

SIMPLE

# Grinding jigs

By GEOMETER

**W**ITHOUT too much time spent on their construction quite a variety of work can be performed with simple grinding jigs—facing, shortening, truing, polishing and similar operations on screws, rivets, nuts, washers, collars, valves and other parts. The problem usually comes down to holding and presenting small parts firmly and expeditiously and even where the actual operation could be done with a file, a grinding wheel may prove much more speedy and satisfactory, as it can make up for in peripheral speed what may be lacking in heaviness of cut.

In fact, in certain circumstances of metal removal, a grinding wheel may be compared with machining or hand processes as a turbine to a reciprocating engine from the point of view of power. High surface speed and light pressure take off metal equally as high pressure and low speed—in the manner that a turbine obtains its power from revs, not torque.

### Problem of holding

With this in mind, the situation may be crystallised by some circumstance such as the need for a few screws or rivets of non-standard length. Long ones can, of course, always be snipped or sawn, but then there arises the question of finishing, resolving into the problem of holding.

After some essays with a file, grinding appears to have tempting possibilities, though in the absence of an organised method of holding, objections are soon discovered—damaged nails, overheated fingers, screws or rivets varying in length with ends out-of-square, some snicked along the side—and the occasional one flicked on the floor. Holding in pliers, too, leaves a good deal to be desired, as does holding in a vice.

All objections may be overcome, however, using a simple jig, a piece of flat metal of suitable thickness, drilled for screw or rivet to be pushed through. For finishing by filing, there needs to be a clamp on the back—owing to the considerable pressure involved in the process; but for presenting to a grinding wheel, as at

A, a clamp, though shown, is not essential. Screw or rivet can be simply held up by a finger; and when several are required, they come reasonably to length, even allowing for the slight loss in grinding the face of the jig.

Certain commercial nuts with a ragged outstanding thread can be smoothed on the principle, in a jig with a plain drilled hole and riveted backing plate, as at **B1**; and countersunk screws can be brought to uniformity and smoothness as at **B2**, two or three at a time if required, and as expeditiously polished on a mop or bob, without fraying or cutting into the face of these.

For use on a lathe, with the grinding wheel on a mandrel in the chuck, the jig can be in the form of a long straight lever, hinged on an angle bracket, as at **C**, this mounted on the topslide. The part, a countersunk screw, having been fitted and secured by a nut, taken past the grinding wheel by moving the lever.

Using a jig with a tapped hole, as at

at **D1**, screws to be slightly shortened, turned in with a screwdriver can be squared and brought to length in a single operation. Chamfering or pointing on the ends, as may be needed can be done, as at **D2**, in a plain-hole jig set at the appropriate angle.

Valve ends, or tappet heads that are hard but nevertheless hollowed, can be ground flat and square in a plain-hole jig, as at **E**, a jig made from a block of aluminium drilled and reamed, or bored to size. Components pushed through it are pressed up to the grinding wheel and rotated by hand.

Using a slightly more complicated jig, as at **E**, angle faces on valves may be ground. Two drilled plates screwed to a block locate a valve by its stem, and a third plate acts as a stop. With the device angle mounted on the topslide, the cross slide screw puts on feed. The valve, kept pushed down to the stop plate, may be turned by a screwdriver or suction-cup stick, depending on whether or not the head is slotted.

