point of connection of the weight with the fly wheel, G the centre of gravity of the weight H, and K the points of connection of the spring to the weight and wheel respectively, and F is the force in the spring. The letters indicate the following $a = AB$, $r = AG$, $b = BG$, d_1 is the shortest distance from B to AG, and d_2 is the shortest distance from B to HK, the direction of the force F.

Now let w be the weight of each revolving mass and F the force produced by one spring, then we have at once $C = \frac{w}{g} r\omega^2 = mr\omega^2$ where $m = \frac{w}{g}$ and the moment of C about the pivot B is $M = mr\omega^2 d_1$ and if we let x represent the shortest distance from G to AB it is at once evident from similar triangles that $r d_1 = a x$ and hence that $M = mr\omega^2 d_1 = m\omega^2 a x$. From this it will be seen that M depends entirely on ω and x, and if we choose M and x as axes of co-ordinates, we may plot upon the sheet curves similar to the C curves already taken up. If ω is constant or the governor is isochronous then, evidently M varies directly with x only and the "M" curve will be a straight line passing through O and we have again the case of neutral equilibrium. From what has already been said, it will be evident that if the M curve is steeper than the line from any point on it to O, the arrangement is stable, and on the other hand if the curve is less steep the arrangement will be unstable, the stable condition again corresponding to greater variations in speed than the unstable case, exactly as in the case of the fly ball governor already discussed. Thus the M curve is the characteristic curve for this type of governor.

Now through K draw a line perpendicular to AB, cutting the latter line at distance e from the pin B. Let C_2 be the resolved part of F such that the moment of the spring about $B = C_2 e = F d_2$ and then we have $M = m\omega^2 a x = C_2 e$ provided we neglect the effect of the valve gear. Thus $C_2 = m\omega^2 x \frac{a}{e} = const \times m\omega^2 x$, or the C_2 curve may also be drawn on the same axes as before, and this curve shows the effect of the spring. From the curve thus drawn the spring pull F may be found and the spring designed to suit the given conditions.

If, in addition to the two curves already described, a C curve on an r base be drawn the power of the governor may be obtained by integrating the quantity $C \cdot dr$ between r_1 and r_2.

While the investigations already made enable one to determine the conditions of equilibrium of the parts, they give no information as to the rapidity of the adjustment to new conditions of load, and this point will now be discussed. So far we have only been dealing with the centrifrugal force on the balls, *i.e.*, the force due to the acceleration of the weights along a radius, and this force acts continuously during the running of the governor. When, however, the speed of the wheel is changing during the adjustment for new load, we must accelerate the wheel as well as all masses connected with it, each mass having an angular acceleration $\alpha = \frac{\delta\omega}{\delta t}$ where