

NORTHERN OHIO INTERURBAN LINES

The Columbus, Delaware & Marion Railway, recently placed in operation between Columbus and Delaware, forms the nucleus for an electric trunk system which will eventually connect Cleveland, Toledo and other Northern Ohio cities with the Buckeye State capital. The road is rapidly being extended northward from Delaware, and will be placed in operation to

there is little doubt that the cars of some of these roads will operate into Columbus over the Columbus, Delaware & Marion, and it is estimated that with these roads in operation the receipts from this traffic arrangement will be sufficient to pay all fixed charges on the line.

ROUTE SELECTED

The route traversed is the main north and south highway out of Columbus. From Columbus to Delaware the line parallels



TRESTLE AT SLATE HILL NEAR ENTRANCE TO GLENMARY PARK

Prospect within sixty days and to Marion before the close of the summer. Right of way has been secured for a branch to Richwood, which will be built this summer. Extensions north of Marion have been planned, but the exact terminal points have not been decided upon. It is certain, however, that con-

the Big Four and Pennsylvania on one side and the Hocking Valley on the other, the steam roads being from 1 mile to 2 miles on either side. So far as the suburban traffic is concerned the electric has considerable advantage over the steam roads, since it touches all the towns and hamlets on the old

stage route, while the steam roads do not. Between Columbus and Delaware the pike is very thickly settled, the average population being about 2000 to the mile outside the incorporated country towns. North of Delaware is rich farming country with an average population of 800 to the mile outside the towns. The points touched and their population, and the distance from Columbus are shown in the accompanying table:



COMBINATION OF GAGES IN COLUMBUS

nection will be made which will afford through routes between Cleveland, Toledo and Columbus.

Aside from the business of its own line the road forms the natural entrance to Columbus for other roads now under construction or projected. At Delaware it will connect with two lines already under construction, while at Marion connection will be afforded with three lines for which all arrangements have been made. Under traffic arrangements already perfected

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	Population	Distance From Columbus
Columbus	135,000	.. Miles
Clintonville ..	2,000	8 "
Worthington .	800	11 "
Stratford	250	23 "
Delaware	10,000	25 "
Radnor	300	33 "
Prospect	1,250	38 "
Richwood ...	1,400	46 "
Owens	250	43 "
Marion	17,500	47 "

168,750

Clintonville is a beautiful suburban town inhabited largely by people who do business in the city. Worthington prides itself on having once been larger than Columbus. In the early 20's, when it was decided to move the State capital from Chillicothe to the central portion of the State, Worthington came within one vote of securing the prize. The town has hardly recovered from the disappointment of the failure, and has laid dormant ever since, until the improved transportation facilities

of recent years have put new life into the place. Delaware is the seat of a large college, which is attended by nearly 2000 pupils, and it is the capital of Delaware County. Marion is the capital of Marion County and is a live manufacturing town.

HISTORY OF THE SYSTEM

The Columbus, Delaware & Marion Railway is the outgrowth of a series of projects that have attempted to occupy the territory between Columbus and Delaware. The Columbus, Clintonville & Worthington Railway was built in 1893, and extended from North Columbus to Worthington. The following year A. Sullivan built a line from Worthington to Flint, but it was operated for a short time only as a horse car line. In 1901 James Holcomb and J. E. Lattimer, of Cleveland, purchased the Columbus, Clintonville & Worthington, and the Delaware City Railway, and proceeded to secure right of way for a connecting line, calling the company the Columbus, Delaware & Marion Railway. About the same time the Columbus, Delaware & Northern Traction Company was formed by John G. Webb, H. A. Fisher and others, who had been interested in building other lines out of Columbus. Both companies did considerable grading, and after a long series of legal disputes the Cleveland people finally sold out to Messrs. Webb and Fisher, who completed the road, retaining the name of the Cleveland company. Mr. Sullivan undertook to sell the Worthington-Flint line at the same time, but the franchise was of questionable value because of non-operation, besides being for a highway line, so the company declined to buy, but Mr. Sullivan had possession through Worthington, and

down Summit Street, the route directly down High Street being unavailable because of the broad gage (5 ft.) of the Columbus Railway Company. Later the Summit Street franchise was sold to the Central Market Street Railway Company, which was organized by allied interurban interests for the purpose of operating a standard gage city system. In approaching the



