cover the whole width of the double tube. The cover plates at the joints are double, being placed inside and outside the plates. They are alternately flat strips 5 in. wide by \(\frac{1}{2}\) in. thick, and T-irons 5 in. by 2\(\frac{1}{2}\) in. by \(\frac{1}{4}\) in. The angle irons at the corners of the tubes are 2\(\frac{1}{2}\) in. by 2\(\frac{1}{2}\) in. by \(\frac{1}{2}\) in., in 10 ft. lengths, with 2 ft. covers at the joints. The ends of the tube are finished with inside rings of plate 2\(\frac{1}{2}\) in. wide by \(\frac{3}{4}\) in. thick, riveted through to outside rings of angle iron 4 in. by 2\(\frac{1}{2}\) in. by \(\frac{1}{2}\) in., and by these angle iron flanges, which are perforated with holes 9 in. apart, the junction between the tube and the tapered casting is made.

It will be seen in Fig. 3 that two of the cast-iron girders and the brick arches turned between them, which form the superstructure of the North London Railway bridge where this crossing occurs, have been removed to make room for the tube, and that the latter is well covered over by concrete set in Portland cement, which extends as far as the adjacent cast-iron girders on each side of the tube.

Figs. 7, 8, and 9 show the details of the tubular box and castings for the main crossing the Britannia Bridge, over the Limehouse Cut, in the Commercial-road East. The gas main is carried over the bridge by a wrought-iron tubular box 45 ft. long, 6 ft. 3 in. wide, 2 ft. 3 in. deep in the centre, and 2 ft. \(\frac{1}{2}\) in. at the sides. The tube is laid on the north side of the bridge, and it is carried by an arched trough of cast-iron (Fig. 8) 21 ft. 8 in. span, and curved to conform with the shape of the bridge, of which the brickwork is cut away for that length, and of a breadth sufficient to admit the cast trough, which is 7 ft. 6 in. wide. The depth of the ribs of this trough is 2 ft. 4 in., corresponding to the thickness of the arch of the bridge, and it is laid at the same skew as the arch. This casting is made in six parts, bolted together through longitudinal flanges in the centre beneath the wrought-iron tubes by 1\(\frac{1}{2}\) in. bolts. By two transverse flanges the castings are also connected lengthwise, as seen in the sections.

The wrought-iron tube is made of \(\frac{3}{4}\) in. plates throughout, and is of similar construction to the one just described as crossing the North London Railway, except that a greater depth being available in this place, it was unnecessary to divide the tube into two compartments. The plates forming the top and bottom are 6 ft. 9 in. wide and 3 ft. long, and the joints are strengthened by flat cover plates 5 in. by \(\frac{3}{4}\) in. on the inside, and on the outside by T-irons 5 in. by 2\(\frac{1}{2}\) in. by \(\frac{1}{4}\) in. The junctions between the sides and the top and bottom of the tube are formed with L-irons of the same section as those for the North London Railway crossing, and the flanges at the ends by which the tube is secured to the special casting connected with the 45 in. main are made of angle irons 4 in. by 2\(\frac{1}{2}\) in. by \(\frac{1}{2}\) in. Fig. 8 shows an enlarged cross section of the tube, and in that figure, as well as in Fig. 7, it will be seen that the tube is surrounded with Portland cement concrete, with which the arched cast-iron trough is also filled.

Fig. 9 shows an elevation of the special casting by which the wrought-iron tube is connected to the circular main. It is of the same nature as that previously described, and illustrated in Fig. 6, but differs from it in that the rectangular face is smaller on account of the altered form of the tube. It is, moreover, only 4 ft. in length, and is made in one casting, instead of being in two pieces and bolted together. A short length of 48 in. pipe, with a reverse curve in it, connects the tapering casting with the ordinary 4 ft. main.

Fig. 10 is a longitudinal section of a similar construction, and shows the tube crossing the bridge over the Regent’s Canal in the Commercial-road East. This, like that illustrated in Figs. 6 and 9, is supported by a cast-iron curved trough, shorter, however, it being only 12 ft. 9 in. long. Two such castings are used in this crossing, as the bridge over the canal has a double arch.

The total length of the wrought-iron tube is 51 ft. over all; it is of the same area as the Limehouse Cut tube, and of a precisely similar construction, the thickness of and size of plates and L-irons being the same in each case. At the ends, special castings of the same form as used elsewhere, and curved 48 in. pipes form the connexion with the 4 ft. main.

Fig. 11 is a section of another form of tube laid down between the girders of the Vine-street bridge over the Metropolitan Railway at Clerkenwell. This bridge, originally in one span of 49 ft. 9 in., was afterwards widened by another of 67 ft. 9 in. It is a structure carried upon four wrought-iron girders, which support transverse cast girders, the intervals between which are filled with flat brick arches carrying the street, the level of rails being about 17 ft. below the underside of the wrought-iron girders. The gas tube, which is placed midway between two of these girders, extends from one abutment to the other of the Vine-street bridge, resting on the central pier. Its position is indicated in Fig. 11, which shows a part of the bridge, and the relative positions of the gas tube and adjacent girders. The total