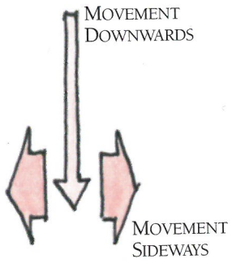
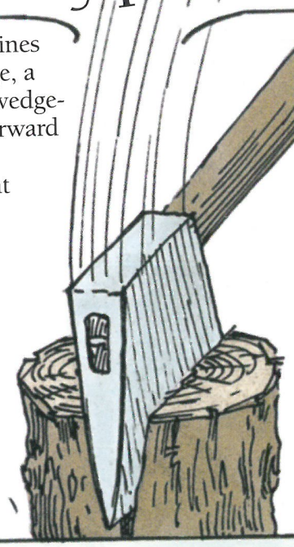
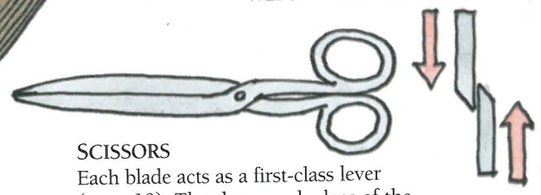
CUTTING MACHINES

Nearly all cutting machines make use of the wedge, a form of inclined plane. A wedge-shaped blade converts a forward movement into a parting movement that acts at right angles to the blade.







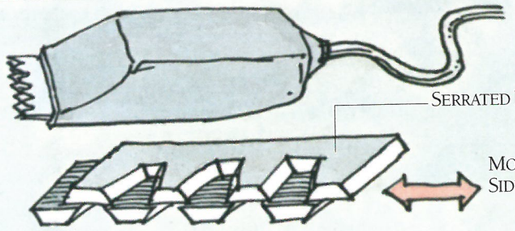
SCISSORS

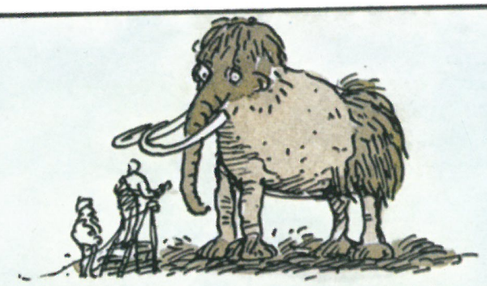
Each blade acts as a first-class lever (see p.19). The sharpened edges of the blades form two wedges that cut with great force into a material from opposite directions. As they meet, they part the material sideways.

AXE

An axe is simply a wedge attached to a shaft. The axe's long movement downwards creates a powerful sideways force that splits open the wood.

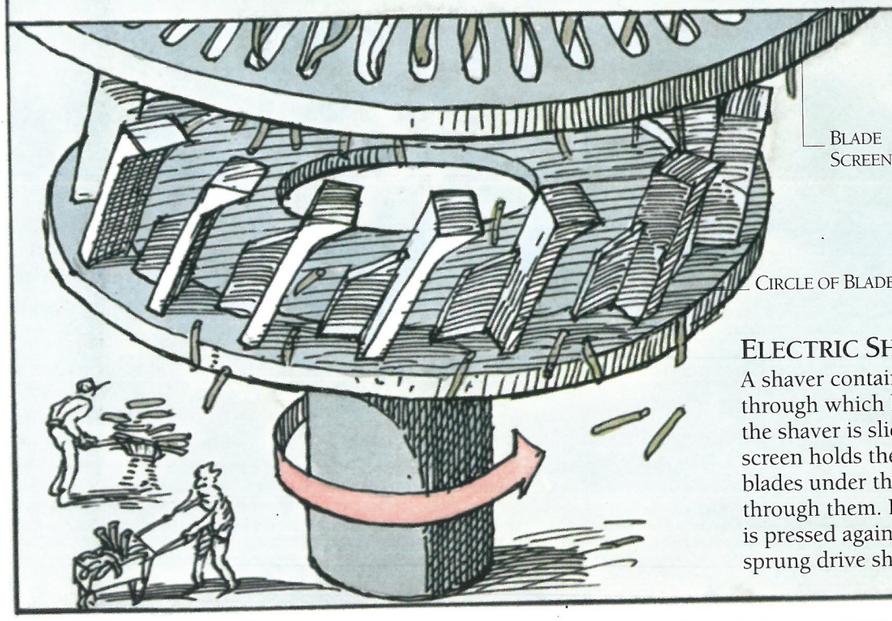
The axe has another built-in wedge: a sliver of metal is driven into the top of the shaft, and this jams the shaft tightly into the socket in the axe's head.