STONE CRUSHER AND BALLAST CARS

center of the city it was necessary to utilize Fourth Street, already occupied by the Columbus Railway Company, and this called for the laying of a third rail for the standard gage. The combination track, together with the combination-special work, are shown herewith. The combination track was formed by bolting two grooved rails together, the bolts passing through a cast steel plate, which is placed between the sides of the rails to make a solid joint.

All cars operate to the union interurban station located on Gay Street, near High Street, in the center of the city, which is equipped for both passengers and freight. Cars operate on hourly headway from Columbus to Delaware, and there is a local car operating on half-hourly headway between Columbus and Worthington, taking the place of the old Columbus, Clintonville & Worthington car.

At Delaware the company operates 7 miles of city system on fifteen-minute headway. This system comprises two city loops and three lines on main streets, connecting all the railway stations and affording excellent service for a town of this size.

The traffic arrangement in Columbus is a most desirable one. The city company gives only fifteen-minute headway, and the interurban cars are scheduled to arrive between the city cars, so there is no delay in enter-

ing the city. Cars do not stop for local passengers, and despite the fact that this route is considerably longer, the schedule to the center of the city is ten minutes faster than if the cars went directly down High Street, following the cars of the Columbus Railway Company. The traffic arrangement is on the Dayton plan, the city company taking one-half of the city fare for



STEEL BRIDGE AT STRATFORD

thus delayed construction work for a considerable time, until the Columbus, Delaware & Marion put several hundred men at work overnight and tore up the line, relaying with its own tracks and completing the work before morning.

TERMINAL FACILITIES

For entrance to Columbus the company secured a franchise

through passengers and all of the fares derived from local passengers. Each car is equipped with a Sterling-Meeker two-face register, and upon entering and leaving the city the conductor rings up the number of through passengers in the car. All through tickets read to or from the union passenger station. Passenger rates are considerably less than 2 cents per mile. In connection with other roads entering Columbus the company sells mileage books, good for the holder on any of the lines, at the rate of $1\frac{1}{4}$ cents per mile; \$6.25 for 500 miles and \$12.50 for 1000 miles. The steam roads operating between Columbus and Delaware have combined to fight the electric road for this business, and they are selling twenty-ride tickets at \$8, which meets the single-trip ticket of the electric road. These tickets



