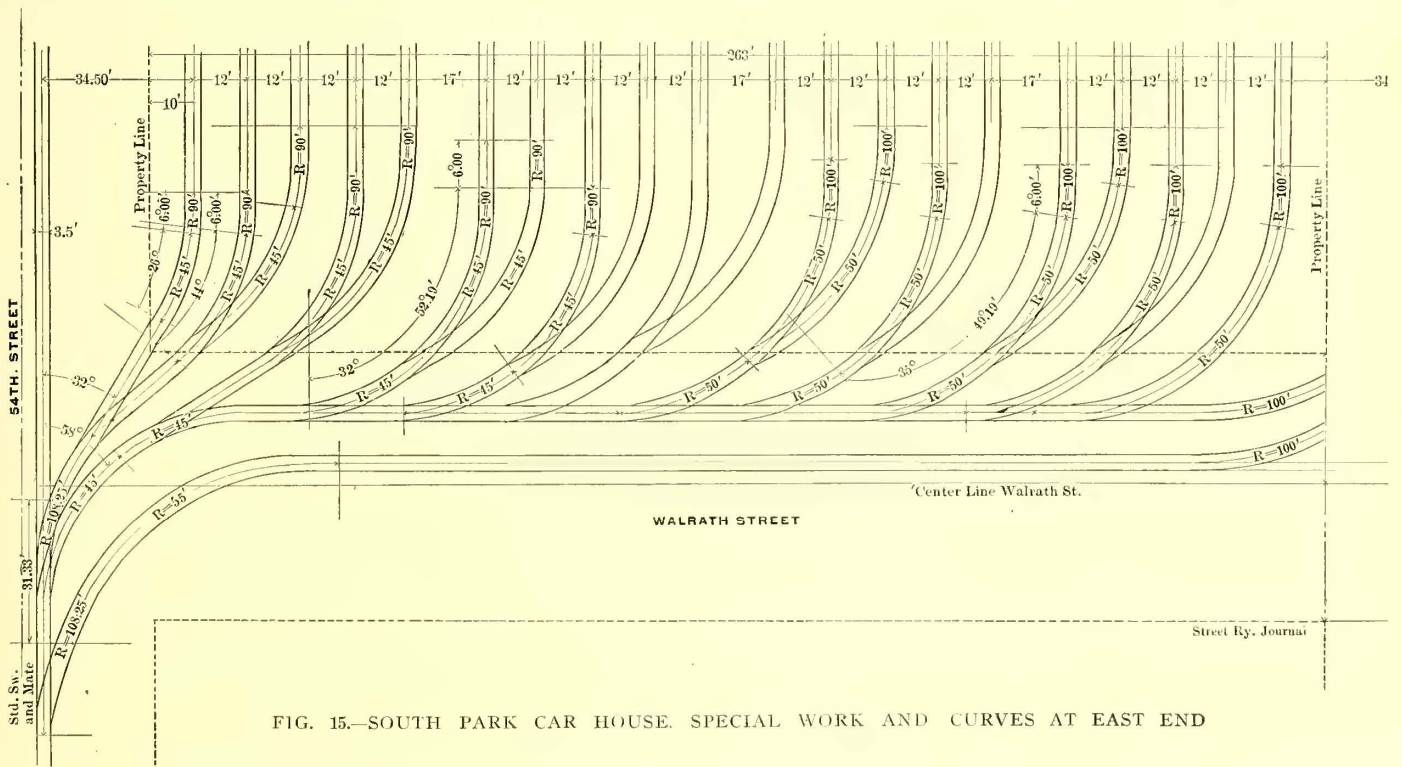
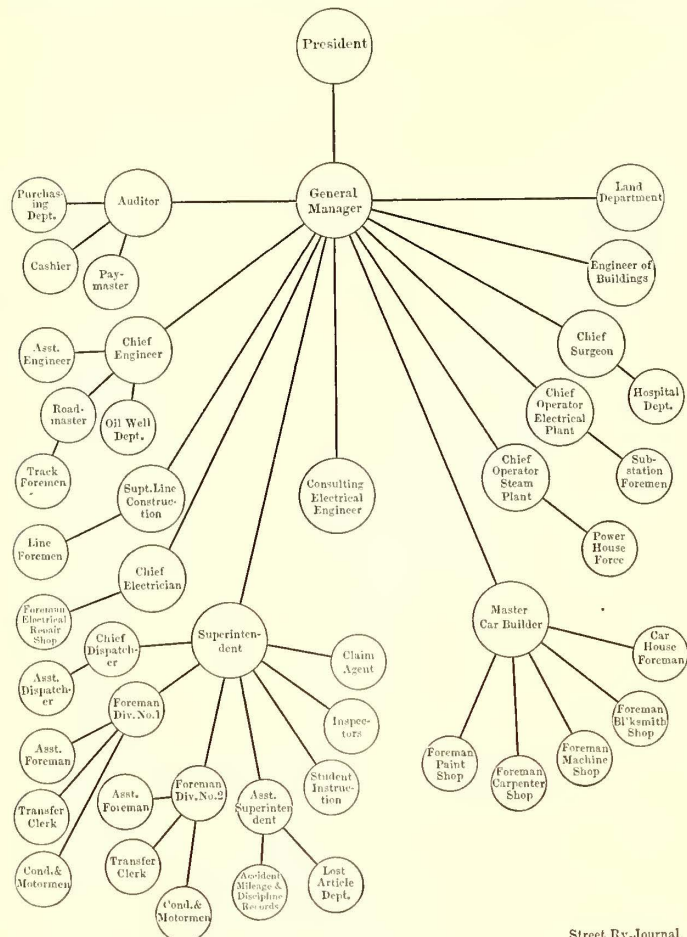


FIG. 15.—SOUTH PARK CAR HOUSE. SPECIAL WORK AND CURVES AT EAST END

ings will be the third, built in the shape of a block letter C, 263 ft. across, and containing the carpenter, blacksmith and machine shops. In the 75-ft space between the two long buildings and between the wings of the end building will operate a 50-ft transfer table. The group of shops will have a total length of 587 ft.

manager, Howard E. Huntington; auditor, C. A. Henderson; superintendent, John J. Atkin; chief engineer, G. J. Kuhlerts; chief electrician, J. L. Clarke; master car builder, E. L. Stephens; consulting electrical engineer, R. S. Masson; superintendent of line construction, C. O. Anderson; engineer of buildings, E. S. Cobb,

In a subsequent issue an account will be given of the different features entering into the operation of the Los Angeles Railway Company's system. This will include a statement of the methods employed and reproductions of the forms used in engaging motormen and conductors, tests by the company's surgeon for physical fitness, manner of securing employees'



Street Ry. Journal

FIG. 17.—ORGANIZATION CHART OF LOS ANGELES RAILWAY COMPANY

references and bonding, details of the practical instruction in car operation given to both motormen and conductors, permanent rules and regulations governing the duties of motormen and conductors and temporary rules regarding such subjects as transfers and rights of way, merit system, wage rates, monthly hospital fees, accident insurance, dispatching methods, mileage reports, claim department methods, and other important details.

CORRESPONDENCE

A SINGLE-PHASE RAILWAY MOTOR

Boston, Mass., March 31, 1904.

EDITORS STREET RAILWAY JOURNAL:

I have read with much interest the additional information given in your last issue concerning the Westinghouse alternating railway motor. I have already gone upon record as a believer in the future of the alternating motor for railway purposes, and I am gratified to learn of the practical steps which are being taken in its development. I am sorry to learn, however, that the present crop of apparatus is being planned for so low a trolley voltage as 1000 volts. It is, of course, true that such a step simplifies the overhead work, but on the other hand, it is not providing high enough voltage of distribution to bring out fully the characteristic advantages of the alternating system. Even as warm a friend of alternating motor systems as I must admit, to be candid, that they have some disadvantages. On the plans of action now under way

the value of the rail return is seriously impaired by the use of alternating current even of the low frequency proposed, and the power factor of the system being only moderately good, there is an abnormal demand for current in proportion to the energy delivered and a certainty of exaggerated drop in the working conductors unless the voltage is pushed up. Between added drop in the overhead wires and the corresponding increase in track resistance, the alternating system must show a good margin of gain in the change for higher voltage on the working conductors in order to make a good economic showing. Undoubtedly the gain in raising the trolley wire pressure from 600 volts to 1000 volts is more than enough to square the game, but whether it is enough to render the game thoroughly attractive is quite another matter.

In the interurban work, where alternating motors are most acutely needed, the working voltage might just as well be pushed up to a point where it would count for more, and the manufacturers are sure to encounter prompt demand for higher voltage which they will be obliged to meet. It might as well be faced first as last.

In the matter of power factor, I regret to see any attempt to raise a cloud of dust in the manner tried by your correspondent. It is decidedly infra dig. on the part of an engineer who evidently understands the real facts, and, moreover, it does no good. A low power factor is per se a bad thing, which may be more or less mitigated by other conditions, but should be taken for what it is—a not unreasonable price for certain very considerable advantages. I am well aware that an increase in power factor may result from increased energy losses, and, in fact, I have an interesting remembrance of a pair of 1-hp induction motors which I once designed and which may serve to illustrate the point. One of them got, quite by accident, some abnormally bad iron, and showed a power factor of .94, if I remember correctly, but a real efficiency of about .72. Its mate had an efficiency of .79, and a power factor of about .80. But it does not follow that a motor of low power factor will be highly efficient. In the case of alternating railway motors, as in other motors, the power factor may be bad for a variety of causes, and the motor of bad power factor may or may not have compensating good qualities. But nothing is gained by attempting to dodge the real issue and by descanting on the possible or hypothetical virtues of motors of low power factor. The fact is that sensible people must realize that by working with alternating motors there are certain important gains to be made, and that the loss of a few per cent in real or apparent efficiency of the motor is a small price to pay for these gains. The day has gone by in which it is necessary to apologize for the especial characteristics of the alternating system. The alternating-current railroad system will stand or fall, not by a change of a few per cent in the apparent energy demanded, but by the qualities of the motor as motors, and by the operative results of the system as a whole.

LOUIS BELL.

VERTICAL MOTOR-GENERATOR SETS AT THE LEND-GASTEIN ALUMINUM WORKS

Oerlikon, Bei Zurich, March 16, 1904.

EDITORS STREET RAILWAY JOURNAL:

Dear Sir—In your issue of March 5., you are so kind as to publish an article descriptive of the vertical motor-generator sets as installed by our firm at Lend-Gastein. Unfortunately an erroneous statement was made in the article on page 377, where you say, "The motors are of the synchronous type." As a matter of fact, they are non-synchronous. Will you kindly correct this in one of your numbers? The motors have their rotor windings short-circuited upon themselves. The starting of the motor is performed by starting the generators, which are, of course, separately excited.

E. HUBER.

THE EVANSVILLE & PRINCETON TRACTION SYSTEM

The Evansville & Princeton Traction Company is one of the latest interurban lines in Indiana, and the first in the south-western section of the State. It is 28.25 miles in length, and outside of the terminal cities and towns through which it passes is located upon a private right of way, averaging 60 ft. in width.

The population, according to the last census in the towns and townships directly on the route, was 77,141, and in townships tributary, but not directly on the route, 9540, equivalent to about, directly on the route, 1500, making a total population of 78,641.

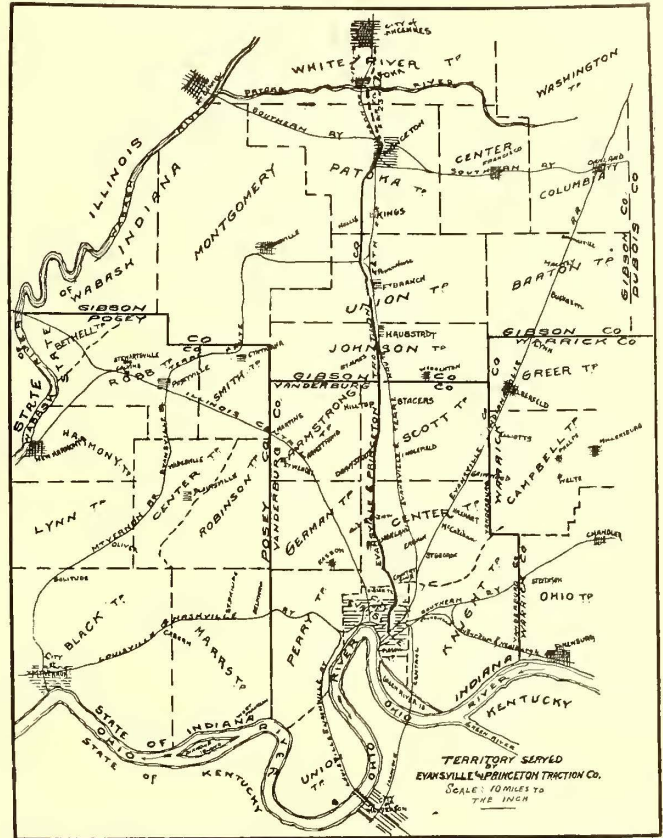
Evansville and Princeton are both growing rapidly, so that 85,000 people would probably be a fair estimate of the tributary population.

ROADBED AND TRACK

The roadbed upon the private right of way is 12 ft. to 16 ft. wide, with slopes on fills of 1½ to 1, and in cuts of 1 to 1. It is wider in the cuts in order to allow for ditching. It is thoroughly drained with open side ditches and cross drains of extra heavy sewer pipe culverts, having concrete bulkheads, large ditches and cattle runs being crossed by timber bridges resting on pile bents. In addition large streams are crossed by either girder or through truss bridges upon concrete abutments. The largest of these is that over Pigeon Creek, shown in one of the illustrations.

The track consists of 70-lb. T-rails, 30-ft. lengths, with 22-in. Weber joints, the joints being staggered. The ties are 6 ins. x 8 ins. x 8 ft., mainly hewn white oak. In Evansville a 7-in. Shanghai rail is used through the paved streets. The car house special work is constructed of 56-ft. T-rails. All spikes are 5½ ins. x 9-16 in. Country sidings have spring frogs and spring switches with long leads. The road crosses the Evans-

All the cross-roads and farm crossings are of plank, placed according to steam railway practice.



MAP SHOWING TERRITORY SERVED BY THE EVANSVILLE & PRINCETON TRACTION COMPANY



4-MILE STRETCH OF STRAIGHT TRACK



VIEW ON THE EVANSVILLE & PRINCETON ELECTRIC RAILWAY

ville belt line in Evansville, and a branch of the Evansville & Terre Haute Railroad north of Fort Branch, and the main line at Princeton, the crossings being of the two-rail type.

The road is at present dirt ballasted, but the company has closed a contract for stone ballast with a concern having a quarry on the line of the road, and in consequence of this contract has installed a thoroughly modern stone crushing plant.

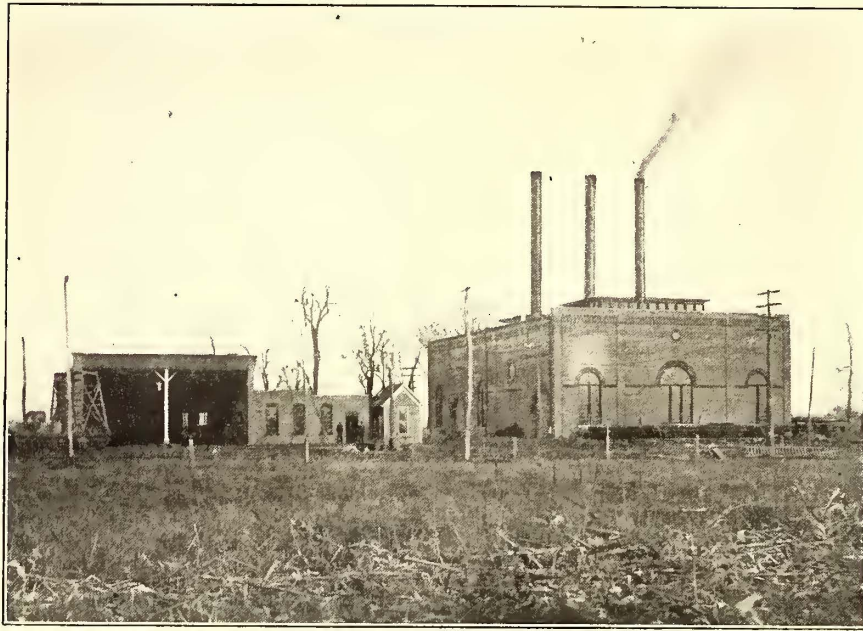
The track is bonded under the joints with No. 000 concealed copper bonds, furnished by the Ohio Brass Company.

LINE CONSTRUCTION

Bracket construction is used in the country, span wire construction in the cities and towns. The trolley wire consists of one No. 00 round wire and feeder of No. 0000 W. P. insulated copper, and the high tension of No. 2 copper. The telephone

line is strung upon the same cross-arm as the feeder wire, except along the high-tension line, where it is placed upon oak brackets. Stromberg-Carlson telephones are placed at various

with Westinghouse low-equivalent type of lightning arresters and fuse circuit breakers. The switchboard consists of blue Vermont marble panels with the latest type of Westinghouse switches, circuit breakers, ammeters and voltmeters. Synchronizing lamps are used for throwing in the machines. All high-voltage wire is bare copper, mounted on high-tension line insulators. All wire from the generators, exciters and transformers to the switchboard is lead covered.



GENERAL VIEW OF POWER STATION

points along the line. All overhead material was furnished by the Ohio Brass Company.

POWER HOUSE

The power house, a brick structure, 75 ft. x 104 ft., is located at Fort Branch, adjacent to a creek, where an artificial lake was built for condensing water.

The main units consist of two 400-kw, 360-volt, three-phase alternating current revolving field-type Westinghouse generators, direct connected to two 18-in. x 36-in. x 42-in. Lane & Bodley cross-compound condensing Corliss engines, running at 100 r. p. m. The condensers consist of two 12-in. and 15-in. x 10-in. Worthington jet condensers. The exciting units, which also light the buildings, consist of two 30-kw, 125-volt, 350 r. p. m. Westinghouse exciters, direct connected to two 7 $\frac{3}{4}$ in. x 12-in. Buckeye engines.

In the boiler room there are three 300-hp Stirling boilers, with 48-in. x 80-ft. independent stacks. The pop valves are set for 150-lbs. pressure. In the boiler room there are also two 9-in. x 5 $\frac{1}{4}$ -in. x 10-in. Laidlaw-Dunn-Gordon piston-type feed pumps, and two Wainwright closed feed-water heaters. The exhaust from the condensers and the feed pumps is arranged to pass through the heaters, the exhaust piping and the feed-water piping being by-passed, so that either or both heaters can be used or both can be cut out. All high-pressure piping is extra heavy, long sweep bends being used to allow for expansion. The steam pipe is covered by Johns-Manville asbestos covering.

In the engine room is one 300-kw Westinghouse rotary converter, also three 125-kw, 400-11,000-volt static transformers,

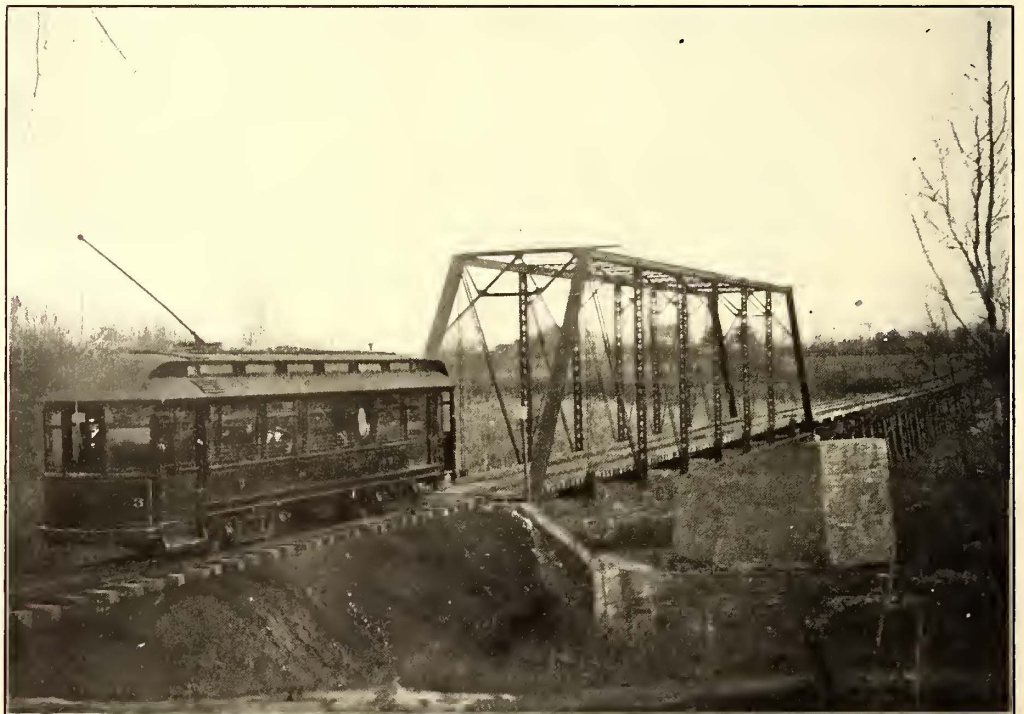
The sub-station and waiting room near Evansville is a brick structure, with tar and gravel floor and concrete floor. The apparatus here is the same in make, size, etc., as that in the power house sub-station.

