A setting-up SURFACE GAUGE

By GEOMETER

ALTHOUGH the scribing block or surface gauge is intended primarily for marking off on the surface plate, often it can be usefully employed in setting up work or tools on the lathe.

Typical jobs are truing bars in the independent chuck, adjusting scribed circles to spin truly, and setting crossed centre lines exactly to the lathe axis. It can also be used for testing spinning truth on the face of a part, as when a wheel casting is being set up in a chuck; and there are numerous occasions when the height of a tool needs to be verified.

An advantage of the scriber, or pointer of a surface gauge, over a tool is that it is not rigidly mounted, and so does not mark the work being trued. Other factors in its favour are the ease and speed with which it can be moved across work (much faster than traversing a tool), and the facility with which the point can be adjusted up or down to scribed lines -with the spindle and work being turned through 180 deg. for checking.

Lack of space is the usual objection to the use of a surface gauge on a lathe, the bed of a small lathe being so narrow, and that of a large one having widely-spaced guides or inverted vees.

On a large lathe, the problem can be overcome by bridging the bed with a flat plate, while on a small lathe, the solution is a surface gauge with a long base A. This takes up little room between the headstock and the saddle, and is quite stable even on a small lathe-whereas a separate plate and heavy based gauge are out of proportion on a narrow bed, and easily upset in use.

The base can be a casting obtained from a simple pattern, but a piece of mild steel bar requires less work for the faces and sides already being reasonably true. On this, the ends can be faced by holding one end in the independent chuck, and centring the other for support from a half centre in the tailstock.

On a large lathe, of course, the bar would merely be held in the independent chuck. The underside or working face can be filed and draw-filed true, although it can be machined on the faceplate by drilling and tapping holes for mounting by studs and nuts. In a machine shop, shaping would probably be the method (followed by draw-filing) while surface grinding would give a one-operation finish.

The pillar can be from silver steel rod, which is perfectly parallel, so that the clamp will slide smoothly and grip firmly. Screwcutfing the thread to about three-quarter depth reduces work for the die, and promotes accuracy if the finishing has to be done by a hand die-holder. The pillar can then be fixed in the tapped hole in the base by a locknut ***B.***

The clamp C follows normal design, containing a bolt with a sleeve for the scriber, all being held by a knurled nut. The bore of the clamp should be accurately machined or reamed to slide smoothly on the pillar-then minimum contraction is needed to hold, and the faces are not drawn out of parallel.

The hole for the bolt should also be accurate, and it is a great advantage for the bolt to be fitted with a D-washer, so that it does not slacken as the scriber is tapped to set it.

Anyone not able to slit the clamp on the lathe can use a hand slitting saw against a guide block ***D. The*** D-washer is best made from strip metal, using taper drifts for rough shaping, and a punch for finishing ***E,*** both from silver steel rod. The strip should be heated red for driving the drifts in, then filed flat and carefully punched-old. Cut roughly to shape, D-washers can be finished on a mandrel; while the bolt and sleeve for the clamp can be faced flush in the chuck in a bush ***F.***

Silver steel scribers can he pointed by filing, bent heated to red, and hardened dipping in water--then polished and tempered. A flat ended rod, however, is best for seeing the gap X when setting up round material. El