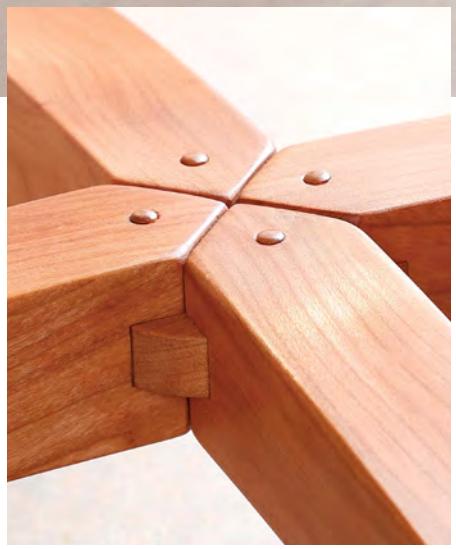
Dining Table Shows Off Its Secrets



Exposed joinery, echoed shapes, and elegant curves on display

BY TIMOTHY COLEMAN

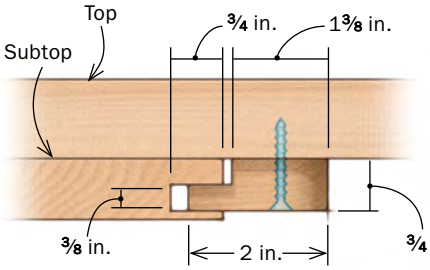
Well-executed joinery is at the heart of every piece of furniture I make, but it's often hidden. However, when designing this cherry table, with its stretchers so low to the floor—and therefore quite visible—I made the stretchers' central joinery a focal point by exposing it.

The overall lines of the table came first: the stretcher assembly rising from the floor in a gentle arc, the legs resting on the stretchers and thickening as they curve upward, fastening to a subtop that supports

Photos: Barry NM Dima

AROUND THE BEND

The few straight lines in this table are mostly hidden.



