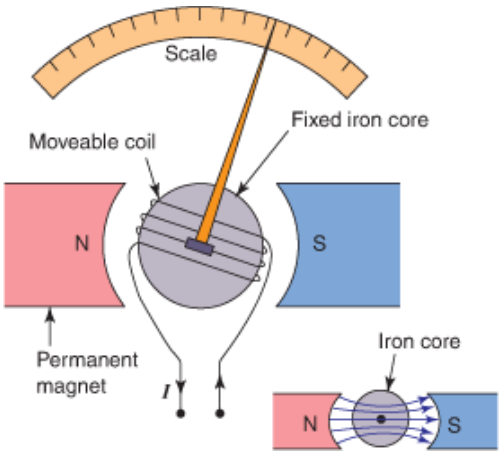
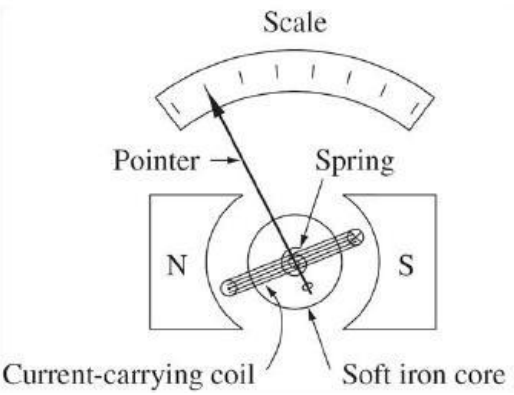
Qualitatively describe the application of the motor effect in: M-B

The Galvanometer

- Measures the magnitude and direction of small DC currents.
- A current-conducting coil of wire is connected in series
- When he current flows, a magnetic field is induced around the coil which interacts with the external magnetic field of the permanent magnet. This causes the coil to experience a force due to the motor effect.
- The force causes the needle to rotate and give a reading on the scale.
- The needle rotates until the magnetic force acting on the coil is equalled by the counter-balancing spring.
- Curved/radial magnets are used to generate a radial magnetic field. This ensures that the plane of the coil is always parallel to the magnetic field, keeping the torque constant and at a maximum. This also means that the scale of the galvanometer is linear, with the amount of deflection proportional to the current flowing through the coil.





The loudspeaker

- A device that transforms electrical energy into sound energy.
- Consists of a permanent circular magnet that has one pole on the outside and the other on the inside. The coil of wire (voice coil) in the space between the poles is attached to the speaker cone.
- When an AC current flows in the coil, it produces a magnetic field which interacts with the external magnetic field of the circular magnet.
- The alternating current results in a changing magnetic force acting on the coil, causing it to move back and forth due to the motor effect.
- The coil oscillates back and forth causing the membrane of the speaker cone to vibrate at the same frequency as the AC current passing through the coil.
- The volume of the sound is related to the size of the electric current flowing through the coil.
- The force acting on the coil moving the speaker cone is directly proportional to the AC flowing through the coil.

- The AC supplied to the coil varies in frequency and form to produce the different frequency sounds and voice from the speaker.