

amicable way. They have, in fact, pursued this policy in the past. But they are not willing to resign the management of the stockholders' property to an outside and irresponsible organization, to forget their duty to the public or to coerce their employees into joining the Amalgamated Association, the Concatenated Order of Hoo-Hoos, or Dowie's church.

What would be thought of a street railway manager who should order the entire working force of the system to join even a total abstinence society on pain of dismissal? He would be denounced right and left as a tyrant, and would probably have a strike on his hands within forty-eight hours, in spite of the fact that such a move might be decidedly for the benefit of the service. Americans pride themselves on maintaining personal liberty, and how they can reconcile liberty with an attempt to coerce individuals into membership in any social, religious or political body passes our understanding. Moreover, the one strong hold that street railway employees have on the sympathy and support of the public is that they are working with and for a public service corporation. How can they reasonably ask help in breaking down the responsibility of that corporation to the public? A company that would turn over its public service and its discipline to any association for any purpose ought to forfeit its franchise and go out of business. The Chicago strikers are asking a sheer impossibility, and they ought to be sane enough to recognize the fact. They may be assured, too, that violence in such a cause will meet its due reward. We deprecate the suggestion that the Federal forces must be called in to prevent interference with the mails, for such a subterfuge is of doubtful ultimate expediency and a humiliation to the community that is thereby self-confessed as unable or unwilling to defend its own rights against the aggression of the irresponsible body of hoodlums that always collects when a strike is on. We do not think that the Chicago police force has forgotten the proper use of the long night-stick, or the lesson of the Haymarket. The local authorities should be amply able to cope with any rioting that is likely to arise, and we do not see how the strikers on the issues raised can hope for any material sympathy that may give them a chance for ultimate success. Rioting will certainly alienate whatever sympathy might possibly be expected.

Strikes very generally lead to violence, for the reason that no single body of men can force a settlement merely by abstaining from work. To win, they must have the assistance of circumstances, as when impending contracts make it cheaper to settle than to fight; strong public sympathy that is able to force a compromise; passive strength which may win by arousing fear of a general sympathetic strike with its attendant disaster; or sufficient criminal aggressiveness to terrorize the community into surrender. Rioting is a pretty sure sign that the strikers have a cause so weak as to alienate legitimate support, and rioting is a thing that must be suppressed in the interest of the whole people. Of course, rioting involves many elements besides the strikers, and Chicago has very large riotous possibilities, but we think the present difficulty will be easily controlled. With a company that stands openly for the principle of arbitration, and is entirely willing to deal with the union, the strike can have no permanent motive power, and we earnestly hope that it may be amicably settled. But this much is certain—that no street railway company can so far forget its duty as a public servant as to give up its power of enforcing discipline, or of making such traffic arrangements as will accommodate its patrons. The question of wages is one which is always to the front, but as we sometime since remarked, the average motorman earns as much as the average minister of the Gospel,

on a very much smaller equipment of special training, and with quite as much certainty of permanent employment. These are times, too, when wages are tending to fall rather than rise, and the man with a steady job may consider himself in luck. The coming winter will see a larger body of unemployed labor than for some years past, much of it skilled labor at that, and a strike, even were it founded on just claims, is just now singularly ill-timed.

Schedule Speeds

The schedule speeds prevailing in the several large cities of this country vary in the main between 7 m. p. h. and 12 m. p. h. In cities having broad streets, where the obstructions by team traffic are few, schedule speeds as high as 10 m. p. h. and 12 m. p. h. are frequently found prevailing over an entire system of city lines. On the other hand, there are cities where there is no inherent reason why equally high schedule speeds could not be made, but where, nevertheless, they are very low, and it is a very difficult matter to raise them. In general, it may be said that the schedule speed prevailing on any city system is dependent more upon the amount of obstruction from team traffic than upon anything else. To a certain extent such obstructions are beyond a company's control. They are certainly not beyond a city's control, and it is for the management in each city to conduct a vigorous and diplomatic campaign of education in this respect as possible. At the Saratoga Convention Mr. Grant, of St. Louis, told of methods there pursued in eradicating the team obstruction evil. Schedule speeds at St. Louis have been undergoing a decided quickening the last three years, and this has been made possible only by freedom from team obstruction. In the same discussion Mr. Beggs outlined the different but no less effective methods he had used at Milwaukee in stopping delays of cars by teams. In any city much can be done by educating the public to realize the loss of time caused by team-traffic obstructions to street railway traffic. Once the public team owners and municipal authorities are fully awake to the importance of the matter, it becomes easy to secure and to enforce police regulations which will make a marked reduction in the amount of obstruction by teams.

Aside from the question of street obstructions there are a number of very complex engineering questions in connection with schedule speeds in city service. Some managers are strongly inclined to insist on schedule speeds which are close to the fastest attainable. The majority are more conservative, and leave a considerable margin between the schedule time and the fastest possible time that could be made over a given route. It has been accepted for some years as a general proposition that fast schedules are the most economical, both for the company and passengers. From the passenger's standpoint there can be no doubt that fast schedules are appreciated, provided they are not accompanied, as they are on some roads, by a jerking in stopping and starting, which counteracts all the satisfaction over making fast time. Leaving out of account the traffic-drawing qualities of a fast schedule, and considering schedules from a purely operating standpoint, it has been commonly considered that faster schedules, up to a certain limit, are more economical, because of the saving made in the various items of cost which depend upon time rather than upon mileage. The largest single item of operating expense per car mile is the item of trainmen's wages. Since conductors and motormen are paid by the hour an increase in schedule speed means a greater mileage per hour, and a consequent reduction in this item per

car mile. Most of the other operating expenses per car mile are not so directly dependent upon the schedule speed as are wages, though they are modified by it. The amount of power required per car mile, and consequently expense for power, increases as the schedule speed increases. Just what the relation between schedule speed and power consumption is depends on so many elements that it cannot be definitely figured. It has been generally considered that since the cost of power is considerably less than the wages of motormen and conductors a considerable increase in power cost, caused by the increase in schedule speed, would be more than offset by the reduction in cost of trainmen's wages per car mile. One point must be considered in this connection, and that is that as cars increase in length and weight the cost of power becomes a greater proportion of the total operating expense, while the conductors' and motormen's wages are a smaller per cent of the total. This means practically that the increase in power consumption, due to any increase in schedule speed will be greater in proportion to the saving in conductors' and motormen's wages than it would be with a shorter car. There are a number of other items which increase with the schedule speed, such as cost of motor maintenance, brake-shoe wear, and other things which it is extremely difficult to figure upon in advance. Last, but not least, there is the accident record to look after. The more a motorman is crowded to make a schedule the greater chances of accident he will take. It does not follow, however, that increased schedule speeds always means more accidents. There is, no doubt, a critical schedule, above which accidents, power expense and maintenance expense increase enormously. It is for the manager to determine about what this critical schedule is and keep below it.

Emergency Stops

At the present time the exigencies of interurban and other heavy electric railway work have compelled the adoption of air brakes on electric cars to a very large extent. That such brakes are vastly superior to even the best and most skillfully applied hand brakes has been demonstrated over and over in theory, in experimental runs and in the hard school of everyday service. Air brakes came slowly, it is true, on account of the small need which existed on the earlier roads for such extreme measures, and by reason of the additional expense of the equipment. The increasing speeds and the rapidly-growing weight of the equipment forced the issue, but even now the change to power brakes is not as complete as one might wish. Speed is still increasing, cars are growing still heavier, and the constant demand for more frequent service has brought still further need of improved stopping devices. Interurban lines are laid out with a freer hand than has been usual in ordinary railroad location, the grades are stiffer, the curves sharper and more numerous, and usually the roadbed rather lighter. The result is an increased need for powerful and efficient brakes. After making all allowances it must be admitted that the last season has had more than its share of accidents due to cars getting beyond control, and it is high time to overhaul the brake question, with a view of seeing whether better means of stopping cannot be devised. Accidents have sometimes happened through failure of the brakes to act properly, but we are inclined to the opinion that in most instances the brakes are in average good working order, are properly inspected and promptly applied. They require a certain space in which to stop the car, and this space is sometimes too long, considering the speed and weight of the car and the necessities of the case.

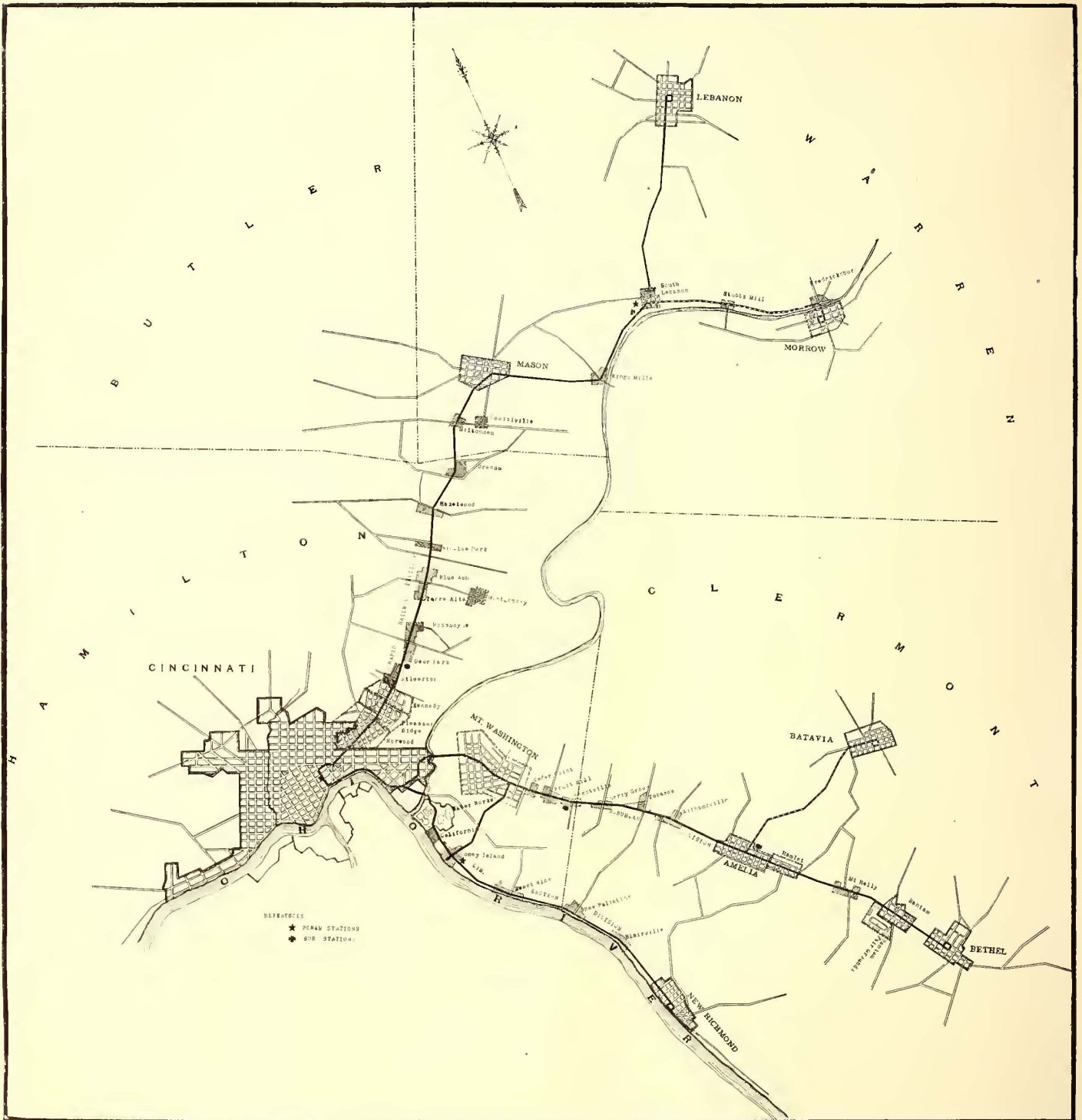
It, therefore, is pertinent to inquire whether some additional stopping power cannot be furnished, capable, in time of great need, of stopping the car much more quickly than air brakes of the ordinary sort worked under average conditions. There have been, and still are, track brakes intended to bear directly upon the head of the rail, but they have not yet been in sufficient use to show their real value. One very pretty brake of this kind has been introduced recently, but like the others it has not yet shown its practical value. On general principles a track brake, the effective pressure of which is not limited by danger of skidding the wheels, ought to be capable of producing retardation up to the limit imposed by the safety of the passengers. Of course, this would imply very great strains on the brake mechanism and on the track, but if the former stands the work the latter may be neglected, since the first consideration is the stop, and such desperate measures need rarely be resorted to. We wish some of the roads on which track brakes of any kind have been introduced would go to the trouble of having a careful test of their effectiveness made for various speeds, and would make public the results. Such tests are in themselves necessary to show whether the brakes can be trusted to do their work, and have a direct bearing on the responsibility of the road in case of accident. It would mean no small gain if by using track brakes the space required for a full stop could be reduced to one-half its present amount. It would imply a greatly lessened danger of collisions in fog and darkness, and would enable a car to be pulled up quickly enough to avert many minor accidents. It is of relatively small importance whether the track brake proves desirable for general service. If it can make an emergency stop promptly, it has claims sufficiently strong to ensure its popularity.

Still another question in this same line involves reversing the motors as an emergency measure. All our readers who have had a reasonably long experience will recall that on the early electric roads the motors were reversed without hesitation in a tight place, and that the controllers were so planned that reversal was the work of a moment. They will also probably recall divers gears and armatures that came to grief by too rash reversals. As time went on most roads, having suffered by hasty motormen, passed stringent rules against reversing the motors save in direst extremity, and at present not only are these rules generally in force but controllers are commonly so built that reversing is sufficiently inconvenient to prevent its employment under any ordinary circumstances, no matter how great the necessity. It has been often stated in print, and out, in defense of this condition, that reversal is really comparatively ineffective, and will not stop a car much, if at all, more quickly than power brakes. No one who has ever reversed one of the old Sprague cars in a really tight place is quite ready to swallow the proposition without proof, and we would like in addition to the track brake tests to suggest a really careful investigation of emergency stops by reversal. Under what conditions are these more effective, and under what conditions less effective than braking stops with the best brakes now obtainable? Everybody agrees that reversal is hard on the motors, but people do not make emergency stops with a view of coddling the car equipment. It is not a case of what means one would prefer to employ to avert an accident, but what means will certainly be effective. If reversal can stop a car in 100 ft. on a slippery track where brakes would require 110 ft., then reversal is wanted, and vice versa. Between the two, however, there is no compromise as emergency measures, since the brakes must be off if the reverse is put on.

CINCINNATI INTERURBAN DEVELOPMENT—I

Compared with other large cities in Ohio the development of interurbans radiating from Cincinnati has been unusually slow. For several years three electric railways have operated out of Cincinnati, but because of existing conditions they have been unable to penetrate into the heart of the city, and have been

of enterprise on the part of the interurban railways, but the chief retarding influence seemed to be the fact that the interests formerly controlling the Cincinnati street railways preferred to keep the interurbans outside the city limits so that the city lines could carry the passengers out to them, and retain the entire city fare. This policy was strengthened by the fact that the Cincinnati lines not only use a wide gage (5 ft. 2½ ins.) but



MAP OF INTERURBAN LINES CONTROLLED BY THE INTERURBAN RAILWAY AND TERMINAL COMPANY OF CINCINNATI

obliged to transfer their passengers to city cars at the city limits. Quite naturally this condition has proved a serious handicap to the development of the passenger business and a still greater one to the growth of the package freight business.

It is only within the last year that the people of Cincinnati have enjoyed the advantages of boarding a comfortable interurban car in the center of the city and riding without change to towns within a radius of 30 miles or 40 miles of that point. The territory covered by these lines is shown in the accompanying map.

Several unusual conditions contributed to the apparent lack

employ the double trolley system, which was saddled on them years ago by the telephone interests. Added to these were the obstacles of numerous heavy grades and narrow streets, which caused small radius curves and very narrow devil strips, some of them only 3½ ft.

INITIAL MOVEMENT

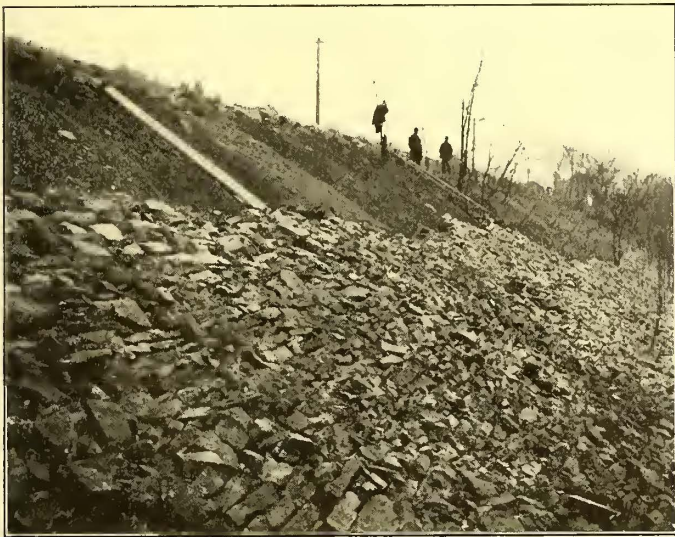
In 1900 a syndicate was formed by George R. Scrugham, Lee H. Brooks, J. M. Kennedy, C. H. Davis, W. E. Hutton, E. G. Kinkhead and others of Cincinnati, with a view of giving Cincinnati its proper position among Ohio cities as

an interurban center. The system developed by this syndicate, embracing 101 miles of track, is now in complete operation. The property is controlled by the Interurban Railway & Terminal Company, of Cincinnati, and comprises the terminal station and other facilities, as well as the lines of the Cincinnati & Eastern Railway, the Suburban Railway and the Rapid Railway, each of which is now operated as a division of the completed system. The first company was organized as the Cincinnati & Eastern Railway Company, to build a line paralleling the Ohio River to New Richmond.

