Woodsmith PLANS

Classic Hall Tree

Classic Hall Tree

We designed a strong, stable tree without a massive "trunk."

There's not much to this hall tree: posts, hooks, feet and cross pieces. But as simple as it is, working out the final design took quite a few revisions.

POST. For one thing, a hall tree requires a center post. A solid post would have been hard to find — and pretty heavy. Plus, it would've had a tendency to warp. We considered laminating the post from two or three pieces of stock. But then there would have been visible joint lines running the length of the post.

So instead of a single, solid post, we decided on four narrower posts (each 1" thick) that are connected by the hooks, feet, and some special cross braces. This "Lincoln Log" approach lightened the weight of the tree and also made it quite a bit more interesting to look at (and build).

HOOKS & FEET. With the post designed, next we worked on the hooks and feet. Of course, these pieces have to look right. But changing their size (and shape) also affected the stability and utility of the tree. So we played with the shape of the pieces and their lengths, trying to get a balanced look that worked well when you added coats, hats, and umbrellas. This required building several prototypes. But that wasn't a big deal; you don't have to cut any tenons on the inside edges. Instead the pieces are simply sandwiched between the posts.

MATERIALS

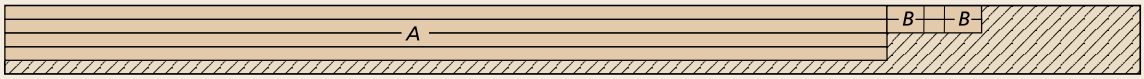
A	Posts (4)	1 x 1 - 65¼
B	Cross Pieces (4)	1 x 1 - 3
C	Top Hooks (4)	1 x 4 - 10
D	Bottom Hooks (4)	1 x 4 - 8
E	Feet (4)	1 x 5 - 13½

CUTTING DIAGRAM

1" x 5" - 60" Red Oak (2.6 Bd. Ft.)

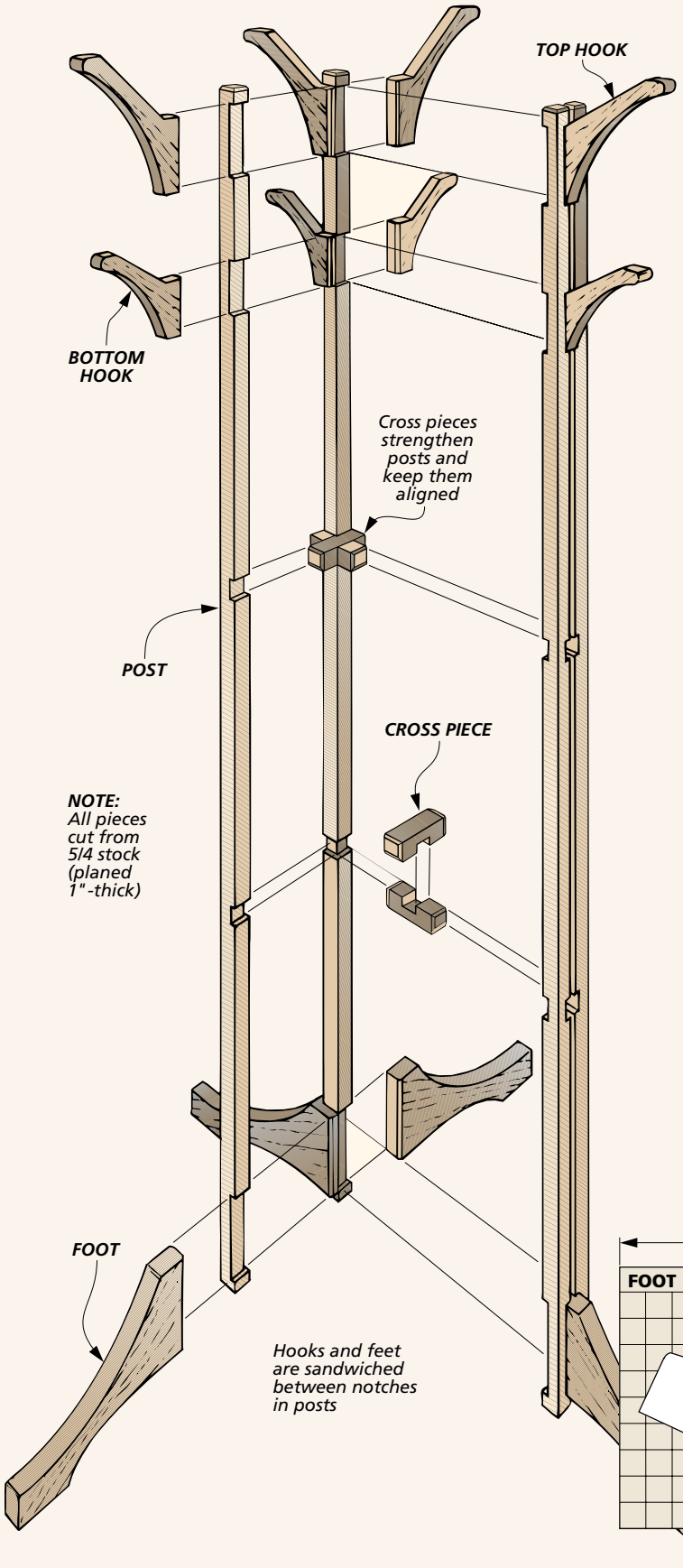
1" x 4" - 84" Red Oak (2.9 Bd. Ft.)

