Photos: Jonathan Binzen

Arts and Crafts Coffee Table

Fresh work in a familiar style

BY JOHN HARTMAN

My artist wife and I love Arts and Crafts furniture, and our recent move to a new home motivated us to design and build pieces in this classic style. We both liked Kevin Rodel's Limbert-inspired coffee table (*FWW* #252) with its theme of gridwork and square cutouts, but we felt that the design was a bit too bold to live well with the other furnishings in our living room. We adopted the rough format of his table and the tilt of the legs, but our design diverged in most other details. With an understated shelf, beveled through-tenons, and stretchers shaped at the ends to corbel-like curves, we aimed to develop a traditional look that felt true to the style without directly referencing a specific maker. The split panel and its curving cutouts bring a bit of whimsy to an otherwise simple form and invite the viewer to notice the negative shapes.

I started designing the table by making a rough mockup out of 1-in.-thick foam board. I adjusted the dimensions until the size and height of the table felt right in the room and in relation to the sofa. Since our living room is entered from the side, I knew the end view of the table would be the dominant one. So I focused on that as I developed the design. After sketching several versions on paper, I moved the design into SketchUp for further refinement.

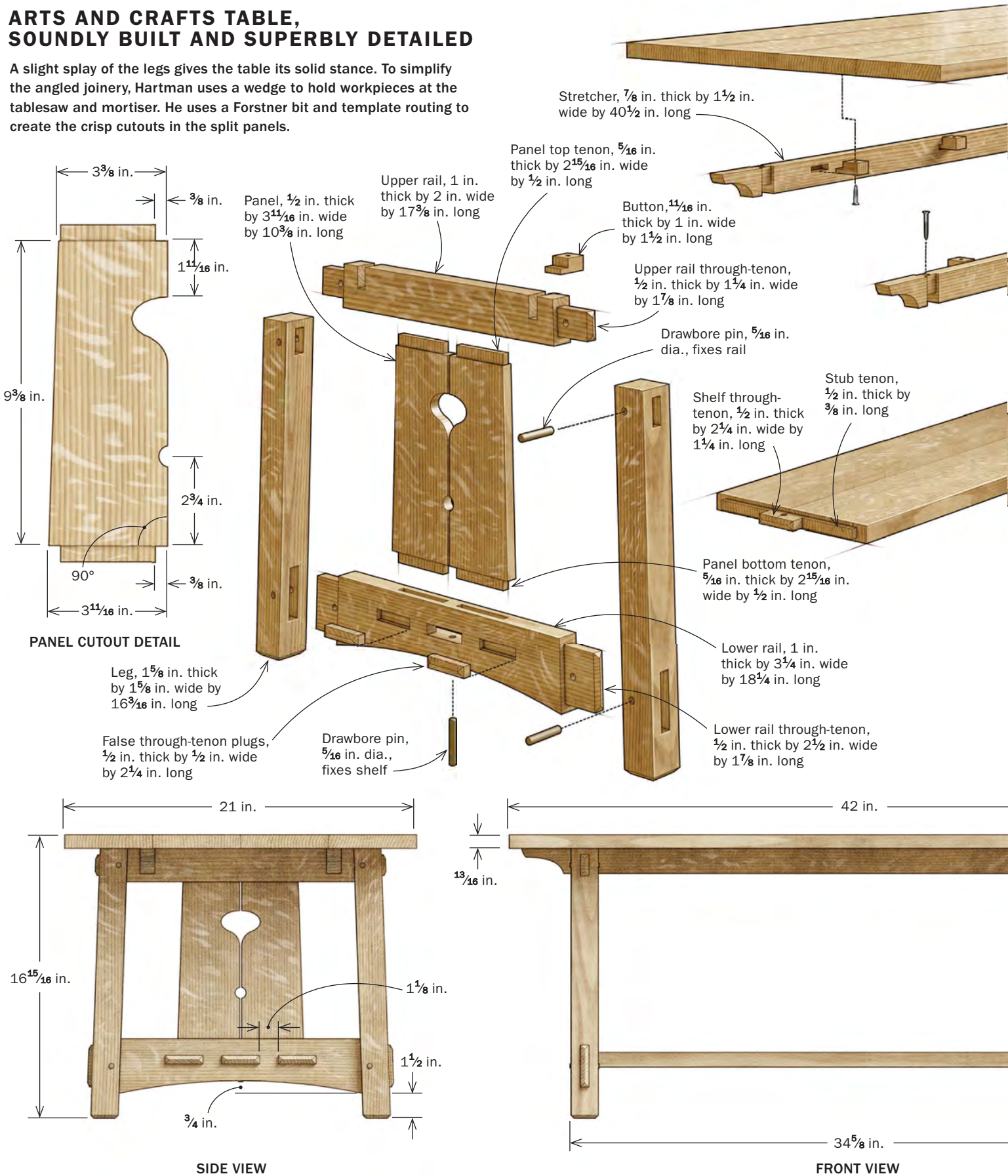
All went smoothly until I woke up suddenly one night to the realization that I had made a mistake. In my drawings, the shelf was connected to the lower rail with three through-tenons—a clear example of cross-grain construction. How had I missed it? I had forgotten about wood movement. Struggling to find a solution, I consulted with an experienced woodworking friend. He suggested a way to solve the problem while keeping the look unchanged. The answer was to retain the center through-tenon but to cut the outer two tenons back, creating stub tenons. I could glue and pin the center tenon but let the stub tenons move in the joint. And I would add faux ends on the outside of the lower rail to give the appearance that there were three through-tenons. Perfect—a solution that didn't change the appearance of the table.