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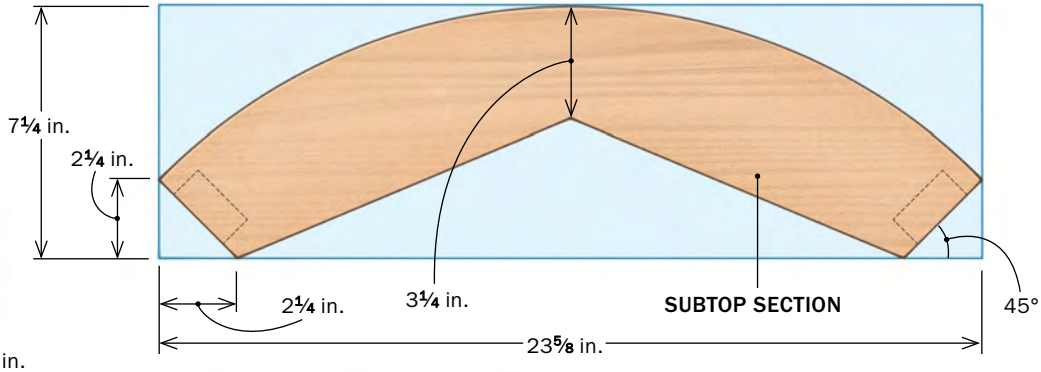
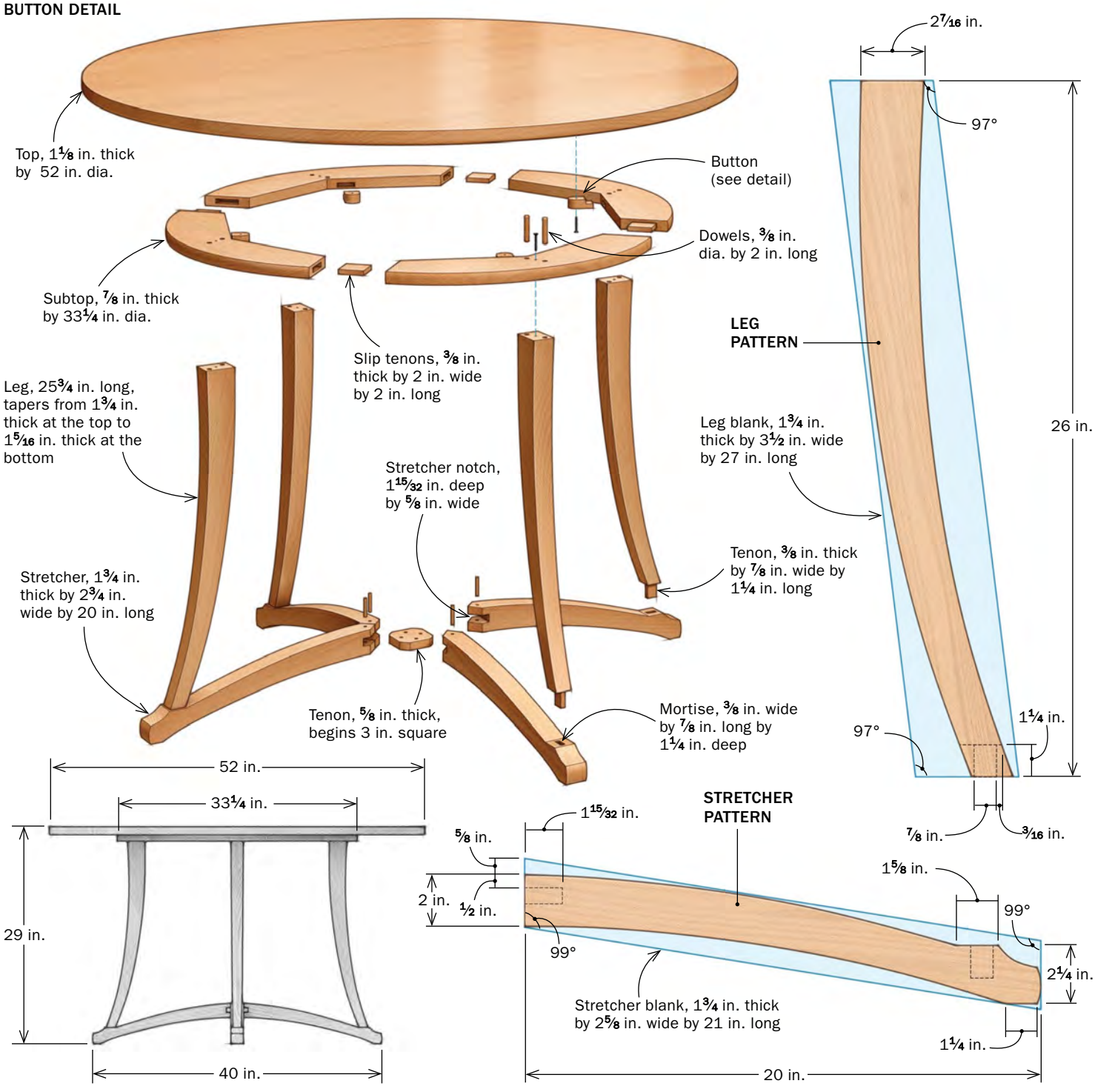




Drawings: Christopher Mills

Lay out and cut the stretcher joinery

Templates are your road map. *Once the 99° ends are cut, Coleman uses a template to lay out the upper and lower curves of the stretchers, as well as the joinery areas.*

Reference flats guide shaping and joinery. *With the top curve drawn, use a square to draw a reference flat at the top of the arc, square to the inside joinery face (upper right). You'll register this flat on the chopsaw table to cut the 45° ends. You'll also run it against the bandsaw fence to cut the notches for the tenon. To true up the leg joint area, which is square to the outside end of the blank, Coleman again uses a square (lower right) in case the template's not perfect.*

a round tabletop. Once I had that idea in focus, it was a matter of figuring out how to accomplish it. While the joinery is not exotic—dowels and mortise-and-tenons for the legs and a pinned bridle joint to connect the stretchers—the curved parts complicated matters. The key was to create flat reference surfaces for the joinery before cutting the curves. This simplified both the layout and cutting of the joints.

