figure 1 under $f$ in the bottom series,) under a full load of the truss.

Now, this condition as to weights borne by $fp$ & $fl$, obviously has place when only alternate nodes, beginning at $b$, are loaded. For, $2w \div 9$ must be transferred through $fp$ from the right of the centre to the left hand abutment; from the statical necessities of the case. But with the other nodes loaded, $em$ becomes liable to the same stress, or tendency thereto, as $fp$; and these two diagonals being partially antagonistic, the weights acting, or tending to act upon them, may or may not, wholly or partially neutralize one-another, and leave the two diagonals inactive, when the truss is fully and uniformly loaded. At least, no reasons have hitherto occurred to me, sufficient to prove either hypothesis impossible, and if such reasons exist in the case, I must leave it for more acute investigators to point them out. Until that shall be done, I must adhere to the recommendation, that both contingencies be provided for, in proportioning trusses of this class.

To pursue the subject a little farther — no diagonal is required in the place of $bp$, all tendency to action in that place, being over-balanced by effects of weight of structure upon $dr$. The tendency upon $co$ is equal to $2w \div 9 - w'$, upon the theory of no decussation, or of non-action of $em$ & $fp$ from weight of structure; and $2w \div 9 - 7w' \div 9$, upon the other theory. The latter and greater weight should be u-