The car house, 47 ft. x 110 ft., and repair shop, 20 ft. x 50 ft., is also located at Fort Branch, adjacent to the power house and park. It is of brick, with tar and gravel roof, and is to be equipped with 7 $\frac{1}{2}$ -hp motor, emery wheel, shaper, medium sized lathe, drill press, wheel press, grindstone, forge and necessary small tools for a modern repair shop.

There is a small office building for the superintendent adjacent to the car house.

ROLLING STOCK

The rolling stock consists of five interurban passenger cars, one double-truck work car and six single-truck flat cars. One double-truck freight and express car has been ordered. The passenger cars are single end, semi-convertible, combination baggage and passenger, with vestibule. They are 42 ft. 3 ins. over all, and were built by the St. Louis Car Company. The side and end sills are constructed of two 8-in. channels, arranged to allow the window sash to drop between same.



TRESTLE AND BRIDGE ON EVANSVILLE & PRINCETON TRACTION LINE

The cars are mounted on the St. Louis Car Company's M. C. B. type of trucks, and are each equipped with four Westinghouse No. 56 motors, and Westinghouse independent air brakes. They are heated by Peter Smith hot-water heaters, the stove being placed in the motorman's vestibule, and have Ohmer registers, Knutson retrievers and arc headlights. The seats are of the St. Louis "Walkover" type. The cars have a saloon just back

of the baggage partition, with dry hopper and water cooler. The interior finish is mahogany. A view of this car was published in the *STREET RAILWAY JOURNAL* for Dec. 5, 1903.

The work car also has a quadruple No. 56 motor equipment. In addition to the above the company also has two hand cars and one velocipede for track and overhead repairs.

CAPITALIZATION, EARNINGS, ETC.

The company has a capital stock (all common) of \$600,000, and a bonded indebtedness of \$400,000, or \$14,000 per mile.

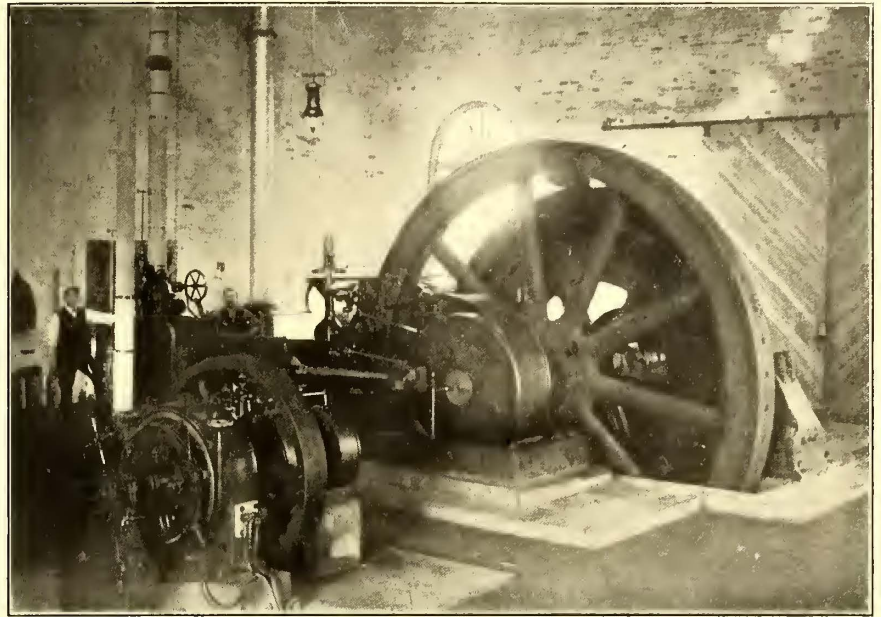
The line was put in operation in the middle of December, was financed by Denison, Prior & Company, of Cleveland, Ohio, 1903, and during the month of January, 1903, the average daily receipts were about \$200.

The rate of fare depends upon the distance traveled. The line is divided into 5-cent zones, and the through fare is 45 cents. The company also sells 500-mile and 1000-mile mileage books at the rate of $1\frac{1}{4}$ cents per mile. school tickets and party tickets, making special party rates. The express and parcel freight business has not yet been fully developed, as the company has not received its express car. This business, however, even under the present conditions, has increased to such an extent as to make it difficult with the combination passenger cars to maintain the schedule. The cars run under an hourly schedule. The officers of the company are: Joseph E. Heston, Princeton, president; Samuel T. Heston, treasurer; E. J. Baldwin, Princeton, secretary; W. L. Sonntag, Evansville, general manager; H. E. Burchfield, general superintendent; H. G. Walker, chief engineer. The consulting engineers of the line were E. P. Roberts & Company, of Cleveland.

It is to be feared that too little attention is being paid by managers generally to the standard rules for electric railway operation adopted by the American Street Railway Association. It is hardly necessary to say that it is useless to get together and formulate such rules if the various companies do not adopt them.

WORK AND EMERGENCY CAR ON ON THE BOSTON ELEVATED

The Boston Elevated Railway Company has for construction and emergency service on its elevated division a car which is



INTERIOR OF POWER STATION

probably the most complete in the country. It is about 40 ft. over all, and is of the gondola type, with a closed compartment at one end. The flat end is for carrying special work, timber, etc., and is provided with a pneumatic jib crane for lifting heavy apparatus to and from the platform. On the open end of the car is a large number of pieces of timber of all sizes.

The inside of the closed end of the work car is divided into three or four compartments. The following are a few of the construction and emergency apparatus carried: Chains of all sizes, each one distinctly marked with its size and length, such as $\frac{1}{2}$ in.—15 ft. long; $\frac{3}{4}$ in.—12 ft. long; troughs for laying over the third rail in the subway or on the elevated structure, so that workmen will not come into accidental contact with it;



PLATE GIRDER BRIDGE

While, of course, technically, there is no obligation on the part of the various members of the American Street Railway Association to adopt standard rules recommended by that body, every company owes to itself, and to the electric railway business in general, to come as near the uniform standard as possible. That the matter has not received more attention since the last convention, we believe to be due mainly to the fact that it is one of those matters that can be put off until a more convenient time, and so gets delayed from month to month, with no action taken. It is, of course, a serious matter to revise all the rules of a road to conform to the rules recommended, but if it is to be done at all the sooner it is done the better.

lumber of various sizes; ropes and tackle of various sizes; all kinds of bars and lanterns; a complete assortment of jacks, including two 30-ton lifting car jacks, six 15-ton Norton jacks, two 10-ton journal jacks, two 8-ton journal jacks, five bridge jacks, two Pearson pulling jacks and two Pearson derailing jacks; a number of portable work boxes filled with tools ready to be taken by the workmen on to the structure or along the subway; two Bell re-railing frogs, and quite a complete assortment of medical supplies, including arnica, medicated cotton and linen for bandages, applications for burns, etc. The work car has also a trail car, which can be used if required, and which is equipped with a 15-ton crane 15 ft. long.

THE ORGANIZATION OF THE OHIO INTERURBAN RAILWAY ASSOCIATION

On Thursday, March 31, a number of interurban electric railway managers met at the Algonquin Hotel, in Dayton, according to a plan which has already been outlined in this paper, to organize the Ohio Interurban Railway Association, a body which promises to occupy an important position in the future development of electric railways of Ohio. The remarkable progress made by electric railway builders in Ohio during the past few years is too well known to require description. Suffice it to say that the development has been carried on with such feverish energy that each promotor has practically ignored his neighbor, and has given no attention to the possibilities of co-operation. Lately, however, there has come a period where operation rather than construction has become the keynote for many of the prime movers in this development, and the desirability of an exchange of opinions and ideas has become apparent.

As outlined several weeks ago in these columns, the initial movement was made at Dayton several weeks ago, although at that time the chief object in view was an agreement for interchangeable mileage for all the interurban lines radiating from Dayton. Several of the bright minds in the movement pointed out the desirability of extending the scheme to all the roads of Ohio and Eastern Indiana, and of the formation of a new State association, which would be to Ohio what the New York and Pennsylvania State associations are to their respective States. An organization was accordingly effected, and the first meeting was called for the time and place mentioned.

While the Dayton meeting was devoted primarily to the discussion of the interchangeable transportation plan, the extent of the attendance and the interest manifest in the above and other topics touched on, indicates that a strong and efficient organization will result. Over sixty railway men, representing about thirty companies, were present at the session and joined the organization.

It was decided to profit by the experience of other associations of this character, and to make the business features predominate, rather than the social features. For the time being, at least, meetings will be held once a month, alternating at the various centers of the State, in order that interest may be awakened throughout the district, and it was decided that only one subject shall be presented and discussed at a time. Each session will occupy a portion of one day, and the subject at hand will be thoroughly thrashed out, and, if possible, some action will be taken at the time. As far as possible, it will be the aim to systematize and standardize methods of construction, maintenance and operation. It was pointed out that the possibilities for co-operation for mutual benefit were almost unlimited. The opportunities for connecting up lines and operating through fast cars from center to center, the desirability of uniformity in freight and express rates and classifications and the interchange of business, the desirability of standard operating rules, and the chances for co-operation in legislation, were among the topics suggested for future discussion and adoption, and these and similar subjects will be taken up at meetings in the future.

The Dayton meeting resulted in the adoption by the majority of the companies represented, of an interchangeable ticket book which will be accepted for transportation over all the roads in the agreement, and if the new Ohio Interurban Railway Association never effects another tangible agreement, there is little doubt that it will have accomplished something that will tend to stimulate and increase the business of all concerned. The subject was thoroughly discussed in all its phases, and the form of coupon book which was finally adopted, was the result of the combined experiences of interurban managers

from all over the district. The best evidence of this was the fact that while the original committee, composed largely of men from the immediate vicinity of Dayton, presented a sample form of coupon book, which they believed was thoroughly acceptable, the discussions in the open meeting resulted in the adoption of a book which differed in nearly every clause from the original book, and that too without a dissenting vote in any case.

It was the consensus of opinion that the interchangeable book would result in the securing of business from a class that has heretofore largely patronized the steam roads on short hauls as well as long—the commercial traveler. Most traveling men buy the steam road interchangeable mileage, and by reason of having this mileage they take the steam train rather than pay cash to electric roads, despite the fact that the latter give more frequent service and lower rates than the steam roads. With an interchangeable book, good on all the roads in the district, and selling at a reasonable price, it is figured that much of this class of business can be secured by the electricians. The new book will be particularly advantageous for representatives of jobbing houses that cover all the small towns within a limited radius of such centers as Cleveland, Toledo, Cincinnati, Dayton and Columbus. Heretofore it has been impractical for such houses to take advantage of the reduced rates on electric roads because they could not afford to buy mileage books on all the roads in their district, but with an interchangeable book the advantages will be obvious. It is not the intention to have the interchangeable book supplant the various forms of commuters' books sold by the various lines, and these will be sold as heretofore to the regular patrons whose requirements they have answered.

The meeting was called to order at 2:25 p. m., by President Harry P. Clegg, who delivered the following address of welcome:

Gentlemen: It gives me great pleasure to greet you here to-day on the occasion of the launching of the Ohio Interurban Railway Association. That this craft is assured a long, successful and useful career upon the seas of utility is of a certainty forecast by the many favorable auguries attendant upon this ceremony. The excuse for our existence, the reasons for our being, are best answered by calling to your attention the spontaneity with which we sprang into existence.

Upon the first occasion of the gathering together at Dayton of any considerable number of men engaged in interurban work, and with the idea of arriving at uniformity in the minor matter of an interchangeable mileage book, the many other subjects that would facilitate operation, and that could be advantageously handled and agreed upon, became so apparent to the representatives of the various properties gathered here that it needed only the suggestion of Mr. E. C. Spring to crystalize this organization then and there into existence. We simply came into being by reason of the necessity existing for such an organization, and we lay no claim to originality, either in the inception of the idea or to our plans for carrying out the same.

Our ground work may have its faults, but we have endeavored to steer clear of them by providing that our deliberations should be as untrammelled by red tape as it was possible to have them, and at the same time provide sufficient regulation to be business-like.

Our constitution recites that the objects of this association shall be to promote knowledge upon all matters relative to the construction, operation and management of interurban railways and their equipment, to promote the interchange of traffic, and to encourage social relations amongst its members. It is intended to embrace all matters that it would be of interest and advantage to us to consider, and provision has been made for amplifying the purposes of this organization if it is deemed advisable.

We are inviting you here to-day to join us in sharing its advantages, in increasing its influence and in broadening its scope.

How many times have we all heard from our patrons these suggestions, with variations: "You traction men ought to get together and arrange this and determine that or standardize the other." We all knew that it would be greatly to our benefit to do these things, but the majority of us have been so engrossed with details pertaining to construction, our properties being

very largely of recent development, or we have been so occupied with other and more pressing matters that, although we recognized the need of this organization, we permitted the formation of it to be deferred.

Let us, however, endeavor to counterbalance the tardiness with which this step has been taken with such prompt, active and effective work that the fruits of our efforts will make us wonder how we managed to accomplish anything in the past without the assistance and advantages of this organization.

We are here to-day for the purpose of furthering our mutual interests and safeguarding the traveling public's interest by getting together and acting together in all matters which it will be of mutual interest for us to consider; and that this will of necessity tax us for the exercise of our broadest and most indulgent views upon the matters presented is an all apparent fact.

I wish, therefore, that this indulgence first be exercised in considering the Ohio Interurban Railway Association, its officers, its aims and its ideals.

It must not be regarded as the exponent of any single interest, or any set of interests, but ever be the champion of and reflect the express wishes and desires of the whole body; that its deliberations should be conducted with the utmost fairness is, therefore, essential. We gladly extend to the supply men the full privileges and opportunities of our organization, knowing well that there will be no unseemly advantage taken by reason of it.

The dignity and lofty purposes that should be the attributes of that business, which, as was said at the last convention of the American Street Railway Association, has more to do with and more intimately concerns the private life, the private necessities and the private conveniences of the citizens than any other business, should prevail.

Let us not lose sight of that fact, and let it be the anchor that will prevent our drifting into frivolity, for a wasting of time that will lead to vain regrets.

President Clegg stated that he had the resignation of Mr. Boyer, one of the members of the executive committee, and that there would, therefore, be a vacancy to fill. Mr. Spring moved that the secretary be instructed to cast the ballot for F. J. J. Sloat, of the Cincinnati, Dayton & Toledo Traction Company, to fill the vacancy. This motion was seconded, put to vote and carried.

The president then called upon Mr. Merrill, chairman of the committee on Interchangeable Mileage, for his report.

Mr. Merrill read the report of the committee, and reported that up to date twelve companies had signified their willingness to become parties to the agreement. It was decided to consider the agreement clause by clause. Mr. Merrill stated that the book cover was to read as follows:

Form No..... Book No.....
Interchangeable Coupon Ticket.
Sold by.....Railway.

Good between all stations on the interurban electric lines mentioned below.

Good only for the individual use of persons whose signature appears on contract and when officially stamped by selling agent and subject to all the conditions named in contract. Signature to contract must be made in ink.

Care should be taken to keep the coupon strips in their original folds within the cover for the convenience of the conductor in tearing coupons. Read all conditions and notices hereon.

Days of the month, name of the month and year to be printed on margin providing for two-year limit.

Mr. Adams, of the Toledo, Fostoria & Findlay Railway Company, suggested the addition to the words "good between all stations" on the interurban lines mentioned on the face of the cover of the words "or hereafter added."

Mr. Merrill stated that this clause appeared in another place in the book, but thought the suggestion a good one to have on the face of the cover "or which may hereafter be bulletined."

Mr. Adams then asked whether the book could be used by more than one person. In the discussion on this point Mr. Fravel, of the Dayton & Western Traction Company, said that the companies could readily add to the number of persons who may use a book, but to start out he thought they should feel their way cautiously.

Mr. Spring, of the Dayton, Covington & Piqua Traction Company, said that one member of the committee had reported to him that on several roads out of Dayton the abuse of mileage good for more than the individual has been very extensive. For instance, one man going over the road met a half-dozen drummers and took them along on his mileage book, the road getting only the reduced rate, whereas it would otherwise have reaped the benefit of the individual rate of fare. This is but one objection to the unlimited number entitled to the use of mileage books.

Mr. DeWeese, of the Dayton & Northern Traction Company, Mr. Lang, of the Dayton & Western Traction Company, Mr. Sloat, of the Cincinnati, Dayton & Toledo Traction Company, and others, also expressed their opinion that the interchangeable book should be made good for one person only.

Mr. Stebbins, of the Appleyard system, said of the references to the book being a mileage book were erroneous. The book contains five-cent coupons instead of mileage coupons, and Mr. Stebbins said this was a great advantage, as in this way each road can charge its own mileage rate, one road charging one rate, another another rate. He also discussed the question of the number of coupons to be contained in the book, and the discount to be allowed by its purchase over the local fare.

After considerable discussion it was voted that the book should be good for one individual only.

Mr. Merrill stated that the next provision on cover of book provided for a two-year limit. After some discussion on this point, Mr. Anderson, of the Dayton & Xenia Transit Company moved that the limit of the book be one year. The motion was seconded, put to vote and carried. It was then decided to incorporate in the book \$12.00 worth of coupons and sell it for \$10.00.

Mr. Merrill then read the wording of the agent's stub as follows:

AGENT'S STUB

To be filled out and detached by selling agent and forwarded to the auditor's office with his daily report.

Interchangeable Coupon Ticket.
\$12.00 for \$10.00.
Good only for use of

.....
Sold at Station.
..... 190...
This book expires....., 190...

There was a discussion on the elimination of the word "daily" from the words "with his daily report." It was argued in favor of doing so that on some roads the agent makes returns monthly, and this plan would permit each road to continue its present practice. It was decided to omit the word "daily."

Mr. Merrill then read the audit check, which was adopted as read.

Mr. Merrill then read Clause 1 of the contract, as follows: "This cover, when accompanied with coupon strip, all of which must be attached to cover in consecutive order, entitles the purchaser whose name appears as signature to this contract, to transportation over any of the electric railways herein mentioned and will be hereafter bulletined, providing the signature on back of coupon, made in the presence of the conductor, agrees with signature affixed to contract."

Mr. Lang called attention to the importance of providing that the coupon strip should also bear the same serial number as the cover, so that a passenger could not substitute some other strip in his cover.

Mr. Gunn, of the Appleyard system, stated that the interchangeable Central Traffic Association book contains this contract: "The cover of this mileage is of no value except as part of the strip bearing the same serial number."

Mr. Anderson, of the Dayton & Xenia Transit Company,

moved that the wording be changed to read: "This cover, when accompanied with coupon strip, which must bear the same serial number as the cover to which this strip must be attached in consecutive order, entitles the purchaser, etc." This wording was adopted.

Mr. Merrill then read Clause 2 of the contract, which was adopted as read.

Mr. Merrill then read Clause 3, as follows: "Mutually agreed that if this reduced rate ticket is presented by any other than the original purchaser, or if the conductor demands the surrender of the ticket and payment of full fare, said ticket to be surrendered and application for rebate made on company from whom the original purchase was made. No attempt to be made with the object in view of adjusting differences with the conductor."

There was some discussion as to whether these clauses might not provoke lawsuits in case the signature given to the conductor was not identical with that on the book.

Mr. Lang moved that the wording be changed to read as follows: "It is mutually agreed that if this reduced rate ticket is presented by any other than the original purchaser, or if for any reason the conductor demands the surrender of the ticket and payment of full fare, then said ticket shall be surrendered to the conductor, who shall issue his receipt therefor, and application for rebate shall be made to company from which the original purchase was made, but no attempt to adjust differences with the conductor shall be made."

The motion was seconded, put to vote and carried.

Mr. Merrill read Clause 4 of the contract, which was adopted as read.

Mr. Merrill then read Clause 5, as follows: "Conductor will detach sufficient number of coupons to cover local fare on his train.

Mr. Lang moved that the language of Clause 5 be altered to read: "Conductor will detach a sufficient number of coupons at their face value to cover the local cash fare on his train."

The motion was seconded, put to vote and carried.

Mr. Merrill then read Clause 6, as follows: "This ticket admits of checking baggage only in accordance with the rules of the road over which it is being used."

This clause was adopted as originally read.

Mr. Coen, of Lake Shore Electric Railway Company, said that they had recently discussed with their attorneys the subject of damage on account of lost baggage, and the latter had said that posting bulletins in waiting rooms specifying a maximum damage for which the company will be responsible is not sufficient, but that every ticket on which baggage can be checked, must contain a contract, giving the specification. He therefore recommended the addition to Clause 6 of the words "Provided that in case of loss or damage to any baggage checked under the terms of this clause, the liability of the company responsible therefor is hereby agreed to be not in excess of \$50."

