A small lathe VERTICAL SLIDE

MANY milling operations in the lathe can be performed with the work mounted on the topslide, or on the cross-slide table, or on an angle plate attached to this table. They are operations involving lines of traverse and feed into which height adjustment does not enter, and for numbers of them an initial setting of work at correct height is essential. Naturally, this is a process requiring time and care; given means of height adjustment, it is greatly expedited.

By GEOMETER

There are other operations, in which height adjustment is required as part of the machining procedure. Widening the slot in a piece of material by machining along one edge with an end mill is an example; and for such operations as this, a vertical slide on the cross-slide enables the material to be raised or lowered as necessary. The same is true when all that is required is an initial height setting of work in relation to mill or cutter. The vertical slide admits of quick adjustment.

Usually, a commercial vertical slide is made from castings, and often has provision for tilting from vertical for angular feed. The simple non-tilting slide comprises two castings: one for the base and pillar forming the guides, the other for the table. The tilting slide consists of three: one for base and pillar; one for the guides; the third for the table. Both tables are slotted for square-headed bolts.

For a small lathe, a simple non-tilting vertical slide can be built up from mild steel bar and flat material, as at ***A, B*** and C. Certain machining operations-such as those on the guides and table-which can prove to be problems, are thus avoided; for the flat faces of the material serve as guides, and tapped holes in the face of the table can take work-holding studs, obviating the need for tee-slots.

The base can be a disc cut from round bar, or sawn and turned from flat material then bored to locate the machined end of the square bar used for the the pillar-for that is the section combining the advantages of simplicity, rigidity in all directions, and ease of mounting to the base-by brazing or welding.

The square bar can be faced in the independent chuck-or if too much overhang is involved, it can be filed reasonably true for centre positions to be located with depth gauge and scriber, or on a faceplate using a surface gauge. Then, with centres drilled, support can be given from the tailstock for facing the ends. Even with considerable overhang, drilling right through can be done, with care, operating from each end. For the major part of the distance the hole should be cleared for the feedscrew -which can be of vee or Whitworth profile.

Four bolts hold the table to side plates and a backplate-fitted to slide on the pillar. These pieces can be faced in the independent chuck, or by mounting each on the topslide, or on a block on the cross-slide table, and using a face mill to true it. The **width of the side plates should be the same as the pillar; then working clearance can be given by shimstock** or paper at the faces up to the backplate.

One side plate can be fixed through close fitting bolts and holes, and the other made adjustable through clearance holes, a small bar opposite each bolt being provided with grubscrews. Holes in table and backplate take the turned ends of the bars.

Other details are the pressure screw with a flange to abut to the thrust plate, and a taper-fitted ball handle with a collar between it and this plate to eliminate end play. Holes X in the face of the table are tapped for holding studs.

For the pillar to be square with the base, the base should be faced on a set-up as at ***D.*** A centred plug, or centred long bolt, stepped under the head., should be fitted; then, adjusting the jaws of the independent chuck, positions Y and Z on two faces at right angles should be brought parallel with the lathe axis. I3