4 in. between them. These girders are rivetted together back to back, over the cap of each column through the 10 in. plates forming the ends of the girders, by rivets spaced 4 in. apart. In this manner the girders are made continuous over five spans, but at each fifth column a space of 1 in. is left between the backs of the girders; they are, however, fastened together by four fishplates, each 12 in. long by 3 in. wide and 3 in. thick, and four bolts 1 in. diameter, passing through the angle irons and webs of the girders, where oval holes have been made to allow of expansion and contraction.

The riveting of the girders at the bearings over the columns and brackets, as well as at those points where the rolled joists rest, is all countersunk, and at the ends the girders are fastened to the columns, each by four bolts 3 in. diameter, and a heading of lead 3 in. thick is interposed between the surfaces in every case.

Transversely the structure is braced horizontally at three points in each bay, once over each pair of columns and twice in the span, the braces being 8 ft. 4 in. apart, and consisting of horizontal T-irons 6 in. by 3 in. by 3 in., fastened to the lower flanges of the main girders by three 3 in. rivets. Upon the longitudinal girders a series of timber joists are laid to carry the rails of the viaduct. There are six joists to each bay, the distance apart of each from centre to centre being 4 ft. 2 in. The joists themselves are 12 ft. 9 in. long, 8 in. deep, and 6 in. wide (Fig. 4), and are fastened at each end to the upper flanges of the main girders by two 3 in. diameter bolts. The ends of these joists are concealed by a cast-iron cornice 3 in. thick and 8 in. deep, bolted to the timbers, as shown in Fig. 4.

The longitudinal timbers which carry the rails are of Memel, 9 in. by 6 in., cut to 25 ft. lengths, and having a scarf joint, which is placed over the cap of each column. These sleepers are fastened to the transverse joints by 3 in. bolts, two at each point of crossing. An oak blocking course runs along the whole length of the viaduct at the ends of the joints, and between this and each longitudinal sleeper a close planking of 3 in. Memel is spiked. The space in the centre of the viaduct between the rails is left open, with the exception of a single plank 9 in. by 3 in., and square transoms 4 in. by 4 in. every 8 ft. 4 in., to which the former is spiked. At each transom there is a tie rod 3 in. diameter to maintain the gauge. The planking is cut in minimum lengths of 20 ft. 10 in., so that each length may cover five transverse joints, and the oak blocking course shown in the section is in 25 ft. lengths, moulded, and 12 in. deep, bolted to every joist by two 3 in. bolts, and scarfed over each column in the same manner as are the longitudinal sleepers.

The standards for the viaduct railing are of wrought iron, cruciform in section, and 2 1/2 in. by 2 1/2 in. by 3 in. thick, placed 8 ft. 4 in. apart from centre to centre, and fastened to the oak blocking course by four 3 in. wood screws. The top of each standard is formed with an eye, through which is passed a tube of wrought iron, 2 in. in diameter and 3 in. thick, which forms a hand-rail.

The double viaduct is precisely similar in the details of its construction to the single one just described, excepting that instead of two columns in the width, three are necessary, the girders, bracing, and joists being increased in proportion to the altered dimensions.