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Shaker Hall Table



Published in Woodworker's Journal "From Shop to Home: Essential Projects, Tips and Techniques for Today's Home Woodworker"

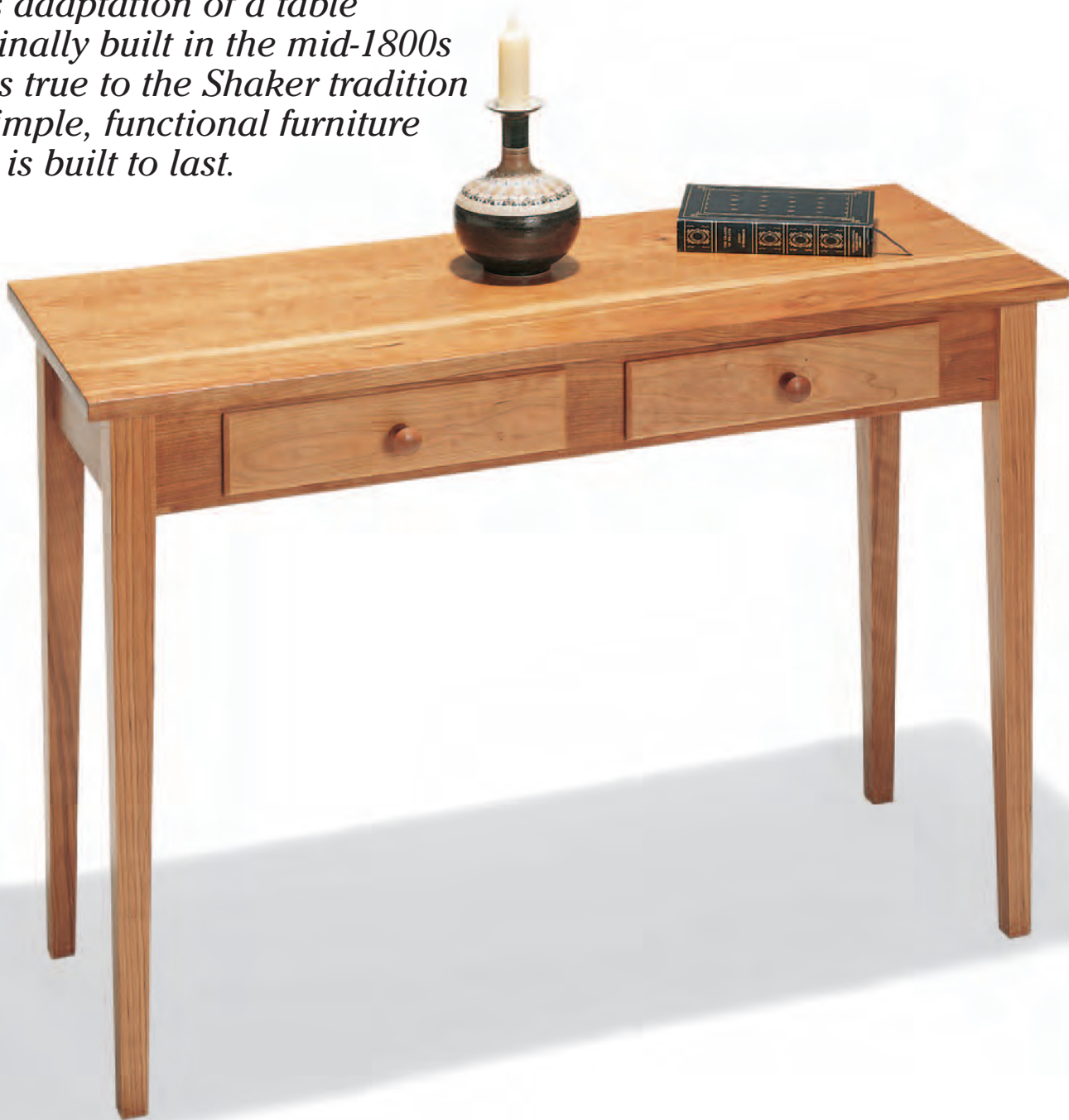
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\$7.95

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Shaker Hall Table

This adaptation of a table originally built in the mid-1800s stays true to the Shaker tradition of simple, functional furniture that is built to last.



When woodworkers think of the Shakers, one thing springs quickly to mind: The exquisite simplicity of their furniture designs.

Shaker woodworking is truly a marriage of form and function, and this table is no excep-

tion. The original version of this piece was used by the North family in the Shaker village at New Lebanon, New York, around 1840. That piece was slightly deeper than this one, and it featured three drawers across the front apron. The

original craftsman's material choices are hard to improve on. He used cherry for all the visible parts and clear pine for the hidden drawer components and web frame pieces. We used the same materials in our version of this classic table.

