

# Oval Boxes

## How to make steambent containers

by Tom McFadden

I designed my oval boxes and carriers after studying Shaker examples. Typically, the sides of Shaker boxes were made of maple and splayed into three or more tapered fingers in the area of the scarf joint, where the two ends overlap. In my boxes the sides are of cherry, maple, madrone, mahogany, oak, ash or walnut, and I leave the outside overlapping end square, instead of cutting fingers on it. All these woods steambend easily in a thickness of  $\frac{1}{8}$  in. Before bending, the inside end involved in the scarf joint is tapered to produce a smooth surface when assembled. I fasten the joint with copper tacks and yellow glue, and attach the handles on carriers using the same. (The tacks are available from Fasco Fastener Co., 2023 Clement Ave., Alameda, Calif. 94501.) The pine tops and bottoms fit into the bent sides of the box and rim, and I secure them with round-head brass brads. The completed pieces are finished with two coats of polyurethane followed by an application of paste wax. I make the boxes in seven sizes and the carriers in five sizes.

When selecting stock for bentwood boxes, you should use only straight, even-grained wood for the side pieces. Imperfections such as curl, knots (sound or otherwise) or slanting grain may cause the pieces to break or to bend unevenly. You can use kiln-dried stock, but lumber that has been air-dried to 10% or 12% moisture content will respond to the steam more readily and produce more consistent results. Resawn, a good  $\frac{3}{4}$  board will yield three side pieces.

Before resawing, crosscut each board to within 3 in. or 4 in. of its finished length; then joint one face and edge, and plane the unjointed face. Now rip the boards to width, then resaw and plane them to produce blanks  $\frac{1}{8}$  in. thick. Take ten of the  $\frac{1}{8}$ -in. blanks, align and stack them one atop another and tape them together with masking tape. Mark out the narrow part of the outside end of the scarf joint and the location of the tacks by laying a pattern on top of the bundle. The ends of the pieces can now be stack-sawn to shape and the  $\frac{1}{16}$ -in. dia. pilot holes drilled for the copper tacks. Smooth the end-grain edges with a stationary belt or disc sander.

Next separate the pieces and with a hand plane taper the inside end of each overlap down to  $\frac{1}{4}$  in. over the last 6 in. After tapering, sand each side piece inside and out with a 100-grit belt in a belt sander, and round the edges by hand slightly with 120-grit paper. Mark the inside of each piece with a pencil so you'll know which way to bend it after it comes out of the steam box. The completed side pieces are again taped into bundles to await steaming.

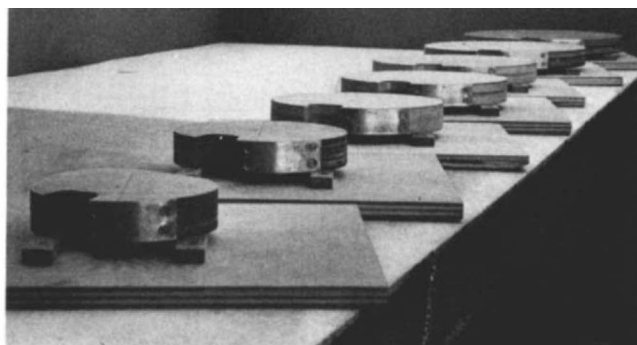
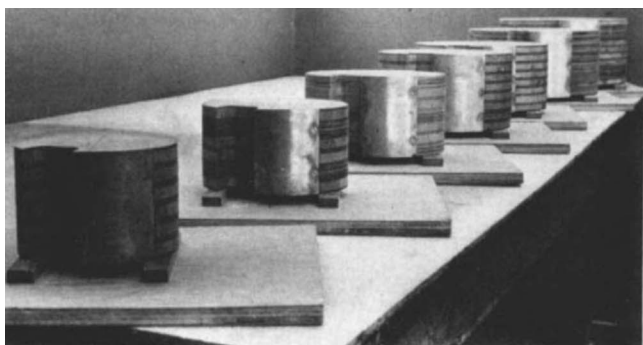
I made the bending forms for the boxes and their tops from stacked  $\frac{3}{4}$ -in. hardwood plywood, sanded and varnished to facilitate removing the completed side pieces. I use hardwood plywood for the forms because of its stability in the

*Tom McFadden, a woodworker by trade, lives near Navarro, Calif. Photos by the author.*

