

HOLDING and INDEXING

**WORKSHOP
and TIPS HINTS**

CHUCKS By GEOMETER

WHEN a lathe is the only major machine tool in a workshop, there are often times when it must function in ways other than those originally intended. This is particularly so in model engineering with the workshop built around the lathe. Certain types of milling, planing, grinding, lapping, indexing, and so forth, have all to be done on the lathe in the absence of specialised machines or equipment.

Many non-standard operations, based on milling or boring machine practice, are performed with a cutter or tool rotating in a chuck or holder, working on a component mounted on a slide or saddle. All told, they form an extensive and varied group, which greatly extends the scope of the lathe.

A further spread of operations follows when components (on which turning operations have perhaps already been performed) are held stationary in the chuck or on the faceplate or angleplate for machining or grinding with slide-mounted heads or attachments.

Locking devices

For this group of operations, the chuck or faceplate must be held firmly often in some particular angular relationship with features already finished; accurate resetting or indexing is frequently required. Examples are found in machining keyways, teeth of gears, the tangential flanks of cams, and other angular flats. Even for certain filing operations on the lathe, it can be an advantage to have the chuck firmly held against rotation.

On a flat-bed lathe, a simple way of securing the chuck is as at A. A piece of suitable angle-iron or rectangular-section steel, bent at right-angles, is drilled through one flat for bolting to the bed, and through the other for attaching a clamping plate by a bolt. Packing pieces can be interposed to the jaw of the chuck; and if they are rounded at the jaw ends, and the angle piece has a slotted hole for sliding across the bed, a small amount of rotational movement

is possible for the final adjustment of work in the chuck.

On a gap-bed lathe, a way of securing the chuck is as at B. Two pieces of rectangular steel are each bent to extend from the jaw to the bed. Then they are drilled for a clamping bolt, which can be fitted with distance pieces if clearance is restricted. The material can be bent in an old vice, or on a small anvil if the section is heavy and must be heated to red. With a heavy section, each piece can be drilled and tapped at the lower end for a screw to the bed to permit angular adjustment.

Both ways of holding a chuck apply whether it is a three-jaw or four-jaw, and so admit of three or four basic settings—with, of course, a check on work from a square or surface gauge on the bed. For holding a four-jaw chuck on a flat-bed lathe, an alternative way is as at C, with a pair of jacks on a flat plate. Four basic settings can be made, with delicate final adjustment; but care is needed to avoid slightly jacking the chuck if this would be detrimental to accuracy.

When a chuck cannot be held by its jaws, or a faceplate must be secured, a clamp, D, can sometimes be used on the boss of the backplate or faceplate. Two aluminium blocks can be easily faced, drilled and bored, and two flat bars bolted up with an adjusting screw in each.

Either a three-jaw or four-jaw chuck can be held behind its key sockets by a band which can be anchored to the bed of the lathe, E. A bar, clamped to the bed, mounts a long stud through a block attached to the band by countersunk screws—or by silver-soldering or brazing. Thus fine settings can be made.

For indexing from an initial setting, an index plate, F, can be made from sheet steel or iron to rivet to a band clamped to the flange of the chuck backplate. Then the stud of the holding device can be provided with a pointer. Dividing of the index plate can be done in any of several ways; for turning it and cutting out its centre, it can be clamped to a plywood backing on the faceplate. □

