&c., and connected by pins or bars, of a length equal to $ab$ Fig. 13, Pl. 1. The cross section of these chains should contain about 6 square inches to each truss, for a 72 feet common road bridge of 16 feet width of way.

In fig. 14, Pl. 2, $A$ represents a top, and $B$ a side view of the chain, and its connection with the foot of the arch piece above described. The end links are twisted $90^\circ$, so as to have one end open horizontally to receive the arch piece, and the other vertically to receive the transverse pin, $C$ is a side view, and $D$ a cross section near the middle of the transverse pin, shewing the manner in which the vertical and diagonal parts connect with said pin.

This pin may be formed in this manner. Take a bar or plate of wrought iron, 6 to 7 inches wide, and $\frac{3}{8}$ to $\frac{3}{4}$ thick, of a length about 2 inches shorter than the pin is to be. Let this be rolled or swedged into the form of a trough, whose cross-section is shaped as seen at $E$. Then take a bar of the same or a little greater length, about 4 inches wide in the middle, and tapering towards the ends; the section in the middle having a trapezoidal form as at $F$. Let this be bent in the form seen at $G$, and placed in the trough formed as above, with its convexity upward, and the ends welded and swedged to a cylindrical form, (about $2\frac{1}{2}$ inches diameter,) to receive, or pass through the links of the chain. It will readily be seen at $C$ and $D$, how the lower or troughed portion is punched for the reception of the diagonals, which cross one another, and are secured by nuts below, and how the upper part is pierced, and tapped for the vertical to screw into. This should be done before welding. The ends of the pin are slightly headed in the direction of the length of the chain, to keep the links from slipping off.

LIII. The vertical is a round bar of wrought iron of about $1\frac{3}{8}$ inches in diameter, as I have used them in bridges of from 70 to 80 feet span, the lower end screwed into the transverse pin as just above described, and the upper end having a thread cut for 9 or 10 inches, with two-