Keep Cranking

When it comes to doing work, it often helps to have an advantage. That's where machines come in. Machines are devices that give us an advantage. There is a trade-off, though. Machines are designed so that less force is needed to accomplish a task. The lessened force, however, must be applied for a longer time or over a greater distance.

Materials
A couple of paper clips

To Do
Unbend a paperclip. Straight it out as best as you can, but don't worry if it's not perfect.
Hold one end of the clip tightly between the thumb and index finger of your left hand. Grasp the free end of the clip with your right hand. Try to roll the clip using the fingers of your right hand.
Most likely the clip didn't turn. Spinning a straight wire that is held in place can be hard to do. What you need is an advantage—a mechanical advantage!
Place two bends in the clip so it looks like this:
Now grasp one end of the clip. Hold the opposite end and rotate the clip as if it were a crank.

The Science
Congratulations—you've built a simple machine! The clip has become a crank. By changing the way the force was applied to the clip, you gained an advantage. This advantage made turning the clip easier.
Check It Out! Although it may not look like one, a doorknob is a type of circular crank. Its wide knob lets you apply a force that can turn the inner shaft. Without a knob, it's almost impossible to turn the shaft.
Next time you're in a hardware store, look for a doorknob display. If you're lucky, you'll get a chance to check out this advantage.