

## WHEEL and PULLEY PATTERNS

By GEOMETER

**I**N the majority of cases, castings for wheels and pulleys can be produced from simple patterns, though for the more complicated types of castings with spokes—either curved or straight—the patterns themselves must be built up.

But this is not a difficult process and it has, moreover, the advantage of enabling flat pieces of wood, like boards, to be placed back-to-back across the grain to avoid warping at large diameters; and in small sizes, plywood can be used on the same principle, to provide strength where sections would otherwise be rather fragile.

Where there are no undercuts, and the boss and rim of the pulley or wheel are tapered to draw from the mould, fairly considerable “dishing” occasions no difficulty—though the pattern is preferably turned from a solid block of wood, rather than built up. It is then (advantageous to employ a pair of gauges in sheet metal, marked out, sawn and filed to the profile, as at **A**, to maintain the web at its designed shape and thickness.

This design, of course, when it is for the flywheel of an engine, admits of using an extended bearing on the flywheel side, while keeping the rim, the functional part of the wheel, towards the crankshaft. After turning, the pattern can be smoothed to remove marks, using scrapers and sandpaper.

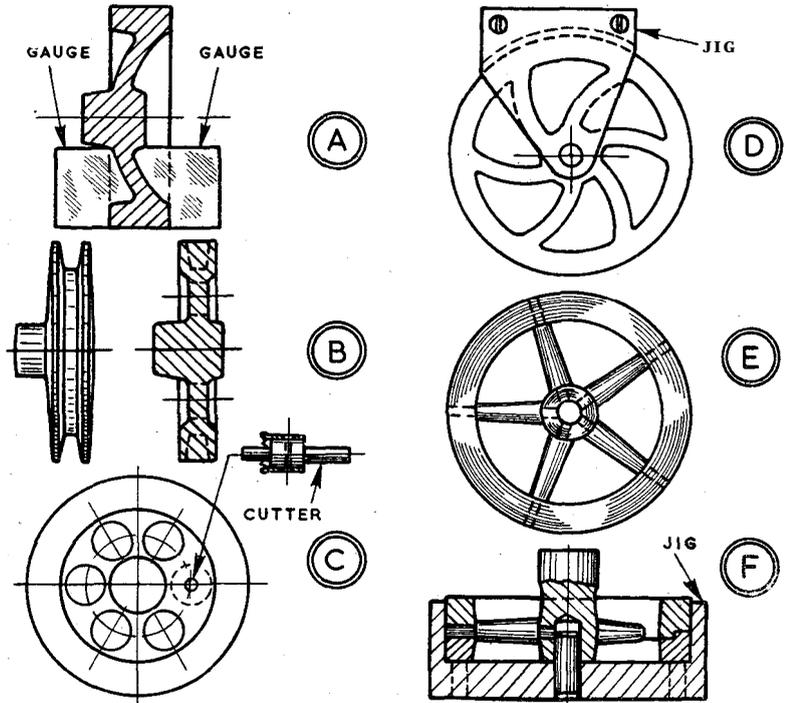
### Forming the grooves

In the case of V-pulleys, little or no advantage obtains from machining V-grooves in the patterns, though this can be done, as at **B** (left), when the diameter does not exceed about 3 in.—since in large sizes, moulding such patterns is difficult. There is the disadvantage, too, that the pulley must be solid, and if it is desired to relieve the faces for lightness, then this must be done by machining the casting itself.

As it is usually desirable to save weight (and metal) by relieving the faces to form a central web, a better way is to produce the pattern as at **B** (right), then machine the V in the casting—especially as a cast V would probably need machining to true it.

For a large pulley, the pattern can be machined from a piece of flat board, relieving each side for the web, except to the centre where the boss will be—then extending the boss outwards as required with separate pieces, dowelled, tacked and glued. Such a pattern? as at **C**, may also have lightening holes for these to be produced in the casting.

On the pattern, the pitch circle and centres for the holes can be marked and carefully centre-punched, then small holes drilled to take the pilot



or guide of the trepanning cutter, which should be used from either side. A cutter of this type, particularly in small sizes, can be made from a piece of steel tube of appropriate diameter. It should be faced at the end, teeth sawn and filed, then these given a slight “set,” outwards and inwards, alternate ones, for clearance like a saw. A shank can be turned to fit the bore of the tube and with a pilot incorporated, then the tube fixed with a cross rivet.

A flywheel pattern with curved oval-section spokes can be built up in three pieces—the centre with spokes, and a ring either side extending the rim, all in plywood. The apertures leaving spokes-cut out with a fret-

saw-can be filed true, as at **D**, using a jig of two pieces of sheet metal, located through the boss, and bolted together outside with plywood between them. Filigree and smoothing to oval section can be done afterwards.

For a flywheel with round-section spokes, these should be turned separately for the pattern and dowelled into the boss and the rim, as at **E**. Direct dowelling into the boss is possible, but the rim must be in two pieces, drilled at the joint, which should preferably be stepped for location. Assembly-tacking and gluing-in a jig (of wood) as at **F** is helpful, using a guide pin for the boss which can have a chucking piece to set up for checking truth. □