Again, resolving forces perpendicularly to the plane, we have

$$R - W\cos\alpha = 0$$

$$\text{or} \qquad R = W\cos\alpha = W\frac{AC}{AB}$$

$$\text{and} \qquad \frac{R}{W} = \frac{\text{base}}{\text{length}}$$

Hence the power, weight and pressure on the plane are proportional to the height, length and base of the plane.

Cor. This latter result is at once seen from the "triangle of forces;" for, drawing CN perpendicular to AB, the sides of the triangle BCN, taken in order, are parallel to the directions of the forces, and therefore represent them in magnitude; and the triangle ABC is similar to BCN.

Screw.

73. *The Screw.*

Fig. 14.

The Screw is a circular cylinder, on the surface of which runs a protuberant spiral thread, whose inclination to the axis of the cylinder is everywhere the same. This thread works freely in a fixed block, wherein has been cut a corresponding groove. The power is applied perpendicularly to a rigid arm which passes perpendicularly through the axis of the cylinder and is rigidly attached to it, and the weight is supported on the cylinder (whose axis is here supposed to be vertical), and may be supposed to act in the direction of this axis.

74. The complement of the invariable inclination of the thread to the axis, or (the axis being vertical) the inclination to the horizontal line which touches the cylinder at the point,

Fig. 13.

is called the *pitch* of the screw. If a right angled triangle BAC be drawn, having the base AC equal to the circumference of the cylinder, and the angle BAC equal to the pitch of the screw (α), and this triangle be wrapped smoothly on the cylinder, its hypothenuse will mark on the cylinder the course of the thread, and by superposing similar triangles the whole