This motion was seconded, put to vote and carried.

Mr. Merrill then read Clause 7 of the contract.

Mr. Lang moved that the opening of this clause be changed to read: "This ticket is good, etc."

This motion was seconded, put to vote and carried, and the clause as thus amended was adopted.

Mr. Merrill then read Clause 8 of the contract, which was adopted as read.

Mr. Merrill then read Clause 9, which was changed to Clause 10, and, on motion of Mr. Fravel, the following words were added thereto: "I have read all the conditions of the above contract and hereby accept the same. (Contract must be signed in ink.)"

Mr. Lang then moved the adoption of the following as Clause 9: "In selling this interchangeable coupon book over the

lines of any company, the selling company acts as agent only, and assumes no responsibility beyond its own line."

The motion was seconded, put to vote and carried.

Mr. Clegg suggested that in view of the other matters before the association, the matter of the notification to conductors, and the arrangement between the various roads as to how the coupons should be handled, be referred to the Transportation Committee to be appointed by the chair, with authority to act.

The motion was seconded, put to vote and carried.

As amended, the book will read as follows:

BOOK COVER

Form No. Book No.

Interchangeable Coupon Ticket.

Sold by..... Railway.

Good between all stations on the Interurban Electric Lines mentioned below and hereafter bulletined.

Good only for the individual use of person whose signature appears on contract and when officially stamped by selling agent and subject to all conditions named in contract. Signature to contract must be made in ink.

Care should be taken to keep the coupon strips in their original fold within the cover for the convenience of the conductor in tearing coupons. Read all conditions and notices hereon.

Day of the month, name of the month, and year to be printed on the margin providing for one year limit.

AGENT'S STUB

To be filled out and detached by selling agent and forwarded to the Auditor's office with his report.

INTERCHANGEABLE COUPON TICKET

\$12.00 for \$10.00

Book No.

Good only for individual use of

Sold at..... Station.

....., 190..

This book expires..... 190..

AUDIT CHECK.

Interchangeable Coupon Ticket.

Book No.

This to be used for signature of purchaser.

Sold at..... Station.

....., 190..

Expiration date punched in margin of cover,

The conductor will take up this audit check upon first presentation of ticket, and return same to audit office with his other collections.

CONTRACT NO.

1. This cover when accompanied with coupon strip which must bear the same serial number as the cover to which this strip must be attached in consecutive order entitles the purchaser whose name appears as signature to this contract to transportation over any of the electric railways herein mentioned, and will be hereafter bulletined, providing signature on back of coupon made in the presence of the conductor agrees with signature affixed to contract.

2. Failure on part of conductor to note discrepancy in signature on coupon does not forfeit selling company's privilege to demand surrender of ticket at its option.

3. It is mutually agreed that if the reduced rate ticket is presented by any other than the original purchaser, or if for any reason the conductor demands the surrender of the ticket and payment of full fare, then said ticket shall be surrendered to the conductor, who shall issue his receipt therefor, and application for rebate shall be made to company from which the original purchase was made, but no attempt to adjust differences with the conductor shall be made.

4. All coupons will be null and void unless attached to cover in same consecutive order as originally purchased and good only when torn by conductor in the presence of the passenger.

5. Conductor will detach a sufficient number of coupons at their face value to cover the local cash fare on his train.

6. This ticket admits of checking baggage only in accordance with the rules of the road over which it is being used, provided that in case of loss or damage to any baggage checked under the terms of this clause the liability of the company responsible therefor is hereby agreed to be not in excess of \$50.00.

7. This ticket is good over lines heretofore mentioned for one year from date of purchase. No rebate will be allowed for unused portion of ticket at expiration of time limit as punched on margin.

8. Minimum fare to be collected limited to ten cents.

9. In selling this interchangeable coupon book over the lines of any other company the selling company acts as agent only and assumes no responsibility beyond its own line.

10. I have read all the conditions of the above contract and hereby accept the same.

.....
(Contract must be signed in ink.)

The meeting was then opened for general discussions, and several gentlemen were called upon by the chair for suggestions of topics for future consideration.

F. W. Coen, treasurer of the Lake Shore Electric Railway, described the progress his company has made through the recent introduction of limited through cars from Cleveland to Toledo, and dwelt at some length upon the possibilities of such service between other centers. Referring to the article on this subject recently published in the *STREET RAILWAY JOURNAL*, he pointed out the remarkable increase of earnings per car mile shown by the limited cars. He predicted that the expansion of the limited through service idea in connection with the interchangeable coupon books adopted by the association would have the effect of securing for the electric roads much of the business of commercial travelers.

Mr. Wilcoxon, superintendent of the Western Ohio Railway, stated that his company had just perfected an agreement with the Dayton & Troy Electric Railway for the operation of through limited cars between Lima and Dayton. Mention of this arrangement is made in another column of this issue.

Edward C. Spring, superintendent of the Dayton, Covington & Piqua Railway Company, was called upon as the practical founder of the new association to give his ideas as to the best methods of carrying out the aims of the organization. Mr. Spring reviewed briefly the constitution of the association, and advocated frequent meetings to keep up the interest and effect tangible results. He suggested that for the time being, meetings be held every month, to alternate in various centers of the State, and that but one subject be discussed at a time. He stated that the executive committee had decided on this course. He urged that all present make personal appeals to their own companies and to neighboring roads to secure a large membership for the association. He advocated that each road make an effort to have at least one representative present at each meeting, and he stated that the executive committee had decided to select topics for discussion which would be timely and of great interest and value to every operating company in the State.

Theodore Stebbins, director

of the Appleyard system, pointed out the good results obtained by the New York and Pennsylvania State associations and the New England Street Railway Club. He advocated that the Ohio organization profit by the experience of others and confine its sessions strictly to business, rather than having extended programs given up in a large measure to frivolities.

J. M. Morgan, president of the Cincinnati, Toledo & Detroit Short Line, a proposed road, advocated that one of the first essentials



EDW. C. SPRING

of the association be a committee on legislation, and the united effort of all members to correct some of the obnoxious measures that now hamper the development of interurban properties. He pointed particularly to the action of steam roads in refusing to exchange freight business with electric roads, and cited the case of the Toledo & Western Railway, which is handling standard freight cars by electric locomotive, but whose business, he stated, is being hampered by the inability to interchange cars with the connecting steam roads.

George S. Davis, of the *STREET RAILWAY JOURNAL*, was asked to give some figures relative to the growth and extent of the interurban business in Ohio. His remarks were in brief an outline of the article on Ohio Electric Railways published in the March 12 issue of this paper. Replying to Mr.

Morgan's statement that the freight business on interurban roads was being handicapped by the inability to interchange with steam roads, Mr. Davis ventured the opinion that as soon as the electric roads commenced to originate any substantial amount of car load business, there would be no difficulty in inducing the steam roads to interchange. As a matter of fact, while the steam roads claim to have no intercourse with the



PRESIDENT CLEGG



SECRETARY MERRILL

Toledo & Western, Mr. Davis stated that foreign steam road cars are handled almost every day on this road, and Toledo & Western cars have been sent to all parts of the country. Recently 125 car-loads of a certain article were shipped from a point on the Toledo & Western to an eastern city without change of cars. The electric road has no direct dealings with the steam roads because the cars are handled through Toledo by the Toledo Terminal & Belt Railway, a steam belt line, and then delivered to the steam roads, and in this way every steam line running out of Toledo is defeating its own alleged boycott against the electric road. The Cincinnati, Georgetown & Portsmouth Railway, of Cincinnati, which to all intents and purposes is an electric line, interchanges car-load freight business with steam roads and its freight and express cars are hauled into the center of the city by the Pennsylvania Railroad locomotives. As instances of the exchange of passenger business between steam and electric roads, Mr. Davis stated that during the summer months the Wheeling & Lake Erie (steam) sells thousands of tickets from points along its line to Lakeside, a resort reached by the Lake Shore Electric Railway. At Springfield, the Erie Railway (steam) has an arrangement whereby all passengers for Springfield are transferred to the city over the Dayton, Springfield & Urbana Railway.

CONVENTION NOTES

The next meeting of the Ohio Interurban Railway Association will probably be held in Cleveland about the first of May. This point is deemed suitable because it is desirable to secure a larger membership from northern and eastern Ohio.

Walter H. Abbott, consulting engineer for the Pomeroy-Mandelbaum properties, was scheduled for a paper on "Steam Turbines," but at the last moment he was unable to attend. Mr. Abbott's work in this line has been fully described in recent issues of the *STREET RAILWAY JOURNAL*. The paper will be presented at an early meeting.

Thursday noon the supply men headed by H. B. Gay, of the Electric Storage Battery Company, and Harry N. Ransom, of the National Electric Company, entertained the street railway men at an elaborate luncheon in the banquet hall of the Algonquin Hotel.

Thursday evening, through the courtesy of E. B. Gunn, of the Appleyard system, the delegates enjoyed a trip in a special car to the main power station of that system, located at Medway, 20 miles from Dayton. The power station, which

is one of the largest and most modern interurban stations in Ohio, was fully described in the *STREET RAILWAY JOURNAL* of May 23, 1903. The delegates were much interested in the trip of inspection.

Friday morning a number of the railway men accepted an invitation from the National Cash Register Company to inspect its famous manufacturing plant, an establishment which has the reputation of being one of the finest in the country.

The Dayton interurban lines issued orders to accept the badges of the Association as transportation to all points, and quite a number of the delegates took advantage of the opportunity to inspect the lines of the magnificent system centering at the Gem City.

President Harrie P. Clegg, Vice-President Edward C. Spring and Secretary-Treasurer J. H. Merrill worked like Trojans to make the first meeting a success, and no one was more agreeably surprised than themselves at the splendid attendance and the interest evidenced.

The following is a list of the charter members of the Ohio Interurban Railway Association:

ELECTRIC RAILWAY MEN

S. F. George, president Cincinnati, Dayton & Fort Wayne Traction Company, Dayton.

F. A. Ferneding, superintendent Dayton & Xenia Traction Company, Dayton.

C. N. Wilcoxon, superintendent Western Ohio Railway Company, Lima.

C. F. Smith, general manager Toledo, Bowling Green & Southern Traction Company, Findlay.

Richard Emory, general manager Appleyard properties, Columbus.

C. A. Black, president Detroit, Monroe & Toledo Short Line, Toledo.

Howard B. Arnold, auditor Dayton & Northern Traction Company, Dayton.

F. J. J. Sloat, general manager Cincinnati, Dayton & Toledo Traction Company, Cincinnati.

C. E. Hooven, general manager Cincinnati, Lawrenceburg & Aurora Railway, Cincinnati.

J. M. Morgan, president Cincinnati, Toledo & Detroit Short Line, Toledo.

T. E. Howell, superintendent City Railway Company, Dayton.

F. D. Carpenter, general manager Western Ohio Railway Company, Lima.

A. W. Anderson, superintendent Dayton & Xenia Traction Company, Dayton.

F. W. Adams, general manager Toledo, Fostoria & Findlay Railway, Fostoria.

J. R. Harrigan, general manager Columbus, Newark & Zanesville Traction Company, Newark.

E. J. Rauch, superintendent Canton-Akron Railway Company, Canton.

F. J. Green, president Springfield & Xenia Traction Company, Springfield.

George W. Rounds, general manager Canton-Akron Railway Company, Canton.

John L. Bushnell, president Springfield, Troy & Piqua Traction Company, Springfield.

H. C. Dimond, secretary Springfield, Troy & Piqua Traction Company, Springfield.

William Glaney, assistant superintendent Dayton & Northern Traction Company, Brookville.

R. W. Deaver, auditor Dayton & Western Traction Company, West Alexandria.

Howard Fravel, superintendent Dayton & Western Traction Company, West Alexandria.

J. M. Parker, general superintendent, Springfield & Xenia Traction Company, Springfield.

H. C. Lang, secretary, Western Ohio Railway Company, Cleveland.

Theodore Stebbins, director Appleyard system, Columbus.

Albert Emanuel, attorney Dayton, Covington & Piqua Traction Company, Dayton.

O. F. Ehring, chief clerk to general manager Appleyard system, Columbus.

W. J. Canada, electrical engineer Appleyard system, Columbus.

Dennis Dwyer, president Dayton, Covington & Piqua Traction Company, Dayton.

W. E. Ralston, superintendent Dayton & Troy Railway Company, Tippecanoe City.

R. A. Crume, assistant superintendent Dayton & Troy Railway Company, Tippecanoe City.

O. H. Murlin, auditor ticket receipts Dayton & Troy Railway Company, Tippecanoe City.

Frank M. Nusbaum, chief engineer Dayton & Northern Traction Company, Brookfield.

J. Yorty, chief engineer Dayton & Xenia Traction Company, Dayton.

J. R. W. Gregg, chief electrician Dayton & Xenia Traction Company, Dayton.

W. A. Grim, chief engineer Urbana, Mechanicsburg & Columbus, Columbus.

R. E. DeWeese, superintendent Dayton & Northern Traction Company, Dayton.

C. Kline, assistant superintendent Dayton, Covington & Piqua Traction Company, West Milton.

E. B. Gunn, general superintendent Dayton, Springfield & Urbana Railway Company, Springfield.

B. M. Brown, superintendent Columbus, London & Springfield Railway Company, Columbus.

R. M. Graham, chief engineer Dayton, Covington & Piqua Traction Company, West Milton.

J. S. Harshman, president Appleyard system, Springfield.

W. S. Lasure, road master Appleyard system, Fairfield.

J. R. Randall, general manager Southern Ohio Express Company, Dayton.

R. D. Colburn, superintendent motive power Dayton, Covington & Piqua Traction Company, Dayton.

J. O. Arnold, president Dayton & Germantown Traction Company, Dayton.

Adam Anweiler, superintendent Piqua City Line, Piqua.

R. H. Carpenter, general passenger agent Western Ohio Railway, Lima.

F. B. Mason, chief engineer Western Ohio Railway, St. Marys.

J. H. Merrill, purchasing agent Western Ohio Railway, Lima.

Harrie P. Clegg, president Dayton & Troy Railway Company, Dayton.

Fred W. Coen, treasurer Lake Shore Electric Railway, Cleveland.

Edward C. Spring, general superintendent Dayton, Covington & Piqua Traction Company, West Milton.

W. A. Black, treasurer Columbus, Delaware & Marion Railway, Columbus.

SUPPLY MEN

A. L. Wilkinson, general sales agent Ohio Brass Company, Mansfield.

C. F. Wickwire, special representative Ohio Brass Company, Mansfield.

John F. Ohmer, vice-president and general manager Ohmer Fare Register Company, Dayton.

E. B. Grimes, assistant vice-president and general manager Ohmer Fare Register Company, Dayton.

W. E. Hinmon, special representative Ohmer Fare Register Company, Dayton.

W. D. Riddell, consulting engineer, Riddell & Son, Xenia.

George K. Cretone, special representative Newcastle Bridge Company, Dayton.

George F. Lewis, special representative Viscosity Oil Company, 134 West Ninth Avenue, Columbus.

William L. Bloomer, manager Bloomer Bureau Publishing Company, Columbus.

George E. Fischer, president and treasurer Fidelity Construction Company, Atlas Hotel, Dayton.

Eugene H. Farr, manager Farr & Boylus Company, Chicago.

C. W. Chamberlain, Dayton, president Board of Trade.

E. C. Welfeck, Jr., Salesman Keasby & Matison Company, Cincinnati.

H. B. Gay, manager Cleveland office Electric Storage Battery Company, Cleveland.

B. C. Butler, agent American Brake-Shoe Company, Columbus.

E. L. Van Winkle, Salesman for Post-Glover Electric Company, Cincinnati.

Judson Pratt, local manager Valveline Oil Company, Cincinnati.

Edward B. Wright, general manager Sheridan Coal Company, Dayton.

Henry N. Ransom, National Electric Company, Cleveland.

E. C. Spencer, Dayton Manufacturing Company, Dayton.

Clem V. Jacobs, Street Railway News, Cleveland.

Will I. Ohmer, Recording & Computing Register Company, Dayton.

J. E. Gimperling, Jr., William B. Scaife & Sons Company, Dayton.
 F. C. Peck, salesman, Standard Brake-Shoe Company, Chicago.
 F. M. Randle, representative American Stoker Company, Erie, Pa.
 George S. Davis, STREET RAILWAY JOURNAL, New York, Cleveland.

SINGLE VERSUS MULTIPHASE GENERATORS IN ALTERNATING CURRENT RAILWAY WORK

BY W. A. BLANCK

The present great interest in the development of alternating-current railways makes most timely some considerations as to the selection of the generators delivering the energy to the system, particularly the choice between single and multiphase machines.

If the road to be equipped with the alternating-current system

power house is located at the center of the line, which is divided into sections, as the case may determine. These sections are separated by suitable insulators, and arrangements are provided for readily connecting them by jumpers in case of emergency. A simplification of these cases is also shown in corresponding figures designated 2, 4 and 6, where the rail is used as a common return for both primary and secondary circuits. It will be noted that in case this is done with the three-phase generators, Fig. 6, 34,000 volts must be delivered to the bus-bars in order to maintain 20,000 volts between the transmission line and the grounded neutral.

In Fig. 1, using a single-phase system, it is necessary to install double-pole switches on the transmission line both in the power house and sub-station. Normally the static strain between the transmission line and ground will be half of the impressed voltage.

In Fig. 2, with a single transmission line, it is only neces-

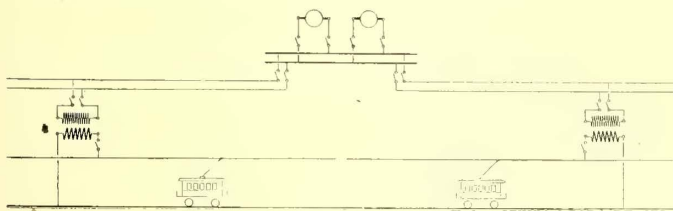


FIG. 1

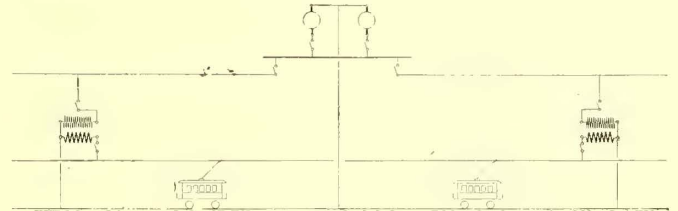


FIG. 2

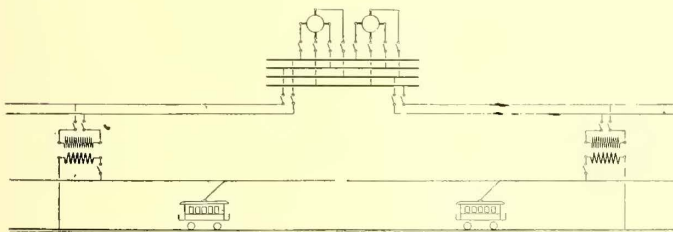


FIG. 3

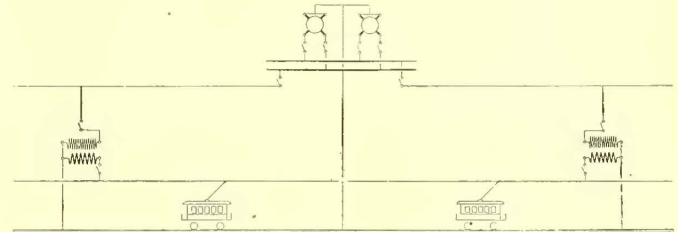


FIG. 4

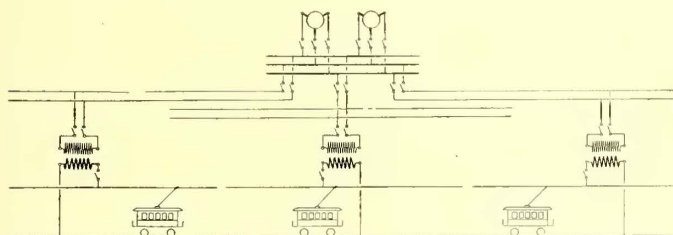


FIG. 5

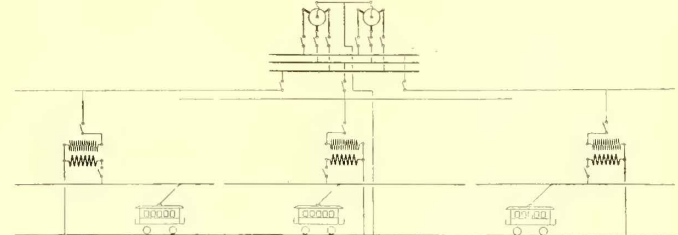


FIG. 6

tem takes its current from a power house in which polyphase apparatus is already installed, it would be natural to supply the various sections of the line from the different phases of the generators. However, in case of an entirely new installation, the use of single-phase generators may be more advantageous, notwithstanding the greater cost of the single-phase as compared to the multiphase generator of equal capacity. Some of the relative merits of the two systems will now be considered.