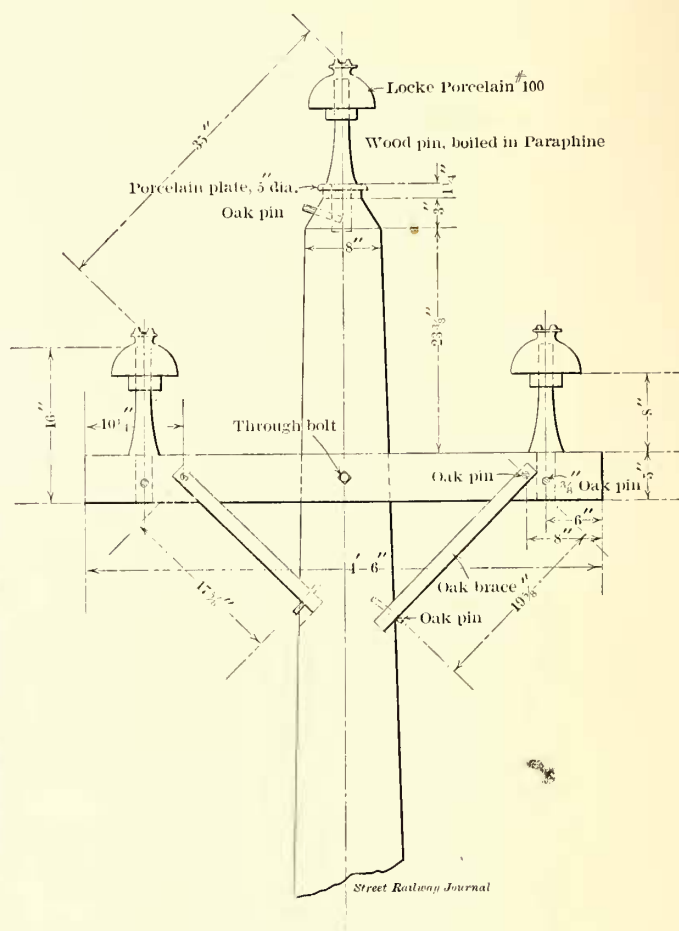
TYPICAL LINE SCENE

are interchangeable on any of the suburban trains of the three roads. The electric people claim that on account of the numerous advantages of their mileage books this action has not deprived them of the business of the commuters along the line. As soon as the track can be placed in suitable condition it is the intention to put on limited cars which will make the through run in one hour, about the same time made by the steam roads, with the added advantages of landing passengers in the business districts of both Delaware and Columbus.

ROADBED AND TRACK

Between North Columbus and Delaware the line parallels the highway except where it passes through villages, and then it takes the center of the street. Right of way is 20 ft. wide, and it is separated from the highway by a ditch and a fence. The inside line is also fenced. North of Delaware the right of way is from 50 ft. to 125 ft. wide across country, closely paralleling the Hocking Valley Railway. From Delaware to Prospect 13 miles is practically a tangent, and it has been selected by the General Electric Company as a place for making high speed tests. On the Columbus-Delaware section the maximum grade is 2 per cent except for one $3\frac{1}{2}$ per cent grade, which is to be lowered. North of Delaware the grade limit is $1\frac{1}{2}$ per cent. There are very few curves except in the cities, and none of them are over 4 degs., adapted for high speed. The company was unable to find gravel along its line, so it

purchased a stone quarry near Stratford and is ballasting the entire line with crushed stone. The crusher and construction cars are illustrated herewith. Track is of 70-lb. A. S. C. E. section in 30-ft. lengths. The company experimented with bonds on the Columbus-Delaware section, and used three types, namely, American Steel & Wire, Ohio Brass and Morris bonds. Rails are cross bonded every 1500 ft. with 0000 Ohio Brass bonds. Switches are 400 ft. long, with 79-ft. leads. No. 10 frogs are used, with high switch stands equipped with oil



DETAILS OF TRANSMISSION POLE

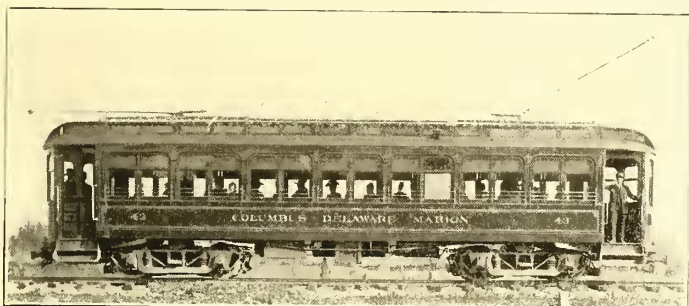
lamps and targets. At a number of dangerous road crossings the company has installed Parish gong signals. These start ringing when the car is within 1200 ft. of the crossing, and are operated by the trolley wheel tripping a switch attached to the trolley wire. There are few cuts or fills but there are several very good bridges, two of which, a double girder and a long trestle, are illustrated herewith. The trestle, which is 990 ft. long and 65 ft. high, is an unfortunate structure owing to the peculiar land formation of slate shale. The bank slides continually, and although the company has spent a large amount of money in driving piling and filling the bank it is impossible to keep the bridge in line. The trestle is well built, and of course perfectly safe, but the company has abandoned hope of keeping it in shape for high speed and will fill the entire ravine, requiring something like 300,000 ft. of dirt. Old settlers claim that the large tree to the left of the bridge shown in the cut has slid 50 ft. in as many years.