Start with the Top

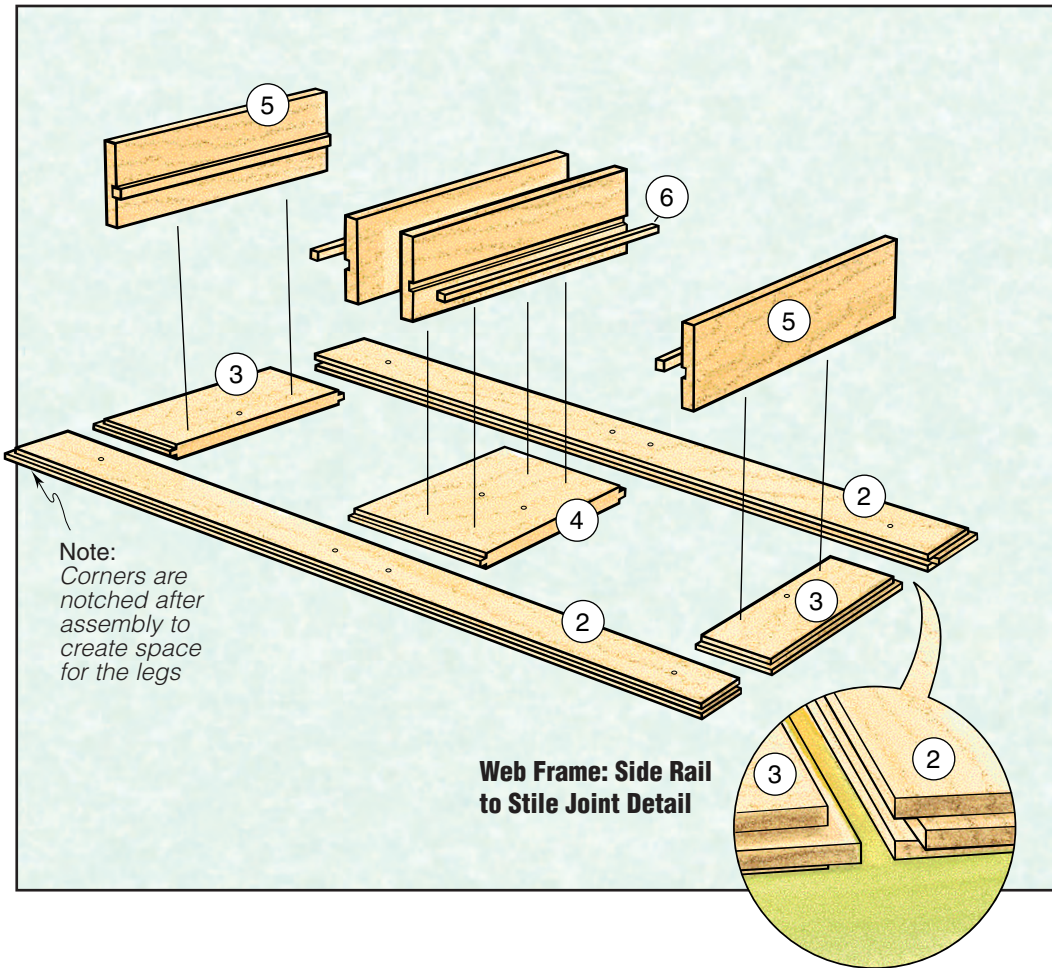
Since it will be the focal point of the table, choose your best stock for the top (piece 1). Always select an uneven number of boards to form a panel like this so that a board ends up defining the center of the top instead of a joint line. Be sure to spend time arranging the pieces before you joint their edges, but with this small of a top, don't worry too much about alternating the crowns. Instead, concentrate on the final appearance of the top and let that guide you in your selection process.

After jointing, glue the edges and, using a piece of scrap to protect the cherry, lightly tap the boards with a mallet until they're aligned perfectly. Tighten the clamps until slight beads of glue begin to emerge from the joints. Wait about 15 minutes, and scrape off these rubbery glue beads. When the glue is thoroughly dry, lay a straightedge across the tabletop and scribe pencil lines on the high spots. Now use a belt sander to sand the top flat, concentrating on these high areas first, then the full panel.

Cut the tabletop to length next, making sure your cuts are perfectly square. (See the *tip* at right for a technique on squaring panels.) With the top milled to final size, go ahead and cut the rest of the pieces to overall size, following the *Material List*, page 115.

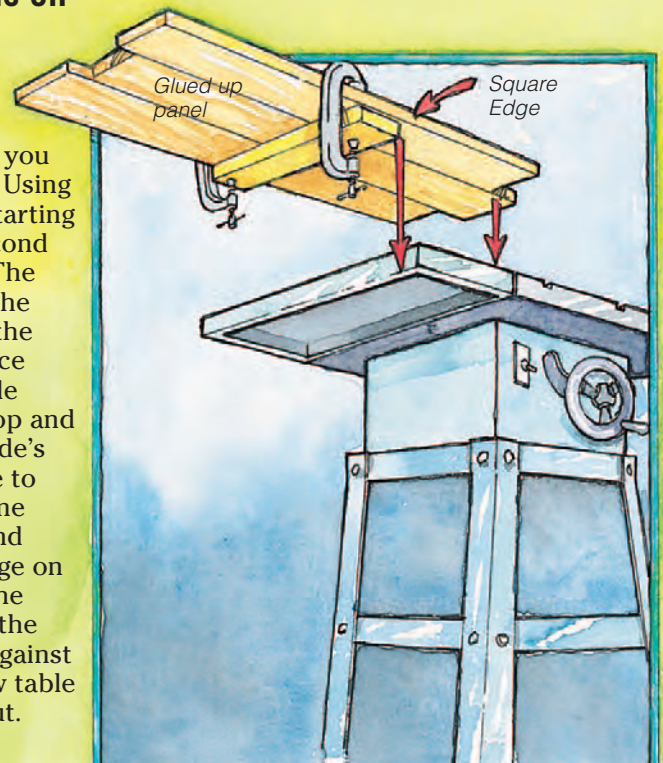
Making the Web Frame

The drawer support sub-assembly is a simple web frame, (see *Exploded View*, this page) composed of two stiles (pieces 2) and three rails (pieces 3 and 4). With all five



Squaring Panels on a Table Saw

Mark one end of the panel square, and mark the edge you use as a reference. Using the first line as a starting point, lay out a second line on the panel. The distance between the two lines must be the same as the distance between the outside edge of the table top and the edge of the blade's teeth. Use a square to draw the second line across the panel and clamp a straightedge on the line. Now flip the panel over and let the straightedge ride against the edge of the saw table as you make the cut.