For the purpose of discussion, three typical cases have been chosen, shown by Figs. 1, 3 and 5, using one, two and three-phase generators. In each case, 20,000-volt generators are assumed to feed directly into the high-tension bus-bars, thus simplifying the diagrams by the omission of the step-up transformers. High-tension switches connect the bus-bars to the transmission lines leading to the stated sub-stations. In the sub-stations are installed the step-down transformers, with primaries connected to the transmission line by high-tension switches. Single-pole switches are inserted between one side of the 3000-volt secondaries and the trolley wire, while the other side and the transformer case are tied to the rail. The

sary to use single-pole switches in all primary circuits, thus affecting a very material saving in the expense of high-tension switches as well as a saving of 50 per cent in transmission line copper and insulators. It will be noted, however, that this arrangement subjects the transmission system and transformers to the full static strain of the impressed voltage. This will call for somewhat greater care in insulation of the transformers, and will continuously subject the insulators of the transmission line to a higher strain. The decreased number of insulators, with the corresponding decrease in points at which failure can occur, however, tends to counterbalance the somewhat more rigorous requirements.

Should it transpire that one line is grounded in Fig. 1, the system can still be operated until such time as repairs can be made, while in Fig. 2 such a failure would necessitate the shutting down of that particular transmission line. This condition, however, is exactly analogous to that of a star-connected three-phase system now so generally operated with a grounded neutral.

When the system depicted in Fig. 1 is in normal operation, the adjacent sections are at the same potential, and the section

insulators are subjected to no strain whatsoever, while if one section is shut down the insulator will have to withstand the full trolley potential of 3000 volts.

Should any one section of the transmission line, or any one sub-station be put out of commission, it is possible by use of the jumpers mentioned above, to feed the disabled trolley section from each of the adjacent sections, thus maintaining service without excessive drop.

A very important feature in the operation of this system is the fact that the full generator capacity is available at any point on the system, thus making it possible to take care of any lack of balance in the distribution of the load, due to the congestion of traffic at any point of the system.

In Fig. 3 the use of two-phase generators is considered. This will be most advantageous when applied to a system consisting of a single line with the power house located at the center. Current will be supplied to one end of the system from one phase of the generators, while the second phase feeds the other end.

In comparing the Figs. 3 and 4, the conditions are exactly similar to 1 and 2, so far as the saving in switches, copper and insulators and the static strains are concerned. However, a noticeable difference exists so far as operation is concerned. Since the adjacent sections are fed by different phases, the section-insulator must stand 4200 volts when in normal operation. In case one section of the transmitting system is disabled, current can be supplied by means of jumpers only from the adjacent sections supplied by the same phase, which will result in double the drop due to similar occurrence in case 1. Since the section of the system fed by the different phases must be entirely separated, this arrangement does not provide for an unbalance in load so well as in Fig. 1. In fact, only 50 per cent of the generator capacity is available on either section, a point of considerable importance in practical operation.

In Fig. 5 the application of three-phase generators to the single-phase system is considered. This arrangement is best adapted to a railroad system consisting of main line and branch, with the power house located at the junction, since it will then be possible to feed the sections without necessary overlapping of the transmission lines. Again, similar relations hold between Figs. 5 and 6 as between Figs. 1 and 2, so far as the saving in switches, copper and insulators and the static strains are concerned. The insulators separating sections fed by different phases have to withstand 5200 volts, as compared with the 4200 volts in Fig. 3. The same limitation in feeding any section of the trolley from its adjacent section in case of a disabled transmission line hold as in Fig. 3. So far as available generator capacity for any section is concerned, the two cases are materially different. In Fig. 5, due to the delta connection, it is possible to utilize 66 per cent of the generator capacity on any section, whereas, in Fig. 6, with the star-connection, only 33 per cent of the generator capacity is available on any one section.

It is evident that, on account of the high potentials, section insulators must be of considerably greater length than those now used on the low-voltage trolleys; making them approximately from 4 ft to 6 ft. in length. This will have a very appreciable effect on the lights when the car passes the section insulator, as well as presenting the difficulty in starting which would arise should the car come to rest under the insulator. Moreover, the arcing due to the interruption of the current with the high voltage trolley is apt to prove serious.

All these difficulties can be overcome in Fig. 1 by the use of two trolley bows, one mounted over each truck of the car. Since these will more than span the insulator, the current will not be interrupted, thus materially improving the operation of the system.

This arrangement with the two bows can only be applied

in Fig. 1, as in Figs. 3 and 5 it would not be permissible to short-circuit two sections fed by different phases.

A metallic telephone circuit system installed on the same poles as the grounded high-tension line will be subjected to higher static strain and greater inductive action than in the case of the ordinary transmission line. The effect of induction can be overcome by frequent transposition of the telephone wires. To guard against shocks due to static strains, care must be taken to provide perfect insulation for the telephone instruments, as well as for the person using the 'phone.

From the foregoing discussion, it appears that it will be entirely possible to use two and three-phase generators now installed to furnish power for single-phase systems, but that the difference in potential between sections and the small generator capacity available on any section are serious obstacles to the satisfactory operation with this arrangement.

Where entirely new apparatus is to be installed, it is undoubtedly better to use single-phase generators. Their first cost is somewhat greater, but the system is far more flexible in its stability to handle unbalanced load conditions, and with the double bow trolley, gives perfect continuous service over section insulators.

While the suggestion to use rail as common return for both high-tension and trolley circuits is a radical departure from current practice, it does not involve greater risks for personal injury or the continuity of the service than in the ordinary three-phase system with grounded neutral. The immense advantages of simplification and decrease in the expense of the transmission system, most imperatively bespeak for this feature most careful consideration.

The Cleveland & Southwestern Traction Company has adopted the method of operating cars in use on steam roads. Cars run on schedule, and calls for orders are made only when a car is five minutes late. All telephone booths and stations have been equipped with Egly automatic registers, which record all orders received by the crews. The company considers this plan of great advantage, as it fixes the responsibility in case of mistakes or accidents.

* State Statistician Johnson, of Indiana, says that the dearth of farm hands in that State is due to the rapid development of the interurban electric railway. The uncertain hours of farm work, it seems, cause men holding permanent places to give up their jobs in order to assist in building an electric railway, and then permanently to abandon their former line of work if a position as motorman or conductor is available, or they can secure any other berth.

Under a lease which expires 1096 years hence, the Chicago & Milwaukee Electric Railroad Company has secured from John Alexander Dowie the right to extend a line through Zion City. According to the terms "said lease is to expire 3000, A. D." The reason given for granting a lease instead of a purchase is that it is forbidden "to sell the property of God."

John D. Rockefeller has made a contract with the Cleveland & Southwestern Traction Company for delivering to his summer home at Forest Hill, near Cleveland, a large amount of fine washed gravel for making roadways and walks in his private park. Rockefeller purchased a gravel bank at Wellington, 45 miles from Cleveland, and the material will be screened and washed and delivered to Forest Hill in bags. It will be handled at night, as it will be necessary to traverse Euclid Avenue, Cleveland, for a distance of 7 miles over the tracks of the Cleveland Electric Railway.

ST. LOUIS THE CONVENTION CITY

As stated in the editorial columns of this issue, a decision to hold the 1904 convention of the American Street Railway Association at St. Louis, was reached at the meeting of the executive committee of the association held at that city on March 26. The selection of a place for holding the convention was very thoroughly considered at the meeting of the executive committee in New York on Feb. 29. There were arguments in favor of St. Louis, but it was determined to make no ultimate decision until after a personal inspection by the members of the committee of the hotel, convention hall and other facilities afforded in St. Louis.

At the meeting in that city it was found that the World's Fair management would designate October 12 as "American Street Railway Association Day," thus making it one of the formal days of the Exposition. They also promised the Association their cordial co-operation in making the meeting a success in every respect, and also placed at the disposal of the association for its meetings "Recitation Hall," which is in the great building known as "Festival Hall," and is located in the central part of the grounds. For the meetings of the subsidiary associations they offered smaller halls in the same building. As October is a very attractive month in St. Louis, it was decided to accept these offers and designate Oct. 12 and 13 as the days of the convention. It was also proposed to make the entire week commencing with Monday, Oct. 10, one which would offer special attractions to street railway men, and to this end it has been suggested that the American Railway, Mechanical and Electrical Association should hold its convention on Monday and Tuesday, Oct. 10 and 11, and that the Street Railway Accountants' Association should hold its meetings on Friday and Saturday, Oct. 14 and 15. The annual banquet will be held on Thursday evening, Oct. 13. The place of holding this banquet has not yet been selected.

The Southern Hotel has been designated as the headquarters of the association. There are a large number of other hotels, however, many of which were personally inspected by the executive committee. Among them was "The Inside Inn," which is the large building erected within the Exposition Grounds for the accommodation of visitors, and which will undoubtedly be patronized by a great many people. The secretary of the association is now preparing a circular which will give such information as will enable any person by the exercise of a little care, to be well located during "Convention Week" at the Fair. The association will also send to all members before the meeting, a book giving the names of every hotel and lodging house in St. Louis, their location and the rates per day and week, and will exercise every endeavor to have all attendants at the convention well cared for. Assurances were also secured from leading hotels in regard to rates, and were regarded as very satisfactory.

The program for the meetings of the American Street Railway Association has not yet been fully decided upon, but Prof. W. E. Goldsborough, chief of the Department of Electricity, has consented to address the association on its first meeting upon the Exposition and those exhibits which will be of particular interest to the delegates.

The meeting of the executive committee at St. Louis was attended by two representatives of the Supply Men's Committee and by a representative of the Street Railway Accountants' Association.

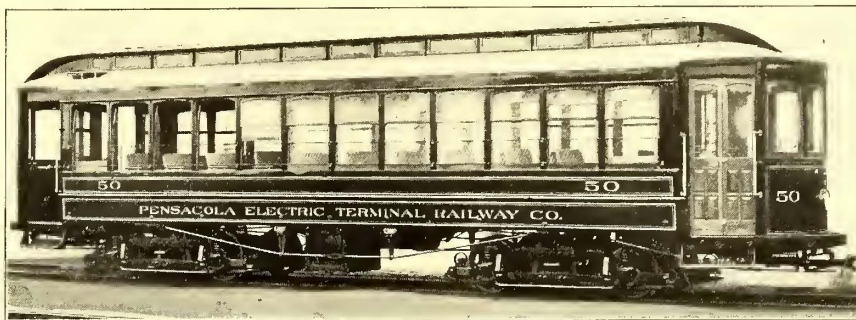
As a result of its trip to St. Louis, the executive committee is very enthusiastic as to the accommodations at St. Louis for the convention and the prospects for a successful meeting,

and in this opinion they will undoubtedly have the hearty assent of the great majority of the members of the association.

INTERURBAN CAR FOR THE PENSACOLA ELECTRIC TERMINAL RAILWAY

The Pensacola Electric Terminal Company, of Pensacola, Fla., has lately received from the J. G. Brill Company the car shown in the accompanying illustration. The large windows, which are opened at the rear, and the low window sills show that it is of the builder's well-known semi-convertible type. The car, which is mounted on No. 27-E-1 trucks with four 25-hp motors, will be run on a fast schedule between Pensacola and Palmetto Beach, a popular and fashionable wintering resort. Pensacola has a large transient population, and is well known as one of the largest lumber markets in the country, and has also a considerable export trade in fish and fruit. Its fine harbor is shared by a United States Navy Yard, and the shipping is extensive.

The car seats forty-eight passengers, the seats being 35 ins. long, leaving the aisles 28 ins. wide. Cherry in natural color



INTERURBAN CAR FOR PENSACOLA ELECTRIC TERMINAL RAILWAY COMPANY

and birch ceilings comprise the interior finish. The corner posts are $3\frac{3}{4}$ ins. thick, and the side posts $3\frac{1}{4}$ ins. The arms are of special design, and are arranged so as not to block the window lifts. Removable net window guards extend from corner post to corner post and give ample protection to passengers. The car body measures 33 ft. 4 ins. over the panels, and 42 ft. 9 ins. over the vestibules; from panels over vestibules, 4 ft. $8\frac{1}{2}$ ins.; width over sills, 8 ft. $2\frac{1}{2}$ ins., and over posts at belt, 8 ft. 6 ins. The platform timbers are reinforced with angle-irons and angle-iron center-knees extend to crossings inside the body bolsters. The side sills are 4 ins. x $7\frac{3}{4}$ ins., with 12 ins. x $\frac{3}{8}$ in. steel plates on the inside, to which the bases of the posts are secured. The needle beams are double-trussed, and substantial under trusses are anchored at the body bolsters. The end sills are $5\frac{1}{4}$ ins. x $6\frac{7}{8}$ ins. Brill sand-boxes, angle-iron bumpers, "Dedenda" gongs, conductors' gongs, ratchet brake handles and channel-iron radial draw-bars are included in the equipment. The wheel base of the trucks is 6 ft. 6 ins., and the diameter of the wheels, 30 ins. The trucks have solid forged side-frames, to which the transoms are secured with double and single corner brackets forged from single billets.

The fiftieth anniversary of the advent of the first street railway in Philadelphia was celebrated on April 4. It was on that day, in 1854, that the Philadelphia & Delaware River Railroad was chartered. The road built by this company was equipped with ten dummy engines and a few horses and mules. About 3 miles of track were operated, and less than 150 men were employed.

The Indiana Railway Company, which has lines connecting South Bend, Mishawaka, Elkhart, Goshen and Niles, Mich., has announced a raise in rates amounting to 15 to 20 per cent. between all points except South Bend and Mishawaka.

ALL STEEL RAILWAY SUBSTRUCTURE

A section of track 135 ft. in length, in which the rails are laid on a curved steel channel or stringer, has been laid on Forbes Street, in Pittsburg, and views of it are shown in the accompanying engravings. The construction is the invention

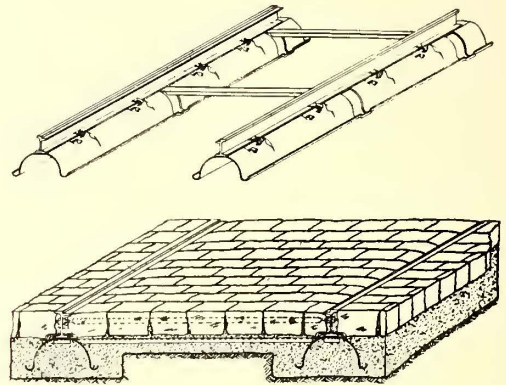


ALL STEEL STRUCTURE ON EXPOSED TRACK

rail, is then thrown into the girders from the ends and packed into place and the tie-pieces are inserted and act as spaces to maintain the required gage.

When enough girders and tie-pieces have been laid, the rails are placed on them, care being taken to have the rail joint about the center of the girder on which it occurs. The rail clips are then inserted. These clips are all alike except those used at the rail joints, where they have to be slightly altered on account of the interference with the angle-bar rail splice.

The ballast is then completed by tamping under the sides of the girders whatever is required to give them firm and even bearing. While the tamping is being done the track can be brought to the required alignment and elevation. The ballast is then placed between the girders and outside of them,

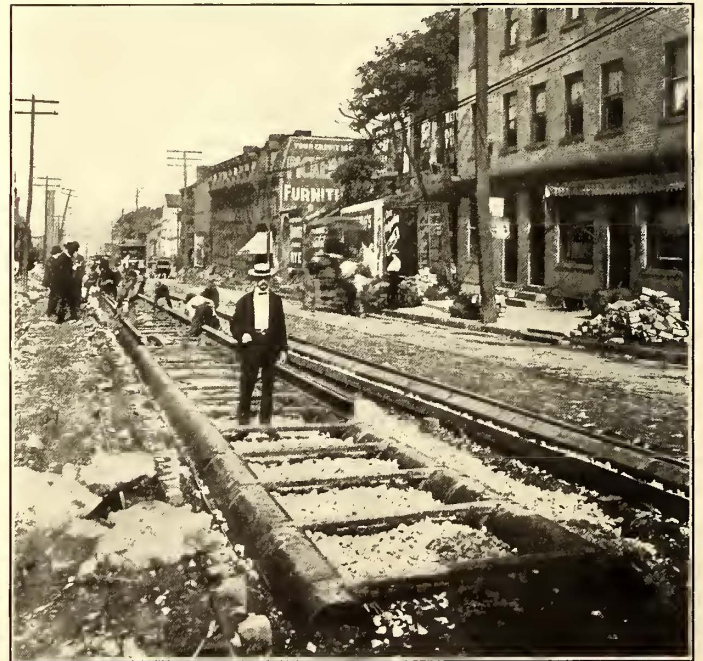


SECTIONS OF STEEL RAILWAY STRUCTURE

of Samuel E. Duff, superintendent of the Riter-Conley Manufacturing Company of Pittsburg, and is termed by him "Railway Substructure."

The system consists of three parts, girders, tie-plates and clips, the latter for holding the rail to the girders. The girders are 7 ft. 6 ins. long, or one-quarter of the ordinary length, and rest on a broken-stone or gravel ballast, which

and the paving can be laid. The weight of the substructure for steam railroad work per linear foot of track, that is for two rails, of the girders with tie-pieces and clips, is 110 lbs. per ft., while the weight of the street railway design is 80 lbs. per foot complete. It is thought, however, that these weights can be decreased, as the tests show that the structure possesses unnecessary strength.



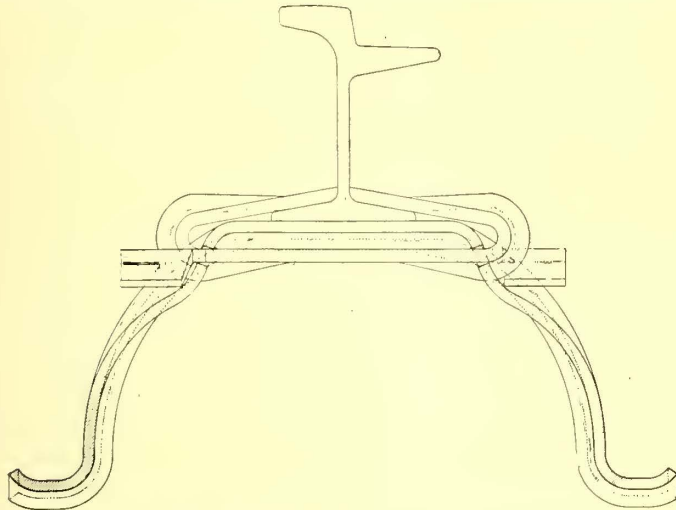
VIEWS OF FORBES STREET, PITTSBURG, SHOWING METHOD OF LAYING STEEL TRACK STRUCTURE IN PAVED STREET

is prepared as in wooden cross-tie construction, although it is not necessary to excavate to the full depth for the entire width of the roadway.

The ends of each succeeding pairs of girders are lapped over the ends of the immediately preceding pair by means of a slip joint. The broken-stone ballast, which is used under the

If a concrete foundation is desired, it can be employed, as the form of the girders is such that the shocks of the passing traffic are taken up by the top of the steel girders and are not transmitted directly to the concrete. It is thought that there will be less trouble in breaking of concrete than when the rails are laid directly on the concrete. It has also been

found that it is not necessary with either concrete or broken-stone ballast to fill the inside of the girder completely in order to obtain sufficient bearing power. With concrete the inventor recommends that a space of about 2 ins. should be left unfilled under the top flange of the girder, thus allowing a uniform deflection to take place as the moving loads pass over the rails



CROSS-SECTION OF RAIL AND SUB-STRUCTURE

and avoiding any interference with the clips that hold the rails in place.

As the clips are not held fast in the ballast or concrete, they can be removed at any time by simply straightening out the ends and driving them back through the slots in the girders. As they are annealed, this can be done a number of times without breaking them. As soon as the clips are removed, the rails can be lifted off of the girders and new ones laid. And as the clips rest against the webs and not the outside of the bottom flange, a new section of rail could be used without great difficulty.

In curves having a radius of over 500 ft. the ordinary straight girders can be used. For curves having a lesser radius special curved girders are employed.

Although the initial cost of the structure would probably be more than that with wooden ties, the manufacturers claim that the system is much more durable, and that the tendency to break down at the joints is eliminated. The expense of laying is comparatively small, as no delicate tools are required, and there is less tamping than with wooden tie construction.

AMUSEMENT APPARATUS FOR RAILWAY PARKS

Coincident with the development of suburban and interurban electric railways there has been a large increase in the number of picnic parks owned and controlled by traction companies. Since, in many cases, this feature is a very important factor in the financial success of a company, it is one that deserves careful consideration whenever the question arises of securing suitable attractions.

