Methods of MAKING and TRUING SPANNERS

By GEOMETER

ONLY by using well-fitting spanners can nuts and bolts be tightened securely, leaving corners and flats of hexagons undamaged so that they do not detract from the appearance of the finished model or piece of equipment. Pliers, however well handled, almost invariably leave evidence of their use; and a close scrutiny will reveal when stretched or loose spanners have been employed.

In the process of tightening without marking, there is nothing to equal the box spanner which, enclosing the nut or bolt head, applies drive to all corners and the flats leading up to them. Each is thus subjected to reduced force, since the tightening effort is spread over three times the area by comparison with a similar operation carried out with an open spanner. There is another advantage in using a box spanner on very small nuts, which may not be easy to fit by fingers on bolts or studs in restricted positions. Each nut can be placed in the box spanner-and with end access for this to the bolt or stud, a start can easily be made.

Using mild steel rod drilled at the ends, tubular box spanners can be made by various methods, with bodies or shanks of suitable length and provided with means for turning, as at *A*. Ordinarily, they are drtlled cross-wise at two positions at right angles to take tommy bars. For small nuts and bolts they can be knurled to twist in the fingers: and in larger sizes, each can be fitted with a knurled collar flxed by a grubscrew. Again, a box spanner can be made as a socket end soldered to a piece of rod, which is pressed or soldered int a metal handle, or squared and tapered and driven into a wood handle for use like a screwdriver.

According to choice or to the number of spanners to be made, the hexagons in them can be produced by punching, planing, broaching and pressing methods. For a few spanners, typical tools are as at *B*, all from silver steel rod: a punch 1, a planing tool for the tailstock 2, and a planing tool for the slide rest 3. The punch should be hardened and tempered to dark-straw-purple, and the planing tools to dark-straw for cutting.

A blank for the punch can be made by turning silver steel rod a few thou larger than the corner dimension of the finished hexagon. Then it is indexed to six positions, and lines are scribed with a pointed lathe tool sideways on the slide. Flats are then filed and the tool hardened and tempered. The corehole into which it is pressed or driven should not be less than the dimension of the flats of the hexagon.. Using the vice, the punch can be pressed in, or carefully tapped in with a hammer. To get it out, the material can be stretched by careful tapping round with a hammer on a metal block.

The planing tool for tailstock use is made by turning a blank with diameters plus on corner dimensions, and a shank just below core diameter, then filing the diameters down and producing cutting edges, as at C. The tool for slide rest use is filed to the shape and angle shown (with clearance for cutting) from a circular blank, using a plate gauge filed to angle from a nut. This tool is mounted by its square shank to the slide; the other is fitted in a holder in th tail-stock, as at *D*. In each case, the work is indexed to six positions for planing.

Pressing methods for making spanners from tubing (or from rod drilled and turned to wall thickness) require a punch and die-blocks, as at *E*. The punch can be mild steel hexagon rod, tapered and casehardened, or silver steel rod hardened and tempered. It is driven into the tubing, which is fitted in the die-blocks and squeezed in the vice. In commercial sizes, the blocks can be tapped to mount in the jaws and the tubing heated for squeezing.

Pressing methods may also be employed for truing stretched open-spanners, as at F, using mild steel V-jaws for the vice. Carbon steel spanners can be heated red and trued on a bolt head; then cleaned up by filing, hardened, and tempered to blue-purple.