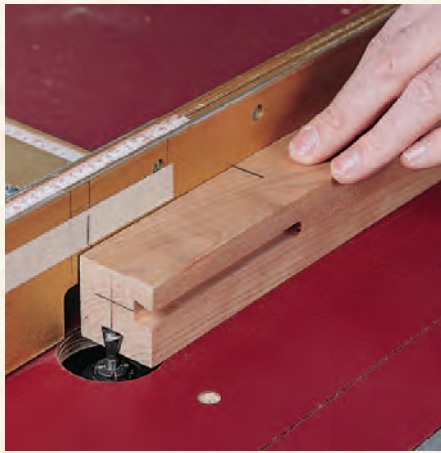


Figure 1: A $\frac{3}{16}$ " straight bit removes most of the waste in the sliding dovetail grooves, then a $\frac{1}{2}$ " dovetail bit finishes the job. To limit the length of the cut, visual stops are marked on both the fence and the workpiece.

pieces cut to size, create tongues on the ends of the three rails, and grooves on the inside of each stile. Refer to the *Technical Drawings* on pages 118 and 119 for dimensions, and make these joint cuts on your router table.

Glue and clamp the web frame together (checking for squareness by measuring diagonally), then set it aside. Once the glue cures, go back to the *Technical Drawings* for the location of the notches where the



Figure 2: Use scrap cutoffs from the apron stock (since they're the exact thickness of your workpieces) to set the fence for the dovetail cuts on the aprons.

frame will meet the legs. Cut these out with your jigsaw.

The next bit of machining is to form a tongue all the way around the outside edge of the web frame. When the table is assembled, this tongue will fit into grooves on the inside faces of the aprons. Form the tongue on the router table (see *Technical Drawings* for dimensions), using a rabbeting bit with a guide bearing or a straight bit in combination with the router table fence.

Before moving on to the aprons, machine and install the drawer runners and slides (pieces 5 and 6). Cut the runners to size and rout a groove on one face of each to accept the slides (see *Technical Drawings* for locations). Glue the slides in the runner grooves and, when the four subassemblies are dry, screw and glue them to the web frame from the bottom up — just be sure the slides are oriented correctly to accept the drawers.

Cutting the Leg Dovetails

The legs (pieces 7) on our table are tapered. However, there is another machining step to complete on the legs while they're still square. The aprons are attached to the legs with sliding dovetail joints, and the tails of each joint are cut into the legs. The pins will be formed on the ends of each apron in the next step.

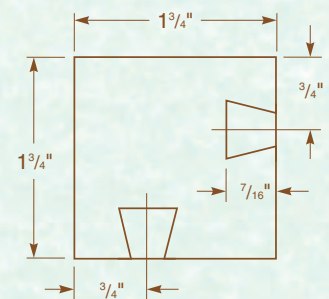
The easiest way to cut the stopped grooves in the legs is on your router table. Use the *Technical Drawings* (pages 118 and 119) and the *Leg Elevations* on this page to set your fence and bit height, then mark stops on your fence and workpiece to keep the length of the cut to 4".

Cutting the Apron Openings

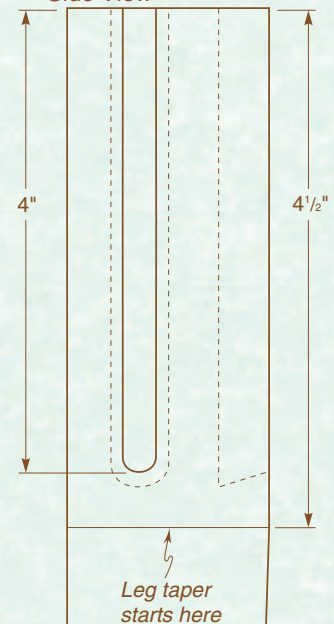


STEP 1: Extend your saw's blade to full height to mark the start and end of its cut on the fence. Now lay out the drawer openings on the apron and line one up so the blade, when raised fully, will emerge at the leading edge of a cut. Push the workpiece to the end of the cut, as shown above, then hold the piece firmly in place until the blade stops spinning.