Among concerns prominently identified in the manufacture of apparatus for recreation grounds is the Herschell-Spillman Company, of North Tonawanda, N. Y. While this company builds an extensive line, it has devoted particular attention to the development of riding galleries. Its latest models embody many expensive improvements, and are used extensively throughout the country.

The improved gallery has an outside diameter of 40 ft., and is made to revolve by a Norway iron cable passing about the

cable rim situated under the platform, and is so placed that the cable acts as a band to bind the gallery together more firmly. The inner ends of the arms or sweeps are attached to a set of machine-finished hub castings which are fastened to the center pole.

The gallery consists of sixteen strong, accurately finished wheels, running upon a heavy steel track 7 ins. wide; upon these the superstructure is built, consisting of sweeps, horses, chariots, platforms, steps, picture center, image, etc. This gallery is supplied with steel and malleable castings in very many places where cast-iron has always been used, thus reducing the weight and adding materially to the strength and fine appearance of the gallery.

Every part is so designed, constructed and numbered, that in a few hours the entire machine can be taken apart and packed ready for transportation. The gallery can be put together quickly and accurately, requiring only the services of three men.

There are twenty-four horses, four chariots and sixteen chairs with each machine. The building, carving and painting of the horses is done by expert mechanics, who have had long experience in this line of work, thus enabling them to give a very life-like appearance to the horses. Each horse has an easy galloping motion, and there are no iron rods to annoy the rider. The four chariots are of fine design, and will each seat easily four to six people. The chairs are also finely decorated. The entire gallery will seat comfortably fifty-six adults.

Over the gallery is a 50-ft. 8-oz. army duck tent, with substantial side walls. The tent is supported by proper poles, ropes and tackle. Every gallery is also furnished with military band organ fitted with two barrels, each barrel containing eight up-to-date popular selections of music. The organ has a rich, powerful tone, and is supplied with trumpets, piccolos and flageolets.

This gallery is also furnished with a negro or Chinese image, neatly clothed, represented as turning the organ. The construction is such that it automatically, but very naturally, turns its head and bows to the audience whenever the gallery is in motion. The gallery is equipped with a special stud-wheel,



ELECTRICALLY OPERATED RIDING GALLERY

which prevents accidents and saves labor in operating the machine.

The picture center supplied is one piece of canvas, showing a fine continuous oil painting, which is much more convenient to take down and pack for transportation than the old style

center. It is also very much more durable and adds materially to the beauty and finish of the gallery.

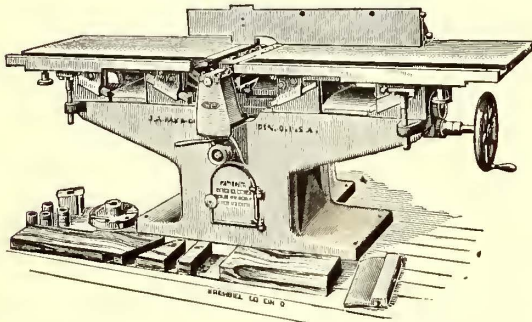
A special engine and boiler are usually furnished with this riding gallery, but if desired, the latter can be arranged for electric drive or any other form of motive power.

The accompanying cut refers to a machine recently installed in a very popular park. This machine differs from the regular riding gallery furnished by this company merely in the matter of a carved picture center on the machine, instead of the oil-painted canvas center. This carved picture center is of the same general design as the front of the organ used on this machine, and there are small mirrors in every other panel. This simply shows one of the many variations that this company makes in its product in the way of beautifying the machine and giving it a far more elaborate appearance.

It will be noticed from the illustration that this machine has a pavilion over it instead of the canvas tent. It is driven by electricity from a street railway circuit, and is handled by one man. The controller box is placed on the machine, and it is, therefore, unnecessary for the operator to leave the machine at any time. This makes a very neat arrangement, and one that is very much appreciated by park managers.

UNIVERSAL WOOD-WORKER

The wood-working machine shown in the accompanying cut has been designed by the J. A. Fay & Egan Company,



UNIVERSAL WOOD WORKER

of Cincinnati, Ohio, to meet successfully the most particular requirements. It will do a variety of work and saves the use of several separate machines, as it does each kind of work to advantage. It is adapted for heavy work, and is especially

Vibration and wear on all parts are lessened by new and ingenious devices, while the different adjustments, change of knives, etc., can be made easily, quickly and accurately.

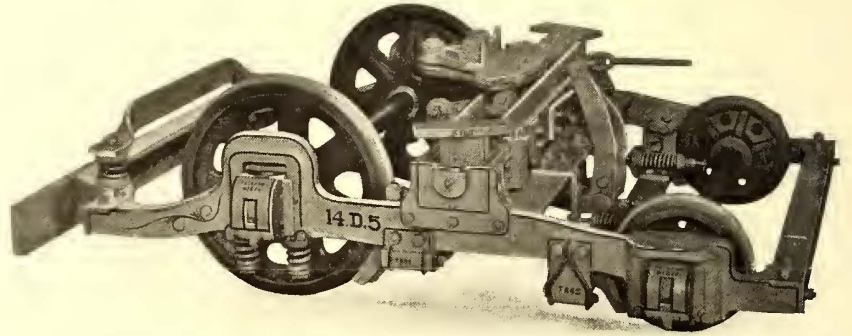
An attachment for boring is mounted at the back of column, having a table and necessary stops to regulate the cuts. A fence is also provided for angle boring, and a table placed on top of the boring table for rotary mortising.

The tables are each 6 ft. long and are planed true. Each has independent vertical and horizontal adjustments, and is easily raised and lowered. The adjustable fence and bevel-rest requires no separate adjusting, as it raises and lowers with the tables.

IMPROVED MAXIMUM TRACTION TRUCK

The Brooklyn Rapid Transit Company has recently ordered 400 No. 14-D-5 maximum traction trucks from the Peckham Manufacturing Company. This type, which is shown in the accompanying illustrations, embodies numerous improvements resulting from extended investigations made by the Peckham Company of the behavior of maximum traction trucks under different operating conditions.

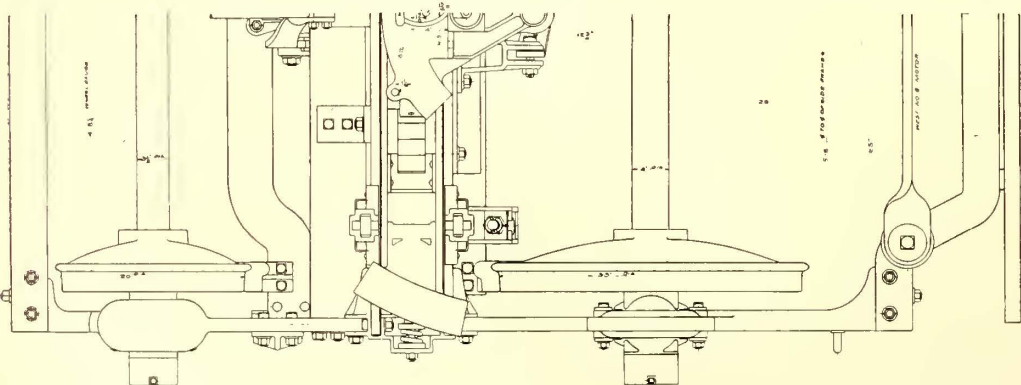
Instead of having the truck frame surrounded only on three sides of the truck, the No. 14-D-5 truck is surrounded on all sides by extra strong, low carbon steel side frames, which are so braced at the ends and center as to keep the truck frame square. The side-frames are provided with flexible spring



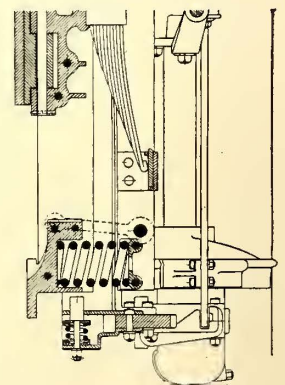
IMPROVED MAXIMUM TRACTION TRUCK FOR HEAVY SERVICE

supports on the journal boxes to prevent crystallization and relieve the truck and car from shocks and concussions when crossing rails and switches.

An important feature of this truck is the center-bearing



SECTIONAL VIEW OF TOP FRAME



CROSS-SECTION THROUGH CENTER OF BOLSTER

recommended for street car shops and where large timbers are worked.

It is made to plane 16 ins. wide, and will plane to advantage out of wind, surface straight or tapering, rabbet and face inside blinds, rabbet door frames, bevel, joint, chamfer, bore, grain, bead, rip, cross-cut, tenon, rout, groove, work circular moldings, and other like work.

swing-bolster, which supports the car body and allows it to swing easily when turning curves. This ease in turning relieves the wheel flanges (especially those of the small wheels) from side strains, thereby preventing derailments and excessive flange wear. This bolster is located so near the center of the truck that the weight of the car body upon the small wheels is sufficient, without the aid of special spring devices, to pre-

vent the small wheels from jumping the track. As the motors are supported outside of the driving axle, the traction is increased and the motors made accessible more easily.

This truck is well suited for short radius curves, owing to the use of a segmental self-oiling swivel plate with a king pin over or near the axle, which permits the truck to swivel on curves with as short a radius as 20 ft.

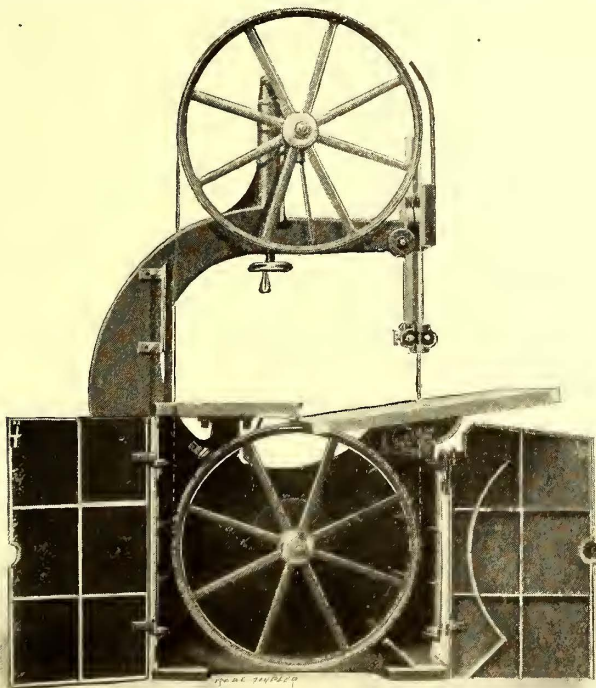
The low end extensions of the side frames prevent coming in contact with open car steps. The flange-shaped end extensions of the side frames, which are machine fitted to correspond to angle-bar cross-sections, prevent the truck from getting out of square. The angle-bar end sections are accurately machine-fitted to end extensions and secured by machined bolts driven into reamed holes. The journal boxes are packed with wool waste and oil.

The brake mechanism is designed to give the proper amount of brake pressure to both the large and the small wheels without the use of adjusting springs. The wear of the brake-shoes can be adjusted simultaneously upon all four wheels simply by turning one bolt. Brake-shoe chattering is prevented by the use of the Taylor non-chattering brake hanger.

The principal dimensions of this truck are: wheel base, 4 ft. 6 ins.; diameter of driving wheels, 30 ins. or 33 ins., and of pilot wheels, 17 ins. to 22 ins.; diameter of driving axles, $3\frac{3}{4}$ ins. or 4 ins., and of pilot axles, $3\frac{1}{4}$ ins. or $3\frac{1}{2}$ ins. The weight of the truck without motors is 5200 lbs. The carrying capacity is 25,000 lbs. per truck, and 50,000 lbs per car.

A UNIQUE BAND SAW

The machine shown in the accompanying illustration has been designed and built by the American Machinery Company, of Grand Rapids, Mich., and Manchester, England, to meet the demands of pattern makers for a first-class band saw. The



A UNIQUE BAND SAW

company builds several sizes of band saws, but the one illustrated, which is called the type "B," is stated to be its best.

The band-wheels of this machine are cast-iron 38 ins. in diameter, carefully turned outside and in, besides having the web between the spokes milled concentric with the rims. Rubber bands or tires of the best quality are vulcanized to the wheels. These light wheels will prevent the breaking of light blades which otherwise break when a machine with heavy

wheels is started suddenly. They are very sensitive and so adjusted in connection with the steel spring cushion that sudden strains and expansion of blades are instantly taken care of.

The work table is 40 ins. long, 36 in. wide, 40 ins. from the floor. It is very generously ribbed and strong, having the necessary throat and slot to disengage the saw. The bracket, which is 11 ins. wide, $8\frac{3}{8}$ ins. long, is bolted to the under side of the table, giving ample bearing and width to carry the table true with the working of the machine. This table can be tilted by a screw and hand-wheel from a straight plane to 45 degs. one way, and 5 degs. the other.

On the left, between the column and the work-table is an auxiliary table which is bolted to the frame. This table is 21 ins. wide and 22 ins. long. It increases the surface of the work-table almost by one-half.

The driving band wheel is entirely enclosed with a casing having two doors. These doors open in the center and swing each way, allowing the operator to put on or remove the saw at his pleasure. This casing is provided with a device whereby the dust is collected and thrown to the front of the machine by the action of the air which the wheel creates, doing away with all the annoyances of piping and encasing.

The bearings upon which the shaft of the driving band wheel is carried through the main frame, have long boxes which reach the entire length, and are designed with an oil-well underneath the entire length of the main bearing. The upper band wheel, or driven band wheel, is carried upon a shaft which is $1\frac{1}{2}$ ins. in diameter and 20 ins. long. The box which carries this shaft is $12\frac{1}{4}$ ins. in length, babbitted with genuine babbitt and split on the side with two screws to compress the box and take up the wear, the end thrust being taken up by a collar upon the end. This shaft is also prepared as the lower shaft for the carrying of the wheel.

The greatest height of cut of this machine is 18 ins. It will carry saws from 3-16 in. to 2 ins. in width. The tension on the saw is taken up by a telescope spring placed on the top of the adjusting screw with one spring of the required weight and elasticity to carry 3-16 in. to $\frac{1}{2}$ in. saws, and a double spring taking the rest of the range of saws from $\frac{1}{2}$ in. to 2 ins. The blades are 20 ft. long; any length between this and 18 ft. may be used. The weight of the complete machine is 2600 lbs.

AMERICAN JACKS FOR SIBERIAN RAILWAY

A contract for a car-load of track jacks has been received from the Russian Government by the Duff Manufacturing Company of Pittsburg, Pa., for use on the Siberian Railway. This railway, and in fact nearly all the Russian railways, have been using the company's Barrett jacks for several years, but this contract is unusually large, as the Siberian Railway is such an important factor in the Russo-Japanese war. The placing of the order with an American firm is especially interesting, as it greatly minimizes the somewhat prevailing belief that Russia did not intend to purchase any American manufactures, but would look to European markets for its requirements. On the same day that the Duff Manufacturing Company received the Russian contract it received an inquiry for a rush order of Barrett jacks for the Japanese railways. It is a peculiar coincidence that the two warring nations should have sent specifications for the same article to the same firm on the same day.

The Boston & Worcester Street Railway has adopted a new schedule of fares between Boston and Worcester, making a single fare either way 45 cents. Return trip tickets may be bought at the rate of 40 cents each way. Of this fare 5 cents is collected by the Boston Elevated Railway, which operates the cars in Boston and Brookline, and 5 cents by the Worcester Consolidated Street Railway, which operates the cars in Worcester.

FINANCIAL INTELLIGENCE

WALL STREET, April 6, 1904.

The Money Market

Such changes as have occurred in the money situation during the last two weeks bear rather on the outlook than on immediate conditions. Rates for money remain the same as they were, call funds being abundantly supplied at $1\frac{1}{2}$ to $1\frac{3}{4}$ per cent, and loans on time easily obtainable at $2\frac{1}{2}$ per cent for sixty days, $3\frac{1}{2}$ for four months, and $3\frac{3}{4}$ to 4 per cent for five and six months. These very low rates reflect the unusually strong position of local bank reserves, the present surplus standing at \$24,000,000, as against \$2,000,000 a year ago. Loans have now been expanded to the unprecedented total of \$1,022,000,000, but the recent increase in the account has been more than offset by the unparalleled figure attained by cash holdings. Several causes have combined to permit the great augmentation of specie and legal tender reserves. Of these the two most important are the Panama Canal operation, which has drawn large amounts of currency from the interior for deposit in New York, and the second the quieting down of interior trade which has enabled the out-of-town banks to keep an exceptionally large balance in this city. The recent loan expansion is explainable partly on the ground of increased activity on the Stock Exchange and partly as the result of the \$50,000,000 Pennsylvania loan, payments on which began last Friday. The one point of doubt regarding the future is the effect of the canal settlements under which this country is obligated to pay some \$40,000,000 to France. Sterling exchange has risen sufficiently to allow a small profit in gold exports, and a preliminary engagement of \$600,000 for Paris was announced on Monday. This, it was generally agreed, is the beginning of a movement which is likely to reach good-sized proportions in the course of the next two months. As to the amount of gold which our bankers will ship, there is wide difference of opinion. Some authorities look for a very heavy drain, placing their estimates as high as \$30,000,000 to \$40,000,000. Other authorities make much more moderate calculations, and contend furthermore that the gold taken for export will be largely offset by the release of Treasury funds contemplated in the Panama financial plan. The situation may be summed up in the conclusion that no immediate rise in money rates is probable, and that whatever advance may occur later on will be slight, owing to the extremely large surplus held by the New York institutions. A feature, however, whose significance cannot be ignored, is the inability of corporations desiring to borrow large sums over long periods to obtain accommodation at anything like the prevailing market quotations. This means that while lenders are perfectly willing and even anxious to put out their funds on approved and readily marketable collateral they are averse to getting any more tied up with loans which cannot easily be converted into cash.

The Stock Market

Interest in the stock market for the last two weeks has converged entirely upon the question of the dissolution of the Northern Securities Company and the consequences it may have for other roads, particularly the Union Pacific. Northern Securities stock has sold on the curb at 100, an advance of 15 points from where it sold when the court decision was handed down a month ago. In the curb dealings also there has been some urgent bidding for Northern Pacific and Great Northern shares "when released." The incident, however, of overshadowing concern has been the enormous purchases of Union Pacific stock on the Stock Exchange, leading to an advance of nearly 20 points from the lowest it sold the day before the Northern Securities opinion was delivered. All manner of conjecture has accompanied this astonishing movement, but at this writing no trustworthy explanation has appeared. The old idea that control of the property is being sought, has been strengthened by the announcement that the Harriman interest has brought suit in the Circuit Court at St. Paul to overthrow the plan for dissolving the merger proposed by the Hill-Morgan faction and to secure a declaration that the Union Pacific is entitled to receive for its Northern Securities holdings the \$72,000,000 of Northern Pacific stock which it first put into the combination. If the Harriman party were to carry its point, the Union Pacific would virtually control the Northern Pacific Company, the Hill-Morgan people would be placed in the position of a minority in Western railroad affairs, and, in short, the whole situation which precipitated the disaster of

May, 1901, would arise again. All this, of course, suggests an obvious motive for a contest for control of the Union Pacific, or at least for the acquisition of a sufficient interest in Union Pacific securities to give rival capitalists a voice in the management of the company. The whole episode, it is quite needless to say, has paralyzed investment activity in the general share list, it has checked whatever disposition there might have been for the outside public to come back into Wall Street, and it has put a restraint upon the general advance in prices.

The traction group, in view of the supreme importance of the railway share dealings, has been forced to take a back seat in the recent market. Some satisfaction was expressed at the lowering of franchise valuations in the estimates for the new year given out ten days ago. But the market for the various stocks scarcely gave much heed to the matter. There has lately been some rather good buying of Metropolitan, on the idea that the stock is selling too low on its merits, and that the short interest created on the recent decline has by no means been fully covered. The inside speculative party in Brooklyn Rapid Transit has made no further effort to advance the price. Left to itself the stock has acted well, and it is in a position to become a trading favorite should the speculation take a shift into a new quarter of the market. Dealings in Manhattan Elevated have been small, and its fluctuations unimportant.

Philadelphia

Dealings in the traction shares in Philadelphia have scarcely made much response to the activity in the general market. The only stock to make any noteworthy gain during the last two weeks is Union Traction, which rose from $48\frac{3}{4}$ to 50, the highest price of the season. Philadelphia Company common has been comparatively active, but shows no net advance for the period. It declined from $40\frac{1}{2}$ to $39\frac{3}{8}$, and then recovered to $40\frac{1}{2}$, subsequently selling at 39, "ex" the dividend. The preferred changed hands at $44\frac{1}{2}$ and $44\frac{1}{4}$. Philadelphia Electric was heavy, rising at one time to 6, but later falling back to 5 13-16. Consolidated Traction of New Jersey sold as low as $62\frac{7}{8}$, and as high as 64. Philadelphia Traction declined from $95\frac{1}{2}$ to 95, and rallied to $95\frac{1}{4}$. A few scattering lots of American Railways were taken at $43\frac{3}{4}$. Small transactions occurred in Fairmount Park Transportation at 24, and Pittsburgh preferred at $48\frac{3}{4}$. One hundred and fifty shares of Reading Traction were dealt in at $29\frac{3}{4}$, down one-quarter per cent from the last previous sale.

