COR. 2. Resolving the forces horizontally we have

$$P \cos (\theta + a) - R \sin a = 0.$$

Also resolving them perpendicularly to the direction of P,

$$W \cos (\theta + a) - R \cos \theta = 0,$$

These two equations give R in terms of P or W.

Or these relations might at once have been asserted from the "triangle of forces" (§ 29): for this gives

$$\frac{P}{\sin a} = \frac{W}{\cos a} = \frac{R}{\cos (\theta + a)}$$

Although these results have been obtained only for a particle, they are true for a body of finite size supported on the plane by a power whose direction passes through its centre of gravity.

72. In the case where the power is acting parallel to the plane, as where it is exerted by a string, parallel to the plane, passing over a pully and supporting a weight P hanging freely, we have from the above by putting $\theta = 0$, or at once by resolving the forces along AB, observing that P is the tension of the string, Power acting parallel to plane. Stevinus.

$$P - W \sin a = 0$$

and the mechanical advantage $\frac{W}{P} = \frac{1}{\sin a}$, and is the cosecant of the inclination.

If BC (vertical) be called the *height* of the plane, AB its length: then, since $\sin a = \frac{BC}{AB}$, we have

$$P - W \frac{BC}{AB} = 0$$

$$\text{or} \qquad \frac{P}{W} = \frac{\text{height}}{\text{length}}$$