By GEOMETER

GLANDS AND PIPE FITTINGS

A GLAND or stuffing box is the normal means of permitting reciprocation of a piston rod or plunger, or rotary motion of a shaft, at the same time preventing leakage of steam or water, oil, or whatever may be the fluid. Essentially, soft resilient packing is employed which will compress on adjustment and lightly grip the piston rod or plunger, eliminating leakage but not setting up undue friction.

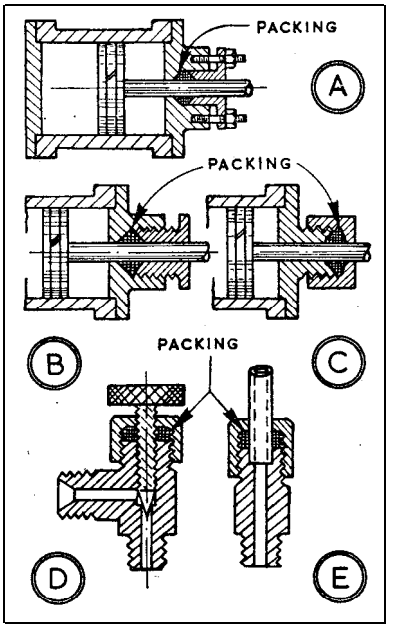
Too much reliance,. however, must not be placed on the inherent characteristic of a small degree of " take up," self-adjustment or compensation which a gland possesses. It is important for associated metal parts to be true and in good adjustment. In particular, portions of piston rods and plungers which actually work in glands should be smooth and parallel, for if the gland of a small engine has to be over-tightened to prevent leakage, power will be seriously diminished or the engine prevented from running. Repacking and adjusting a gland on a force pump (domestic type, for example) cannot long obviate leakage primarily caused by wear of plunger or piston rod.

Types and packing

Diagrams ***A, B*** and C show the main types of glands. That at ***A*** is the common oval-flanged pattern, adjusted by nuts on two studs and originally used for steam engines-possibly because the major work was plain turning, no threads being required other than those for the studs. In model sizes other than the smallest, construction is straightforward, but care is required to tighten the nuts evenly, maintaining the flange square and the piston rod free.

The gland at ***B*** utilises an internal thread and has a hexagon or slotted flange for adiusting. To avoid binding, thread and must be concentric-for which reason skill is required in making, especially in model sizes. In this respect, the gland at C is sometimes preferred, where the thread is external and a nut screws on.

Either glands B or C may be used on screw-down valves (domestic water



taps), and small needle valves, ***D***. In the latter connection, it can be said that the packing will compress and seal in the thread, as shown, providing it is true and smooth, and an important saving in length can be made, by comparison with valves having a plain diameter for the packing to bear on.

Most model and small commercial glands can be packed with soft asbestos string, loosened by untwisting, and made into strands of suitable size. Soft ordinary string or wool can also be used. The strands should be smeared with graphite or graphite grease for steam, and for water can be lubricated with water-resistant grease, and wound round the piston rod or plunger, in the direction in which a screw gland tightens.

Pipe fittings

An adaptation of the external gland (C and ***D)*** is to a simple union fitting ***E*** which can be both smaller and shorter than an ordinary pattern. Unlubricated packing should be used and the nut screwed up tightly, particularly if there is pressure-

though owing to possible blow out, the union is not really suitable for pressure. For this, a flange on the pipe ***F*** is desirable in conjunction with packing in the nut if required.

The normal pipe flange G is secured with two bolts, or by studs and nuts when fitted to a cylinder, and requires a jointing washer or gasket of paper or asbestos sheeting. Such a flange may be a plain oval brazed on the pipe, or have a small boss, as shown, mto which the pipe fits and is soldered.

A flange with a stepped seating ***H*** prevents jointing blow out, and in small sizes metal-to-metal connection can be made by lightly grinding the parts together.

Where a pipe needs to be at an angle, a special flange may be used Z or on a' cylinder or other casting a banjo fitting J employed or an elbow ***K*** screwed in and set as required with a lock-nut for connection by ordinary union. The banjo union,. it will be seen, has a circular sealing washer and bottom, an internal recess, and a hollow fixing screw drilled cross-wise to match with the recess. ❑