tion of breaking off the work of the association to take in what are frequently purely pleasure trips and social functions. In this case, however, the time was well spent, as the line in question is the only third-rail line in the State, and is considered to be one of the best built and best operated roads in the country.

E. P. Roberts opened the discussion on the subject of the width of cars. He said that while it was desirable to standardize car widths, there occurred to him three important points to be considered: First, the width permissible due to municipal restrictions; second, the methods of making use of the available space to provide for different kinds of service; third, the cost of grading on interurbans and the cost of paving on city streets.

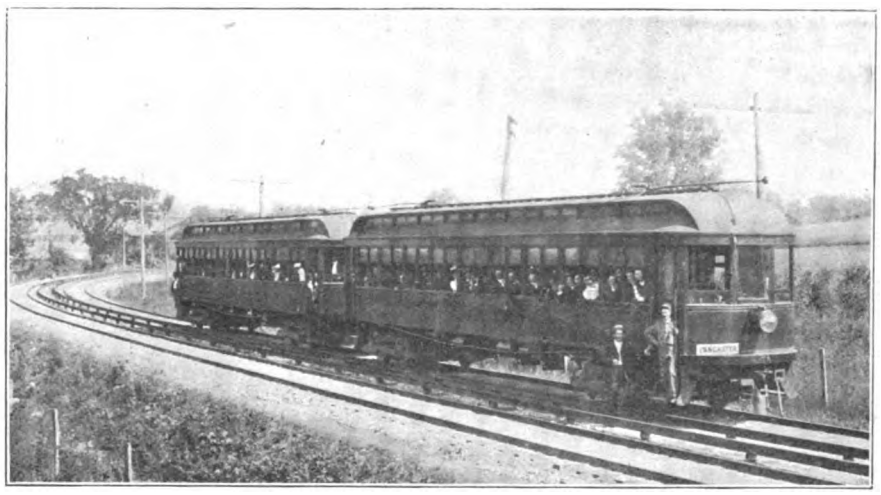
On the first point it was generally the rule to get as wide a strip as possible in the cities, although sometimes city companies declined to take all they could get on account of increased cost of paving. He thought interurbans might well help to pay for increased width of devil strips in cities. As interurban lines become longer and interline traffic greater, there is more and more complaint of uncomfortable and narrow seats. He thought interurban companies should design a different type of car for the long limited runs than for the local runs. He referred to the chair cars in use on some roads, but the objections to these is that they limit the seating capacity. The long-distance cars should have wide and deep seats, high roll backs and tilting cushions so that passengers will not tend to slide off from seats. Arm-rests he thought desirable, and for this class of travel he thought there was no objection to cutting down the aisle space to the smallest possible degree in order to make the seats wider and more comfortable. There should be plenty of knee room and seats against partitions should have a slanting back as well as other seats; the space left by this slope could be used for storing card tables or other accessories. Seats should not be too high from the floor and there should be foot-rests. For local and short haul traffic, he said the seats should be narrow and the aisles wide. Low back seats were more desirable than high back for such runs, as they afforded a maximum seating capacity. There should be no arm-rests and the backs should be hollowed out to afford free passage in the aisles. There should be longitudinal seats near the doors so that a number of passengers could stand there. This would also effect quick loading and unloading. He referred to a car which his company is designing for one of the most prominent high-speed roads in the country. This car will be 9 ft. wide over all and 8 ft. 6 ins. over sills. The seats will be 35 ins. center to center, 35 ins. from inside of panel to edge of arm-rest; cushions, 17 ins. x 35 ins.; corrugated backs, 26 ins. high; aisles, 19 ins. wide. The cars will have a smoking compartment, toilet room and washstand and a small baggage compartment, and will be 60 ft. long.

J. C. Gillette, master mechanic of the Columbus, Delaware & Marion Railway, said they had some cars which had 36-in. seats and very narrow aisles. On these the eaves and drip board had been dispensed with. The windows came down almost flush with the car seats, and the bodies are 4 ins. narrower at the sills than at the windows. These cars are 67 ft. long.

Further discussion was interrupted by the adjournment for the Scioto Valley trip.

