transferred by \( lk \) and \( ek \) together. But the lifting power of \( lk \) is further increased by \( \frac{1}{3} \) of the weight sustained by \( fj \), which increases the horizontal thrust of \( lk \), the same as a like amount sustained by \( ij \); also, by \( \frac{1}{4} \) the weight sustained by \( ek \); this member having 5 times the vertical reach of \( lk \). Now, as each one of these items results from the weight transferred through \( lk \) and \( ek \), and is greater or less in proportion as the last named weight is greater or less (\( f \) and \( g \) being unloaded), since all the conditions are the same, except as to amount of weight, it must follow that the greatest stress of \( ek \), is when \( f \) and \( g \) are unloaded, and all the other points \( b, c, \&c., \) are fully loaded — unless it be when \( f \) and \( g \), or one of them, be wholly or partially loaded. But any weight at \( f \), increases the thrust and lifting power of \( lk \), through increased action of \( ij \) and \( fj \) both, while it diminishes the amount sustained by \( ek \) and \( lk \), whence the action of \( ek \), is diminished, inasmuch as it transfers to \( k \), a less proportion of a less weight.

Again, weight applied at \( g \), while \( f \) is unloaded, relieves the tension of \( fj \), and diminishes its lifting power represented by \( fi' \) and \( rx \), and if of sufficient amount, relaxes \( fj \), and brings tension upon \( gk \); so that, when the weight at \( g \) equals \( w \), or \( 7w'' \), \( lk \) has a lifting power \( = \frac{1}{3} \) pressure at \( i \), less what is due to the horizontal pull of \( gk \), plus, amount due to horizontal pull of \( ek \); while the weight bearing at \( k \), equals \( 9w'' \) (being weight at \( e (= 7w'') + 2w'' \) through \( dl \)). Now if \( ek \) lifts as much as \( ky \), \( lk \) must have as great a horizontal thrust as \( ij \), and be capable of lifting \( \frac{1}{3} 16w'' \) (= weight bearing at \( i \), \( = 5\frac{1}{2}w'' \); which taken from \( 9w'' \) bearing at \( k \), leaves \( 3\frac{1}{2}w'' \) sustained by \( ek \). Then it remains to be seen