Screwcutting tool feeds

WORKSHOP HINTS and TIPS

By *GEOMETER*

Success in producing good threads with a single-point tool (screwcutting in the lathe) depends on quite a number of factors-on the condition of the lathe, the setting of the tool, the type of material, and, by no means least, the manner or sequence in which the cuts are taken.

To obviate shake and endplay, the lathe spindle bearings and thrust must be in proper adjustment. Indentations of centred work should be clean and accurate, and sufficiently large for firm support and resistance to wear -on the tailstock centre, which should be constantly lubricated and from time to time checked for setting. The cross-slide should be adjusted to noticeable (but not heavy) friction against the feedscrew; while topslide friction should be fairly heavy to prevent inadvertent movement. Saddle and leadscrew must also be well adjusted.

Using a gauge, as at A, tools can be checked as they are ground to shape and given clearance, and as they are afterwards set up. Holding edge W-WI to the face of a chuck or the work, an internal tool can be checked for setting; while an outside one can be verified in a similar manner by presenting edge X-Xl to the work. Such a gauge has vees of 60, 55 and 47-1/2 deg., covering metric, US, Whitworth and BA threads. A single face at 14-1/2 deg. provides for checking and setting tools for Acme and standard worm threads.

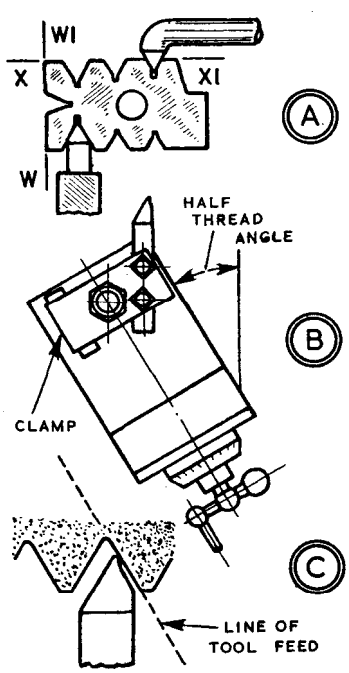
Given that a thread is tine pitch and consequently shallow, no difficulty is likely to be encountered merely by taking a series of cuts with straight in-feeds, whatever the material. Again, should the material be brass, phosphor-bronze, or cast iron, all of which chip or flake as they cut, or aluminium alloy which cuts easily, unusual difficulties are not likely unless the threads are coarse and deep. But any steel or tough material, even with threads of quite small or moderate pitch, will almost certainly give rise to dtfficulties-roughness, digging-in, stripping-owing to the converging flows of metal as the thread deepens.

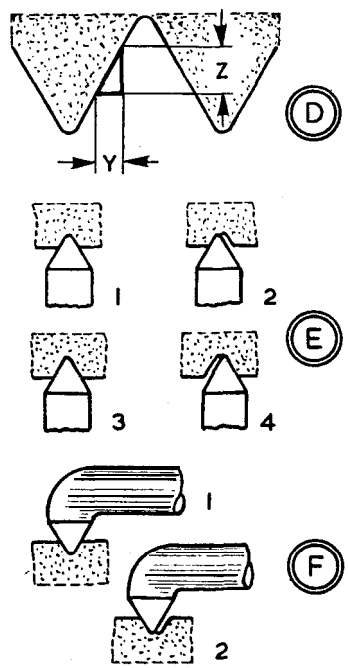
The remedy, of course, is to avoid this self-obstructing flow of swarf, by arranging for the tool to cut, wholly or at least substantially, on one edge at a time, when the swarf runs off as a-single flowing ribbon, or in regularly-twisting and breaking curls. That is the merit of a topslide setting at half the thread angle, as at ***B,*** when the tool is fed straight down one flank of the thread, as at C.

Such an arrangement, however, contains a number of drawbacks, and has no advantage over a regular sequence of cuts. The " generated " flank of the thread is rough and requires finishing by a backcut. With a whole-form tool,. there is still a risk of a dig-in at times-obviated by using a relieved tool as shown. Tool overhang is fairly large, and a special clamp may be needed. The slide may obstruct either the chuck or the work, and double or multiple-start threads can be finished only at some risk of their being out of accurate phase. Depthing requires use also of the cross-slide.

A regular sequence of cuts is based on the principle at D. On one flank of the thread, a cut of equivalent depth can be obtained by a topslide feed Y, or a cross-slide feed **Z.** Thus, a cut Y will be on one flank, and the cut **Z** following will be of the same depth on that flank, and cutting also on the other flank at the bottom, bringing the tool into the full form of the thread.

Proportions vary according to thread angle, and may be held from zero on the micrometer collars. Taking Z as 0.100 in., Y is 0.060 in. for metric and US threads; 0.052 in. for Whitworth; and 0.044 in. for BA. A first cut taken as ***El,*** can be followed as E2 (Y), then as E3 (Z); and a back-cut E4 will give clearance and finish, for beginning again. The same is true for internal threads, as at F1 and 2. ❑





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