If $B\,L$ or $B\,R$, according to the direction of motion, represents the force P, and $B\,A_1$ the force $d\,F$, then $B\,L_1$ or $B\,R_1$ is the resultant of these forces, and the tangent of the angle $A_1\,B\,L_1$, or $A_1\,B\,R_1$, which angle we designate by α, is

$$\text{tangent } \alpha = \frac{P}{d\,F},$$

or, substituting above values,

$$\text{tangent } \alpha = \frac{1}{4\,\pi\,T\,d\,t}.$$

We see from this that the effect of inertia to increase or decrease (according to the direction of motion) the moment of

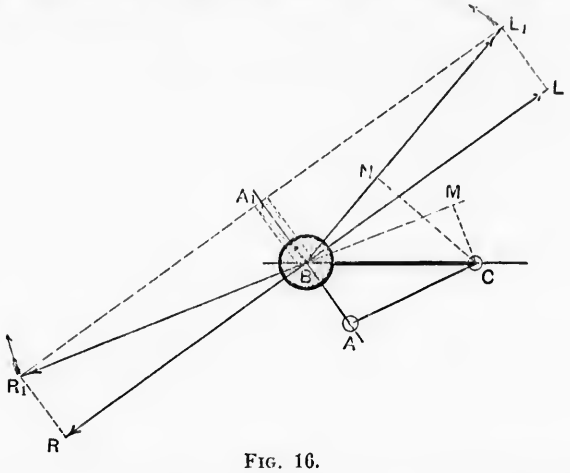

FIG. 16.

force about the weight pivot is less the greater the number of revolutions per unit of time, and is greater the less the interval of time in which the change of speed takes place.

Let us assume that the weight B is no longer concentrated in a point, but is spread out into a disk of considerable size, as in Fig. 16, whose radius we call r; then the force of inertia relative to the axis A is greater than before.

By a well-known law of inertia, the radius of gyration of the weight is $R + \frac{r}{\sqrt{2}}$, therefore the force of inertia acting at B is

$$P = \frac{\left(R + \frac{r}{\sqrt{2}}\right)^2}{R} M \frac{d\,\omega}{d\,t}.$$