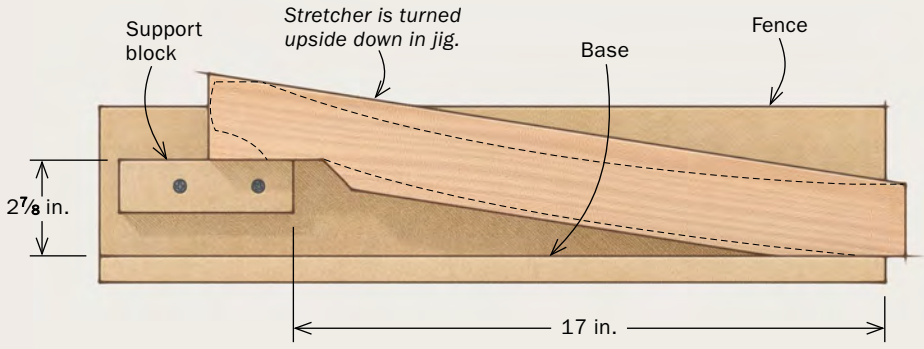
Making the stretchers

The stretcher assembly is made up of four identical pieces. Each one comes to a point so the four nest snugly together. At that joint, a single large slip tenon fits into a notch in each stretcher, and the assembly is glued and pinned. The rounded corners of the tenon are visible, making it appear to be a disk. This visible joinery is not only strong construction, but it is also an elegant design feature as the tenon echoes the circular shape of the tabletop.

To make the stretchers, I used several templates. One was to mark the angles on the ends of the blank before cutting them at the chopsaw. I used a second template to lay out the curves and the leg flats. I laid out the reference flats with a square. Later, I would use the flats to register the blank at the chopsaw and the bandsaw. To ensure the strongest stretchers—and legs—and to visually enhance the curves, the grain in the blanks should follow the curve of the templates as much as possible.

I cut both the flat for the leg joint and the reference flat at the bandsaw and cleaned

Cut, clean, and check. *After Coleman cuts the leg joint area and the reference flat at the bandsaw, he cleans up the cuts with a broad chisel and a handplane, respectively (left). He regularly uses a square registered on the stretchers' ends and sides to ensure the cuts remain flat and square.*



Miter jig orients the stretcher

After Coleman lays out the miters, he turns to the chopsaw and a simple jig to hold things in place. He miters the ends by turning the blank upside down so that one reference flat rests on the base of the jig and the other on the support block. He cuts one miter on each stretcher, then rotates the saw and resets the jig to cut the second.

them up with hand tools. A chopsaw and simple jig helped me tackle the stretcher miters.

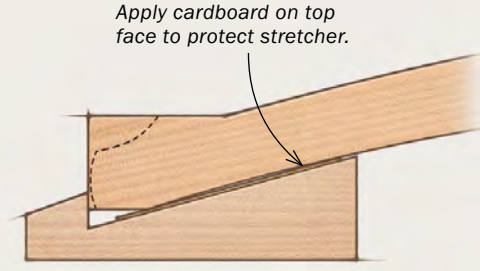
One big, shared tenon

The stretcher assembly derives its strength from the shared tenon, for which the deep notches in the ends of the stretchers provide significant glue surface. When fully seated against the tenon, the stretchers don't quite touch; instead, there is a 1/16-in. reveal between the miters to emphasize the junction.

Lay out the notches, cut them at the bandsaw, and tidy up the bottoms with

Mortise jig

Coleman uses a hollow-chisel mortiser to cut the mortises. The jig holds the part so the joinery face is parallel to the table.



Cut the notches. *The notch is cut on the bandsaw by running the square reference flat against the fence with a stop to limit the depth of the cut (top). Coleman cuts the walls before removing the waste in between by cutting a series of kerfs. He cleans up the bottom of the notch with a chisel registered in a knife line made during layout (above).*

Drawbores lock it together

Drilling jig

Bore through the top of the joint and partway into the lower part of the stretcher. A filler strip in the notch helps keep the bit from wandering. A 3-in.-tall block holds the piece at the correct height.

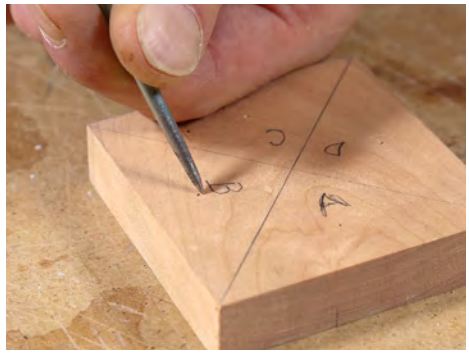
a chisel. Make the 3-in.-square slip tenon after you've cut the notches so you can mill it to fit, but don't round over its corners just yet.

