general, let the stiffness of the lower be to that of the upper as $n : 1$.

Also let w = weight at B, d = the deflection that it would produce in the distance $A\ c$, e = the compression of the post by the same weight, x = the actual deflection in the upper beam. Then $d : x :: w : \frac{w}{d}\ x$ = weight sustained by upper beam, and $w - \frac{w}{d}\ x = w\ (1 - \frac{x}{d})$ = portion of weight transmitted to lower beam.

The deflection of the lower beam by the weight w is $n\ d$, hence the actual deflection will be determined by the proportion $w : n\ d :: w\ (1 - \frac{x}{d}) : n\ d\ (1 - \frac{x}{d}) = n\ d - n\ x = n\ (d - x)$.

The difference between the deflections of the beams must give the compression of the post, which is accordingly equal to $x - n\ (d - x) = (n + 1)\ x - n\ d$. But the compression of the post as determined from the pressure will be $w : e :: w\ (1 - \frac{x}{d}) : e\ (1 - \frac{x}{d})$, equating these results we have $e - \frac{e\ x}{d} = (n + 1)\ x - n\ d$, whence $x = \frac{d\ (n\ d + e)}{(n + 1)\ d + e}$. This value substituted in the expressions $\frac{w}{d}\ x$ and $w\ (1 - \frac{x}{d})$ will give the portions of the weight sustained by the upper and lower beams, and by the post.

From the above we learn that when the beams are equal, the pressure upon the post is always less than $\frac{1}{2}\ W$.

For in this case $n = 1$ and $x = \frac{e\ d + d^2}{2\ d + e}$ when $e = o$ or the post is incompressible, we have $x = \frac{d^2}{2\ d} = \frac{d}{2}$, and each beam bears half the weight, consequently the strain upon the post, which is always equal to that upon the lower beam, will be $\frac{1}{2}\ W$. If e be not o the value of x will be greater than $\frac{d}{2}$, and consequently the post will transmit to the lower beam less than $\frac{w}{2}$.