Leg Elevations Top View



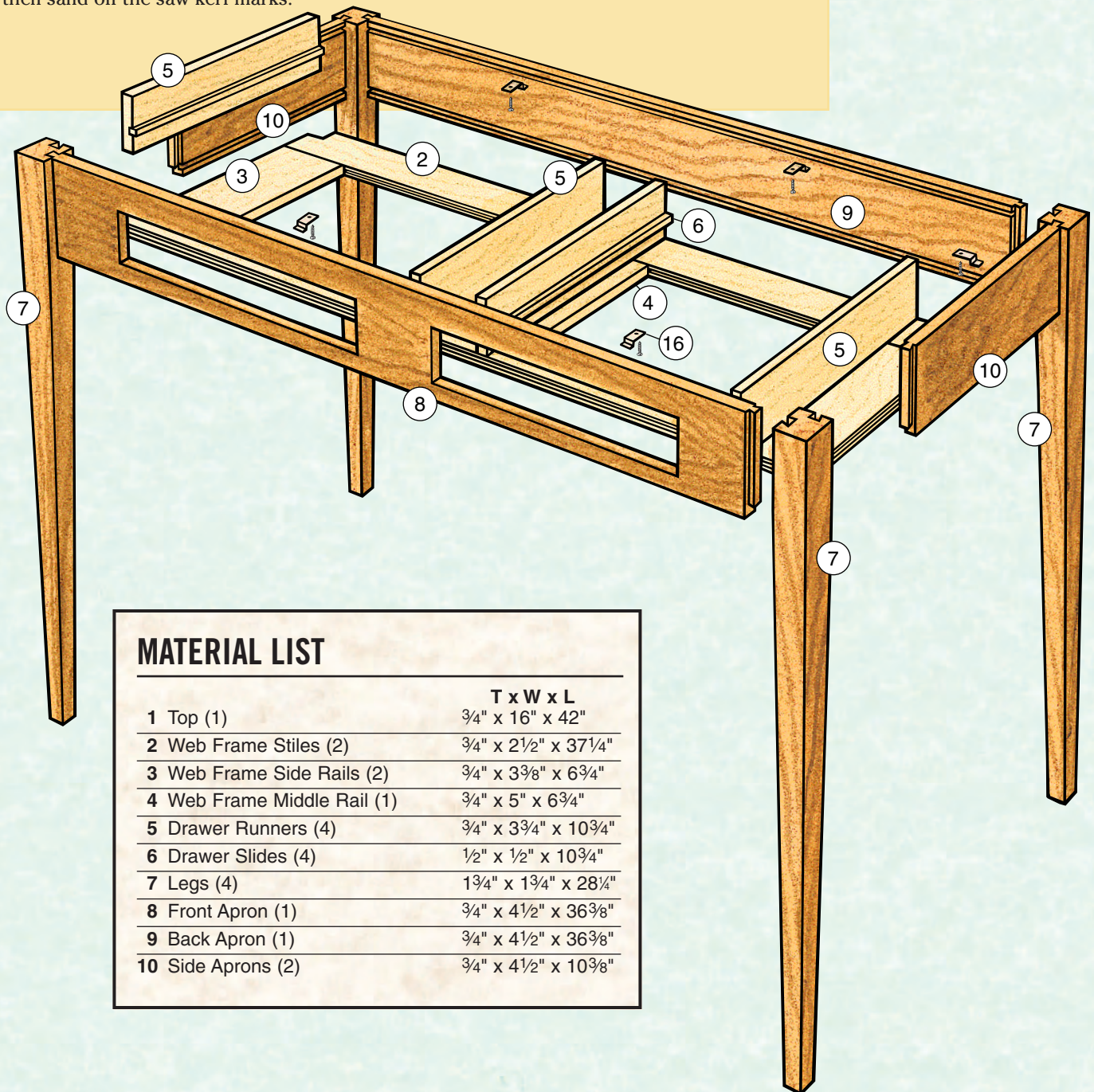
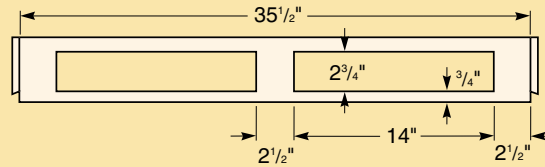
Side View





STEP 2: Once you've made all four table saw cuts, complete the horizontal lines with your jigsaw, sticking masking tape on its bottom to prevent scratching the apron. Make the vertical cuts, then sand off the saw kerf marks.

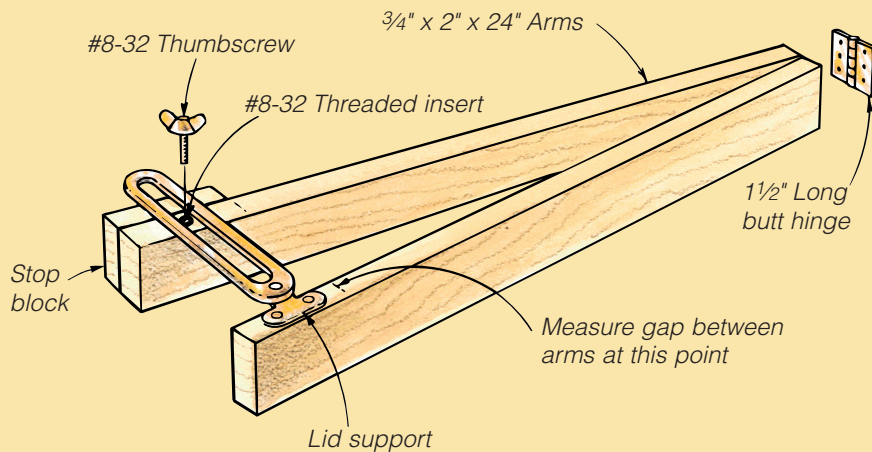
Front Apron Elevations



MATERIAL LIST

	T x W x L
1 Top (1)	3/4" x 16" x 42"
2 Web Frame Stiles (2)	3/4" x 2 1/2" x 37 1/4"
3 Web Frame Side Rails (2)	3/4" x 3 3/8" x 6 3/4"
4 Web Frame Middle Rail (1)	3/4" x 5" x 6 3/4"
5 Drawer Runners (4)	3/4" x 3 3/4" x 10 3/4"
6 Drawer Slides (4)	1/2" x 1/2" x 10 3/4"
7 Legs (4)	1 3/4" x 1 3/4" x 28 1/4"
8 Front Apron (1)	3/4" x 4 1/2" x 36 3/8"
9 Back Apron (1)	3/4" x 4 1/2" x 36 3/8"
10 Side Aprons (2)	3/4" x 4 1/2" x 10 3/8"

Tapering Legs on the Table Saw



Tapered legs are elegant, and cutting them is easy, especially with a tapering jig on a table saw. Here's a classic design that features two straight pieces of wood hinged together at one end. A lid support near the other end lets you change the angle. A small block of wood screwed to the side of one arm acts as a stop. To use the jig, make the gap between the arms at the

stop block equal the amount you want removed from the bottom of the legs. For the hall table, this distance is $\frac{3}{4}$ ". Align the saw blade with the top of the taper (on our table, this distance is $4\frac{1}{2}$ " from the top of the leg, because the taper begins at the bottom of the $4\frac{1}{2}$ " wide apron). Start the cuts near the top of the legs and work down to the narrow ends.

Shaker Table Leg Dimensions



If you don't want to build a tapering jig from scratch, the aluminum one shown in the photo above is an inexpensive alternative.