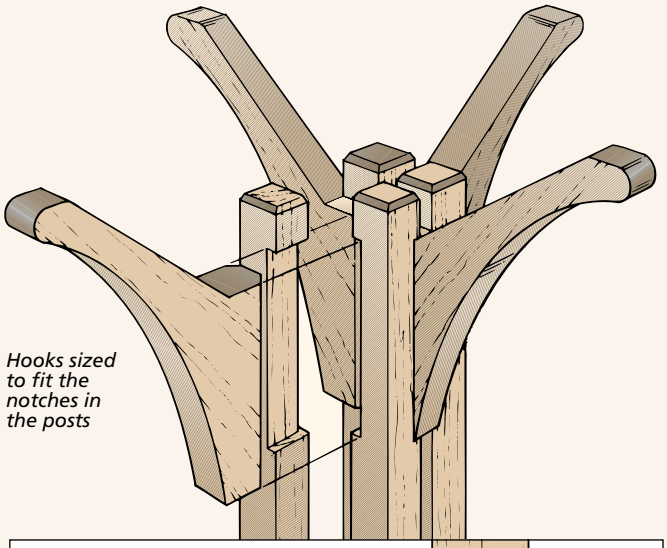
1" x 5" x 84" Red Oak (3.6 Bd. Ft.)

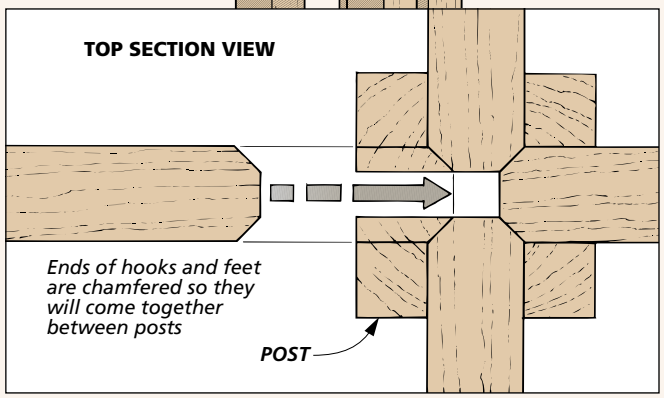


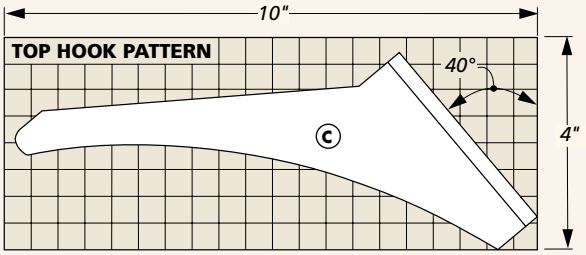
Construction Details

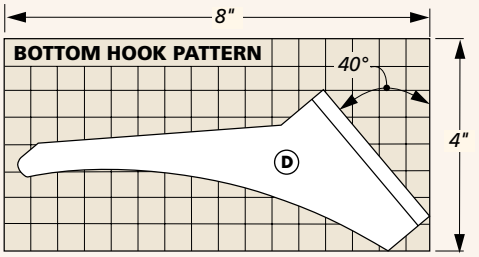
OVERALL DIMENSIONS: 69¾"H x 22⅜"W x 22⅜"D