THE SCIOTO VALLEY TRIP

General Superintendent S. S. Bradley, assisted by his master mechanic and his passenger agent, was in charge of the car. Each of these gentlemen took particular pains to point out the most interesting features of operation and construction, so that the trip was the source of a great deal of valuable information for many. This property was quite thoroughly described in the STREET RAILWAY JOURNAL of Dec. 3, 1904, and the large and well-equipped power station and the substantially built roadbed and third-rail construction, which were profusely illustrated in that number, were the subjects of many favorable comments. The line has recently been extended from Circleville to Chillicothe, and this work, which was done by the company under the supervision of Mr. Bradley, is even better than the old. The roadbed is graded 16 ft. wide, and from 20 ins. to 30 ins. of excellent gravel is placed under and around the ties, covering the ends. This piece of track, which has been in use less than sixty days, was in beautiful condition, and the managers all agreed that it was as fine as any they had ever seen on an electric line. The road has many long tangents and the cars equipped with four 125-hp motors make better time between terminals than the steam road which closely parallels the line. New station buildings have recently been erected in all important towns. They were designed for the future, the machinery rooms having space for two 400-kw rotaries and controlling apparatus, and there is a large passenger waiting room with ticket office, and an unusually large freight and express room with unloading platforms for cars and teams. The buildings are of natural colored brick with concrete foundations and floors and tile roofs. It was figured that it was economy to erect buildings of this character and carry no insurance on them rather than to build frame station buildings, making insurance necessary. The cost of third-rail maintenance as compared with overhead interested many, and Mr. Bradley stated that thus far it had cost less to maintain the entire third-rail and high-tension systems than the 1½ miles of trolley line in village streets. As to removal of snow and ice, he admitted that they had discovered no absolutely reliable method of keeping the third rail clear in certain kinds of weather, but the road was only tied up once for a period of 30 minutes last winter.



TWO-CAR TRAIN ON THE SCIOTO VALLEY TRACTION COMPANY, CARRYING MEMBERS OF THE OHIO INTERURBAN RAILWAY ASSOCIATION ON INSPECTION TRIP

Motormen on this line are all old steam locomotive engineers, a number of them from the parallel steam road. They are paid 25 cents an hour, and conductors 20 cents. The plan of promotion by order of seniority has been dispensed with; in fact, all runs are equal, as they are changed regularly. A man starts early in the morning for one period of two weeks and then starts in the afternoon and works until late at night, and the men are shifted from one division to another at regular intervals. This eliminates all dissension and the men are all on the same footing. Mr. Bradley claims they are well pleased

with this arrangement after they become accustomed to it. Steam rules are followed as closely as is practicable. Orders are issued in duplicate on tissue paper, and the orders are complete, no abbreviations being used.

It will be remembered that the road has two divisions which join 12 miles out of Columbus. Formerly the cars of the two divisions ran in and out of the city 5 minutes apart, but now they are brought into the city in trains, and frequently three cars are hooked together. The sight of three big 60-ft. cars running through the narrow streets and into the business district of the city was one which excited the admiration of the managers. The cars have type M controllers, with Westinghouse straight air brakes and VanDorn couplers with 9-ft. beams, so that they make the right angle curves in the city without difficulty. In increasing the service for summer traffic, Mr. Bradley believes it is much better to operate cars in trains than to give half-hour headway, and it was pretty generally agreed that the cars on the half-hour usually run light, while those on the hour are crowded. People do not become accustomed to the half-hour cars until they have been on for a number of months, and then when they are taken off in the fall there are complaints, so it is better not to put them on at all. With train operation, the labor cost is, of course, reduced, although Mr. Bradley makes it a practice to have a conductor on each car. This not only increases the safety of operation, but insures getting all the fares. Bell ropes are not carried through the trains, and while it takes a few seconds more to ring two or three bells, there is not the liability of accident.

The company is just preparing to take up the freight proposition and it is building a passenger and freight terminal in Columbus. It is located in the wholesale district, and it will have ample room for loading and unloading a number of cars. When this is completed the company will entirely abandon the use of the interurban loop which traverses the heart of the shopping district and which is responsible for a great loss of time and excessive wear and tear on equipment. For freight service it is the intention to install a number of box-car trailers, which will resemble the interurban cars by having windows and steam road roof.

