NUTS for the JOB

By *GEOMETER*

THOUGH nuts are but minor items in an engine or machine, its function, efficiency and appearance inevitably owe a great 'deal to their design and application. Suitable choice of nuts, too, can materially aid the assembling and dismantling of certain parts and the adjustments that may be needed to others.

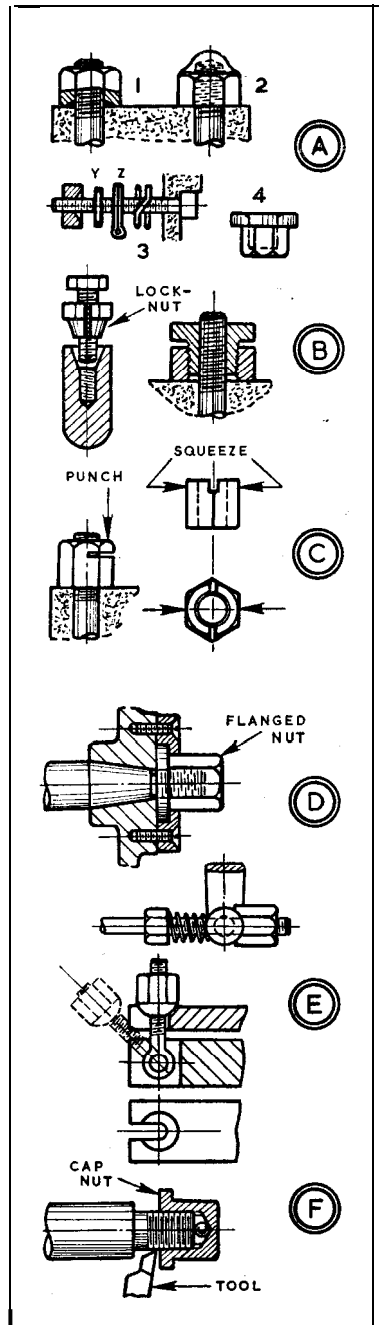
There are stock problems concerning nuts that occur'in everyday, work. The nut which does not seat squarely, because the threads are askew with the end, can be trued by fitting on a stud in the chuck, and skimming its end. The replacement nut whose thread pitch is in doubt, and whose bore is too small for a thread gauge to enter, can be checked by screwing on a piece of wood, the marking on which can be matched to the screw or stud. An unknown thread in a casting can be verified in the same way.

The nut which leaks oressure. or seeps oil from its face or ihreads, can be sealed by running back and winding a strand of asbestos string round thk bolt or stud-before tightening again firmly. Often it is helpful if the nut is chamfered slightly at the bottom, Al, to contain the strand of string-an operation performed on a stud in the chuck, by a boring tool or turning tool with ample clearance.

A domed nut, A2, with its thread square with the end, seals automatically, and in an exposed situation prevents rusting or corrosion of threads-and consequent seizure. At other times, its appearance can commend its use.

An internally-chamfered nut, A3, is sometimes used with a lead washer Y to make a sound electrical connection to a wiring tag Z, there being a double-coil spring washer on the other side of the tag. Sealing a banjo union with fibre washers can be done with a flanged cap nut, A4, whose face does not cut the washer against which it abuts.

Externally-tapered nuts in tapered holes can be the means of centralising components; when split and used for locking, a nut of this type, B, grips the screw it contains, eliminates backlash, and admits of fine adjustment. Such nuts serve for tappets and gauges, holding securely with moderate tightening.



A nut of special application is one in two parts with differential threads, B right. Both parts have the same size hexagon ¡ and the outside one has a finer thread than the bolt or stud. Initial tightening is normal, with the spanner on both hexagons. Then it is applied to the top one alone, for the final tightening and locking.

The security of nuts presents problems with many solutions. Thin locknuts may be used on top of standard nuts, or spring washers or tab washers beneath them. Slots may be provided for split pins in standard nuts-as an alternative to deep castellated nuts. On occasion, for semi-permanent assembly, the end threads of bolts may be dented, each at one position, with a centre punch. In deep nuts, C, slotting from the side or the end admits of punching after fitting, or squeezing beforehand, for gripping through slight displacement of the threads.

In restricted positions, dismantling of taper-fitted parts-such as a sprocket or flywheel on a shaft-is easily effected using a nut with a flange which is contained by a collar riveted or screwed to the boss, D. Turning the nut back, it pulls on the collar, and so frees the tapers.

By appropriately shaping the ends of nuts, self-locking on a round trunnion (against a spring), or floating alignment in a spherical seating is possible, *E*. The one fitting may be used for adjusting a rod, the other for securing a hinged part-as the lid of a jig. The spherical radius is produced by turning, and the other by filing or milling.

Accuracy of threads in nuts ensures security and sealing-and smooth working of parts, such as piston rods in gland nuts. And so all functional work should be done at one setting, using the tailstock chuck for the tap, or guiding it with a centre. Any mandrels used should be screwcut or finished with the tailstock dieholder. One which is flat-ended can be used with a ball for truing a troublesome cap nut, *F*. ❑