

# Picking up screw threads

By GEOMETER

**W**HETHER or not threads will pick up with facility in screwcutting depends on their pitch (reciprocal of their t.p.i.), and on the pitch of the leadscrew. The process may be simple where the lathe has a screwcutting dial, but not all machines are so fitted, and their use without costly mistakes calls for a return to first principles. Of course, if the thread to be cut is short and the lathe can be reversed, the answer may be to keep the leadscrew nut engaged.

Ordinarily, however, other methods are necessary, and the proper picking up of threads, even those with "round" numbers of t.p.i. depends on the leadscrew of which examples may be found with 4, 5, 6, 8 and 10 t.p.i.

Taking as examples, threads of 16, 20, 24, 28 and 30 t.p.i., threads 16, 20, 24 and 28 will pick up anywhere on a leadscrew 4 t.p.i.; threads 20 and 30 will pick up anywhere on a leadscrew 5 t.p.i.; threads 24 and 30 will pick up anywhere on a leadscrew 6 t.p.i.; threads 16 and 24 will pick up anywhere on a leadscrew 8 t.p.i.; and threads 20 and 30 will pick up anywhere on a leadscrew 10 t.p.i. In each case, the others would require care.

The reason is as follows—with a leadscrew 4 t.p.i. as the example. In making one turn, the leadscrew advances the saddle one pitch (1/4 in.) and in that distance, the work must have made a number of whole turns—four for 16, five for 20, six for 24, seven for 28 t.p.i. In the case of 30 t.p.i., there would be seven-and-a-half turns of the work; so engagement anywhere might be the half-turn

wrong—and the same for other leadscrews and threads which do not work out completely.

For threads which will not pick up anywhere and are odd whole numbers of t.p.i., the simplest method is to work to the nearest whole inch on the lathe bed, on the following principle. In turning its full number of t.p.i., a leadscrew advances the saddle 1 in., and any thread with a whole number of t.p.i. completes whole turns. So, stopping the lathe and moving the saddle back any complete inch, the thread will automatically pick up again.

Having completed the first cut, the lathe can be stopped, chalk marks made on chuck and leadscrew, as at A, and a pencil mark put on the bed ahead of the saddle. Measuring back on the bed to a complete inch over the work, another pencil mark can be made, the saddle returned to this, and the leadscrew nut engaged.

## Multiple start thread

In the case of a half-thread, it is necessary to work to the nearest 2 in. on the bed, since that is the distance needed to bring such a thread, 43 t.p.i. for example, out to whole turns (nine). In the case of a quarter-thread, such as 5-1/4 t.p.i., it is necessary to work to the nearest 4 in., to bring the thread out to the nearest whole number (21).

On a multiple-start thread, it is the lead which is the effective pitch for screwcutting, and the pitch is a fraction of the lead. It may be necessary to begin such a thread at a definite position, as at B, where there is a hole in the side of the round nut. With the leadscrew nut engaged, the spindle is turned to bring the feature into desired attitude; then the screwcutting tool is advanced by top-slide feed to position—perhaps the face of the nut.

Individual threads of multiple-start type can be spaced in two ways. In the case of a double-start, as at C, one thread is cut at the first stage; then working the same, the tool is advanced a whole pitch for the second stage, using the micrometer collar on the top-slide. Alternatively, as at D, where X is the spindle gear, Y the intermediate, and Z the leadscrew gear, the gear train can be disengaged, and the spindle rotated a half-turn from one mark to the other on its gear.

