

A and B is 20 ohms in both conditions, but the current consumption is twice as much in the normal (Fig. 1) as in the divide-by-two condition (Fig. 2).

Since the resistance of a voltmeter is constant for any one switch setting, its range value must be proportional to the current flowing at full scale deflection. With the divide-by-two button pressed the application of half the original voltage will bring the pointer to full scale deflection.

The voltage across A B to give full scale deflection is 120 mV. and 60 mV. in the two cases, so that when shunted for current measurement and when on the divide-by-two range, only half the normal current is required in the shunt to produce the necessary voltage for full scale deflection.

In the case of "a.c.," the maintenance of constant resistance is unimportant, but the halving of the current for full scale is reflected from the secondary of the transformer to the primary side and thus affects both voltage and current measurements.

Replacement of Internal Batteries and Cell

Two 4.5V. batteries and a 1.5V. cell will be found beneath the battery cover. These batteries should be examined from time to time to ensure that their electrolyte is not leaking and damaging the instrument. This condition will generally only occur when the cells are nearly exhausted. If it is known that the meter is going to stand unused for several months, it is preferable that these batteries should be removed to prevent possible damage.

When replacing batteries, the connections for the 1½V. cell are obvious, but the 4½V. batteries must be inserted with their negative poles (the long brass strips) uppermost. Markings of cell polarities will be found inside the battery box.