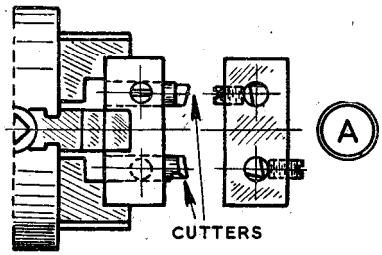
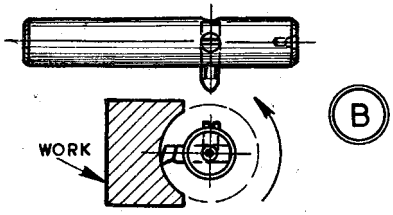
SIMPLE MILLING CUTTERS

By Geometer



A



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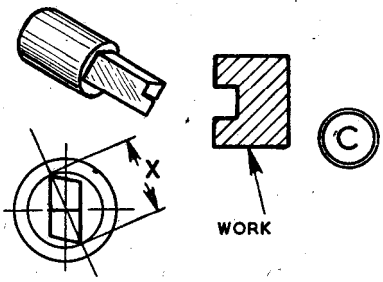

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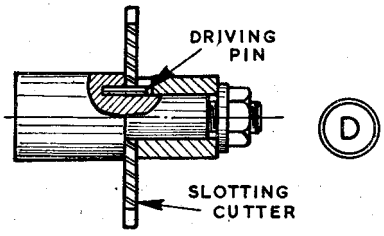

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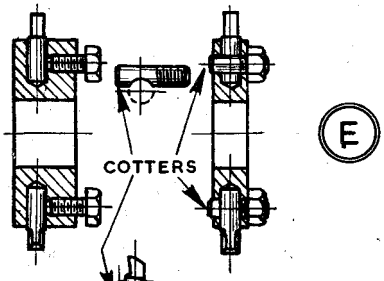
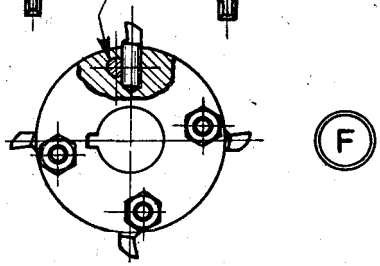


E



F

FOR a large number of milling operations, as performed by the amateur in the lathe when rate of production is not important, simple cutters contrived at very small cost in the workshop provide results equal to those obtaining from bought tools.

It is not, of course, essential to employ multi-tooth or multi-blade cutters for many milling and similar operations. With care, and by regulating the speed and feed, the same work can often be done with a single-point tool. In production work, multi-cutting-edges permit of a high rate of feed; and wear is distributed over all the cutting edges-which together mean faster production and longer runs on set-ups.

For facing operations in production work, a large end mill or slab face cutter would be used; but in lathe milling, a single-point cutter or tool as used for turning can be employed. If the surface is small, a tool off-set in the independent chuck is all that is required; and such a tool will also cut a slot.

If the surface is large, however, a holder is necessary for the tool, this being mounted in the independent chuck. In such an event, an improved double-blade cutter can be made, as at ***A,*** where a piece of rectangular mild steel has been drilled (and, if possible, reamed) to take two round tools held by grubscrews.

True setting in the chuck with the cutter tips rotating in the same plane can be easily checked by allowing the tips to scrape past a fixed bar on the slide or other mounting, Should the setting be incorrect, the holder can then be tapped or packed as required; and the cutters can be adjusted by the chuck jaws to spin on the same circle. A preliminary check for projection of the cutters from the holder can be made by laying this on its back-on a surface plate, and using a surface gauge or height gauge, over the cutter tips.

For milling soft materials like aluminium or brass, cutters of silver steel, hardened and tempered, are satisfactory.; but for cast iron and steel, cutters can be made from short pieces of round high-speed or alloy steel tools.

For milling hollow surfaces or radii, a single-point tool set in a mandrel can be used,. as at ***B.*** The mandrel should be driven by holding one end in the chuck and supporting the other at the tailstock, since a set-up between centres driving the mandrel by a carrier is too choppy and chatter-inducing. A double-edged cutter can be used on this set-up, checked for length over its tips and set centrally in the mandrel.

Small end cutters for narrow slots in work can be made from silver steel, as at C. The piece of rod should be turned to the diameter, X, of the cutter. Then the diameter is filed to rectangular section backed off behind the cutting sides; and the end face is backed off oppositely to form a pair of cutting edges. The tool is hardened and tempered in the normal way and should be run at fairly high speed with light cuts.

A bought slotting cutter or saw' needs to be mounted on a mandrel, as at ***D,*** where there is a driving pin fitting in the keyway, and the sleeve holding the cutter up to the shoulder is slotted to fit over the driving pin.

As distinct from saws, slotting cutters may be built up m a mild-steel holder, as at ***E*** and ***F.*** Four or more cutters or tools may be used, clamped by grubscrews or setscrews, the tools being flattened on the sides if required. Grooved cotters, however, admit of a narrower holder and avoid the need for tapped holes. The holes for the cutters having been drilled, they should be temporarily plugged (pieces left projecting for removal), then the cotter holes can be easily drilled through the holder.