One important wedge

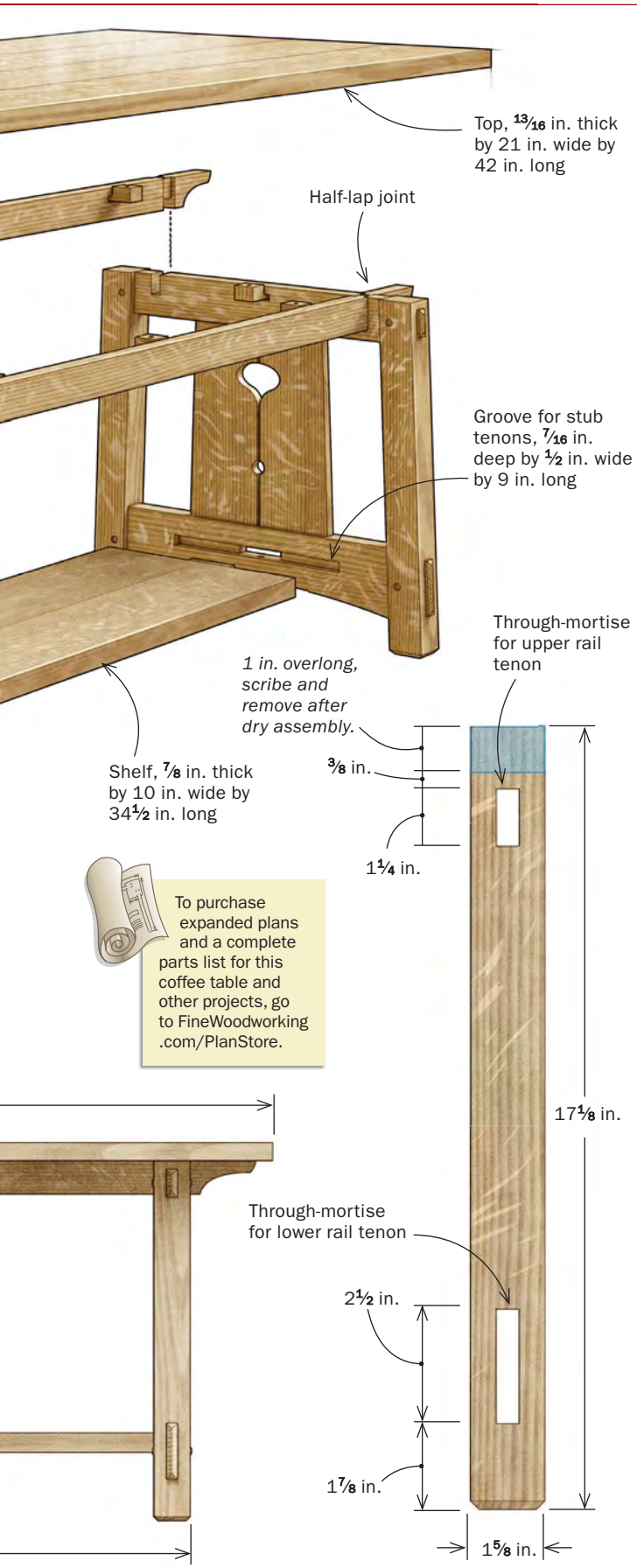
The biggest challenge in this project is cutting accurate angles on the ends and shoulders of the rail tenons and machining the mortises in the legs to match. There is a trick I have found to make this easier. I use a wedge to hold the workpieces at the correct angle on the tablesaw and the mortiser. To make the wedge, I

ARTS AND CRAFTS TABLE, SOUNDLY BUILT AND SUPERBLY DETAILED

A slight splay of the legs gives the table its solid stance. To simplify the angled joinery, Hartman uses a wedge to hold workpieces at the tablesaw and mortiser. He uses a Forstner bit and template routing to create the crisp cutouts in the split panels.