It was the fixed policy from the start that an essential factor in the development of interurban passenger and freight business was a suitable terminal station in the heart of the city, to which all interurban cars should be operated. Backed by the syndicate, a measure, known as the Roubush bill, was proposed be-

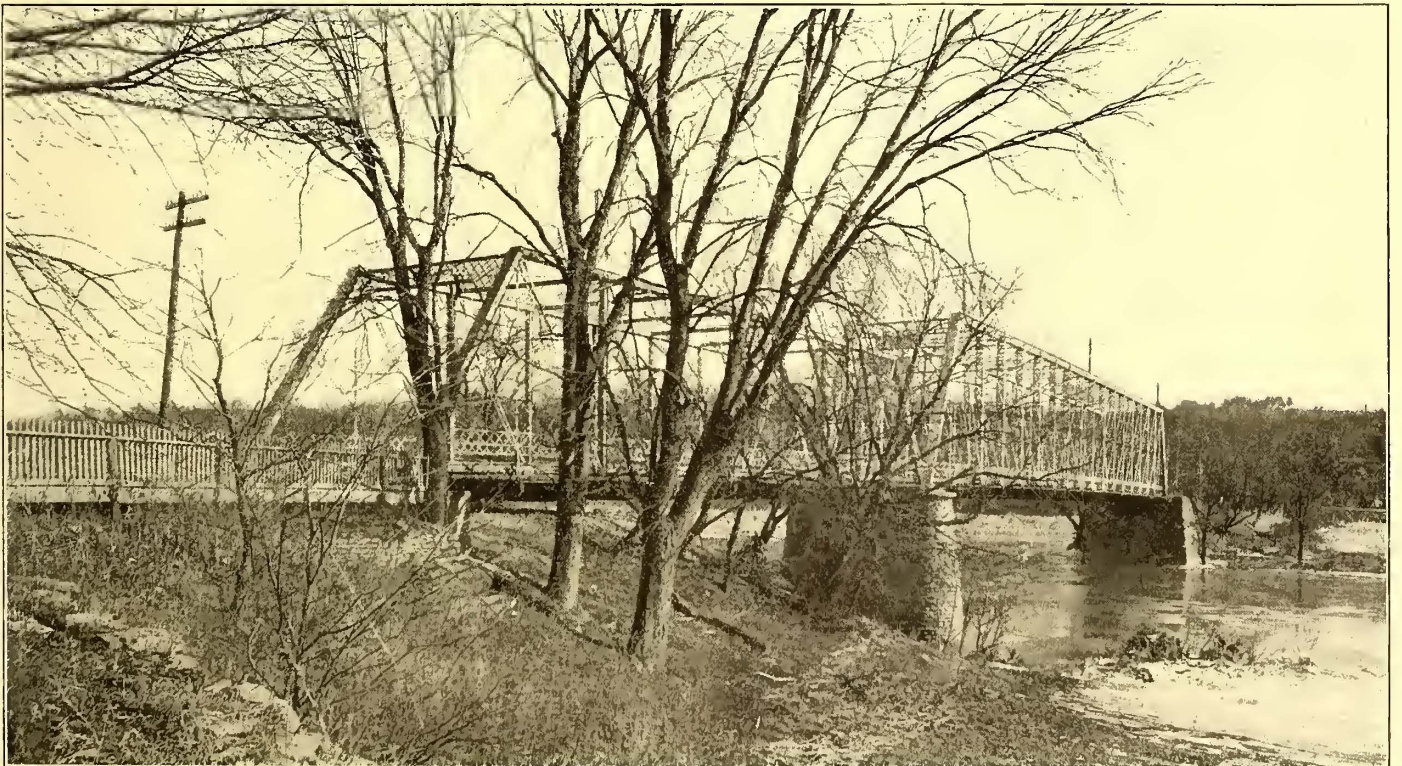


MIAMI RIVER BRIDGE (CINCINNATI & EASTERN DIVISION)



RIP RAP ON HEAVY FILL NEAR OHIO RIVER (CINCINNATI & EASTERN DIVISION)

fore the Ohio Legislature. It provided that interurbans operating outside a city might condemn right of way inside of municipalities, including city streets, for terminal purposes. Naturally, the measure met with strenuous opposition from all city companies in the State. While the fate of the bill was still undecided the Cincinnati lines were leased to the present Cincinnati Traction Company. Amicable overtures were made, the new management and the syndicate reached a satisfactory settlement, and the bill was allowed to die. A traffic arrangement was made whereby the interurban cars might operate to a terminal station, the division of city fares being on a basis of 2 cents to the interurban company and 3 cents to the city company. The interurban company agreed to make all changes in tracks and curves necessary to let its cars into the city. The proposition of laying a third rail was considered, but the interurban people decided that the advantages of standard gage were not commensurate with the added investment. They have gone ahead on the theory that the chief utility of the interurban is to develop business to and from towns within a radius of 30 miles to 40 miles of a large center, rather than to form



MIAMI RIVER BRIDGE (CINCINNATI & EASTERN DIVISION)



RETAINING WALL (CINCINNATI & EASTERN DIVISION)

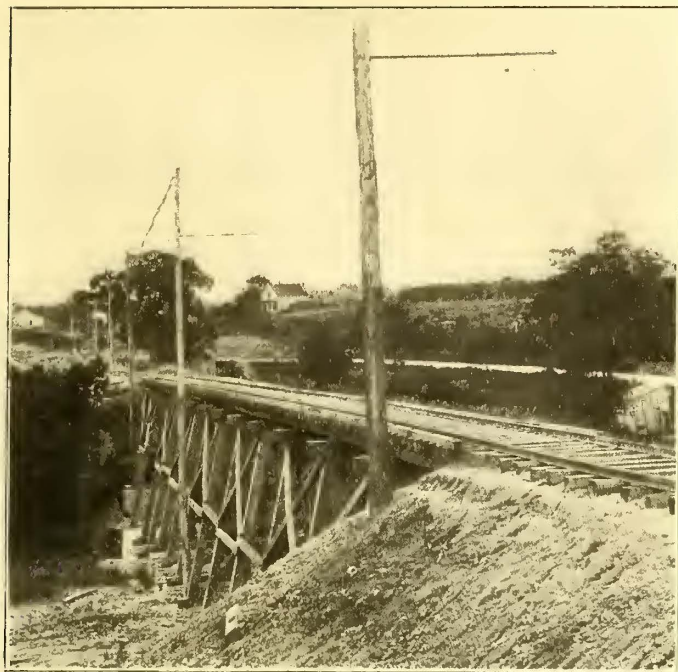
traffic arrangements with other lines and attempt to compete with steam roads for long-distance traffic.

CINCINNATI & EASTERN DIVISION

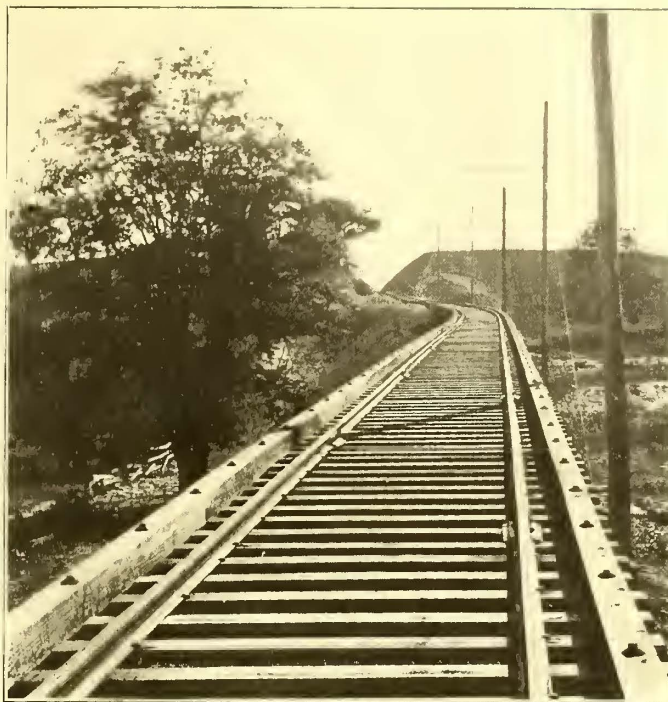
Work on the Cincinnati & Eastern was started Sept. 15, 1900, and the line was placed in operation to New Richmond, a distance of 24 miles, on Oct. 12, 1902. The road is at the side of the highway which parallels the Ohio River, and the cars are seldom out of sight of the great yellow stream, backed by a range of "Blue Grass" hills on the Kentucky side, making this an ideal scenic route. In building a portion of this road the company encountered some unusual and expensive engineering difficulties. In the district known as Turkey Bottoms the highway had traversed the lowlands that were frequently inundated, and the company not only had to raise the entire highway but provide means to prevent the embankment being washed away by high water. Fortunately, unusual facilities were at hand for accomplishing this. The city of Cincinnati is erecting, at California, near this point, an immense water works pumping station and filterage plant.

FILL THROUGH APPROACH NEAR NEW WATERWORKS
(CINCINNATI & EASTERN DIVISION)FILL, NEAR CINCINNATI, SHOWING RIP-RAP BEING
PLACED ON IT10-FT. BRICK, CONCRETE AND STONE ARCH CULVERT
(SUBURBAN DIVISION)

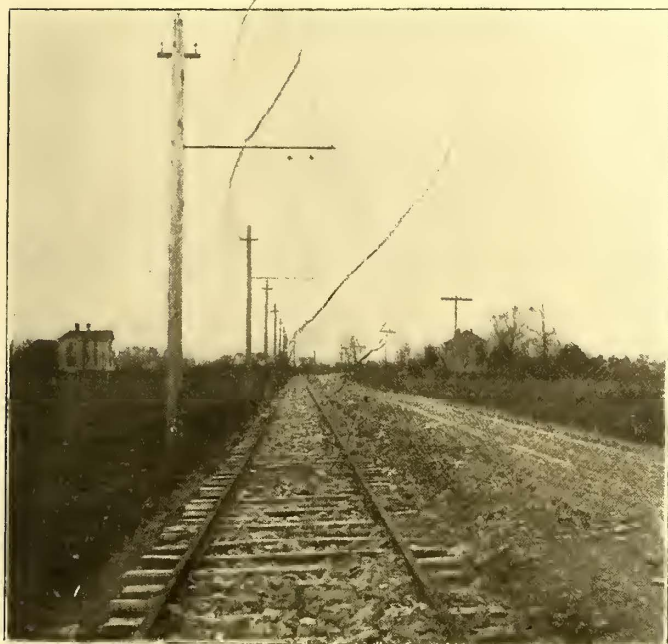
The tunnel to the plant passes directly under the fill, and a great deal of solid rock was encountered. An opening was made adjoining the highway, and something over 117,000 yds. of rock and shale were delivered in dump cars from the tunnel. A view of the fill, together with the tunnel power house and hoist, is presented; also a view of another large fill protected by broken rock. This division has the largest bridge on the system. It has a 400-ft. span crossing the Little Miami River, and a 63-ft. approach, and is built for double track. Views of this bridge are shown. Near the city limits there is an overhead crossing over the Pennsylvania Railway. This is provided with a gauntlet track, which dispenses with switches at the bases of the inclines, and also serves as guard rails. From the city limits to Coney Island the line is double track, to provide for the heavy summer traffic to this park, which is the most popular resort near Cincinnati. A



FRAME TRESTLE ON STONE FOUNDATIONS (SUBURBAN DIVISION)



TRESTLE AND CUT, APPROACH TO LEBANON (ON RAPID DIVISION)



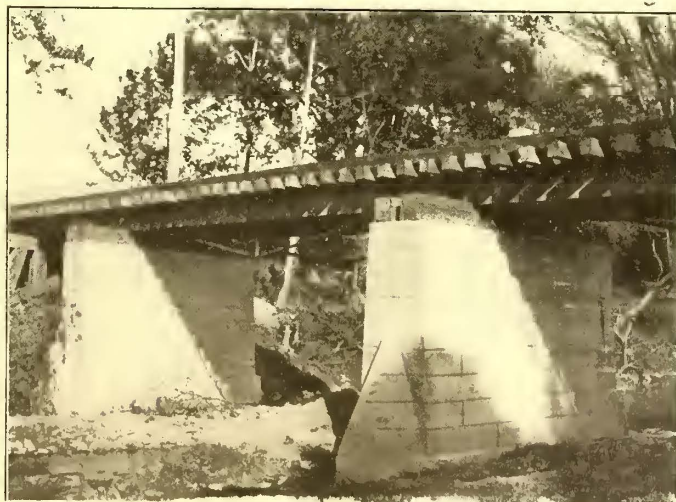
SINGLE TRACK NEAR AMELIA (SUBURBAN DIVISION)



CUT 557 FT. LONG, 40 FT. DEEP, NEAR LEBANON (RAPID DIVISION)



CUT NEAR LEBANON (RAPID DIVISION)



TRESTLE ON CONCRETE PIERS CROSSING SMALL CREEK (RAPID DIVISION)

California	1,073
Coney Island.....	406

Intermediate population.....	2,752
Tributary population.....	5,000

Total ... 12,730
 description of the park will be given in the second installment of this article. The city is preparing to build in connection with the waterworks system a fine park bordering the river, and this will prove a source of revenue to the company. There is practically no competition offered the Cincinnati & Eastern for a distance of about 20 miles, as there is no steam road on the Ohio side and only one line on the Kentucky side, running two local trains a day, so that the majority of the people now cross the river and take the electric line into the city. The population contributing to the Cincinnati & Eastern division, exclusive of Cincinnati, is shown in the accompanying table.

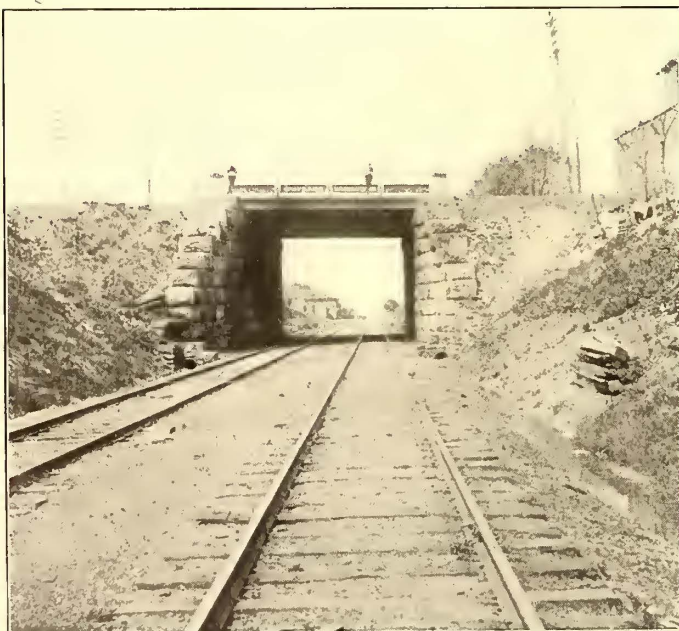
SUBURBAN DIVISION

The construction of the Suburban Railway was started April 15, 1901, and it was placed in operation June 1, 1903. This line extends



FRAMED TRESTLE 330 FT. LONG, CROSSING A RAVINE 60 FT. DEEP (RAPID DIVISION), NEAR KING'S MILLS

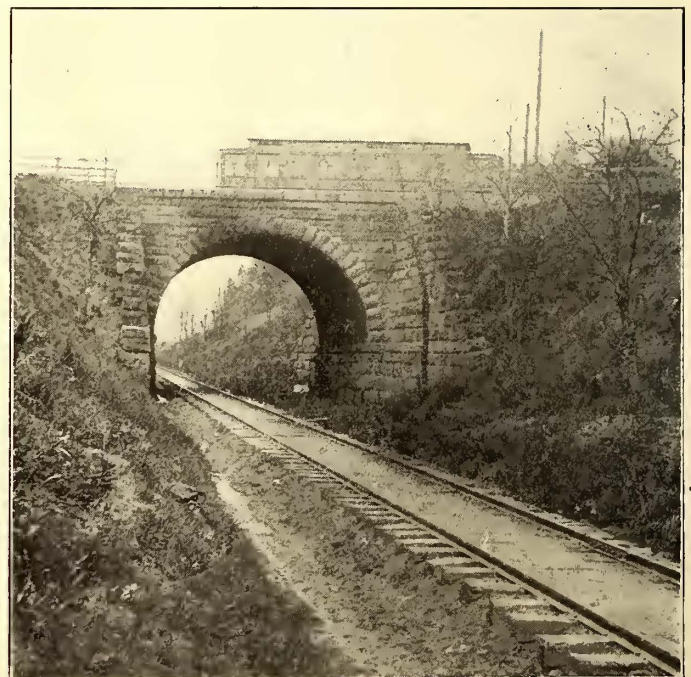
Sweet Wine.....	318
Eight Mile.....	276
Blairsville	516



CROSSING BALTIMORE & OHIO RAILROAD OVERHEAD (RAPID RAILWAY DIVISION)

New Palestine.....	473
New Richmond.....	1,916

4,978



OVERHEAD CROSSING AT PLEASANT RIDGE, OF THE PENNSYLVANIA RAILROAD (RAPID DIVISION)

to the village of Bethel, in Clermont County, a distance of 32 miles from the city limits. From Mt. Washington to Bethel the track is built at the side of the old Ohio Turnpike, on right of way bought outright from the turnpike company,

and it is separated from the pike by a ditch and a pole line. At the present time the cars of this line go south from Mt. Washington to Coney Island, and enter the city over the tracks of the Cincinnati & Eastern, but a direct line from Mt. Washington into the city is being built, and will be placed in operation as soon as the city completes an extensive levee work at the crossing of the Miami River. This will improve the running time for the Suburban Railway, and the loop formed will be used for local business and excursions. The district traversed by the Suburban is one of the most fertile market gardening districts in the country. Fruit and vegetables of every description are raised in immense quantities, and the people are now sending their produce to market by the electric road instead of hauling it long distances. The population of the towns along the Suburban Railway follows:

Mt. Washington.....	781
Cedar Point.....	370
Fruit Hill.....	431
Forestville.....	730
Cherry Grove.....	311
Tobasco.....	560
Withamsville.....	517
Amelia.....	1,223
Hamlet.....	305
Mt. Holly.....	217
Bantam.....	470
Bethel.....	850
	<hr/>
Intermediate points.....	6,765
	<hr/>
Tributary population.....	4,216
	<hr/>
	10,971
Tributary population.....	5,200
	<hr/>
Total.....	16,171

RAPID RAILWAY DIVISION

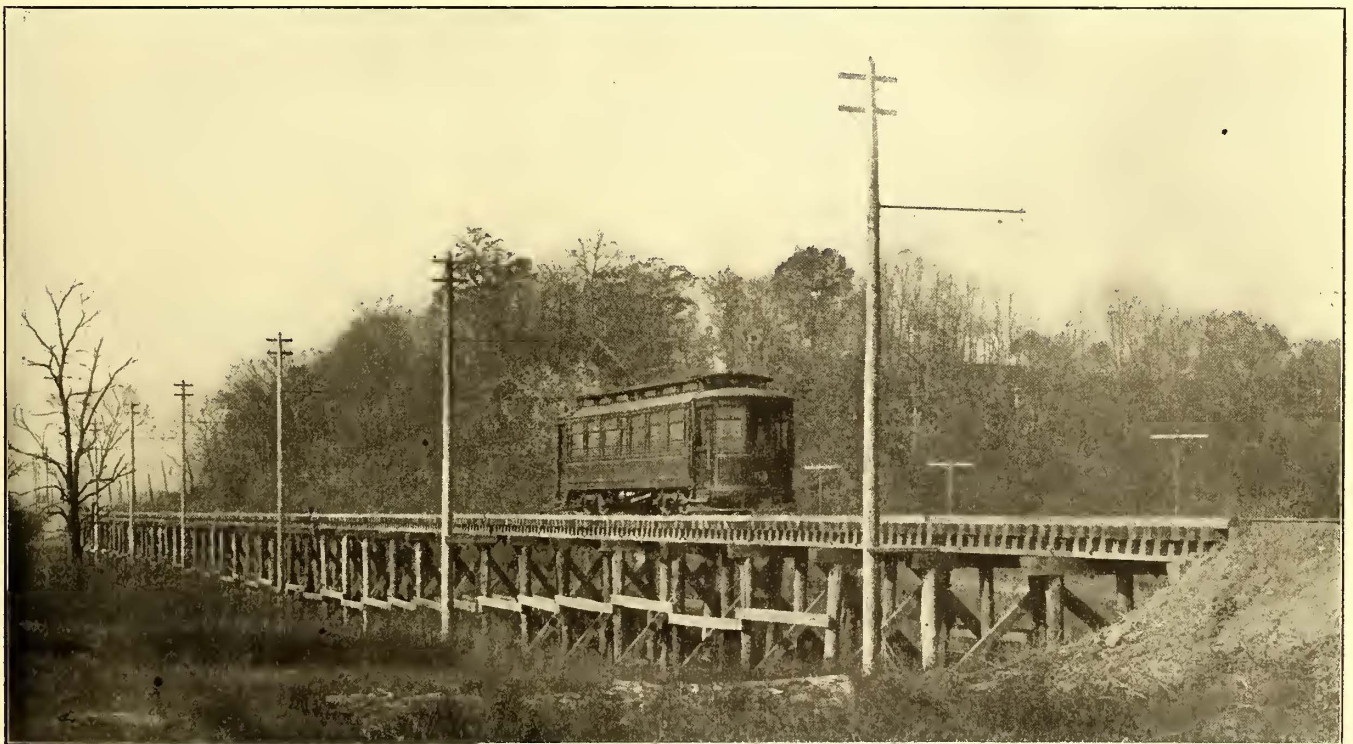
The Rapid Railway was placed in operation to Lebanon, 32

built. The country is rough in many places, and a number of instances of bold engineering marks the work. Approaching Lebanon a hill was cleft fairly through the center, the cut being 35 ft. deep. At Kings Mills there is a double-deck trestle



TYPE OF CONCRETE ARCH CULVERT MASONRY USED WHEREVER POSSIBLE IN CROSSING SMALL WATERWAYS

330 ft. long and 60 ft. above the water. Near this the hillside has been cut and a solid stone retaining wall erected. Passing through the villages of Kennedy and Silverton the company widened the entire turnpike to enable it to lay double track without going to the sides of the roadway. A large amount of money was spent to enable this road to enter the city. New routes had to be made for the city company in order to avoid severe grades and narrow streets, and a large amount of special work had to be laid to provide curves that would carry the long cars. The Rapid Railway is now handling almost exclusively the employees from a number of factories in the outlying towns. At Kings Mills are the plants of the King Powder Company



PILE-DRIVEN TRESTLE

miles from Cincinnati, on Oct. 1 of this year. Electric roads almost without number have been projected to this point from Cincinnati, but the Rapid is the only one in sight or likely to be

and the Peters Cartridge Company, which give employment to over 1000 hands. Owing to the dangerous nature of these plants the buildings are scattered over a radius of several miles,



SINGLE-TRACK CONSTRUCTION

and the companies insist that the employees shall live at a considerable distance from the works. This fact ensures a heavy commuter business for the road. Lebanon, seat of Warren County, is a beautiful town, and is noted for its wealth and famous men and women. Heretofore its only connection with Cincinnati has been a branch steam line affording infrequent service, and the recent formal opening of the electric road, which was witnessed by the writer, was the occasion of a sincere outburst of public favor. Lines building to the north and west from Lebanon promise to make the town an important inter-urban center, as they will form valuable feeders for the Rapid Railway. A line is under construction to Franklin, and will be completed in a few months. The Dayton, Lebanon & Cincinnati, a steam road, is now being equipped with electricity, while another road is projected to Dayton. A line is being projected from Lebanon to Xenia, which will connect with the Springfield & Xenia Railway, thus establishing through connection to Springfield and Columbus. The census of 1900, which is used as the basis of all calculations here, gives the population of the district tributary to the Rapid Railway as follows:

Norwood	6,480
Pleasant, Ridge.....	953
Kennedy	209
Silverton	131
Deer Park.....	311
Rossmoyne	370
Terra Alta.....	102
Blue Ash.....	507
Winslow Park.....	193
Hazelwood	370
Brecon	441
Miltomson	210
Mason	629
King's Mills.....	1,653
South Lebanon.....	592
Lebanon	2,867

16,018

Intermediate population.....	6,500
	<hr/>
	22,518
Tributary population.....	5,000
	<hr/>
Total	27,518

ROADBED AND TRACK

The construction work on all the lines follows a high standard, and all of the track through the country is laid with 70-lb. A. S. C. E. section in 30-ft. lengths. In several villages and towns a "shanghai" T-rail is used, while in towns where there is pavement a 7-in. "Trilby" has been adopted. The ties are 6 ins. x 8 ins. x 8 ft., of genuine white oak, purchased in West Virginia and Kentucky, and brought down the river in logs by the company itself. Rail-joints are of the 22-in. continuous type, and the National elastic nut track bolt is used. Bonds of the General Electric No. 0000 9-in. concealed Wood type, with No. 0000 cross-bonds every 1000 ft., are employed. All sidings and turnouts to car houses, etc., are provided with the Lorain Steel Company's double-spring frog, which gives a continuous rail either way. The ballast on the



DOUBLE-TRACK SPAN CONSTRUCTION



SINGLE-TRACK, SIDE-POLE BRACKET CONSTRUCTION



DOUBLE-TRACK, CENTER-POLE BRACKET CONSTRUCTION (RAPID RAILWAY DIVISION)

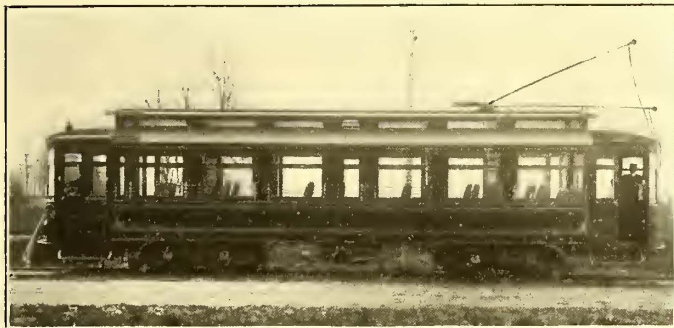
bridges resting on blue lime stone abutments. The entire district is a rolling country cut up by streams, and some of the grades are very severe. On the Rapid Railway there is one grade of 5.83 for 650 ft. In the city there are a number of short 8 per cent and 9 per cent grades. There are a number of perfect tangents on the system; one on the Rapid Railway is 4 miles long. The private right of way, enclosed by American Steel & Wire fencing, ranges from 40 ft. to 100 ft.

