

# GRINDING SQUARE AND VEE FACES

By **GEOMETER**

**B**ESIDES flatness and parallelism, common relationships on faces of components, tools, packing, etc., are squareness, 45 deg. angles and Vs, and for these to be produced with reasonable precision it is essential to employ correct principles and some care in setting up and working.

Depending on the size and shape of a part, the problem of grinding square faces can be solved in either of two ways—using two grinding wheels, or locating from a face at right angles to that being worked. Using two grinding wheels, a straight type grinding on the periphery, and a cup (or dish) type grinding on the face, one after the other on the machine spindle, two faces of a part can on occasion be finished without moving it. Then, with two faces finished truly at right angles, the two faces to make a square can be finished by parallel grinding.

### Setting up

This principle may be followed on a lathe running the grinding wheels on mandrels in the chuck, and mounting the part on the vertical slide. Even for outside faces it may be more convenient than the other, but is essential for leaving true bottom and side faces in narrow grooves in parts.

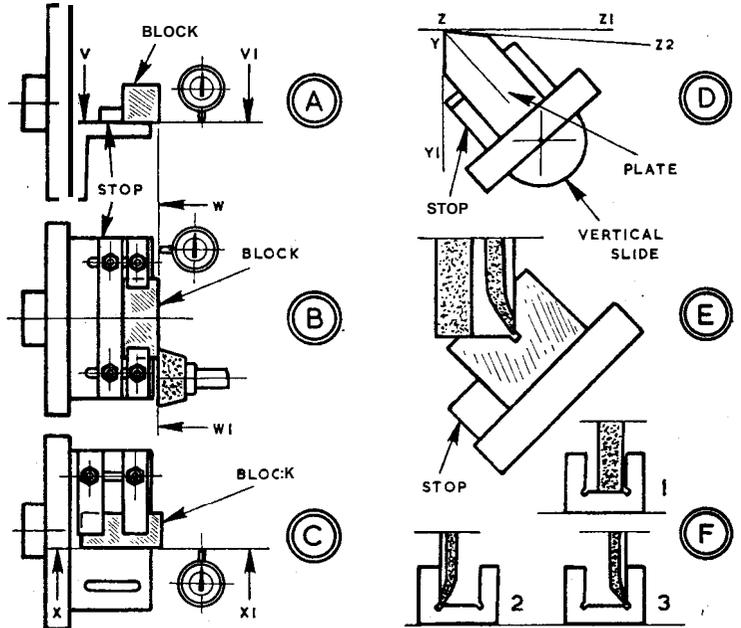
The alternative principle of locating from a face at right angles and using one grinding wheel can also derive from the vertical slide, or from the angleplate—either of which can be “clocked” true with a dial indicator. If it is necessary to use a portable grinder or motorised head, the part must be mounted on an angleplate on the faceplate, and the setting up principle is the same as that for accurate turning as at **A**, **B** and **C**.

To set up, proceeding on the assumption that the lathe is ordinarily true, the angleplate, because of possible errors, must be tested on line V-VI, and packed true to its backing on the faceplate if a uniform reading does not obtain. Given accuracy, the front face of the block will then grind true; and with two faces at right angles, the others can be finished by parallel grinding.

However, as this would mean changing the set-up, a backstop can be fixed as shown, and clocked to uniform reading on the cross slide feed when the front face W-WI, will grind and test true. By this means with reasonable care the block can be brought longitudinally square. Then for squaring its ends a set-up can be made at right angles, clocking true on line X-XI. If required, a backstop can be fitted and when several blocks are to be finished will obviate need for individual checking and setting.

point—the final cuts having been light and the setting unaltered.

Clock checking the angle faces of the plate, experimentally resetting and grinding, an included angle of 90 deg. can be obtained. Whatever the included angle of the faces, Y-YI will give a uniform reading, Z-ZI being the bed line; but face Z-Z2 will show a varying reading, unless the included angle agrees with the lathe alignment. Halving the angular error between ZI and Z2 and re-grinding, uniform readings can be obtained. If lathe alignment is in



The grinding of Vs follows principles from which, with care and using only a dial indicator, it is possible to produce an accurate angular gauge for use when setting up. Employing a cup wheel on a mandrel in the chuck, and making a set-up on an angleplate on the vertical slide as at **D**, a piece of parallel plate with a square end brought to a stop and ground each side will have a central

error this will be contained on the plate; and two such plates on a flat surface will reveal the error. By re-adjustment, splitting errors, an accurate 45 deg. will eventually obtain to form a gauge to set the slide.

From this a set-up can follow to grind V-blocks with either a straight or a dish wheel, as at **E**. Accurate grooves however, as at **F1** and 3, can be finished with both types of wheel. □