

BEGINNERS WORKSHOP

These articles by Geometer (Ian Bradley) were written about half a century ago. While they contain much good advice, they also contain references to things that are out of date or describe practices or materials that we would not use today either because much better ways are available or for safety reasons. In particular, never use abrasive cloth on a lathe without a backing board. These articles are offered for their historic interest and because they may inspire more modern approaches as well as reminding us how our hobby was practised in the past.

Simple drilling jigs

GEOMETER describes their uses and how they aid accuracy

BASICALLY, A DRILLING jig is intended to guide the drill to the required point on the work, without the need for marking off or centre-punching, and to maintain the drill in alignment while the hole is produced—thus saving time and promoting accuracy.

There are cases, too, where a guide for a drill is essential, even for one hole, such as when there are variations in the texture of the material, or 'the drill cannot be started squarely. These occur when drilling wood on the side of a knot, or starting a drill in metal on an uneven or sloping surface.

Spacing jigs

For general use, jigs can be in mild-steel, thick enough to guide the drill by the diameter when the point engages the work. The hole(s), a close fit for the drill(s), should be centre punched, drilled undersize, then opened out with the drill(s) of the size to be used.

The jig at *A* is used for spacing holes along the edges of metal or wood, for rivets or screws. It has a guide strip attached by screws to the outer edge. In use, the first hole is drilled, holding or clamping the jig; then it is moved along, a hole at a time, and a rivet or screw used for spacing location.

Removing broken studs

The jig at *B* is used when drilling out a broken stud-car cylinder head, manifold, or a similar component. The hole centres are carefully spaced, one drilled for an adjacent stud, and the other for the drill left undersize. A centre line intersects the centres of the holes and is carried to the edge to be aligned to a mark scribed on the work. The jig is clamped with a distance piece and nut. After a test start, the jig is removed, the indentation examined, and the jig replaced (re-adjusted, if necessary) to drill through the stud.

The jig at *C* is used when drilling a circle of holes to cut out a large round

hole in sheet material. It is clamped for each hole and finally the centre piece is snipped or chiselled out and the edges smoothed with a file. This jig maintains accuracy, reduces subsequent work, and is useful where there are ribs or hollows which would cause the drill to run.

When bolts have to be drilled for split pins, a nut can have a corner filed and the guide hole drilled. This guide nut is held in a vice each bolt to be drilled fitted with a lock-nut, screwed into the guide nut and locked for drilling, as at *D*. If orientation of hexagon on bolt and split pin hole is not important, a distance piece can be used on the bolt instead of a lock-nut.

When pins have to be drilled for split pins, a small metal block can be drilled to accept them, and have the drill guide hole at the required distance from the end, as at *E*.

Split jigs, *F* and *G*, are easily made from round material. Two blocks, each provided with a small vee-groove (triangular file) are clamped with the vees aligned, then drilled for the pin, etc. The blocks are separated, small vee grooves are made where the guide hole is to be, the blocks then aligned with round material, clamped, and the guide hole drilled. If necessary, the blocks can be filed on their faces to grip the diameter held (and the drill hole opened out) for the assembly to be mounted firmly in a vice. Such jigs are valuable for angular holes *G*, as the angle can be accurately marked on the faces for filing the initial guide vees.

When circular guide bushes can be machined and drilled (in a lathe), a machine vice mounting can be effected, as at *H*, with the bush above round material of similar diameter@