OVERHEAD LINE

Several types of overhead construction have been employed, as shown in the accompanying illustrations. In the towns adjoining Cincinnati, where double track was advisable, a fancy malleable iron center pole bracket, furnished by the Craighead Engineering Company, adopted. A stretch of this type of line work is illustrated. On double-track through the country cross suspension was substituted, and an example of this class is also illustrated.

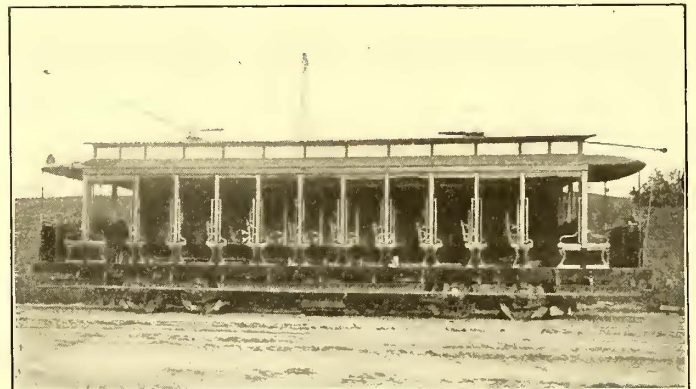
Suburban and Rapid lines is napped blue lime stone, placed 8 ins. under the ties, filled up even with the rails and brought out beyond the ends of the ties. On the Cincinnati & Eastern

The standard interurban work is all side-bracket construction, including 10-ft. 2-in. Craighead flexible brackets, cape and cone hangers and 15-in. soldered ears. The trolley wire is No. 00

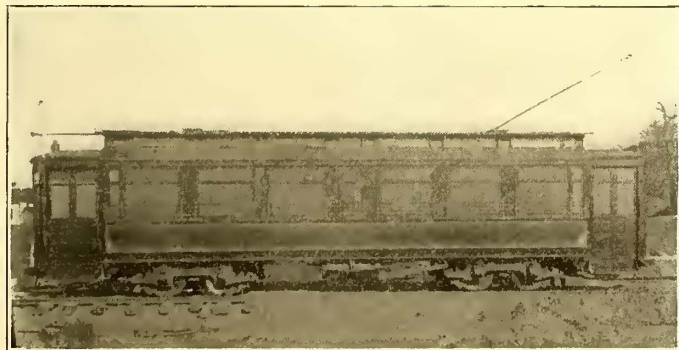


STANDARD PASSENGER CAR 46 FT. LONG

gravel ballast, 6 ins. under the ties, is used. Tracks are carefully trenched on both sides, and at all road crossings double-strength tile has been used, with dressed stone or concrete head-walls. There are a number of timber trestles, resting on concrete or stone piers, and there is one pile-driven trestle of



OPEN CAR



CLOSED CAR

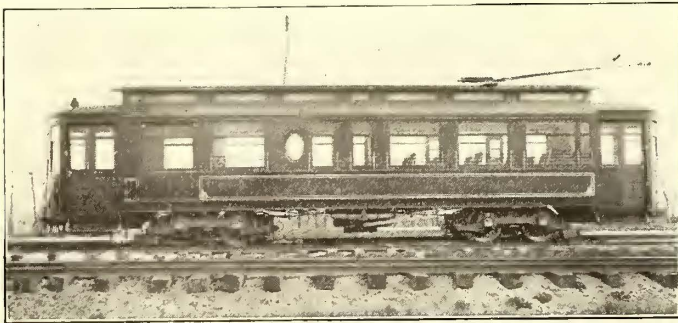
considerable length, which is illustrated. There are a number of 8-ft. to 10-ft. brick, stone and concrete culverts, while the smaller arch culverts are all concrete. There are several girder



INTERIOR CLOSED CAR

round, and to conform to the standard in Cincinnati two wires are placed 18 ins. apart. The right-hand wire is always used, as, of course, the overhead return system is not employed on the interurban roads.

The standard pole line carrying high-tension wires has three cross arms. The lowest is 18 ins. above the bracket, and has provision for telephone wires and direct-current feeders. Five feet above this is an 8-ft. cross-arm, carrying four pins for high-tension wires, two on each side of the pole. Two feet



COMBINATION CAR 46 FT. LONG

above the second arm is a 6-ft. arm carrying one high-tension pin near each end. The two arms provide for two three-phase circuits in equilateral triangular arrangement. The high-tension insulators are the Knowles 30,000-volt, glass type, which have been found very satisfactory. The high-tension wires are No. 4 hard-drawn copper for 10,000-volt transmission. The direct-current feeders are No. 0000, with the exception of 10 miles of aluminum. Poles are 35 ft. tall and spaced 100 ft. apart. On the Rapid Railway the poles are of Idaho cedar, all straight, with 8-in. tops, making a pole line that is hard to equal. All poles are being painted white with black butts. Westinghouse and Garton-Daniels lightning arresters are used on poles every half mile, being grounded to a 14-in. x 14-in. copper plate sunk 5 ft. in the ditch. All pole lines are anchored every half mile. Stromberg-Carlson iron box telephones are placed at



STANDARD FREIGHT AND EXPRESS CAR 46 FT. LONG

all turnouts for communication with the dispatcher. The same company furnished the wall instruments for all stations.

SPECIAL TYPE OF CARS

The designing of cars for this system was a problem which gave the engineers no little trouble. At first glance it would seem that a road using 5-ft. 2½-in. gage could adopt a very wide car, but as a matter of fact it was necessary to go to the other extreme on account of devil strips 3½ ft. to 4 ft. wide. Curves of only 35-ft. radius necessitated unusually short trucks, and precluded the possibility of as long a car as is used by many interurban systems. The city public, which had never seen interurban cars on the streets, was considered, and it was deemed advisable to make the cars follow as closely as possible

the lines and general appearance of the city cars; hence the monitor, rather than the steam, roof was adopted, and a peculiar arrangement of windows made the cars seem shorter than they really were. For the same reason the car was hung very low, thus necessitating only one step, 14 ins. above the rail. There are thirty-six cars in regular service, all furnished by the St. Louis Car Company. Twenty-six of these have smoking compartments and ten are combination passenger and express cars. They measure 46 ft. over all, 34-ft. body and 8 ft. extreme width. The framing is of the Robinson patent beam construction. The side sills are of steel, 8-in. x 2½-in. Carnegie section, weighing 18¾ lbs. to the foot. The ends of the side channels are bent with round corners, extending around to the center of end sills, joints being broken at opposite ends. All uprights, corner posts and side posts are seasoned ash. The uprights are riveted to steel channels. All longitudinal rails, top plates, ventilator rails, etc., are yellow pine without splices and faced with mahogany. The flooring is double, of ¾-in. material, with two thicknesses of felt between, and fastened with screws. The window sashes are double, and both sections drop below the arm-rail, which is covered when not in use. Seats are of the St. Louis walk-over type with grab handles across the top. Those in the passenger compartment are finished in red plush, and those in the smoker in rattan. Pantasote curtains, Consolidated electric heaters, Stanwood steps, electric bells and brass trimmings throughout are among the accessories. The finish is dark mahogany with the customary decorations. The toilet room and water-cooler are located between the compartments. At each car house there is a filtration tank, and the coolers in the cars are filled each trip. The combination cars were made to resemble closely the passenger cars. The door takes the place of the first window, and has a glass in it the same size as the other windows; when open, the door slides back of the next window. The baggage compartments may be used as smokers if desired. There are longitudinal seats, divided in the centers and hinged at the ends, that may be swung up to the roof and hooked when not in use. The trucks are, of course, unusually wide to conform to the gage, but have only a 4-ft. wheel base. In principle they are a modification of the St. Louis No. 47. Four No. 56 Westinghouse motors are used, and these are outside hung. Cars are equipped with the Westinghouse air-brake system, Hunter fenders, and both arc and incandescent lamps of the St. Louis make. Three freight and express cars have recently been purchased, and these follow more closely the lines of interurban cars, as it was found that the anticipated public protest against large cars did not materialize. These cars have the steam type of roof and they stand rather high. They are 48 ft. over all and have no vestibules or partitions. They have two doors on each side, one 4 ft. 6 ins. and the other 6 ft. wide, and are provided with the same general equipment as the other cars, except that they are double-enders, whereas the others are all single-enders. All controllers are the K-14 type. In addition to these cars the rolling stock includes four fourteen-bench open cars for summer excursions, three work cars and a supply car. All cars are equipped for the double trolley system, one pole being positive and the other negative. Between the two poles there is a switch, so that in case the positive pole is broken while in the country the negative pole may be used as positive. There is also a switch operated by the motorman which cuts out the negative pole at the city limits and throws in the ground, after which the negative pole is hooked to the top of the car. Of course, in the country the active pole and wire are 9 ins. off center. Nuttall poles, bases, wheels and split gears are adopted as standard.

The second installment of this paper will describe the buildings erected for the operation of these lines, including terminal stations, car houses and power houses. The power system will also be described in detail.

THE HEATING OF RAILWAY MOTORS

BY S. T. DODD AND M. C. CANFIELD

An editorial in the STREET RAILWAY JOURNAL of Oct. 31, on the above subject, raises a question as to "the possible effect of specialized means of ventilation on the final temperature of railway motors and on their useful working capacity." The result of motor ventilation, as here suggested, is perhaps more important than is immediately appreciated, and it has seemed to us that it is worth while to discuss this subject somewhat at length, and state what has already been done in the way of ventilated motors, and, in this connection, indicate what the probable tendency of the development of street railway motors is apt to be.

The service capacity of a railway motor is subject to two limitations. In the first place, the maximum current and consequently the initial acceleration of the car is defined by the commutation limit of the motor. The railway motor having been originally developed almost entirely for city service, this limit has controlled its development and rating. It is due to this fact, probably, that we have adopted a standard rating of railway motors by which a motor is rated on its capacity for one-hour service, rather than on its capacity for continuous work, as is the method of rating usual with other types of electrical apparatus.

The second limitation by which we find ourselves confronted is the heating of motors due to their internal losses. This

been sold in competition with each other for the same service. Curves 2, 3 and 4 refer to the ordinary type of motor, with frame practically enclosed, and having more or less ventilation in the armature. Curve 1 refers to a motor built with special attention to the ventilation of the armature, the escape of heated air from the same, and the admission of cool air to the interior of the motor. The curves are based either on tests which we have made ourselves or on claims of the manufacturers published in trade circulars.

The temperature due to the full load of the motor for one hour is in each case taken as a standard, and points on the curves are determined by operating the motor at various loads for periods which will, in each case, develop the standard temperature. As a consequence, it is evident that the curves will cross at the point representing one hour at full load, and will diverge at longer periods as the different motors represented vary in their carrying capacity at these longer periods.

It will be noted on inspection that curves 2, 3 and 4 lie fairly close together, while for all times longer than one hour, Curve 1 lies uniformly above them. The percentage of difference between Curve 1 and the other curves gradually increases, until at the end of the seven-hour period Curve 1 is practically horizontal at 54 per cent, showing that the motor represented by it is capable of carrying for a long period 54 per cent of its rated current with the same rise of temperature as developed by its full load for one hour, and the relative position of the other curves shows that the motor represented by Curve 1 has attained a marked improvement in long-time capacity.

We have been accustomed so long to comparing railway motors on the basis of their heating on one-hour rating that the benefits are not immediately apparent which would be derived from increasing the long-time capacity of a railway motor, although maintaining the same hour rating, or even at the expense of decreasing the hour rating. As a consequence, it seems that it might be of interest to discuss the results which could be attained by two equipments, such as are here represented, one of which we will call the No. 1 equipment, having a long-time capacity of 54 per cent of its hour rating; the other, which we will call the No. 4 equipment, having a long-time capacity of 35 per cent of its hour rating. We will apply these equipments to one or two detailed cases.

Let us consider a 30-ton car, geared for a maximum speed of 45 m. p. h., and making one stop every 2 miles. Let us then calculate the size of equipment necessary to operate this car with motors of the No. 1 type, and also with motors of the No. 4 type. In order to arrive at a basis for calculation, we will refer to the data given in Mr. Armstrong's Institute paper, entitled "High-Speed Electric Railway Problems," presented at the meeting of June 30, 1903. Fig. 2 is a reproduction of Fig. 4 of that paper, and gives the speed and energy curves for a single car geared for various maximum speeds. Referring to the curves for 45 m. p. h., we derived the following data:

Schedule speed, two stops per mile.	33 m. p. h.
Average energy consumption per ton mile.	85 watt-hours
Average energy consumption per ton, at 33	
m. p. h.	2.8 kw
Average energy consumption 30-ton car.	84 kw

If we consider such a car taking an average energy of 84 kw and equipped with motors of the No. 4 type, with an average capacity of 35 per cent of their hour rating, the size of equipment for operating such a car would be 240 kw, or, making the necessary allowances for motor efficiency, approximately 258 hp. This would correspond to an equipment of four 64½-hp motors.

Let us now consider the same car equipped with four motors of the No. 1 type, which have a long-time capacity of 54 per cent of their hour rating. The rated capacity of such an equip-

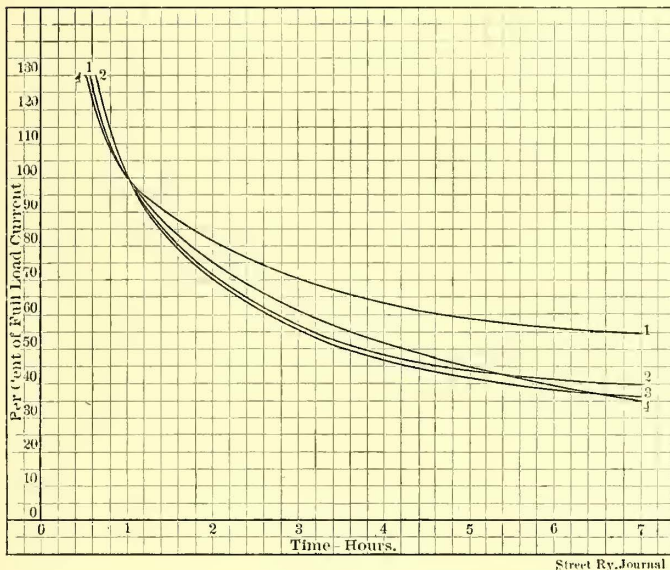


FIG. 1.—HEATING CHARACTERISTICS OF RAILWAY MOTORS

imposes a limit upon the capacity of motors which we meet with in interurban service more frequently than in city service. With stops occurring at intervals of from 1 mile to 5 miles, a little more or less initial acceleration does not have a very important effect upon the schedule, and a motor is demanded which can be called on to run for long periods of time, delivering an average amount of power, rather than one which can be called upon for abnormal efforts at intervals. As a consequence, there is a field to be covered by increasing the capacity of motors for long-time service, and we wish to indicate briefly the results which have been attained in this direction, and the development to which these results may lead.

Fig. 1 presents a set of curves which show the proportions of rated loads which various motors will carry for different periods with the same heating. There are four curves referring to four different motors, which have been put on the market by four different manufacturers. These motors are practically of the same size and commercial rating, and have

ment would be 156 kw, or 168 hp, which would correspond to an equipment of four 42-hp motors.

In order to get an approximate idea of the saving effected by the use of the latter equipment, aside from the question of first cost, we can figure the weight of the equipments at 65 lbs. per horse-power. The weight of the two equipments would then be as follows:

	Pounds.
258-hp equipment.....	16,800
168-hp equipment.....	10,900
Difference in weight of equipments.....	5,900

This shows a saving in car weight of about 3 tons, which, if we wish to make the weight of the complete cars the same, could be devoted to greater seating capacity. When we consider that 5900 lbs. represents a weight equivalent to about forty passengers, it will be seen that the saving effected by using a motor of the No. 1 type is something which is by no means to be neglected.

Let us illustrate this point still further by comparing two

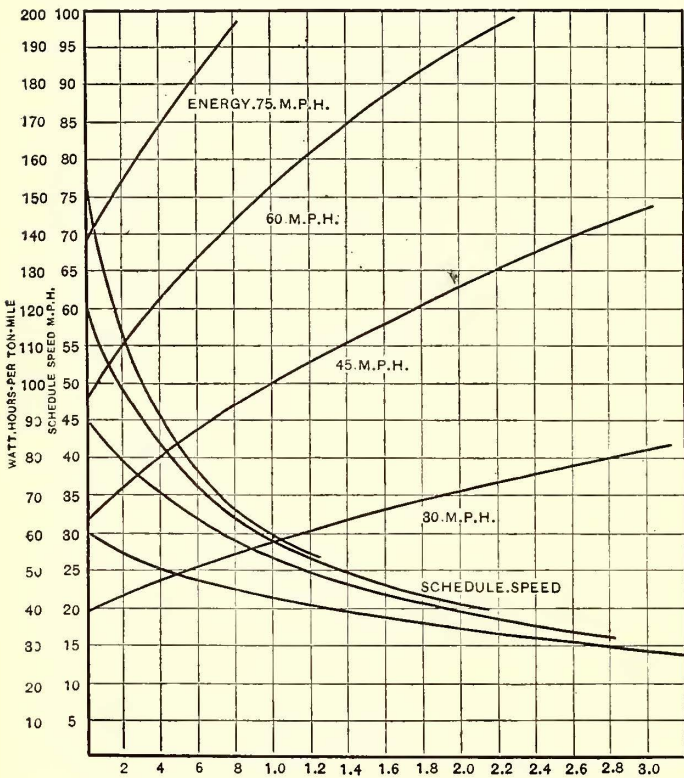


FIG. 2.—SPEED AND ENERGY CURVES

equipments of exactly the same one-hour rating. We will assume that the equipments are geared for a slow speed, such as would represent freight service, and will consider the difference in maximum load which the equipments could handle without exceeding their heating limits. Let us assume that we have two equipments, each rated at 200 hp, or 186 kw. One of these equipments is of the No. 4 type, and its average capacity is 65 kw. The other equipment is of the No. 1 type, and its average capacity is 100 kw.

