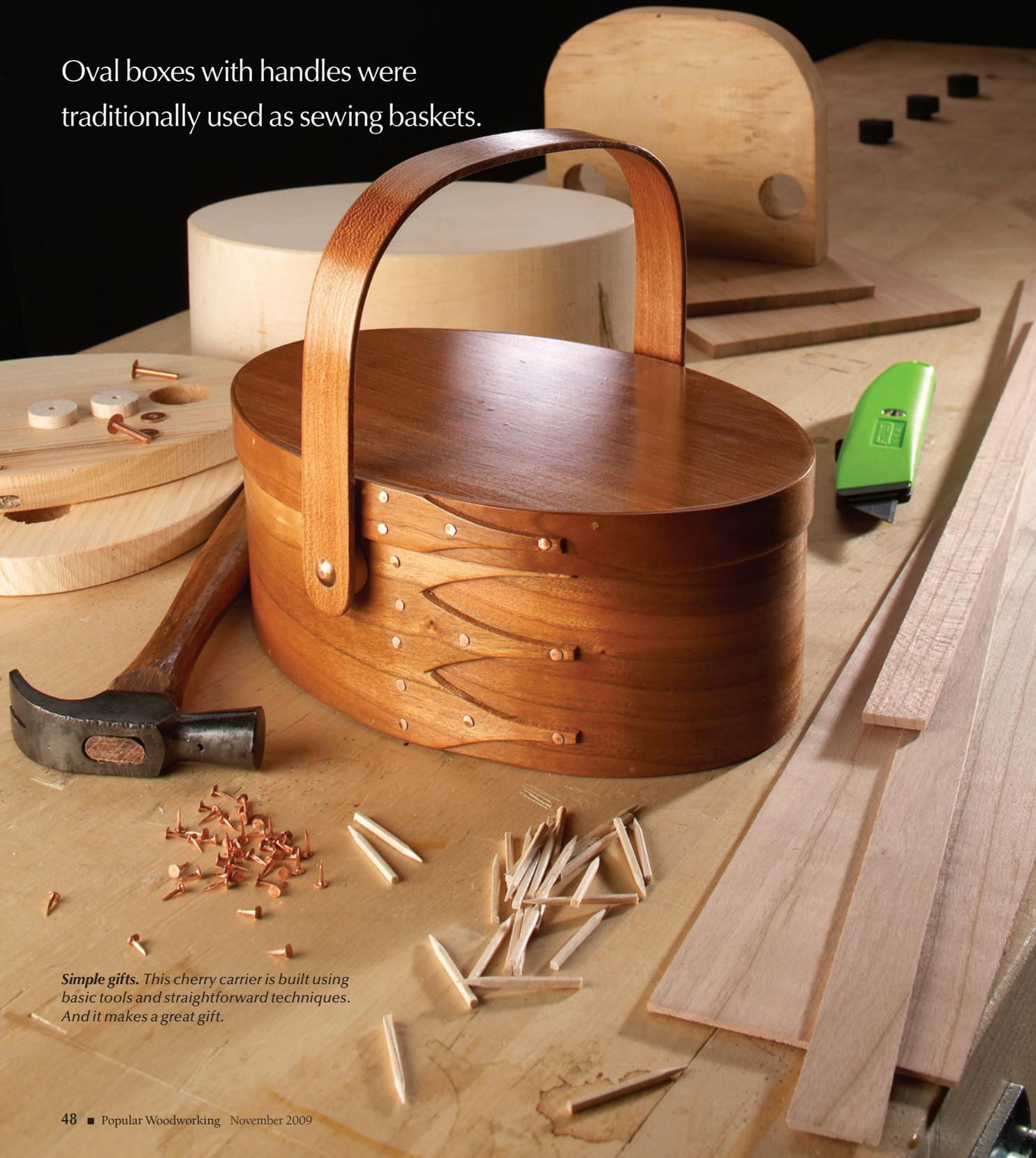


Shaker Swing-handle Carrier

BY JOHN WILSON

Oval boxes with handles were traditionally used as sewing baskets.



Simple gifts. This cherry carrier is built using basic tools and straightforward techniques. And it makes a great gift.

