

## CHAPTER 10

## ELECTRIC CURRENT AND ITS EFFECTS

**2-mark questions:**

**1. Draw in your notebook the symbols to represent the following components of electrical circuits: Connecting wires, switch in the 'OFF' position, bulb, cell, switch in the 'ON' position, and battery.**

**Answer:**

Connecting wires



Switch in the OFF position



Bulb



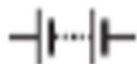
Cell



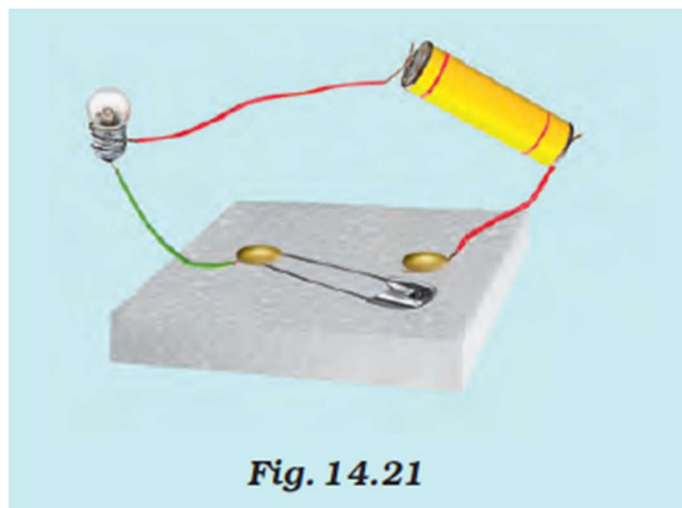
Switch in ON position



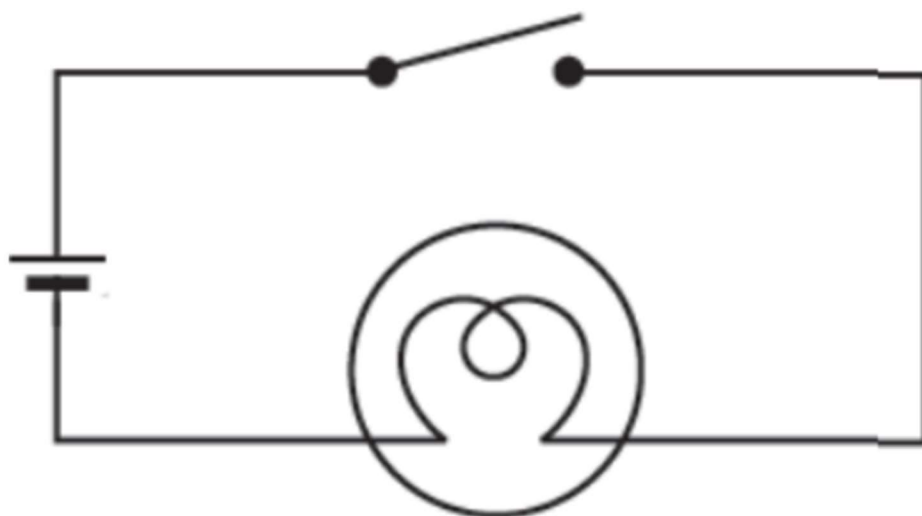
Battery



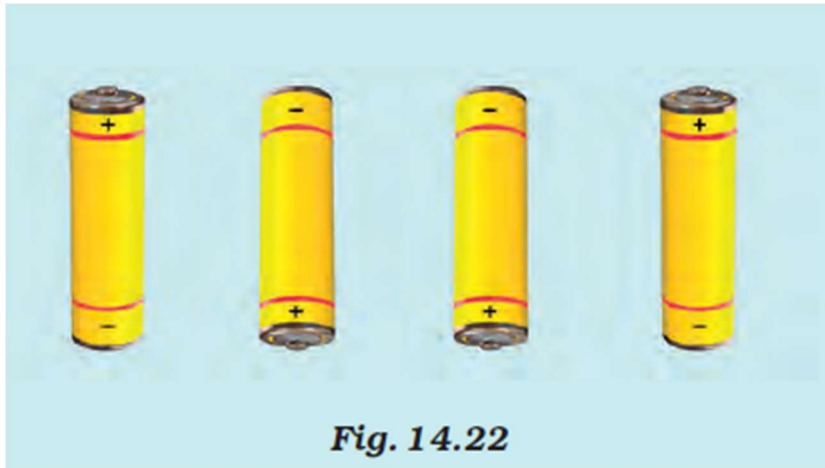
2. Draw the circuit diagram to represent the circuit shown in Fig.14.21.