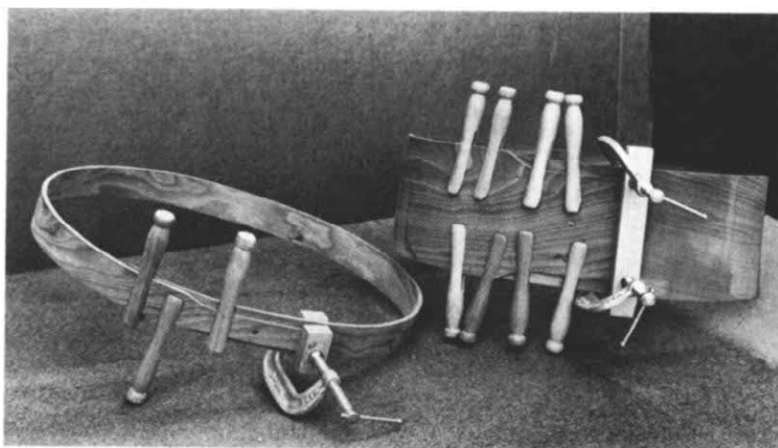


*Author's Shaker-style oval boxes and carriers are steambent from various hardwoods, glued and nailed at the splice. Boxes nest one inside another. Below, rack of dowels inside steambox holds the stock, sawn and planed to about  $\frac{1}{8}$  in. thickness, on edge for a 15-minute soak in unpressurized steam.*

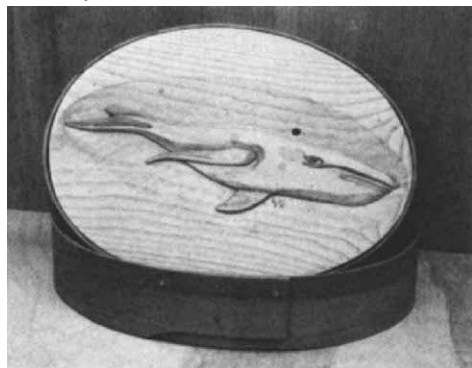




*For seven sizes of box, McFadden has made seven sizes of mold, plus seven more slightly larger molds for their lids. The molds are hardwood plywood, sanded smooth and varnished. Stainless-steel plate let into each mold is an anvil against which first row of tacks may be clinched.*



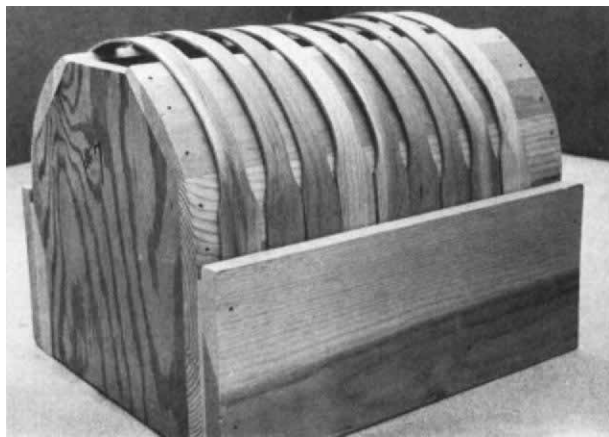
*After steaming, box sides are wrapped around the bending form and clamped in place, above. The clamp shown here was made by welding two steel bars to the jaws of a Visegrip pliers. When the piece has cooled enough to retain its shape, the scarf joint is glued and minimally nailed, then clamped with C-clamps and clothespins, upper right, until the glue has dried. At right, author drives and clinches the remaining nails against an anvil made from 1½-in. galvanized pipe. Below, one of McFadden's boxes, with carved lid.*



face of temperature and humidity changes. Each form is fitted with a stainless-steel plate in the area of the scarf joint that lets me drive tacks through the wood without damaging the form. Stainless steel is used to ensure against staining the steamed wood. The plate is let flush into the surface of the form and attached with stainless-steel screws. At one end of the plate the form is notched to accept an adapted Visegrip which clamps the steamed sides in place while they cool and are glued and riveted with the tacks. Further, each form is mounted on a plywood base plate which fits interchangeably into a frame screwed onto a table. Two cleats hold the form  $\frac{1}{2}$  in. above the base plates so that the completed sides can be easily gripped from below and slid upward off the form.

The side pieces are placed in the steam box and subjected to unpressurized steam for 15 minutes. After steaming, quickly remove each piece from the box, wrap it tightly around the form and clamp it with the adapted Visegrip. After the piece has cooled enough for its shape to set, remove it from the form. Apply glue to the scarf joint and then re-clamp it on the form for tacking. Only the center vertical row of tacks is driven at this time; these will fix the size of the oval and will hold the overlap in place while the side is removed from the form and the overlap is clamped with C-clamps and clothespins. Drive the remaining two rows of tacks after the glue has dried. The points of the first row of tacks are turned over and mushroomed against the stainless plate in the bending form; the remaining tacks are hammered in against an anvil made from  $1\frac{1}{2}$ -in. galvanized pipe. The finished side pieces are hand-sanded with 120-grit paper to remove the raised grain caused by the steaming.

