

the vertical line indicated by the plumb line. If we mark this line on the body, and then suspend the body from another point, as *b*, and again draw on it the line marked out by the plumb line, the center of gravity must lie in this line also; and, since it is in both lines, it must be at their intersection. If the experiment has been made carefully, we shall find that the body may be balanced on a pin point applied at this intersection.

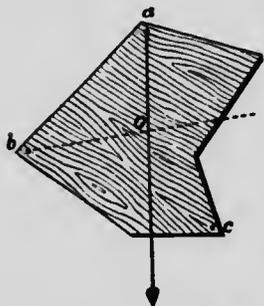


FIG. 5. FINDING THE CENTER OF GRAVITY

This method of finding the center of gravity is based on the fact that no matter how the body is suspended *it remains at rest only when its center of gravity has reached the lowest level possible.*

5. Balancing. Probably every one has tried to balance a long stick or even a pencil vertically on the tip of his finger (Fig. 6). To prevent the stick from falling requires considerable skill and agility on the part of the performer. It is easy to make a bottle stand right side up on a table, but it takes a skillful juggler to balance it on the rim of a plate.

A block of stone on the ground shows no tendency to tip over. Indeed considerable effort is required to overturn it. The tumble jack (Fig. 7) will not remain tipped over; but insists on standing upright.

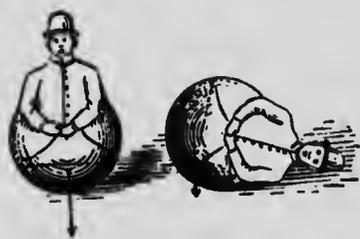


FIG. 7



FIG. 6

A pencil, which can with difficulty be made to stand upright by itself, refuses to upset if two penknives are stuck into it as shown in Fig. 8. Let us find the reason for these facts.

6. Stability. In general we know that a body may be tipped over easily if it stands on a small base, and with difficulty if it stands on a large