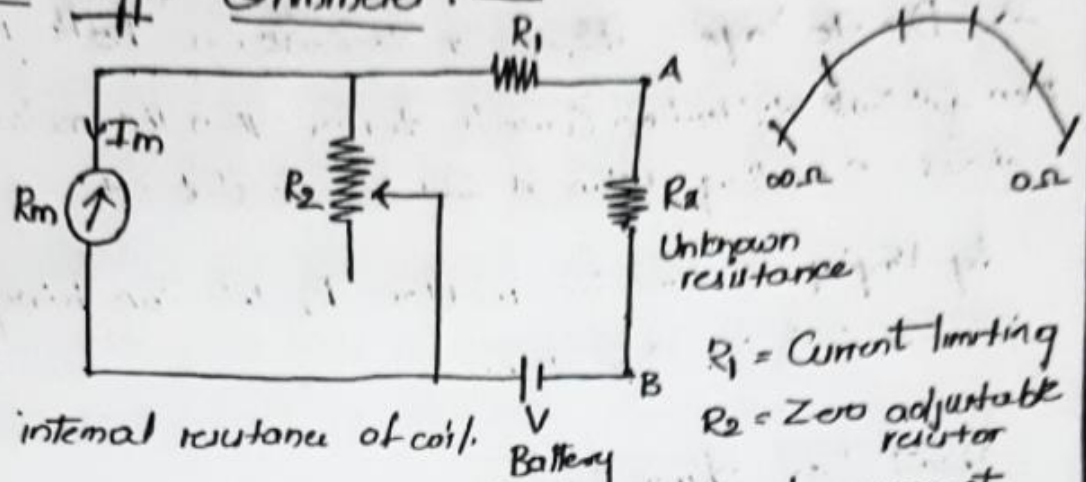
Series Type Ohmmeter :—



R_1 = Current limiting

R_2 = Zero adjustable resistor

RM = internal resistance of coil.

→ The Series type ohmmeter Consists of Dársonval movement connected in series with multiplier resistance 'R_1' and the battery 'V'.

→ The Unknown resistance 'R_x' is connected in series with the basic meter as shown in fig.

→ The deflection of the meter depends on the magnitude of Unknown resistance 'R_x'.

The calibration of series type of ohmmeter is as follows

i) $R_x = 0$ (A+B short ckt)

ii) Max current flows through the meter

iii) The resistor R_2 is adjusted to get the full scale deflection current through the meter.

Then the position of pointer is marked as 0Ω on the scale.

ii) $R_2 = \infty$ (A+B are open ckt)

The current flows through the meter is zero hence the position of pointer is marked as ∞Ω on the scale

iii) Half Scale position resistance (R_h) :—

It is the Value of R_x at which the meter gives half of the full scale deflection Current.

$$R_h = (R_m \| R_2) + R_1$$

$$R_1 + \left(\frac{R_m R_2}{R_m + R_2} \right)$$

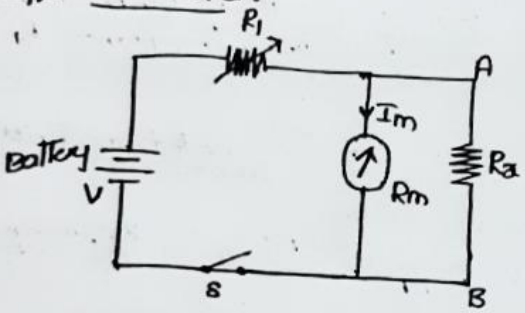
→ The intermediate readings can be found by using non Value of R_2.

→ Since Current is inversely proportional to resistance and meter reading is (∞ to 0)Ω

→ Due to age, there is a decrease in battery Voltage then full scale deflection Current is drawn then the meter doesn't shows 0 reading when A and B are shot ckt.

By Varying the Variable resistor R_2 We can bring the pointer back to 0 position.

Shunt type ohmmeter:—



→ The shunt type ohmmeter consists of dArsonaval movement Connected in series with multiplier resistance and battery

→ The unknown resistor R_2 is connected across the basic meter as shown in fig.

→ The Current flows through the meter the magnitude of unknown resistance

→ The switch S is provided to remove the battery when the instrument is not is used

→ The calibration of shunt type ohmmeter is as follows

(i) an known Resistance; $R_2 = 0$ (A+B short ckt)

No Current flows the meter then the pointer position is marked an '0' volts on the scale (ii) $R_2 = \infty$ (A & B open ckt)

→ The entire current flows through the meter by varying resistor R_1 to get the full scale deflection current of the meter. Then the pointer position marked as ∞Ω

iii) Half scale position resistance R_h

→ It is the value of R_2 at which the current through the meter is half of the full scale deflection current of the meter

→ The intermediate marking are made by connecting different known values

→ Due to time and age there is a decreasing battery voltage. due to this full scale deflection current decreases. hence the meter doesn't show full scale reading. When the terminals A and B are opened

→ Then by varying the resistor R_1 it is possible to bring the pointer back to full scale deflection current of the meter

→ The shunt type ohmmeter has used to measure low resistance value.

AC Voltages