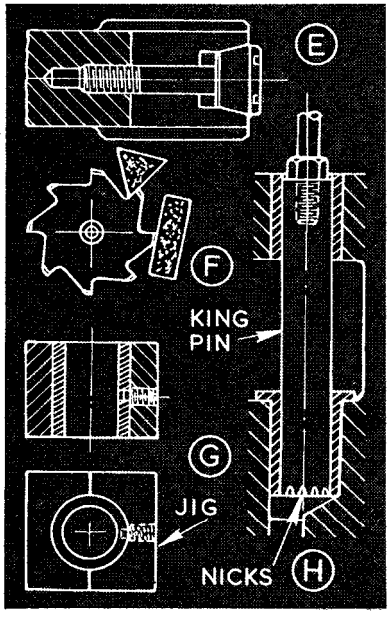
Reamers and how to use them

GEOMETER describes the processes involved in using hand and machine reaming

WHETHER USED ON machine or by hand, the function of-a reamer is to produce a smooth accurate surface in a bore such as that of a bearing or bush, for the shaft, pin or bolt to enter with a very good fit.

In this respect, a reamer is a much better tool than a drill and can also produce finishes superior to normal machining on lathes. In fact, bores machined on lathes are often finished with reamers to improve the surface and bring them to size.

Holes to be reamed must be drilled or machined undersize, the amount of material left depending on the roughness of the surface. For a smooth surface and true hole, between 0.001 in. and 0.002 in. is ample to leave in reaming parallel bores. Excess material means extra work and in some cases can cause the reamer to chatter and the surface to become wavy. Bushes fitted in housings compress on entering and must be reamed to size.



In all reaming, maching or hand, rotation is very slow and ample power is essential. In hand work, either the component is held in the vice and the reamer turned with a substantial tap wrench, or the reamer' is held and the component turned-when it is a size and shape permitting proper leverage.

Rotating slowly, the reamer or component is advanced and, should swarf clog the flutes, withdrawal is made,. but maintaining the same direction of rotation, since a reamer must not be turned backwards. If possible, it should pass through the bore-to admit of which, it has an undersize shank.

Should chatter occur in the early stages, a strip of thin shimstock down the flutes one side will often cause the reamer to cut smoothly. Before finishing, the shimstock must be removed, or the result will be an oversize hole. Different thicknesses of shimstock afford, however, a means of utilising worn reamers and producing holes of required size or oversize.

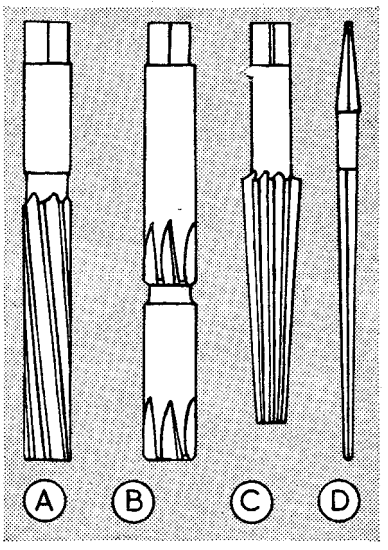
Oil can be used as a lubricant on steel, silver-steel, phosphor-bronze, brass and gunmetal ; paraffin on aluminium and duralumin ; tallow and graphite in equal parts on cast-iron.

Types of reamers

An ordinary hand reamer ***A*** has straight or left-hand spiral flutes, to prevent self-advance in the bore. The diameter may be parallel, though normally it is slightly tapered from the end for entering. Adjustable reamers are provided with six blades regulated by nuts on the threaded shanks.

A line reamer ***B*** has two sets of cutting edges to ensure correct alignment of separate bores-such as the kingpin fittings of car stub axles. A taper reamer C is for finishing or adjusting taper bores in sprockets (motorcycle) or small pulleys. Use in a lathe ensures true-running of the sprocket or pulley.

A taper broach ***D,*** which has a scraping rather than a cutting action,



is for opening out drilled holes to take taper pins-as when a collar is pinned to a shaft, the pin then driving in firmly. A machine reamer ***E*** has short normal cutting blades, an axial slit and a coned central screw for adjusting with a pin-spanner to regulate the size.

Reamers slightly dulled on the cutting edges can be sharpened with hand hones ***F,*** rubbing along the flutes and the relief edges. When undersize,. shimstock can be used to increase diameter-obtainable in thicknesses from 0.0015 in. upwards.

Reaming blind bushes

Bushes in blind holes (certain kingpins) present a problem, for the taper on a reamer prevents finishing to the end for the pin to go right home. Such bushes must either be brought to size before fitting, or specially finished in situ.

If a lathe is available? a reaming jig G is made from two pieces of steel in the four-jaw chuck, with a bore the size of that in the component-obtained by calipering. A shouldered screw into the oil hole prevents rotation. In reaming, the bush is compressed in the vice, and brought to fitted size for the pm when in the component.