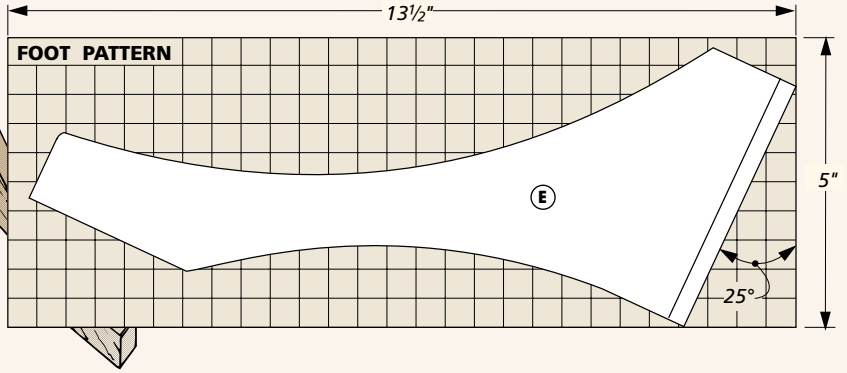




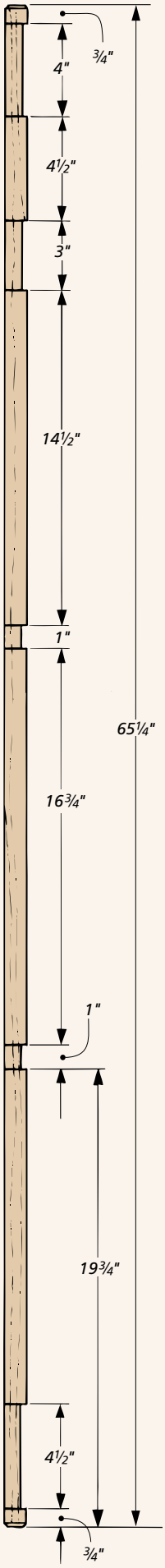


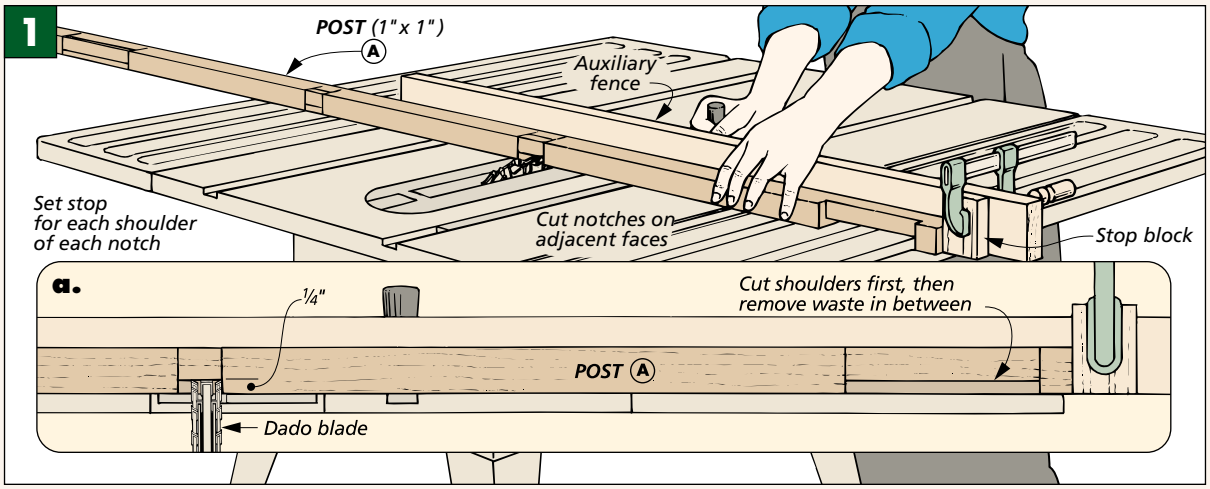


NOTE: *All grids are ½" square*



POST DETAIL





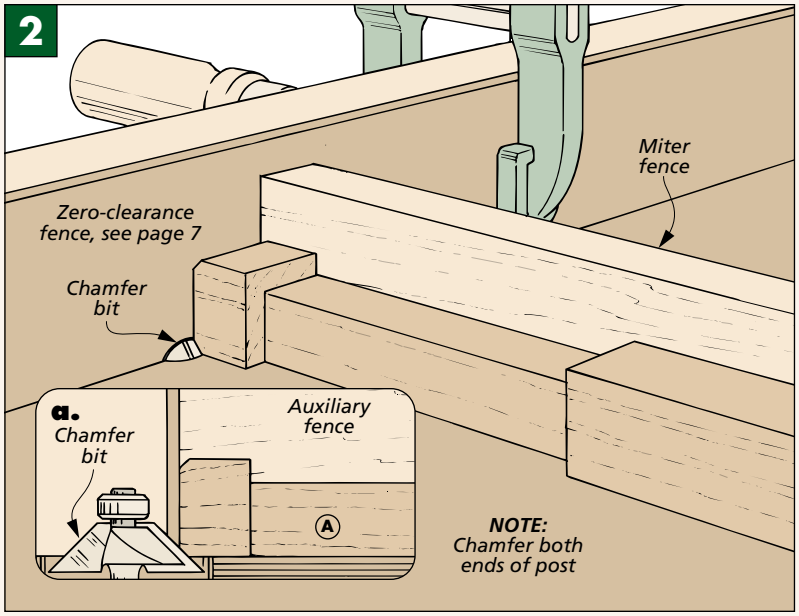
To build this hall tree, I started with the "trunk." This trunk is made up of four long posts, see drawing in margin. Each post has a series of notches cut on two adjacent faces to hold the hooks, cross pieces, and feet.

POSTS

To make the posts, I started with a 5"-wide blank of 5/4 stock planed 1" thick. Keep in mind when you're choosing and milling this blank that the straighter these pieces are now, the easier it will be to cut the notches and assemble them later.

CUT TO LENGTH. With the blank ready, I cut it to final length (65¼") and ripped it into four 1"-wide **posts (A)**, see drawing in margin. This way, all the pieces will end up exactly the same length, which is important when it comes time to cut the notches.

CUT NOTCHES. With the posts cut to size, I began work on the notches. These are cut on the inside faces of each post, see Fig. 1. And since they trap the hooks and feet, it's important that they line up across the four posts.



