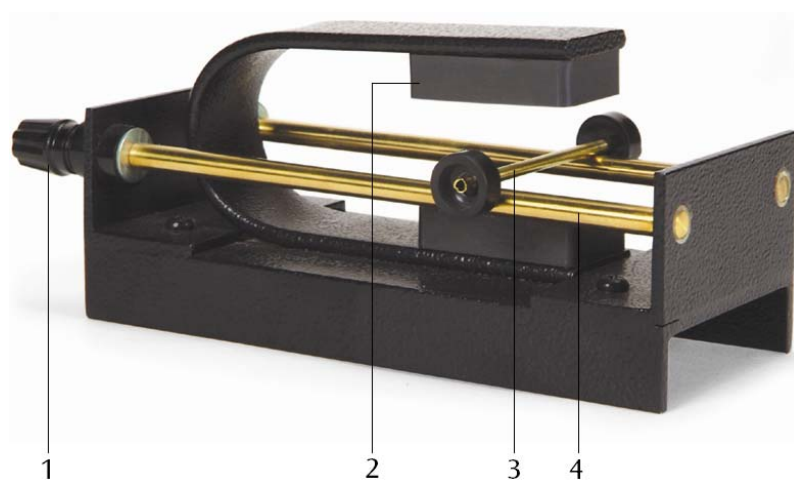


## Force on a Conductor in a Magnetic Field U30065

### Instruction Sheet

11/08 ALF



- 1 Sockets
- 2 Magnet
- 3 Axle
- 4 Rail

### 1. Description

The apparatus is used to demonstrate the rolling motion of a current carrying conductor in the magnetic field of a magnet.

It consists of a powerful U shaped magnet mounted on a base plate, a pair of brass rails complete with 4 mm sockets and a brass axle.

A power supply unit is connected to the rails. When the axle is placed on the rails the electric circuit is completed and the axle is repelled along the rails in a direction either towards or away from the magnetic field. Reversing the current will have the opposite effect.

### 2. Technical data

Dimensions: 175 x 65 x 70 mm<sup>3</sup>  
 Operating voltage: 6 V max.

### 3. Additionally required equipment

- 1 DC Power Supply 0 - 20 V, 0 - 5 A (230 V, 50/60 Hz)  
U33020-230
- or
- 1 DC Power Supply 0 - 20 V, 0 - 5 A (115 V, 50/60 Hz)  
U33020-115

### 4. Operation

- Connect the power supply to the sockets of the rails.
- Place the axle onto the rails.
- Switch on the power supply, apply a voltage of max. 6 V and observe the movement of the axle.

Fig. 1 shows the basic set-up of the apparatus. The magnetic field is vertical, while the current is flowing horizontally. This will move the axle at right angles to both the current and the magnetic field, as shown in fig. 1. If either the current or the magnetic field are reversed, then the axle should move in the opposite direction.

The direction of the motion can be found using Fleming's left hand rule (refer to fig. 2).

If the thumb and the first two fingers of the left hand are held so that they are at right angles to each other, then the first finger will represent the field, the second finger the current and the thumb the motion.

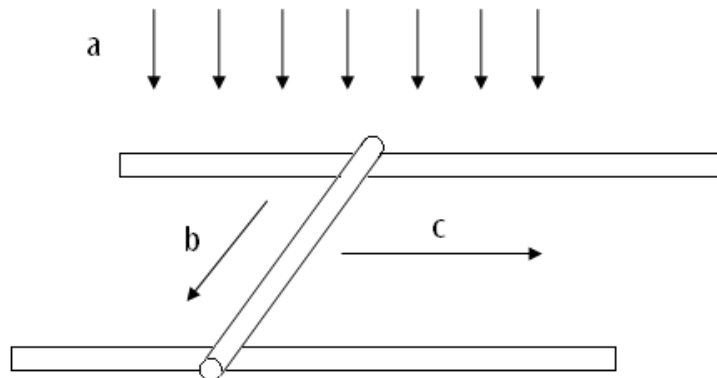


Fig. 1 Basic set up (a magnetic field, b current, c motion)

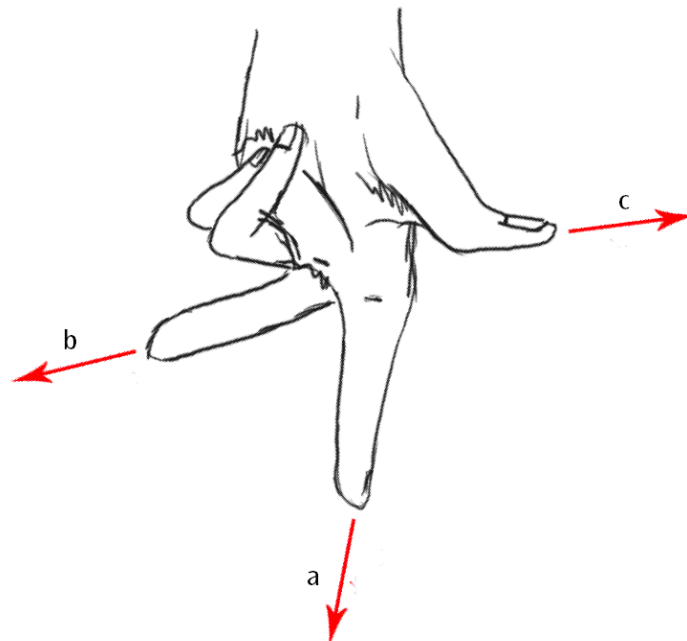


Fig. 2 Fleming's left hand rule (a magnetic field, b current, c motion)