

SETTING rotating boring tools



EMPLYING the lathe on a jig-boring principle, with the tool rotating and the work mounted on the vertical slide with longitudinal feed by saddle movement inevitably raises problems of setting and feeding the tool in use. For holes, it is a boring tool, of course, though parallel bosses and spigots can be tackled by the same method.

By **GEOMETER**

It is not disputed, of course, that setting up can be done in the four-jaw chuck to virtually "spot on" accuracy—given a dial indicator, time and patience in ordinary use. But it is always noticeable on getting down to fine dimensions, that the mere

Fine radial feed or setting of tools can be obtained in either of two ways on the principle of the inclined plane, or on that of the eccentric. The inclined plane gives a small radial movement for a larger endwise one, and the eccentric provides a similar radial movement for considerable rotational displacement. First, however, there may be the problem of locating the work accurately by scribed lines to a truly-spinning needle, which, to avoid the chuck jaw push-over effect, can be mounted in a holder as at **A**. The holder is held in the chuck and the needle-soldered in a hole in the central rod-set true at the tip by adjustments to four small screws.

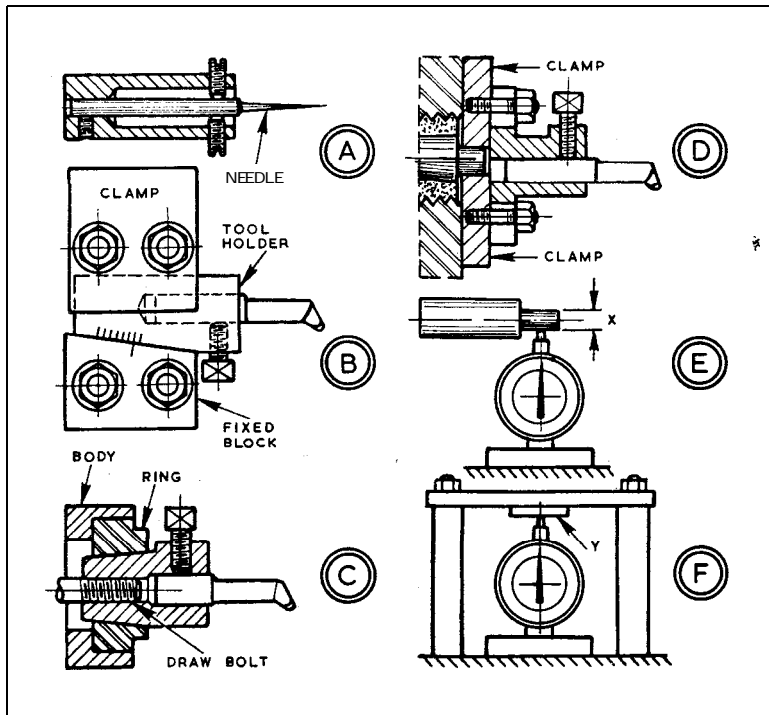
The inclined plane method of tool feed can be arranged as at **B**, using an angle plate on a faceplate. The fixed block is bolted to provide the guide and reference base for the toolholder, which is kept pressed up to it and unclamped, and move endwise for setting cut. Inclination can be according to needs; but about 1-1/2 deg. will give a feed of 1/40, increasing diameter by about 0.001 in. for 0.020 in. endwise movement.

Eccentric feed

Eccentric feed for a tool can be provided as at **C**. The body is circular to hold in the chuck and has a few thou eccentricity in the bore, while the taper-ended toolholder is fitted in a ring which can be turned in the body with the draw bolt slackened. Setting up adjustment can be made locating the toolholder in the ring, and final fine cuts obtained turning the ring in the body. With a four-jaw chuck, roughing cuts can be applied by adjusting the jaws.

The alternative is as at **D**, with a circular plate located on an eccentric spigot in the spindle bore, and clamped back to the faceplate. The toolholder is held by studs and nuts to the plate, with major adjustment made through slots. The spigot can be turned eccentrically by mounting the plug in the spindle with a strip of shimstock one side.

To set tools initially, an indicator can be mounted as at **E**, on a base to push across the lathe bed, picking up the reading from a mandrel turned to required diameter **X**, or using a bridge gauge as at **F**, a slip gauge **Y**, of radius dimension, will give the reading for the tool tip. □



Usually the tool is mounted in the four-jaw independent chuck for its radial setting to be conveniently obtained by adjusting the chuck jaws. This is done by starting at small diameters and working outwards for holes, and at large diameters working inwards for bosses and spigots. A considerable amount of work may be done in this way; though if dimensional accuracy is important, some difficulties will almost certainly be encountered on approaching finished sizes in the absence of fine, controlled radial feed of tools.

pressure of the chuck jaws can have a marked effect. Slackening will set a marked wobble into the work; and the tightening of one without slackening the other can be quite sufficient to correct a wobble or start one.

In turning it may not be of great importance, because once a setting is obtained it is finished. But working with the tool rotating and needing to be set for each cut, it can present a problem towards the finish when there is no certainty as to depth of cut applied.