Referring again to Fig. 2 we can obtain the energy consumption per ton under any particular condition by multiplying the energy per ton mile and the corresponding schedule speed as given on the energy and speed curves of this figure. With a gearing for a maximum speed of 30 m. p. h., the average consumption is about 1.2 kw per ton. Dividing the average capacities of the two equipments, as above given, by this factor, we have a maximum load capacity for the No. 4 equipment of 54 tons, and a maximum load capacity for the No. 1 equipment of 83½ tons. It appears, therefore, that under these conditions the No. 1 equipment would be capable of handling a load 50 per

cent greater than the No. 4 equipment without exceeding its heating limits, provided that the two motors were of identically the same capacity upon their hour rating.

In addition to the above considerations it is evident that the No. 1 type of motor is worked nearer to its maximum efficiency than the No. 4 type. Fig. 3 represents a characteristic curve of efficiency of a railway motor. We have noted on this curve the points corresponding to 54 per cent and 35 per cent, respectively, of the maximum current input. It will be noted that the motor carrying an average of 54 per cent of its maximum load is working at a point of efficiency on the curve several per cent higher than the motor carrying 35 per cent of its maximum load. As a matter of fact, the difference is even greater than this, for when running at full speed on a level track, the current consumption is a good deal less than the average on which we have based our calculations, and, as a consequence, when running at full speed, the type No. 4 motor would be working low down upon the efficiency curve, while the No. 1 type would be working well up toward the knee. What the exact difference would be could be determined only in particular cases, but it is evident that a considerable economy will be effected by working an equipment at a high fraction of its full load.

The discussion above has purposely been made very general. We have not taken into account such detail questions as the reduced weight per horse-power of the ventilated motor, nor the difference in repair account, nor the increased life of arma-

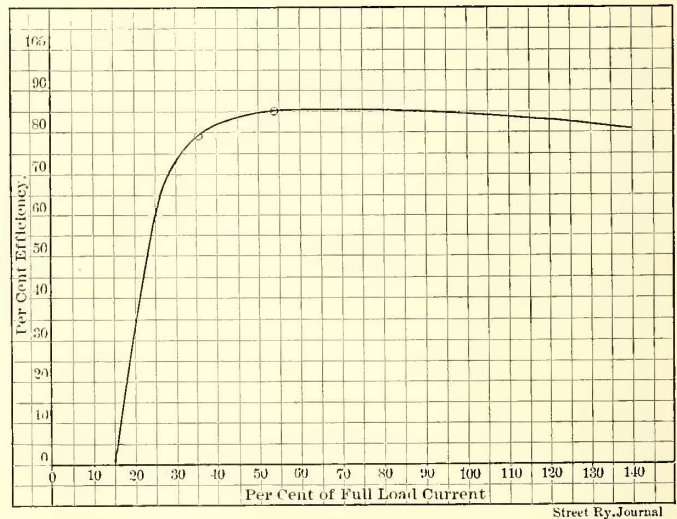


FIG. 3.—EFFICIENCY CURVE OF RAILWAY MOTOR

ture and field coils, which would be incident to the use of the cooler running type of motor; nor have we discussed the decreased acceleration incident upon heavier loads applied to a small motor. These are details which would have to be made the subject of a more particular discussion.

With regard to the further question of danger from dust or moisture, it is a fact that in all modern motors provision is made for the escape, outside of the motor casing, of grease and oil from the bearings. This very fact renders the motors liable to the admission of dust at their most sensitive point, viz., directly to the bearings, so that if any damage was to be anticipated from dust entering a ventilated motor, we are already liable to that danger in every type of modern motor. Modern insulation is to a great extent waterproof, and the danger to be anticipated from moisture on a ventilated motor of this type can be determined only from experience. We can say that we do know that motors here referred to as the No. 1 type have been in operation through the snow and slush of winter and through the dust and rain of summer, and no trouble has yet been experienced which could be attributed to this source.

The point to which we wish particularly to call attention in this article is that while the limits are rather narrow within

which improvements can be made, we do not believe that the street railway motor has yet reached the final phase of its development. If results, as sketched in this article, can be attained by merely opening up the interior of the motor and permitting some access of cool air to it, what are we going to be able to attain by careful attention to this point in the design and by proper porportioning of core losses and copper losses with a view to the increased ventilation? In particular, is it not going to pay to at least experiment with the forced ventilation of our motors? Nearly all our most efficient forms of motive apparatus use some sort of artificial cooling. Our most efficient steam engines are equipped with condensers, and are water-jacketed in guides and bearings. Our gasolene engines make use of water-jackets and cooling devices. Shall we not find that the final type of street railway equipment will include some method of artificial cooling of the interior of the motor, and that, thereby, we can lessen the weight and cost of electrical details, allowing more room for bearings, gears and other mechanical parts, while at the same time we can increase the ratio of paying tonnage to dead weight of our car equipments?

INTERVIEW WITH CHARLES T. YERKES ON HIS LONDON PLANS

Charles T. Yerkes, who is now here from Europe on his annual visit, consented, at the invitation of the STREET RAILWAY JOURNAL, to furnish this paper some interesting and exclusive details regarding his London plans. These will involve the control of some 140 miles of underground and surface track, and the expenditure of at least \$85,000,000, about half of which will be American capital. Mr. Yerkes when interviewed at his office, 54 Wall Street, said: "The Underground Electric Railways Company, Ltd., of London, whose capital is £5,000,000, half of which is paid up, is converting the Metropolitan District Railway from steam to electric motive power. It is also building the Baker Street & Waterloo Railway, which is a double line operating from the Waterloo station of the London & South-Western Railway, thence under the River Thames to the Victoria Embankment, where it has an interchange station with the District Railway, thence to Trafalgar Square, then on to Piccadilly Circus, under Regent Street—the great shopping center—to Regent Park, terminating near the Baker Street station of the Metropolitan Railway Company. This system was purchased from the London & Globe Finance Corporation when the latter got into financial difficulties some eighteen months ago. It was bought for 25 per cent of the amount that had been expended on the part completed, which was about two-thirds of the road. We are going to extend the lines at both ends. From Waterloo we will construct the line on to the Elephant and Castle, and from Baker Street we will build on to Paddington, the London terminus of the Great Western Railway.

"The Great Northern, Piccadilly & Brompton Railway, which runs from Finsbury Park to Earl's Court, has also been acquired. This line goes through by way of Tottenham Court Road and Piccadilly. The Charing Cross, Euston & Hampstead Railway is another road which will be controlled by the company. It will be a double line, running from the Charing Cross station of the South-Eastern Railway to the Euston station of the London & North-Western Railway, thence to Camden Road, at which place it will divide, one line proceeding to Hampstead and Golders' Green, and the other line going to the Kentish Town station of the Midland Railway Company, and then on to Highgate. The underground company will include in its system the surface lines of the London United Tramways, which start from Shepherd's Bush and Hammer-smith, and run to Hampton Court and Southall. A franchise, permitting of the building of a surface road between Golder's

Green and Edgeware, is also the property of the underground company.

"For the purpose of operating the whole system a power station, which was illustrated in the STREET RAILWAY JOURNAL for July 18, 1903, is under construction at Chelsea Creek, London, Southwest, and will be the largest plant hitherto built in the world for the generation of current for electric railway use. The plant, which will cost upwards of \$6,000,000, will occupy four acres. It will have a water front of 1100 ft. on the River Thames and Chelsea Creek. On Lots Road, Chelsea, 860 ft. will be the frontage. The power house itself will be 453 ft. long and 175 ft. wide. The office building will be 81 ft. in length and 25 ft. in width. German and Belgian steel is being used in its construction. The initial capacity of the plant will be 75,000 hp. The British-Westinghouse Electric & Manufacturing Company, Ltd., secured the contract for the steam and electrical equipment.

"There will be ten Westinghouse-Parsons turbines of 7500-hp capacity each. The generators, also of Westinghouse build, will be of three-phase type, wound for 11,000 volts, 33 1-3 cycles. The normal rating of each generator will be 5500 kw, but they will carry an overload of 50 per cent for two hours at practically the same steam consumption per kilowatt-hour. The plant is designed with a view to increasing the capacity by one-half. The boiler equipment, in the first instance, will consist of 84 units, of 520-hp capacity each.

"Within the building over the boilers storage has been provided for 15,000 tons of coal. Two unloading machines, worked from bridges which span a large tidal basin, will discharge the coal from the barges. The capacity of each of these machines will be 60 tons per hour. The contract has been undertaken by the John A. Mead Manufacturing Company, of New York. The chimneys for the power plant will be four in number, each 17 ft. internal diameter and 275 ft. high. The contract was awarded to the Alphons Custodis Chimney Construction Company. The District Railway will consume 50 per cent of the power generated in the Chelsea plant, while the Baker Street and Waterloo line will require 10 per cent. These two roads we anticipate having ready for active operation about the latter part of next year, at which time the necessary power will be ready to deliver.

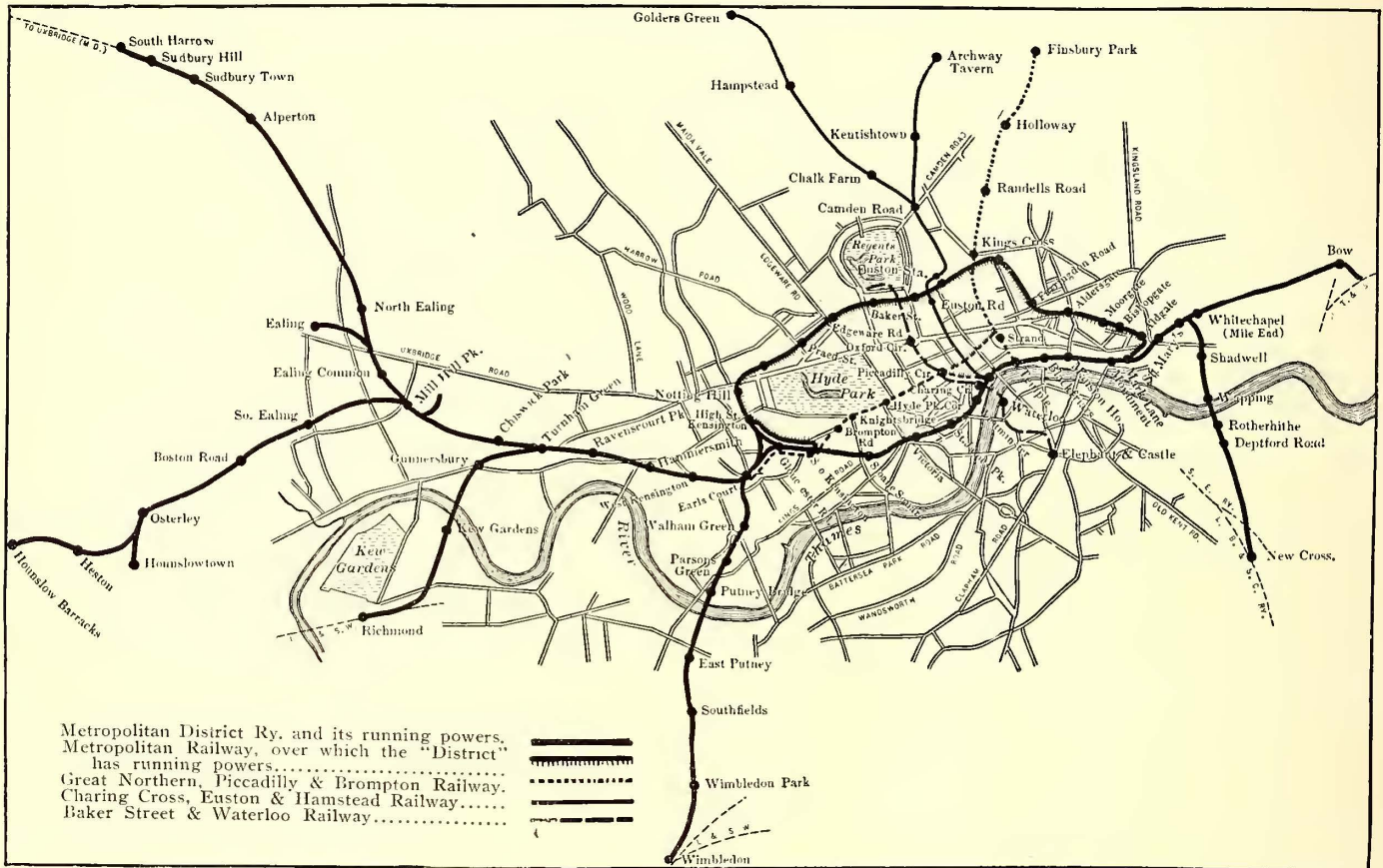
"The Underground Company has an agreement with the District Company whereby securities and some cash—but mostly securities—have been accepted as payment for the changing of the system from steam to electricity. Since we have commenced work the value of these securities has increased from 40 per cent to 50 per cent. We are doing this work without profit, charging the District Company net cost, payable in securities at market price. Our whole profit lies in the increase in value of these securities. The District road will be entirely changed, and very little left except the tunnel itself. All the tunnel walls along the route will be whitened."

Regarding the rolling stock, Mr. Yerkes said: "The question of cars has been given a great deal of consideration. We have gone into the matter very fully for the last two years, and have conducted many experiments. Fourteen sample cars have been built, and are now running on our Ealing-Harrow line. This line, which is operated by power generated at a temporary station at Alperton, is 5 miles long, all double track. Two trains of seven cars are employed on the road. One of these trains is equipped with the British Thomson-Houston system of multiple control, and the other with the Westinghouse system. Each car has motors aggregating 500 hp. These trials have been going on for the last twelve months, and I expect to decide as to which system will be adopted before I return to Europe next month. We shall require 480 cars. Each will seat fifty-two passengers. The trucks will be made of iron and the body will be built of non-inflammable wood and aluminum. The part of the car containing the motor will be

steel cased. Nothing will be in the tunnels that is liable to catch fire.

"We have found that the great danger of all electric operation is the creation of an arc. If an arc is once formed nothing can resist it. The only thing we can do is to have material in proximity to it that will not burn. Metals will take fire from an arc as quickly as wood. Therefore, the proper thing to do is to have your material of such a character that it will not smoke or continue to burn after the arc is destroyed. During our experiments with cars at our testing plant at Harrow, we did our best to burn up a car. We built fires beneath it and also inside of it, with the result that the car was not burned and very little damage done to it. Of course, we took the chance of losing a car, but while we were about it we preferred to make a practical test. The plan of the car which we

are seven American directors on the board. Charles T. Yerkes is chairman of the company. The other American directors are: James A. Blair, of the New York banking house of Blair & Company; T. Jefferson Coolidge, Jr., president of the Old Colony Trust Company, of Boston; James H. Hyde, of the Equitable Life Assurance Society of New York; James Speyer, of the New York banking house of Speyer & Company; Robert H. McCurdy, of the Mutual Life Insurance Company, of New York, and L. F. Loree, president of the Baltimore & Ohio Railroad. The British members of the directorate are William Abbott, of London; Frank Dawes, of the law firm of Bircham & Company, of London; Lord Farrer, director of the Midland Railway Company; Charles Ainsworth Spofford, of London; Edgar Speyer, of the London banking house of Speyer Brothers, and Charles James Cater Scott,



YERKES SYSTEM OF UNDERGROUND ROADS

Street Rv. Journal

have adopted is even an improvement over the ones just spoken of."

In reply to the question as to the prospects for financial success attending the operation of the various lines to be operated by the underground, Mr. Yerkes, said:

"We don't care to guess for the public what kind of business we are going to do. I know, however, that in and around London there are 8,000,000 people, with very meager facilities for transportation. When you know this, it is not worth while to surmise. In a business we always have to take chances, but I believe that this is the best chance I ever took.

"It is our intention to charge a single fare of 2 pence on the different tube lines from one end to the other. On the District line 2 pence will be the popular fare, but the line will be divided into 'zones,' the present rate of the District Railway being based upon the mileage the passenger travels. We believe the introduction of the American system of a one-fare rate will tend to build up the lines and make them much more popular."

Though the Underground Electric Railways Company, Ltd., is incorporated under the British Limited Liabilities Act, there

chairman of the London & India Docks Company. Jonkheer Henry Teixeira de Mattos, of Teixeira de Mattos, of Amsterdam, is also a director.

CARS FOR THE SUBWAY

The mechanical department of the Interborough Rapid Transit Company of New York has been kept busily engaged during the last few weeks in testing the cars built for the subway, which are now being received from the manufacturers. At present more than 200 of these new cars are in the yards and shops of the Interborough Company, and between seventy and eighty are daily pressed into service on the East Side elevated lines, where they are in regular service. The company is taking this means of testing the equipments thoroughly and getting the stiffness out of them before the opening of the subway. It also affords an excellent opportunity to enable the motormen to become familiar with them. The Manhattan division has been short of cars, and the opportunity to try-out the subway equipments, pending the arrival of new coaches for the elevated, was welcomed by the management.

CHICAGO STREET RAILWAY STRIKE

As announced last week, the conductors, motormen and gripmen on the lines of the Chicago City Railway Company went on a strike, and since that time cars have been operated on the South Side system only under great difficulty, the union men and their sympathizers obstructing the movement of the cars as much as possible and preventing, by intimidation, all patronage of such cars as were operated. Mail cars were operated regularly through the week, the union offering to furnish men if necessary to do this, in order that no excuse might be afforded for an appeal to the Federal authorities for protection. Where the company endeavored to follow up the mail cars by regular passenger coaches, however, difficulties were met with at every step; the streets were obstructed by teamsters, and the police seemed powerless to keep the lines open. Piles of stone, timber and iron were placed on the car tracks at regular intervals, delaying the movement of the cars until these obstructions were removed. Crowds lined the streets on which the company attempted to operate its cars, and, as is usual in such cases, the lawless element asserted itself. In many instances, bricks and paving stones were hurled at the cars, and in two or three cases showers of missiles were thrown upon passing cars from the tops of tall buildings, in some cases crashing through the roof of

the coach and often injuring the employees. On Thursday morning, Mayor Harrison published a strike proclamation, in which he warned the people not to congregate upon the



"WHO THREW THAT BRICK?"



A FAVORITE METHOD OF OBSTRUCTION



TYPICAL SCENE AT CLARK AND VAN BUREN STREETS

streets, especially along the railway. This, however, had no appreciable effect, and the entire day was marked by stormy scenes between the strike sympathizers and the em-

ployees as well as at frequent points along the lines, and efforts made to prevent non-union men from accepting service from the company. In several instances, where the men persisted in staying at their posts they were assaulted, and in some cases very seriously injured.



SCENE AT MADISON AND CLARK STREETS

ployees in charge of cars. Toward the end of the week the company succeeded in maintaining regular service upon the Wentworth Avenue electric line, which runs down Clark Street from Twelfth Street. But this section soon became a storm center, as is clearly shown by the views herewith presented. At the corner of Van Buren Street and Clark Street a great deal of trouble was experienced, because of the peculiar physical conditions. The Union Traction Company operates a cross-town line on Van Buren Street which is one of the busiest down-town outlets for the West Side lines, and all the Wentworth Avenue cars pass this intersection. The union loop for the elevated service is also on this street, and the supports for the structure occupy considerable space in the roadway, so that there is always a great deal of confusion at this point. The strikers took advantage of this favorable opportunity for hampering the operation of the Chicago City Railway Company's cars on the lines running north and south, and they succeeded in keeping that portion of the system constantly in confusion.

On Friday night the company had succeeded in operating regularly twenty-five cars over the electric lines turning into Clark Street, but a new complication arose at this time through a sympathetic strike being declared by the firemen. Their places were filled, however, after considerable difficulty, but on Saturday night the announcement was made that the engineers had followed the firemen, and that the teamsters, who had been relied upon for hauling the coal to the power plants, had announced that they would cut off the supply of fuel if it were to be handled at the stations by non-union labor.

Although the labor leaders had announced, with considerable flourish of trumpets, that the present controversy would be carried on without disturbance or violence of any kind, the actual conditions show a complete disregard for authority. Several cases were reported where members of the Union in the preliminary meetings on the day the strike was declared, opposed the policy of ordering an immediate walk-out, and they were denounced as spies and maltreated by their companions. Pickets were stationed at all of the car houses and power sta-

At the beginning of the trouble the Mayor gave instructions that the police were not to assist in the operation of the cars in any way, but they were to be entirely neutral, merely maintaining order along the lines and in the vicinity of the company's property. It soon became apparent, however, that this was impracticable, and the indignation which was manifested on all sides resulted in a modification of this policy, so that by the end of the week the cars were operated under strong police protection. This, of course, greatly incensed the strikers, and led to several demonstrations. At the Council meeting on Monday the Mayor was denounced bitterly by the union supporters because of the protection afforded the company by the police, but the legal department has since supported the position of the administration in placing policemen on the cars and taking such other steps as were deemed necessary for the safety of patrons of the company. It is significant that the City Council passed a resolution endorsing the action of the Mayor in taking such strenuous measures to prevent mob violence.