Install a $\frac{3}{16}$ " straight bit in the router to remove most of the waste, and then run a piece of scrap to check your setup. Now mill two grooves on each leg — one on each of the inside faces that will be tapered.

Switch to a $\frac{1}{2}$ " dovetail bit with a 14° bevel. Again, start with your piece of scrap to check the setup, then cut the tails, as shown in *Figure 1*.

The Aprons

As long as you're set up on the router table, switch your attention to the aprons (pieces 8, 9 and 10) to complete the other half of your dovetail joints. Make these cuts with the same 14° dovetail bit.

To complete these cuts, the workpieces are held vertically as they're moved across the

table (see *Figure 2*). Make sure your fence is high enough to keep the piece truly vertical (use an auxiliary fence if necessary). Set the fence so that only part of the bit is exposed, and cut one side at a time. Test the scrap piece in the leg until your setup is perfect, then mill the cherry workpieces. Finally, trim the bottom end of the pins so they seat perfectly in the rounded end of the groove in the legs.

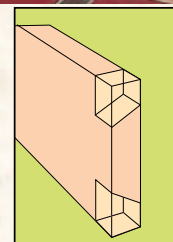
The front apron (piece 8) has two holes cut into it for the drawers. Use the *Technical Drawings* to lay out these openings, then follow "Cutting the Apron Openings" on pages 114 and 115 to complete the cuts.

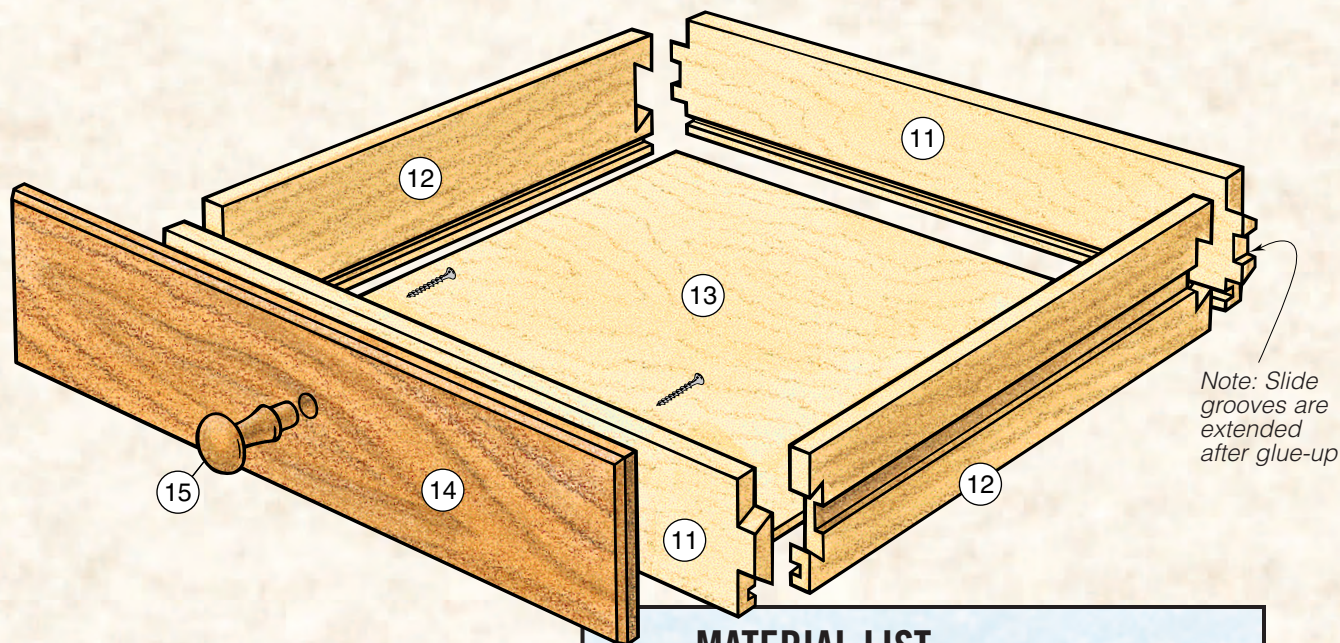
The last milling operation on the aprons is to cut grooves along the insides of each of the four pieces. These grooves are

cut on the table saw with a dado head, and they will house the web frame you assembled earlier. See the *Technical Drawings* for dimensions and location.



Figure 3: Use a high auxiliary fence on the miter gauge to cut the dovetail pins on the drawer sides. A dovetail saw can be used to cut the tails (right) on the drawer fronts.





Note: Slide grooves are extended after glue-up

MATERIAL LIST

	T x W x L
11 Drawer Fronts and Backs (4)	1/2" x 25/8" x 137/8"
12 Drawer Sides (4)	1/2" x 25/8" x 113/8"
13 Drawer Bottoms (2)	1/4" x 107/8" x 133/8"
14 Drawer Faces (2)	1/2" x 31/4" x 141/2"
15 Drawer Knobs (2)	
16 Table Top Fasteners (8)	

Tapering the Legs

Traditionally, a table saw has been the tool of choice for tapering legs, although a jointer will also work well. To cut tapered legs on a table saw, you'll need to purchase or build a version of the tapering jig described in the tint box on the preceding page. With the jig in hand, note that the tapers don't run the full length of each piece. The top 4 1/2" of each leg remains square (where it meets the apron), so each taper is actually only 23 3/4" long.

Draw the leg pattern (see the *Technical Drawings* for dimensions) onto some scrap, then rip a sample taper on some 1/4" plywood. Make adjustments as necessary until you're satisfied with the setup, then rip two tapers on each leg. The tapers are on the same sides as the sliding dovetail grooves you machined earlier.

Now you're ready to dry-assemble your table to make sure everything fits just right.

