A LARGE BORE LATHE SPINDLE PAYS OFF . . .

the spindle should be so arranged that the hole is concentric. The change gear spigots may be threaded $\frac{3}{4}$ in. × 24 t.p.i., *left* hand.

Many ideas have been put forward for a grinder workrest design, but the design I favour is quite straightforward and does not call for the use of unduly cumbersome steel sections. A complete workrest is shown at the centre of Fig. 3, and to give an idea as to how the angle pieces are fixed, an underneath view of two tables from the mating unit may be seen at either side.

The chief dimensions are given in Fig. 4. Although I used solid $1\frac{1}{2}$ in. dia. bar for the stem, a piece of pipe would serve very well, and should there be a shortage of large round stock for the base, a square piece of bar may be used. This may not look so pleasant but it is an unfortunate fact that however hard one tries to keep these grinder components clean, they soon become covered in grit and rust.

The workrests themselves consist of $3\frac{1}{2}$ in. lengths of $2\frac{1}{2}$ in. × $\frac{3}{16}$ in. bar each fixed to a $1\frac{1}{2}$ in. length of angle steel by two $\frac{1}{4}$ in. BSF screws which enter tapped holes in the plates. As the actual location of the angle pieces can be rather confusing I have included Fig. 5, which gives an underside view of the left and right rests.

The important advantages of this kind of workrest lie in the way in which a lathe tool may be held at exactly the required angle (usually 5 deg.) to grind a front clearance free from those numerous facets which are apt to appear on a tool ground by hand control alone. Fig. 6 illustrates the operation.

Parting tool problem

It is unfortunate that the rests are not of much help when grinding the top rake (Fig. 7) although this is usually a flat surface or, at most, one with a slight concavity. It is much easier to produce than the conical outline of the front clearance.

In grinding the sides of a parting tool on the sides of the wheel, it is necessary to bridge the gap between the workrests by clipping a further plate to each rest in turn. I have tried L-shaped plates to overcome this slight inconvenience, but had to abandon the idea as they got in the way of each other.

Doubtless those who like making accessories will take pleasure in adding refinements by way of table angle adjusting screws and scales graduated in degrees.

Nowadays when a power tool is available for almost every operation, the little hand drill is apt to be despised. But for those engaged on small work it can be an invaluable accessory for tapping holes. Fig. 8 shows a No 6 BA thread being tapped in a piece of $\frac{1}{8}$ in. thick mild steel. Holes of from No 2 BA downwards may be tapped rapidly and efficiently by this method. One can soon acquire the knack of holding square to the work.

There is one important requirement, however. The drill must be of a light pattern similar to that illustrated. This is geared at 4 : 1 so while only a modest force is needed to screw in a tap, it may be reversed quite rapidly. One must be prepared to take the slight additional weight as soon as the tap has fully backed out: this will prevent the whole from falling and striking the tap against the vice or other adjacent part.

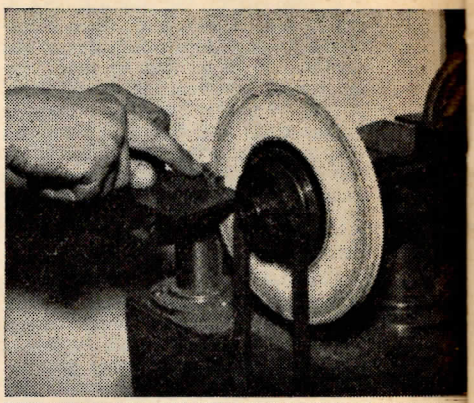
Approach the job calmly and without using undue force and as experience is gained, it will be found quite possible to tap blind holes as well.

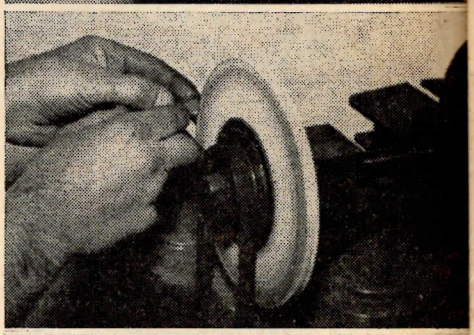
Even a brace

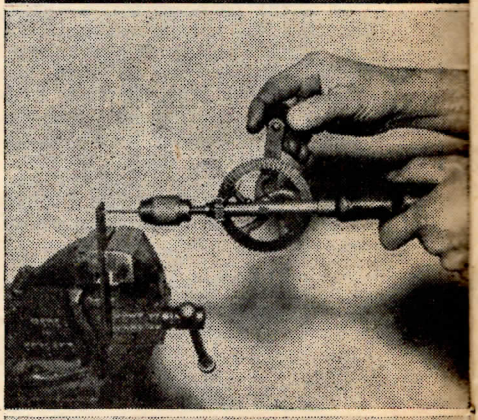
I have also successfully used a carpenters' brace for tapping holes in the region of $\frac{1}{4}$ in. and $\frac{5}{16}$ in. On one occasion, having a large number of $\frac{1}{4}$ in. BSF holes to thread, four extra long flats were ground on the shank of a seconds tap to enable the chuck jaws to grip more satisfactorily.

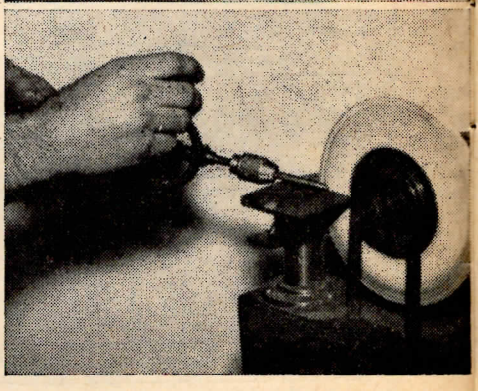
When a quantity of work has accumulated for tapping, it is always best to thread the small holes first: small taps are easily broken when the hands are shaking from the exertion of dealing with the larger sizes.

A final example of the use of a hand drill is illustrated in Fig. 9, which shows a convenient way of repointing a centre punch or scriber. To prevent the formation of a flat, the tool should be rotating before making contact with the grinding wheel. ▣









Top to bottom—Fig. 6: Grinding a 5 deg. front clearance. Fig. 7: Grinding the top rake on a lathe tool. Fig. 8: A hand drill can be useful for tapping small threads. Fig. 9: Repointing a centre punch