

The definition of "effective range" set down in the specification is as follows when related to the Avometer:—

d.c.—from 0.1 of full-scale to full-scale value.

a.c.—from 0.25 of full-scale to full-scale value.

Although a.c. limits of accuracy are only claimed up to 2,000 c/s., sufficient accuracy for most practical purposes can, however, be obtained over the audio frequency band.

In practice Avometers are very well within these limits due to the great care taken in the manufacture of the various components used within them, and the fine initial calibration.

Inasmuch as rectifier moving coil instruments give readings on "a.c." proportional to the mean, and not to the r.m.s. value of the wave form with which they are presented, they depend for their accuracy not only upon their initial calibration, but also upon the maintenance of a sinusoidal wave form. Since the form factor (r.m.s. value divided by mean value) of a sine wave is 1.11, this has been taken into account in calibrating the meter, which does therefore indicate r.m.s. values on the assumption that the normal sine wave will be encountered. Generally speaking, considerable wave form distortion can occur without appreciably affecting the form factor and resulting accuracy of measurement, but the user should recognise the possibility of some error when using distorted wave forms, squarish wave shapes producing high readings and peaky ones, low readings.

#### **Design and Construction of the Avometer**

The instrument consists of a moulded panel, on the inside of which are mounted the whole of the switching apparatus, resistances, shunts, transformer, rectifier, etc., together with the movement. The panel fits into an attractively finished, robust case, the joint having been rendered completely dust proof, whilst a leather carrying strap is provided to facilitate portability. The entire switching of the multipliers, shunts, transformer, etc., is accomplished automatically by means of two switch knobs on the panel, each plainly marked, so that the range in use appears opposite an arrowhead.

These switches are of generous and robust design, contacts being arranged to make before break on adjacent ranges; a feature which provides a further factor of safety to the user. When the instrument is set for operation on "d.c.", the moving coil employs universal shunts and series multipliers, whilst on "a.c." the moving coil is associated with a rectifier and tapped transformer system in addition to series multipliers.