

# DIVIDING IN THE LATHE

IT IS A great convenience, even on a simple lathe, to be able to mark round components with the commonly-required numbers of divisions, such as four or six, as are necessary when making squares and hexagons; and to make other numbers of equal spacings in a neat and regular manner, such as to provide serrations on the edges of small bosses and knobs by which a finger grip can be obtained on fittings.

It is true, square and hexagon material can be obtained in ranges of standard sizes; but these do not cover all requirements—such as an exceptionally large size, or if a fitting is needed with a circular flange larger than the hexagon, or if a square or hexagon is required on the end of a shaft for key or spanner manipulation.

To make squares or hexagons to a high degree of precision, milling is, of course, necessary; but for general purposes careful filing-checking by micrometer if desired is quite satisfactory. When the lathe has means of dividing, the material is machined slightly larger than the size over the corners, a pointed tool being mounted sideways in the toolholder and set touching the work.

### Using four-jaw chuck

At each located position the tool is traversed by saddle or topslide, leaving a scribed line. To produce the flats, the material between the lines is filed away, the job being removed from the chuck and held in the vice, still on the bar or in soft jaws to avoid damage.

When equipment includes a four-jaw chuck and the jaws overlap the flat surface of a bed, squares can be marked by holding each jaw to a support bar, as at **A**. Such a bar can be from round mild steel, say about 5/8 in. dia., its length having been obtained by checking with inside calipers from the bed to the under-

sides of a pair of jaws when these are horizontal: The bar should be reasonably to length, and it can be used either side of the bed, but on one side only for one job.

Another method, applicable in the absence of a four-jaw chuck and also to work between centres is to clamp a straight bar to the work, as at **B**. Distances X-XI can be equalised with a surface gauge or scribing block and a mark made on the work with the tool; then the bar can be set horizontal again, after rotating half a turn, for making the second mark.

Quarter markings are made with the bar set vertically with a square from the bed. Pressure can be kept on the work from the tailstock to prevent movement.

### Quicker method

Much more speedy and wider in scope, however, are drilled backplates, as at **C**, in conjunction with a simple plunger device for holding. Indexing for drilling can be done from a change gear which can be mounted on a mandrel in the chuck, key-pinned and held by a setscrew. A locating bar in the toolholder fits between the gear teeth, as at **D**.

When there are two chucks, 12 spacings on one backplate and 40 on the other will give the following divisions most commonly needed: on the first, 2, 3, 4, 6, 12; on the second, 2, 4, 5, 8, 10, 20, 40. The first can be obtained from a 48 or 60 tooth gear; the second from a 40 or 80 tooth gear.

The guide for a drill about 1/8 in. dia. should be from silver steel, and hardened. A countersunk screw fixes it to a mild-steel bar which is mounted from the back on a block or wall, or from the bench or stand at the front of the bed, as at **E**.

For a bench lathe, indexing can be as at **F**, a cross-bracket fixed behind the lathe carrying a pivoted bar with a silver steel pin. Normally, the bar holds by its own weight, or a wing-nut and screw can be fitted at **Y** for tightening.

