number to the right, in the first of the three columns, is the intensity of working-stress to be used. The three columns are for the three cases, — both ends fixed, one end fixed and one end hinged, and both ends hinged, marked ▣▣, ▣◎, and ◎◎ respectively. The tables were calculated by the formula of C. Shaler Smith, C.E.; to whom the author is indebted for its use, and for other valuable information in connection with bridge work. Then, to find the area of the top chord or batter brace, divide the stress given on the diagram by the intensity of working-stress taken from the table; from the quotient subtract the area of the top plate, and divide the remainder by two: the final quotient will be the area of each channel. This calculation should be made with both the stress in the panel nearest the middle of the span and that in the end one, or, in long spans, that in the one next to the end. If, then, with the depth of channel assumed, it be found that there is, in the table of channel sections employed, a light channel that will not be much too heavy for the end, and a heavier one suitable for the middle of the chord, all right: if not, another trial must be made, with a channel of a different depth. The greater the depth of channel, the less the ratio of length of strut to diameter, and consequently the greater the intensity of working-stress, and the less the sectional area required: so, generally speaking, it is well to use the lightest and deepest channels possible, unless the saving in section be small, when it will be more economical, for other reasons, to use the next smaller depth. These reasons will be given in Chapter XV. The dimensions of the channels and plate should be written on the diagram of stresses as shown on Plate V.

The sizes of the post channels are to be found in a similar manner to the one just described, with these two exceptions, — that the column for two hinged ends is to be used, and that there is no plate. Some engineers prefer fixing the upper ends of the posts by attaching them, through the medium of plates, to the chord, thus saving a little in the section; but, as will be seen farther on, there is no true economy in so doing.

In high double-intersection bridges, where the diagonals are