# Facing and centring operations

By GEOMETER

IT is a sound principle, whenever practicable, to use the lathe for work which can be got on to it--even work which can be done by other means, such as filing or free-hand grinding. For the great merit of the lathe on simple work is its ability to leave end faces flat and square and corners on diameters finished with neat continuous radii or chamfers.

True, all sorts of pieces of material hacksawed from bar in the vice can be finished to length and " squared " to some degree of accuracy by hand filing. Outside radii can be filed on round bar held in the vice, or ground by twisting the end of the bar at an angle against a grinding wheel, and internal chamfers can be made with a hand scraper.

## Chucking **odd shapes**

**Any** such hand-finished pieces subsequently set up in a lathe, however, will reveal considerable errors. Moreover, it may have taken an even longer time to finish them thus defectively. Hence, from every aspect, it is a sound principle to use the lathe when possible; and if time is needed to effect a set-up, it may well be regained, with the work made much easier and results far more accurate.

For short, odd-shaped pieces of material the most adaptable chuck is the four-jaw independent type, its reversible jaws with parallel faces and square steps providing for a variety of holds, particularly when supplemented by packing. Pieces of bar material of reasonable length can be easily chucked true with a firm hold. Non-solid sections, such as channels, T-sections, and angles like the angle iron, as at A, require appropriate packing, an edge or edges of which can be chamfered with a file for clearance.

Longer pieces of material, within the capacity of the lathe, may be centred at the end before chucking and the centred end then supported by a half-centre (or cut-away type) which will permit full advance of the facing tool. For angle material outside the capacity of the lathe, a set-up can be made as at ***B,*** and quite a small lathe can be used for facing long pieces. The tailstock is removed and a steady rigged for the tail end of a long bar held in the chuck.. Wood blocks with a hole or Vs and bolted to the bench make a suitable steady. Then the angle iron can be held by clamps and the end faced close to the chuck.

If it is of large diameter and relatively thin-walled, setting up tubing for facing can be a problem-and a piece as for a boiler barrel needs to be neatly finished, even though that may not be functionally essential. A solution is to turn a large plug from a block of wood, centre and press it in the tail end of the tubing for support from the tailstock; then turn another block of wood with a stub on which the tubing can be forced. A keen pointed tool should be used with light cuts.

For facing tubing at the tailstock end, another method of setting up and driving is as at C. A piece of rectangular bar is scribed, sawn and filed sufficiently accurately to push inside. Two normally-fitted jaws grip the bar centrally, and two reversed hold the tubing over the ends. Packing here obviates marks.

## Expansion plug

For the tail end of tubing, an expansion plug can be made as at ***D.*** In making the plug, it is drilled centrally, then used with a centred bolt, a piece of steel tubing tapered on the outside_, two washers and a nut. Running friction on the bolt tends to keep it secure.

On solid material, centre positions for setting up can be obtained with a combination square. For other than round sections, the blade can be set to centre distance and used each side, scribing a series of lines. Marked with a centre punch, the position can then be centre drilled.

On round material, the centre head and blade are used for scribing. Alternatively, this material may be supported by the fixed steady, as at ***E,*** for facing and centring; and for long bars? a jig as at ***F*** can be made, using a rmg brazed or welded to flat material. ❑