Building the Drawers and Drawer Slides

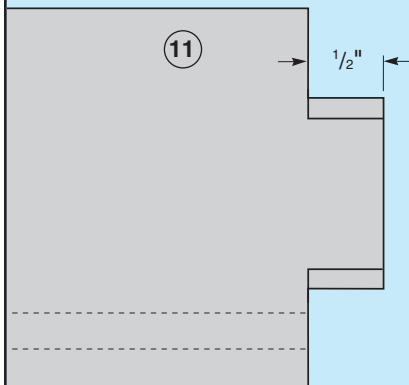
The most interesting aspect of the drawers is the large dovetail joint that holds the drawer fronts and backs (pieces 11) to the sides (pieces 12). Typical of Shaker craftsmanship, these joints are simple in design and exceptionally strong.

In the Shaker tradition, the front apron is made from a single piece of cherry with openings cut out for the two drawers. These drawers are held together with large dovetail joints.

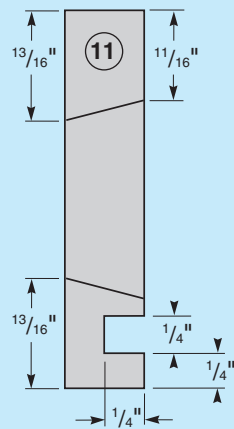
Before creating these dovetails, cut all the parts to size and set up to mill the grooves for the slides in the drawer sides (see *Technical Drawings*). But first double-check your layout lines by testing a side against the piece it will match. To do this, lay a penny or washer on the web frame and hold



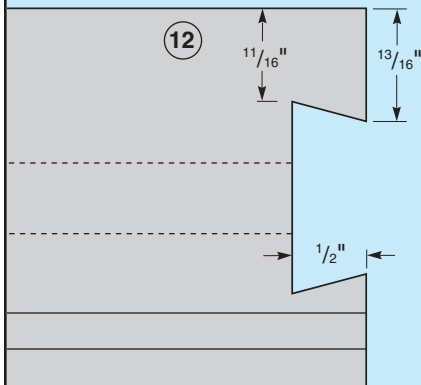
Drawer Front
(Front view)



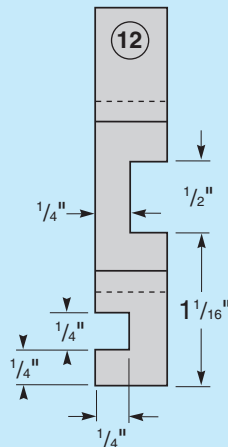
(End view)



Drawer Side
(Side view)

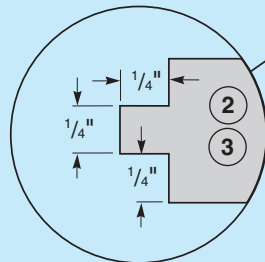


(End view)

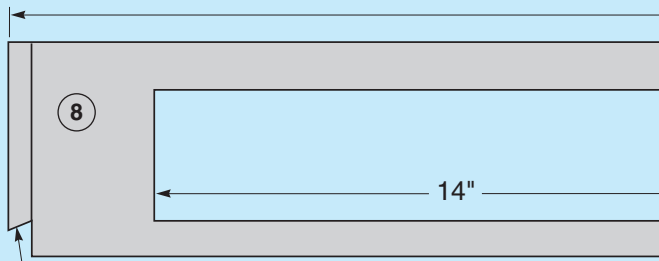


Note: Cut the pins on the ends of the drawer sides first, then use them to help lay out the tails on the drawer fronts.

Tongue Detail

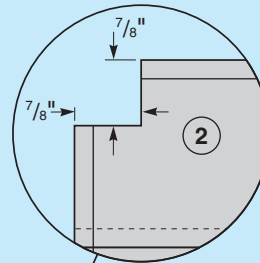


Front Apron
(Front view)

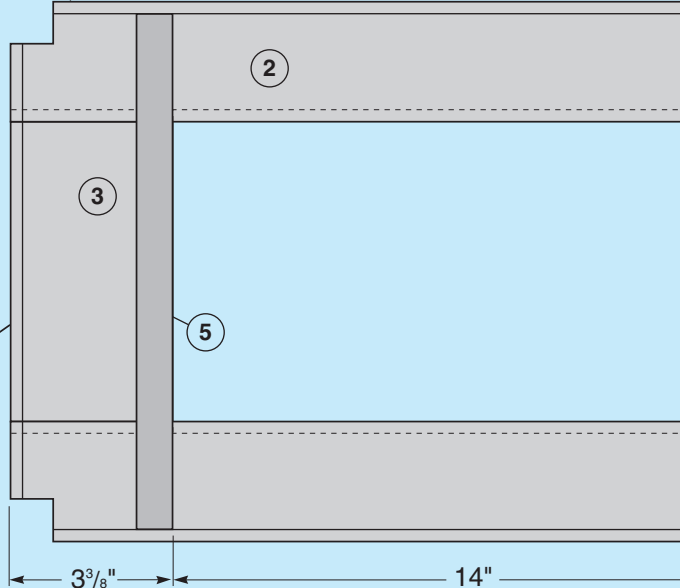


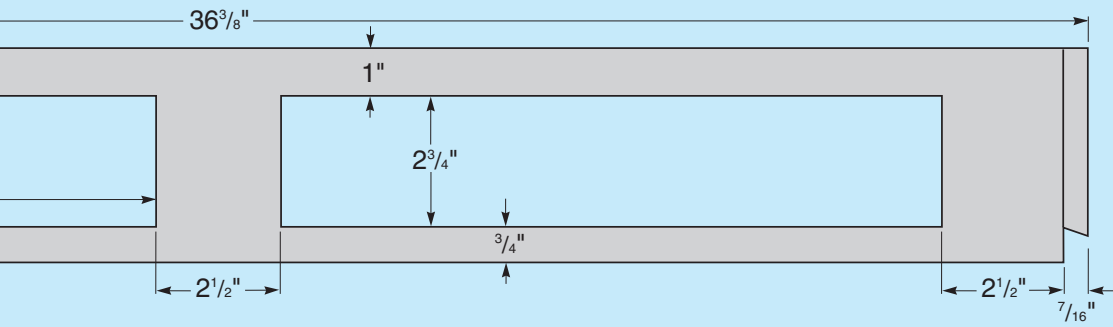
Remove the bottom end of each pin so that it seats perfectly in the rounded end of the groove in the leg.

