SIMPLE JIGS and TEMPLATES

WORKSHOP HINTS and TIPS

By GEOMETER

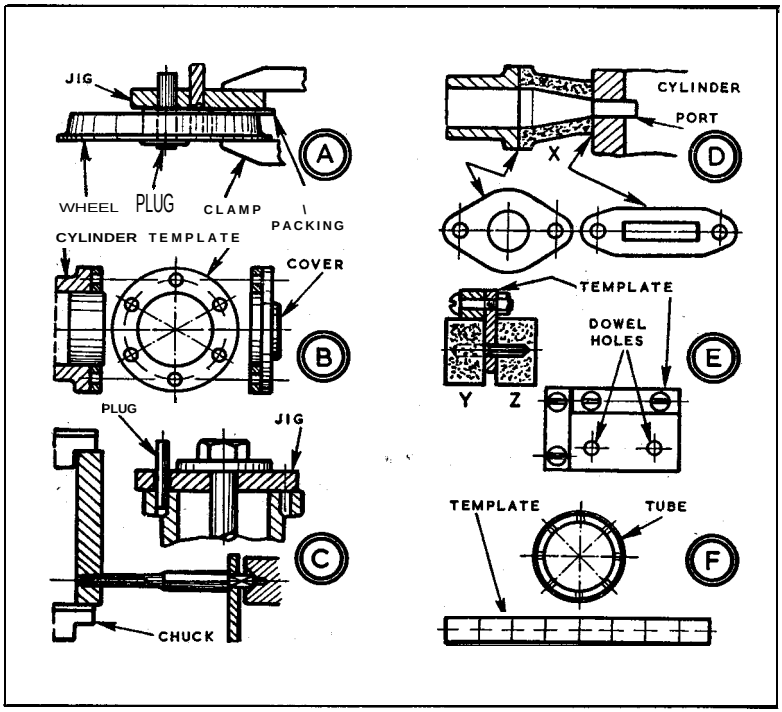
EVEN on the one-off jobs with which model engineers are chiefly concerned, simple jigs and templates can be a very helpful means to accuracy in a variety of operations, such as drilling, tapping, filing, marking-off and dividing. Often, too, they save considerable time, as well as eliminating the hazards that beset many operations.

For instance, if a mistake occurs in making a template, no harm is done. There may have been an error in marking off, or the drill may have run from position. In either instance, a second template can always be made -but it is another thing if the mistake is on a component, such as a casting.

Again, a jig or template can be essential if there is a slight flaw, such as a tiny blow-hole, in a surface where a hole is to be drilled. Possibly the flaw would be taken out in the drilling-but not before it had drawn the drill off course; whereas, with a jig, and with care, the drill will penetrate truly, uninfluenced by the flaw.

By using a jig, the crankpin hole in a locomotive wheel can be drilled accurately in position, as at ***A.*** The coupled wheels are drilled the same; and with the pins in all wheels having a like throw, the coupling rods run freely without excessive clearance in the bores. Sometimes, of course, one wheel can be drilled first and used as a jig for the others, mounting it to each by a plug in the bore. With two wheels clamped face to face, the drill is run from the back of the drilled one.

A large steel washer will serve as the drilling template for a steam cylinder and its covers, as at ***B.*** Alternatively, a piece of thick sheet metal or thin plate can be marked off, bored, and drilled for the same purpose. This avoids scribing lines on the cover, which would otherwise have to be done for it to be used as a template for the cylinder. A template of this type should be used with its respective faces to pairs of parts-one face to the cylinder (with a locating plug in the bore), the other face to the cover (where the spigot provides location). Finally, a tiny centre punch dot near a corresponding hole in the cylinder and cover indicates the rotational setting.



The tapping of holes is sometimes accompanied by difficulties which can be avoided by using a jig. There is the ever-present problem of keeping the tap square, to which can be added others when holes are relatively shallow. The tap may not bite at first, and a few poor attempts may ruin the hole. Hence, when difficulties are foreseen, a tapping jig, as at C, is advisable. It can be from flat bar, drilled, tapped and faced in the independent chuck for accuracy. With a tapping size plug in the hole to be tapped, the jig can be located and clamped-or held by a through-bolt to a cylinder. With the plug removed, a second tap can be run in carefully, followed by a plug tap.

Holes tapped by this method are square with the face of the work, and the threads are full depth all the way. A slight chamfer can be given to the tops of holes by a sharp drill, twisted in fingers.

When parts must be filed to match one another-it cannot be done with them clamped together-a template gives accuracy, used on one and then the other. An example is the fitting of a carburettor to the cylinder of a two-stroke engine. The bore of the carburettor is round, the port in the cylinder a slot. As at ***D,*** a special distance piece X can be used between them, drilled, milled, and finally filed to template to match the port in the cylinder.

By using a template, dowel holes can be drilled in the abutting faces of two parts to be invisible. In the example at ***E,*** the template is located on short dowels; and with parts Y-Z on a flat surface. strips are screwed to the template to locate it for drilling holes in Y.

For semi-precise locations, like centres of rivet holes, templates of paper aid in marking off at times-as at ***F,*** where holes are spaced round a tube, using a divided strip.