Drawings: John Hartman

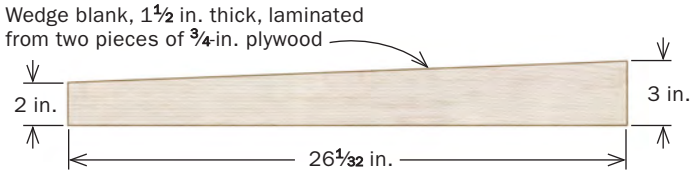


LEG FRONT VIEW

To purchase expanded plans and a complete parts list for this coffee table and other projects, go to FineWoodworking.com/PlanStore.

Legwork

Wedge sets the angles. *Using a taper jig on the tablesaw, Hartman begins the build by slicing a long wedge from a plywood blank. He keeps the tapered cutoff to use on the mortiser when bit clearance is an issue.*



Angled crosscut. *Using the wedge to produce the proper angle, cut the bottom of the leg to length on the tablesaw's crosscut sled. Leave the leg's top end 1 in. overlength until after the top mortise is cut and fitted.*

Angle the mortises too. *Because the legs are canted, the mortises for the rail tenons must be angled. Working at the hollow-chisel mortiser, Hartman puts the wedge beneath the workpiece to create that angle.*

Build the ends

Lower rail first. *Using the wedge again on the crosscut sled, make the angled end cuts on the lower rail.*

Crosscut layout. *Cut both ends of the lower rail and one end of the top rail. Clamp the lower rail between the legs, and set the angled end of the top rail against one leg. Then mark the length by tracing the other leg.*

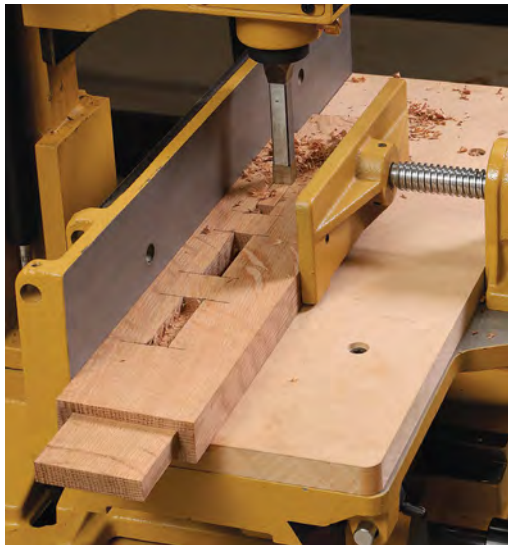
first laminate two pieces of ¾-in. Baltic-birch plywood to make a blank 1½ in. thick. Then, using a tapering jig on the tablesaw, I cut the rectangular blank to a wedge shape. I face the wedge with sandpaper so workpieces will not slip.

Doing the legwork

Now I put the wedge to use. With a crosscut sled at the tablesaw, hold the leg against the wedge and cut the bottom end of the leg to length. Leave about 1 in. of extra length on the top end of the leg to prevent splitting during the mortising and fitting process.

The wedge comes in handy again for mortising the legs. After laying out the through-mortises on both faces, place the wedge on the mortiser's table and put the leg on top of the wedge. To make it easier to align the edge of the hollow chisel to the top and bottom layout lines, I use a little setup block with one end cut to match the 2.2° angle of the legs. I stand it on the leg beside the layout line and shift the leg until the hollow chisel kisses the setup block. I set the hollow chisel's cutting depth at a little over

Easy angles. *With a dado blade in the tablesaw and the wedge against the miter gauge, cut the lower rail's tenon cheek in several passes. Use the rip fence as an end stop to control the location of the tenon's shoulder. Flip the wedge end-for-end to cut the tenon's other cheek.*



More mortising. *After completing the single through-mortise at the center of the lower rail, Hartman cuts the shallow outer mortises that will hold the caps of the faux through-tenons.*

halfway through the leg and cut the mortises from both faces. If the layout is accurate, the mortises should meet up nicely.