About twenty-five Wentworth Avenue electric cars were run



GUARDING THE MOTORMAN AND CONDUCTOR

on a five-minute schedule Monday despite the strikers. There was only one serious blockade, which lasted half an hour, and was caused chiefly by the peculiar operation of a Union Tractor car at Van Buren Street. Teamsters took part in the blockade. Three thousand persons gathered and were dispersed. Several small attempts at wrecking were reported, and a few torpedoes snapped harmlessly under the wheels of the first car north at West Thirty-Ninth Street. One southbound car was turned into West Thirty-Ninth Street by a spiked switch. A heavy tile crashed to the sidewalk from the roof of the new post office while a car was passing. Policemen formed the majority of passengers on all the cars, and curious crowds watched the movement of cars down-town in silence.

One hundred and fifty men, including repair men, linemen and dynamo men, struck on Monday, and they were followed on Tuesday by the machinists.

Owing to the rioting and intimidation resorted to the company has offered a reward of \$100 for the arrest and conviction of any one participating in these outrages.

Six hundred Pinkerton specials have been pressed into service to patrol the electric lines and guard against tampering with the overhead construction.

Five cable trains, each consisting of a grip car and "trailer," were operated on Cottage Grove Avenue under a guard of 1000 policemen on Tuesday. Twenty-five cars were operated on the Wentworth Avenue line under police protection, and arrangements were made to open other lines.

Chief of Police O'Neill instructed his subordinates to board United States mail wagons if the drivers showed a disposition to blockade street car tracks or hinder the police in their efforts to keep the streets clear. The drivers in such cases are to be arrested after the mail is delivered at the post office.

As usual, all sorts of hold-ups are resorted to by those who hope to profit by the strike. The executive board of the Street Railway Men's Union decided to proceed against the Chicago City Railway in the courts to compel the company to provide vestibules for all its cars according to a law passed during the last session of the Legislature.

Another move was made when George F. Harding, Jr., in a bill, filed before Judge Holdom, asked that a receiver be appointed immediately for the Chicago City Railway, and that the

A noteworthy feature of the situation is the fact that both the firemen and the engineers were under contract with the company not to engage in any sympathetic strike. Their unions are entirely independent of the Amalgamated Association, and as they had no grievance against the management it was assumed that they would continue in the discharge of their duties, the firemen particularly, as their agreement for the coming year had only been signed during the last week. The announcement that both of these labor organizations had repudiated their contracts and violated their pledges to the management in order to assist the motormen and conductors was received in a very different spirit by the strikers and the general public, the former hailing this acquisition to their



A UNION ARGUMENT

forces as a very substantial victory, while the public naturally looked with contempt and scorn upon the organization that could resort to such methods.

The attitude of the company remains exactly the same as it was at the beginning. The management will continue to operate its cars, or such portion of them as may be possible, with the assistance of non-union men, but, of course, the service will be inadequate until the strike is broken. This the officers say will undoubtedly be the ultimate result, as the company cannot possibly make the concessions which the men demand.

As might have been expected, the present difficulties have been seized upon by the politicians for currying favor with that element of the laboring class which is dominated by union influence, and they are threatening to institute an active campaign for municipal ownership. One result of this movement was the action taken by the Federation of Labor, which has been active during the last week in inciting demonstrations against the company with a view to preventing the adoption of the franchise extension ordinance now before the Council committee. In spite of these facts, however, the company expresses its determination to resist every encroachment upon its rights, and thus far it has consistently maintained its position.

The announcement was made, unauthoritatively, on Friday night, that the State militia would be pressed into service to supplement the efforts of the police in maintaining order. Protest was immediately filed by the strikers with Governor Yates, and at the same time it was declared that the North Side and West Side lines would be tied up by a sympathetic strike if this policy was followed.

The illustrations accompanying this article are reproduced from photographs used through courtesy of the "Chicago Tribune."



RESERVES AT DANGER POINTS

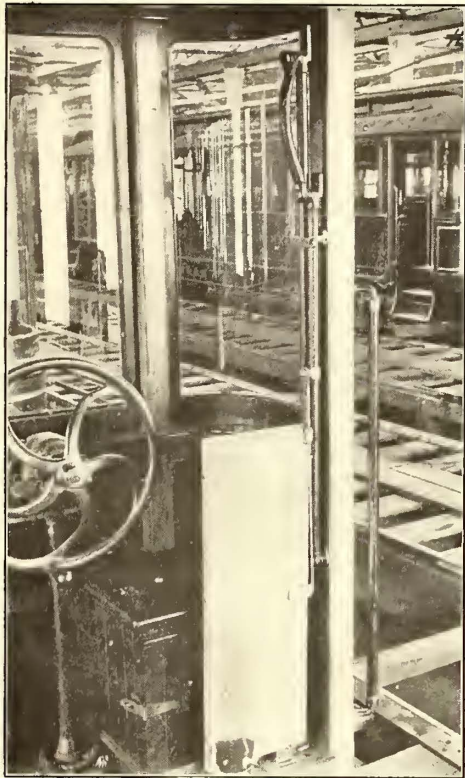
receiver proceed at once to operate the road under the old agreement with the strikers, or settle present troubles by arbitration. Mr. Harding, in making the application, alleges that the railway has been operating since last June without a franchise, and makes this allegation the basis of his application.

A conference was held on Tuesday between Mayor Harrison, the officials of the company, and the special Aldermanic Peace Commission appointed by Mayor Harrison at the direction of the City Council. This was followed by another meeting in which President Mahon of the Amalgamated Association of Street Railroad Employees and his legal advisers took part. Mayor Harrison declared that the outlook for a settlement of the strike by arbitration was decidedly flattering.

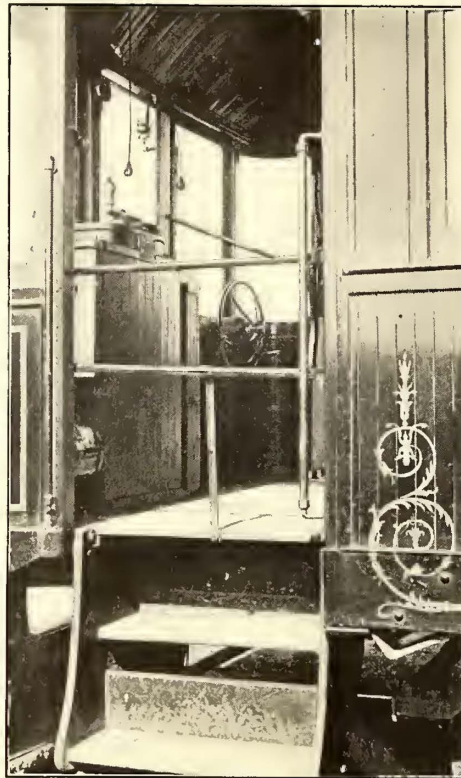
PLATFORM GATE AND TRAP DOOR

To prevent passengers from alighting from cars on the wrong side and thereby protect them from the danger of being

Joseph McMillan, assistant to General Manager Randolph, is credited with the invention, states that the gate has been in satisfactory operation for several months. The device is not patented. Even a cursory examination of the accompanying illustrations will show that it is of simple construction, takes up very little space and presents a neat appearance.



GATE FOLDED BACK AND TRAP DOOR RAISED



GATE CLOSED, WITH TRAP DOOR DOWN

The gate is made of two pieces of 3/4-in. pipe, one end of which is screwed into a brass casting that is secured to the door-post and acts as a hinge. The other ends are screwed to brass castings that rest in brackets when the gate and trap-door are closed.

The lower pipe of the gate is secured to a trap-door by a wrought-iron strap. When the gate is raised to a vertical position and folded back to the door-post, the trap-door, by the same movement, is brought to an upright position.

Original experiments were made with the gate alone, for the trap-door was entirely an after-thought. Without it, however, the use of the gate was found to be fraught with some danger, because it left an opening in the floor of the vestibule next to the gate into which people would accidentally stumble. This led to adding the trap-door, which proved profitable, because it increased the

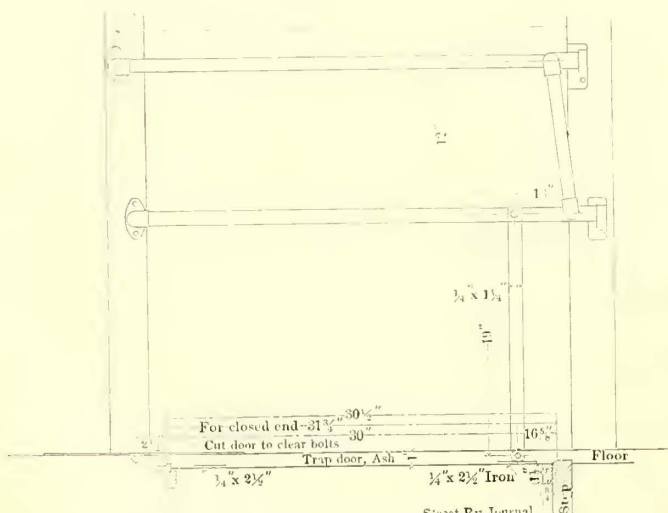
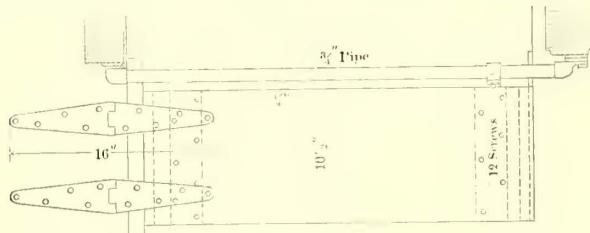
struck by a passing car, the mechanical department of the Pacific Electric Railway Company, of Los Angeles, has designed a combination gate and trap door, the construction of

vestibule's standing room by two passengers. The trap-door is made of ash.

To equip a car with four of these contrivances costs only \$40, approximately. All the work, even to the manufacture of the parts, is done in the shops of the Pacific Electric Railway Company. The cars on all the interurban lines of the company are to be so equipped.

NEW CALIFORNIA LINE OPENED

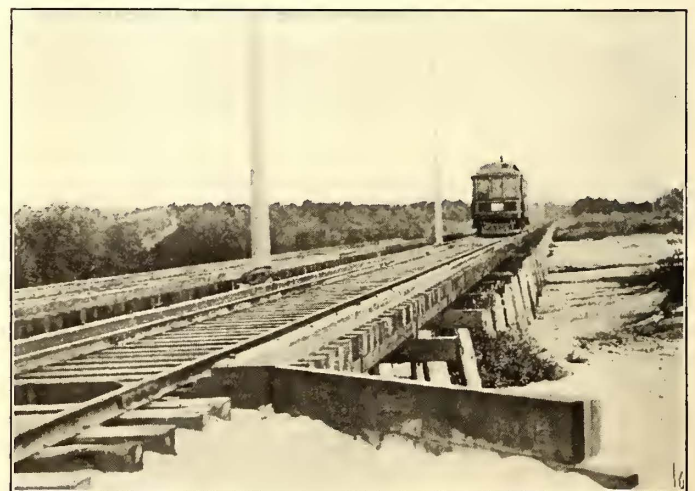
Another interurban line of the Pacific Electric Railway Company has been opened out of Los Angeles. It runs off east



DETAILS OF TRAP DOOR FOR STEPS

which is shown in the accompanying cuts. The contrivance is now in use on all of the company's Long Beach cars, and is very inexpensive.

William Jennings, mechanical superintendent, who, with



CAR CROSSING 1300-FT. BRIDGE ACROSS SAN GABRIEL RIVER

through a beautiful stretch of semi-tropical country to the little town of Whittier, distant 17.38 miles. The line was opened for regular traffic on Nov. 7. Half-hourly service is maintained most of the day (hourly when midday dullness obtains), with

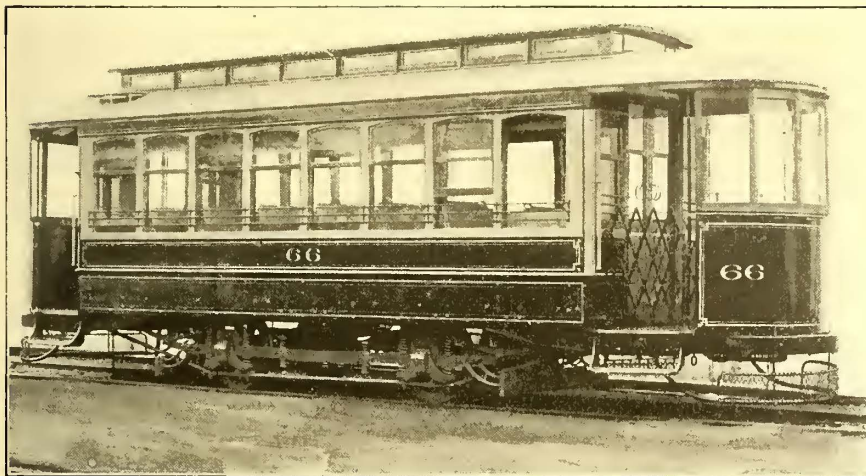
the last car leaving the city of Los Angeles at 11:30 p. m.

When completed the Whittier line will be the equal of any of the other Huntington lines out of Los Angeles, having broad-gage, ballasted, oil-sprinkled tracks, and using exclusively the type of car shown in the accompanying illustration. The difficulty in obtaining steel rails has made it impossible to open the line double-tracked all the way to Whittier, but the grading is completed for the purpose and the poles equipped for overhead work. A few weeks more will see this line a rival of the famous Long Beach line of the Pacific Electric Railway Company.

The new line, outside of incorporated towns and cities, is over a private right of way. The country traversed is rich with freight, and the company is preparing to handle all it can get.

SEMI-CONVERTIBLE CARS FOR ATLANTA, GA.

Ten semi-convertible cars have just been completed for the Georgia Railway & Electric Company, of Atlanta, Ga., by the J. G. Brill Company. Ten 28-ft. cars of this type were built



NEW CAR FOR ATLANTA

for this railway company last year. The new cars have an unusual and interesting feature, namely, the lower side panels are made to serve as sill plates. These plates are composed of $\frac{1}{4}$ -in. x 18-in. steel, bent around the corner posts and brought to the door posts. This feature is the railway company's idea, and besides stiffening the sides and giving longitudinal strength, provides a guard for the prevention of injury to the car by collision with vehicles. The cars have straight sides, but on account of the guard rail and the division of upper and lower panels in the usual style of curved side cars, an appearance of curved sides is given. The sides are unusually low, bringing the top of the window sills 24 ins. from the floor. The windows are stored in roof pockets in the usual method of this type of car. The runways for the window trunnions are entirely of metal, precluding all possibility of sticking. Three-bar window guards extend from corner post to corner post for protection of passengers' arms. The illustration shows the corner window in roof pocket, and the next window raised part way. The ability to raise the window but a small distance is one of the advantages claimed for the car over the wall window pocket systems. The seats are placed transversely to the car, and the corner seats longitudinally. The total seating capacity is thirty-two. The seats are upholstered in spring

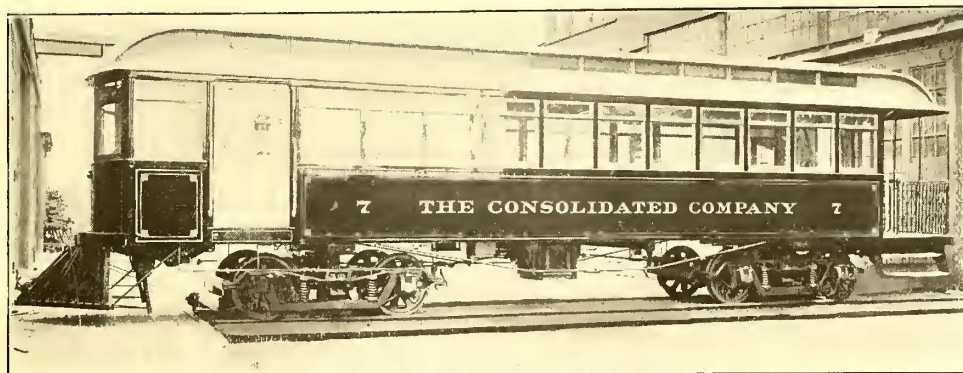
cane and are of the "walk-over" type. Interiors of the cars are finished in natural cherry, with decorated birch ceilings. Light, portable vestibules are provided for the platforms, and folding gates at the entrances, which are arranged to close against the corner posts.

The general dimensions of the cars are as follows: Length over end panels, 20 ft. 8 ins.; over crown pieces, 30 ft. 8 ins.; from panel over crown pieces, 5 ft.; width over sills, 7 ft. 10 $\frac{1}{2}$ ins., and over posts at belt, 7 ft. 11 ins.; height from bottom of sills over roof boards, 8 ft. 11 ins. The side sills are 3 $\frac{3}{4}$ ins. x 7 $\frac{3}{4}$ ins., and the end sills, 3 $\frac{1}{2}$ ins. x 7 $\frac{3}{4}$ ins.; thickness of corner posts, 3 $\frac{3}{4}$ ins., and of side posts, 3 ins. Cars are furnished with angle-iron bumpers, ratchet brake handles, folding gates and other specialties.

NEW CARS FOR CAMBRIDGE, OHIO

The American Car Company, of St. Louis, has lately built two fine combination passenger and baggage cars for the Consolidated Company, of Cambridge, Ohio. The cars have a number of interesting features. They are intended to run in but one direction, and are, therefore, provided with a cow-catcher at the forward end, and the controlling appliances are located in the baggage compartment. The rear platform is of the Detroit type, with grill work gates and enclosure. The seating of the passenger compartment is arranged transversely to the car and accommodates thirty-six passengers. The seats have reversible backs, and are 36 ins. long, leaving the aisle 21 ins. wide. The rear seats are stationary, and have hard-wood paneled backs. They are located 2 ft. 9 ins. from the rear end of the car. The windows are composed of two sashes, the upper being stationary and the lower arranged to drop into wall pockets, which have hinged covers. A hard-wood partition with glass in the upper part separates the compartments. Folding seats are provided in the baggage compartment for the use of smokers. The interiors are finished in cherry, of natural color, with ceilings of the same. A sliding door is provided at either side of the baggage compartment. This compartment is 10 ft. 8 ins. long.

The length of the car over crown pieces is 44 ft. 1 $\frac{1}{2}$ ins., from panel over crown piece at rear end, 5 ft. 7 $\frac{1}{2}$ ins.; width over sills, 8 ft. 6 $\frac{1}{2}$ ins.; over post at belt, 8 ft. 7 $\frac{1}{2}$ ins.; from



THE CAMBRIDGE COMBINATION CAR

center to center of posts, 2 ft. 9 ins. The cars are equipped with sand-boxes, angle-iron bumpers, gongs and vertical ratchet brake wheels of the Brill manufacture. The trucks are the American Car Company's M. C. B. No. 14-B, with wheel base of 6 ft., 33-in. wheels, and are to be equipped with 50-hp motors.

FINANCIAL INTELLIGENCE

WALL STREET, November 18, 1903.

The Money Market

The tension in the money market has subsided materially during the past week. Two causes have combined to bring about this favorable result, one the import of several millions of gold from London, the other the slackening of currency transfers to the interior. While these have been the more conspicuous influences at work, the decrease in loans which has been extremely heavy during the last fortnight, must also be taken into account. This loan contraction has been brought about by the shifting of credits from the local banks to the trust companies and other outside lenders who have been attracted by the high premiums offered for the use of money. Actually, therefore, if it were possible to discover the grand total of the market's outstanding credits, it would probably be found that there has been no very great decrease. But, inasmuch as money rates are always fixed more by the Clearing-House reserve than by any other criterion, and, inasmuch as this surplus has been benefited by the shifting process just described, the operation may be said to have contributed toward the decline in money quotations. In consequence of a further reduction of over \$10,000,000 reported in the bank statement last Saturday, the Clearing-House members were able to record a small increase in their surplus reserve in spite of a \$3,000,000 loss in cash. Whether or not the sudden falling off in the interior currency movement means that these demands are pretty near over for the season, the best opinion is that the autumn drain to the West and South has passed its maximum, and that from now on the losses to the banks on this account will be comparatively small. A sharp recovery in exchange at the principal interior cities seems to confirm this judgment of the situation. If the market is to feel no longer the strain of domestic requirements, the chances are that no further large amounts of gold will be drawn from Europe. The gold already shipped from London is already enough to afford a considerable help to local cash holdings for the next two bank statements at least. The sharp upturn in sterling exchange during the last few days may be taken as reflecting the belief that the specie importations are over for the time being. While call money on the stock exchange continues to rule around 5 per cent, a noteworthy concession has been made in time money, the rates on all classes of business having fallen during the week from 6 per cent to 5½ per cent. According to the view now held in banking circles, the present rates are not likely to be exceeded during the remainder of the season, and when the first of January settlements are completed most bankers agree that we shall run into a really easy market.