Since you don't need to lay out any more joinery on the stretchers, you can cut their curves at the bandsaw. However, I leave the outside end of each stretcher square so a clamp block can more easily hold it in place when gluing them to the legs. The final shape of the end is easy to cut and refine afterward.

Mortise with a jig and clamp block

I used a hollow-chisel mortiser to cut the mortises that receive the leg tenons. To hold the curved stretchers at the proper angle, I created a ramped jig that follows the lower curve of the stretcher and is notched for the stretcher's end (see p. 35). You'll use the same ramp as a clamp block when gluing each leg to its stretcher. Once all four mortises are done, soften the

Mark the tenon. *Assemble the joint and mark the tenon with a brad-point bit. Label each stretcher and its location on the tenon.*



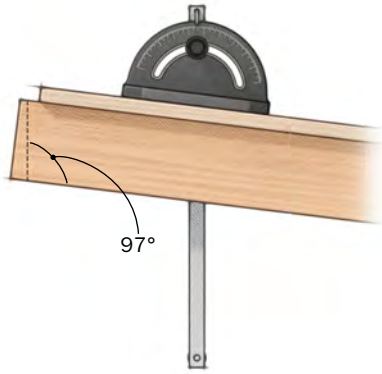
Mark the offset. *Use an awl to prick an offset a heavy 1/32 in. to the center of the tenon. This is where you'll drill, ensuring the stretcher is drawn tight when you drive the pins.*

Drill at the offset. *Bore through the tenon at the awl marks. Coleman then countersinks the holes and, on each pin, tapers the end that will go into the hole to help the drawbore seat.*

Assemble gently and mark the tenon. *Reassemble the joint and drive the pins slightly. Mark the ends of the notch on the square tenon (left). With a compass, scribe the corners of the tenon (above). Don't go past the lines from the previous step. Coleman radiuses the corners with a disk sander.*

Make the curved, tapered legs

Cut the angled ends. *The bevel leaves the ends parallel to the floor. Coleman uses his tablesaw and a miter gauge for these cuts.*



Draw the tenons after tracing the curves. *With the legs' sweep established, scribe the tenons. A square registered against the end ensures the tenon shoulder is at the correct angle.*

Legs start at the tablesaw... *Coleman cuts the tenon shoulders at the tablesaw using a miter gauge. Next, he cuts the cheeks. Finally, he trims the narrow end cheeks at the bandsaw.*

...and finish at the bandsaw. *Coleman saws each leg's interior, convex curve before turning to the outside curve. Using a flexible straightedge and a pencil, he draws the taper before taking it to the bandsaw. Finally, he smooths the machine marks with a jointer and hand tools where appropriate.*

stretcher's corners, including where they meet in the middle, with a slight radius, and prep the parts for the final finish.

Drawbores strengthen the joint

For durability and to aid assembly, I drawbored the center joint. This starts with drilling holes through the stretchers for the ¼-in. pins. I use a jig at the drill press to elevate the pointed end of the stretcher (opposite page, top left).

Then, on the square tenon, draw lines from corner to corner to help locate the stretchers. Label and mark each stretcher and its spot on the tenon so that everything will go back to roughly the same place.

Assemble the pieces and check for square. Insert a ¼-in. brad-point bit by hand into each pin hole to mark the tenon. Take the joint apart and, with an awl, mark a 1/32-in. offset from each dimple toward the center. Drill at these marks.

Now's the time to determine how much to round over the tenon's corner. Reassemble the joint and drive the pins in just a bit. Mark the square tenon at each notch's base to set the boundaries of each corner's curve. Use a compass to connect the lines. Do not go past the lines, or you may undercut the rounded tenon and leave a gap. You may need to fudge the curve a bit to connect the lines. I use a disk sander to radius the tenon.