The craftsmen of the Shaker community were known in their day for quality workmanship of utilitarian designs. This project represents one of their adaptations of the oval box in a size commonly referred to today as a #4. (See *Popular Woodworking* August 2003, #135; it's also available online at ShakerOvalBox.com.)

During the period from the 1890s to the 1930s, large quantities of carriers were made and sold in the Shakers' "fancy goods trade," or what we would call a craft or gift store. Such carriers, which they called "work baskets," were lined with satin and fitted with sewing items including a pincushion, needle holder, beeswax for waxing button thread, and an emery ball for sharpening pins and needles. One famous photograph taken at Sabbathday Lake Shaker Village in 1923 shows Brother Delmer Wilson and his output of 1,083 carriers.

Project Items

The swing handle carrier requires the following (as shown in the opening photo):

Wood

- Hardwood bending stock for the lid ($\frac{1}{13}$ " x $\frac{3}{4}$ " x 28") and bottom band ($\frac{1}{13}$ " x $3\frac{1}{16}$ " x 27")
- Top and bottom boards: $\frac{1}{4}$ " thick
- Handle: $\frac{1}{8}$ " x $\frac{3}{4}$ " x 15", limber enough for bending

Fasteners

- Small copper tacks $\frac{1}{4}$ " long, the #2 size
- Wood pegs to hold the top and bottom boards
- Copper trunk rivets with washer and wood spacers made from $\frac{3}{4}$ " dowel

Forms

- A core the inside volume size of the box
- Two shapers for holding the wet wood until dry
- Handle bending form
- Patterns for cutting forms and bands

Bending

The most exacting materials in a bent-wood box are the sides. They need to be strong yet limber, able to bend yet provide adequate strength for the project. Hardwoods such

Work basket. This reproduction of a Shaker work basket by Dave Coleman shows the attachment of needle holder, pin cushion, beeswax and emery, tied with matching ribbons through holes drilled in each quadrant of the oval. Some of these sewing baskets were made with lids like Dave's, others were left open to display the fine contents as in Brother Delmer's carriers.



as maple or cherry are commonly used. Be aware that any one piece of wood can exhibit a wide range of flexibility, and you may need to try different pieces to be successful.

Band stock is available from The Home Shop (shakerovalbox.com). For those wishing to dimension their own bands, the use of a table saw or band saw to resaw wood, followed by sanding to final thickness in a drum sander, is recommended. And attention to exact thickness is important. The thickness for this project is from .075" to .082". You may have been surprised to read the notation of $\frac{1}{13}$ " in the Project Items list.

That is the traditional way of the American veneer trade to indicate thickness—a fraction whose numerator is always one. Use of a dial caliper will help you in achieving the desired thickness for your project.

Tools

You will need a tray of some sort to soak the bands and handle. This can be a specially made tray, or something as simple as a length of eaves trough (a gutter) with end caps. Traditionally, hot water (above 180°F) soaking was used, and I follow that method, although a steam-bending apparatus can do



Brother Delmer Wilson. Carriers were an important part of the Shaker's Fancy Goods Trade. Here Brother Delmer Wilson stands next to his winter's output of carriers which would go from the woodshop to the sisters' shop where they were lined with colorful fabric and sewing aids.

the job if you have access to that. A longer soaking in cold water (12 hours or more) can work, but the thicker handle in this project would more reliably be bent after soaking in hot water.

Dimensioning bending stock requires a well-equipped woodshop, as to a lesser extent does cutting 1/4" stock for tops and bottoms. If you buy these two items, for the cutting and assembling you'll need relatively few tools. If you have access to a band saw, an electric drill, and a belt and disc sander (the small benchtop variety with a 4" x 36" belt and 6" disc is ideal), together with a utility knife and a small ball-peen hammer, then you have all that's needed.

There are, of course, alternative ways for those with limited shop access or a preference for hand tools such as the use of a coping saw for cutting ovals, and using the utility knife to do all the finger profiling. An alternative to wood cores and shapers (discussed next) is the use of 1"-thick rigid polystyrene foam board, a residential construction mate-

rial, which can be cut with only a utility knife and a sandpaper block. This foam board can be used for a core by gluing together several layers with foam construction tube glue or double-sided tape.

