BRIDGE OVER THE REGENT'S CANAL.

Plate XL.

The Metropolitan and St. John's Wood Railway, the works of which were commenced in June, 1865, is, as we have stated on a previous page, constructed to be worked as a single line, provision being made to lay down a double line of rails as soon as an increased traffic renders the widening advisable. A portion of the railway lying between Victoria-road and the Finchley-road Station of the Midland Railway, the construction of which was sanctioned during the Parliamentary session of 1863, is now (April, 1872) in course of construction. The terminal station in Baker-street adjoins, and is in connexion with, the station of the Metropolitan Railway at that place, so that every facility for the exchange of trains is given to passengers. A junction, moreover, has been made between the two railways, but it is not now used for traffic.

The St. John's Wood Railway for the greater part of its length runs along the centres of the Park-road, the Wellington, and the Finchley-roads, so that very little private property has been interfered with by its construction, except in the neighbourhood of the Regent’s Canal at Marlborough-road and at Belize-road. For a distance of two miles a single tunnel, of the section shown in Fig. 8, Plate XL., has been built, but in some places a double line was constructed. On account of the change from double to single line several different types of construction were employed, these comprising, besides short lengths of open cuttings between retaining walls, arched tunnels of 25 ft. and 32 ft. span, various brick-arched and girder-covered bell-mouthed junctions, and some examples of shallow construction of road bridges, over the railway, as at South Bank, where the respective levels leave but little room between the rails and the roadway. At this place the roadway is carried on cast-iron plates of a section similar to Fig. 9, Plate XL. The total rise of the railway, from Baker-street to the summit near the Swiss Cottage Station, is 97 ft., making an average gradient of one in a hundred. The bridge shown in Plate XL carries the line over the Regent's Canal between North and South Bank, St. John's Wood. As it was necessary to cross under these two roads, and over the canal at a height above sufficient to leave a headway 10 ft. in the clear, between the under sides of the girders and the level of the water, steep approaching gradients and extremely shallow construction became unavoidable. The bridge, which is horizontal, has a span of 80 ft. on the square, and 84 ft. on the skew, the length of girders over all being 94 ft. 8 in. There are three main girders of the form shown in Figs. 1, 2, and 3, and in the sections, Figs. 4 and 5. They are placed 17 ft. 3 in. apart between centres, and have a depth of 8 ft. in the middle, reduced to the ends to 6 ft. by curving the top flange. The centre girder, sections of which are shown in Figs. 4 and 5, has an upper flange 2 ft. 9 in. wide and 1½ in. thick in the strongest part; the flanges are, moreover, stiffened at the edge by angle-irons, 5 in. by 4 in. by ½ in., as shown. The web-plates, which are ½ in. and ¾ in. thick, are stiffened every 6 ft. by angle-irons and web-plates, as shown, and gussets (Fig. 5) are placed at intervals at the foot of the stiffeners, and connected to the shallow longitudinal girders that run for the whole length of the bridge on the top of the cross girders. The angle-irons at each stiffener are also turned round and riveted to the same longitudinal girders, as shown, Fig. 5. The main girders rest upon cast-iron bedplates formed of two pieces, the upper of which is bolted with countersunk bolts to the bottom flange of the girder, and is left free to slide on the lower half of the bedplate, which is bolted through a wall timber into the brickwork with bolts 1½ in. in diameter.

The small longitudinal girders (Figs. 2, 3, and 5), are 1 ft. 3 in. deep, made with web-plates ¾ in. thick, and angle-irons 2¼ in. by 2½ in. by ½ in. They are placed 3 ft. 6 in. from the main girders, and serve to distribute a passing load over two or more of the cross-girders to which they are rivetted.

The section of the cross-girders is shown in Fig. 6. They are 8½ in. wide and 8 in. deep in the centre, diminishing to 6½ in. at their junction with the main girders, to which they are rivetted. The top and bottom flange-plates, together with the web, are ½ in. thick, and the rest of the section is made up with angle-irons 4 in. by 2½ in. by ½ in. The cross-girders are placed 3 ft. apart from centre to centre, and the longitudinal sleepers carrying the rails (which are made of a special section, reduced in height) are laid in short lengths between them, and kept in place by hardwood wedges. The level of the sleepers is half an inch higher than the top flanges of the cross-girders, and a wood packing is in-