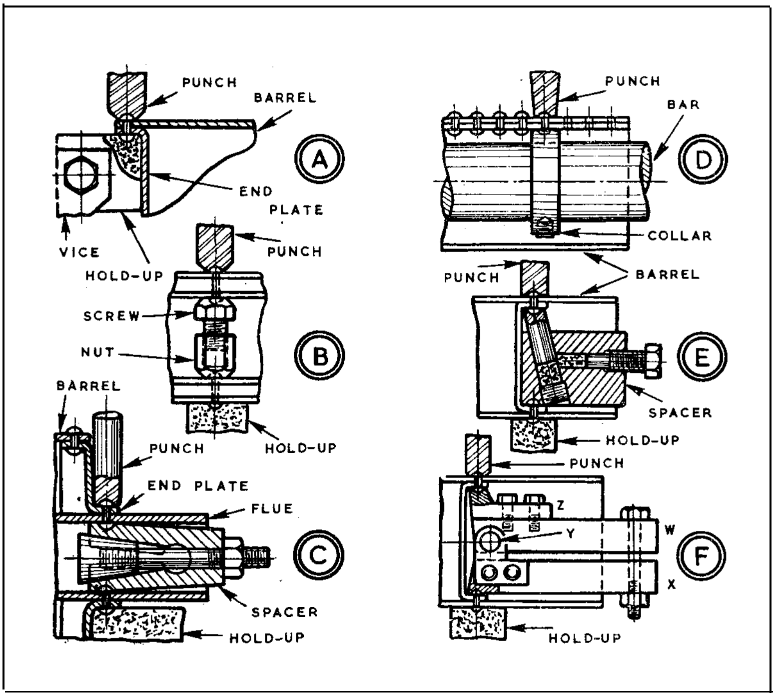
HOLD-UPS and SPACERS for RIVETING

By GEOMETER



ASSUMING that design is correct, efficiency and neatness are almost inseparable qualities in riveting, which is an essential operation in many fields of professional and model engineering. Correct design means, of course, that with due allowance for scale and contingent problems the boiler or other component has a sufficient number of rivets, of suitable size and material, disposed to take stresses in shear and give an acceptable factor of safety. At practical fulfilment, the result of much thought and many decisions on these matters is satisfying to an enginer and can be pleasing to a layman, for neat lines and groups of snap head rivets have more to offer visually than the finest welded joints.

As always, of course, between design and product lies the track of practical production well-beaten, perhaps, but with pitfalls which require preparation to avoid.

Plates to be joined should be drilled so that rivets fit closely, and the burrs are removed at the edges of holes by filing or lightly countersinking. Rivets must be of correct length, their heads properly supported on hold-ups, and their shanks turned with snap head punches. Long rivets can be shortened by snipping the shanks and filing each one to length with the rivet pushed through a hole in a piece of flat steel bar, which can be faced to thickness if necessary.

Hold-ups and punches can be in mild steel or cast steel, made by dimpling the material with a drill, heating it to red, and driving it on to a hard steel ball. The facing of each should be so that the shoulder of a snap head is just proud of the end. The tools can be used soft, or mild steel can be case-hardened, and cast steel hardened and tempered. Hard copper rivets can be annealed by heating them to red and plunging them in water, to aid in forming snap heads on then shanks.

For riveting the flanged endplate into the barrel of a boiler, a hold-up and punch can be used as at ***A*** with the hold-up gripped in the vice. Ordinary care gives a good result; and for a simple job, the endplate can be invisibly soft-soldered by fluxing in the barrel, putting in a lump of solder and heating, so that with tilting and turning the solder runs all round the joint. Tinning before riveting is helpful in this work .

When a hold-up cannot be used direct, it is advantageous if, in design, rivets have been arranged in opposition. Then they can be fitted and finished in pairs, using a spacer as at ***B.*** Here the spacer is a screw and blind nut, each machined from hexagon rod to tighten with spanners with the rivets in place.

For supporting at a distance down a tube (like a flue), a spacer can be made from round mild steel, as at C. The piece should be drilled and tapered inside on the lathe for a cone and drawbolt. With rivet head depressions made, the material can be cross-drilled and slit to expand. Round the diameter, between the rivet head depressions, the material should be chamfered by filing to clear other rivet heads.

For riveting down the length of an open-ended barrel, a hold-up ***D,*** consists of a piece of heavy mild steel bar with a movable collar. One end of the bar is gripped in the vice and the other held by an assistant.

Expanding spacers for working at a distance down barrels can be made on hydraulic or mechanical principles, as at ***E*** and ***F.*** The body of the hydraulic spacer is from rectangular mild steel bar, drilled and reamed a slant to take a well-fitting plunger with the open end of the hold plugged. Another hole is drilled from the end, breaking into the first, and is tapped for a pressure screw which is fitted after filling the holes with thick grease.

The mechanical spacer consists of bars W and X hinged at Y, at a small off-set from the rivet line. One carries a screwed-on jaw Tightening the bolt expands the spacer between two rivets. ❑