Cores and Shapers

In addition to a soaking tray you need cores and a set of shapers. The core is a wood plug the size of the inside of a box. The hot, wet band is bent around it. Made from soft wood (foam board also can be used), they are created using the oval pattern at right.

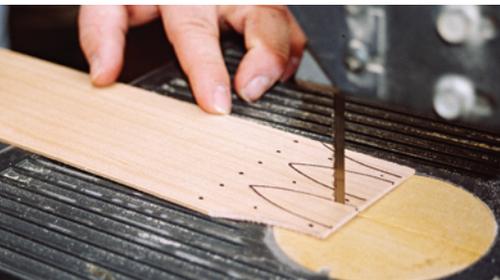
The shapers are the key to the Shakers' box production. You will need a pair for each box made at one soaking. If you wish to make five of one sized box, then 10 shapers are needed. The alternative is to bend on five successive occasions, which is a lot more work than making a few extra shapers. They are made to the same oval pattern as the cores, only they have a 10°-beveled edge to act as corks in the oval opening. Cut them slightly oversized by cutting 1/16" outside

your pattern line. Drill holes for ventilation and to allow you to grab them for removal after the band is dry. The wood for shapers can be solid or ply.

Preparing Bands

The bands are prepared for soaking by cutting out the shape of the fingers and drilling the holes for copper tacks using a 1/16" drill bit. The final edging to the fingers is done with a sharp knife. A slight 10° bevel is given to the curved edges and the ends of each finger.

The square end is feathered to make a smooth curve to the inside of the box. This feathering goes from full thickness about 1 1/2" back from the end to an almost sharp ending. A belt sander, and wood block that serves as a holder, is best for this work.



1 Fingers. Profile the finger design to rough dimensions before final trimming with a utility knife. The locations for copper tacks are drilled at this time, too.



2 Trimming. My preference for trimming is a utility knife with a fixed, not retractable, blade. This gives the necessary control. Use heavy-duty blades, not the lighter ones that come with a new knife.



3 Feather. The inside end of a band is feathered back 1 1/2". This will provide a fair curve to the inside of the box.

4 In hot water. The band has been feathered on one end and the fingers are trimmed and drilled on the other. The hot water tray has an electric hot plate with wood blocks under each end for stability. While a full boil is not necessary, water more than 180° Fahrenheit will soften the lignin.



5 Core. The wet band is wrapped around a core the size of the inside of the box. Here the wrapped band is marked so that the core can be removed and the band returned to its proper size. Note that all the band's fingers are held to prevent them from splitting. The mismatch at the lapped edges of the band is common at this stage and will be made even when tacking.

Place the bands in hot, nearly boiling water for 10 to 20 minutes before attempting to bend around the core.

Bending the Oval Band

Your soaked band will cool quickly once it is removed from the tray. When this operation goes in a smooth even motion, band breakage is minimized. Your core will need a pencil mark to show where to start the feathered end of the band in bending. Here is how you find that mark: The major tack line in the swing handle carrier is $\frac{3}{4}$ " forward of the center of the box, which is also the point of attachment of the handle. The start point of the wrap is $2\frac{1}{4}$ " to the left of the main tack line.

Copper tacks clinch the band. No glue is needed for this efficient fastening. The tacks are $\frac{1}{16}$ " longer than two layers of veneer and clinch to hold the lap securely. Have your tacks, anvil, hammer, a pair of shapers and a core ready when the band is taken from the hot water.

The central operation of all box construction takes but a few seconds. In one smooth sweep, hold the feathered end at the start mark and bend it half way around. Change hands, hold and complete the wrap. Pencil a mark across the veneer lap to register the circumference. The photograph in step 5 shows this step completed. Hold the fingers securely at all times to avoid splitting the wood between them. Do not worry about having the edges exactly even or the main tack line exactly where you want it at this stage. Both of these steps come next.

Open the band slightly to remove the core. Bring the band together so the pencil marks meet. Now align the edges of the lapping band, then tack the lap.

The last step is to place a shaper in both sides of the oval band. These can be rotated if needed to bring the main tack line into position on the oval. The band is pliable while wet, so you can rotate the shaper. Match the second shaper with the position of the first to avoid a skewed band. Be gentle while inserting the shaper and do not push too hard because this will flare the edges of the band.

