

Ways with angle plates

By GEOMETER

A L work with a flat base can be stood on the surface plate for scribing horizontal lines, or checking surfaces that should be parallel to the base. For scribing, the point of a surface gauge can be set to height from a steel rule, though a vernier height gauge with scribing attachment gives greater precision, as settings can be made on the instrument to an accuracy of 0.001 in. The position of centres can be scribed, and lines marked to which machining cuts are to be taken.

For checking machined parts, the procedure is similar. The work is stood on the surface plate and tested with a surface gauge or vernier height gauge. If you have an indicator, you can mount it on the surface gauge with its plunger resting on the work. Errors are shown by variations in reading. When necessary, the indicator can be set to specified dimensions with gauge blocks on the surface plate.

To perform the same operations on the top face, the work must be mounted with its flat base vertical, on an angle plate, as at **A**, where the scriber is set for marking horizontal line **S-T**. Other horizontal lines are marked by setting the scriber up or down.

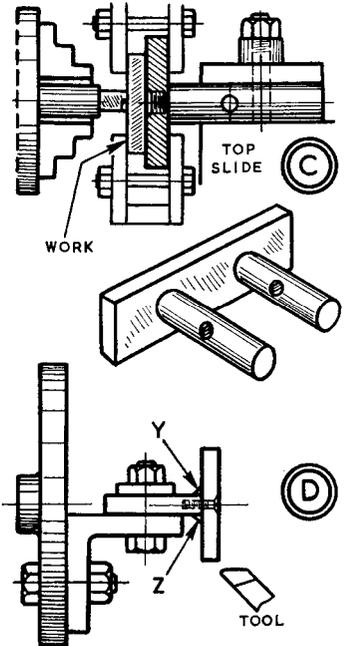
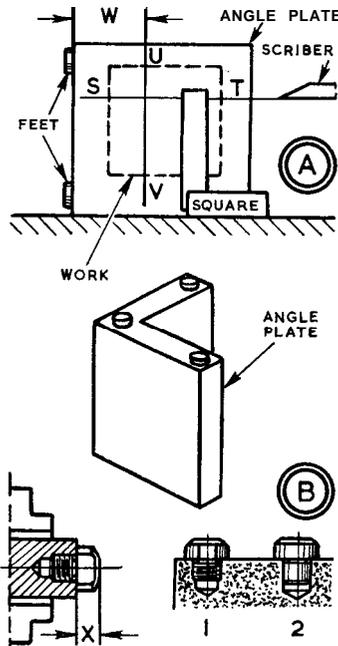
On machined work, an indicator can be used with the surface gauge. All operations of marking-off and testing can be performed near to the angle plate and a distance away—given that the face of the angle plate makes a precise right-angle with the surface plate. If it does not, the angle plate must be packed.

These two ways of mounting work, on the surface plate and on an angle plate, permit of marking-off and testing in two planes. For the third plane, as represented by line **U-V**, it is necessary to use squares—with the risk of reduced precision—or to turn the angle plate on its side, so that once again marking-off and testing can be done direct from the surface plate. Thus, with a true angle plate, such as a box one, the line **U-V** can be marked with the scriber set to a vertical height **W**.

An ordinary angle plate which is not true in this respect may be fitted with feet to bring both its functional faces at right-angles to the surface plate. This can be done as at **B**, with three screwed-in feet 1, or three pressed, 2. The pressed-in are fitted in smooth drilled or reamed holes, and are often used in jigs and fixtures. For angle plates the screwed-in are preferred, as they tighten more firmly and can be easily faced to different depths.

good quality mild steel; each foot has two flats by which it can be screwed into the angle plate.

Besides mounting work for marking-off and testing, you can use an angle plate to set up work for milling on a lathe which is not equipped with a vertical slide. It can be mounted on the cross slide in place of the top slide, where it is usually too high. For mounting on the top slide of a small lathe, the special "angle plate" shown



To check the depths to which feet must be machined, set the angle plate with its faces vertical, using three pieces of material like silver steel rod, with shimstock packing. In facing feet, which is the last operation on them, they are screwed one at a time in a holder. A zero setting is taken from the face of this for the top slide collar; and to **X** for the shallowest foot, and to **X** plus n thou for the other two. The material can be

at **C** has the advantage that it extends below the centre line of the lathe spindle. Construction is very simple, with proportions to suit the lathe: two pieces of steel rod are screwed firmly into a flat plate.

An alternative construction employs two pieces of flat plate, joined at right-angles as at **D** by countersunk screws, for brazing or welding at **Z**. Facing is done on the ordinary plate on the faceplate, as shown. □