Working the rails

Next cut both lower rails to length on the crosscut sled using the wedge as before. For the upper rails, I cut just one end now. Because the legs are tilted, I don't rely on the plans to get the correct length of the upper rails; instead, I cut one end and then make a field measurement to determine final length.

To do this I place a lower rail between two legs and clamp it in place. Then I lay an upper rail in position with the end that's been cut registered against the inside face of one leg and the other end resting on the other leg. I mark the rail where it meets the leg and then cut it to length; I cut the second upper rail to the same length.

Smart layout. *To find the exact location of the end panel's upper shoulder, Hartman first cuts the tenon on the bottom of the panel. Then he sets the shoulder of that tenon on the lower rail and traces along the upper rail.*

First the Forstner. *To make the panel's small half-circle cutout, use a fence and a Forstner bit at the drill press.*

Upper cutout. *After rough bandsawing the upper cutout, Hartman fixes a template to the workpiece with double-sided tape, then trims to final shape with a double-bearing bit.*

Smooth trimming. *To avoid cutting against the grain, trim half the shape with the workpiece riding on the table and the other half with the template on the table.*

Fair the taper. *After tapering the outside edge of the panel on the bandsaw, smooth it with a handplane.*

Shelf and stretchers

Mark the stretchers from the shelf. *After milling the long tenons on both ends of the shelf with a dado blade at the tablesaw, lay the stretcher on the shelf and transfer the shoulder locations. This will determine where you cut the half-lap notches.*

Using a dado blade, cut the tenons on the rails. With a miter gauge set to 90°, place the wedge against the gauge and the rail against the wedge. Set the tablesaw's fence to serve as an end stop for the workpiece. Slide the end of the rail along the fence to cut the shoulder, and then nibble away the rest of the cheek. Flip the wedge as needed. Hand-fit the tenons to the mortises in the legs.

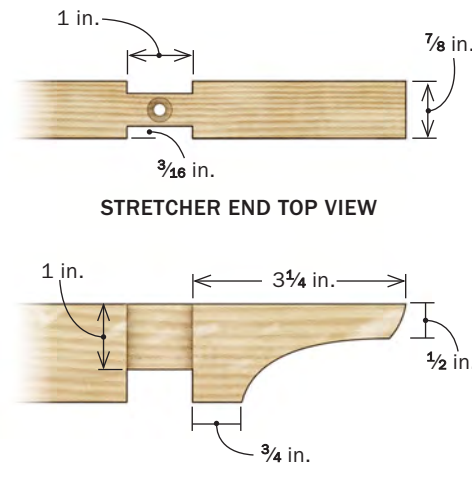
With the tenons cut, mark the lower rail for the through-mortise and groove that will receive the shelf. With a ½-in. hollow chisel set to cut a little more than halfway through the rail, chop the through-mortise, working from both faces of the rail. Then reset the depth of cut to 7/16 in. and chop the groove for the shelf's stub tenons. To cut the mortises in the upper and lower rails for the end panels, switch to a 5/16-in. hollow chisel in the mortiser.

Now it's time to install the drawbore pins. First mark out the placement of the holes in the legs and, with a 5/16-in. brad-point

Notching the stretcher. *Using the miter gauge and a dado blade, with the fence serving as an end stop, Hartman cuts the stretcher's half-lap notches. He used the same arrangement, with the blade set lower, to cut the shallower notches on the faces of the stretcher.*

Test the fit. *Gentle taps with a rubber mallet should be sufficient to send the half-lap home.*

Rough shape the end. *Hartman bandsaws the curves at the end of the stretcher. Afterward, he'll template-rout them to final shape. You could also do the final fairing by hand.*



bit in the drill press, bore through the legs. Then dry-assemble and clamp up the legs and rails. Inserting a ¼-in. transfer punch in the holes you've drilled in the legs, mark the tenons. Hold the punch tight toward the shoulder of the joint. This will make a mark offset by 1/32 in. toward the shoulder. Disassemble the legs and rails and drill 5/16-in. holes in the tenons at the points you've just marked. Lightly chamfer the holes with a countersink bit. Re-assemble the legs and rails and drive the pins through the holes. The slight offset ensures that the pin will draw the joint tight.

