Points on TAPPING

GIVEN foresight and care, few serious risks attend the tapping of holes, though as a rule the smaller the tap the greater is the respect accorded to the job, even by the most experienced worker.

Of course, not every risk can be eliminated from tapping. It may be necessary to tap a tough material like stainless steel. A hard spot may be encountered in cast iron. The taps used by an amateur may be somewhat worn, having never been the equals of those used in commercial production. When the chances of breaking a tap are increased, extra care goes a long way towards getting the job done without mishap.

By GEOMETER

Choice of taps can be governed by foresight of one's requirements. In each size, as at A, there are three types: taper 1, second 2, plug 3. The taper tap is suitable for through-holes in hard materials, or for ordinary materials if the tapping drill is small, when the taper part has a reaming action. It cannot be used, however, for blind holes 4. So normally the second tap (which has a few threads tapered) is chosen for starting to tap holes. Should they be through-holes, they are finished with this tap-and if they are blind holes for studs, they can often be finished with it. But for full depth tapping, a plug tap is needed, following the second tap, as this type cannot be used by itself. Thus, second and plug taps meet normal needs.

The principle is adhered to when economies are made by altering taps. For a one-off job with expense to be considered, a second tap can be used to start holes and tap them as deeply as possible. Then, by shortening its end through careful grinding, it can be converted to a plug tap to finish them to the bottom. In the same way, a worn second tap can be made into a plug tap. Conversely, if a few threads of a plug tap are chamfered by grinding, it can be used for starting to tap holes-which may enable a job to be done with only a plug tap to hand.

Tables give sizes of tapping drills, and not all tables agree-a point sometimes determined by the job in hand. At B, the diameter of a tapping drill should be ***V*** for threads to be full depth. The nearest drills may be slightly larger and smaller. But little thread strength is lost from a slightly larger tapping hole; and this helps in tapping hard material. If a very good thread is essential in soft material, a slightly smaller drill must be chosen.

The theoretically exact size of drill can be obtained by calculation. The pitch of thread ***W*** is the opposite of t.p.i. If 1 is divided by t.p.i., ***W*** is obtained as a fraction of 1 in. Depth X is a fraction of ***W*** according to thread form. If twice X is subtracted from the outside diameter of the tap, the core diameter (tapping drill size) ***V*** is obtained.

As at C, a tapped hole should be slightly chamfered at its end Y. This may be done before or after tapping. When a stud is also to serve as a dowel, the hole for it should be plain at the end Z. On the lathe, the operation of full depth tapping a blind hole is simplified by undercutting the end of it, as shown, with a small boring tool.

A tapping jig, as at ***D*** and ***E,*** helps in tapping full depth threads in plate, and in starting a tap squarely in shallow blind holes, as in the flange of a cylinder. The jig can be of steel, faced, drilled and tapped in the lathe, and clamped or bolted to the work, where a tapping drill locates it. Tap wrenches for home production can be as at ***F,*** one from round rod, the other from two pieces of square bar.

Lubrication helps in tapping most metals: light lubricating oil or soluble oil for steel, silver steel and brass (or dry);. the same for aluminium and duralumm (or paraffin) ; turpentme for cast iron (or dry); neatsfoot oil for stainless steel.