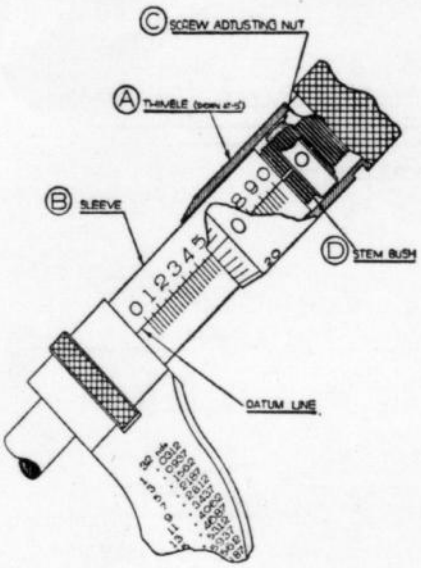
HOW TO READ A MICROMETER



A Micrometer is a gauge operated by means of a screw. This screw, in a Micrometer adapted to English measurement, has 40 threads to an inch, thus, with one complete turn of the screw it advances 1/40th of an inch. One-fortieth of an inch equals 25 thousandths of an inch, or .025".

To the spindle is attached a thimble "A". the lower edge of which is bevelled and which is divided into 25 parts, each of which represents one-thousandth of an inch. On the inner sleeve "B" a line parallel to the axis is cut. This is called the datum line and when the Micrometer is closed the line on the thimble marked "O" coincides with it. This is zero and all measurements are calculated from it. The sleeve "B" is graduated with a number of transverse lines and with each complete revolution of the thimble a new transverse line comes into view, that is each transverse line above zero denotes an opening of the Micrometer of .025". Every fourth line is marked 1, 2, 3, 4, and so on. These figures represent tenths or one hundred thousandths of an inch. Suppose the thimble were screwed out so that graduation 2, and three additional sub-divisions were visible (as shown in Fig. 1), and that graduation 10 on the thimble coincides with the datum line on the sleeve. The reading would be 0.200 + 0.075 + 0.010 or 0.285 inch.

HOW TO READ A MICROMETER GRADUATED IN 1/10,000"

To make a Micrometer read to ten thousands of an inch it is provided with a Vernier which is graduated on the sleeve, and this is read in conjunction with the graduation on the thimble. On the sleeve are graduated ten divisions which occupy the same space as nine divisions on the thimble. It will be obvious, therefore, that the difference in width between each division on the thimble and each division on the sleeve is one tenth of a graduation. As the graduations on the thimble are thousandths, the difference is therefore one-tenth of a thousandth. When, therefore, the graduated line on the thimble (i.e., the thousandth line) does not exactly coincide with the axial line on the sleeve, it is necessary to note which is the first vernier line which coincides exactly with a graduated line on the thimble. If this is the first line, i.e., that line numbered 1, add one-tenth to the thimble reading, if the second vernier line is the first exactly to coincide, add two tenths, and so on up to nine tenths, after that the thimble reading gives the next complete thousandth. Anyone can familiarise himself with taking exact measurements after a few minutes' practice.

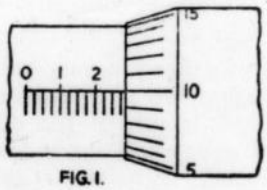


FIG. 1.

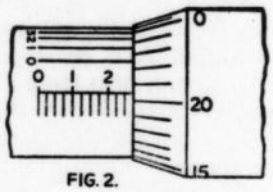
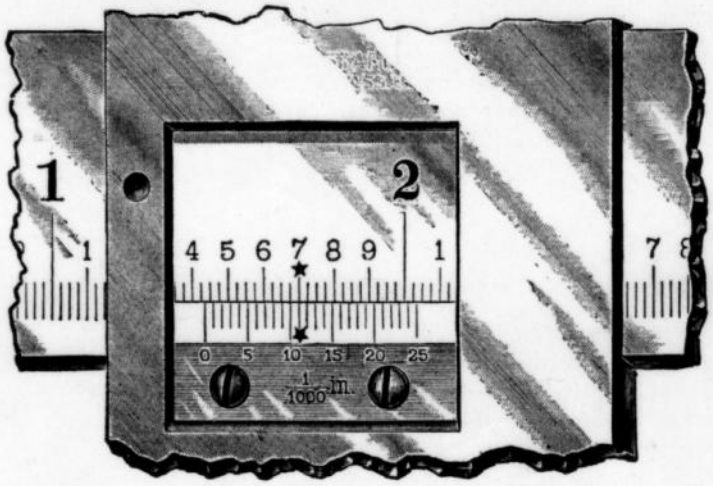


FIG. 2.

READING THE VERNIER ON A CALIPER OR GAUGE



The principle is the same as described above. The bar is marked in 1/40ths of an inch (.025). The 25 divisions on the Vernier occupy the same space as 24 divisions on the bar. The difference between two of these divisions is therefore 1/25 of 1/40, or 1/1000 of an inch.

To read the tool, note how many inches, tenths (or .100) and fortieths (or .025) the 0 mark on the Vernier is from the 0 mark on the bar; then note the number of divisions on the Vernier from 0 to a line which exactly coincides with a line on the bar.

In the illustration, the reading is 1.4 plus .025 plus Vernier reading .011 = 1.436 ins.