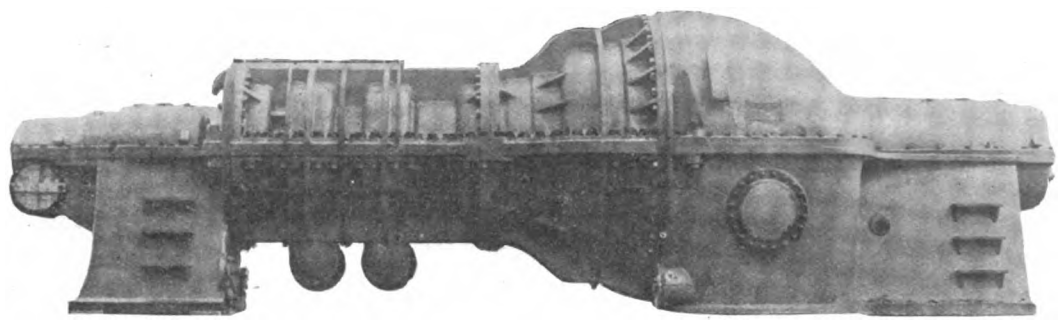
The passenger business thus far has proven most gratifying, and it is believed the freight business will place the property on excellent paying basis. The company has never sold any of its bonds and will not do so until the property is more thoroughly developed.

The Indiana Supreme Court has decided that a baseball park owned by an interurban traction company in connection with a pleasure resort, and communicating with it by gates, through a high board fence, used for playing baseball on Sunday, requiring persons to purchase tickets for the privilege of passing through said gates and sitting in the grand stand to watch the game, in preference to standing at the two sides of the park where there is no fence, and for the privilege of which no fee is charged, is a violation of the law prohibiting the playing of baseball on Sunday where an admission fee is charged.

9000-HP STEAM TURBINE FOR BROOKLYN

The sixth of the huge power plants to be constructed for the Brooklyn Rapid Transit Company will show, in some respects, a radical departure from the features usually found in stations where reciprocating engines are installed. Among the more important of these is the small floor space needed for the machinery. The engine room of the ordinary station requires 60 per cent of the total ground space, and the boiler section 40 per cent. In the new turbine plant, the turbine floor occupies but two-thirds the space required for the boilers.

The Brooklyn Rapid Transit Company's new Williamsburg station is designed to accommodate a total of nine steam turbine and generator units, three of which are now being installed. One of the most interesting of these is the Allis-Chalmers 9000-hp unit. A view of the body of the turbine, as it appeared when loaded on a 36-ft. flat car for shipment from the West Allis works of the Allis-Chalmers Company, is shown in the accompanying illustration.



9000-HP STEAM TURBINE FOR WILLIAMSBURG STATION OF BROOKLYN RAPID TRANSIT COMPANY

The turbine is of the horizontal multiple-expansion, all-around parallel-flow type, generally known as the Parsons type, operating at 750 r. p. m. The generator is a Bullock alternating-current machine, built by the Allis-Chalmers Company at its Cincinnati works. It will carry 25 per cent overload continuously and 50 per cent overload for three hours with but small temperature rise.

A noteworthy feature in the construction of the Allis-Chalmers turbine is the blading; the blades are made of a special alloy and of such form and dimensions as will secure the highest economy. The individual blades are mounted in groups, each group forming one-half of a circular row. The inner ends of the blades are swaged, firmly secured in accurately spaced slots in foundation rings and riveted in slots in their respective channel-shaped shrouds. The blade rings are secured by special calking strips in accurately machined grooves in the cylinder and rotor, thus absolutely insuring against throwing out due to centrifugal force. The channel-shaped shroud secures the blades in a substantial manner at the proper angle and spacing, and eliminates the danger of stripping, permitting the turbine to be safely operated with a minimum radial clearance. This special design of blading does away with hand work. The machine construction insures great strength, perfect alignment and uniformity in the spacing of the blades. Having adopted the proper working principle, the efficiency of a steam turbine depends on the accuracy of the angles, the spacing and the form of the blades. All of these factors are obtained in the construction of the Allis-Chalmers turbine.

The lubricating arrangement is free from complications, complete and efficient. It is equipped with a direct-acting steam pump for use on starting up the turbine. The turbine and generator rotors are direct connected by a flexible coupling, each being carried in two bearings of the ball and socket type. In the generator design especial attention has been given to thorough ventilation.

The turbo-generating unit measures approximately 47 ft. in length over all, 13 ft. 3 ins. in width and 11 ft. 6 ins. in height above the engine room floor. Its height above the foundation is scarcely more than that of the low-pressure cylinder of a reciprocating engine, of equal capacity, above the upper platform, and such cylinders are frequently more than 30 ft. above the engine foundations.