Ways with chucks

THE standard mounting for a chuck on a lathe is a backplate screwed on the spindle. To change a chuck, you unscrew the mounted one. On many lathes, particularly those employed on production work, this chuck is a large, four-jaw independent one.

Taking it off and fitting a small three-jaw type is a procedure that is not always relished; and as Bert, a tool turner friend of mine, is firmly convinced, there are advantages in holding the smaller chuck in the larger one.

Interesting as life always has been to him, there used to be times when he found it exasperating. How often it happened that, as soon as he had

By GEOMETER

put the big chuck on to his lathe, along came the foreman with an emergency job that required the small one!

Then one day Bert came across a thick ring of cast iron which he machined on the faces and the periphery. At the finish he had a flange larger than the body of his small chuck, which he mounted using sunken screws. After that, when a small job came along and the large chuck was fitted, he mounted the small one in it, pressing the flange up to the face and truing by the jaws.

This method has the further advantage over a normal mounting for a self-centring chuck in that you can counteract wobble on the work by adjusting the jaws of the independent chuck; whereas, with the self-centring chuck mounted by a backplate to the spindle, you are forced to use packing or make a split bush.

It is a principle that can be recommended for mounting a drill chuck, which is normally fitted by its taper shank in the spindle. Unless such a chuck is a precision type in mint condition, you may find that, mounted in the spindle, it grips small work with a wobble that cannot be corrected.

By using a sleeve to mount the drill chuck, as at ***A, you*** can adjust the independent chuck so that the work spins true. The sleeve you can machine from mild steel rod, first drilling through, then boring with a tool from the angled topslide.

Mounting a self-centring chuck by other means than its orthodox backplate on the spindle has advantages for machining parts with an off-set. Here the principle differs from that when the work is offset in the independent chuck, for with the jaws of this converging to the centre, there is a limit to the eccentricity that can be obtained on round material.

By mounting the self-centring chuck eccentrically, its jaws centre normally on the work, which is given the required off-set. This is shown at ***B,*** where the chuck is on a faceplate. A balance weight should be fitted when the off-set is considerable. You can machine small crankshafts and eccentrics on this set-up.

In normal use, a lathe chuck is a revolving vice, the independent type being specially adaptable to work of irregular shape. This indicates possibilities for its use as a special machine vice on substantial drilling machines. A driving plate, fitted by a threaded stub, as at C, makes a firm base for the chuck. The stub can be an exercise in screwcuttino. using soft material like brass, aluminium or duralumin. Make the threads a reasonable fit with a smooth finish.

For certain milling and shaping jobs, a chuck which is normally mounted by its backplate must be held securely. Back gear can be engaged as well as single speed. but you usually find that the work is not in the correct position. With the device at ***D, you*** can fix a chuck in any position.

Make a pair of blocks, using aluminium or duralumin, to grip the boss of the backplate, and mount them between mild steel bars, one each side of the lathe bed, with three bolts made from mild steel rod.

To bore soft jaws-with which some self-centring chucks can be fitted, each should be drilled and tapped for a clamp, as at ***E.*** Then you can apply pressure to prevent movement.

Diagram F shows how you can set up a worn chuck jaw for grinding with a cupped wheel. Fit a toolmaker's clamp and clock it true with the jaw in the chuck. Mount the jaw on an angle plate on the vertical slide, and clock the clamp true again, as X, before removing it. ❑