Chicago

The receiver of the Union Traction Company has made a proposition to the city for the settlement of the traction muddle on the north and west side lines. He offers that the company, in return for renewal of the franchises, will agree to give the city municipal ownership on six months' notice, pave and light the streets on which the lines run, lower the tunnels, and maintain the best possible street car service, provided the city will pay the tangible value of the property and whatever the court may determine the companies' ninety-nine-year rights are worth in case the city decides to take over the roads. Those who are best informed on Union Traction affairs, say that dividends on the leased lines will, in all likelihood, be passed again. Loss of traffic during the severe winter, together with the loss of cars by fire and heavily increased operating expenses generally are the reasons assigned for the inability to pay the guaranteed rentals. Dealings in the Union Traction group of securities have been light. Three hundred Union Traction common sold at $5\frac{1}{2}$ and ten shares of North Chicago at 71. City Railway advanced sharply from $161\frac{3}{4}$ to $166\frac{1}{2}$ on sales of about 400 shares, the price later receding to 165. Lake Street Elevated receipts dropped from $17\frac{7}{8}$ to $15\frac{3}{8}$, but later recovered to $17\frac{7}{8}$. Metropolitan Elevated common sold at 17. The preferred declined from $49\frac{3}{4}$ to $48\frac{1}{2}$, then rallied to 50, fifty shares selling at the higher figure. Fifty shares of Northwestern Elevated common changed hands at $17\frac{1}{2}$, and an odd lot of the preferred at 45. Three hundred Union Elevated sold at $2\frac{7}{8}$.

Other Traction Securities

In the Boston Traction group Massachusetts Electric preferred has been the most active. It rose on fairly large transactions from $72\frac{3}{4}$ to 74, reacting later to $73\frac{1}{2}$. Massachusetts Electric common has been curiously dull around 19. Boston Elevated sold as high as $139\frac{1}{2}$, dropped to 138, then recovered to $139\frac{3}{4}$. West End common was dealt in between $91\frac{3}{4}$ and 92, and the preferred between

110 and 111. Realizing sales in some volume have been reflected in the United Railway issues on the Baltimore Exchange. The income bonds declined from 54 to 52½, the general mortgage 4s from 91 to 90, and the stock from 8 to 7½. Charleston Consolidated Street Railway 5s advanced a point from 84 to 85. Atlanta Street Railway 5s was strong at 105⅞ and 106. City and Suburban, of Baltimore, 5s were in good demand at 113⅞, up to 113½. Other sales comprised Columbus Consolidated Street Railway 5s at 104¾, Lexington Street Railway 5s at 96, and Baltimore Traction convertible 5s at 102½.

Speculation in Miami & Erie Canal Transportation stock was the feature of the trading in Cincinnati last week. The failure to get through the Legislature the bill changing the electric canal-boat towing project to a steam road, resulted in a tremendous slump in this security. Speculators who believed that some plan might still be worked out to make the property valuable, bought freely in the stock, and over 2500 shares changed hands with a range of from 1½ to 3¾, the latter the closing price for the week; one lot of 1000 shares sold at 2, the middle of the week. The demand for Cincinnati, Newport & Covington common and preferred continued strong. About 400 shares of the common sold at between 30¼ and 30¾, and over 500 shares of the preferred sold at 85½ to 86½. Detroit United sold at 64½ to 65, Cincinnati, Dayton & Toledo at 21, Cincinnati Street Railway at 138, and Toledo Railways & Light at 20½, all small lots.

The only noteworthy feature in the local curb dealings has been the advance in Interborough Rapid Transit on large transactions. A week ago the stock rose from 107⅞ to 108⅞ on sales of 1400 shares. During the last week it went to 110½, reacting later to 110, with sales of 2300 shares. Two hundred New Orleans Street Railway common sold at 9½, and 100 more at 9. Fifty New Orleans preferred went yesterday at 30. The only other dealings were the sale of 1500 Washington Traction preferred from 45 to 44¾, 100 United Railways of St. Louis preferred at 55, and one lot of Syracuse Rapid Transit bonds at 100¼.

Traction were apathetic at Cleveland last week. Cincinnati, Dayton & Toledo sold at 21, a shade in advance of previous sales. Three small lots of Northern Texas Traction sold at 32¾, also a slight advance over previous sales. A small lot of Northern Ohio Traction & Light sold at 15¼, a fractional decline. Cleveland Electric advanced to 75 on a small sale.

Security Quotations

The following table shows the present bid quotations for the leading traction stock, and the active bonds, as compared with two weeks ago:

	Closing Bid	
	March 22	April 5
American Railways	43	43
Aurora, Elgin & Chicago (preferred).....	—	—
Boston Elevated	138½	139
Brooklyn Rapid Transit	43	44¼
Chicago City	*158	—
Chicago Union Traction (common)	6	5
Chicago Union Traction (preferred)	30½	30
Cleveland Electric	73½	72½
Consolidated Traction of New Jersey.....	63	62
Consolidated Traction of New Jersey 5s.....	105½	105
Detroit United	64	64
Interborough Rapid Transit.....	108¼	109
Lake Shore Electric (preferred)	—	—
Lake Street Elevated	13¼	1½
Manhattan Railway	143¼	142
Massachusetts Electric Cos. (common)	19	19
Massachusetts Electric Cos. (preferred)	72	74
Metropolitan Elevated, Chicago (common).....	16½	a17
Metropolitan Elevated, Chicago (preferred).....	a48½	48
Metropolitan Street	112½	113¼
Metropolitan Securities	77	80
New Orleans Railways (common)	9	8½
New Orleans Railways (preferred)	29	29
New Orleans Railways 4½s.....	79	a78
North American	85¼	84½
Northern Ohio Traction & Light.....	14½	14½
Philadelphia Company (common)	40	*38¾
Philadelphia Rapid Transit	14	13¾
Philadelphia Traction	95½	95¼
St. Louis Transit (common)	12	11
South Side Elevated (Chicago)	90½	90
Third Avenue	120½	120
Twin City, Minneapolis (common).....	92	91
Union Traction (Philadelphia)	48½	49½
United Railways, St. Louis (preferred)	54½	52
West End (common)	90	92½
West End (preferred)	109½	110¾

a Asked. * Ex-dividend.

Iron and Steel

The quarterly statement issued yesterday by the Steel Corporation, while showing a very heavy shrinkage in earnings from a year ago, is nevertheless encouraging proof that the corner has been turned in the steel industry. Net receipts turn out to have been over twice as large in March as they were in January. The directors of the company, moreover, have seen fit to continue a full 7 per cent dividend on the preferred shares. The conclusion to be drawn from the report can hardly be otherwise than hopeful as far as the future is concerned. Return to the great prosperity of eighteen months ago is not, of course, to be expected but the worst has evidently been seen of the recent depression, and a fairly prosperous condition is to be looked for during the rest of the season. In the lower branches of the iron industry demand is reported as increasing. Southern makers are well filled with orders for two months ahead, and are taking a moderate amount of additional tonnage. With the Northern makers business is even more active. In the higher branches of the trade the situation is fairly satisfactory, the main blot on the outlook being the hostile attitude of labor in New York City. Quotations are as follows: Bessemer pig iron \$13.85, Bessemer steel \$23, and steel rails \$28.

Metals

Quotations for the leading metals are as follows: Copper 13½ cents, tin 28 cents, lead 47-16 cents, and spelter 5½ cents.

MEXICO CITY TRACTION MERGER

The Compania de Ferrocarriles del Distrito Federal de Mexico, S. A. (the Federal District Railway Company of Mexico), which operates an extensive system of electric traction in Mexico City and suburbs, has purchased the Compania Mexicana de Traction which concern was recently granted concessions for the construction of upwards of 100 miles of track in and around the capital of the southern republic.

The first named enterprise is owned by a British capitalized concern—the Mexico Electric Tramways, Limited, in which the London financial house of Wernher, Beit & Company is the dominant factor. The Wernher-Beit people also control electric traction systems in South Africa, Chili and Portugal. About 120 miles of road are in operation, while concessions have been secured which permit of the building of fully 50 miles more track. According to the last financial statement, the capital of the Mexico Electric Tramways is £1,900,000. Last year some 35,000,000 passengers were carried over the system. The receipts amounted to nearly \$3,000,000 (Mexican). Practically all the material, equipment, etc., is of United States manufacture.

The Compania Mexicana de Traction is controlled by Americans. The capital of the company is \$500,000, subscribed by Pittsburgers. The president of the company, who is now in Mexico City, is M. R. McAdoo, formerly general manager of the Pittsburg, McKeesport & Connellsville Railroad Company. The American board of directors, styled an advisory board, is composed of James B. Oliver, president; Julius Bieler, treasurer; James H. Park, Reuben Miller and Frank B. Smith. These gentlemen, with the exception of Mr. Oliver, are prominently interested in the Crucible Steel Company. The company acquired what are known as the Moylan, Garcia & Reguima concessions, permitting of the building and operating of about 100 miles of line, 50 miles in Mexico City proper, and the balance in the suburbs. These franchises were for the construction of several miles of track running parallel to the Wernher-Beit lines. The company also obtained a concession for the building of about 10 miles of line in Mexico City down past the Chapultepec fortress to one of the most flourishing suburbs. One of the most important features of this franchise is that it gave the company a valuable entrance into the city. The necessary permits have also been secured for lines to traverse the Colonia del Paseo and the Colonia Nueva del Paseo also over the streets of the American colony. The Empresa del Circuito de Banos, a 2-mile horse road, which operates in the heart of the Mexican capital, was also taken over by the American company.

W. W. Wheatley, who recently resigned from the general management of the railway department of the Public Service Corporation of New Jersey, has been appointed general manager, vice Charles Clegg, at the special meeting of the board of directors of the Federal Company, which met in Mexico City last week, when the purchase of the Mexican Traction Company was finally consummated. No official particulars are yet available as to the purchase price. Mr. Wheatley resigned from the Public Service Corporation on Feb. 1, and left for Mexico City about two weeks later. He entered on his new duties April 1.

THE EARNINGS OF THE CLEVELAND ELECTRIC RAILWAY

PARIS LETTER.

(From Our Regular Correspondent.)

President Horace E. Andrews, of the Cleveland Electric Railway Company, has inaugurated a campaign of publicity regarding the business of the company, and has made public the statement of earnings of the company for last year, showing the decrease in earnings caused, the company says, by the decrease in fares and the alleged abuse of transfers.

The statement, as given out, shows only the gross earnings of the company by months. The months during which the company failed to show an increase in earnings were November, December, January and February. Abnormal conditions prevailed, however, during January and February. If the company had been operating on its present ticket rate schedule, it would have scarcely held its own in earnings, not including the extra day of Feb. 29. The growth of the use of transfers after universal transfers with transfer to and from Willson Avenue were adopted was very great.

The table of earnings made public by Mr. Andrews has earnings of both the Cleveland City and the Cleveland Electric Railway Companies compared for the year 1902, and that portion of 1903 prior to consolidations. It is as follows:

	1903	Increase or Dec.	Per cent Increase or Dec.
January	\$360,937.17	\$39,529.90	12.29
February	328,088.92	37,614.92	12.95
March	373,214.21	35,276.87	10.44
April	380,172.91	47,739.25	14.36
May	415,746.05	43,566.14	11.71
June	403,854.20	39,279.60	10.77
July	405,408.48	14,559.87	3.63
August	404,062.29	10,421.43	2.65
September	385,758.73	10,875.38	2.90
October	385,022.55	2,666.48	.70
November	355,822.26	*13,490.56	*3.65
December	362,023.38	*14,419.22	*3.83
First quarter	\$1,062,240.30	\$112,421.69	11.84
Second quarter	1,199,773.16	130,584.99	12.21
Third quarter	1,195,229.50	35,856.60	3.09
Fourth quarter	1,102,868.19	*25,243.30	*2.24
First half	\$2,262,013.46	\$243,006.68	12.04
Second half	2,298,007.69	10,613.38	.46
Total	\$4,560,111.15	\$253,620.06	5.89
	1904	Decrease	Per cent Decrease
January	\$332,090.90	*\$28,537.80	*7.99
February	317,399.37	*10,689.55	*3.25

*Indicates decrease.

The table showing the growth of transfers by months shows the percentage of traction patrons who rode on transfers:

	1903	Per cent
January	10.36	
February	11.90	
March	10.15	
April	14.53	
May	11.74	
June	47.19	
July	76.11	
August	76.30	
September	84.16	
October	70.35	
November	50.54	
December	52.92	
	1904	Per cent
January	45.99	
February	49.70	
First quarter	19.03	
Second quarter	10.75	
Third quarter	24.94	
Fourth quarter	78.63	
Fourth quarter	60.16	

BROOKLYN COMPANY TO INSTALL 5500 KW TURBINE.

The Westinghouse Machine Company has received an order from the Brooklyn Rapid Transit Company for one 750-r. p. m., 5500-kw turbine connected to a 25-cycle three-phase Westinghouse alternator, wound to give either 6600 volts or 11,000 volts. The Transit Company expects to install this set in the proposed extension to its Kent Avenue power station.

Interest in traction affairs in Paris continues to center round the Metropolitan Railway concessions. The company reports that it has carried out, as far as is practicable, the recommendations of the Prefect of Police regarding the improvement in its stations. These recommendations have been embodied in a report made by the Commission appointed after the lamentable accident of August last, which report has not yet been made public. Certain details of the report are evident from the action taken by the Metropolitan Railway. The backs of all seats in the stations have been removed, and the lighting circuit is connected to feeders independent of the circuit supplying current to the tunnels for lighting purposes. This avoids all chances of the station being thrown into sudden darkness by reason of failure of the lighting circuit in the tunnel. In addition large electric signs have been placed showing the outlets from the stations, and oil lamps have been furnished for all stations. Duplicate exits are also to be provided at all important new stations.

The most important station as yet constructed on this system, and also that involving the greatest amount of constructional work, is that at the Opera, and is fast approaching completion. The station consists of three levels, for three different lines, Nos. 3, 7 and 8, respectively. These stations are superposed at depths of 6, 12 and 18 meters from the surface. Although the two lower portions of the station are not far advanced, arrangements have been made that their completion will not interfere with the traffic on the upper story of the station, which is destined for the No. 3 line, called Courcelles-Opera-Place Gambetta.

This line is approaching completion and will shortly be put in service. The equipments have been ordered and are due about the end of June next. This means that public service will be in all probability started towards the end of the summer. The equipments will be of the usual train control system, similar to the Sprague-General Electric system, known in America. Ninety equipments will be furnished by the French Thomson-Houston Company, arranged for two motors of 175-hp each. A novel feature will be the use of double-truck cars of a length of 15 meters. All controlling mechanism is to be mounted in special cabs at the head of the motor cars, which cab will be armored and insulated from the rest of the car. The trains will consist of five cars, the three alternate ones being motor cars, and the second and fourth cars trailers. Special insulated cables will in all probability be used, and the cars will be undoubtedly built of fireproofed wood.

The new Opera station is laid out on very simple lines, the main staircase will have a breadth of 9 m, and the ticket office a superficial area of 324 sq. m. The length of platforms is 75 m and their width 4 m. The station will probably be furnished with elevators between the three levels, this being the first Metropolitan station to be so equipped. The line itself runs under the busiest thoroughfares of the city, the inner boulevards, and is expected to give great relief to the center of the city.

1903 appears to have been a fairly prosperous year for most of the French tramway companies. Their annual meetings will soon be held, and meanwhile several of them publish the following results of traffic receipts and increases over 1902:

	Receipts, 1903	Increase Over 1902, Francs
Cie Generale Parisienne de Tramways	8,193,433	577,059
Cie Francaise de Tramways de Bordeaux	4,384,068	314,265
Cie de Chemins de Fer Nogentais	2,412,766	247,167
Cie des Tramways de Nice	2,016,627	206,866
Cie des Tramways de Rouen	1,989,925	8,833
Société des Tramways d'Amiens	611,753	21,159
Société des Tramways Algeriens	790,349	54,791

The Nice Tramway Company, the largest, perhaps, outside of the metropolis, is a model of progress. It is stated that the company will build a new double line between Villefrance and Beaulieu, a very hilly district, and to equip the line with twenty cars with multiple-unit or train control system. This will be the first use of the train control system on French tramways, and will undoubtedly be followed by other applications. The cars will be equipped with two 50-hp motors each.

The existing omnibus and cab companies are keenly feeling the competition of the Metropolitan system, and the Prefect of the Seine has just approved of a new tariff for cabs, varying from 75 centimes for first kilometer, and 25 centimes for following for two-place vehicles to 1.25 per first kilometer and 40 centimes for following kilometers for six-place cabs and carriages. About 1000 vehicles are to be licensed on this basis and each will be furnished with a new "taxameter." The formation of a company, with a capital of \$80,000, is announced to work this patent meter.

The strike on the Est Parisien tramways lately come to an end, has been followed by one on the Paris-Arpajon light railway line. About 200 men are out, and demand various concessions of which

all do not relate to wages. For instance, overtime is not paid extra, and only one day a month is given as rest. Pay is made monthly. The men demand a fixed day of rest per month, or two days not fixed. Pay is to be made fortnightly, with extra pay for overtime. These are their principal requests, and neither side appears to be able to give way on any detail. The steam trains are kept running, as required by the company's charter, but the electric service has been stopped.

The Est Parisien lines, which are operated largely by the surface contact system, are in a very bad way, and the company's shares appear to indicate that a crisis is approaching in the company's affairs. As is well known, Paris has had enough of the surface contact system, and it is very doubtful whether any more franchises will be given for this system of traction.

The Curtis steam turbine is about to make its appearance in France. The Thomson-Houston Company has obtained the sole right to make and sell in French territory, and announces that it has just received an order for two 800-kw machines for installation in the station of the Nice Gas & Electricity Co. The turbines will be delivered this year and ready for service.

A scheme is on foot to provide a complete light railway system for the Department of Haute Vienne. The total length will be 325 km, and the estimated cost over \$5,000,000. The project will be presented, when complete, to the general council of the Department.

Another project is to provide a feeder to the existing line passing through Mt. Blanc and uniting the French and Italian side of the Alps. Chamomix will be the French terminus, where a junction will be made with the narrow-gage electric line connecting with the network of the P.-L.-M. Railway. The French and Italian governments will shortly be approached in the matter.

The Oporto Tramway Company has asked estimates for the transformation of its line into single-phase, 25 cycles in place of the present 500-volt d. c. This step has been taken as the result of the successful applications of single-phase motors in the States, the Lamme motor especially having made a good impression. The installation is of some importance, requiring the use of four 500-kw steam turbine groups. It is proposed to use a voltage of 1000 volts outside city limits and 400 volts within. This would occasion the use of transformers on the cars to step-down the voltage to 400.

Resulting from the Berlin-Zossen high-speed experiments, it is announced that the German government has decided to put into service a "lightning train" of the same description as used at Zossen, between Berlin and Hamburg. A special track will be reserved for this train, and the speed will be 200 km per hour. German engineers expect this line to be in service before the end of the present year. This would reduce the time of transit between Berlin and Hamburg to two hours.

CONDITIONS IN BLOOMINGTON AND NORMAL

Bloomington and Normal, Ill., are now in every way the quiet, peaceable cities they were before Jan. 1, when the conductors and motormen of the Bloomington & Normal Railway went on strike. Cars are run on regular schedule, the volume of traffic is even greater than ever before and the present employees are more efficient than the old men. On the Union Depot and Front Street lines the traffic has actually increased to such an extent that the company has found it necessary to place larger cars in service.

The strike was caused by the refusal of the company to comply with a demand of the union for an increase in wages. As a result about fifty-seven men went out, including three regular and two extra line men and shop men from the car house. All the power station employees, who are non-union, remained at their posts. The strike soon digressed into a series of riotous demonstrations increasing in boldness until a protective league of citizens was formed to guard the public interests and police the streets. One of the worst demonstrations against the company was made on Jan. 3 at the Court House Square, where a car was almost totally wrecked. Fortunately no one was injured. Of the several attempts at dynamiting cars, the most dastardly was made at 8 p. m. Jan. 30 on a Front Street car, at the corner of Front Street and Robinson Avenue. Charles F. Evers, whose home is in St. Louis, and who formerly worked for the St. Louis Transit Company, was the motorman of this car, and the conductor was a man who had deserted the strikers. A young woman passenger was severely injured in this attack.

More than half of the men who went on strike have applied to the company for reinstatement, but so far only five have been taken back and they are now working as extras. The men work eleven and twelve hours a day and average \$65 a month.

The company has recently established a school for motormen, in charge of C. Robinson as instructor. The results are very satisfactory.

