

PATTERNS for HOLLOW CASTINGS

By Geometer

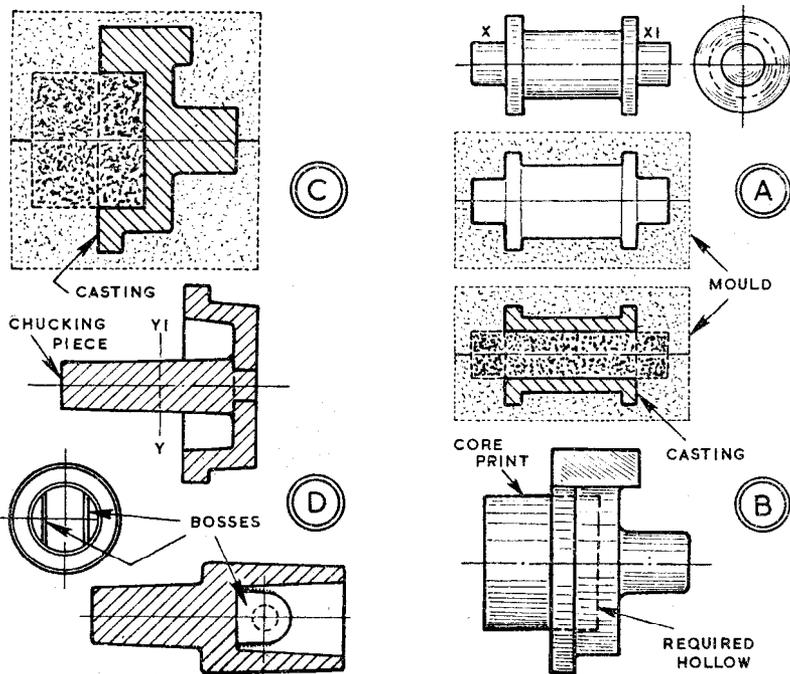
BY hollowing or "coring" certain castings considerable advantages can often be obtained-over-machined from the solid or built-up components-in saving of weight, material, time, effort and cost.

Frequently, too, little or no extra work is involved on a simple pattern; and on occasion it is possible by slight adaptation of design to utilise such a pattern for a hollow casting where the orthodox method would be to employ a special core, demanding a core box, in conjunction with the pattern.

Castings having round straight holes on the main axis, either right through or partly through, can be produced from simple patterns by embodying core prints of suitable size

The same principle obtains when the casting is partly hollowed-as for the crankcase halves of a model petrol engine. The simple pattern, as at **B**, carries the core print one and to avoid any tendency for the core to over-balance when it is being placed in the mould, the length of the core print should rather exceed the depth of the required hollow. The casting produced is as at **C**.

The rules for applying this method of coring are quite straightforward. It is essential for the cored hole to be small enough for the bore of the



machining cut would vary considerably in depth.

To call attention to the fact that the projections on patterns are core prints and not bosses, they should be painted red (grey or black for the rest of the pattern). A label may also be tied to the pattern with instructions such as: 3/4 in. hole cored right through. In the case of a core partly through, as at **C**, some instruction must be given, either on a label or painted on the pattern, such as: 2 in. dia. hole cored 3/4 in. deep from face.

Where a casting is to be partly hollow, yet the hollow is not circular, or if circular contains bosses or ribs, then production must be from a simple pattern or a special core box must be used-the latter best avoided if possible.

For example, the endplate of a two-stroke crankcase may be hollow to save weight, or contain a boss for the rotary valve shaft, with another for the inlet port. Then the pattern can be as at **D** (top). The main portion can be machined hollow, and the boss, ending at Y-Y 1, but with chucking piece attached, glued in like that for the inlet port. With tapers on the faces, the pattern can then be moulded without a core.

The principle is applicable also to piston patterns (bottom) down to about in. bore--best turned from boxwood with tapers inside and out--then the bosses, extending up to the crown, are glued and tacked in.

in the wood patterns as they are being turned. Depressions are then formed in the moulds whereby the actual cores can be located.

Where a cylinder casting (for a steam engine, for example) must have a hole cored right through, the simple pattern, as at **A** (top) has a circular core print at each end, X-XI. After moulding the result without a core would be a solid casting the same shape as the pattern, but by placing a core through the mould the casting is left with a bore (bottom). The core, of course, being of sand like the mould, can be knocked out when the metal has cooled.

casting to clean up properly in machining. For this, in small sizes, it is necessary to have between 1/16 in. and 1/8 in. depth of metal-which means the cored hole must be 1/8 in. to 1/4 in. less in diameter.

As the core is to be provided by the foundry, a dimension should be chosen for it which is certainly a whole 1/8 in., and preferably a whole 1/4 in., even though this may mean leaving rather more metal than necessary. If an "odd" dimension is chosen for the core, that actually used may be smaller, and the cored hole eccentric through the casting. Enough metal would be left, of course, but the initial