type of measurement. It has its own battery for its function for operating the electrical circuits so that it is able to measure the quantities. The constant factor is controlled by the range switch. Thus the deflection is proportional to the input current which can be measured from the scale calibrated for this purpose.

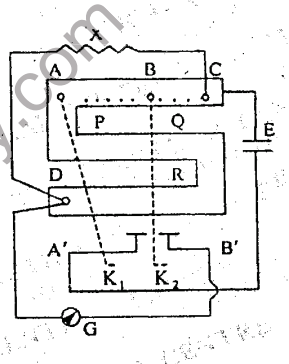
15.10 POST OFFICE BOX:

Post office box is a practical form of Wheatstone bridge. It measure resistance with sufficient accuracy. This was originally designed to measure resistance of telegraph wire, is it was named post office box.

PRINCIPLE:

It works on the principle of Wheatstone bridge under this condition $\frac{R_1}{R_2} = \frac{R_3}{R_4}$

CONSTRUCTION:



It is shown in a simplest form. The arms AB and BC contain resistances P and Q respectively. The arms are called ratio arms. Each of these arms contain resistances of 10Ω, 100Ω and 1000Ω. The third arm AD corresponds to the third resistor R. In this arm, the resistance are arranged in such a way that a resistance of 1Ω or 10,000Ω can be introduced in steps. The unknown resistance X is connected between the terminals C and D. This forms the fourth arm of the Wheatstone bridge. By applying the Wheatstone bridge principle:

$$\frac{X}{R} = \frac{Q}{P} \quad \Big| \quad X = R\frac{Q}{P}$$

The value of X can be found upto the hundredth part of an ohm.

15.11 QUESTIONS FROM PAST PAPERS:

Galvanometer:

Q.1 Give the construction and working of moving coil galvanometer. Show that the current "I" is directly proportional to the angle of twist. On what factors does the sensitivity of galvanometer depends? **(2013, 2011, 2009, 2006,2002 P.E)**

Ammeter and Voltmeter:

Q.2 Describe the conversion of a galvanometer into a voltmeter. **(2007,2011)**

Q.3 With the help of a diagram describe how a galvanometer is converted into an ammeter. Derive the equation for the shunt resistance. **(2005,2004,2003 P.E 2003 P.M)**

Wheatstone Bridge:

Q.4 Describe Wheatstone Bridge. Prove that for a balanced Wheatstone Bridge $\frac{R_1}{R_2} = \frac{R_3}{R_4}$ **(2012,2010,2008,2006,2003 P.E, 2002 P.M)**