The lid band (soaked along with the bottom band) is next. The box itself acts as the core. Size, alignment and centering are observed for this band, too. When tacked, the lid band goes in place with the fingers pointing the same way as the bottom fingers.



6 Tacks. Small copper tacks $\frac{1}{16}$ " longer than the two thicknesses of veneer are used to clinch the lap. No glue is used. The wood cradle secures the pipe anvil to the bench.

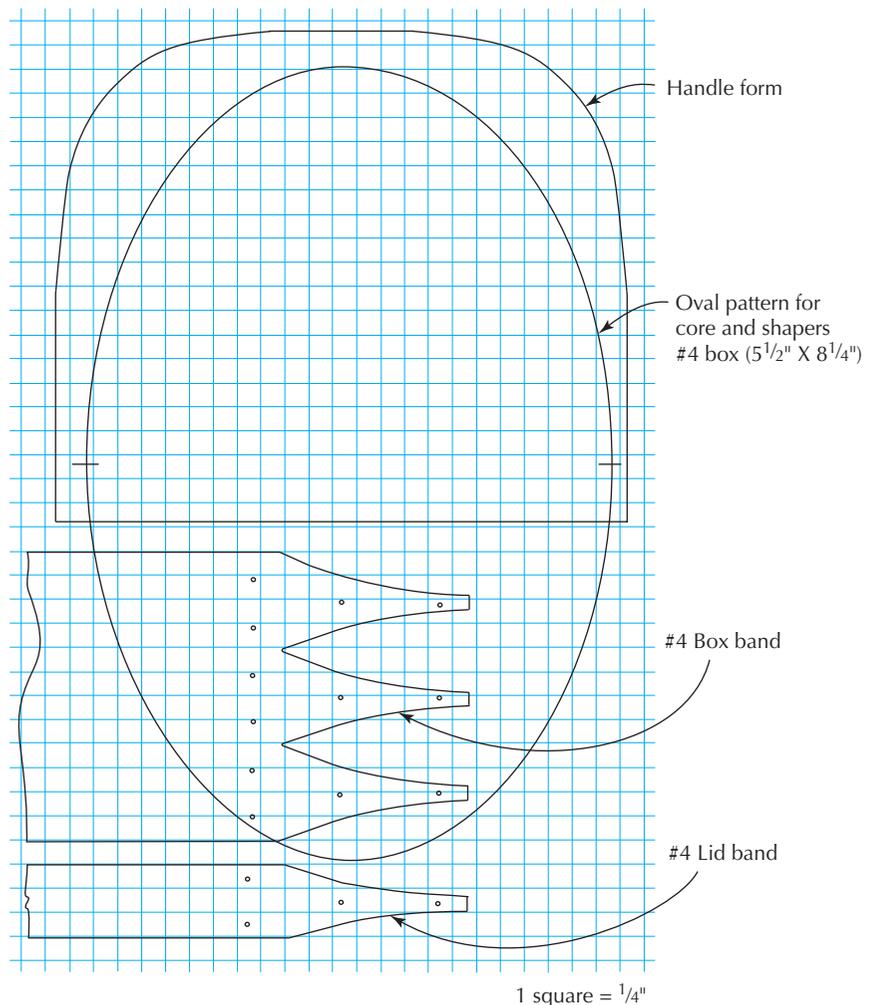


7 Shapers. Once tacked, wood corks called shapers are put in both sides to hold the box shape for one to two days of drying. The 10° edge bevel and the holes for ventilation are a hallmark of this piece of bench equipment that is key to the Shaker system of production. The top band is wrapped on the box itself. It will be tacked then returned to the box for drying. Note that the direction of the band finger matches that of the bottom band fingers.

Online EXTRAS

For a full-size PDF of the patterns shown below, go to:

popularwoodworking.com/nov09



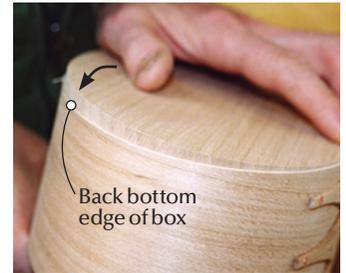
SHAKER SWING-HANDLE CARRIER PATTERNS



8 Mechanical pencil. Here I'm tracing the oval on the 1/4" boards used for tops and bottoms. A mechanical pencil will ensure accuracy of this line.