Corner Notch Detail



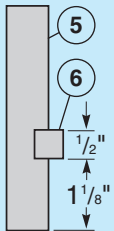
Note: Corners are notched after the web frame is assembled to create space for the leg.



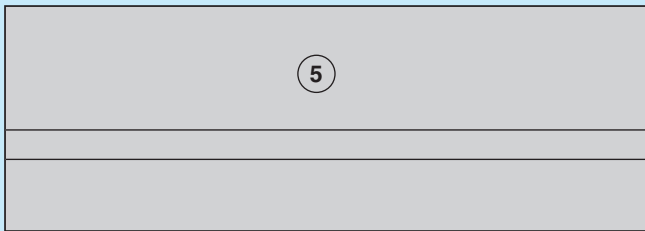


Drawer Runner

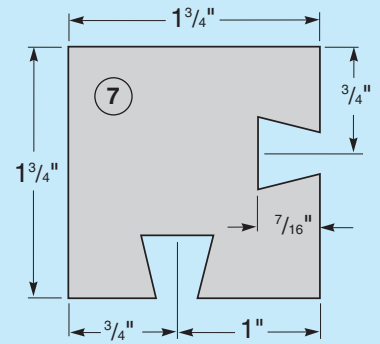
(End view)



(Side view)

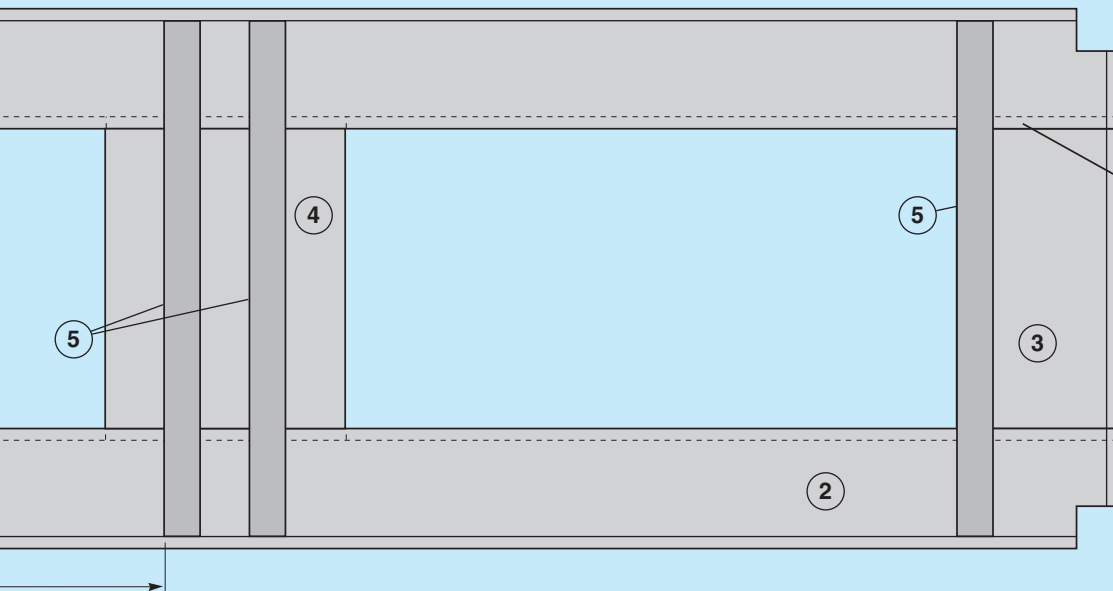


Leg (Top view)

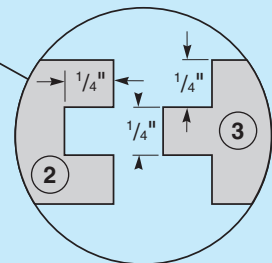


Web Frame

(Top view)

