TRUE and ECCENTRIC CHUCKING

By GEOMETER

THE small inaccuracy of the standard self-centring chuck, after a period of use, is a fact known to all experienced turners, who, by various ways and means, prevent its entry into components-where, obviously, it could lead to trouble in assembling.

One way of countering inaccuracy is to " machine all over at one setting " -or at least all critical diameters and faces. Where this is not practicable, because components must be unchucked, there is the choice for resetting them by such means as centred mandrels, stub mandrels, split bushes, and clamps with loose caps. There is, too, the device of soft jaws for a chuck, which can be machined to grip particular diameters.

It can be claimed, of course, that' the standard self-centring chuck makes a good showing in view of its construction and the vagaries of its use-gripping diameters which may be long, short, rough, smooth, round or only allegedly so.

Its jaws resemble cantilever brackets, on which there is always the possibility of tipping under pressure; while the scroll which effects their movement, if originally accurate, sooner or later develops strain or wear-induced errors.

Special types of chuck greatly reduce if not totally eliminate the possibility of such errors; the type of chuck which has a concave face, jaws with inclined guides that obviate overhang, and a scroll on which pitch error is reduced as the cosecant of guide inclination.

For the standard self-centring chuck, however, overcoming its inherent or acquired errors requires no more than a mounting on the flat face of a faceplate, where it can be adjusted, instead of on the spigot of a backplate, where it must run concentrically. Gripping a given diameter of bar, this can be set to run truly with the chuck-holding screws temporarily loosened to permit of adjustment.

If required, a piece of packing can be used on each holding screw between the chuck and the faceplate; and if there are three holding screws, two holes are drilled in the faceplate, or two slots cut-which latter admit, when occasion demands, of specific eccentric chucking.

An occasion is as at *A*, when the crankpin of a one-piece cantilever crankshaft is to be machined as the last of a series of straightforward operations. The first is to machine the mainshaft with the material between centres, or chucking by the web end, supporting the other by the tailstock centre.

Following this, the crankpin centre can be marked in vee-blocks, centre-punched if required, and brought to spin truly by off-setting the chuck in which the mainshaft is gripped-directly in smooth jaws, or with protective packing interposed.

Another occasion as at *B* is drilling, reaming, or boring, material for an eccentric. With a mounting initially in vee-blocks, eccentricity can be marked as for the crankpin, using a surface gauge set down top-to-centre for the main centre line, and up from this to point X for throw, which can be centre punched and set spin truly. At the finish, a piece of material can be turned as a setting-up dummy for future occasions.

Much superior support to that provided for a multi-throw crankshaft by throw plates and a between-centre mounting follows from an eccentric chuck mounting, as at C, the free end of the shaft carrying a throw plate with a plug running in a bearing attached to a pad centre. First and subsequent setting-up can be done from this throw plate.

In making, it is bored, cross drilled, split, and the throw marked. Then the plate is clamped on a stub in the chuck to bore for its plug, which, at any subsequent setting, must run truly.

Resetting for the second of a shaft can be done as at *D*. Before unchucking, points Y-Z on a bar U-bolt clamped to the centre web should be brought horizontal with the lathe bed, and the faceplate located-as by a bar to the leading screw.

Freed in the chuck, the shaft can be turned to bring points Y-Z level again, then the chuck retightened, and the throw plate turned for its plug to run truly. ❑