employed; then, by following the horizontal line which contains this stress, either to right or left, will be found the size of the counters or counter required.

As previously mentioned, the sections required for, and the sizes of, the hip verticals, can be found without calculation from one of Tables VI., VII., or VIII. Should the joists and flooring be of oak instead of pine, the section required for, and the size of, hip verticals, can still be found from the table by supposing an increase of one foot in the panel length.

The sizes of the lateral and vibration rods can be found from Table IX. by looking in the column headed "Working-Stress = 7.5 tons per square inch," in the same manner as explained for counters. If the panel length correspond with the one given in Table IV., or if it do not differ greatly therefrom, there need be no calculations made for stresses in the lateral systems and sway bracing; for the dimensions of all the struts and rods for these systems are given in Table XXV. In that table the dimensions in the column marked "Pan. 1" are the sections respectively of the upper portal struts, the portal vibration rods (if any), the lower portal struts (if any), and the end lower lateral rods. Those in the other columns are the sections respectively of the upper lateral struts, the upper lateral rods, the post vibration rods (if any), the intermediate struts (if any), and the lower lateral rods. The portal struts are thus assumed to belong to the first panel; the first upper lateral strut, with its sway bracing, to the second panel, etc.; so that, when the bridge has an odd number of panels, there is no lateral strut or vertical sway bracing given for the middle panel. The forty-foot, fifty-foot, and sixty-foot spans, being pony trusses, have only lower lateral rods. Spans above one hundred and fifty feet in length have vertical sway bracing.

If the counter stresses be large, it is preferable to use double counters: sometimes both single and double counters are employed in the same truss. Where there is an odd number of panels, the centre diagonals should be made double and adjustable. The number of main diagonals per panel is generally two; but, if the sections become so great as to necessitate excessively large chord pins, it is better to employ four; placing two inside,