A NEW COMPANY TO COMPLETE LINE BETWEEN NEW YORK AND PHILADELPHIA

A charter has been granted in New Jersey for the New Jersey Short Line Railroad, which is to be an extension of the Trenton & New Brunswick Railroad from Milltown to Elizabeth. The company is incorporated for \$300,000. The incorporators of the company are: Richard D. Ashbridge, of East Downingtown, Pa.; Thomas P. Phillips, Abraham A. Moyer and Thomas R. Heller, of Philadelphia; Thomas P. Curley, George H. B. Martin and John H. Sintzeo, of Camden. The road will extend from Milltown Junction, where the Trenton & New Brunswick Railroad connects with the Middlesex & Somerset, for New Brunswick, across the Raritan River, and thence direct to the Kill von Kull, at Elizabeth. It is presumed that passengers will be carried by steamer or ferry from this point to New York City. The road will be constructed under a steam railroad charter, and both passengers and freight can be carried. It will be entirely upo. private right of way. The Trenton & New Brunswick Company has been working upon the plan for nearly two years. While this line is being built a through service will be run from Trenton to Jersey City, via New Brunswick, Bound Brook, Plainfield and Elizabeth. This will be begun May 10, and the fare will be 80 cents single or \$1.50 excursion. The distance from Jersey City to Trenton, via Bound Brook, is about 72 miles. Owing to the difference in gages it will be necessary to transfer passengers at Trenton, on the trip from Jersey City to Camden. The lines north of Trenton are all standard gage, while the Camden & Trenton line is 5 ft., and the Philadelphia, Bristol & Trenton (Pennsylvania line) is 5 ft. 2½ in.

THE FLOODS IN INDIANA AND OHIO

The floods this spring in Indiana have been unusually severe, and in Indianapolis are said to have been the worst in the history of the city. White River, Fall Creek and Pogue's Run have verified the warnings given some time ago of what they could do under proper conditions. Fortunately, there has been little loss of life, but there has been great damage to property and serious personal inconvenience to thousands. In the face of the serious damage the public service companies, one and all, have done very well. This is particularly true of the electric railway companies, many of which had tracks under water and their power plants and car houses partly submerged for days.

The waters began to recede on Sunday, March 27, and on Monday, March 28, with the apparent passing of the danger point, the interurban lines running into Indianapolis, all began active preparations to resume operations on regular schedule. The Northwestern Company's plant at Lebanon escaped serious damage, but it was impossible to run cars beyond Carter's Hill, just outside the Indianapolis city limits. The Shelbyville line of the Indianapolis & Cincinnati Traction Company experienced much damage in the neighborhood of Super Creek, just east of Brookfield. Passenger traffic had to be suspended. Sixty feet of the approach to the bridge at Sugar Creek were washed away, and the power house at Shelbyville was flooded. The Indianapolis & Martinsville line had a great deal of trouble near Martinsville, but there were no serious delays. The Indianapolis & Franklin line was damaged by Sugar Creek and Blue River. The bridge over the smaller stream was washed away, and one of the 150-ton bridges was torn from its fastenings and thrown up on the bank at one side. The Indianapolis & Plainfield line was forced to suspend operations because of the flooding of the West Washington Street power plant in Indianapolis, from which its lines are operated. The Kokomo and Broad Ripple lines of the Indiana Union Traction Company suffered severely, and for several days cars were not run through from Kokomo to Indianapolis.

Several Ohio Interurban roads are again affected by floods, the condition being especially serious in Western Ohio, owing to the overflow of the canal feeder system. The Celina division of the Western Ohio Railway bordering Grand Reservoir was washed out and the city of Celina was in danger of being submerged. The Western Ohio power station at St. Marys was partially submerged, but did not close down. At Findlay the Toledo, Bowling Green & Southern Traction Company's line was again washed out, and at Troy and Piqua the lines of the Dayton & Troy Electric Railway and the Springfield, Troy & Piqua Traction Company were covered by water. Some of the city lines at Zanesville were tied up and the new power station was in danger for several days. At Fremont the Lake Shore Electric Railway was flooded for the fourth time this winter, and the company was obliged to transfer passengers through the main street of the city.

MUNICIPAL OWNERSHIP VOTE IN CHICAGO

On Tuesday, April 5, at the municipal election in Chicago, a ballot was taken on three propositions bearing on the street railway situation.

The first of these was as to whether the "Mueller law" should be adopted and put in force in the city. This law was passed by the last Legislature, and authorized cities in Illinois to construct, own, operate and lease street railways, and to provide the means therefor.

The second proposition asked for an opinion as to whether, if the Mueller law be adopted, the City Council should proceed without delay to acquire ownership of the street railways.

The third proposition asked for an opinion as to whether the City Council should, instead of granting any franchises, proceed at once under the city's police powers and other existing laws to license the street railway companies, until municipal ownership could be secured.

The last two, manifestly alternative propositions, were placed upon the ballot merely for the purpose of securing the opinion of the voters, the result of the vote having no legal bearing on the situation.

The chief interest in the election centred in the vote on the "Mueller law." This vote stood 152,433 for and 30,104 against the proposition. On the proposition that the city should at once take over the street railways into its control the vote stood 120,744 for and 50,893 against. For the temporary licensing of street railways until such time as the city is prepared to take them over, the vote was 120,181 for and 48,056 against.

ANOTHER STEAM LINE TO BE ELECTRIFIED

It is said that the plan for electrifying the Keeseville, Ausable Chasm & Lake Champlain Railroad, to which reference was first made in the *STREET RAILWAY JOURNAL* months ago, has been worked out and that the work is to begin at once. The third-rail system is to be adopted. The road extends from Port Kent, Essex County, N. Y., to Keeseville, Clinton County, and was built thirteen years ago, mainly to supply freight facilities for the pulp, paper and horseshoe nail mills along the Ausable River, which the road traverses for more than a mile. It connects with the Delaware & Hudson Railroad, and the Lake Champlain steamers. Traffic is heavy on the line in the summer, as an excellent view of Ausable Chasm can be obtained, and it is thought that the electric service will be more satisfactory than steam. The railroad crosses Ausable Chasm by means of a cantilever bridge, with trestle work at each end. In order to avoid future expense of repairing or replacing these trestles, it has been decided to fill in the ravines. One of these trestles is 160 ft. long. Thirty-eight feet is the greatest depth. The other trestle is 258 ft. long, and about the same depth. It will take about 29,000 cubic yards for the fill. The contact rail is to be placed 2 feet from the track rail, and protected by white pine plank. Power will be obtained from a dam across the Ausable River, constructed ten years ago. A new turbine wheel will be installed and 1200 hp will be developed.

MUNICIPAL "L" FOR NEW YORK

Senator McCarren has introduced in the Legislature a bill to provide for the construction and operation of a municipal elevated railway on Willoughby Street, Fulton Street, Brooklyn, the New York & Brooklyn Bridge and its terminals, Centre Street, Delancey Street, New York, the Williamsburg Bridge, South Fifth Street, Union Avenue, Throop Avenue, Willoughby Avenue, and under Fort Greene Park, Brooklyn, and to provide for the appointment of a commission to construct it. The bill authorizes the Mayor to appoint a commission to be known as "the Municipal Railway Commission of the City of New York," to consist of three members, who are to hold office until the railroad shall have been completed and turned over to the City of New York. The commission is authorized to use such portions of bridges across the East River as may be necessary. The Board of Estimate is, by the bill, directed to authorize the Comptroller to issue corporate stock or bonds of the City of New York to the amount of \$15,000,000, at interest not exceeding 4 per cent, to be redeemed in fifty years to defray expenses. It is not to be lawful to charge any person more than 3 cents for one continuous ride from any station in Manhattan to any station in the Borough of Brooklyn or vice versa. Any net surplus is to be used to retire the stock and bonds, and whenever the increase of the receipts shall justify such action, the commission is to recommend a reduction of the fare charged to passengers.

BIG STEEL COMPANY IN CALIFORNIA

Street railway builders in Southern California are deeply interested in a mammoth steel company that has just been organized in San Diego. It is the Pacific Steel Company, which incorporated on March 19 with a capital stock of \$100,000,000. The new company proposes to work ore deposits in Lower California and the Southwest. It is understood that coal is to be brought from Oregon. At the first meeting of the directorate on March 22 Gen. Harrison Gray Otis, of Los Angeles, was elected president. C. W. French, of Cleveland, Ohio, who originated the movement for incorporation, is chairman of the board of directors. Other officers of the corporation are: A. A. Purman, of Cleveland, Ohio, vice-president; Victor A. Dehnel, of Cleveland, Ohio, secretary; George W. Fishburn, of San Diego, treasurer; Victor E. Shaw, of San Diego, general counsel; Willard Fuller, of Cleveland, Ohio, general superintendent. The offices of auditor, general manager and chief engineer are left vacant for the present. The Union Trust Company, of Pittsburg, Pa., has been chosen fiscal agent for the Eastern States.

LAKE STREET ELEVATED CHANGES ITS NAME

At a meeting of the stockholders of the Lake Street Elevated Railroad Company, of Chicago, March 31, the name of the company was changed to the Chicago & Oak Park Elevated Railroad Company. The meeting was then adjourned until April 20. This is one of the moves that has been made as a preliminary to the reorganization of the company in the near future. The suggestion has been made that perhaps by this change of name the property will escape some of the odium that is attached to the old name which in the financial world is associated with twelve years of financial vicissitudes.

STRIKE ON CLEVELAND & SOUTHWESTERN

Motormen and conductors to the number of about 150, employed by the Cleveland & Southwestern Traction Company, went on a strike March 31. The demand of the men was for the discharge of H. A. Nicholl, general manager of the company, and the withdrawal of a number of rules he has instituted.

The trouble had been brewing ever since Mr. Nicholl took charge of the property, Nov. 1 last. Previous to that time the system had been operated on a rather loose basis, with no general manager in active charge. As a result, the men had grown careless and the number of accidents was abnormally large. Mr. Nicholl was engaged with the understanding that stringent reforms were to be instituted, and these he set out to accomplish with great earnestness. The dispatching system was thoroughly revised and the men were made directly responsible for carelessness in operation and accidents. A system of watch inspection was instituted which required that watches be examined every two weeks. Signal lamps and flags were placed on cars, and the running rules were made more stringent. Conductors were required to clean their cars at the end of each run and motormen were required to attend to the oiling of cars at the end of a run. Several other reforms were instituted.

The climax came when the manager instructed Superintendent E. W. Coe to suspend certain men for minor offenses. The order was not complied with and Mr. Coe was asked for his resignation. Then the men met and formed a union and voted to strike. The question of wages did not enter into the controversy.

Monday night, April 4, officials of the company held practically an all-night session with the men, but no agreement was reached. On Tuesday noon, however, the strike was settled. The company signed an agreement with the employees and promised to change several rules that had been obnoxious to them. The men will not be required to sweep out or oil their cars, but it is probable that the layovers at the terminals will be done away with. The agreement provides for the employment of either union or non-union men. All old men are to be retained, however. The question of the resignation of Manager Nicholl was waived by the men, and he will continue. No attempt was made to operate cars while the men are out, but service was promptly resumed on Tuesday afternoon.

The New Hampshire Traction Company has issued an attractive folder, containing a map of its lines and connections, covering the territory between Lowell, Mass., and Rochester. It also has the time-tables of the several roads which connect Lowell, Lawrence, Nashua, Haverhill, Exeter, Portsmouth, Dover, Somersworth, Rochester and intermediate towns and beaches. The folders have been placed in all cars of the company's lines for free distribution to patrons.

REPORT OF THE ADOPTION OF THIRD RAIL ON DELAWARE & HUDSON

Again it is reported in Scranton that the Delaware & Hudson Company has decided to equip its line between Carbondale and Wilkesbarre, a distance of 34 miles, with the third-rail system. Some time ago the Delaware & Hudson reduced the fare between Scranton and Wilkesbarre to 20 cents, and since then its passenger traffic has been so congested that it has seriously interfered with the moving of coal trains. It is the company's intention, so it is said, to add two new tracks to the road, making four in all, and equip the new ones with an electric system for passenger trains exclusively. Competition between the Lackawanna & Wyoming Valley Railroad and the Delaware & Hudson is responsible for the latter company's reduction in passenger rates.

The Lackawanna & Wyoming Valley, which is the new third-rail road recently bought by the Westinghouse people, made a round-trip rate of 50 cents between Scranton and Wilkesbarre. The Delaware & Hudson, which had previously charged 85 cents, met the rival company's reduction by announcing a flat rate of 20 cents each way. At the same time several new trains were put on, in all aggregating thirty-three a day. It was then found that the present double track could not handle the business.

PENSION PLAN FOR "L" EMPLOYEES IN NEW YORK

The Interborough Rapid Transit Company, of New York, controlling the present elevated railway system, and the underground lines now building, is planning to submit to its employees for their approval a general pension scheme. The plan, as generally outlined, provides for a sick and death benefit and a pension to be paid after the retirement of an employee who has been on any one of the elevated road lines for a certain number of years. The sum to be paid in sick or death benefits, and in pensions after retirement is to depend on the amount paid in by the member who is to benefit by the pension. Unofficially it is said it is proposed to divide the pension fund into five grades—one to pay 50 cents a month, a second to pay \$1, a third to pay \$1.50, a fourth to pay \$2 and a fifth to pay \$2.50. Those who pay \$2.50 a month are to receive \$1 a day as a benefit for fifty-two days in case of sickness or an accident which prevents them from working. In case of death, their heirs will receive \$1,000. Those who pay \$2 a month are to receive a sick or accident benefit of \$5 a week and a death benefit of \$800. Those who pay \$1.50 a month are to receive a sick or accident benefit of \$4 a week, and a death benefit of \$500. Those who pay \$1 a month will receive no sick or accident benefit, but a death benefit of \$200. Those who pay 50 cents a month will receive a death benefit of \$100.

DISSOLUTION OF SOUTHERN COMBINE

The Norfolk, Portsmouth & Newport News Company, in which has been merged the Norfolk Railway & Light Company, the Berkley Street Railway Company, the National Gas Company, of Berkley; the Old Dominion Railway Company, of Portsmouth, and the Norfolk County Ferry Company, will be dissolved in a few days. This action was decided upon at a lengthy meeting held last week. Pending the final arrangements, no official statement has been issued.

It is stated that the Norfolk Railway & Light Company, the Old Dominion Railway and the ferries have always been independent concerns, and when the merger took place these companies simply pooled their securities, the recent meeting being to decide a basis for returning the securities which were pooled. It is said that the dissolution is due to the fact that, after a trial, the combined railroads did not find the arrangement profitable, and all concerned felt that by the individual operation of the roads larger dividends could be paid the stockholders.

The ferries have been leased by the Norfolk, Portsmouth & Newport News Company, and it is understood that this concern will continue their operation. The Berkley road and National Gas Company will, it is stated, go back into the hands of the Railway & Light Company of America. It is yet to be determined how the Norfolk, Portsmouth & Newport News Company will be operated. It is said that the Norfolk Railway & Light Company and the Old Dominion Company have never lost their identity, even though these roads were in the merger. Some time back the Terminal Line withdrew from the Norfolk, Portsmouth & Newport News Company, and has since been operated separately.

CINCINNATI TRACTION RELIEF ASSOCIATION

The Mutual Aid Association, composed of employees of the Cincinnati Traction Company, met Tuesday, March 22, to elect officers and arrange to change its constitution. At present the members contribute as dues 25 cents a month each, and the Traction Company puts in \$600 a month. With its 1800 members there is contributed \$450 per month. In January and February \$3,700 was paid out in sick benefits, and in nineteen days of March \$1,300 more was drawn to pay benefits. Death benefits are \$800, and if this amount is in the treasury at the time of a death no assessment is made. If not, the men are assessed \$1 each. It is proposed to change the constitution so as to pay a sick benefit only when a member is sick two weeks or more. Last year's assessment on the men amounted to \$5 for the twelve months, while in less than three months this year they have been requested to pay \$4 in assessments.

PRESIDENT MELLEN OF THE N. Y., N. H. & H. ON ELECTRICITY

In a long interview which he gave a few days ago at New Haven, President Mellen, of the New York, New Haven & Hartford Railroad expressed the following view regarding the general substitution of electricity for steam as motive power on railroads:

"I believe we are rapidly approaching the time when steam will give way to electricity as motive power, and the steam engine or locomotive be consigned to the scrap heap. The great obstacles to-day to the substitution of electricity for steam as a motive power upon railroads are the character of the construction of the roads themselves, the frequency of crossings and the danger attending the conducting of the power by third rail.

"These will be greatly overcome, and in the near future; and looking ahead a very few years on such portions of systems as have eliminated these dangerous crossings, as, for instance, our line between New York and New Haven, I confidently expect to see the steam locomotive become in the nature of a curiosity."

Closely following this came the announcement that the New York, New Haven & Hartford Railroad will soon establish through electric service over the Fair Haven & Westville and other lines between New Haven and Waterbury and that negotiations are in progress to open a new line between Mt. Carmel and Cheshire. Electric railway connections will also be made with Meriden and Middletown.

ANOTHER FRANCHISE PLAN IN CHICAGO

John C. Fetzer, the new receiver of the Chicago Union Traction Company, has advanced a plan whereby the franchise question between the city of Chicago and the Chicago Union Traction Company might be settled at once. This plan is to grant the receivers of the Chicago Union Traction Company a franchise under which the city could at any time purchase the company's property at its physical value plus whatever value the franchises of the company may have as decided by the courts. This would, of course, provide for a settlement whichever way the court decides in the ninety-nine year act case. Under such an ordinance the company could probably secure money to make improvements at once, as whatever money was put into improvements would have to be paid by the city in case it took over the lines. Among the most needed improvements mentioned by Mr. Fetzer are 200 new cars and the erection of \$1,500,000 power house.

CLEVELAND COMPANY ASKS FOR FRANCHISE EXTENSION

On Monday, April 4, the Cleveland Electric Railway Company presented to the City Council of Cleveland a formal proposition for a twenty-five-year franchise extension. The company offered to return to the old six-ticket-for-a-quarter plan and to issue one transfer for each fare. A report adverse to its acceptance was made by the Council committee, and the proposition was rejected. Last week the Council requested the company to make some proposition, and offered to relieve the company of all special taxations, such as paving, bridge maintenance, and grade-crossing expense. President Andrews of the company submitted figures to show that while the company would lose \$200,000 in receipts as demonstrated by the previous experience with the six-tickets-for-a-quarter plan, it would be relieved of payment of between \$70,000 and \$100,000 under the special tax provision. Councilman Hitchens, leader of the Republican faction in the Council, has announced that he will endeavor to pass an ordinance extending the franchise of the company for twenty years, on a basis of seven tickets for 25 cents, and one transfer. His ordinance will be introduced next week.

LIMITED SERVICE ON OHIO ROADS

The Western Ohio Railway, of Lima and the Dayton & Troy Electric Railway, of Dayton, have effected a traffic arrangement for the operation of through limited cars between Lima and Dayton, Ohio, a distance of 83 miles. Each road will furnish one car, which will be especially equipped for the service, and each car will make two round trips, giving two limited cars each way per day. The 83 miles will be made in two and one-half hours, and the fare will be \$1.45. The parallel steam road makes the run in two and one-quarter hours and charges \$2.20. The new limited service will be an immense improvement over the present service, for, while the cars on the two roads connect, and tickets are sold clear through, the present running time is three hours and forty minutes. The two interests mentioned are planning to effect a traffic arrangement with the Cincinnati, Dayton & Toledo Traction Company, whereby limited cars may be operated from Lima to Cincinnati, a distance of 148 miles.

ELECTRIC TRACTION FOR CHRISTCHURCH, N. Z.

A contract for the construction and equipment of an extensive electric traction system in Christchurch, New Zealand, has been allotted. While the award was made to a local concern, practically all the material, equipment, etc., will be manufactured in the United States.

The New Zealand Electric Construction Company, which was organized recently for the chief purpose of developing the water powers in New Zealand, will carry out the work of building the Christchurch lines. Somewhat more than 30 miles of road will be constructed under the existing contract. The value of the contract is £250,000. The municipal authorities will operate the lines. Christchurch has a population of about 50,000. The city is built on a dead level. The existing lines are mostly operated by steam. The Canterbury Tramway Company runs an 8-mile road to Sumner. Another line goes to Sunnyside, and another runs to Port Hill Sydenham—all suburbs of Christchurch. In the city proper about 10 miles of steam and horse lines are operated. The municipal authorities have acquired all these systems, and they will be electrically converted.

The power house will be installed with Curtis turbines and Babcock & Wilcox boilers. The rails—6000 tons—have been ordered from the United States Steel Corporation. The special work will be of Lorain manufacture. The feeder cable will be supplied by the American Steel & Wire Company.

Thirty-five cars will be employed in the first instance. They will be built by the John Stephenson Company, of Elizabeth, N. J. The motors will be of General Electric build. The trucks will be of Peckham manufacture.