Handles for the carriers are resawn and shaped in the same manner as the side pieces. They are steamed and bent around



*Rack keeps carrier handles bent while they cool and dry.*

a form, then placed in a drying rack until they are attached to the sides with glue and copper tacks.

Cut the tops and bottoms from pine (quartersawn is best) with a moisture content of 6% to 7%. It is essential that this material be very dry or it will shrink away from the side pieces and leave ugly gaps. Place the side piece for the box on the pine bottom, trace the inside shape and bandsaw along the line. Make final adjustments in the fit with a disc sander. Round the edges of the pieces slightly, and sand them. Use dividers to mark the location of the brass brads that will hold the top and the bottom in place. Then drill the pilot holes through the side pieces, and drive the brads. □

# Shaker Carrier

## Dovetail box, steambend handle

*by John Kassay*

This not-so-difficult-looking project offers two challenges—the hand-cut, through-dovetail corners and the sculptured, steam-bent bail (handle). Carrier is the Shaker name for a box fitted with a bail. Those carriers that exhibit pleasing form, fine construction, and quality craftsmanship were made for the Shakers' own use, whereas carriers made for sale in Shaker stores, though well crafted, look mass produced. With the exception of the manner in which the bail is fastened, this carrier is a fine example of one made for communal use.

To make the carrier, thickness-plane enough pine (wood species is optional) to make the sides (A), ends (B) and bottom (C). All surfaces should be hand-scraped and sanded. Those surfaces that will be on the inside of the carrier should be finished surfaces and so marked. Now lay out the sides and ends and add  $\frac{1}{32}$  in. to their widths and lengths, and cut accordingly. The extra length allows the ends of the dovetails to project minutely beyond the outside surfaces. After the sides and ends are assembled, these projections are planed or sanded off, resulting in a better appearing dovetail joint. The extra width is used for truing up the edges at the top and bottom of the carrier, again after assembly.

Mark out and cut the bottom  $\frac{1}{4}$  in. longer and wider than the overall length and width of the carrier sides and ends. Sand the inside surface and shape the upper edges as shown in the drawing. Nail the bottom in place—a nice touch here would be to use  $\frac{7}{8}$ -in. fine-cut headless brads (available from Woodcraft, 313 Montvale Ave., Woburn, Mass. 01888).

Nailing the bottom onto the carrier sides may seem to contradict all we have been taught about wood movement, but it is the way the Shakers did it—and they had central heating too. It has been suggested that the bottom ought to be let into a groove in the sides, like a frame-and-panel. However, I have rarely seen good results from altering a Shaker design. In this particular case, inletting the bottom would eliminate a characteristic Shaker form, the molding created by the protruding bottom, and it would greatly complicate the carrier's joinery. I think that when the bottom worked loose, the Shakers would just nail it on again.

The bail is made of ash; red or white oak or hickory could be used instead. Mill straight-grained stock to overall thickness, width and length (detail 2), then steam it and bend it around a mold before tapering it to shape. Although it's difficult to shape the bail after bending, it's more frustrating to lose a pre-shaped bail during the bending process.

The photo on the facing page shows my bending jig, with a back-strap made of four strips of 24-gauge galvanized sheet steel, spot-welded together at the center (*FWW* #8, Fall '77, p.40, and #30, Sept. '81, p.84). This apparatus will bend

*John Kassay is the author of The Book of Shaker Furniture, available for \$40 from University of Massachusetts Press, Box 429, Amherst, Mass. 01004.*

Now make a full-size pattern of half the length of the bail, trace it onto the bent wood and cut out the shape. With a block plane and a scraper blade, taper the bail in thickness from the center to the ends, as shown in the edge view, then spokeshave it to the cross-sections shown. Note that the undersurface is rounded, while the outer surface is left flat. Both ends of the bail are flat where they attach to the carrier ends, and chamfered on their outer corners. Fine-sand all the surfaces and ease any sharp corners, except those where the bail meets the carrier. Fasten the bail with four brass rivets and washers, two at each end; you could substitute countersunk flat-head woodscrews.

*Wedges hold bent stock against bending form while it cools and sets. Steel back-up strap with end blocks helps make the bend, but once bent, the strap can be tipped away from the stock, as shown.*

