

## 25.5: Wedge and Screws

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### Wedges

The wedge is a movable inclined plane, used to split a body. Examples are axes, chisels, knives, nails, and pins. Because friction plays a large role in the operation of the wedge, it is difficult to determine its mechanical advantage.

### Screws

The screw is essentially an inclined plane wound around cylinder. A common example is a jackscrew ([Figure 22.4.2](#)). Let  $\ell$  be the length of the arm, and let  $p$  be the pitch of the screw (the distance between successive threads). Then one complete turn of the arm will move the end of the arm a distance  $2\pi\ell$ , and this will result in the load being moved a distance  $p$ .

Since the input work is equal to the output work,

$$W_i = W_o \quad (25.5.1)$$

or

$$F_E(2\pi\ell) = F_R p \quad (25.5.2)$$

The mechanical advantage of the jackscrew is then  $F_R/F_E$ , or

$$M. A. = \frac{2\pi\ell}{p} \quad (25.5.3)$$

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