BRIDGE OVER THE HUDSON RIVER AT ALBANY.

PLATES LXXXII. AND LXXXIII.

A FINE railway bridge recently erected across the Hudson River, at Albany, by Messrs. Clarke, Reeves, and Co., of the Phoenixville Iron Works, Philadelphia, is illustrated in Plates LXXXII. and LXXXIII. The bridge, which consists altogether of fifteen spans, and has a total length of 1740 ft., or nearly a third of a mile, was built under the following specification:

Specification.

1. The arrangement and lengths of the spans of the bridge to be as follows: Crossing Maiden-lane one of 63 ft. and one of 70 ft.; Quay-street of 110 ft. Then, beginning at the west shore of the Albany Basin, there are to be seven spans of 70 ft. each, crossing the said Albany Basin on a curve of about 720 ft. radius to the Albany Pier; thence crossing the main channel of the river on a straight line; two spans of 185 ft., a swing bridge 274 ft. long, and two spans 185 ft. each, arranged in the order in which they are named—the length of spans given being from centre to centre of piers; and all of the piers and abutments being parallel to each other, and at right angles to the straight portion of the bridge.

2. The superstructure to be entirely of wrought iron, except necessary bearing and joint blocks, which may be of cast iron, and to carry, at the bottom thereof, a double track railway, and also two side walks, each side walk being 6 ft. wide. The bridge to be built with two lines of main girders, 26 ft. apart in the clear on the straight portion of the bridge, and 27½ ft. apart in the clear on the curved part.

3. The several planes of the superstructure will be built in accordance with the general plans attached to and forming part of these specifications, and lettered and described as follows:
   A. Elevation of drawbridge, 274 ft. long.
   B. Elevation of the fixed spans, 185 ft. long.
   C. Elevation of basin spans, 73 ft. long.
   D. Plan of cross beams of floor.

4. The main girders of the bridge over the basin to be not more than 8 ft. in height, and those over the main channel not more than 25 ft. in height, outside measure. The depth of the floor must not exceed 2 ft. 10 in. from the under side of the track rail to the lowest points of the bridge.

5. Both the cross beams and stringers of the railway floor to be of iron, leaving nothing to be of wood, except the cross-ties, upon which the rails are to be laid. The side walks to be outside of the trusses, and supported by continuations of the cross beams of the railway floor.

6. The main girders of the bridge to be proportioned to carry a rolling load of 6000 lb. per lineal foot of bridge in addition to the weight of the superstructure, without subjecting the iron to a greater tensile strain than 10,000 lb. per square inch of parts in tension, and 9500 lb. compression per square inch sectional area of upper chords.

7. The floor system to be proportioned to carry any load that can be imposed upon any cross beam or stringer by passing locomotives with driving wheels carrying 6 tons each, and geared 7 ft. 9 in. apart between centres, without exceeding the limits of stress above specified for the main girders. Shearing strains upon joint pieces shall not exceed 7500 lb. per square inch.

8. Due provision to be made for the expansion and contraction of the main girders under changes of temperatures and the consequent tendency to movement upon the piers and abutments.

9. The swing bridge must be made easily adjustable, so that any deflection of the ends, from any cause, may be readily corrected.

10. The turn-table shall be constructed upon the most approved plan, and of the best material and workmanship, to be operated by a suitable steam-engine of ample power, with necessary machinery and gearing for operation of same, located on the top of the bridge over the turn-table, and properly housed from the weather, with storage room for fuel, &c.

11. The friction wheels or rollers, upon which the swing bridge is to revolve, shall be of an outside diameter of not less than 15 in., and of such number and width of face that, when the whole weight of the swing bridge is distributed uniformly upon them, each wheel will carry a load not exceeding 2500 lb. for each inch in width of face.

12. The circle of wheels shall be 30 ft. in diameter outside, and the turn-table so constructed that the weight of the bridge, when revolving, shall be uniformly distributed over all the wheels. The faces of the wheels to be accurately turned to exact uniformity of diameter,