as to reduce the bending-moments; and that the diagonal ties be placed close to the posts, and the beam hangers close to the ties. Especial care is needed at the panel point where the number of chord bars is different in the consecutive panels. It is possible to arrange the bars there, so that there will be an extremely large moment produced, or so that it will be smaller than at any other panel point of the bottom chord. The neglect of any of these precautions will cause an undue bending-moment on the pin.

The arrangement completed, the next questions to be decided are, first, under what condition for loading will each pin take its greatest bending-moment, and, second, at what point on the pin will this be found. In large bridges, and in many well-proportioned small ones, the bottom chord pins are subjected to their greatest bending-moments when the bridge is fully loaded. Under this condition, the stresses in the chord bars can be taken from the diagram of stresses; but those in the main diagonals must be calculated for the load covering the whole bridge, and their horizontal and vertical components be ascertained.

After having had some practice, one will very often be able by simple inspection to decide at what place the greatest moment of flexure will exist; but, if not, it will be necessary to calculate the values of both horizontal and vertical moments at different points, and find where their combined result is a maximum. As Professor Burr shows, the actual moment is represented by the diagonal of a rectangle whose sides represent the vertical and horizontal moments. It is usually more convenient to square the component moments, add the results, and extract the square root of the sum, than to make out a diagram.

The moments of the stresses can be easily recorded by drawing two curved lines, as shown in the accompanying diagram, representing the directions in which the stresses tend to bend the pin, and writing each moment as calculated under one or other of them, according to whether it would produce positive or negative rotation. The difference between the sums of each column will give the actual