sum of these weights must be equal to \( w \). We therefore have

\[
\frac{w x}{d} + \frac{w x}{e} = w \text{ or } (e + d) x = c d, x = \frac{e d}{e + d}
\]

Substituting this value we find

For the pressure upon \( A \) and \( B = \frac{w x}{2d} = \frac{w e}{2(l + d)} \)

For the pressure upon \( C = \frac{w x}{e} = \frac{w d}{l + d} \)

If the ends of the posts instead of resting against solid points of support, be placed upon a second beam, the circumstances of the case will be very different.

**Fig. 42.**

Let \( A \), \( C \) and \( D \), \( F \) be two equal beams connected by an upright in the centre and loaded with a weight at \( B \).

If we suppose \( B \), \( E \) to be perfectly incompressible, then in case of flexure \( a c \) and \( D \), \( F \) would retain their parallel positions, and each would assist equally in sustaining the load, the post would then be pressed upwards against the point \( B \) with a force equal to the reaction of the lower beam or equal to \( \frac{w}{2} \).

But if the post be elastic it will be compressed to some extent by the action of \( \frac{w}{2} \), and as a consequence, \( D \), \( F \) would rise, and the deflection becoming less it would sustain less of the weight. \( A \), \( C \) must then sink lower to compensate for this diminished strain on the lower beam, and in proportion to the elasticity of \( B \), \( e \) will be the difference of the strains upon \( A \), \( c \) and \( D \), \( F \).

To determine the strains and deflections of the beams and the degree of compression of the posts by calculation. Let the beams be supposed of any relative size, and to make the case