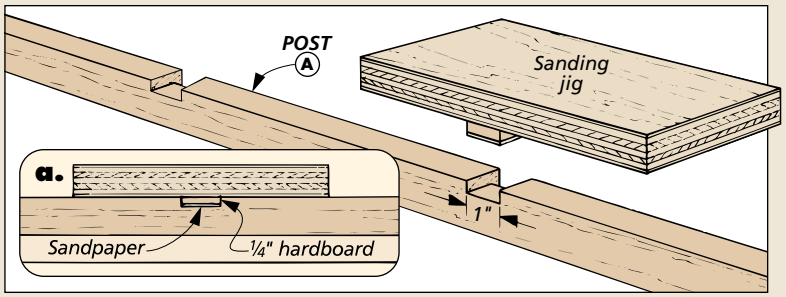
To do this, first I laid out the notches on a single post, see drawing in margin. (Note that the top and bottom notches are the same distance from the ends of the post, but they're not the same length.)

With the notches laid out on one post, I set the dado blade to make a ¼"-deep cut. And I added a long auxiliary fence to the miter gauge to support the piece, see Fig. 1.

The trick to making sure that the notches are identical is to use a stop block, see Figs. 1 and 1a. After setting it to cut the first shoulder, I made two passes on each piece, rolling

TIP FROM OUR SHOP

SANDING BLOCK. If the notches on the posts aren't smooth, you'll notice it when the hooks and feet are glued between them later. So I created a simple sanding block, see drawing. The "handle" of the block spans across the notches so their depth stays consistent and their edges aren't rounded over.



To keep the posts from bowing at the center, they're held together with simple cross piece assemblies.

the post between passes so the notches ended up on adjacent faces.

When the first shoulder had been cut on all the posts, I moved the stop block to cut the second shoulder of the notch. After making this cut, any waste between the two shoulders can be removed with overlapping passes. Then I worked on the next notch, following the same procedure.

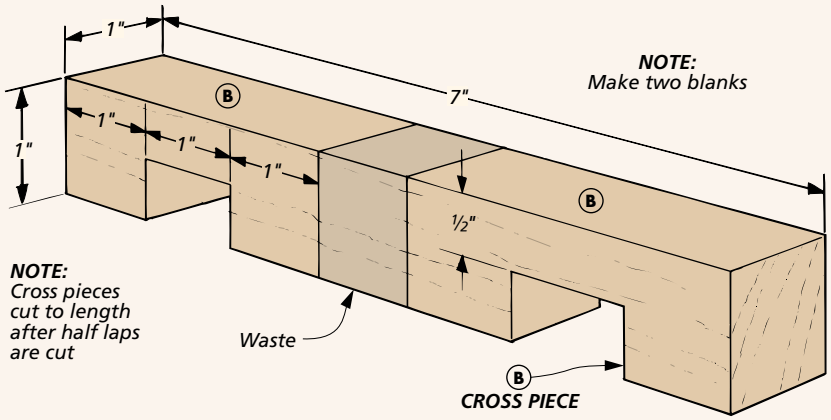
Note: Because of the length of the posts, you'll need to flip them around halfway through this process.

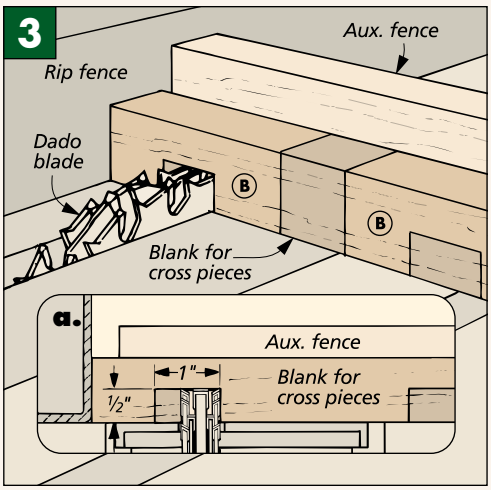
When the notches were cut, I noticed they had some shallow kerf marks left by my dado blade. I was concerned that these marks would be visible after assembly. So to remove them, I made a simple sanding jig, see the box on previous page.

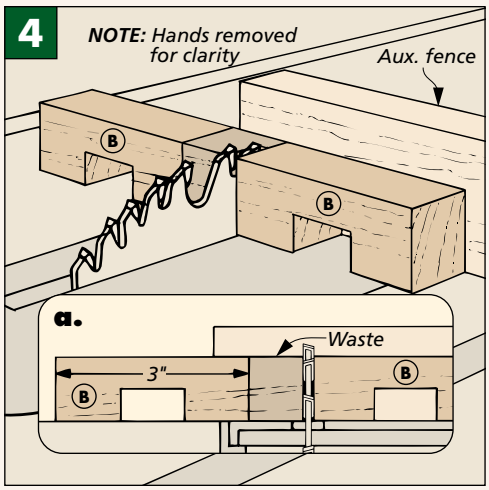
CHAMFER ENDS. With the saw marks removed, all that's left is to chamfer the ends, see Fig. 2. These pieces are so long that I was concerned about routing this chamfer, but I found that holding them flat on the table wasn't difficult, especially when using the miter gauge and an auxiliary fence to support the piece. However, I did decide to add a zero-clearance fence. (For more on this, see page 7.)

