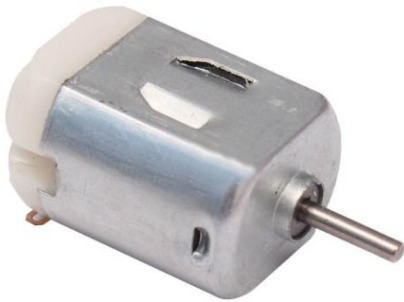


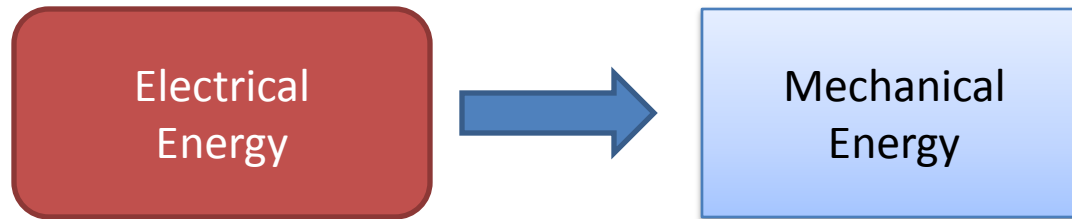
ELECTRIC MOTOR

- You must have seen electric motor at various places around you. Here are few pictures of motor & the places they are used at:



What is an electric motor?

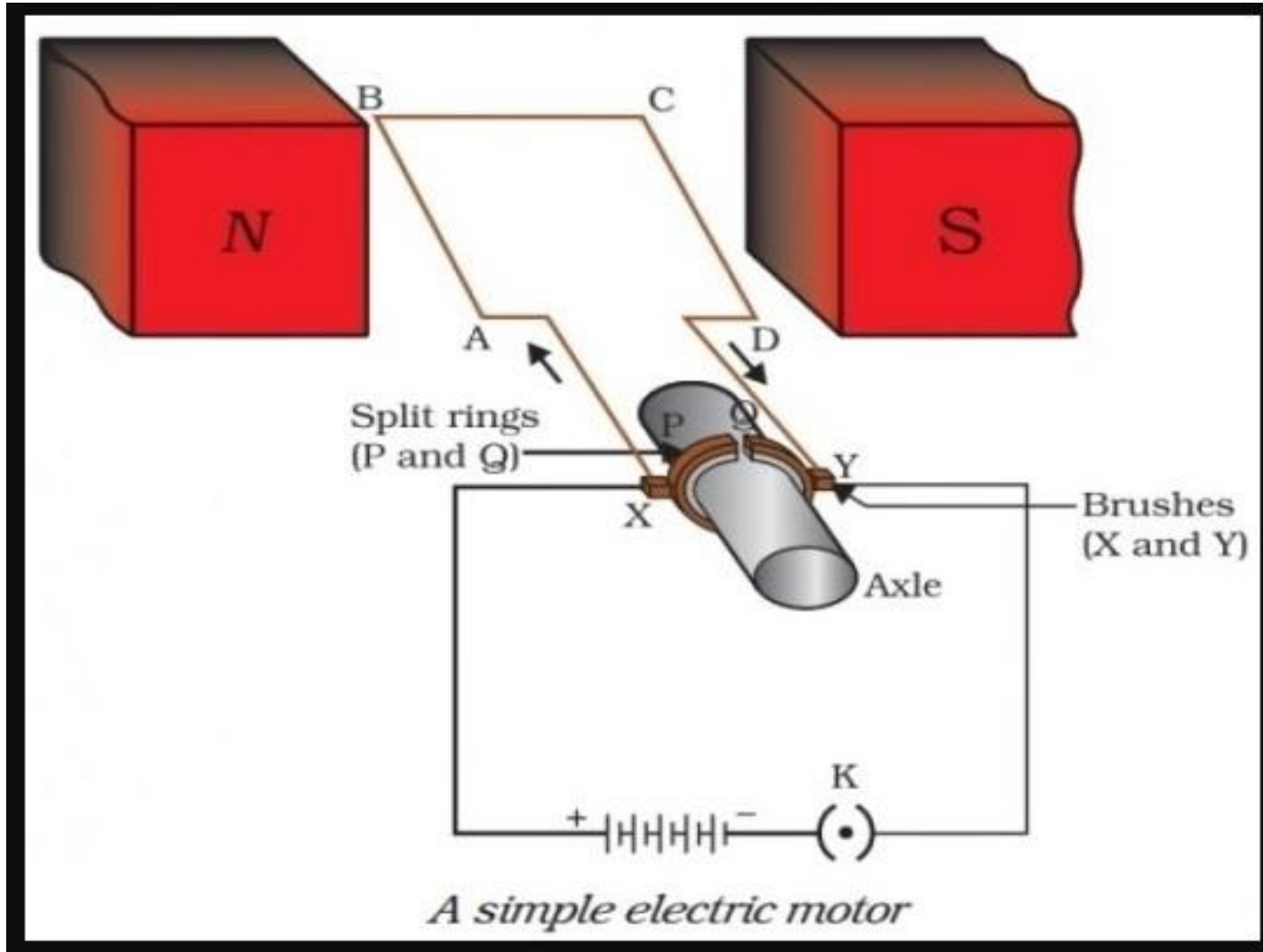
- Definition: An electric motor is a rotating device that converts electrical energy into mechanical energy.