OVERHEAD

The pole line over the majority of the road is 35 ft. tall, spaced 100 ft. apart. The poles between North Columbus and Worthington are 40 ft. tall, with a 6-ft. cross arm near the top, carrying the lines of the Columbus Citizens' Telephone Company, under an arrangement which was inherited from the old Columbus, Clintonville & Worthington road. All poles are painted black to a height of 10 ft., with the balance white.

This feature, together with the white rock ballast, gives the line a very clean appearance.

Details of the overhead work and high-tension line as well as track are shown. Side arms are of 1½-in. pipe, 9 ft. long, guyed to the pole. Two 0000 grooved trolley wires are used. The west wire is continuous from one end of the road to the other without connecting with switch pans, all switches being on the east side of track. This leaves the line open for high-speed limited cars. The east line is continuous over the main track, but contains switch pans for sidings. Great care has been exercised in the construction of the high-tension lines, as 33,000 volts are used in transmission. Absolutely no iron is used at the top of the pole, except the through bolt which holds the cross arm. This cross arm is 4 ins. x 5 ins. and 4½ ft. long. Pins are 16 ins. long and No. 100 Loche porcelain insulators are used. Two of these are mounted on the ends of the cross arm, while the third is on the ridge pin, forming a 35-in. triangle. The top of the pole is cone shaped, and in this is bored a 2-in. hole 5½ ins. deep. The pin is driven into this and is secured by a ¾-in. round oak pin 5 ins. long. A 5-in. porcelain plate is placed around the base of the pin, and is provided with a raised groove, which prevents the dampness from getting into the top of the pole around the pin. Transmission wires are copper, No. 2 and No. 3, as required. Braces for the cross arms are oak, pinned with oak pins to cross arm



STANDARD CAR

and pole. Two Garton-Daniels lightning arresters are used to the mile.

POWER EQUIPMENT

The power equipment and methods of distribution are entirely on a temporary basis. In anticipation of extensions north of Marion it has been decided to erect the main generating station at that point, which will eventually be the center of the system. Plans for this station are being prepared and contracts will shortly be let. It has been settled that the original installation will comprise three 2000-kw steam turbines.

The present power station is located at Stratford at the falls in the Olentangy River. The company purchased the ruins of an ancient paper mill, and from the solid stone walls reconstructed the building into the present plant. The building faces the river and the old mill was formerly operated by a water-wheel in the race near the falls. The company is not at present operating the water power because of its varying efficiency. It is claimed, however, that in the wet season 500 hp can be derived, and an average efficiency the year round of 200 hp. The company owns the water right and proposes to utilize it later. The engine room of the building is 40 ft. x 80 ft., and the boiler room 46 ft. x 56 ft. A trestle has been erected at the side of the boiler room, and coal is dumped in bins below, having a capacity of twenty-five cars.

Three 250-hp Heine boilers are in use and two more are being installed. The boilers are hand fired, and they use Hocking Run of mine coal. Safety valves are set at 140 lbs. The present power equipment was intended for temporary service only, and includes several types of apparatus. There

is a McIntosh & Seymour twin tandem-compound four-cylinder engine, turning at 127 r. p. m., and belted to a four-pole General Electric railway generator of 400-kw capacity. On the other side of the room there is a Porter-Allen single cylinder engine, turning at 150 r. p. m., developing 500 hp normal, direct connected to a six-pole General Electric 400-kw machine. Then there is an Armington-Sims high-speed vertical engine turning at 260 r. p. m., and developing 250 hp, which is belted to a four-pole Westinghouse generator of 200 kw capacity. In the engine room there is also a Cochrane heater and Sorg purifier, rated at 1200 hp. In the basement below, and connected to the two large engines, is a 500-hp Dean condenser of the jet type. There are also two pumps, one operating the condensing system and the other the feed-water heater and purifier, and they are arranged to pump either way.

