Principle of the galvanometer

Background

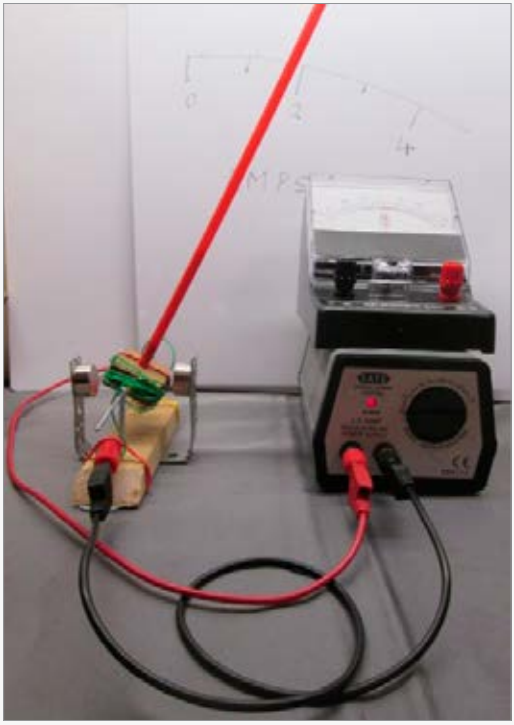
A galvanometer (seen sitting on top of the power supply in the photograph) is a valuable instrument for detecting if electrical current is flowing. This demonstration looks at what happens to cause a galvanometer's needle to deflect.

You will need...

- ✓ Two strong neodymium magnets,
- ✓ a small rectangle of timber that can pivot about a horizontal axis,
- ✓ 2 m of insulated wire,
- ✓ a pair of leads,
- ✓ a 12V d.c. power supply and
- ✓ a drinking straw.

Follow these steps

1. Wind 2 m of wire around the rectangle of timber in such a way that the first 10 cm and the last 10 cm are free to be coiled into a weak spring.
2. Mount the rectangle so that it can pivot freely about a horizontal axle. Position the coil between two strong magnets.
3. Attach the straw pointer to the rectangle as shown.
4. Connect the ends of the coil to the 12 V d.c. power supply using a pair of leads.



So what happened?

When the power supply was switched on, a current flowed through the coil. This established a magnetic field surrounding the coil which interacted with the magnetic field already in place due to the presence of the pair of magnets. The result of the interaction was that the rectangle rotated on its axle and this caused the needle to defect away from the vertical.

What next?

1. Increase the voltage and observe that the resulting increase in current causes the straw pointer to deflect through a bigger angle.
2. Reverse the polarity of the power supply and observe that the pointer deflects in the opposite direction.