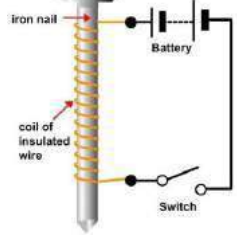


Electromagnet



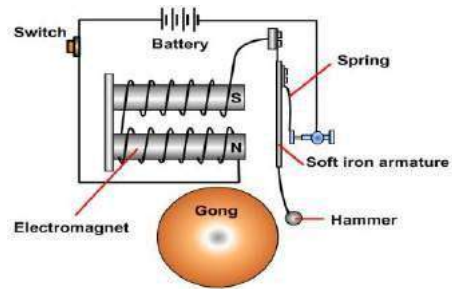
It is a **temporary** strong magnet made from a piece of soft iron when current flows in the coil wound around it. It is an **artificial** magnet. The **polarity** and magnetic field **strength** can be **changed**. **Demagnetized** by switching off the current.

Strength depends on:

1. Number of turns in coil
2. Amount of current flowing

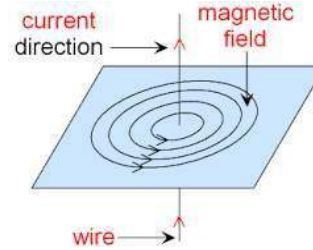
Uses: lifting and transporting huge mass of iron scrap, loading furnaces with iron, electric bell, electric fans, electric motors, etc.

Electric Bell:



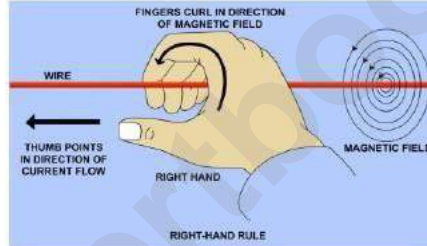
Electromagnet and Electromagnetic Induction

Magnetic field associated with a straight current carrying conductor:

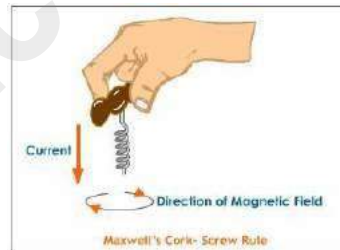


Methods to find the direction of magnetic field:

1. Right hand thumb rule

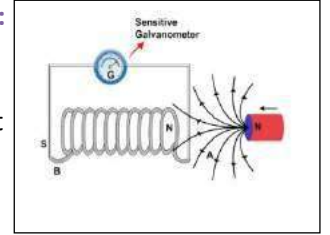


2. Right hand cork screw rule



Electricity from magnetism:

As long as there is relative motion between a closed coil and a magnet, a current is induced in the coil.



Electromagnetic Induction :

The property due to which the changing magnetic field within a closed conducting coil induces electric current in the coil is called **electromagnetic induction**.

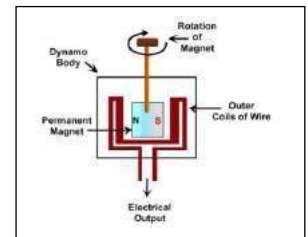
The current produced in a closed coil, when magnetic lines of force rapidly change within it, is called **induced current**.

To increase strength of induced current:

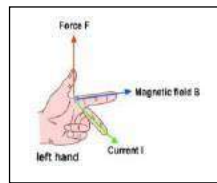
- By increasing number of turns in the coil
- By increasing the strength of magnet used
- By increasing the relative speed between magnet and closed coil.

Dynamo :

Converts mechanical energy into electrical energy
Principle : Based on Electromagnetic induction.

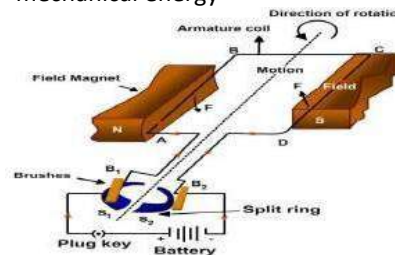


Force on a current carrying conductor in a magnetic field



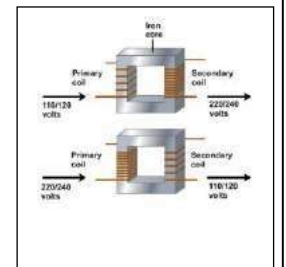
Application : Electric Motor

- Converts electrical energy to mechanical energy



Transformer:

Device used to increase or decrease the alternating voltage
Principle : Based on Electromagnetic induction.



Permanent magnet

Magnetic properties are retained permanently

It is comparatively a weak magnet

Its strength cannot be changed

North pole and south pole are fixed

It cannot convert an ordinary piece of iron into a magnet

Electromagnet

It loses its magnetic properties when current is stopped

It is a stronger magnet

Its strength keeps on changing

The position of north and south poles can be changed

It can convert an ordinary piece of iron into a temporary magnet