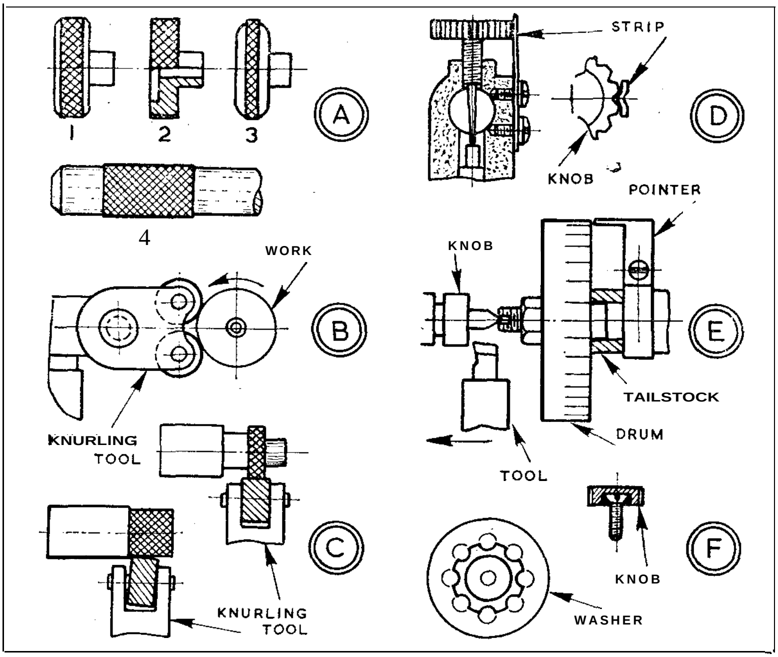
Knurled and other handles

By GEOMETER

THE smoother a surface is, the less friction it affords against sliding movement ; and small knobs, terminals, the handles of certain tools and instruments must be provided with a means for obtaining a grip, either to effect rotation, or merely to hold firmly -perhaps when there is a trace of grease or oil on the fingers.

The usual way of doing this on knobs and lengthy handles, such as the examples at A1, 2, 3, 4, is a diamond knurl which can easily be formed by a wheeled tool in the lathe; though a straight knurl of parallel serrations can be provided in the same way for narrow knobs. Special knobs and lengthy handles can be furnished with parallel serrations by indexing and planing operations.

There is, of course, nothing complicated about a knurled surface, and it is often subsidiary to the main function of a tool; but it has some importance. A high standard may not be necessary or even expected on minor commercial items. On the other hand, there would be no doubt about the choice between two micrometers, for example, one with typical knurling, and the other on which it was well " chewed "-showing that in production something had not gone as it should. In the same way, value may be lost from otherwise excellent work.



Often knurling is one of the last operations: but in special cases or uncertainty, it should be one of the early ones. Then if anything goes wrong there is little loss. It requires heavy pressure on the work, and so is best performed with work held close in to the chuck, or with one end in the chuck, with the tailstock end deeply centred. If a wobble results, the work can be trued for later operations. Parts which are to finish as thin shells should always be knurled before the inside is finished -to ensure the inside diameter is not affected.

For a diamond knurl, two knurling wheels with opposite spirals are required mounted in a floating head, as at B. The teeth on the wheels must be sharp and clean, the bores well-fitting on the pins, with the jaws of the head giving support each side. A narrow knob or handle is easiest on which to produce a good knurl, as the wheels can be run straight on, as at C, right. Any slackness on a wheel, allowing it to tilt, left, is almost certain to cause trouble on a long knurl.

The teeth of knurling wheels are evenly spaced, and as the knurl is formed, engage the work after the style of gear teeth. Thus, the diameter of the work has an influence; and near any particular size, a few tests on different diameters will give the one producing the best knurl. This is to say, unless diameter is reasonably correct, the knurling wheel will end on a " half-tooth " and this will start a defective or "little" knurl and break up the full knurl. Chips may then be caught up and cause further damage. Running a knurl down beyond the proper diameter (because of a fault) also tends to defective results. Trial pieces for starting are advisable for lengthy knurls and important one-off jobs.

On knobs or handles to be indexed for adjustment, parallel set-rations are generally preferable to diamond knurling. They ensure a more definite setting against the edge of a springy strip used to retain the setting, as in the case of a taper jet needle, as at ***D.*** Hold is given by slightly bending the strip one side or indenting centrally with a chisel.

Such serrations can be planed with a tool mounted sideways on the slide, using an indexing device as at ***E*** when no other is available. This consists of a wood disc or drum turned on a bolt to a diameter to take a strip of evenly-marked paper right round-held by transparent tape. The end of the bolt is slotted, and the end of the work filed to a chisel edge. A simple pointer is fixed to the tailstock barrel.

On a larger handle, serrations can be provided by drilling the edge with a suitable washer fitted, as at F; and a very small (brass) knob can be made with a threaded (steel) shank by sweating in a suitable screw as shown