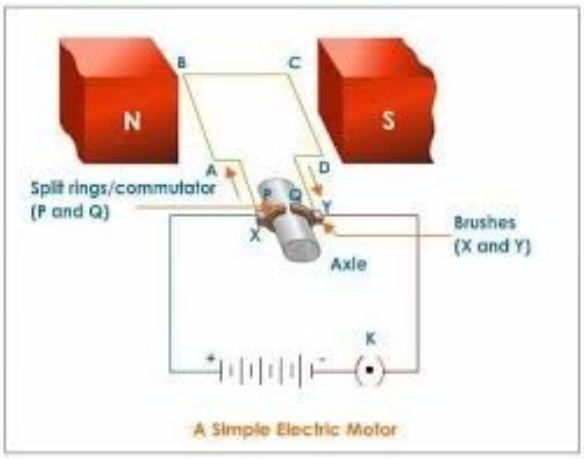
Physics Class Notes

Electric Motor

The schematic diagram of a motor is given



The major parts of a motor are,

- ***Field magnet (NS)***
- ***Armature (ABCD)***
- ***Split rings (P&Q)***
- ***Graphite brushes(X&Y).***

Armature is a metallic coil wound round on a soft iron core so that it can rotate about an axis along with the split rings. It is placed in between the poles of the field magnet. As the armature carries current and it is placed in a magnetic field, opposite forces will be experienced in arms AB and CD and the armature begins to rotate.

In the given arrangement, according to Fleming's Left Hand Rule, the force on the arm will be downward and the force on the arm CD is upward. Hence it turns in anticlockwise direction.

If the rotation of the armature is to be sustained, the direction of current through the armature should continuously keep on changing. The split rings (split ring commutator) and graphite brushes helps to change the direction of the current through the armature after every half rotation.

Energy change

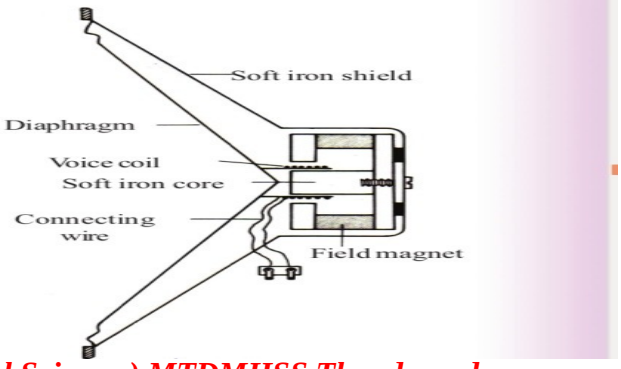
Electrical Energy → Mechanical Energy

1.Why split ring is called "split ring commutator"?

Ans: If the rotation of the armature is to be sustained, the direction of current through the armature should continuously keep on changing. The split rings helps to change the direction of current through the coil after every half rotation. Hence it is also called split ring commutator.

Moving Coil Loudspeaker

Moving coil loudspeaker is a device works on motor principle. The schematic diagram of a moving coil loudspeaker is shown



Important parts

- **Diaphragm**
- **Voice coil**
- **Field magnet.**

1.Where is the voice coil situated?
Ans: In the magnetic field.
2.To which part is the diaphragm connected?
Ans: It is connected to the voice coil.
3.From where does the electric current reach the voice coil?
Ans: From the amplifier.
4.What happens when current is passed through the voice coil?
Ans: Voice coil vibrates.

Working:

- Amplified audio signal from the microphone reaches the voice coil.
- The voice coil moves to and fro rapidly, in accordance with the electrical pulses.
- These movements make the diaphragm vibrate.
- Thereby reproducing sound.

Energy change

Electrical Energy → Mechanical Energy.