bearing points, to avoid the disadvantage of too long cylinders in the top rib, and long verticals.

LX. From 70 or 80, to 160 feet stretches, should be made with double cancels, or two crossings of diagonals, as seen in Fig. 23, Pl. 4. The formation and connection of the parts in this case are precisely as in the above, except as follows: 1st. The end cylinders $cb$ and $cd$ incline at $60^\circ$ instead of $45^\circ$ with the horizon, and must be beveled accordingly. Also, these parts having greater length, will usually require to be cast in 2 pieces, and will require the tie and brace $ef$, as well as lateral stiffening, which may be done as hereafter described for stiffening the verticals. Or, when the track is on the top, by a transverse bar at $e$, and diagonals (Fig. 23, Pl. 4,) from one truss to the other, which will also afford lateral support for the ends of the trusses. If the track be at the bottom, as from $a$ to $d$, such an arrangement would interfere with the passage of the trains, and lateral support must be provided at the ends by braces or guys ($gg$, Fig. 23,) that may not produce such interference. With the track at bottom also, the end-most verticals will act by tension only, and such materials and connections should be provided as will afford the necessary resistance.

With the track on the top, the end-most verticals are useless and unnecessary, if other means than the brace $ef$ (Fig. 22) be used to stiffen $ab$, and the two diagonals at each end represented by dotted lines, are unnecessary to the strength of the structure in all cases, unless for very short spans. It is not to be expected however, that the proportions of a bridge on this plan will be assumed without such an analysis as to determine the amount and kind of force each part must sustain, which done, it will readily be seen what parts are necessary, and what proportions should be given them.

Another modification which the double cancelled truss requires is, an opening in the middle of the vertical, for