

LAMINATED SLAT PROPS

From the March 1979 Model Builder Magazine by Fred Hall
 Notes on a clamping fixture by Jerry Sullivan
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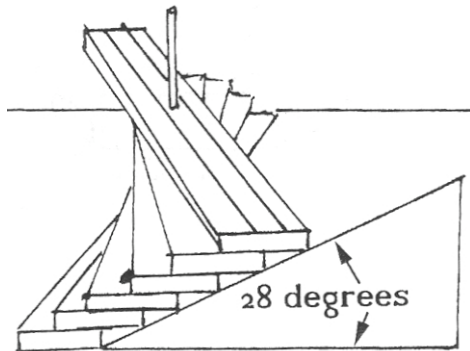
To construct a laminated slat prop, strip some 1/16 sheet to 3/8 inch wide or 1/8 sheet to about 1/2 inch wide. Whatever thickness is chosen, the slats must be wide enough so that the overlap allows adequate stock for the blade after the steps have been carved away. Cut the lengths to the desired diameter. For 1/16 sheet use nine to twelve slats, for 1/8 sheet use six to nine slats depending on the width chosen. Stack them evenly and drill a 1/16 inch hole down through the center of the stack. Use a drill press to make the hole accurate as this will be the hub of the prop.

On the top and bottom slats draw parallel lines on each side of the hole to define the thickness of the blades when done. To figure the spiral of the stack, a simple blade tip angle technique is used. The term *P/D* is the pitch to diameter ratio of the prop and is independent of the prop diameter. Reference the chart which gives the tip angle for a given *P/D* ratio. Cut a couple of wedges from 1/8 sheet to this angle.

Blade Tip Angle and P/D

Angle	P/D	Angle	P/D
20	1.14	34	2.12
22	1.27	36	2.28
24	1.40	38	2.45
26	1.53	40	2.64
28	1.67	42	2.83
30	1.81	44	3.03
32	1.96	46	3.24

Make a base board of suitable size and material with an accurate 1/16 hole near the center. Insert a shaft. Put the pile of slats over this shaft. Now using the tip angle guide spiral the slats as shown in the illustration to contact the angle guide placed at the ends of the slats. (Get the spiral in the right direction or else you will have a left hand prop!) Draw lines with a pen to mark the area for gluing on each slat below. An alternate method is to draw tick marks at each end only. These will aid in setting the proper angle when reassembling.



Remove all slats (except the bottom one) preserving the order. Paint the bottom slat with full-strength Elmer's glue and put the next slat on top of it. There is no need to put glue on areas that don't overlap. Repeat until the stack is completed.

Carve the trailing faces by removing the steps, then carve up to the lines that define the middle portion of the blade. Leave this area uncarved until last. Carve some undercamber into the trailing faces as desired. Trim the blades to shape. (I use a silver Peck prop for an idea. Ed) Sand to smoothness and finish with dope or clear, Krylon.

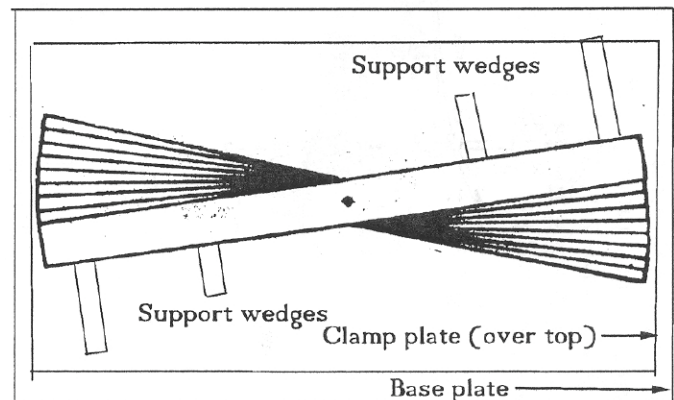
A clamping fixture for gluing

I have made a couple of props using this technique. I find that they seem pretty efficient. Also they are about 1/2 the weight of the Silver Peck props. The biggest problem that I had was making sure that all the slats were properly glued together. For my latest sample, I made a clamping fixture that put a little pressure on the slats while drying.

During the setup steps, and before the slats are glued, make the following pieces. You can use long pins to hold the slats in position as you are working.

Make a clamping plate from a piece of 3/4 inch board very similar to the base that is used to assemble the propeller. A 1/16 inch hole in the center will be used over the assembly shaft. When pushed down you will find that the stack will be deformed as there is no support for the overhanging slats. To solve this, I made a couple of tip guides out of 1/4 inch material that were just under the same height as the stack.

Using a couple of pointed balsa sticks, the mid angle of the stack can be measured and two more angle guides were made from 1/4 inch material. These four supports can be glued to your base plate to nestle under the prop stack. Then remove the slats and glue/assemble as above. Place the clamp plate down over the shaft and weight or clamp lightly. When dry, examine the slats for proper gluing. Any joints not glued can be fixed by coating a piece of paper with White glue and spreading the joint, insert the paper to spread the glue.



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