The Stock Market

The stock market of the week has furnished a curious mixture of powerful bear manipulation, directed against a number of the leading railroad stocks and some rather remarkable bull operations in a few other quarters of the market, notably among the local street railway issues. A general reluctance to buy is still manifest. It undoubtedly represents the fear which has presented itself to most men's minds that no considerable improvement can be expected in prices while the business of the country is on the down grade. Admitting that the decrease in trade activity with its accompanying effect upon the earnings of the railroads and manufacturing enterprises has already been pretty liberally discounted, the doubt is still strongly suggested that stocks cannot go up very much, even if they do not go down, until the extent of the industrial reaction becomes better defined. Investors seem, accordingly, to have taken the ground that there need be no hurry about making their purchases, and this sentiment, translated into a market factor, implies a lack of what is commonly known as "buying power." The conviction that no serious resistance will be offered while this inertia lasts is the chief encouragement given bearish speculators in making their depredations. Naturally the favorite objects of attack are the stocks like Pennsylvania and the Steels, where the supply is particularly large, and where there is no particular concentration of holdings. In the decline in Pennsylvania shares, which has been the real feature of the week, these technical conditions have undoubtedly had far more to do with the movement than have considerations regarding the actual merit of the stock. On the other hand, among the western railroad shares, and among other issues which enjoy

a more or less organized support, the bear attack has so far accomplished very little. A fair analysis of the general situation would appear to be that a part of the list is still vulnerable, and will probably have to go lower, while in other parts the possibilities of decline are pretty well exhausted.

The strength of the local traction stocks has continued to be by all odds the most impressive feature on the long side of the week's market. Extravagant stories persist in going the rounds, to the effect that some big merger deal is impending, but so far this seems to be a pure invention of the speculators' imagination. The logical reason why the traction shares should be selected as the first to rebel against the general Wall Street pessimism, is the one which these articles have already pointed out, namely, that the prospect of a reaction in general business is far less of a deterrent to purchases of New York traction properties than to buying of any other class of securities. The Street seems to be just waking up to a proper appreciation of the wide extent which shares like Manhattan and Metropolitan have passed into investors' strong boxes during the recent decline. It has been a comparatively easy matter for a coterie of speculators who have perceived the strength in the market position of the stocks to get control of their limited floating supply and bid them up sharply. Similar conditions, although somewhat less pronounced, are an equally satisfactory reason for the advance in Brooklyn Rapid Transit.

Philadelphia

Scarcely anything of note has happened among the Philadelphia traction securities during the week. Considering the pressure upon other quarters of the market this group has held very well, and its action has certainly encouraged the idea that liquidation has run its course. Prices, however, have done little more than hold their position of a week ago. Philadelphia Company common has, as usual, been more active than the rest, selling down from 36 to 35¼, and recovering to 36. The preferred, which sold last week at 42, rallied a point to 43. Philadelphia Traction has been steady at 95, and so has Union Traction, between 44 and 43¾. Fairmount Park Transportation, after selling at 19 for an odd lot, dropped to 18 on the sale of 100 shares. Fractional transactions were reported in Philadelphia Rapid Transit at 12, American Railways at 42⅞, Chicago Union Traction at 5½ for the common and 30 for the preferred.

Chicago

The strike on the City Railway has caused some liquidation of the stock, which has sold off from 166 to 164. Union Traction has also weakened, with sales of the common at 5½, and the preferred at 28½, and later at 29¼. An official of the latter company says that he does not believe the road will be taken out of the hands of the receivers until the ninety-nine-year franchise act has been finally disposed of in court, and this he says may be a matter of some years. Many improvements are contemplated in the service of the system, provided the Eastern interests can be persuaded to put up the money. A single sale of West Chicago was reported at 50, which is the low record price. Northwestern Elevated common sold at 16, and South Side at 92 and 93. Lake Street stock changed hands at 3½, the income bonds sold down from 30 to 27, while the first mortgage 5s gained a point from 98 to 99. The receiver of the Lake Street company has been discharged, and it is now thought that the financial reorganization will be speedily accomplished.

Other Traction Securities

Little change has occurred among the Boston traction specialties. Boston Elevated dropped from 140½ to 139¾, and rallied to 140. Massachusetts Electric common sold as low as 18, and as high as 18¾. The preferred rose from 77 to 78, then fell back to 77. West End common ranged between 90½ and 90, and the preferred between 109½ and 109. The week's dealings in Baltimore have been very light, with scarcely any variation from the previous quotations. United Railways stock sold at 8⅞ and 8½, the income bonds between 58½ and 58¾, and the general mortgage 4s between 90⅞ and 90½. The only transaction in outside bonds was a single sale of City and Suburban (Washington) 5s at 92. On the New York curb Interborough Rapid Transit rose on fractional purchases from 90 to 94, declined to 91⅞, then was bid up sharply to 99, at which figure 1000 shares were sold. This movement was in sympathy with the general advance in the traction securities on the stock exchange. New Orleans Street Railway, on sales of 300 shares, fell from 8¼ to 7¾, then rallied to 8. These are the low

prices for the season. New Orleans preferred sold to the extent of 100 shares at 27.

Cincinnati Street Railway stock was unusually active at Cincinnati. Sales numbered about 1300 shares, all in small lots. Practically all of it sold at 128, but the closing sales were at 129 and 130. Detroit United was firm at 64½ to 65 on sales of 150 shares. Cincinnati, Dayton & Toledo bonds sold at 81½, and small blocks of the stock at 26½. Toledo Railway & Light brought 22½ for small lots, which is a three-point improvement over last week.

Northern Ohio Traction & Light has been the active feature in Cleveland of late. Last week sales numbered about 900 shares. It opened at 13½, and went down steadily to 11. Monday it strengthened and went back to 13. There is a well-defined rumor that a certain member of the Everett-Moore crowd has been forced to liquidate, and is selling Northern Ohio at the best figures available. The stock is in good demand at these prices, which is considered very low, in view of the fact that the road is earning over 2 per cent, and is making fine gains every month. Cleveland Electric was in good demand, and several lots were dislodged at 65, and then the price went to 66½. A small lot of Toledo sold at 21½, and a small lot of Northern Texas came out at 30. A block of Detroit & Port Huron Shore line 5s sold at 94, and Northern Ohio Traction Consolidated 5s at 95½; both of these are gilt-edged securities.

Security Quotations.

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

	Closing Bid	
	Nov. 10	Nov. 17
American Railways	42	42
Aurora, Elgin & Chicago (preferred).....	—	a65
Boston Elevated	140	140
Brooklyn Rapid Transit	37	38¼
Chicago City	165	164
Chicago Union Traction (common).....	5½	5¼
Chicago Union Traction (preferred).....	28	a35
Cleveland Electric	65	66½
Consolidated Traction of New Jersey.....	60	60
Consolidated Traction of New Jersey 5s.....	105	105¾
Detroit United	64	63¾
Elgin, Aurora & Southern.....	a56	a45
Lake Shore Electric	—	a15
Lake Street Elevated	3	2½
Manhattan Railway	133¾	139¼
Massachusetts Electric Cos. (common).....	18	18
Massachusetts Electric Cos. (preferred).....	76	76
Metropolitan Elevated, Chicago (common).....	17	17
Metropolitan Elevated, Chicago (preferred)	55	55
Metropolitan Street	111½	114
New Orleans Railways (common).....	7¼	7¾
New Orleans Railways (preferred)	28	27
North American	70½	70
Northern Ohio Traction & Light.....	12½	13
Philadelphia Rapid Transit	11½	11½
Philadelphia Traction	95	95
St. Louis Transit (common).....	13½	13¼
South Side Elevated (Chicago).....	90¼	92
Third Avenue	108	108
Twin City, Minneapolis (common).....	86½	87¼
Union Traction (Philadelphia)	43¾	43¾
United Railways, St. Louis (preferred).....	59	58

a Asked.

Iron and Steel

A halt has been called in the process of readjusting prices which has been going on for several weeks in the finished iron trade. Following the action of the steel billet pool ten days ago a cut was announced last week of \$6 per ton in steel bars and in hoops and bands, and a reduction of 20 cents per box in tin plates. In all these cases manufacturers have been influenced by a desire to make the concessions necessary to stimulate consumption again. In other branches, such as steel plates, structural material and steel rails, the former prices are being maintained on the ground that there was not enough advance during the boom to warrant any reduction at present. Whether this notion will prove correct, that is, whether the trade will be willing to buy these products at the level of the past year, remains to be seen. The statistics compiled by the "Iron Age" of pig iron output, show in a very striking manner what has been accomplished by the efforts to restrict production during the past month. On Oct. 1, the capacity of the anthracite and coke furnaces was estimated at 353,142 tons per week. On Nov. 1,

it had declined to 273,715 tons. Notwithstanding this remarkable contraction there was an increase of 89,000 tons in furnace stocks during the month, showing that the restriction will have to be carried a good ways further yet in order to become effective. Quotations are as follows: Bessemer pig iron \$15.10, steel billets \$23 and steel rails \$28.

Metals

Quotations for the leading metals are as follows: Copper 13½ cents, tin 24¾ cents, lead 4¾ cents and spelter 5¾ cents.

THE NEW ADMINISTRATION IN NEW YORK AND MUNICIPAL IMPROVEMENTS

Mayor Löw, of New York, has decided to do nothing in the board of estimate and apportionment in the last days of his administration toward the big public improvements which he and his colleagues had planned. This will result in a legacy to the incoming administration of \$140,000,000 in the shape of borrowing capacity for the issuance of public improvement and other bonds, and the question is being asked, What will be done in this connection by the new administration?

Some of the improvements contemplated, when it was found to what limits the city could go for gigantic and much-needed improvements, included the new Brooklyn Bridge terminal and Municipal Building plaza contemplated under the plans of Bridge Commissioner Lindenthal and Henry F. Hornbostel, at a prospective cost of \$50,000,000. This was the plan to erect gigantic city buildings, the bridge terminal, and office building to be surmounted with a forty-five story campanile, and to convert that section of the city lying between Ann Street, Park Row, Broadway, and Reade Street, into a general municipal plaza.

The plan for the solution of the bridge congestion, with subways and elevated road, at a cost of \$25,000,000, was also included.

The other contemplated improvements were the Staten Island Ferry at \$2,000,000, the details of which were given in the STREET RAILWAY JOURNAL of May 30, 1903; the Manhattan Bridge contracts, aggregating \$6,500,000; the second Brooklyn tunnel, to cost \$10,000,000; the East Side rapid transit extension, along Lexington Avenue, to cost \$15,000,000; the Broadway spur, to cost \$5,000,000, and the moving platform project, to cost something like \$7,000,000, making a total of \$183,500,000, with many smaller items and improvements also under consideration.

The Municipal Arts Commission, which passes on plans of new structures, is now with its ten members, of which the Mayor ex-officio is one, strongly Fusion. Two members retire each year, and as the two vacancies for 1903 will be created before Mayor Low goes out of office, he will have the filling of the places, leaving a solid vote of nine in the board to the one vote which the new Mayor will have, while during the administration just elected only four vacancies will be created. The statute provides that the members of the commission shall be appointed from a list of thirty submitted to the Mayor by the Fine Arts Federation.

THE TRACTION SITUATION IN CALAIS, FRANCE

J. B. Milner, United States Consul at Calais, France, has kindly furnished the following details regarding the present status of the Calais street railways:

Calais still has horse tramways. These are operated at present by an English company, which has a franchise still valid for seventeen years. The Municipality projected a new system, and was granted the concession by the French Government. One Mr. Boulet was granted permission by the Municipal Council to construct an electric tramway system. About a month ago Mr. Boulet died, and now his heirs are trying to sell the rights, but as yet have not succeeded. The contemplated works were estimated to cost \$600,000, in which three lines were comprised, having a length of 16 miles, 8 miles of which were to be within the corporate limits of the city, the contemplated system of traction being the Dickinson trolley. Mr. Boulet intended to begin construction next spring and have the lines in operation within one year. These plans have been thwarted by his death, and a chance now exists for some one to become his successor by arranging with his heirs. An opportunity may exist here for enterprising American capital.

Work on the new electric railway between Brocton and Fredonia, N. Y., is practically completed and it is expected the cars will be running by next week. The fare will be 10 cents, or one-third of what is charged by the railroads.

THREATENED CAR STRIKE IN PITTSBURG

It is reported from Pittsburg that a strike of the employees of the Pittsburg Railways Company, controlling all lines in Pittsburg and vicinity, is imminent. About 2700 men, most of whom are members of the Amalgamated Association of Street Car Employees, would be affected. An ultimatum was presented to President Callary, of the company, on Monday, Nov. 16. It was promptly rejected. The demands are for a rearrangement of the working hours and 23 cents per hour for employees who have been with the company six months.

CHICAGO UNION TRACTION MATTERS

Aside from the general question of franchise renewals in Chicago, considerable interest has been aroused lately over the attempt of the receivers of the Chicago Union Traction Company to secure permits to put overhead trolley wires over certain cable lines in order to make it possible to improve the service. The permits, as originally applied for, were refused by the city authorities. Later, the receivers, through their attorneys, again applied for permits, drawing them up in different legal form. It has been rumored that in case the city authorities refuse these permits, which would enable better service to be given, Judge Grosscup may direct the receivers to go ahead with the improvements in spite of the refusal of the permits on the part of the city authorities, it being the theory that he might do this because of his authority as a Judge of the Federal Court in charge of the receivers, and that he might consider that his authority, together with the apparent needs of the people of Chicago, might justify such an order. Corporation Counsel Tolman, who has gone out of his way in many cases to volunteer opinions detrimental to public service corporations, and incidentally detrimental to the service these corporations can render the public, gave an opinion advising the commissioner of public works to refuse the Union Traction Company permits to extend its overhead trolley system in various places over its cable lines. The main gist of the corporation counsel's opinion is that the city has no power to grant permits for any kind of changes on existing cable lines until the companies can show that they have valid franchises for the lines which would be involved in the permit. The commissioner of public works is advised that it is for the City Council to determine whether the grant of the permits will prejudice the city's interest in the present franchise controversy with the traction companies.

TO HARNESS THE FALLS OF THE OHIO RIVER

The reported plan to utilize the falls of the Ohio River, at Louisville, Ky., for power for electric traction and lighting seems likely to go through. Representatives of the Widener-Elkins syndicate, which is backing the scheme, made the much-mooted trip to Louisville a few days ago to look into the project, and at the conclusion of a conference between them and Major George M. Derby, chief United States engineer for that district, it was announced that the plan for harnessing the falls would be favorably recommended to the War Department. It seems now that the plan is not of such recent origin as the first reports indicated; in fact, it seems that the Widener-Elkins interests have been thinking the thing over for some months past and that their engineers have made a very thorough study of the situation. The plans drawn up by the syndicate's engineers, so the information to hand says, were considered by Major Derby at the conference, and will be given a partial endorsement by him to the War Department. Unofficially, it is said that if the final consent of the Government is secured, about \$2,000,000 will be spent for the initial plant, which will be of a size sufficient to furnish power and light not only to Cincinnati and Louisville, but to traction lines and towns within a wide radius, covering southern Indiana and northern Kentucky. To carry out the scheme it is said that the company is to be organized to include directors of practically all the traction and lighting companies that will be served with power from the new plant. The plans are drawn up with a view of being put in execution on the Indiana side of the river, just above the government dam. Nothing has been said as to the capacity of the plant, and details are lacking. Among those present at the recent conference in Louisville was Prof. Louis Duncan, of the Massachusetts Institute of Technology; John Birkinbine, of Philadelphia, who is said to be a representative of the United Gas & Electric Improvement Company; W. Kelsey Schoepf, of Cincinnati, president of the Cincinnati Traction Company; Major George M. Derby, United States engineer; F. A. Joss, an attorney of Indianapolis, and Benezette Williams, an engineer of Chicago.

A VICTORY FOR THE NEW YORK & PORT CHESTER ROAD

The Court of Appeals has sustained the State Railroad Commission in its grant of the certificate of public convenience under Section 59 of the railroad law to the New York & Port Chester Railway Company, of New York, which plans to build an electric railway from New York to Port Chester. By sustaining the action of the State Railroad Commission, the Court of Appeals decides finally that the original charter of the Port Chester Company is valid. The plaintiff in the action brought to upset the Railroad Commission's dictum was the New York City & Westchester Railroad, one of the subsidiary corporations of the Metropolitan Street Railway Company. It was claimed that the commission had no right to grant the charter, in which, it was urged, there were certain errors or informalities that made it void.

The company now has an application for a franchise pending before the Aldermen of New York. A regular session of the Aldermen was held Tuesday, Nov. 10, when Mayor Low, in a letter, urged that favorable action be taken upon the application. The letter was referred to the railroad committee of the body.

INTERBOROUGH RAPID TRANSIT STATEMENTS FOR THE QUARTER AND FOR SIX MONTHS

The Interborough Rapid Transit Company, of New York, reports earnings as follows for its Manhattan Railway division:

	1903	1902
Three months ending Sept. 30:		
Gross receipts	\$2,938,753	\$2,495,112
Operating expenses	1,307,621	1,338,940
Net earnings	\$1,631,132	\$1,156,172
Other income	80,287	81,287
Total income	\$1,711,419	\$1,237,459
Interest and taxes	668,475	644,769
Surplus	\$1,042,944	\$592,690
Dividends on Manhattan Railway....	828,000	480,000
Surplus	\$214,944	\$112,690
Passengers carried.....	59,443,304	50,464,936
Six months ending Sept. 30:		
Gross receipts	\$6,210,540	\$5,352,362
Operating expenses	2,609,710	2,740,046
Net earnings	\$3,600,830	\$2,612,316
Other income	170,475	192,575
Total income	\$3,771,305	\$2,804,891
Interest and taxes.....	1,353,038	1,300,619
Surplus	\$2,418,267	\$1,504,273
Dividend on Manhattan Railway stock	1,656,000	960,000
Surplus	\$762,267	\$544,273
Passengers carried	125,548,740	108,164,184

IMPORTANT RULING ON SPEED IN MASSACHUSETTS

Two decisions were rendered last week by the Railroad Commissioners of Massachusetts which are sure to have an important effect on the running of street railway cars at high speed for long distances in competition with the railroads. These were the orders limiting the speed of cars of the Boston & Worcester Street Railway, in the towns of Wellesley and Lee.

In the case of the former town the Selectmen had established speed regulations which were objected to by the company on the ground that it had been called upon to make heavy expenditures on street improvements in order that a higher speed might be allowed than that which the Selectmen finally decided upon. The company contended that a speed of 35 miles an hour should be allowed in certain parts of the town, while the Selectmen placed the outside limit of speed at 25 miles per hour.

The Commissioners upheld the decision of the Selectmen and made sundry other restrictions as to stopping cars before crossing other street railways at grade, etc. The Commissioners also suggest that, so far as conditions permit, speed on street railways should be the same throughout the State.

This decision makes it impossible for the Boston & Worcester Company to make the time which it had scheduled between Boston and Worcester.

THE DECISION OF THE SAN FRANCISCO ARBITRATION BOARD

In the STREET RAILWAY JOURNAL of Nov. 14, 1903, the four clauses of the actual award in the findings of the arbitration committee which considered the controversy between the United Railroads of San Francisco and its employees were given. The questions before the board were considered at such length and the findings are so important, however, that a more extended consideration of them than it was possible to give in the previous article seems justified.

As will be remembered, the board agreed upon consisted of Patrick H. Calhoun for the company, W. P. Mahon for the employees, and Oscar S. Strauss, mutually agreed upon by Mr. Calhoun and Mr. Mahon. In the findings Mr. Mahon and Mr. Strauss concurred. Mr. Calhoun dissented, and has since filed his reasons.

It seems that on March 16, 1903, the union made certain demands upon the company which completely abrogated a contract which had been entered into on April 26, 1902, after a strike declared April 19. In this controversy the company granted practically all of the demands made by the men excepting one, which has since been granted, namely, the recognition of the union. This settlement provided for a flat rate of 25 cents per hour for time actually at work, and 30 cents per hour for overtime. It was agreed that the hours of labor should not exceed ten per day, and that all runs should be finished within fourteen hours from their commencement. Later this last clause was amended at the request of the employees so as to extend the hours of labor to eleven, and the hours within which a run should be finished to fifteen.

On March 16, 1903, the union served upon the company new demands. By the answer of the company and the contract agreed upon by the conference committee acting on the part of the company and the union, these demands were either agreed to, modified, or withdrawn, with the exception of those referring to hours and wages. These latter demands, the agreement was, to refer to arbitration, and the board already named was finally agreed upon.

The first meeting of the board was held on Sept. 15, in New York. In the question of fair wages the difficulty was met at the outset of the absence of guiding precedents, and then there were no terms of a contract, because of the very fact that the parties to the controversy were utterly unable to effect a satisfactory agreement. Even the old first principle of political economy, that of the law of supply and demand, was outruled. It resolved itself into a purely humane consideration.

By the testimony it appeared that only four street railway companies out of 345, of which statistics were obtained, were paying a higher rate of wages than the San Francisco Company, and that these are located in Montana. They pay an average rate ranging from 27.5 per hour to 29 cents, owing to the prevailing high wages paid for labor in the mines and the high cost of living. Of the other companies only four pay as high a rate as the San Francisco Company, namely, 25 cents. These companies are located in Oakland, Cal., in San Francisco and in Spokane, Wash., and also one in Chicago. The standard of wages of the Pacific Coast, it was agreed, was recognized by the company in the settlement made in April, 1902, when 25 cents per hour was granted.