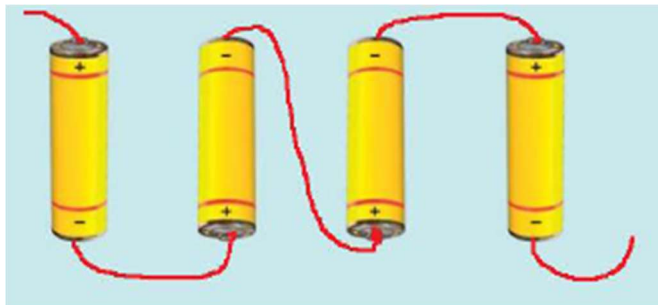
**Answer:**



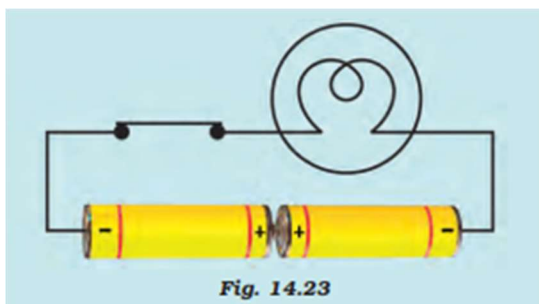
3. Fig.14.22 shows four cells fixed on a board. Draw lines to indicate how you will connect their terminals with wires to make a battery of four cells.



**Answer:**

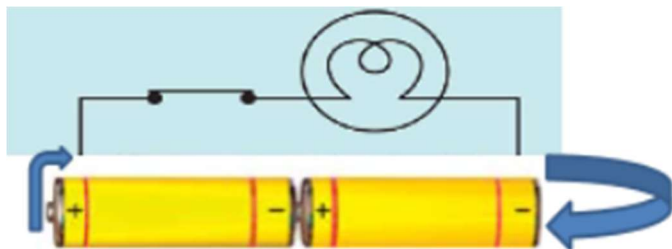


4. The bulb in the circuit shown in Fig.14.23 does not glow. Can you identify the problem? Make necessary changes in the circuit to make the bulb glow.



**Answer:**

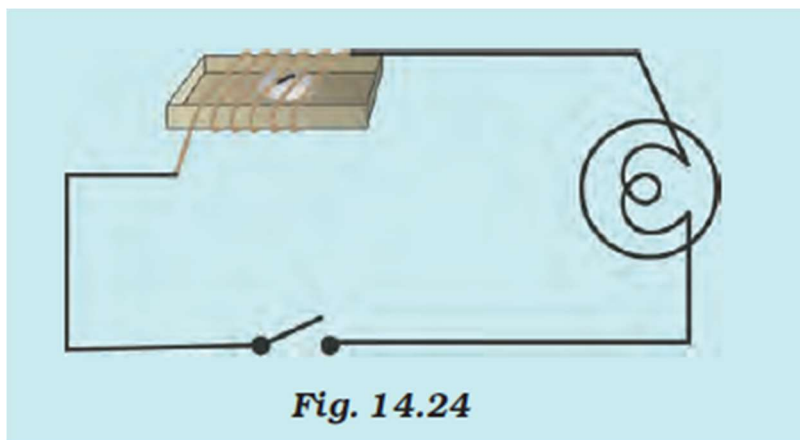
In the circuit above, the bulb is connected on either side.

**5. Name any two effects of electric current.****Answer:**

- i) Heating effect of electric current
- ii) Magnetic effect of electric current

**6. When the current is switched on through a wire, a compass needle kept nearby gets deflected from its north-south position. Explain.****Answer:**

When the current is switched on through a wire, the magnetic field is created around it hence we see deflection in the compass needle kept nearby

**7. Will the compass needle show deflection when the switch in the circuit shown by Fig.14.24 is closed?**

**Answer:**

No, the compass needle does not show deflection when the circuit is closed, and the magnetic field is not created until the current is flowing through the circuit.

**8. Do you think an electromagnet can be used for separating plastic bags from a garbage heap? Explain.**

**Answer:**

No, because plastic does not have the magnetic property to get attracted to a magnet; hence magnet cannot be used to separate plastic bags.

**9. An electrician is carrying out some repairs in your house. He wants to replace a fuse with a piece of wire. Would you agree? Give reasons for your response.**

**Answer:**

It is not a wise idea to replace the fuse with a piece of wire, as it has a very low melting point. In the case of the metal piece, the melting point will be high, and the circuit will be intact in case there is overload or overheating.