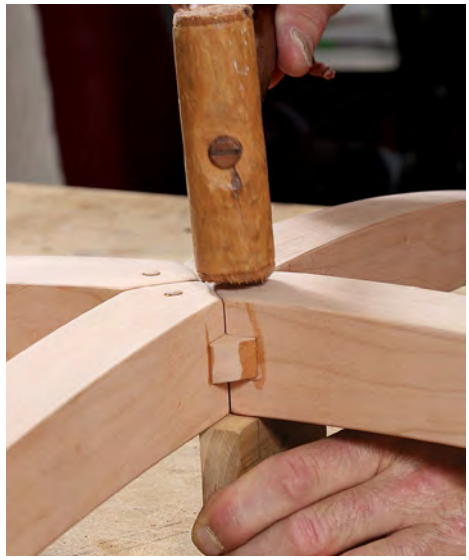
Making the tapered legs

Although the finished legs will taper in thickness, start with blanks a consistent 1¾ in. thick. Cut the end angles before tracing the legs' curves from a template. Since the length of the template includes the tenon, be sure to locate the template on the blank accurately.

Bring it all together

Glue each leg to its stretcher. *A long clamp pulls the two parts together. The curved jig Coleman used to support the stretcher at the mortiser here becomes a clamping caul.*

Carve channels for the epoxy. *Shallow grooves, cut with a carving tool on the tenon's faces, enhance the glue bond. The walls of each notch were scored by the bandsaw.*



Glue and drawbore. *Once the stretchers are in place, spread epoxy in each pin hole and drive the pins. A wood scrap helps bolster the stretchers during the mallet blows.*

Mark the tenon's length on the leg blank with a square registered against the end. The tenons start at the tablesaw with cuts for the shoulders and wide cheeks, and finish at the bandsaw. While there, bandsaw the curves and taper as well. After cleaning up the cuts, slightly radius the edges of the legs and prep them for final finishing.

Glue the legs to the stretchers, using the mortising jig as a clamping caul. Once the glue has dried, you can do the final shaping on the stretcher ends. Because these ends protrude beyond the legs, I soften their shape so they feel nice to rest your foot on.

Assemble and glue up the center joint

Cut the drawbore pins so they are slightly longer than the hole and will stay slightly proud of the joint's surface. Soften their top ends now; it's too fussy to do it after assembly. I apply a slow-set epoxy, which gives plenty of time for assembly, to the insides of the notches. Once the stretchers are in place, I apply epoxy in each pin hole and drive the pins.

Finally, clamp the top and bottom of the joint. Do a final check for square before letting everything sit overnight.

Make the subtop and top

The subtop is a ring of four solid-wood pieces slip-tenoned together. Three dowels per joint or Dominoes would also work. After glue-up, I cut the outside of the ring to a diameter of 33¼ in., placing it ⅞ in. beyond the outside of the legs' tops. I slightly radius the subtop's outside edge

Clamp the joint. *Cork-faced cauls are soft enough to conform to the tops of the pins without pressing them farther into the holes. After clamping, Coleman does a final check to ensure that all the parts are square to each other. He cleans any squeeze-out with lacquer thinner before leaving the joint clamped overnight.*

Position the legs and predrill the subtop. *After locating the legs (right), Coleman drills a centered clearance hole for a screw into each leg (above).*

to soften it. The subtop is fastened to the top of each leg with two dowels epoxied in. But I start by screwing it to the legs to hold everything in place while I drill for the dowels. Driving the screws from underneath helps keep the legs from moving. Make sure the fit between the subtop and legs is gap-free now, because the dowels won't tighten anything later.

Flip the table base assembly upright and drill for the dowels. Apply epoxy to the holes and then drive in the pins.

Use a jigsaw to rough-cut the top's circumference before finishing with a router on a shopmade compass beam. Undercut the top with the router and a ⅞-in.-radius bit. To fasten the base assembly to the top, I use wooden buttons that are screwed to the table and fit into slots on the inside facets of the subtop. □

Timothy Coleman is a professional furniture maker in Shelburne, Mass. See him at Fine Woodworking Live 2018 (finewoodworkinglive.com).

Drive the screws. *With the table upside down, Coleman drives the screws ¼ in. to ½ in. into each leg to make sure they don't move while he drills for and drives the dowels.*

Dowel the subtop to the legs. *Coleman flips the table to drill the holes for the dowels. After clearing them of debris, he applies epoxy inside the holes and hammers in the dowels.*