IMPROVEMENTS FOR HANDLING TRAFFIC AT CONEY ISLAND

The facilities of the Brooklyn Rapid Transit Company for handling the crowds that will visit Coney Island during the coming season will be greatly increased when the many changes and improvements now being made by the company at that resort are completed. The tracks on Surf Avenue and at the old Culver Railroad terminal have been relaid, switches rearranged and the depot reconstructed in part. The work involves an outlay for labor and material alone of about \$107,000, while the acquisition of additional property necessary to carry out its plans cost the company considerably more. The trolley or surface car loops at the Culver terminal, of which there were four last year, have been shortened, and another loop added, making five in all, while, instead of the two tracks for elevated trains, which were so close together last year that there was no platform room between them, there are now four with ample space between the tracks for the reception and discharge of passengers. Then a number of tracks have been laid for the storage of cars and trains and on which extra trains may be kept for use in case of emergency, or should the regular service at any time be insufficient to care for the patrons of the company. To make room for the extra tracks the old buildings and sheds have all been removed from the yard, all that is left of them now being a long, narrow building, which it is planned to fit up for the use of trainmen. The depot building has been torn down in part in the rear, while the interior also has been remodeled, giving much additional room to passengers using any of the lines terminating there, and which will number nearly a dozen in all. The additional elevated tracks will enable the company to run six-car trains over both the Brighton Beach and Culver lines on two-minute headway, while last year one train had to be sent out before another could get in, as there was no room in the yard for switching. On Surf Avenue new tracks have been laid from the West End depot for cars on the Third Avenue and other lines heretofore terminating

at the depot. All the improvements now being made will be completed by May 1 next, by which time the company expects to have the new system in full operation.

THREATENED STRIKE IN BROOKLYN

It is said that plans are well matured for a strike of the employees of the surface and elevated lines of the Brooklyn Rapid Transit Company, and that the strike may also involve the employees of the Interborough Company, operating the elevated lines in New York and the Bronx. The employees of both companies have been secretly organized, and at the last of a series of meetings held Monday in Brooklyn some 150 delegates are said to have made returns which show that the men are overwhelmingly in favor of striking in order to secure redress for certain alleged grievances. This is said to be particularly true of the Brooklyn men.

There is not the slightest intimation of what the grievance is of the Interborough employees, but the case of the Brooklyn men is different. Rumors of dissatisfaction have been heard there periodically for some time past. The principal grievance is said to be the question of wages. Some time ago a change was made from a daily to an hourly basis, which, the men say, worked out greatly to their detriment. Officials of the Brooklyn company say the men have no grievance and profess to know nothing of the impending strike. The Interborough management are reticent, but point to the recent wage adjustment made by them, mention of which was made in the STREET RAILWAY JOURNAL of March 19.

AN EXCELLENT MACHINE TOOL CATALOGUE

The Niles-Bement-Pond Company, of New York, has just issued a new 750-page catalogue of machine tools, which, without doubt, is the most complete catalogue of its kind ever published.

The catalogue opens with six full-page illustrations of the several works of the Niles-Bement-Pond Company, and following these are thirteen pages of medals and diplomas awarded the constituent companies of this concern. After the medals the main part of the catalogue begins. First are the machines for railroad shop use, including a most complete line of driving-wheel lathes. Fourteen different full-page illustrations are given of these machines, showing all sizes from 51-in. to 100-in. swing, and one or two special machines adapted particularly to the use of modern high-power tool steels. The other railroad tools include three different styles of car-wheel lathes, a large variety of axle lathes, cutting-off and centring machines, quartering machines, car-wheel borers and hydrostatic wheel presses.

The next division of the catalogue is devoted to lathes, including all sizes, from the Pratt & Whitney bench lathe to the massive Bement 125-in. crank-shaft lathe. Fifty pages are devoted to planing machines, and a specially large variety of heavy planers are shown. The large portable rotary planers are among the most interesting machines described in this section of the catalogue. Slotting machines and milling machines take a large number of pages, several very handsome full-page illustrations being devoted to work done on the Pratt & Whitney thread milling machine. Many heavy drills are shown, including vertical drills, radial drills and multiple drills.

Fifty pages are devoted to boring and turning mills. Here again the large mills are most interesting, but more space has been devoted to describing the smaller machines. The 16-ft. and 20-ft. mills are particularly massive. Following the section on boring and turning mills are a few pages devoted to miscellaneous machine tools, and then comes a very complete line of boiler-shop machinery, including plate planers, bending rolls, punching and shearing machines, hydraulic presses, steam and hydraulic riveters. In the latter part of the catalogue the full line of Bement steam hammers is illustrated, together with a number of installations of Niles electric traveling cranes. The last pages are devoted to the small tools made by Pratt & Whitney Company.

In the arrangement of the catalogue particular care has been taken to put the various machines in their logical order, so that any machine can be found without reference either to the table of contents in the front of the book or the complete index at the back. Metric as well as English dimensions are given throughout, and code words are placed under each machine.

The whole catalogue is a remarkably fine piece of press work, the cuts coming out with great sharpness and clearness. Some idea of the size of the book can be obtained from the fact that it weighs about 10 lbs., the entire edition amounting to 75 tons of catalogues. While the catalogue is not intended for general distribution, it will be gladly sent to users of heavy machine tools.

FRANCHISES \$16,363,745 HIGHER IN NEW YORK

Increases aggregating \$16,363,745 in the special franchise valuations in New York City are shown in the figures for 1904 just made public by the State board of tax commissioners in Albany. The total is \$251,521,450, as against \$235,157,725 for 1903. This does not include valuations to the amount of \$26,600 placed against corporations last year, but not valued this year. There are increased assessments for the large companies, more particularly the Manhattan Railway Company.

The largest street railway items in the list for New York City are:

	1903	1904
Brooklyn Rapid Transit.....	\$26,803,000	\$26,878,000
Coney Island & Brooklyn R. R. Co.....	895,000	895,000
Interurban Railway System.....	74,386,300	74,790,000
Manhattan Railway Company.....	47,100,000	50,075,000
N. Y. & Queens Co. Ry. Co.....	1,040,000	1,110,000

TROLLEYS TO TRANSPORT FIRE APPARATUS

Arrangements have been made with the Schenectady Railway Company by the city officials of Schenectady, Albany, Troy and Amsterdam for transporting fire apparatus between these cities in case of emergency. A large flat car, suitable for taking any of the apparatus will be stored at the car house of the Schenectady Company. In case of fire at any of the other cities the Schenectady apparatus will be loaded and shipped to the scene of the conflagration, and in case of fire in Schenectady the car will be sent to the other cities, there to load the local apparatus.

NEW PUBLICATIONS

Hendricks' Commercial Register of the United States. Published by Samuel E. Hendricks Company, New York. Cloth, 1228 pages. Price \$6.00.

This extensive volume is designed to place before buyers and sellers, full lists of manufacturers and dealers in everything employed in the manufacture of material, machinery and apparatus used in architectural, mechanical, engineering, contracting, railroad, iron, steel, mining, mill, quarrying and kindred industries. It contains over 350,000 names and addresses, classified according to States, towns and industries, and should prove of great convenience to those who have occasion to consult lists of this kind.

The Theory of Advertising. By Walter Dill Scott. Published by Small, Maynard & Company, Boston, Mass.; 233 pages. Price, \$2.00 net; by mail, \$2.15.

The author, who is director of the psychological laboratory of Northwestern University, has given in this book a simple exposition of psychological principles in their relation to successful advertising. Beginning with a few simple and definite principles, he elaborates each one in turn and shows its proper application, using for his examples specimens of actual advertisements. It is interesting to note in connection with the author's criticisms, most of which were printed originally in Mahin's Magazine, that he has received many complimentary letters from advertisers who followed his advice with successful results. The discussion on the preparation of time-tables, about six pages in length, is especially worthy the attention of railway men. The book is written in a very entertaining style and cannot fail to be of use to all who are concerned in making announcements of various natures to the public.

La Machine Locomotive, by Edouard Sauvage. Published by Ch. Béranger, Paris. 379 pages, Illustrated. Price, 5 francs.

This is the fourth edition of M. Sauvage's well-known book on steam locomotives, and was written especially for the use of railroad mechanics and employees. After the introductory chapter on the history and general principles of locomotives, the writer takes up the different parts of the standard machines, commencing with boilers and continuing through the different parts of the steam mechanism, then treats of the body, method of suspension, wheels, brakes, etc. Two final chapters are devoted to the subject of the maintenance of the locomotives, the care required by them, and the repairs to them. Although the Continental type of locomotive is especially considered, there is considerable treatment of American practice.

The Truth About the Trusts, by John Moody. Published by the Moody Publishing Company New York. 514 pages. Price, \$5 net.

The long statistical experience and reputation of John Moody has fitted him especially for the compilation of this book, which is undoubtedly the most comprehensive manual published of the large industrial, railroad, mining, financial and electrical cor-

porations of this country. In the introductory chapters of the volume the author points out the purpose of the book, which is to "throw at least partial light upon the momentous and steadily growing trust movement," believing in this way that the impracticability of many of the proposed "remedies" will be shown; and while the book is not a defense of the trust idea in general, the author believes in conservative regulation, and that the trust is in a sense an evolution of the natural growth of the country. He does not, however, minimize the evils which have occurred in their past development, among them that of inflated capitalization, although he points out that many of the trusts, like the Standard Oil Company, are under rather than over capitalized. The book is divided into seven parts, the first of which discusses the greater industrial trusts. Then follow chapters upon the lesser industrial trusts, important industrial trusts in process of reorganization or readjustment, the greater franchise trusts, the greater railroad groups, classified statistics of all trusts, and a general review of the trust movement. In the franchise trusts statistics are given of a number of the largest street railway companies, including those in New York, Brooklyn, Philadelphia, New Jersey and Boston. The book is illustrated with a large number of very interesting diagrams.

Dizionario Tecnico in Quattro Lingue, Tedesco, Italiano, Francese, Inglese, by Ing. E. Webber. Published by Ulrico Hoepli, Milan, Italy. 611 Pages. Price, 6 liri.

There has been up to the present a great lack of technical dictionaries in which any attempt has been made systematically to cover electrical terms, and in this book Mr. Webber is supplying a real need, as the fact that the dictionary has already passed through its first edition testifies. The book is of pocket size, and each page is printed in two columns and in the following order for the volume before us: German, Italian, French, English. In this edition the first edition has been revised and enlarged by the addition of about 2000 terms.

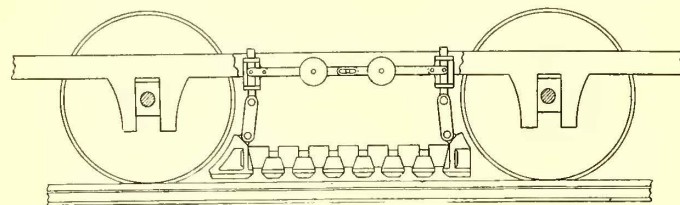
STREET RAILWAY PATENTS

[This department is conducted by W. A. Rosenbaum, patent attorney, Room No. 1203-7 Nassau-Beekman Building, New York.]
UNITED STATES PATENTS ISSUED MARCH 22, 1904

755,140. Electric Railway Signal; Bertram M. Kershner, Pittsburg, Pa. App. filed June 21, 1902. A signal wire extends over a block and is normally grounded at one end; the car automatically disconnects one end from the ground and connects it to a source of current supply to actuate the signal.

755,203. Electromagnetic Rail Brake; Karl A. Wilde, Hamburg, Germany. App. filed Dec. 1, 1903. Comprises a plurality of pole pieces provided with tubular extensions detachably connected, brake-shoes carried by the pole pieces, coil boxes mounted thereon and means to prevent angular displacement of the pole pieces.

755,314. Street Car; Charles K. Pickles, Philadelphia, Pa. App. filed April 17, 1903. The sill of the car frame has an outwardly



PATENT NO. 755,203

extending flange and a step secured to the flange by means applied under the flange and step.

755,391. Electric Railway Shoe; Henry Rosenfeld, New York, N. Y. App. filed Aug. 19, 1903. The shoe has a V-shaped rib on its contact surface, and is weighted to force the rib into snow or ice on the conductor.

755,468. Rheostat; Arthur C. Eastwood, Cleveland, Ohio. App. filed Dec. 21, 1903. Wiring connections of a controller are avoided by mechanically fastening the contact fingers to a metal frame, to which the resistance circuit is applied and connected.

755,509. Car Fender; George Lanhard and Philip Lanhard, Sublett, Mo. App. filed March 9, 1903. Consists of a frame, a pair of side rails pivoted at their inner ends to the frame front and side buffer-springs, a catch basket mounted between the frame and side rails and automatic connections for securing the side rails when lowered and permitting them to rise when struck to form a catch receptacle.

755,539. Pneumatic Sander for Car Trucks; Charles A. Pratte, Denver, Col. App. filed Oct. 30, 1903. Comprises a sand receptacle

mounted on the truck, and an ejector, also mounted on the truck and connected in operative relation with the receptacle and means mounted on the body of the car for supplying the necessary fluid for operating purposes.

• UNITED STATES PATENTS ISSUED MARCH 29, 1904

755,744. Controller; Frank E. Case, Schenectady, N. Y. App. filed Oct. 1, 1902. Across the face of the controller drum an elongated coil is arranged so that its field of force includes all of the arc gaps, a single coil thus serving to disrupt arcs at all points of the controller.

755,782. Electrical Contact Device; John Lindall, Boston, Mass. App. filed Oct. 8, 1903. A third-rail contact shoe, consisting of a box-shaped piece of metal resting at its extremities against a leaf spring to prevent rattling.

755,788. Car Fender; Albert E. McLean, Toronto, Canada. App. filed Dec. 30, 1903. Consists of fender supporting arms adjustable relatively to the roadbed, fender adjusting stays to adjust the fender support arms, and hold them in their adjusted position and fender platform carried by the fender supporting arms.

755,794. Fender; Charles H. Root, Cleveland, Ohio. App. filed Aug. 3, 1903. A main rear sliding fender and a spring to shoot the same forward, a fore tripping fender hinged at the front end of the main fender, a catch holding the main fender against movement, and connections, independent of the main fender, between the fore fender and the catch, acting when the fender is tripped to release the catch.

755,822. Train Control System; George P. Whittlesey, Washington, D. C. App. filed Sept. 26, 1902. A train control system in which the number of train wires are reduced to four and standard car controllers utilized.

755,825. Railway Brake Apparatus; Granville T. Woods and Lyates Woods, New York, N. Y. App. filed Dec. 31, 1902. Means whereby in the case of the motorman becoming incapacitated, the train may be stopped automatically, or by a passenger, or by a flagman.

755,872. Car Fender; James T. Heron and John J. Crowley, New Bedford, Mass. App. filed Jan. 6, 1904. Details of construction.

755,889. Electric Railway System; Timothy Mahoney, San Francisco, Cal. App. filed April 20, 1903. Details.

755,889. Electric Rail Bond; Jang Landsing, Brooklyn, N. Y. App. filed April 25, 1900. Comprises a strap of metal slitted into narrow strips between its extremities, the strips being bent at succeeding points to afford flexibility.

755,905. Electric Traction System for Railways; August Menschel, Montreal, Canada. App. filed May 4, 1903. The driving means are spherical in form and rotate in variable planes, parallel to the line of motion of the car, so that the effective diameter of the driver can be altered without altering the speed of its rotation.

755,999. Electric Trolley Head; John T. Cherry, Plymouth, and Edward H. Clive, Devonport, England. App. filed Nov. 3, 1902. Details.

756,060. Car Fender; Frank A. Schaaf, Cleveland, Ohio. App. filed March 14, 1903. Details of construction.

756,156. Signal Apparatus for Trolley Railways; Almo L. Cheatham, Louisville, Ky. App. filed Aug. 8, 1903. A contact is touched by the trolley wire when it lifts the main conductor in passing, thereby actuating a signal in advance of the car.

756,188. Brake; Frederick Stoltzenburg, St. Louis, Mo. App. filed Oct. 12, 1903. A shaft mounted between two aligned wheels having two eccentrics oppositely thereon, oppositely directed rods having one end connected to the eccentrics, brake-shoes aligned with each other and with the aligned wheels and attached to the outer ends of the eccentric rods, and means for rocking the shaft to simultaneously force apart the brake-shoes and apply them to the opposite aligned treads of the wheels.

ALLIS-CHALMERS COMPANY BUYS CINCINNATI FOUNDRY

The Bollmann-Wilson Company's plant at Norwood, a suburb of Cincinnati, has been sold to the Allis-Chalmers Company, through the Bullock Electric Manufacturing Company, of Ohio, which is the leasing company of the Bullock establishment.

The Bollmann-Wilson foundry at Norwood was established there by Hoefinghoff & Laue at the request of the Bullock Company, which stated that it would take all the castings that the Norwood foundry would turn out. This purchase will give the Allis-Chalmers Company a modern equipped foundry, a shop with an area of 40,000 sq. ft. and six acres of land. The property lies across the street from the Bullock plant on Forest Avenue. It is the intention to improve the foundry property as soon as possible and make additions. Besides the castings that will be needed for Bullock products there will be manufactured at this foundry castings for Allis-Chalmers manufactures.

PERSONAL MENTION

MR. J. W. McCOYL has been appointed superintendent of the Evansville & Princeton Traction Company, of Evansville, Ind.

MR. H. CHAPMAN has been appointed superintendent of construction for the Montreal Street Railway, of Montreal, Que.

MR. F. G. KELLY has been elected secretary of the Topeka City Railway Company, of Topeka, Kan., to succeed Mr. T. W. Berry, who resigned some time ago to go to Chicago.

MR. CHARLES WATSON, a director of the Public Service Corporation of New Jersey, and former secretary and treasurer of the Camden Gas Light Company, of Camden, N. J., has died.

MR. E. W. COE, for some time superintendent of the Cleveland & Southwestern Traction Company, of Cleveland, Ohio, has resigned, and has been succeeded by Mr. J. A. Nestor, of Norwalk, Ohio.

MR. J. J. O'BRIEN, cashier and chief clerk of the Chicago office of the General Electric Company, has become general auditor of the engineering firm of H. M. Byllesby & Company, of Chicago.

MR. W. F. FURBECK, well known in Chicago street railway circles, formerly associated with Chas. T. Yerkes, has recently become connected with the McGuire-Cummings Manufacturing Company, of Chicago.

MR. D. H. SAWYER has resigned as city engineer of Paris, Ill., to accept a position as assistant to General Manager L. E. Fischer, of the McKinley street railway syndicate, with headquarters at Danville, Ill.

MR. FRANK R. PHILLIPS, assistant master mechanic of the Cleveland Electric Railway Company, of Cleveland, has accepted the position of master mechanic of the Cincinnati, Newport & Covington Traction Company, of Covington, Ky. He will assume his new duties at once.

MR. J. BRACKETT RUSSELL, auditor of the Tacoma Railway & Light Company, of Tacoma, Wash., has been appointed to fill a similar position at Manila, Philippine Islands, for the Manila Railway & Light Company, which American capitalized concern is building an extensive system in that part of the world.

MR. W. W. S. BUTLER, who for some two years has been general manager of the Durham Traction Company, of Durham, N. C., has resigned from the company. Mr. Butler has not been well for some time, and will recuperate at Clifton Springs, N. Y., before again engaging in active work. His successor is not yet announced.

AT A RECENT MEETING the directors of the Ingersoll-Sergeant Drill Company adopted unanimously a resolution expressing their deep sympathy at the death of the company's president, the Hon. William Russell Grace, at one time mayor of New York City. Mr. Grace has been succeeded as president by Mr. William L. Saunders, who has been vice-president since 1897.

MR. WILLIAM E. HUTTON, secretary and director of the Interurban Railway & Terminal Company, of Cincinnati, and director of the Cincinnati, Dayton & Toledo Traction Company, has been appointed a member of the Board of Public Service of Cincinnati. It is understood that he will resign his positions with these companies in order to devote his full time to the new work.

MR. M. M. WITHAM, who acted as one of the construction engineers for J. G. White & Company, Ltd., of London, in the building of the Auckland (New Zealand) Electric Traction System, will arrive in New York next week en route for the Philippines, where he will be attached to J. G. White & Company's engineering force engaged in the construction of the Manila electric traction system.

MR. CLAUD T. CAYLEY, vice-chairman of Dick, Kerr & Company, Ltd., of London, sailed from New York for Liverpool on the "Oceanic" on April 6. Mr. Cayley has been making a visit of about three weeks in this country, and about two weeks in Canada, having sailed from England on March 2. Mr. Cayley was for many years chairman of Dick, Kerr & Company. He resigned from that position last December on account of pressure of private business, and was succeeded by Mr. John Kerr, but accepted the office of vice-chairman in order to retain an active interest in the corporation. He reported a very active interest in electric traction among the large steam railroad corporations in England, and that the recent equipment of the Liverpool & Southport division of the Lancashire & Yorkshire Railway, described in the last issue of this paper was attracting wide attention. Mr. Cayley's visit to this country was partly on private business and partly for pleasure.