The evidence showed in comparing the cost of living in 1902 with that of 1903 that there had been an advance. It was claimed on behalf of the street railway employees that that advance had been from 20 per cent to 30 per cent. On the other hand, the company claimed that while there has been an advance, that advance did not exceed more than 3 per cent. The testimony on both sides establishes, so the report says, the fact that there has been for the periods mentioned a rise in the cost of living; that on the average the rent of rooms or apartments such as the employees live in, has advanced about 10 per cent.

In view of all these circumstances the award was:

First—That the United Railroads of San Francisco pay to such of the members of Division No. 205, Amalgamated Association of Street Railway Employees of America, who are now and have been in their employ for a period under two years prior to April 1, 1903, an increase of 5 per cent above 25 cents an hour, and to such of said employees who are now and have been prior to April 1, 1903, in their employ two years and over, an increase of 10 per cent above 25 cents an hour, and that for overtime the like percentages of increase above the present rate be paid.

Second—I adjudge and award that the United Railroads of San Francisco pay to such of its employees who are members of Division No. 205, Amalgamated Association of Street Railway Employees of America, who work by the day, and who are now and have been in their employ for a period of under two years prior to April 1, 1903, an increase of 5 per cent above the daily rate of wage they are now receiving, and to such of said employees

who are now and have been prior to April 1, 1903, in their employ two years and over an increase of 10 per cent above the rate of wages they are now receiving.

It appeared by the evidence that the average hours of actual labor by the body of regular men under the present schedule were ten hours and three minutes, or thereabouts; that at the time when the strike was settled in April, 1902, the schedule which was agreed to by the company was ten hours per day, to be completed within fourteen hours, and that this schedule, upon the request of the union, was amended by extending the hours of labor to eleven, to be completed within fifteen hours. In comparing the hours of service on these roads it did not appear that they were longer or more arduous than generally prevail in this line of service; nor did it appear that they are too long considering the health and welfare of the men in this line of service, and, in view of the fact that the climate of the Pacific Coast is exceptionally mild and free from the severity that obtains in the Middle and Eastern part of the United States, the award was:

Third—I adjudge and award that the same hours and schedule that now obtains be continued. It is always within the province of the railroad, on the one side and the employees on the other, to amend their schedule by mutual agreement. I, therefore, decline to disturb the present schedules.

Fourth—In accordance with the agreement under which this arbitration was entered upon, the wage rate adjudged and awarded shall be deemed to go into effect as of the 1st of May, 1903, and continue until the 1st of May, 1904.

Mr. Calhoun, who did not concur in the findings, says that the rate of wages paid by the company is higher than that paid in the large cities where living is more expensive, and that there is an abundance of labor in San Francisco seeking employment. He claims that the testimony showing a 30 per cent advance in the cost of living was unreliable, and that "the general conditions of the country do not now call for advances in wages, but on the contrary for the most prudent, careful, and economical management of corporate properties."

The hearings of the commission were held in New York. The argument of the company was presented in person by Gen. Tiley L. Ford, general counsel of the company. This argument has since been printed, and is a most logical refutation of the exaggerated claims originally made by the employees.

SOUTHWESTERN ELECTRICAL ASSOCIATION

The first meeting of the Southwestern Electrical Association was held at Oklahoma City last month, and was a pronounced success. The following papers were presented: "Possibilities of the Electric Railway in Oklahoma and Indian Territories," by John W. Shartel; "Heating from Central Station Lighting Plants," by T. K. Jackson; "Single-Phase Alternating-Current Motors as a Means of Increasing Central Station Earnings," by T. Bissell; "Central Station Accounting," by U. S. Hart; "The Nernst Lamp and Its Workings," by M. W. Hanks.

In his paper on the "Possibilities of the Electric Railway in Oklahoma and Indian Territories," Mr. Shartel stated that there are several communities in the two Territories located in sufficient proximity to make an inviting field for the construction of inter-urban lines, and future development bids fair to bring others into similar relations. He emphasized the fact that many electric railways have been laid down without sufficient consideration of their future profitability, and urged that the traffic problem should be very thoroughly investigated before the construction of a street railway is undertaken. The most favorable conditions are when the greater portion of the population is located some distance from the business center, or when a city is spread out over a narrow belt. If a street railway system can be united with inter-urban service, the proposition becomes much more favorable, for the difference in the cost of maintenance of a power house for 4 miles and for 15 miles of railway is measured chiefly by the fuel bill. Many a street railway system in this country which has been dragging a miserable existence, has been saved by interurban connections, and many a town or village which would be wholly inadequate to support a street railway system has enjoyed the benefit of that facility from interurban railways passing through it.

Mr. Shartel strongly urged that when an electric railway is put down it should be built in the most substantial manner. One mile of track constructed for 40-lb. or 50-lb. rails will require more attention and care than five miles constructed of 60-lb. rails, and this is merely an illustration of the burden of maintenance between a poor and good construction. He recommended that wherever possible an electric railway plant should be operated in connection with an electric light plant. Such a plant divides the power house expense in two, and it affords an opportunity which could not otherwise be obtained for selling electricity twenty-four hours in a day.

The association starts with thirty-five active and eleven associate members, the former representing the several electric light, railway and telephone companies of Oklahoma, as well as several plants in Arkansas, Texas and Kansas. The officers elected for the ensuing year are: J. W. Shartel, of Oklahoma City, president; J. N. McLendon, of Fayetteville, Ark., first vice-president; L. F. Duggan, of Wichita, Kan., second vice-president; S. A. Hobson, of Dallas, Tex., third vice-president; J. L. Ellis, of Oklahoma City, secretary and treasurer; T. K. Jackson, of Enid, Okla.; W. K. Berry, of Ardmore, Ind. Ter.; S. P. Render, of Oklahoma City, and W. E. Robinson, of Oklahoma City, executive committee.

It was voted to hold the next meeting of the association at Dallas, Tex., the latter part of April or the beginning of May, 1904.

DISCUSSION ON ELECTRIC RAILWAYS IN PHILADELPHIA

A meeting of the Philadelphia branch of the American Institute of Electrical Engineers was held Tuesday evening, Nov. 10, at the Engineers' Club. A business meeting preceded the reading of the papers, during which a set of by-laws was adopted and new officers elected as follows: Chairman, Charles E. Hewitt; secretary-treasurer, H. F. Sanville; managers, W. C. L. Elgin, Horatio A. Foster, J. Franklin Stevens, W. L. Hodges, C. W. Pike, A. J. Rowland.

C. B. Voynow, assistant engineer of the Philadelphia Rapid Transit Company, presented a paper on "A New Method of Track Laying and Bonding." The paper was very instructive and interesting, describing, as it did, the Nichols-Voynow rail-joint, which is in use throughout Philadelphia, and which has been described in this paper. There was a spirited discussion, in which Messrs. Pike, Hering, Hodges and Hewitt took part.

Horatio A. Foster gave to the meeting reminiscences of his experiences in the early eighties, when installing and trying to operate the first electric railway in the city of Baltimore, for the old Daft Company. The talk was very interesting, and in the light of modern practice, decidedly humorous. Charles E. Hewitt, with the assistance of some lantern slides, showed the development of the railway motor from its beginning to the present time.

The Albert & J. M. Anderson Manufacturing Company sent for exhibition at the meeting their collection of relics of early practice in overhead construction. Some of these relics were very interesting, and, placed alongside of the elaborate new devices, which were also on exhibition, told better than words of the enormous development in electric traction in the last twenty years.

ELECTRIC RAILWAY COMMISSION AT ST. LOUIS EXPOSITION

In view of the growing importance of the electric railway interests of this country, plans are being carried into effect which contemplate a very prominent recognition of the electric railway and electric railway problems at the St. Louis Exposition. The appointment of an advisory commission on electric railway tests of the Louisiana Purchase Exposition has just been announced. The commission is thoroughly representative of each branch of electric railway activity, and will, undoubtedly, receive the support of the entire electrical industry in any plans for the promotion of electric transportation which the commission shall devise.

The personnel of the commission is as follows: J. G. White, president J. G. White & Company, New York City, chairman; H. H. Vreeland, president Interurban Street Railway, New York City; W. J. Wilgus, vice-president New York Central & Hudson River Railway, New York City; George McCulloch, president Union Traction Company, of Indiana, Indianapolis, Ind.; James H. McGraw, president McGraw Publishing Company, New York City.

The commission will act in an advisory capacity in connection with a series of tests on electric railway apparatus to be conducted at the Exposition under the auspices of the department of electricity.

From W. E. Goldsborough, chief of the department of electricity, it is understood that the electric railway test tracks have been laid north of the Transportation Building on the Exposition grounds, and represent a practically level, clear double-track 1400 ft. in length. These tracks will connect with the Intramural Railway and also the steam railway system serving the grounds. It is said that several important manufacturers have already promised complete equipments for exhibition and test, and the present outlook indicates that all of the new systems of alter-

nating-current propulsion, as well as the old direct-current system, will be offered for inspection and operation.

It is not so much the intention to conduct these tests in a competitive sense as it is to arrange for the accumulation of data which will be valuable in promoting further electric railway undertakings from an engineering standpoint. A very complete equipment for testing apparatus will be provided, and all of the work will be done in a thoroughly engineering and scientific manner.

PECKHAM TRUCKS FOR JAPAN

The Tokio-Shigai Railway (Tokio Street Railway), some of whose recent contracts were mentioned in our last issue, has just given an order for 100 trucks to the Peckham Manufacturing Company. The order calls for the standard cantilever extension 8-B single-truck of the Peckham Company, to go under cars with a body length of 18 ft. The order was placed through Okura & Company, of Tokio, who are the contractors for the line.

THE LOW-FARE ISSUE AT CLEVELAND

The City Council of Cleveland has declared the bids made by Will Christy for lines on Denison Avenue, Doan Street, Edgewater Boulevard and Summit Street to be the lowest, and Mr. Christy has made formal application to the Council for franchises to build lines on these streets. As already outlined in the STREET RAILWAY JOURNAL, Mr. Christy, a prominent traction man, recently caused much comment in Cleveland by offering to bid two-cent cash fare for lines on the street mentioned. If the franchises are granted and Mr. Christy fails to comply with the stipulations, he will forfeit \$20,000 in cash, already posted with the city. Mr. Christy still declines to talk about the plans of his company.

The People's Street Railway Company, which is building an alleged three-cent fare line in the city, has been enjoined temporarily from further work. The company has laid about 1½ miles of double track on Denison Avenue in a remote part of the city, but no wires have been strung and apparently no plans have been laid for supplying power for the proposed line. The injunction was granted by Judge Disette, of the Common Pleas Court. The petition filed by a prominent law firm acting for a property owner cites that the requisite number of consents from property owners was not obtained; also that the ordinance as passed by the Council is not legal.

DECEMBER MEETING PROGRAMME OF THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS

The opening session of the December meeting of the American Society of Mechanical Engineers is to be held at 9 p. m. on Tuesday, Dec. 1, at the usual headquarters, 12 West Thirty-First Street, New York. President James M. Dodge will deliver the annual address, the subject being "The Value of an Engineering Education to a Young Man."

The second session will occur on Wednesday morning, at the hall of the Mendelssohn Glee Club, 113 West Fortieth Street. This will be the business session of the convention and professional papers will also be presented. Following this, luncheon will be served at the Society house, and the afternoon will be spent in making excursions to power stations and other points of interest. The evening of this day has been left free for the members to make their own engagements.

The third session will take place in the Carnegie Laboratory of Stevens Institute on Thursday morning at 10 o'clock. Luncheon will be served at the Institute, and will be followed by visits to points of interest about the grounds. The usual reception for guests and friends will be at Sherry's on Thursday evening, at 9 o'clock, and will be followed by dancing and supper. The closing session will be at the Society house on Friday morning, Dec. 4, at 10 o'clock.

The following nominations for officers of this society for the coming year have been made by the nominating committee:

Ambrose Swasey, of Cleveland, Ohio, president; Professor D. S. Jacobus, of Hoboken, N. J., M. L. Holman, of St. Louis, Mo., William J. Keep, of Detroit, Mich., vice-presidents; George I. Rockwood, of Worcester, Mass., John W. Lieb, Jr., of New York City, Asa M. Mattice, of Pittsburg, Pa., managers; William H. Wiley, of New York City, treasurer.

SUBURBAN NEWSPAPER TRAIN AT CHICAGO

The Chicago "Record-Herald" has arranged with the Aurora, Elgin & Chicago Railway Company to distribute the city edition of that paper, daily and Sunday, to fourteen towns and villages within 35 miles of Chicago. The service has already been started, and was inaugurated owing to the demands of the residents of these towns, who wanted to get the city edition because of the fact that it contains more purely local news than the mail edition, which they have heretofore received. The electric line begins at Fifty-Second Avenue, Chicago, but the two cars for the papers are brought all the way down to the loop over the line of the Metropolitan Elevated. Between 3 o'clock and 4 o'clock every morning the cars are loaded with "Record-Heralds" at Van Buren Street and Clinton Street, and at 4 o'clock they begin their run. Reaching Fifty-Second Avenue at 4:25, they are switched to the surface and commence the journey on the electric line. At 4:55 they reach Wheaton, having made necessary stops en route for paper distribution, and here they separate, one going to Aurora while the other travels to Elgin. Thirty-five minutes is the approximate running time to each of these points from Wheaton. The points reached by the service are Aurora, Geneva, Glen Ellyn, Lombard, Wheaton, Elmhurst, St. Charles, Yorkville, Dundee, Carpentersville, Oswego, Ingaltion, Elgin and Warrenville.

SUCCESS OF THE NEW BROOKLYN BRIDGE LOOPS

The four additional car loops at the New York entrance to the Brooklyn Bridge, which the Brooklyn Rapid Transit Company constructed at a cost of about \$100,000, were placed in service on Sunday, Nov. 15, and given their first severe test on Nov. 16.

As reported in previous issues of the STREET RAILWAY JOURNAL, these loops were built because the original four loops were insufficient to accommodate the vast rush-hour crowds. The new arrangement does not involve a change in headway, but scatters the passengers over a much larger area, thus enabling the police to keep better order and prevent dangerous blockades.

Vice-President J. F. Calderwood, of the Brooklyn Rapid Transit Company, spent half an hour watching the working of the system during the rush hours. He said:

"What I have seen convinces me that this plan will work all right. Conditions are 50 per cent better than under the old system already. In a week or two the new plan will work with perfect smoothness. Under the present arrangement, the lines are distributed between the various loops with a view of evenly dividing the crowd. I think that the cars carrying the largest number of people ought to be assigned to the four new loops, where the space between the tracks is almost twice as large as in the old section. I think it probable that a change to that effect may be made in the near future. It is now up to the Bridge people to relax the rule which requires 102 ft. headway between each car. If that be done we will be able to run about twenty-five more cars an hour during the rush hours, and that would mean that we would be able to accommodate about 2500 passengers more than at the present time. We are running 280 cars an hour now."

DESTRUCTIVE FIRE AT CLEVELAND

The Holmden Avenue car house of the Cleveland Electric Railway Company was totally destroyed by fire with all its contents at an early hour Monday morning, Nov. 16. Seventy-three cars were destroyed, and in consequence the company, already short of rolling stock, is in a badly crippled condition. President Horace E. Andrews of the company informed the STREET RAILWAY JOURNAL representative that there were in the car house twenty-seven of the latest type of closed cars, twenty-two single-truck closed cars, sixteen ten-bench open cars, seven fourteen-bench open cars, two snow-plows and two carloads of hard coal for car stoves. The loss on the building, which was completely destroyed, was about \$30,000. Ten cars which happened to be standing in the yard outside were saved, but the front platforms of some of them were burned, the paint scorched and the windows broken. Nothing was left of the cars in the house but the steel framework, the trucks, motors and controllers, and most of these are ruined.

The Holmden house and yard covered four acres and were used for the storage of cars for the Scranton, Jennings and Clark Avenue lines, and all but the night cars of these lines were in the car house at the time of the fire. The ruined building was an old structure erected by Tom L. Johnson for the Brooklyn line in

the horse car days. The company recently erected a large storage house at South Brooklyn, but the Holmden house has been used largely for cars in regular service.

The fire was accompanied by a harrowing fatality. The firemen had the fire practically out when the front wall fell directly on a hose company. Two men were crushed and dead when taken out of the ruins, and two more died after they had been taken to hospitals. A fifth had both legs broken.

President Andrews states that it has not been decided whether the car house will be rebuilt on its present site. It will be necessary to order a large number of cars at once, and as soon as possible the officials communicated with car builders, in order, if possible, to secure immediate deliveries on some cars.

FIRST TEST OF NEW YORK SUBWAY EARLY IN JANUARY

Chief Engineer William Barclay Parsons, of the New York Subway, is of the opinion that it will be possible to run an experimental train in the subway between City Hall and 104th Street, or perhaps as far north as 150th Street and Broadway, early in January. Mr. Parsons also predicts that regular passenger service on this section of the road will begin as early as March or April, bearing out the statement made by Contractor McDonald last week as to when the road will be ready for service.

On the main line of the tunnel, extending from City Hall Park to 104th Street and Broadway, there remain only three short stretches in which tracks have not been laid. These are between the Brooklyn Bridge Station and Leonard Street, at the south end of Long Acre Square, and along Broadway from Seventy-Seventh to Seventy-Ninth Street. These gaps, it is expected, will be completed by Jan. 1. It is at 104th Street that the east and west side lines diverge, and here there is another unfinished piece of work. This work may also be completed by Jan. 1, and in that event it would be possible to operate over the west branch as far as 150th Street.

As to when the entire subway will be open to traffic, Mr. Parsons is reluctant to predict. He says, however, that next September may safely be fixed as a limit. The Harlem River section will not be finished until spring, nor will the section under Washington Heights be bored through before that time.

The only possible delay in beginning actual operation of the tunnel, says Mr. Parsons, is due to the incompleteness of the power houses, and the date when regular trains are to be run will depend upon whether necessary power can be obtained.

DETROIT CARS MUST BE EQUIPPED WITH AIR BRAKES

The Supreme Court of Michigan has just decided that the cars of the Detroit United Railway Company must be equipped with air brakes. This decision affirms the decision of the lower court, which sustained the legality of the ordinance passed by the City Council requiring such brakes to be used.

Two opinions were written in the case, both sustaining the validity of the ordinance. Judge Hooker wrote the main opinion wherein the company was convicted and fined for failing to provide the air brakes required. The reasonableness of the ordinance was determined by the trial judge without a jury, and Judge Montgomery, in his opinion, says that the court having found that the ordinance was reasonable, and the defense having failed to call for a specific finding of facts, the railway company has not put itself in a position to review the decision of the trial judge.

Testimony was introduced to show that it would cost \$350,000 to equip the cars of the company with the brakes prescribed; that such brakes were not necessary to the safe operation of the cars; that the average efficiency of the brakes in use is greater than the brakes prescribed; that no city is known to have all of its cars equipped with air brakes; that such brakes are in an experimental stage, etc.

Judge Hooker says the object of the ordinance is to compel the equipment of street cars with the means of stopping with certainty and expedition.

"We may take judicial notice that this is desirable," he says, "for we are judicially cognizant of the fact that the use of street cars is necessarily attended by imminent danger to citizens on the highway as well as passengers."

As to the claim that the ordinance should be held invalid because of the large outlay required, the court says it does not feel called upon to say much, as it is too well settled that the State or city may enforce regulations clearly looking to the safety of the public, and that all property is held subject to the exercise of the police power.

DOUBLE-TRACKING ELECTRIC ROADS

On the question of double-tracking electric railways, which has recently been urged without rhyme or reason by many New England papers, the New Bedford, Mass., "Standard" recently said: "Recent trolley road catastrophes have caused a demand that all suburban electric lines should be double-tracked. President Sullivan, of the Massachusetts Electric companies, thinks that some roads cannot afford this. The Haverhill "Gazette" replies that 'the only answer to that is that the public thinks it cannot afford to have such speed attempted on single-track lines.' Then the "Gazette" goes on in this certain-sure way: 'The public think is—or ought to be—of prime importance, and after the public have made their decision in such manner that it can be enforced, the corporations may have a different basis of estimating what they can or cannot afford.' Agreeing that 'the public think' is of prime importance, it still remains true that if the public does not think in compliance with the laws of arithmetic, it will run up against a rock, in spite of the intensity or the unanimity of its thought. Double tracks cost money—to build, and to operate. The money comes out of the pockets of the riding public. There is nowhere else for it to come from. If the public does not contribute sufficient to pay the expenses, then there is bankruptcy, which means both private and public loss. Some roads have already had that experience, and some others are expected to have it. Now, without sentiment, and putting aside for a moment "the public think," what is going to be done in such a case? Here is a road which performs a public service, but which nevertheless has insufficient income to support even a single-track line. It is pretty sure to meet financial disaster, anyway. Shall its managers put into it more money, and so make the disaster worse? Or, shall they do what seems much more reasonable, run the road they have, carefully, and thus avoid those occurrences which are misnamed accidents? A public that actually thought would not have much difficulty in deciding."

