Carving a Propeller

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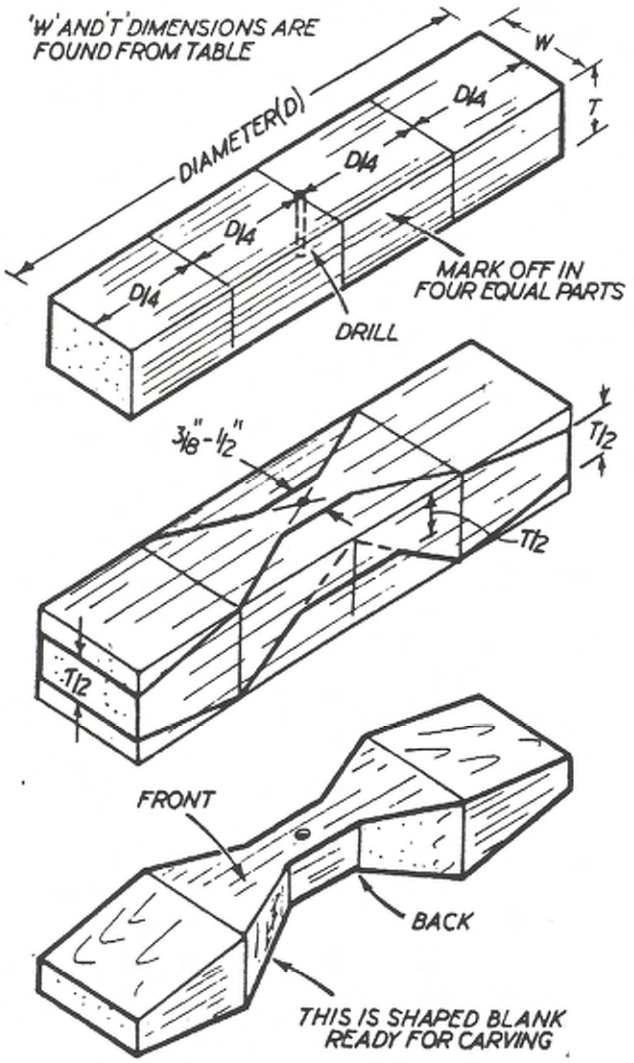
One of the most difficult jobs of carving in balsa —or any other wood for that matter—is a model airplane propeller. Actually it is one of those jobs which appears *more difficult than it really is, for a propeller shape will develop automatically if a certain set technique is followed. This involves marking out a* block *and cutting it accurately to form a propeller* blank. *The blank is then carved edge-to-edge to produce a proper propeller shape.*



PROPELLER BLOCK DIMENSIONS

DIAMETER	6"-8"	10"	12"	14"	16"	18"
W	1 1/4"	1 1/2"	1 3/4"	1 3/4"	2"	2"
T	3/4"	1"	1 1/4"	1 3/8"	1 1/2"	1 3/4"

Producing a perfect propeller by carving demands a certain amount of skill—a skill which is only acquired by practice, so do not expect too much from your first attempts. But every propeller you do carve should bring you one step nearer the perfect article —when you can ultimately produce a piece of craftsmanship of which you can be truly proud. If you build rubber-powered model airplanes, too, you will know that the propeller is probably the most important single component of the whole model—and the better the propeller the better your flights.

A fairly hard grade of balsa should be used for carving propellers, this having good strength when the blades are carved quite thin while still being much easier to cut and shape than a hardwood. The length of the block is determined by the diameter of the propeller required—approximately two-fifths of the wing span of a rubber-powered model airplane, for example.

The width (W) and thickness (T) dimensions of the block are then related to the length to give the correct amount of *blade area* and propeller *pitch*. The table at the bottom of the page gives typical 'W' and 'T' dimensions for different propeller diameters. If this is not a 'stock' size of balsa for the particular diameter of propeller you require you must buy the next nearest size up and trim the block to these required dimensions.

The block is then marked out in pencil in quarters, as shown. Use a metal square and draw these lines round all four faces of the block. Then mark the exact center of the block (on the widest or 'width' face) and drill a hole through the block. It is far easier to drill this hole true and square while you still have a square block than at a later stage.

The faces of the block are then further marked off as shown in the second diagram—marking out the bottom face just like the top, and the second side like the first side. Allow a width of 3/8" to 1/2" at the center for the hub on the top face, and a depth of one half the block thickness on the side.

These outlines mark the cutting lines for the blank. They are all straight lines and, as far as possible, should be sawn rather than cut with a knife as you can get a straighter cut this way. To carve a true propeller you must have an accurately shaped and square blank to start with. The blank, when you have finished cutting it to outline shape, should have the appearance of the bottom diagram.

You are now ready to start the actual carving, but first work out which way the blank has to be carved. For a conventional 'tractor' propeller—e.g. the type normally used on model airplanes—the blades are carved to have a twist from left to right. For a pusher-type propeller the blades are carved in the opposite direction. This does not affect the working of the propeller so much as the way it must be wound up, it being easiest to wind up a propeller in a clockwise direction. The two prop-driven models described later (see pp. 16-17 and 18-19) should have *pusher*-type propellers carved for them. If they are fitted with a tractor-type propeller, it will have to be wound up 'backwards' to propel the model forwards.