

BORING BAR

USING different types of boring bar, either running with the lathe spindle or operated from the tailstock, many operations can be performed that would be difficult or impossible without them. Both the rotating and non-rotating types of bar may be provided with single-point tools or fly-cutters, set to radius, or with double-ended tools giving diameters over the two cutting edges. Both types of bar may be used with or without pilot guides, depending on the work.

Most boring bars can be machined from good quality mild steel with care to obtain a smooth finish to functional surfaces. For one-off or occasional use, they need not be case-hardened, as this implies grinding to size afterwards; and sometimes bar or rod material which has an accurate ground finish can be used as it is.

By GEOMETER

For use in the tailstock, boring bars have taper shanks to suit the barrel, and when bumped in firmly they hold well. An unguided bar should carry a double-ended tool to give a balanced cut which counteracts wobble. A grub screw will secure the tool, and with careful feed it will clean out cored holes in castings that are set up on the faceplate or angle plate.

A guided bar may be similarly used through open castings, its forward end extended to fit in a bronze or duralumin bush in the lathe spindle. Its rigidity is naturally far superior and so it can be employed for more accurate work. Using a single-point tool, a succession of cuts can be taken, setting it out for each one; and when the tool wears, it can be resharpened, unlike a double-ended tool which must be renewed.

A rotating boring bar may be a stubby, overhung type used directly from the chuck or faceplate, or from a special fixture, all of which admit

of adjusting the whole bar to vary the cutting radius. Alternatively, a rotating bar can be supported by the tailstock centre, or by a plain or ball bearing at the tailstock. Sometimes the fixed steady can be used with a long boring bar, or a bearing can be provided on the angle plate on which work is set up.

For accurate turning, requiring the travelling or fixed steady, it can be an advantage to start with the jaws bedding fully. Machining them to radius is a job for an overhung boring bar, **A**. A travelling steady moves with the saddle; while a fixed steady is clamped lightly to the bed in front of the saddle, and so moved along.

Many operations are possible with an overhung boring bar when work is set up on a slide-mounted angle plate. But the deeper a bore must be taken, the likelier it is to cause chatter with an unguided bar. For open bores, when the bar can go right through, the answer to this problem is found in boring and bushing the angle plate, and using a guided bar. The boring, **B**, is done by opening out with an overhung bar from a drilled hole, which is then fitted with a bush, secured by a thin nut, to take the guided type of rotating bar, **C**.

The outsize job which cannot be swung on the faceplate or moved by the saddle sets a boring problem that may sometimes be solved by a rotating boring bar fed from the tailstock. Support and drive for the bar can be arranged, **D** and **E**, using a bored bearing block on an angle plate on the faceplate, and fitting the bar with a pin which comes down flat to a block fixed by a countersunk screw to the faceplate. Several holes in the bar extend its movement, when the pin is changed from one to the other—given that the bar will enter the bore in the lathe spindle.

Support and feed at the tailstock can be provided by a plain bearing with a single ball thrust at the end of the bar. But an arrangement using a ball bearing, **F**, is to be preferred—the pad centre being fitted in the lathe spindle to finish the housing for the bearing. **EI**