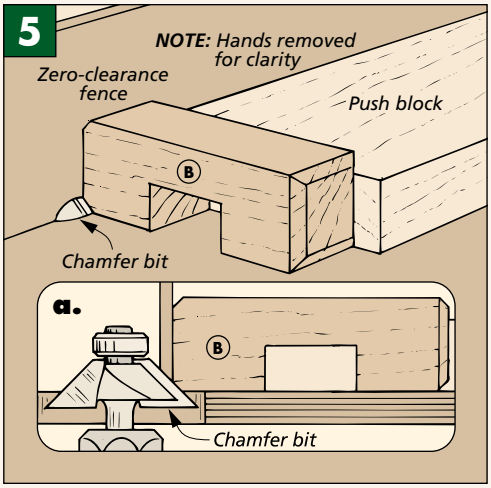
CROSS PIECES

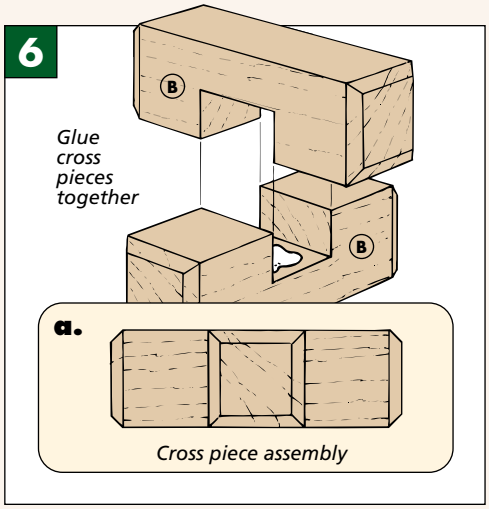
When the posts are complete, I began working on some cross pieces. Each cross piece assembly consists of two individual pieces and looks like short Lincoln Log pieces stacked together. Their purpose is to connect the posts in the middle of the tree so the spacing stays even from top to bottom, see photo above.











OVERSIZE BLANKS. The **cross pieces (B)** fit in the notches in the center of the post. (Mine were 1" x 1".) Their final length will be 3". However, since this is a bit short to work with on the table saw safely, I started with two 7"-long blanks, see drawing above.

With the two blanks in hand, I cut a half lap near both ends of each so the cross pieces would overlap, see Fig. 3. To support these blanks, I attached an auxiliary fence to the miter gauge and used the rip fence as a stop.

CUT TO SIZE. Now the blanks can be cut into four cross pieces, see Fig. 4. (This time, you can't use the rip fence as a stop because the piece will kick back.) Then all that's left is to chamfer the ends, see Fig. 5. Here again, I used the zero-clearance insert. But this time, I supported the pieces with a push block.

Now the cross pieces can be glued together and set aside until after the hooks and feet are made and the tree is ready to be assembled, see Fig. 6.

With the posts and cross pieces complete, the last pieces to make are the hooks and feet. With the two different sets of hooks and the set of feet, there are twelve different pieces to make. Fortunately, the procedure is identical. The only difference is the shape of the pieces.

HOOKS & FEET

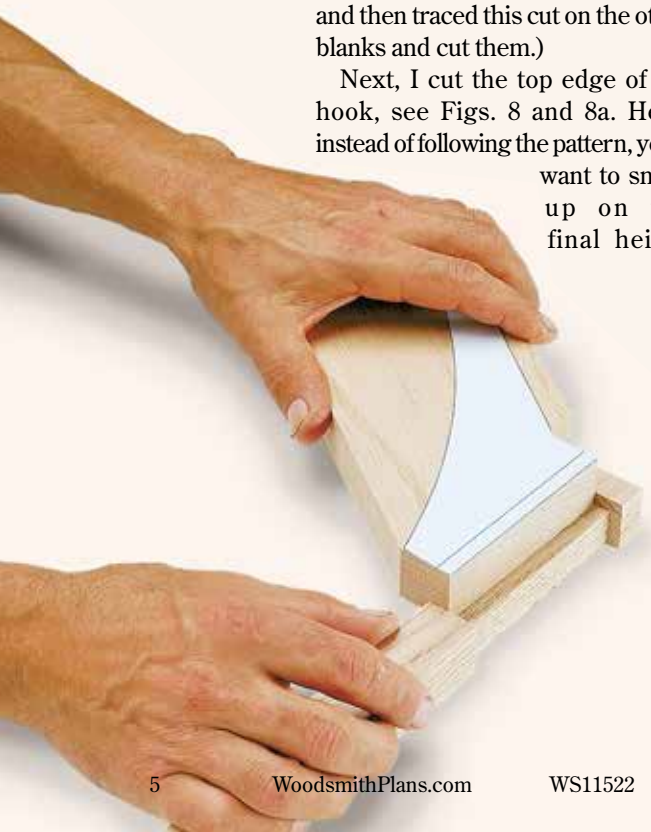
I started by cutting the blanks for the **top (C)** and **bottom hooks (D)** from 1"-thick stock. (Top hook blanks are 4" x 10"; bottom blanks are 4" x 8".)

