Adaptations of the chuck

IN two earlier articles on chuck mountings, I have described ways of using the four-jaw independent chuck as a special vice on the slotted cross-slide of a lathe, so that work can be held for various operations which would otherwise require a vertical slide and machine vice.

I mentioned, too, how the chuck can rotate in its split clamp mounting, to form a revolving steady for rough bars and irregular sections for which the ordinary fixed steady is useless.

From what has already been written, it may be seen that there is plenty of scope for development and adaptation of the basic methods. Keen, contriving machinists may well be able to work out many variations, as solutions to their own particular problems.

Whenever a chuck is used as a vice in a split mounting, success depends on a satisfactory hold on the boss of the chuck backplate. It is advisable for the backplate to have a long boss, and even with this there is a loss of effective length in the nuts or the heads of the setscrews which secure the chuck to the backplate. This is shown in the upper part of diagram ***A.*** where the cap of the mounting is away from the flange of the backplate. By substituting countersunk screws, you can secure maximum hold, as in the lower part of the drawing, where the base is against the backplate.

In addition to this method-which I recommend-the boss of the backplate can be extended by a plug or short mandrel: and advantage can then be taken to provide indexing from a gear or a lathe change wheel. This is a variation on the suggestion I made in the second article for graduating the edge of the chuck backplate to obtain angular settings quickly.

The idea put forward is illustrated at B, where a flanged plug is secured by a stud to the backplate. As can been seen, this plug is a piece of plain turning, with three diameters on which care is essential. We have, first, the short spigot diameter which fits tightly in the thread-relief recess in the rear of the backplate: secondly, the outside diameter which is the same as the chuck boss, or 0.001 in. less, so that the mounting holds on the boss; and thirdly, the diameter on which the change gear is mounted.

All diameters must be square with adjacent faces: and the cap and base of the split mounting must go without shake between the flanges of the backplate and plug. This ensures an accurate mounting for the chuck.

In machining, the plug can be turned between centres with the diameters concentric and the faces square-although there is another way which I consider is easier when the material is only slightly overlength.

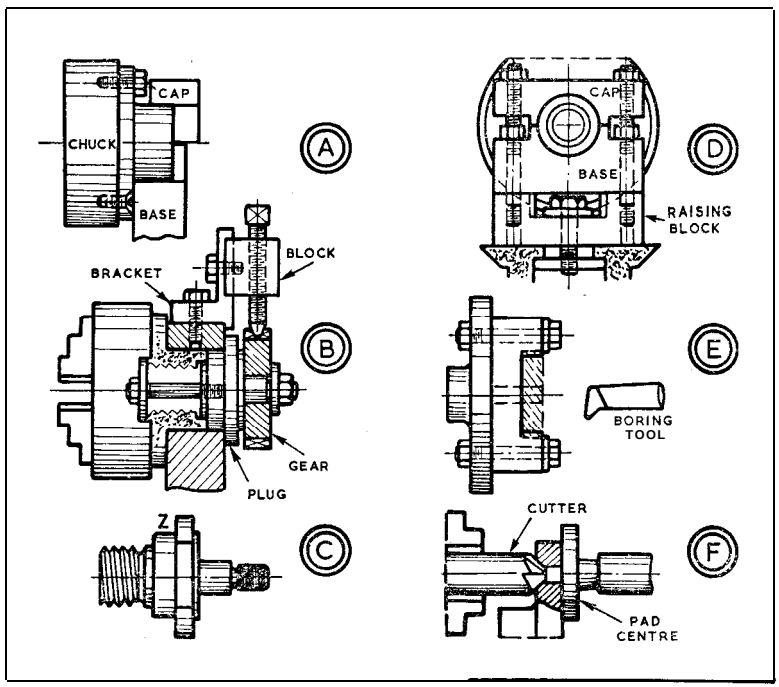
By the alternative method, you rough-turn where the gear will be fitted, and rechuck by this diameter to turn all the others on the opposite side. Then you bolt the plug to the backplate, and mount this with packing to the faceplate, to turn the diameter for the gear and make the thread.

The detent for the gear is as shown: a bracket to the cap of the split mounting, a sliding block for gears of different size, and a taper-ended screw.

Diagram C shows an alternative plug which is a short duplicate of the spindle nose to screw into the backplate. Here diameter Z is 0.001 in. less than the backplate boss. You can machine this plug on the same two set-ups as the other, first in the chuck and then in the backplate.

Another adaptation of a first idea is to use the chuck as a steady, though mounted on the bed of the lathe instead of on the cross-slide. It is done as at ***D,*** where long studs screw through the base into a raising block which, in turn, is bolted to the bed. You can easily machine such a block from duralumin or aluminium-alloy, cutting down the centre with a boring tool, as at E, and securing the work by a strap over this area to face the ends.

For countersinking holes in a backplate, you can cone the end of silver steel rod in the chuck, file four teeth, and harden and temper to make a cutter. Use the thing as at ***F,*** feeding the backplate with a pad centre in the tailstock.



* ***To be continued next week***