WORKSHOP HINTS and TIPS

SIMPLE CUTTER GRINDING

By GEOMETER

ALTHOUGH it is possible to sharpen circular saws and cutters merely by grinding the front face of each tooth, and although this is the only method possible for some tools, a considerable amount of cutter grinding is nevertheless done on the clearance or relief angles of teeth.

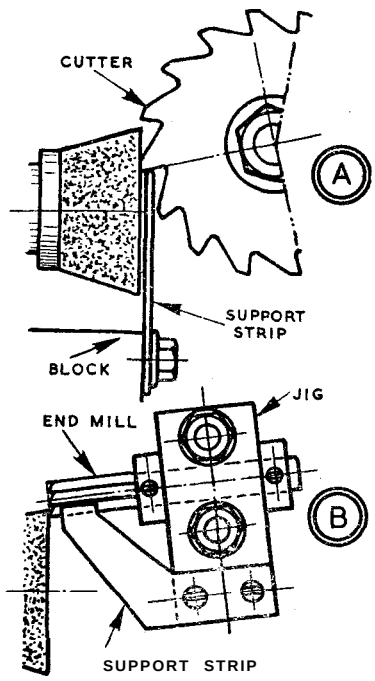
It has the merit of sharpening the cutter, while at the same time bringing it circular. In a works, the machine employed is a universal grinder or a tool-and-cutter grinder. The exceptions to this method of grinding for 'sharpening are tools with complicated profiles, like taps and circular gear cutters. To sharpen these the only practicable method is to grind the front faces of the teeth. In the case of a tap, grinding the profile for sharpening, even if possible, would reduce the diameter and the thread produced would be too tight.

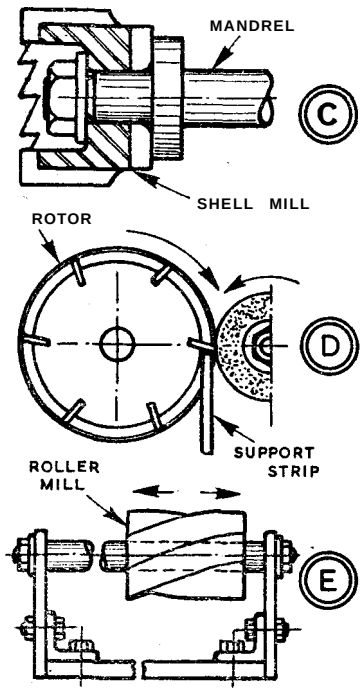
But for a circular saw, a slitting cutter, or a roller mill, the loss of diameter is of no importance. Grinding on the top face or clearance angle of each tooth has the advantage of bringing the cutter circular, so that in use the work is evenly spread over all the teeth. In some instances if the cutter is not carefully ground or the mandrel on which it is mounted wobbles this does not occur. Then there is a type of rhythmic cutting with vibration, and the finished surface is irregular or full of chatter marks.

The principle of grinding on the clearance angles of teeth is as at A. A cup-type grinding wheel may be used and the cutter mounted on a mandrel, free to turn in bearings or a bracket. A support is arranged for the tooth being ground; and the cutter is simply held by hand to the support and traversed past the grinding wheel. When a tooth has been ground, the cutter is turned to the next one without altering the feed. Naturally, the height of the cutter and of its support are such that the required angle is ground on each tooth.

Where a grinder is not available, a lathe can be used on this principle, running the grinding wheel on a mandrel in the chuck and fixing a support strip on a block bolted to the lathe bed. For the cutter, a simple mandrel can be attached to the vertical slide which will provide the means of height adjustment. Cut can be put on from the leadscrew feed to the saddle, while traverse will be from the cross feed.

Au endmill may be sharpened in this fashion, as at ***B,*** showing a method of mounting a small mill by its parallel shank in a simple jig-





on the vertical slide when a lathe is used. Such a jig may be made by boring a hole for the mill shank in a block of material like aluminium, and fixing a support strip by screws. A collar each side of the block locates the mill, while permitting rotation from tooth to tooth. For a larger shell mill, as at C, a mandrel must be provided to mount in the jig, though the principle is the same.

Spiral teeth as on a lawnmower rotor or a wide roller mill, can be sharpened on lathe set-ups. With any spiral tooth cutter, either it or the grinding wheel must be traversed, while the cutter is kept down to the support strip-so that it turns slightly in grinding a tooth.

To grind a lawnmower rotor, one end of the spindle can be held m the chuck, the other supported by the tailstock. Using a portable grinder the support strip must be arranged on the saddle below the wheel, as at ***D*** Each tooth or blade, is then kept down to the support as the saddle is traversed.

To grind a roller mill, grinding wheel and support are as at A, with the mill mounted on a simple jig, as at ***E.*** This is on the vertical slide, cross-wise over the bed. The mill is then merely held down to the support strip and pushed along the mandrel past the grinding wheel.