VICE JAWS for special purposes

By GEOMETER

WITH its capacity to grip firmly or apply steady pressure, the vice holds the solution to a variety of production problems in the small workshop, where it is frequently necessary to adapt equipment and technique to the job in hand. Operations that in a large workshop would require jigs or press tools can often be p&formed with special jaws or other means in the ordinary vice.

One ever-present problem is to grip the work firmly without marking it from rough jaws; another is the problem of holding small parts in a relatively large vice. There are easy solutions to both.

Apart from the normal slip-on pads or soft jaws which can be used to protect work, it is often sufficient to hold the work in cardboard like a piece of cigarette packet. Being thin and backed closely by the metal jaws, this gives a firmer grip on work than thick fibre jaws. Strips of metal, such as aluminium and brass wood, and all sorts of soft materials, can be used in the same way. If the major part of work is machined or likely to suffer damage from standard vice jaws, a pair of smooth-faced ones from mild steel will turn the bench vice, for this purpose, into a fixed machine vice.

At times, too, it is convenient to hold a machine vice by its base in the bench vice, using the machine vice for mountmg the work; and on this principle, special small vices, or pin vices, and even toolmakers clamps, can be mounted for small work.

Mild steel pads, as at ***A,*** adapted to features of components, enable them to be held safely and firmly when even soft jaws would be ineffective. They may be components like unions or plugs with external threads, or merely standard screws, for which the pads are drilled and tapped at their centre line and then eased on their faces to grip. Small-diameter or thin-walled tubing can be held in plain holes; and by countersinking the tops of holes, countersunk rivets can be made from rod.

Typical operations using such pads are as at ***B.*** A snap-head rivet (1) can be made from rod, gripping it in the pads with a suitable amount projecting and forming it with a punch. This is made in the usual way from silver steel rod, dimpling its end with a drill, and rounding the cavity with a steel ball and a blow from a hammer. Hardening and tempering should follow if the punch is to be in frequent use. A countersunk rivet (2) is made by beating the end of the rod into the countersink and filing the surplus off. Tubing (3)-after annealing by heating to red and plunging in water if it is copper or brass--is flared with a taper punch. Matched to a coned union, such a flared end makes a short-length pipe fitting.

A simple pressing operation is performed in dowelled jaws, as at C. It is to squeeze on the clip which secures a flexible hose to its union. Initially, the clip is a ring of annealed brass, which is slipped on the hose. Then the union is pushed in-its entering stem having a nozzle end or serrations; and a squeeze in the jaws completes the job. Usually the radii for them can be intelligently judged.

A half-clip, as at ***D, can be*** finished in jaws as in the upper diagram. Two centre-line drillings are made to produce the radii in the jaws-one for the radius of the rod, the other for the outside radius of the clip; and the face of this jaw is cut back to the thickness of the clip. If required, prior shaping can be done in jaws as in the lower diagram.

Flanges can be produced on sheet-metal discs, squeezing between a strong ring or washer and a centre plug of suitable size; while flanges on straight edges can be formed by beating over flat or rectangular material. Using strip material, light angles can be made in this way-and these made into channels at a second beating, as at E. For shearing operations (preferably using an old vice) jaws can be. made as at ***F,*** with a cast steel chisel and narrow anvil. El