9 Two-degree angle. The disc sander finishes the edge up to the pattern line. The sander table is elevated to 2° to provide a slight cork effect to this ellipse for a tight fit. To make this adjustment, you may need to file out the slide slot so it no longer stops at 0°, or you can remove the thumb screw and use a small C-clamp.



10 Fit the bottom. The oval board is fitted into the bottom by setting it against the front lap and then working the back into place. This will ensure that the feathered end will not be damaged in the process of pushing the oval.

The first half of carrier construction will be complete when these two bands have dried in one to two days. Allow for normal air flow around the carrier. Avoid using extra heat, direct sun, or fan blowing. Drying too quickly can result in the veneer warping.

Bending the Handle

The swing handle needs to be prepared before soaking by rounding the ends and drilling the 9/64" holes for the trunk rivets. The bending form made to the pattern provided on the drawing can use 3/4" plywood, solid wood or foam board. Cut it to shape, and drill 1" holes in the lower corners if you plan on using two small clamps to secure it to the form. Otherwise a 12" sliding-bar clamp can be used to span the whole width. Two small scraps of wood will be needed to protect the wet wood from the clamps as shown in photo 5.

The handle stock is thicker than what you have bent for the box so plan to be thorough in the hot water soaking—20 minutes in the hot water is the minimum. Work while the handle is hot, but ease the wood around the bends and avoid jerky motions. Always put a wood scrap under the metal clamps to avoid getting black mineral stain.

Fitting Oval Boards

The oval tops and bottoms are 1/4" thick. Your boards need to be as dry as the interior of your home when making the carrier to avoid a shrinkage gap that would appear in the next few days (a bummer). To minimize seasonal expansion that might break the band (an even greater bummer), the Shakers used quartersawn eastern white pine. This is a great choice, but may not be available to you, or fit your décor. Select stable wood—



11 Drill for pegs. After the oval board is in place and sanded flush, drill the perimeter every 2" to 3" for wood pegs. This drill jig locks a spare drill to a board with a front table the right height to center the hole on the 1/4" board inside.

softwoods are better than hardwoods, and all quartersawn boards have half the dynamic of flat-sawn stock of the same species. Plywood such as 5-ply, 6-mm birch used in furniture and cabinets also works well.

Use the dry carrier band as a pattern for the oval. Remove the shapers and give the inside a light sanding. Use a mechanical pencil for an accurate line around the inside of the oval band. Now determine the direction of the fingers. It's up to you. Historically, most boxes were pointing right, but significant numbers were lefties. In either case, both top and bottom bands should match.

Getting the top band finger direction to match that of the bottom band can be troublesome in the finished carrier. The reason is this: When the lid is lying on the bench to be traced out, it is in the opposite position from where it is in place on the carrier. Check to make sure that you have the right finger direction to match the bottom.

After band sawing the oval, sand the board up to the line on the disc sander. This is not a right angle, but has a slight bevel to



12 Alternate approach. An alternative drilling method makes use of a drill press. The jig, which is shaped like a bookend, creates a vertical drilling station.

give it a cork effect. To get this, adjust the disc sander table up 2°. Most sanding machines aren't designed to do this out of the box, but you can easily file the slide that adjusts the table to allow it to tilt up. Or, you can tape a 1/8"-thick shim to the outside edge of your disc sander table to achieve this angle.

After sanding, insert the oval board against the front edge first, then press in the back. This avoids catching the feathered end of the band, which can be damaged. Press the board into the oval band until it is even or slightly below the band all the way around. Sand this joint line flush. Now repeat these steps for the lid section.

Fixing Mistakes

You might find two kinds of repairs helpful in your work, each using their own kind of glue. Wet bands that split can be repaired



13 Location. Locating the center front and back from which the hole location is 1" down. Set your box on the floor and look down from a standing position.