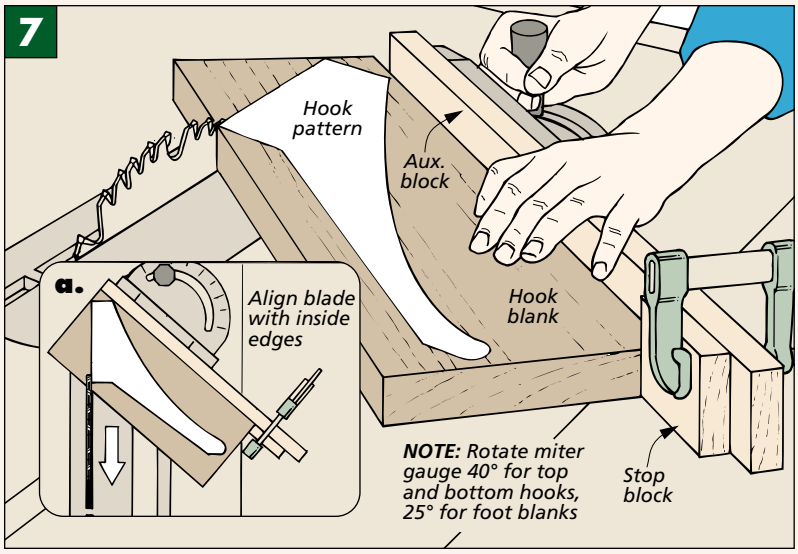
PATTERN. With the blanks cut to size, I created one pattern for the top hook and another for the bottom and then mounted them to two of the blanks. (The patterns for each piece can be found on page 2.

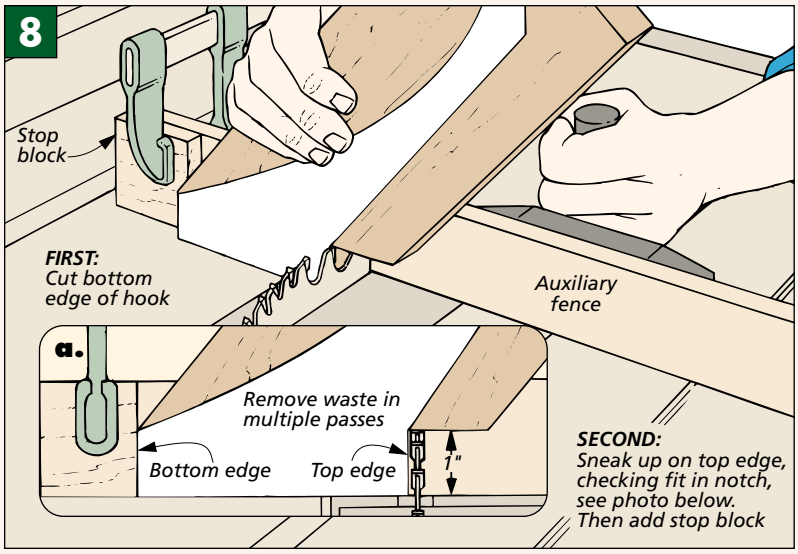
INSIDE EDGE. The next step is to shape the inside edge of each blank (the one that fits into the notches on the posts). This is a two-step process. First, I angled the miter gauge and cut the inside edge of each piece, see Fig. 7. Note: Both hook blanks are cut with the miter gauge angled 40°.

With the inside edge cut, next I cut the top and bottom edges so the hooks fit in the notches in the post. I cut the bottom edge first with the blank standing on the inside edge. (I cut the blank with the pattern first and then traced this cut on the other blanks and cut them.)

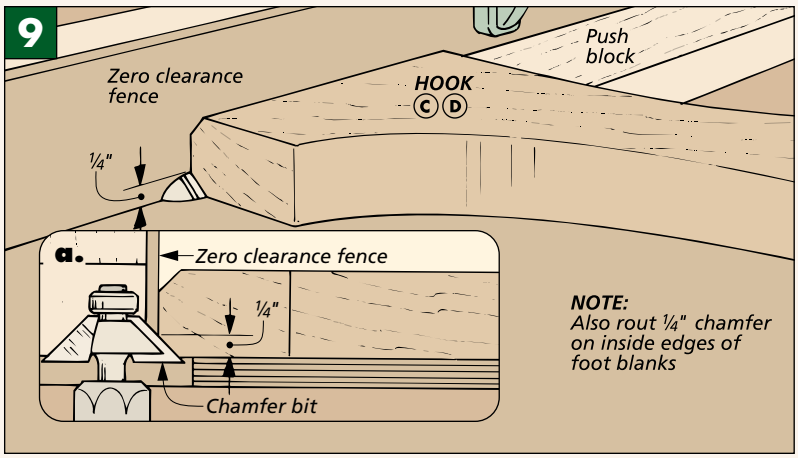
Next, I cut the top edge of the hook, see Figs. 8 and 8a. Here, instead of following the pattern, you'll want to sneak up on the final height (width) of the piece so it fits snug in the notches in the posts, see photo at left. When it does, you can clamp a stop block to the auxiliary fence so all the other blanks will be identical. Note: You'll need to reset the stop block for the other set of hook blanks.

