Draw $P\,N$, $P\,M$ perpendicular to Ox, Oy, respectively, and denote $P\,M$ by x, $F\,N$ by y.

Suppose the plane of the figure to be horizontal; then Ox is a line perpendicular to the direction of the weights, and therefore (§ 36) the moment about Ox of the whole weight collected at the centre of gravity is equal to the algebraic sum of the separate moments about it. Hence if W be the whole weight, and the distance of the centre of gravity from Ox be denoted by $\overline{y}$, we have

$$W.\overline{y} = \Sigma\,(w.\,y)$$

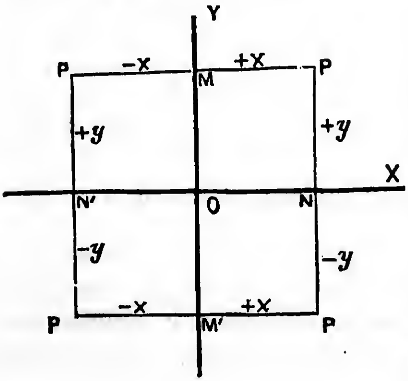
and
$$\overline{y} = \frac{\Sigma\,(w.\,y)}{W}$$

where Σ denotes the algebraic sum of all the products corresponding to that within the bracket. Also, if a moment be reckoned positive when P is above the line Ox, it will plainly be negative when P is below the line, and the difference in sign of the moments will therefore at once be indicated by considering a y positive when drawn upwards from Ox, and negative when downwards.

Similarly, by taking moments round Oy, if $\overline{x}$ be the distance of the centre of gravity from Oy, we have

$$\overline{x} = \frac{\Sigma\,(w.\,x)}{W}$$

where x will be considered positive when drawn to the right of Oy, negative when to the left.



The distances of the centre of gravity from these two lines being thus found, and the directions in which these distances are drawn being indicated by the signs with which they are affected, the position of the centre of gravity is fully determined.