

sliding down,  $\alpha$  is called the limiting angle of friction or the angle of repose  $F = W \sin \alpha$   $R = W \cos \alpha$  or  $W = \frac{R}{\cos \alpha}$

$$\therefore F = \frac{R}{\cos \alpha} \sin \alpha = R \tan \alpha$$

i.e., the friction between the surfaces is equal to the pressure between them multiplied by the fraction  $\tan \alpha$ . Such a fraction is called the coefficient of friction.

Thus the tangent of the angle of repose is equal to the coefficient of friction.

The mechanical screw is an inclined plane wrapped around a cylinder and the inclination of the plane is given by the pitch of the screw.

### QUESTION

What pressure applied horizontally on the outer end of the wrench or handle of a screw jack will be necessary to lift a weight of one ton when the leverage of the handle is 5. The diameter of the screw is 2 inches with four threads per inch. The co-efficient of friction between the nut and the screw is 0.1.

### PULLEYS

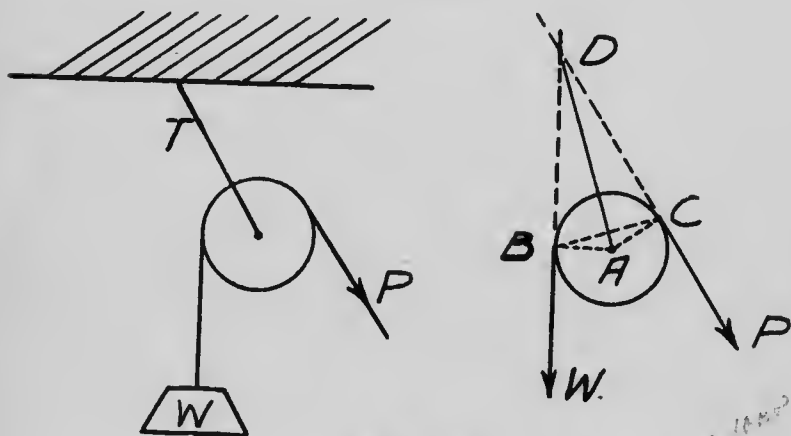


Fig 97

With a single pulley used as in Fig. 97 it would assume some such position as that indicated. The sheave is acted on by three forces  $W$  vertically downwards,  $P$  in the direction of the rope and  $T$  the pull of the fastening. Suppose these forces to be in equilibrium.