ANOTHER OUTLINE FOR RAPID TRANSIT IN NEW YORK

The city plan committee of the Municipal Art Society has added to the literature of the New York transit question a report upon the passenger transportation system. The society goes far beyond the extensive scheme outlined some months ago by Mr. Parsons, chief engineer of the Rapid Transit Commission. It would have a belt east side and west side subway system in Manhattan, supplementary to the tunnels now under way there; it would include and belt Brooklyn in its course, and would extend the system from Brooklyn to Staten Island by tunnel. The plan has two things in common with Mr. Parsons'. Neither proposes to spend any more money until the present tunnels are completed, and both treat the rapid transit systems of all the boroughs as one problem, to be solved by a system of tunnels, elevated roads and bridges which are related to each other and meant to make one continuous thoroughfare between the various distant and now slightly related sections of the city. The society believes that the system ought to be built by a monopoly, under such complete control of the city government that the best interest of the citizens would be served.

TWIN CITY CORLISS ENGINE WORKS

The Twin City Corliss Engine has been manufactured about thirteen years; in that time over three hundred have been made and placed in operation. The first one was built by the Twin City Iron Works to run their shops, which it did for over twelve years, or until the tools were removed from the old shops to the new. It is still in good running order and capable of doing duty for many years to come.

The company now building these engines is known as the Minneapolis Steel & Machinery Company. It is incorporated for \$1,000,000, stock fully paid in, and has no bonded indebtedness. The main office and shops are at Minneapolis, Minn. There are branch offices at San Francisco, Seattle, Denver, Salt Lake City and Kansas City.

The plant occupies over eighteen acres, the buildings having a floor space of eight acres. The shops are completely equipped with modern machinery and the main buildings are entered by standard gage railroad tracks. Electric cranes, pneumatic riveters, and furnaces fed by crude oil are prominent features in the operation of this plant. Over 600 employees and a construction corps are employed at present. Additional building is to be done in the spring.

The company builds Corliss engines, bridges, car houses and structural steel work of all kinds. It is now erecting a large office building in Honolulu, Hawaii.

PARIS LETTER

(From Our Regular Correspondent.)

Statistical tables have lately been issued by "L'Industrie Electrique" for last year's operation of electric railways and tramways in France. These tables show that the applications of electricity for traction have not progressed in the last period as rapidly as might have been anticipated from a consideration of the preceding stages. After rapid progress in the year 1900-1901, the percentage of increase in electric traction has decreased very much, probably in consequence of the insufficiency of financial returns from the electric railways already in operation.

By Jan. 1, 1901, the length of lines had reached double of what it was on Jan. 1, 1900; and the corresponding increase in the power of central stations was still higher, this power being at the latter date three times as much as it was at the former.

No tabulated data are available for 1902, but the total increase in the length of lines for 1901 and 1902 does not exceed 500 km, which represents an average of 250 km per year. The corresponding increase in the year 1900-1901 was over 700 km. The total power used was 28,000 kw before 1900, 64,000 kw on Jan. 1, 1901, and 74,000 kw on Jan. 1, 1903.

The following table shows the progressive changes in length of lines, power, number of cars and systems, as well as the subdivision of same:

	1893	1899	1900	1901	1903
Total length of track in km	37.4	487.5	752.8	1486.	1995.
Total amount of power in kw	1,525	18,718	28,308	64,383	74,000
Total number of motor cars	20	750	1,295	2,425	3,004
Number of lines operated by trolley	2	42	56	76	85
" operated by underground conduit	0	2	3	3	3
" " by 3d rail	1	1	1	4	5
" " bv storage battery	2	6	6	8	8
" storage battery and trolley	0	4	4	6	13
" trolley and underground	0	1	2	2	4
" trolley and surface contacts	0	0	0	7	31
" trolley without rails	0	0	0	0	3

The years 1901 and 1902 thus showed a considerable increase in surface contact systems.

Among the most noticeable installations in traction matters in Paris should be mentioned the following addition to existing plants: A large steam generating station will be installed at St. Ouen, near Paris, to distribute electric power to the surrounding district and to feed present and future railway sub-stations for converting current for the Metropolitan. Three-phase current at 6000 volts will be delivered, the characteristic feature being to generate it by large generator sets of Brown type connected to Brown-Parsons steam turbines. Four generating sets have been ordered from Brown, Boveri & Cie., of Baden (Switzerland), three of them to run at 750 r. p. m., and having a rated capacity of 5000 kw. One is to run at 1500 r. p. m., and is to have a rated capacity of 3000 kw. One motor generator, consisting of a synchronous motor and direct current generator of 300 kw capacity, will be used for excitation. Another exciter of the same capacity, direct-connected to a steam turbine, will be used as a spare unit.

The complete plant will have a capacity of 18,000 kw, and will be put in service in 1905; but the promoters are said to be already contemplating large additions to the proposed plant. This work has not been undertaken by the Metropolitan Company directly, but by a new company called Société d'Electricité de Paris, which has financial connections with the former. The statutes of the new company, which were registered June 27, 1903, appear to be of the most comprehensive extent, including all electrical applications of commercial, financial or technical nature, besides the construction and installation of electrical work. The first capital stock is 5,000,000 fr., provision being made for doubling that amount in the near future, and still more on the basis of capital stock and funded debt.

An electric railway is to be installed in St Najaire, an industrial city, which hitherto has not enjoyed the benefits of electric traction. A steam plant will have to be built for this purpose and sufficient power generated to permit part of it to be used in the local navy yard and wharves, which are among the most important in France.

Bordeaux, which is well provided with electric tramways, is to have a new water power plant, which will be installed by the Thomson-Houston Company on the Dordogne River, at Thilliers. When this station is completed the present steam plant will be discarded.

ANOTHER EXTENSIVE MEXICAN ROAD

An extensive electric railway is to be constructed and operated by American capital between Victoria and Salinas, passing through the towns of Tula and Guadalcazan. The line will be upwards of 100 miles in length. It will run through the Sierra Madre range, and will carry ore and other freight as well as passengers. It will be built and worked by the Mexican Construction Company, a Pittsburg concern, which is largely interested in mining operations along the route of the proposed road. J. P. Loeder is president of the company.

REPORT OF THE NEW SOUTH WALES GOVERNMENT TRAMWAYS

The report of the Railway Commissioners of New South Wales for the year ending June 30, 1903, shows 124½ miles of tramway lines in operation, as compared with 104 miles last year. The operating report for the year is as follows:

	1903	1902
Gross income	£752,034	£631,757
Operating expenses	654,165	541,984
Gross income less operating expenses....	97,867	89,773
Percentage of profit to capital invested..	£2-19-3	£3-5-7
Percentage of operating expenses to gross income	86.99	85.79
Earnings per average mile open.....	6,455	6,546
Number of passengers carried.....	130,405,402	108,135,111
Car mileage	13,695,630	9,344,154

The commissioners report that during the year twenty-four electric cars paid for out of operating expenses replaced twenty-four steam cars and three steam motors. One hundred and sixty four-wheeled electric motor cars and five freight cars were added to the stock during the year and charged to capital. The power station has been extended and the output during the year was 2,826,126 kw-hour.

NEW PUBLICATIONS

Notes on Electric Railway Economics and Preliminary Engineering. By W. C. Gotshall. VI + 252 pages; illustrated. New York, 1903. Published by the McGraw Publishing Co. Price, \$2.00.

This book is the most complete—in fact the only book, so far as we know—on interurban electric railways which takes up the subject in a way which appeals especially to the investor and to the engineer in charge of the preliminary work. Other treatises have been published discussing the purely engineering side of electric railroading, but little or no attempt has heretofore been made to outline a comprehensive method by which the owner, investor or consulting engineer can (1) predicate to any certainty the possible business, freight and passenger, between the two points; (2) undertake the preliminary engineering required for the proposed railway and ascertain the cost; (3) prepare the run-sheets for determining the most economical speeds under given conditions and the power capacity required; and (4) draw up the specifications for securing the results sought.

Mr. Gotshall's book contains a great deal of matter outside of these four subjects, including a thorough and up-to-date statement of the principal engineering features of high-speed interurban electric railroading. The main object sought for in the book, however, was an exposition and discussion of the economic side of the subject, and it was for this reason that the title given to the book was selected.

The first two chapters relate to the preliminary office determination by the engineer or promotor of the approximate earnings of a proposed line, based on the tributary population. Chapter iii. discusses the next step, the preliminary field survey and the fixing of tentative lines for the proposed road on which to base closer and ultimate determinations. In chapters iv. to vii. the writer discusses the treatment by the engineer of the data collected from his preliminary field survey. It includes the fixing of the grade line; preliminary determination of schedules, equipment and cost of construction, a more detailed estimate, based on observations taken in the field, of the probable earnings, and an examination into the probable operating expenses based upon the foregoing determinations. In the latter chapter of this group the author analyses in a most valuable way the results being obtained by existing systems and applies them to other schedules and conditions. In this way he has placed at hand a method of accurately determining the costs of operation for almost any proposed system, and points out the fallacy as well as danger of

using the percentage of gross receipts method now so commonly employed.

Chapters viii. to xvi. are devoted to describing the final engineering work of the proposed undertaking. Field parties are again sent out, and as a result of the study of conditions thus made, the detailed plans are prepared. Special chapters are devoted in this part of the book to track construction and superstructure, overhead and third-rail construction, power stations, storage batteries, motor equipment and rolling stock. In those relating to track and station construction, tables are given in detail of cost for different classes of work, and in that on third-rail and overhead construction an interesting comparison is drawn between these forms of working conductor.

Chapter xiii, on motor equipment and rolling stock, is particularly valuable, as it contains a discussion on the mooted questions of train resistance, and shows graphically all of the formulæ and results which have been developed to date. It also shows the most economical speeds for a given set of conditions in a manner which is very complete. Tables and diagrams are also given showing the relation between the energy consumed for different schedules and different distances between stops, and are worthy the careful consideration of engineers and financiers having the determination of such matters. The relatively great cost of high speeds is strikingly shown. All of this matter and the accompanying determinations and conclusions are entirely new, and the work and development of Mr. Gotshall are most opportune and valuable to the banker, investor, promotor and engineer. Chapter xiv. discusses the right of way, the following chapter the preparation of the specifications, and chapter xvi. gives some hints on the method followed during the construction period.

The best manner of keeping, systematizing and showing relative construction and operating data and records is considered in chapter xvii, while the eighteenth chapter sets forth the controlling considerations governing the kind and character and consequent permissible cost of a proposed installation. The principles laid down are illustrated by an assumed case representing actual conditions.

The book concludes with a set of complete specifications for the construction of a moderate sized high-speed interurban electric railway operating over its own right of way, and a selected list of articles which have been published on interurban railway work.

It is certain that Mr. Gotshall has made a most important and opportune contribution to railroad literature in this book, for the preparation of which his previous training has eminently qualified him. As a member of both the American Society of Civil Engineers and of the American Institute of Electrical Engineers, and as builder of the Second Avenue Conduit Railway in New York and a number of Western interurban railways, he has been able to look at the proposition from both the civil and engineering, as well as from the financial and commercial sides of the question. Mr. Gotshall's recent connection as president and chief engineer, as well as originator and developer, of the New York & Port Chester Railroad Company, and as general manager and chief engineer for a number of years of the Union Depot Railway Company, of St. Louis, also eminently qualify him to consider the question from the standpoint of the manager and operator. The book throughout possesses the rare merit of being not only absolutely abreast of the art, but actually ahead of it in many respects.

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 NOV. 10, 1903

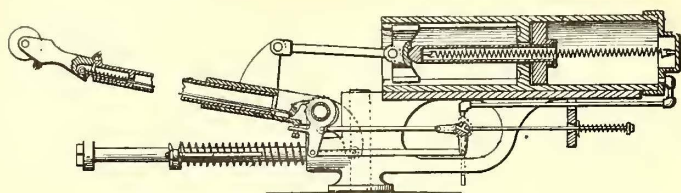
743,435. Apparatus for Controlling Trolley Poles; Judson L. Bogue and David M. Jennings, Denison, Tex. App. filed May 2, 1903. Automatic means for returning the trolley pole to the wire after it has accidentally left it, said means not interfering with the manipulation of the pole by the motorman, by means of the cord.

743,521. Trolley Stand; Frederick Kennington and David L. Fawcett, Leeds, England. App. filed Jan. 14, 1903. A horizontally and vertically movable pole having a spring interposed between a lug on the pole and the vertical socket.

743,542. Trolley Signal; Charles H. Morse, Cambridge, Mass. App. filed June 25, 1901. Current is directed by the passing cars through electro-magnets which control safety and danger signals at each end of the block.

743,654. Electric Car Heater; James F. McElroy, Albany, N. Y. App. filed Sept. 2, 1903. A special electric heater for the motorman's compartment is automatically thrown into and out of circuit by the movement of the door of the compartment.

743,689. Spring Cushioning Device; Clarence P. Byrnes, Sweickley, Pa. App. filed July 8, 1903. A spiral spring having superimposed coils with a continuous angular flange engaging the successive turns and arranged to increase resistance during the stroke.



PATENT NO. 743,435

743,699. Street Car Fender; Matthew Duffner, Allegheny, Pa. App. filed March 30, 1903. An upper shield will automatically close over an object picked up by the fender and so arranged as to prevent the object from rolling off.

743,786. Elevated Railway; Cassius I. White, Nottingham, Ind. App. filed June 15, 1903. The car is hung from a single rail suspended from a series of derricks; relates also to numerous details of the system.

743,789. Railway Station Signal; John L. Wrenn, Washington, D. C. App. filed June 30, 1903. A signal light adapted to be turned on by a prospective passenger is afterwards turned off by the car itself.

743,793. Brake-Shoe Key-Bolt; Edward L. Adreon, Jr., St. Louis, Mo. App. filed April 7, 1903. A brake-shoe key-bolt in the form of an open-seam tube and provided with a funnel-shaped resilient head and a locking key opening provided with a resilient wall.

743,794. Brake-Shoe Key-Bolt; Edward L. Adreon, Jr., St. Louis, Mo. App. filed April 7, 1903. A brake-shoe key-bolt constructed of a single piece of spring metal provided with a locking key opening, and resilient parallel prongs and flaring portions.

743,878. Electric Block Signal; William S. Jackson, Hoboken, N. J. App. filed March 5, 1903. A semaphore is raised by a shoe moved transversely thereto by an electro-magnet, the withdrawal of the shoe permitting it to fall by gravity.

743,888. Electric Safety Appliance; Louis Kleutsch, Richmond Hill, N. Y. App. filed Feb. 20, 1903. A third-rail covering adapted to be raised and lowered by the flange of a car wheel operating upon a suitable leverage system.

743,960. Paving Strip; Louis Vogel, Whitelaw, Wis. App. filed June 20, 1903. The paving strip is so constructed that it will fit snugly against the web between the tread and base flange of the rail, the outer side of the strip being inclined downward to increase the cross-sectional extent of the same near the lower edge.

PERSONAL MENTION

MR. E. M. MULLIGAN, city engineer of Warren, Ohio, has been made consulting engineer for the Cleveland & Sharon Railway Company, of Cleveland, Ohio.

MR. CHARLES L. BORGMEYER, for many years attorney and counsel for the Consolidated Traction Company and the North Jersey Street Railway Company, has resigned from the Public Service Corporation.

DR. F. A. C. PERRINE, president of the Stanley Electric Manufacturing Company, has been selected to deliver the "Founder's Day address," Nov. 30, at the Thomas S. Clarkson Memorial School of Technology, at Potsdam, N. Y.

MR. A. G. HEGGEM, for the past four years general superintendent of the Russell Engine Company, of Massillon, Ohio, has resigned and will go to Kansas City, Mo., where he will open an office as a consulting engineer. Mr. Heggem is a graduate of Cornell University.

MR. H. H. VREELAND, president of the Interurban Street Railway Company, of New York, and Mr. J. C. Hutchins, president of the Detroit United Railway Company, of Detroit, Mich., have been elected honorary members of the Tramways & Light Railways Association, of Great Britain.

MR. ROBERT L. POST has been appointed general manager of the Ithaca (N. Y.) Street Railway Company, to fill the vacancy made by the recent resignation of Mr. H. A. Nichol, who left Ithaca the first of the month to take a position in Cleveland, Ohio. Mr. Post has been connected with the Ithaca Street Railway system for nearly six years, having held many responsible

positions, and at one time fulfilling the duties of acting general manager for nearly a year.

MR. WILLIAM P. JACKSON has been appointed general superintendent of the Bay Cities Consolidated Railway Company, of Bay City, Mich. Mr. Jackson is an experienced street railway and interurban man. He was formerly with the Union Traction Company, of Indiana. For six years previous he was connected with street railway work in Marion, Ohio. He first entered street railway work in the Columbus, Ohio, car shops after considerable experience in lighting and construction work.

MR. MICHAEL OHMER, of Dayton, Ohio, died on Nov. 11, from an acute attack of cystitis. Mr. Ohmer was born in Bisping, Lorraine, 1826, came to Dayton in 1837 and later established a flourishing furniture business. He was one of the organizers of the original Wayne Avenue & Fifth Street Railway Company, of which he was vice-president and general manager, and for a time the president. His eldest son, Mr. John F. Ohmer, is vice-president and general manager of the Ohmer Fare Register Company.

A WIDE CIRCLE OF FRIENDS will regret to learn of the death of Mr. John Graham Millar, manager of the roofing department of the H. W. Johns-Manville Company, of New York. Mr. Millar was born in Birmingham, England, and came to the United States in 1885. After a short period of employment with the United States Leather Company, he associated himself with the business in which he was engaged at the time of his death. He was with the H. W. Johns Company for fifteen years, and was recognized as an expert in the manufacture of asbestos roofing. Mr. Millar was widely esteemed for his integrity and many engaging qualities, and his death is a severe loss to the company with which he was connected.

MR. FREDERICK A. HUNTRESS, general manager, superintendent and purchasing agent of the Halifax Electric Tramway Company, of Halifax, N. S., has been appointed general manager of the Worcester Consolidated Street Railway Company, of Worcester, Mass., to succeed Mr. Richard T. Laffin, who resigned from the company some time ago to become general manager of the Manila Street Railway, of Manila, P. I. Mr. Huntress is a practical street railway man of twelve years' experience. He is a native of Somerville, Mass., where he was born thirty-four years ago. He was graduated from Harvard with the class of 1891 and immediately became connected with the West End Street Railway Company, of Boston. He remained with this company two years and then accepted an important position with the Montreal Street Railway Company. From Montreal he went to Halifax as assistant manager, and six years ago he was given entire charge of the street railway and lighting system of that city. Mr. Huntress will assume his new duties Dec. 1.

THE PUBLIC SERVICE CORPORATION, of New Jersey, announces some important changes in the personnel of its street railway department. Mr. A. J. Bliss has been appointed division superintendent in charge of the Jefferson Avenue, Pavonia, Court House, Washington Street and Willow Avenue lines, also the Hoboken and Pavonia car houses, Fourteenth Street, Barclay Street and Pavonia Ferry terminals. Mr. Bliss succeeds Mr. Hugh Brooks, who has been assigned to other duties. Mr. W. F. Revoire, division superintendent, in addition to his present duties, has been appointed in charge of the Homestead transfer station, Paterson & Hoboken and Rutherford "Y" lines, also the Secaucus car house. Mr. Revoire succeeds Mr. A. J. Bliss, transferred. Mr. Frank C. Southard, division superintendent, in addition to his present duties, has been appointed in charge of the Forest Hill and Mulberry Street lines, also the Miller Street car house. Mr. Southard succeeds Mr. John Sloane, resigned. Mr. James Smith has been appointed division superintendent in charge of the West Orange, Orange Street, Central Avenue, South Orange, Orange & Passaic Valley Railway Company, South Orange and Maplewood lines, also the Roseville, Orange & Passaic Valley and South Orange car houses. Mr. Smith succeeds Mr. John A. Campion and Mr. James McDonough. Mr. Frank H. Brown has been appointed division superintendent in charge of the Main Line, Front Street, Fourth and Summerset, Arlington Avenue and Rahway lines, also the Westfield car house. Mr. John J. Gettings, division superintendent, in addition to present duties, has been appointed in charge of the Kinney Street, Bergen Street and Crosstown lines, also the Springfield Avenue car house. Mr. Gettings succeeds Mr. William B. Taylor, resigned. Mr. Patrick McDermott, division superintendent, in addition to present duties, has been appointed in charge of the Keryn line, succeeding Mr. John Sloane, resigned. Mr. Hugh Brooks has been appointed in charge of all horses and wagons, with the title of Superintendent of Trucking.