ELECTRICAL DISTRIBUTION

Of course the feeder system is at present on a temporary basis. The company is building sub-stations at Worthington, Stratford and Prospect, which eventually will be operated from the Marion power station through the 33,000-volt lines. Just now the entire line from Columbus to Delaware, including the



MOTORMAN'S CAB AND END CAR, SHOWING TURN-UP SIDE SEATS, LEAVING SPACE FOR BASKETS

Delaware city lines, is being operated by a single 500-hp unit. The sub-stations will be completed as soon as possible. The station at Stratford will be equipped with two 300-kw rotary converters, which will be run inverted and will furnish alternating current to the sub-stations at Worthington and Prospect, which in turn will feed their portions of the line each way, while the central section, including the Delaware city lines, will be fed directly from the power house. The high-tension line north runs entirely around Delaware.

Under the present arrangement there are three feeder panels on the switchboard. One panel feeds two 0000 trolley wires and one 0000 aluminum feeder south of Stratford; ultimately this will feed only half-way to Worthington, but at present it supplies clear to Columbus. The second panel feeds two 0000 trolley wires and one 0000 aluminum feeder from Stratford to the North Delaware line, including the city system. By means of pole switches in Delaware any line or any loop of the city lines can be cut out, should it be necessary at any time to turn the full pressure into the main line. The third feeder panel controls a No. 3 aluminum wire around Delaware, extending half-way to Prospect. Under the ultimate arrangement the Stratford water power will be utilized with a direct-connected generator to supply a battery of 264 cells to be installed in the present power house, and the present generating equipment will then be dismantled. The storage battery will feed in series

with the direct current side of the Stratford sub-station, and it will be of great advantage in handling heavy loads to and from Stratford Park or in event of heavy loads on the city lines.

CAR HOUSE AND REPAIR SHOPS

Adjoining the present power house the company is preparing to build a large car house and repair shop. The building will have stone walls with steel-trussed roof, and will be 127 ft. x 140 ft., with eight parallel tracks provided with pits and other necessary appliances. The company is now closing contracts for machine tools and other equipment necessary for handling all the repair work of the system.

ROLLING STOCK

At present the company has in regular operation six very



66-FT. EXCURSION CAR

fine passenger coaches; four were built by the G. C. Kuhlman Company, of Cleveland, and two by the Jewett Car Company at Newark. One of these Jewett cars was displayed at the Detroit convention last fall as the latest product of the Newark company's factory. The cars are of the same general pattern. They are 50 ft. over all, 38-ft. body, 8 ft. 6 ins. wide and 9 ft. high. They seat fifty-four passengers; sixteen in the smoking compartment. They have Hale & Kilburn walk-over seats finished in rattan in the smoker and plush in the passenger compartment; the Kuhlman's have green seats and the Jewett's blue plush. Toilet room and water cooler are located between the compartments. The cars are heated with Consolidated electric heaters. The interior finish is solid mahogany. Windows are the double Pullman type. They have Christensen air brakes equipped for multiple control. Mosher arc headlights,



INTERIOR EXCURSION CAR, SHOWING WIDE CROSS SEATS

Nichols-Lintern air sanders, high speed Providence fenders, and are equipped with the General Electric type-M train control system. The "dead man's" handle is fitted with a special shroud, so that it is impossible to plug the switch. They are mounted on Peckham M. C. B. No. 32 truck, which has a 7-ft. wheel base. The Kuhlman's have four Westinghouse No. 76 motors and the Jewett's four General Electric No. 73.