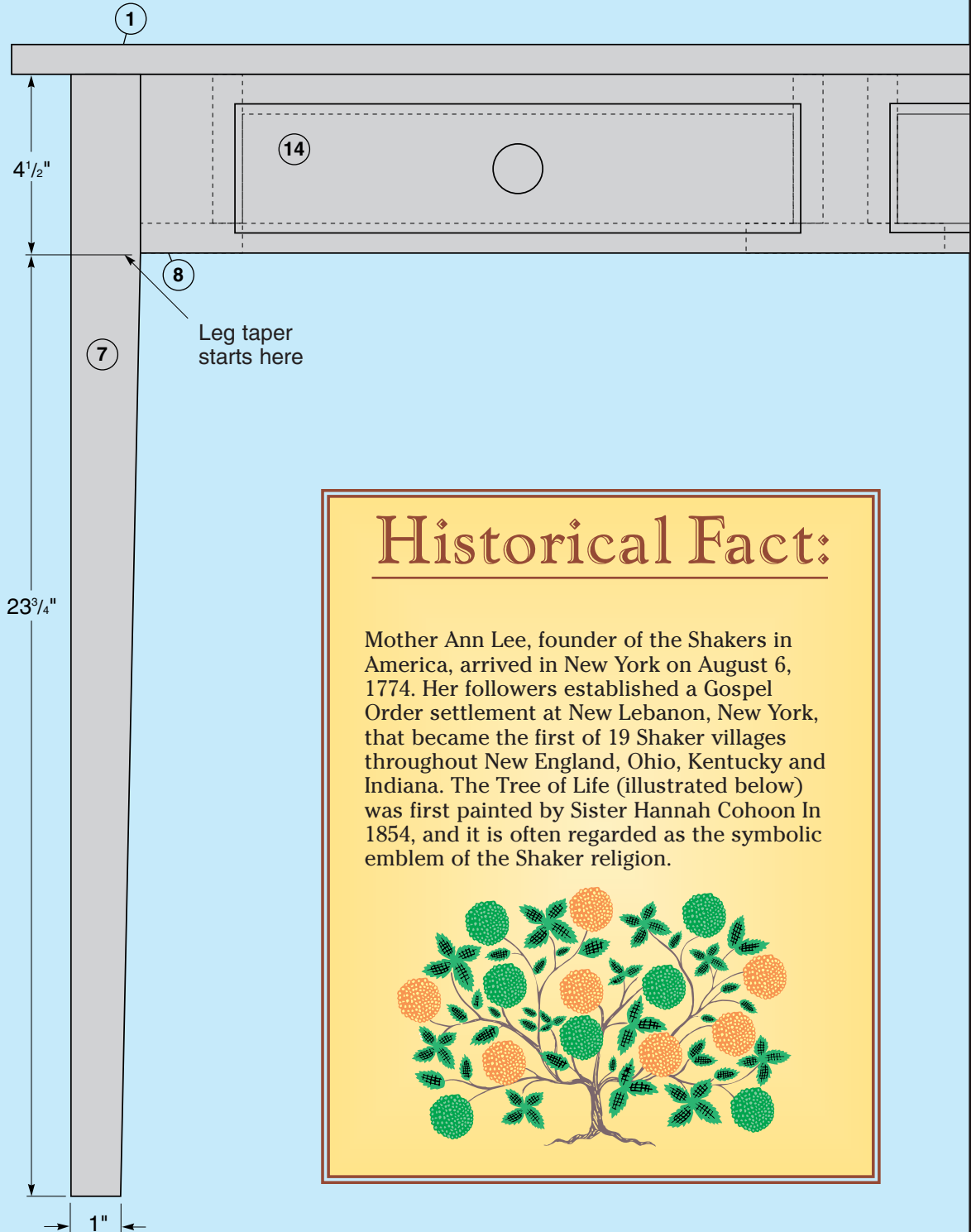


Tongue & Groove Detail



b

Shaker Hall Table
(Front view)



Historical Fact:

Mother Ann Lee, founder of the Shakers in America, arrived in New York on August 6, 1774. Her followers established a Gospel Order settlement at New Lebanon, New York, that became the first of 19 Shaker villages throughout New England, Ohio, Kentucky and Indiana. The Tree of Life (illustrated below) was first painted by Sister Hannah Cohoon In 1854, and it is often regarded as the symbolic emblem of the Shaker religion.



the drawer sides against the drawer slides. The spacer ensures that the drawers will move easily, even when the wood expands and contracts. While you're at the saw, use the dado setup to mill the 1/4" wide grooves in each side, front and back that will house the drawer bottoms (pieces 13).

With all the square cuts done, you're ready to make the dovetail pins on the ends of each drawer side (see *Technical Drawings* for the layout). This is done using a 14° dovetail bit in your router table and a high auxiliary fence on your miter gauge (see *Figure 3*). Make several passes to clean out the waste, then transfer the resulting pattern to the edges of the drawer fronts. A dovetail saw is the best tool to cut the tails on the ends of the drawer fronts (see *Figure 3 inset*).

Dry-fit all the parts, and once you're satisfied with the fit, glue everything together except the drawer bottoms, which float freely to allow for shrinkage and expansion. Before tightening your clamps, measure diagonally in both directions to verify that the drawers are square. When the glue is dry, use a sharp chisel to extend the slide grooves through the drawer's back.

The drawer faces (pieces 14) receive a 1/4" wide 45° chamfer that extends halfway across the edge. Use your router table for this cut.

The easiest way to line up the drawer faces properly is to use hot melt glue. Insert one of the drawers in the table and clamp it in place so the front is flush with the face of the front apron. A straightedge clamped across the apron will align the bottoms of the two drawer faces. Put a small dab of hot melt glue on the inside of each face and press it in place. When the glue has set, remove the drawer and install screws from the inside of the front to hold the face permanently.

Pre-drill for these screws, using an oversize bit in the drawer front to allow for movement and a slightly undersized bit in the drawer face to ensure a good hold. Wrap up this step by installing the drawer knobs (pieces 15), test the operation, and move on to the finishing phase.

Finishing Up

It's a good idea to seal both sides of the tabletop so that warping doesn't occur. This is because the unfinished surface will absorb moisture from the air at a different rate than the top side, which can cause the wood to move unevenly and warp. Sand the entire table and finish everything before installing the top. Use three

coats of natural Danish oil or orange shellac to bring out the luster in the cherry, followed by a coat of wax. Rub some paraffin wax on the drawer slides to make the drawers slide smoothly. In the proper Shaker mindset for this project, tradition says our workmanship must not only look fine but also work well.

Finally, fasten the top to the aprons with eight desk top fasteners (pieces 16). They simply screw in place.

Quick Tip

Make a Dust Filtration Tower

With concerns over the long-term effects of wood dust always mounting, here's a simple project to help keep your shop air cleaner. Make your own dust filtration unit using twelve 15" x 20" furnace filters and a squirrel-cage fan salvaged from an old furnace. Build a wood frame and mount the filters in courses of three per side. The squirrel cage fan will suck the dusty air in through the filters and push it out of the bottom of the tower. Change the filters monthly or as soon as they get really dirty.