Where we use electrical motors?

Examples: Fans, refrigerators, mixers, factories, toys, automobile, etc.

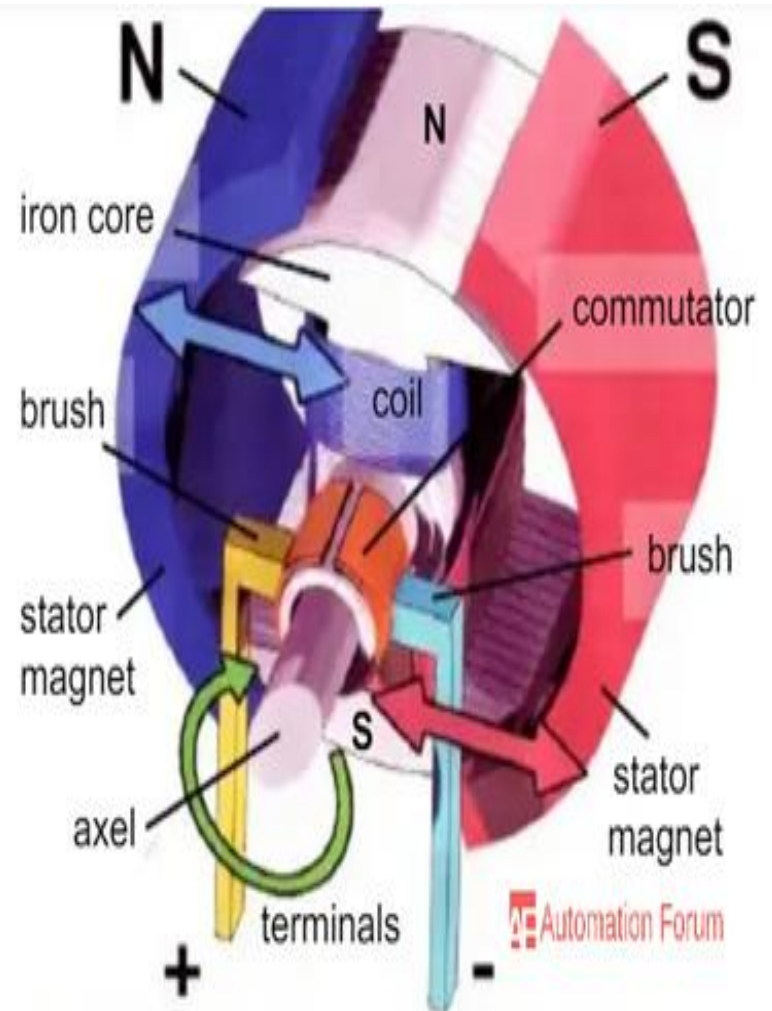
Schematic diagram of an electric motor



Components of Electric motor

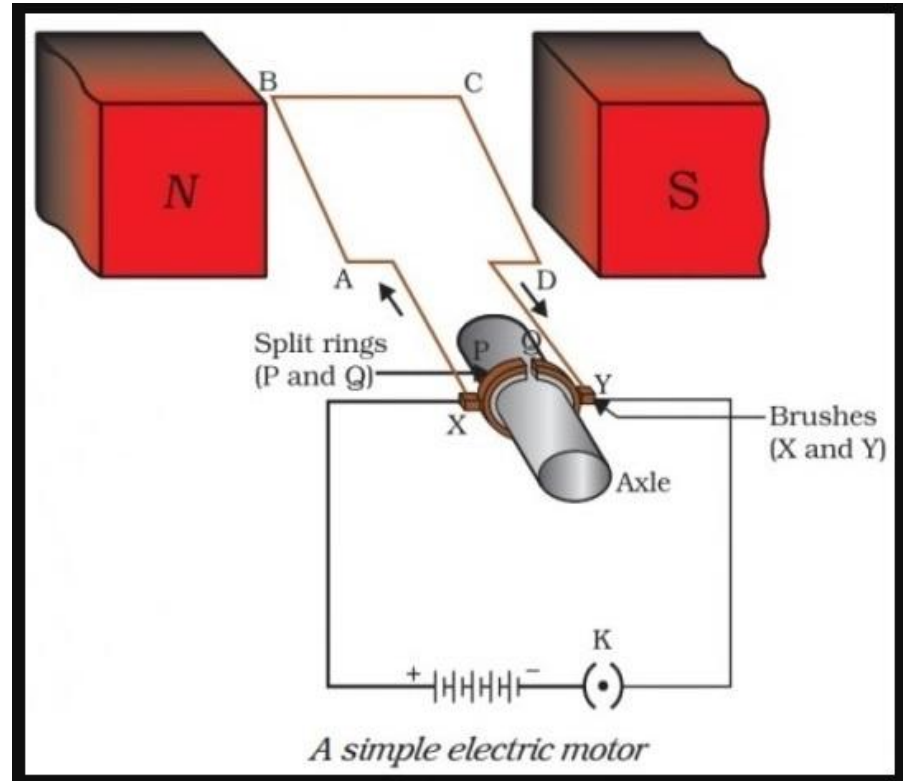
An electric motor consists of:

