What is going on?

Here the conductor i.e. brass rod is placed in a magnetic field. The magnetic field is due to the ring magnet. When we pass current through the brass rod, electrons flow through it. Each of the free electron inside the conductor experiences force under the effect of magnetic field. The total force on the conductor is equal to the net force on all the electrons that are flowing through the conductor. (The total force is equal to the product of strength of the magnetic field (B) , Strength of the current (I) and length of the rod (L). Therefore F=BIL, when the conductor is perpendicular to the magnetic field.) As a result of this the brass rod experiences force and moves. The force on this brass rod is at right angle to the direction of current and magnetic field. A reversal of the current or field will reverse the direction of the force experienced by the brass rod and hence its direction of motion.
You can introduce Fleming's Left hand rule here in order to summerise what you have discovered.

H. A. Lorenz

First to suggest that Electric current in metals is due to the flow of electrons

TARANG SCIENTIFIC INSTRUMENTS

THE WAY TOWARDS PRACTICAL SCIENCE

MECHANICAL EFFECT OF CURRENT

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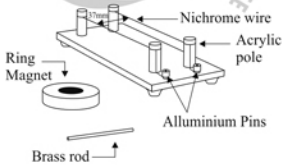
MECHANICAL EFFECT OF CURRENT

Force on a conductor carrying current in a magnetic filed.

Assembly :
Consists of two parallel nichrome wires (26 G & 180 mm in length) fixed between acrylic poles of length 25 mm. The wires are fixed with a gap of 37 mm between them. One end of the wires are connected to the alluminium pins which are used to pass current and other end is tied to the pole itself. A brass rod of 3mm diameter and 70 mm length and a ring magnet of 2 inch dia are part of the kit. Use of minimum 9V & 2A supply is desirable.



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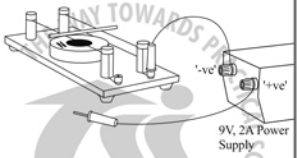
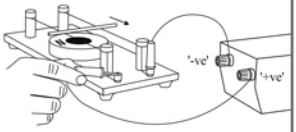
To do and observe :



Step : 1
Place the ring magnet (with N pole above) below the wires and place the brass rod above the wire at the centre of the assembly as shown in diagram. Insert the '-ve' pin of the source in one alluminium pin and keep '+ve' pin free as shown.



Step : 2
Now touch the '+ve' pin of the supply to the another alluminium pin as shown in diagram. You will observe that the brass rod move in the direction as indicated in the diagram.

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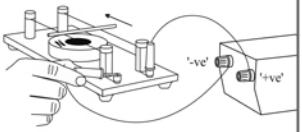
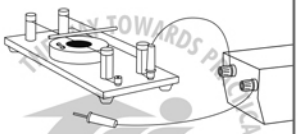


Step : 3
Again place the brass rod at the centre. Now reverse the connection by reversing the polarity of the supply and repeat the Step2. Now you will observe that the brass rod will move in a opposite direction to the earlier one.



Step : 4
Repeat the experiment by changing polarity of the magnet. i.e. by placing the magnet with its south pole upside. Repeat the step 2 and 3 and record the your observation.

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