

is raised, and the work put into it is the force $\times$ distance the force moves. So we might state the Law of Machines as follows: "If there is no friction, the force $\times$ distance the force moves is equal to the weight $\times$ the distance the weight is raised." For example, if the force moves 50 times as far as the weight, then the force is $\frac{1}{50}$ of the weight. Let us apply the law to the jack-screw.

Experiment XIV. — The Jack-screw and the Law of Machines.

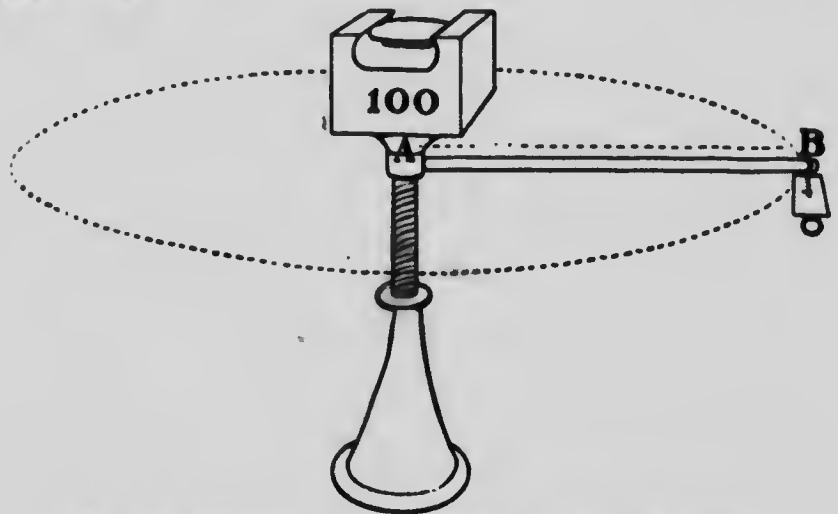


Fig. 16. Apparatus: Jack-screw, Weight, Spring Balance.

1. Notice that when the force at B makes one revolution, the weight is just lifted through the pitch of the screw, i.e., from the top of one thread to the top of the next.

The force moves through the circumference of the circle of which AB is the radius, while the weight is lifted from one thread to the next. Measure AB and calculate the circumference of the circle of which AB is the radius. (Circumference = $2 \times \pi \times AB$.)

Measure the distance from the top of one thread to the top of the next, i.e., the pitch of the screw.