**10. Zubeda made an electric circuit using a cell holder shown in Fig. 14.4, a switch and a bulb. When she put the switch in the 'ON' position, the bulb did not glow. Help Zubeda to identify the possible defects in the circuit.**

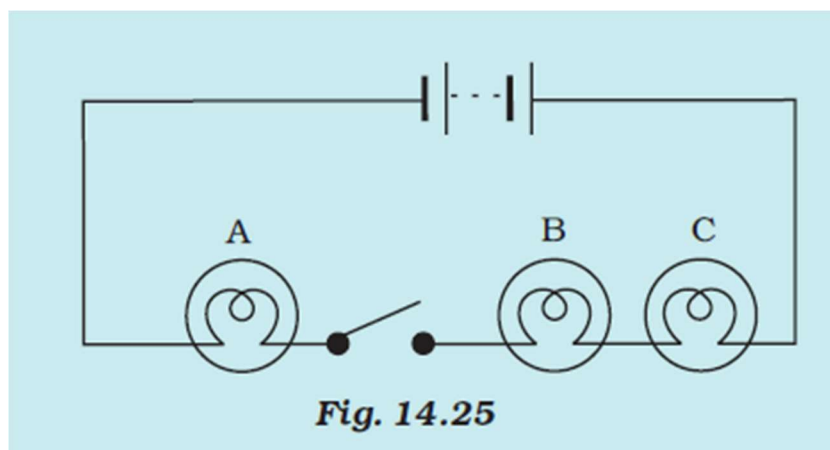


*Fig. 14.4 A cell holder*

**Answer:**

The reasons may be as follows:

- i) The connecting wire may be loose
- ii) The electric cell may be used up
- iii) Switch may not be functioning well
- iv) Cell power has been exhausted

**11. In the circuit shown in Fig. 14.25**

**(i) Would any of the bulb glow when the switch is in the 'OFF' position?**

**(ii) What will be the order in which the bulbs A, B and C will glow when the switch is moved to the 'ON' position?**

**Answer:**

- i) No, the bulb will not glow as the circuit is not complete when the switch is off.
- ii) If the switch is 'ON', all the bulbs glow simultaneously.

### **5-mark questions**

**1.Explain the significance of using fuses in electrical circuits. Describe the mechanism of how a fuse works and its role in preventing electrical fires.**

**Answer:**

Fuses play a crucial role in electrical circuits as safety devices. They are designed to interrupt the flow of electric current in case of excessive current or a short circuit. The fuse consists of a thin wire that melts when the current exceeds a safe limit, breaking the circuit. This prevents the wires from overheating and reduces the risk of electrical fires. Essentially, fuses act as fail-safes, safeguarding both electrical appliances and the overall electrical system.

**2.Explore the applications of electromagnets in everyday life. Provide examples of devices or systems where electromagnets are employed and explain how their magnetic properties are utilized.**

**Answer:**

Electromagnets find widespread applications in various aspects of our daily lives. One common application is in electric bells. The circuit of an electric bell includes an electromagnet. When the current flows through the coil, it turns into a magnet, attracting an iron strip attached to a hammer. This causes the hammer to strike a gong, producing sound. Another application is in cranes, where powerful electromagnets are used to lift heavy loads. Moreover, some everyday items like doorbells, relays, and MRI machines also incorporate electromagnets. The versatility of electromagnets lies in their ability to generate strong magnetic fields when an electric current passes through their coils, making them indispensable in numerous technological applications.



**8. Fill in the blanks:**

(a) Longer line in the symbol for a cell represents its \_\_\_\_\_ terminal.

(b) The combination of two or more cells is called a \_\_\_\_\_.

(c) When the current is switched 'on' in a room heater, it \_\_\_\_\_.

(d) The safety device based on the heating effect of electric current is called a \_\_\_\_\_.

**Answer:**

(a) Longer line in the symbol for a cell represents its **positive** terminal.

(b) The combination of two or more cells is called a **battery**.

(c) When the current is switched 'on' in a room heater, it **produces heat**.

(d) The safety device based on the heating effect of electric current is called a **fuse**.

**9. Mark 'T' if the statement is true and 'F' if it is false:**

**(a) To make a battery of two cells, the negative terminal of one cell is connected to the negative terminal of the other cell. (T/F)**

**(b) When the electric current through the fuse exceeds a certain limit, the fuse wire melts and breaks. (T/F)**

**(c) An electromagnet does not attract a piece of iron. (T/F)**

**(d) An electric bell has an electromagnet. (T/F)**

**Solution:**

a) False

b) True

c) False

d) True

**Summary:**

The passage explores various concepts related to electric current and its effects. It begins by introducing symbols for electric components and the representation of circuits through diagrams. The heating effect of electric current is discussed, highlighting its applications, such as in room heaters and electric bulbs.

The text then delves into the magnetic effect of electric current, demonstrating how a wire carrying current behaves like a magnet. The creation and applications of electromagnets, including their role in electric bells and cranes, are explained.

Additionally, the passage covers the importance of fuses in preventing electrical fires by interrupting excessive currents. The use of fuses as safety devices is emphasized.

The content includes practical activities and experiments, encouraging hands-on learning. Finally, the passage touches on the historical context of electric inventions, mentioning Thomas Edison's contributions.

This comprehensive overview provides insights into fundamental concepts related to electric current, combining theoretical knowledge with practical applications.