Grinding on the bench drill

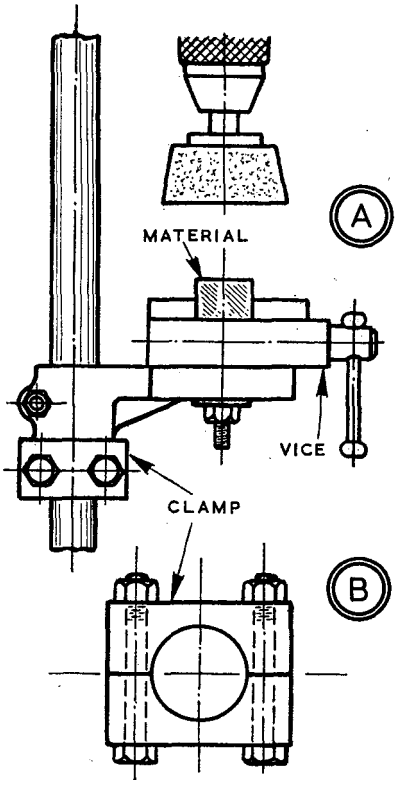
WORKSHOP HINTS and TIPS

By GEOMETER

DESPITE its simple construction tion, it is surprising how frequently the ordinary vertical spindle surface grinder is brought into general use, and how keenly it can be missed when it is not available. It is so quick and easy to go to the grinder to do what is necessary when two or more pieces of packing of the same thickness are required; when a square tool bit-hardened, of course, is oversize and too tight to slip properly into its holder; or when a disc or collar has faced flat one side, but parted off roughly the other-just a few examples of the many possible.

The uneven, out-of-parallel material, oversize tool, or defective part can be mounted or clamped on the slide-often held by magnetic chuck the cup-type grinding wheel started, cut put on, and the job finished often before it could be chucked in a lathe or set up on a shaper or milling machine. The general layout of such a grinder is that of a pillar drill but much more massive, with fine vertical feed and the horizontal slide moved through rack and pinion from a capstan handle.

Because of this similarity, it is clear that a pillar or bench drill must have possibilities in the direction of a surface grinder for the occasional job and small, simple parts. It has a fair standard of precision, once the two main problems have been overcome-the vertical feed and the means for moving the work to and fro beneath the cup-type grinding wheel



The grinding wheel can be mounted on a mandrel as large as the chuck will comfortably accept and with minimum overhang to ensure rigidity. For this reason too, the spindle carrier or quill should not be unduly extended. Downward. feed or cut, can be regulated from the stop employed_ when depth. drilling, a device which may be improved in facility and sensitivitv and whose use overcomes one problem. The problem of moving the work to and fro may be solved in either of two ways-swinging the table round the pillar, or constructing a simple reciprocating slide.

Swinging the table

To swing the table, the arrangement and fitting can be as at A and ***B.*** The table should abut to the top of a fixed clamp, which can be fitted and adjusted for height as required, and the normal table clamp set for a moderately easy but shake-free swing. The bottom of the table boss must be true and can be made so by machining with the table clamped face-to-face on the lathe faceplate. The halves forming the clamp may be dowelled, bored, and the functional face trued at the same setting, paper between the halves during the boring giving a "nip " when the clamp is put into use. Given a dial indicator to mount in the chuck, the table top can be tested for truth and the vice for holding material, packed level.

A rack-and-pinion operated slide easy to make from flat rectangular stock using countersunk screws can be as at C and ***D,*** with dimensions adapted as required. The bed portion to bolt to the drill table consists of two pieces ***R,*** Rl, spaced by centre block S (aluminium, say, drilled for holding bolts), and end pieces T. The bed should be built on a flat surface, centre spacing and end pieces faced and clamped between the sides for drilling and tapping holes.

Drilled and reamed holes accept the pinion shaft U, whose outer end can be drilled cross-wise and fitted with tommy bars, while pinion V may be soldered, and pinion Vl also soldered or pinned with the bed assembled-teeth phased to the racks. The flat top W for mounting work or vice has each end side pieces X, Xl, with plates at the bottom Y, Yl and racks Z, Zl, along the sides. ❑