1. Rectangular coil: ABCD of insulated copper wire.
2. Two magnets: North & South Pole.
3. Split rings: P & Q (insulating).
4. Two Brushes: X & Y (conducting).
5. Current from source.



WORKING OF ELECTRIC MOTOR

1. Current in the coil ABCD enters from the source battery (K).
2. Current enters through brush X in the coil and goes out in the battery from brush Y.
3. You may notice that current in arm AB flows from A → B & In arm CD it flows from C → D. (opposite)
4. Applying Fleming's left hand rule for direction of force on a current carrying conductor.
5. Force on arm AB is downwards while in arm CD it is upwards.
6. Thus coil and axel 'O' mounted free to turn about an axis, rotate anti-clockwise.



7. At half-rotation Q makes contact with the brush X & P makes a contact with Y.

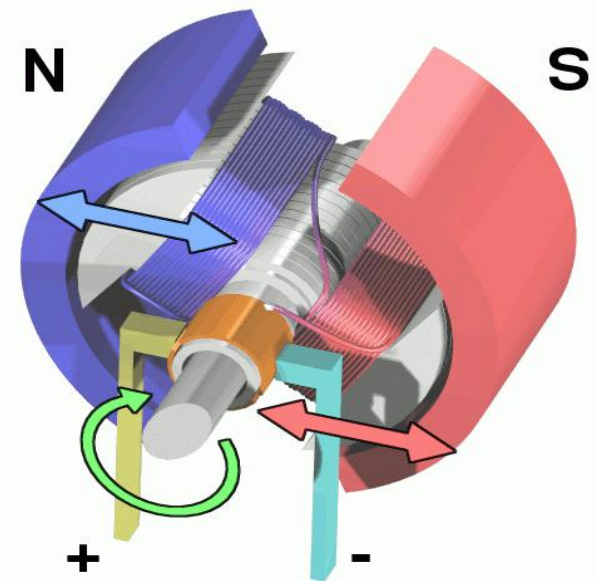
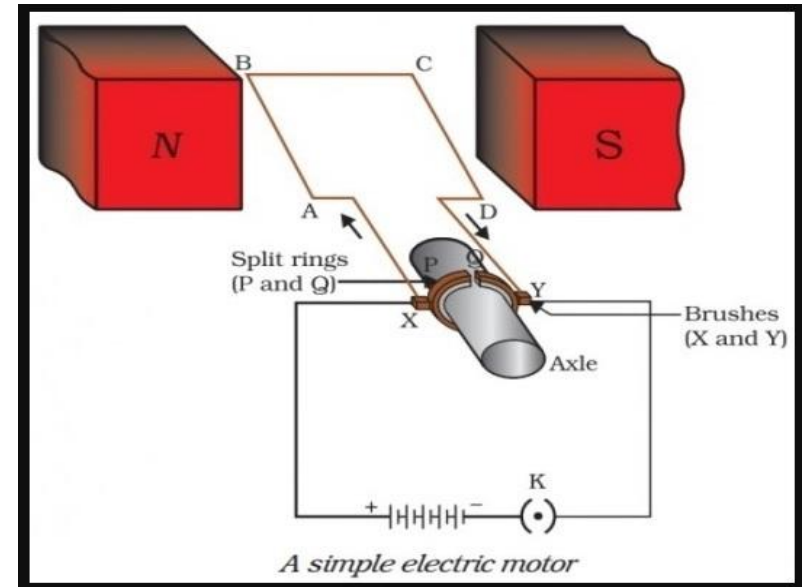
8. Therefore, the current in the coil gets reversed and flows along the path DCBA.

9. A device which reverses the flow of current through the circuit is known as commutator. In electric motor split rings act as commutator.

10. The reversal of current also reverses the direction of force acting on two arms AB & CD, Thus the arm AB which was earlier pushed down is now pushed up and vice-versa.

11. Therefore, coil and axle rotate half a turn more in the same direction.

12. Reversing of the current is repeated at each half rotation giving rise to a continuous rotation of the coil.



Commercial Electric Motor

Commercial electric motors are large in size and are used for industrial and heavy household purposes.

Few differences of commercial motor from normal motor which enhances its power:

1. Commercial motor uses electromagnet in place of permanent magnet.
2. Large number of turns of conducting wires in current carrying coil.
3. Soft iron core on which coil is wound plus the coils are called as armature.