ELECTRIC TRIMMER

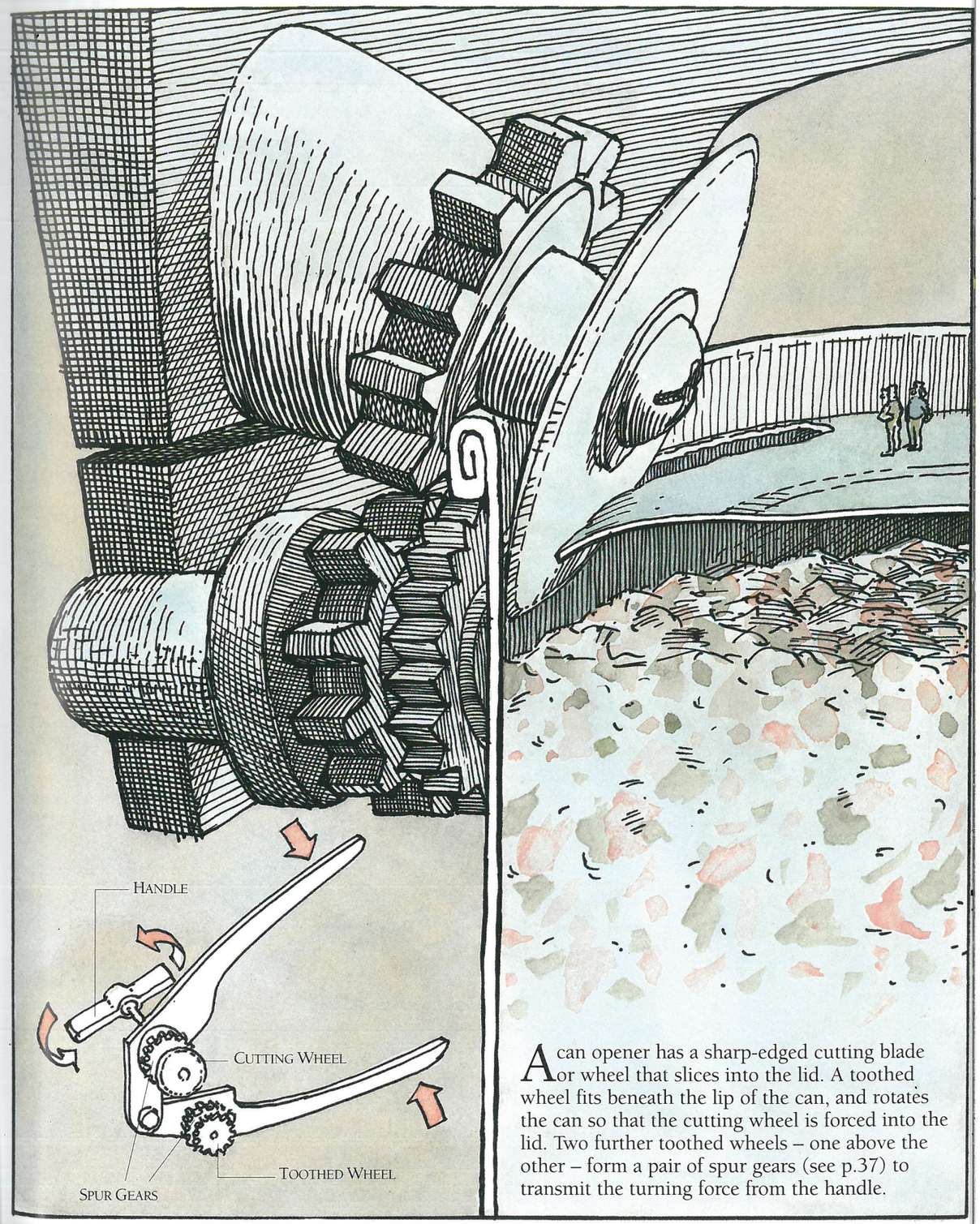
An electric trimmer contains two serrated blades driven by a crank mechanism (see pp.48-9). The blades move to and fro over each other. As gaps open between the serrations, stems or hairs enter to be trapped and then sliced as the blades cross. The trimmer's blades act as paired wedges like the blades of scissors.



ELECTRIC SHAVER

A shaver contains a fine screen through which hairs protrude as the shaver is slid over the skin. The screen holds the hairs so that cutting blades under the screen can slice through them. Each circle of blades is pressed against the screen by a sprung drive shaft.

THE CAN OPENER



A can opener has a sharp-edged cutting blade or wheel that slices into the lid. A toothed wheel fits beneath the lip of the can, and rotates the can so that the cutting wheel is forced into the lid. Two further toothed wheels – one above the other – form a pair of spur gears (see p.37) to transmit the turning force from the handle.