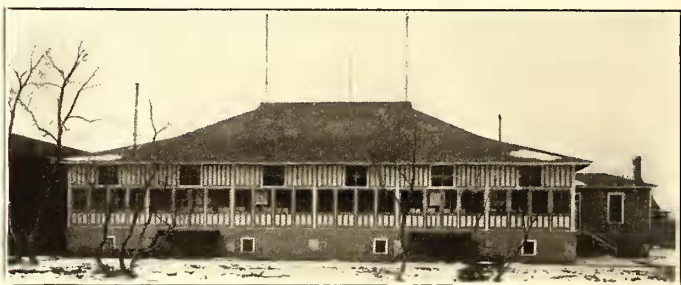
For the suburban service from Columbus to Worthington there are three 42-ft. Jewett cars with 32-ft. bodies. They have St. Louis M. C. B. trucks and are equipped with four 35-hp General Electric motors and K-12 controllers. For summer traffic and excursions they have just received from the Jewett shops two of the largest cars ever built for electric service. They seat eighty-four people, two in a seat. The end seats are placed lengthwise and can be raised when it is desired to carry picnic baskets. Interior finish is of oak and seats are all rattan. The windows drop level with the seats, making them practically summer cars. They are fitted with the same general equipment as the regular passenger cars. Interior and exterior views of these cars are presented herewith.

For freight service the company has provided two 55-ft. express cars, built by the Kuhlman Car Company. These cars are of unusual weight and are very strong. They have steel sides and are provided with two large doors on each side. The side sills are 8-in. channels running the whole length of the car. Bumpers are 3/4-in. x 12-in. steel plates. Cars have double floors and are open from end to end. They are to be heated with Smith hot-water heaters in order that they may handle perishable goods.

In its city service the company operates seven closed cars and six open cars. They are of the small single truck pattern, and have two Westinghouse 25-hp motors each.

FREIGHT AND EXPRESS

It is believed, and with good reason, that the package freight business will form a very heavy part of the gross receipts when the service is in full operation. There is a large amount of truck farming in the district between Delaware and Columbus, and the steam roads give very poor service. Deliveries are seldom made the same day, and in winter goods frequently freeze over night. This is the reason for the electric company heating its express cars. The company has a contract with the Delaware & Magnetic Springs Railway to run its freight car over to Magnetic Springs, where there is a famous spring of mineral water. Columbus is to be made the main distributing point for the water, and a carload per day is guaranteed the Columbus, Delaware & Marion. Freight is to be handled under the standard steam classification, but the rates are somewhat higher than ordinary steam freight. Milk is to be handled on a sliding scale as follows: One mile to 15 miles, 1.2 cents per



STRATFORD PARK PAVILION

gallon; 16 miles to 25 miles, 1.5 cents per gallon; 26 miles to 45 miles, 2.5 cents per gallon; 46 miles to 70 miles, 3 cents per gallon; cans returned free.

PARKS AND OTHER ATTRACTIONS

As a route for pleasure seekers the Columbus, Delaware & Marion will probably secure more of this class of business than any of the roads out of Columbus. Between Columbus and Delaware the line follows the Olentangy Valley, while between Prospect and Marion the road skirts the Scioto River, both affording much beautiful scenery. Aside from this the road is rich in pleasure resorts. At Olentangy Park, North Colum-

bus, a popular resort for Columbus people, the company has arranged to run a spur line into the grounds, and will force the Columbus Railway Company to divide the business to and from the resort.

At the north end of the Slate Hill trestle, which is illustrated herewith, the company has secured fifty-four acres, and is planning to make extensive improvements, with a view to making it a picnic ground for Columbus people. Shelter houses, platforms for games or dancing, swings, tables, benches, croquet grounds and other features will be installed. Not far from this park is a tract of 2000 acres which the government is seriously considering with a view to establishing a military post.

At Greenwood Lake, north of Delaware, the city line connects with Greenwood Park, a private enterprise. There are forty acres of wooded ground with shelter houses, stage, bowling alley and other attractions. This park is very popular with Delaware people.

Still another resort on this line is Gast Grove, near Prospect, which is a favorite camp meeting and picnic grounds for that section of the State. Heretofore the railroads have had heavy summer traffic to and from this point, but this spring the electric cars will run directly through the grounds.