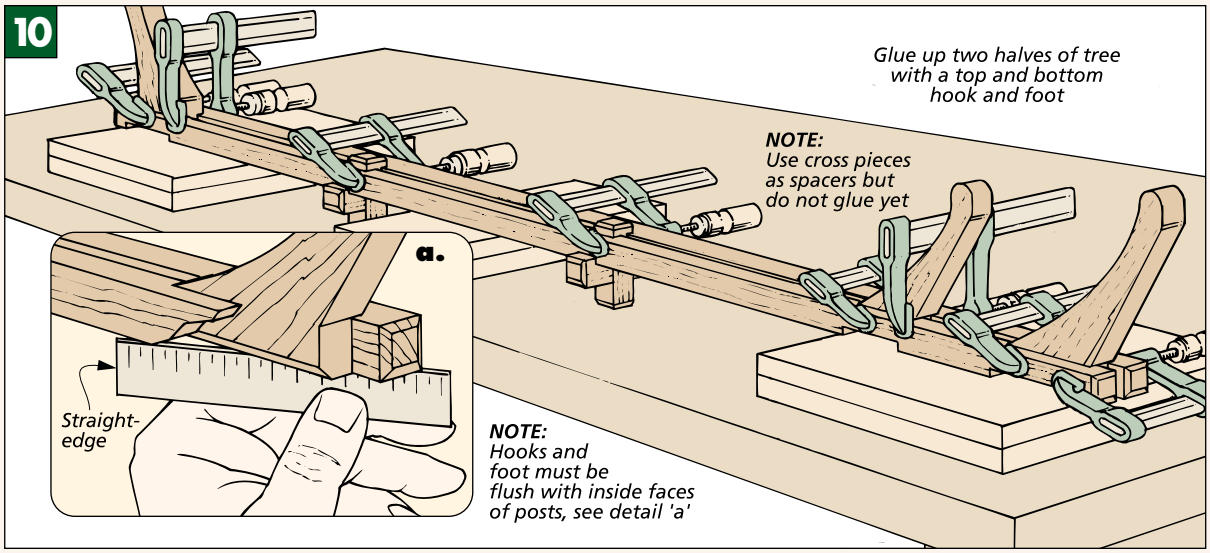






CUT TO SHAPE. Now the rest of the pattern can be cut out. I used the band saw for this and sanded up to the line. When this piece was complete, I traced it on the other blanks so they could be cut and sanded to match.





FEET. With the hooks cut out, you can work on the **feet (E)**. The procedure here is the same. The only differences are that the blank is larger (5" x 13½", see pattern on page 2) and to cut the inside edge, the miter gauge is rotated 25°, refer to Fig. 7.

CHAMFER INSIDE EDGE. When the feet are cut out and sanded, there's still one more step for both the hooks and feet. I routed a chamfer on the inside edges of each piece, see Figs. 9 and 9a. This ¼" chamfer allows all four pieces to come together in the center, see the Section View detail on page 2.

ASSEMBLY

Now that the hooks and feet are complete, the hall tree can be assembled. Here it begins to look like a large "Lincoln Log" project. But fortunately, there's not much to the assembly, if you take it in steps.

