square timber required for a stress \( F_1 \) and length \( d_1 \) sec \( \theta \), that for a stress \( F_2 \) and length \( d_2 \) sec \( \theta \), etc., then take the greatest of these sizes.

The vertical posts should be strong enough to withstand a working-stress given by the equation,

\[
S = \frac{W_2}{2} + \frac{W_2}{2} \left( d_1 + d_2 + \&c. + d_{n-1} + \frac{d_n}{2} \right),
\]

where \( n \) is the number of the tier considered, and \( S \) the stress in the corresponding vertical post.

One dimension of the vertical posts should be the same as the side of the square which is the section of the inclined posts; so that the diagonal braces may be flush with the entire faces of the bents, and be bolted to the verticals without the intervention of filling-pieces.

These equations seem very long, and no doubt many practical bridge foremen would look upon them with disdain: nevertheless, if the falsework is to be designed by any other method than that of guessing, this is the way in which it should be done. The more elevated the bridge, the more important does it become to properly proportion the falsework. The values of \( W_2 \) and \( A' \) will have to be assumed, or roughly calculated, before applying the equations. The other quantities are, or should be, known. The value of \( \rho \) may be taken from ten to fifteen pounds per square foot, unless the situation be more than ordinarily exposed, when it may be taken at twenty pounds. Bridge companies can afford to risk the chance of a hurricane striking the bridge before it is swung.

The sections of the caps are generally made the same as those of the inclined posts. The caps should be dapped to receive both upper and lower ends of vertical and inclined posts. The vertical posts should be drift-bolted through the caps, the bolt being long enough to project five or six inches into each post; and the inclined posts should be held in place by wooden splice pieces, one on each side of the bent, projecting above and below the cap, and fastened at each end by a bolt passing through the two splice pieces and the post. This attachment may be used for the vertical posts instead of the