16 Peen. Peen the rivet until the handle is secured and will stay put.



14 Rivet sequence. The rivet sequence is: copper trunk rivet, handle, $\frac{3}{16}$ "-thick wood spacer, the box side in which has been drilled a $\frac{5}{32}$ " hole, the copper washer for the inside end of the washer.



17 The finished project. Use a clear finish and the cherry wood will patina naturally with time.



15 Trim excess. Snip off the excess length of the rivet, or take it out and grind it to the proper length.

with cyanoacrylate (model maker's instant glue) two-part glue because it works on wet wood. The advantage of this is that any repair will hold the pliable wood before it dries. Minor gaps found around the edges of the oval board can be repaired with carpenter's glue. Wipe glue into the gap and sand immediately. The sander dust loads the wet glue, creating a matching glue line. Unlike cyanoacrylate, which remains clear under varnish, carpenter's glue must be removed from the surface before finishing.

Wood Pegs Hold the Boards

Once the oval boards are in place and the joints sanded flush, it is time to drill for wood pegs. These holes center on the $\frac{1}{4}$ " top and bottom boards, and are placed 2" to 3" apart around the edge. It takes a $\frac{5}{64}$ " hole drilled $\frac{1}{2}$ " deep. Two jigs are shown for ensuring that you do not miss centering the edge of the boards.

Step 11 shows a small drill held down with a wood yoke to create a horizontal drilling jig. Step 12 shows an adaptation for a drill press using a shop-made fence clamped to the work surface. It drills in the vertical mode.

The wood pegs can be split off a thin cutting of wood. However, in my shop, hardwood toothpicks serve for pegs. Holding the

toothpick box firmly to avoid scattering the contents, cut the box in half on the band saw to double your count of pegs. Tap the pegs in securely (no glue needed), and snip off the excess with wire cutters. With the pegs in place, sand the surfaces of the box.

Attaching the Swing Handle

Remove the handle from its drying form and give it a final sanding. The holes ($\frac{9}{64}$ ") for the trunk rivets are centered front and back, spaced down 1" from the top edge of the box. This location, as far up the side as the lid will allow, will ensure stability when picking up the carrier.

The sequence for securing the handle is shown in photo 14. You will need a wood spacer $\frac{3}{16}$ " thick, $\frac{3}{4}$ " round, with a hole $\frac{9}{64}$ " centered for the rivet. These are made by drilling in the end of a $\frac{3}{4}$ " dowel, then cutting segments. This goes between the handle and the carrier. The rivet is fastened on the inside by inserting it through the handle, the spacer and the side of the carrier, then placing a copper washer over the end.

Cut the rivet to a length that leaves $\frac{1}{16}$ " exposed for peening. An electrician's side cutters will do the job and leave this amount exposed, or you can remove the rivet and grind off the surplus. Place the head of the

rivet on an anvil while peening the inside end. The copper end should have a rounded-over appearance from tapping with the ball peen. This is accomplished by hitting in a pattern that peens the edges as well as the center of the rivet end. When you're done, the handle will swing past the ends of the lid, but not be able to pass under the carrier.

Finishing Your Carrier: Paint vs. Varnish

Historically, boxes were painted before the mid-1800s and finished clear after that. This project dates from the latter period, and all examples I've seen have been varnished. Of course that doesn't mean that a painted carrier is wrong or unattractive—only that you may need to think ahead if you wish to use a traditional flat paint with dark wax to patina the surface. It will work better to do this before attaching the handle. Clear finishes can be applied either before or after handle attachment. In either case, leave the inside plain wood. Just like the inside of bureau drawers, you do not want the odors from oil or paint finishes to affect food or cloth.

Clear finishes come in a variety of forms such as shellac, varnish, lacquer, oil and blends of several of these. Some are brushed, some wipe on. Each has fans. All work. Your choice. What do I recommend? Polyurethane for durability, especially for projects used around the kitchen. So, pick a finish you like and are familiar with, leave the inside plain, get it done. Sign and date your lovely creation. **PW**

John runs The Home Shop in Charlotte, Mich., which supplies wood, copper tacks and other critical supplies for the Shaker oval box maker. Contact him at shakerovalbox.com or 517-543-5325 (9 a.m.-5 p.m. Eastern).