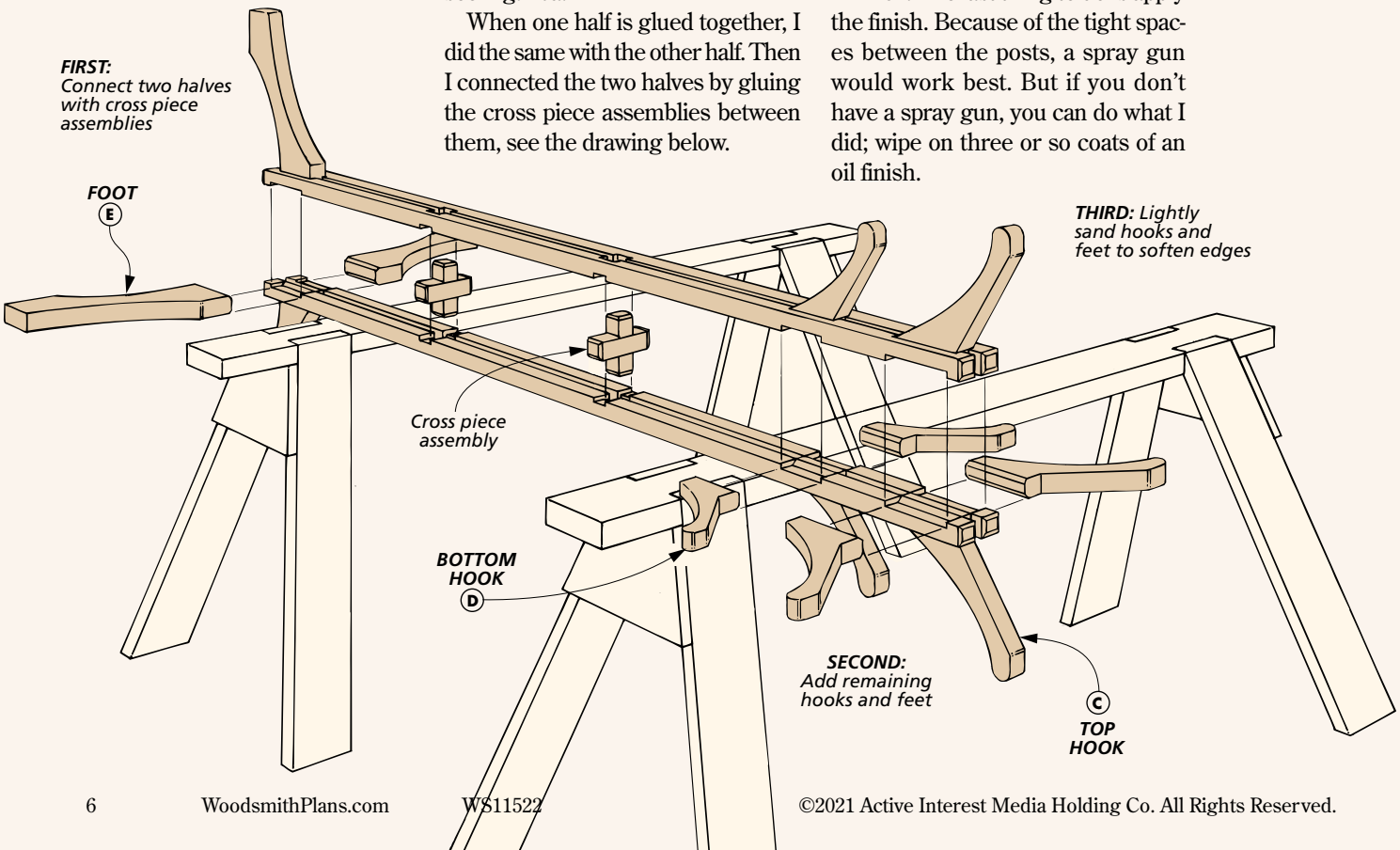
GLUE UP HALVES. The first thing I did was glue up one set of hooks (top and bottom) and a foot between two posts, see Fig. 10. I used the cross piece assemblies to help keep the posts aligned. But the important thing is that the inside edges of all the posts, hooks, and feet are flush, see Fig. 10a.

When one half is glued together, I did the same with the other half. Then I connected the two halves by gluing the cross piece assemblies between them, see the drawing below.

At this point, the remaining pairs of hooks and feet can be glued into the notches, see drawing below. I added one piece at a time, inserting it into the notch and clamping it tight. Shop Tip: To prevent glue squeeze-out, apply glue only to the notches on the post.

After all the hooks and feet were in place, I checked to see if there was a shoulder at the bottom of the hooks. If there was, I sanded the hooks so they made a smooth transition into the posts. Then I softened all the "hard" edges on the hooks and feet.

FINISH. The last thing to do is apply the finish. Because of the tight spaces between the posts, a spray gun would work best. But if you don't have a spray gun, you can do what I did; wipe on three or so coats of an oil finish.



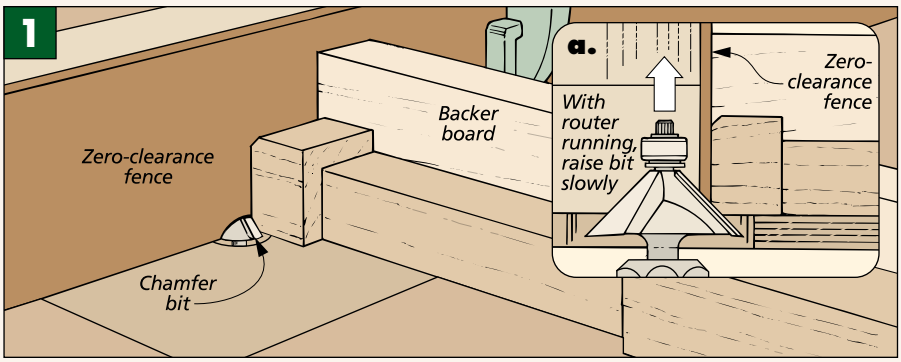
Zero-Clearance Fence for Routing Chamfers

Chamfering the end of a workpiece isn't much of a problem with a router table and a chamfer bit.

But the idea of routing chamfers on the ends of the pieces of the hall tree made me a little nervous.

Because the ends are only 1" square, I was worried that they might get caught in the opening of my router table fence. So to play it safe, I made a zero-clearance fence to fit around the chamfer bit.

I started by lowering the chamfer bit so only the bearing was sticking above the surface of the table. Then I positioned my router table fence so it was about an ⅛" in front of the router bit bearing.



Next, I clamped a piece of ⅛"-thick hardboard to the fence, see Fig. 1. (The bearing is actually behind the hardboard fence.)

To create the zero-clearance opening, all you have to do is slowly raise the bit while the router is running, see Fig. 1a. Shop Note: Raise the bit just high enough to cut the chamfer.

Now all you have to do is rout the ends of the workpieces. Since the chamfers are being cut on end grain, it's a good idea to use a backer board to help prevent chipout.