The most popular resort on the road is Stratford Park, located near the power house, 3 miles south of Delaware. The company owns twenty-two acres on both sides of the river, and has erected the handsome pavilion herewith illustrated. It has a large dance floor, stage, dressing compartments, restaurant and other features. These are divided by glass partitions, and it may be closed and heated in winter. The pavilion is given free of charge, with heat and light, to parties guaranteeing a special car at \$35, or it is rented for \$10 an evening to Delaware parties who pay a 5-cent fare. The company has in-

stalled a number of steel boats, built by the Michigan Boat Company, and these are much in use. The picnic grove is located across the river, and this is reached by a ferryboat, which is operated by a cable and hand windless. A restaurant is conducted by a competent caterer, and arrangements may be made for anything from a simple luncheon to an elaborate dinner. If desired the company arranges to serve supper or refreshments on the car. The Olentangy River at this point is especially picturesque, and is rendered doubly interesting by the falls which are within a stone's throw of the pavilion, as will be seen in the accompanying illustration. The picnic



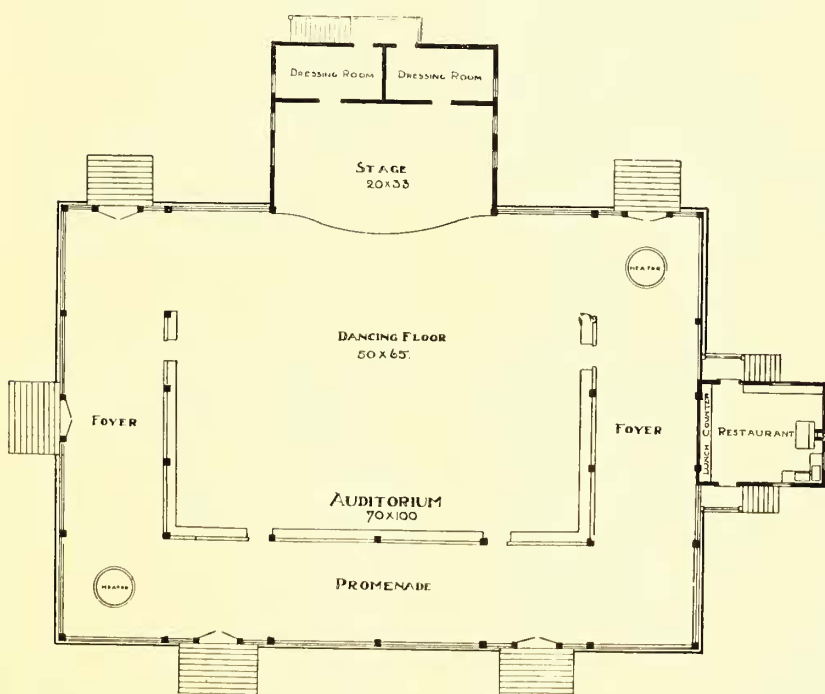
VIEW OF PAVILION AT OLENTANGY FALLS

grove is furnished with benches, tables, swings and other features which will add to the comfort of guests.

ORGANIZATION

The Columbus, Delaware & Marion Railway Company has a capital stock of \$1,500,000, of which \$500,000 is 6 per cent cumulative preferred and the balance common. There is an issue of \$1,000,000 5 per cent gold bonds covering the entire property.

The organization of the management has been completed in all departments. The officers are: John G. Webb, president; T. A. Simons, vice-president; J. M. Lorens, secretary; W. A. Black, treasurer; H. A. Fisher, general manager; Lee D. Fisher, chief engineer; G. G. Crane, master mechanic; E. W. Chandler, purchasing agent; A. L. Neereamer, general passenger and freight agent. Mr. Webb was one of the chief promoters of the Dayton, Springfield & Urbana Railway and of the Columbus, London & Springfield Railway. Mr. Fisher was also one of the chief promoters of the Columbus, London & Springfield Railway and the Central Market Street Railway, and for two years was general manager of the two lines mentioned. He sold out his interests in these roads to take up the Columbus, Delaware & Marion proposition. Lee D. Fisher was prominently identified with the building of all the lines mentioned here as well as the Columbus, Buckeye Lake & Newark road. He has entire charge of the engineering and construction work on the Columbus, Delaware & Marion. The writer is indebted to him for much of the information presented herewith.



PAVILION AT STRATFORD