

# Tools for various purposes

**I**N most workshops there are small tools and gadgets which were once only oddments in the scrap-box until a problem or an idea transformed them. For times out of number-so it seems -the scrap-box contains the answer to a problem in a piece of material, which, machined on the lathe, is exactly what is required.

Short pieces of round material can often be used as stub mandrels for setting up hollow components when they have been faced, turned, and threaded if necessary. Alternatively, round stock can be faced and then drilled and tapped to mount components with external threads. All the softer metals and alloys may be used as laps in different sizes and shapes, or as soft drifts to avoid damage to components. Most of the harder materials can serve as packing pieces, or may be made into end gauges, punches, and so forth. Lead can be pressed into use as a punching block, while mild steel may be used for hold-ups and small anvils. These are just a few of the uses for left-over material.

One's needs may be anticipated and tools may be made which will prove useful later when they may be needed in a hurry. As simple examples, pieces of material are always required in the faced condition-not rough from sawing-off, or with pips from parting-Off. A few minutes can be well employed in just facing off-cuts for future use. They can be used as packing or drifts.

Universal tools are other examples. If one is assembling and holes in components are out of line, a few pieces of standard-diameter mild steel rod, each turned with a long taper, will inevitably prove handy as taper punches. For this work they need not be casehardened.

Further examples are stepped drifts for driving out bushes. Each may be as at A1, with two, three, or more steps on which sleeves are located. These extend the range by covering diameters between the steps. Good quality mild steel may be used for such drifts and their sleeves, with the sleeves made from thick-walled tubing, or by drilling and boring from rod.

By GEOMETER

Casehardening is advisable for long-term use.

In commercial work many simple devices are described as "special tools." It is so with a ball race drift A2, which has a spigot to locate in the inner member and a face to abut to the outer member. A large piece of material is required to turn the tool from the solid. But as in the lower half of the diagram, it can be built up from rod X, a collar Y, and heavy tubing Z. These are turned and then brazed or welded together.

The tool at A3 can be used instead of a taper punch for drawing holes into line. The rod fits one hole and has an eccentric diameter to enter the other which is out of line. By turning

it, the two holes are lined up.

Another special tool is the sleeve which is used at times to centre a casing about a shaft B. Obviously, it can be made from tubing. But small-diameter rod can be used in the space between the casing and shaft; and if three pieces are soldered to a clip, they function in the same way as a sleeve.

Tools for use as hold-ups or anvils in the vice should rest on the jaws or slide-so they cannot drive down. In this respect a large bolt-when cut off and crowned-makes a riveting hold-up C; while thick radiused bar (machined on the faceplate) supports strip material as it is curved by hammering.

A vice anvil for light work can be made as at D from thick plate with deep collars held by studs and nuts by which to grip it firmly. V-supports for round stock E should rest down on the slide. The material can be milled at the end F, clamping twice to the vertical slide or on the top-slide. With the latter mounting there are, of course, areas left to be finished by filing. □

