

In Figure 20b the magnet is being pulled out of the solenoid. The direction of the current is reversed and so there is now an attractive force acting on the magnet. The hand pulling the magnet is still doing work to produce electrical energy.

When a current is produced by electromagnetic induction, energy is always used to create the electrical energy. In the example described in Figure 20 the energy originally came from the muscles working the hand holding the magnet. So electromagnetic induction is just a way of converting energy from mechanical energy to electrical energy. This is the principle behind electricity generation and transformers.

Application of electromagnet induction

A major application of electromagnetic induction is the **a.c. generator (alternator)**.

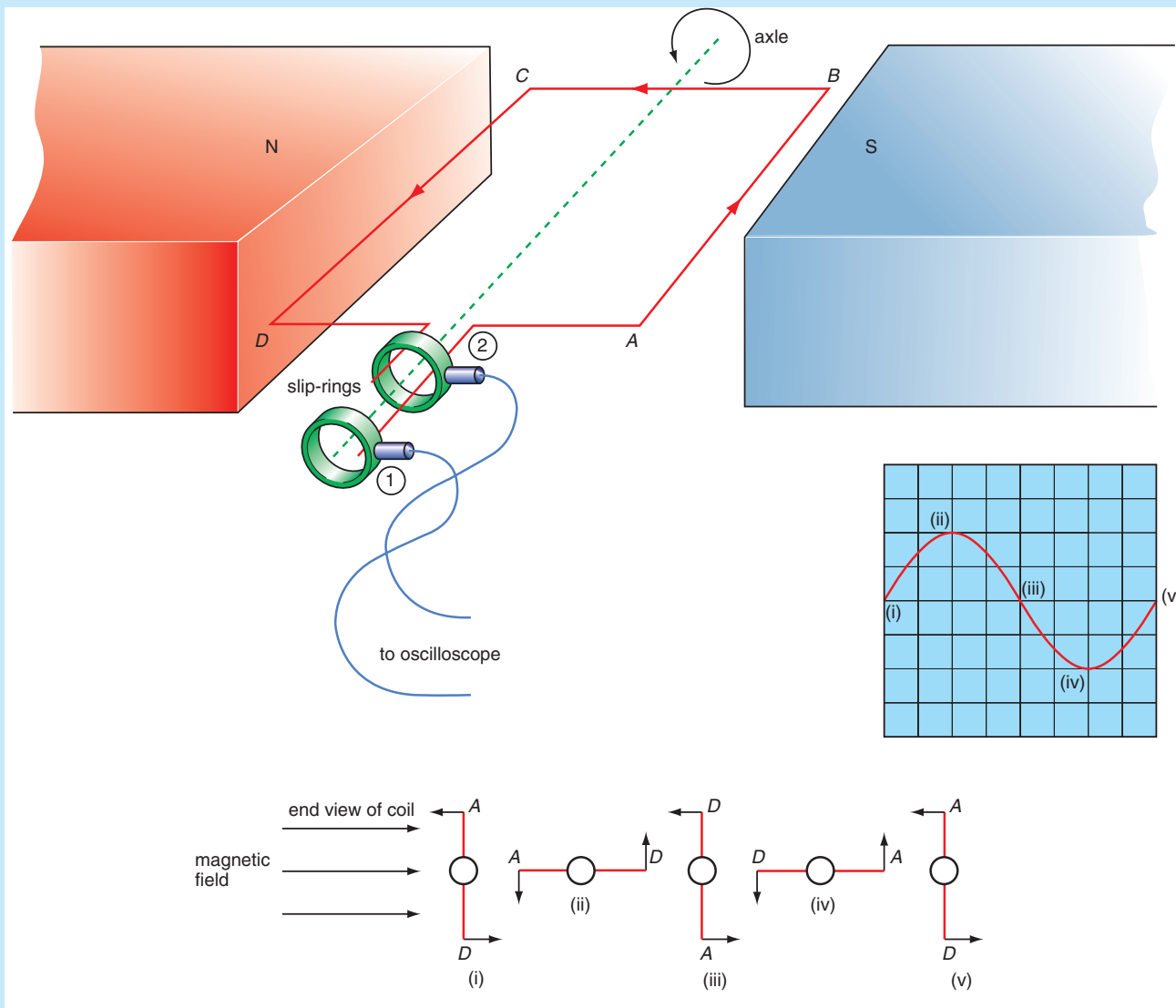


Figure 22a An a.c. generator. **b** How the voltage waveform produced by the generator appears on an oscilloscope screen. **c** The position of the coil

Figure 22 shows the design of a very simple alternating current (a.c.) generator. When the axle is turned, a coil of wire moves through a magnetic field. This induces a voltage between the ends of the coil.

Figure 22b shows how the voltage waveform produced by the generator looks on an oscilloscope screen.