Fit and shape the panels

With the end frames dry-assembled and pinned, you can fit the panels. At the tablesaw, use a dado blade to cut the tenon on the lower end of the panels. To lay out the location of the shoulder for the panel's upper tenon, hold the panel in place in the frame with its lower tenon shoulder resting on the lower rail. Then scribe along the upper rail to mark the shoulder of the upper tenon. Make any adjustments to the tenoning setup and cut the upper tenon of the panel. After all the panels are machined, disassemble the end frames and hand-fit the panels to the rails.

To shape the lower cutout in the panels, I make half-circles on the drill press with a 9/16-in. Forstner bit. Use a fence with a stop to securely register the panels. To shape the flower motif, I use a template and a double-bearing compression bit on the shaper or router table. First, I trace the template onto the panel and trim close to the lines on the bandsaw. Then I use double-sided tape to attach the template to the panel. To avoid climb cutting, I make the trim cut in two passes, one starting from each end of the opening, so the bit is cutting with the grain at all times. To make the second pass I turn the assembly over and raise or lower the bit so the bearing still rides on the template.

Fit the shelf and stretchers

With the shelf cut to length and width, machine 1¼-in. tenons on both ends, making them the full width of the shelf. Next cut

Trim the long tenon to width. *With the shelf tenon still full length, establish the end shoulders with handsaw cuts followed by chisel work.*

Fit the tenon and mark through the mortise. *After cutting the through-mortise and the long groove in the lower rail, Hartman fits the thickness of the shelf tenon with a shoulder plane (left). With the shelf tenon dry-fitted partway into the lower rail, mark the width of the through-tenon using the center mortise as a guide (above).*

Cut back the tenons. *After making careful handsawn kerfs to define the width of the through-tenon, bandsaw the stub tenons to length.*

Assembly

Rails and panels. *Having dry-assembled the frames to mark out and then drill holes for drawbore pins, Hartman here inserts the end panels. When he does final assembly he'll apply glue to the panel tenons only at their inside corners to allow for expansion.*

On with the legs. *Once the panels are in place, the legs are knocked on and then the pins driven through the tenons to tighten the assembly.*

Fitting faux tenons. *Having three through-tenons would constrain the movement of the shelf, so only the middle is a true through-tenon. The outer two are false ends glued into shallow mortises.*

the tenon's end shoulders with a handsaw or bandsaw. To accommodate expansion of the shelf, make the total width of the tenon ¼ in. less than the length of the groove it will fit into. After marking out the width of the through-tenon at the center, trim away the waste on either side of it, leaving stub tenons flanking the through-tenon. Then hand-fit the joint. The pyramidal bevels on the end of the through-tenon can be cut with a sharp block plane. To make matching pyramidal caps for the faux tenons, cut a workpiece to the same width and thickness as the real through-tenon; bevel its end, and crosscut off a ½-in. slice.

I use the shelf to determine the precise location of the stretcher's half-lap joints. First mark the midpoint in the length of the shelf and the stretcher. Lay the stretcher on the shelf with the center lines matched up. Then mark the stretcher at the shoulder of the shelf tenons. Lay out the half laps using those lines, and then machine the joints.

Finish and assembly

I made the table of white oak and fumed it to relate to its Arts and Crafts predecessors. I did the fuming and other finishing before final assembly to simplify the processes and to minimize problems with squeeze-out. For the fuming, I made a tent with scrap wood and plastic sheeting. I dry-assembled the table and placed it in the tent with a bowl of janitorial strength ammonia. After fuming, I wiped on a washcoat of garnet shellac and lightly scuff-sanded once it was dry. I used gel stains to get the color and value I wanted and topcoated with a wipe-on finish.

I glued the end assemblies first and drove home their drawbore pins. The panel tenons needed just a little glue on their inner corners. With the end assemblies cured, I applied glue to the shelf's through-tenon and about an inch of the stub tenon on either side of it. Then I glued in the shelf and drove a pin into each through-tenon. I inserted the stretchers and checked for square, and then I screwed the stretchers to the upper rails. Last, I placed the top upside down on the bench, centered the base on the top, and attached the two with buttons and screws. □

John Hartman works wood in a converted garage in West Springfield, Mass.

Insert the shelf. *With the ends assembled, fit the shelf in place. A drawbore pin driven from the bottom edge of the lower rail will pull the shelf tight. When the base is fully dry-assembled, Hartman will fume it and apply finish. Then he'll disassemble all the parts and proceed with the final, glued assembly.*

Slide in the stretchers. *To complete the base, fit the stretchers' half-lap joints to the upper rails.*

Screw on the top. *Using buttons fitted into slots on the inside face of the stretcher, screw the base to the tabletop.*