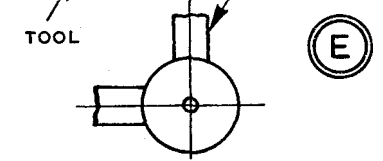
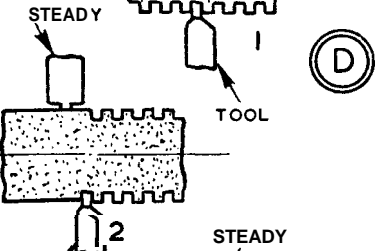
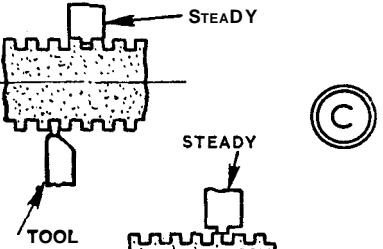
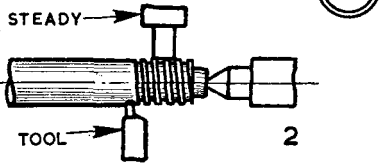
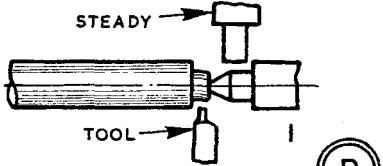
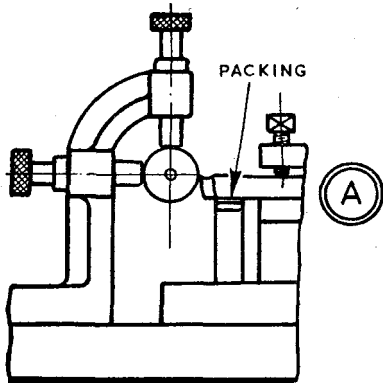


By GEOMETER

Screwcutting long threads



LONG types of screw of square-thread or Acme form, for use as leadscrews, feedscrews, jackscrews-and for many similar purposes-present problems of production which do not occur in shorter varieties of screwed components. With the latter, there is usually no problem of support when the work can be held in a chuck or mounted on the faceplate; and even if the tailstock has to be used, a tool set-up can generally be arranged without difficulty.

It is otherwise with very long threads as, apart from anything else, the length demands use of the travelling steady close to the tool position to obviate spring and wobble with the work pushing away from the tool on a normal depth of cut, and digging in when the cut is increased.

That is to say, as in ordinary turning, functions of the travelling steady are to keep the work turning truly, and to provide the rigid backing necessary to control depth of cut. On a long screw too, with the tailstock close up, a fairly considerable forward overhang of the tool may be necessary for the topslide to pass along by the tailstock for beginning the cut. Because of the rather heavy cut normal for broad threads, the tool would be subject to spring and chatter, unless supported with packing between it and the cross-slide, as at A.

Position of steady

Setting of the steady in relation to the tool can be important; and normally the two should not be directly opposite, as there is a good chance of swarf from the tool running round and getting between the work and the steady jaws-which would have the immediate effect of greatly increasing the depth of cut and possibly breaking the tool. Hence the steady is usually somewhat before or behind the tool.

Of course, a position before the tool is not practicable if the thread diameter is less than that of any

plain portion or boss further along, as there would be a shoulder obstructing the steady jaws before the tool arrived at the end of the thread. With the steady positioned behind the tool, the tailstock alone supports the work at the start of the cut, as at B1; then, after the first few turns, the steady comes into action, as at B2, providing support to the end of the cut.

A number of cuts must be made to bring a square or Acme thread to depth, and after the first one the steady jaws are running on reduced support, touching only at the original diameter. With several cuts on long traverse, this can result in wear on the steady Jaws, which become grooved from working always in the same relationship to the tool, as at C. It may be noticed by irregularities or difficulties in the cut, and by a "clicking" as the saddle is returned. On a one-off job, the effect may be slight and not occasion difficulty, though there are often points to watch.

Alteration of tool

Any alteration of the tool sideways, such as if it has to be removed and sharpened (which is best avoided, if possible, in the course of cutting a square-thread screw), may result in very thin edge support, as at D1, with impending variations in cut. If the steady runs before the tool, there will almost certainly be variations in cut with any type of grooving of the jaws. With the steady providing proper support, at position D2, there would be slack support on the thread; while firm support on the thread would give extra depth of cut at the position shown, with the possibility of tearing the work, or breaking the tool.

Given that the tool cuts freely, many difficulties can be avoided by ensuring the steady jaws are true, and bed on the work to maximum curvature, as at E. This demands preliminary machining, and truing when necessary, with a fly-cutter bar of work radius, adjusting the jaws and traversing the saddle, as otherwise the flat ends of the jaws would wear ridged,