whether $gh$ sustains more than $3\frac{3}{2}w''$, so as to reduce the horizontal thrust of $lk$ below that of $\bar{y}$.

With the truss fully loaded except at the point $f$, $\bar{y}$ sustains vertically, $16w''$, whence $jk$, having the same horizontal thrust exerts a depressive force $= \frac{3}{2}16w'' = 10\frac{3}{2}w''$, at $j$, leaving a balance of $5\frac{1}{2}w''$, exerted by $\bar{y}$ toward lifting the $7w''$ at $g$. Hence, only $1\frac{1}{2}w''$ remains as the weight sustained by $gh$. Therefore, the horizontal pull of $ek$, is not less than that of $gh$, the horizontal thrust of $lk$, is not less than that of $\bar{y}$, and its lifting power, not less than $5\frac{1}{2}w''$, and $ek$ does not lift more than $3\frac{3}{2}w''$, nor as much as when $f$ and $g$ are without load, as determined by the process above explained.

XXXI. To determine the greatest stress to which $dl$ is liable, let the weights at $e$, $f$ and $g$ be removed. Then the pressure at $i$, due to the weights at $b$, $c$ and $d$, equals $6w''$, that is, $1w''$ for weight at $b$, $2w''$ for that at $c$, and $3w''$ for that at $d$. We therefore take $jq''$ on $\bar{y}$ produced, to represent the thrust of $\bar{y}$, produced by $6w''$—draw $q'r''$ parallel with $ji$, and from $q''r''$ find $ft''$ (of course less than $ft'$), and having taken $kv'$ on $jk$ produced, equal to $jv''$, raise the perpendicular $vx' = ft''$, and draw $x'y'$ parallel with $ek$. Then, $x'y'$ represents the tension of $ek$, from which we find $ea''$, representing the vertical thrust of $el$ at its maximum. Also $ky'$ represents the thrust of $kl$; and, having taken $ld'$ on $kl$ produced, equal to $ky'$, raise the vertical $de'$, equal to $ea''$ from $e'$, draw $ef''$, parallel with $dl$, and meeting $lm$ (produced, if necessary), in $f'$, and $ef''$ represents the tension of $dl$.

We have a short way of verifying the correctness or otherwise of the last result, since we know that, in the state of the load here assumed, $6w''$, is transferred from