Shaker Oval Boxes

Volume II

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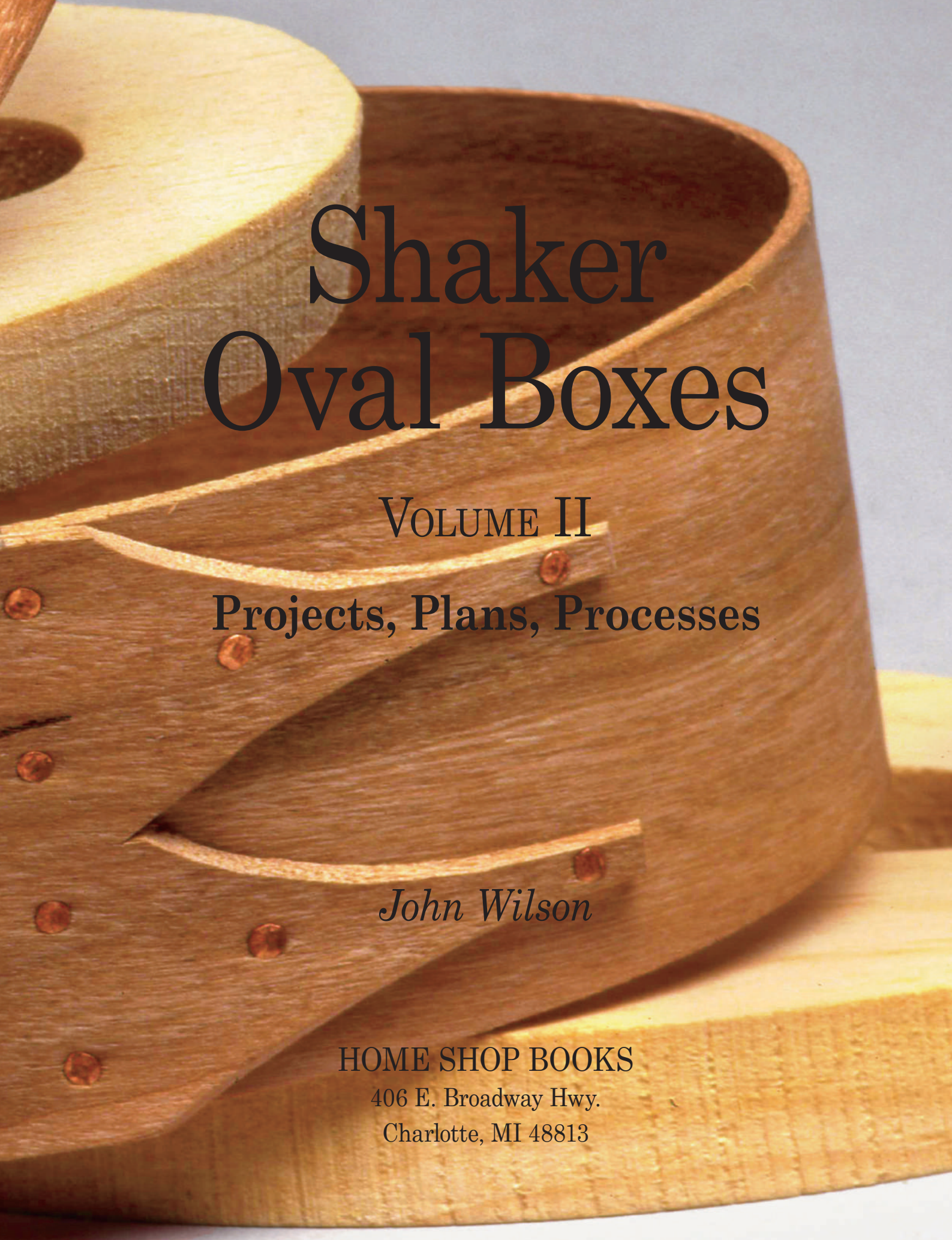

Shaker Oval Boxes

Volume II

Projects, Plans, Processes

John Wilson

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COVER: The Shakers made oval boxes that were not only useful, they had grace. The oval box in progress captures the Shaker use of shapers in construction. Cover photo by Dietrich Floeter.

Panoramic view above of the Home Shop in Charlotte, Michigan, by Jack Terry.

Home Shop Books
406 E. Broadway Hwy.
Charlotte, MI 48813
ShakerOvalBox.com

To Molly and Will, and most especially, to my wife, Sally. You make it a joy to wake up in the morning and begin a book like this, and see it through to completion.

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PHOTO BY JACK TERRY

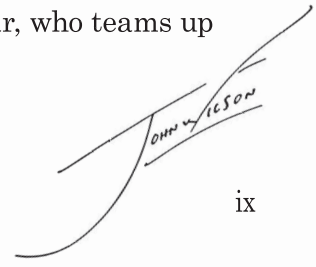
Preface

Eight of the projects in the book appeared previously as magazine articles. To the editors and staff of these publications we owe our thanks. Much that enriches our time in shop comes through the periodicals they edit. We forget that the whole perspective of our craft was transformed from the "industrial arts" that I knew in the '50s and '60s, to a much more inclusive woodworking trade that harnessed both the old hand-work age and the power equipment generation.

I started teaching Woodworking 101 at Lansing Community College in 1977. *Fine Woodworking* magazine was only two years old, still in black and white, but what an eye-opener! Here was a rich tradition that was our heritage. The pendulum was beginning to swing back from large planers, saws, and the most recent shop-size power equipment, to a fuller appreciation for the relevance of the whole world of woodworking past and present.

I am indebted more than anyone to these editors, because they provided me a forum for presenting my ideas and class experiences. The text, drawings and step photos you find here, and in my earlier book *Making Wood Tools*, were refined in the periodicals they edited. Without them this would be a much lesser book. The staff at *Popular Woodworking* gave me opportunity, encouragement, and a generous amount of space, even to being the cover story three times. To editors Christopher Schwarz and Megan Fitzpatrick, photographer Al Parrish, art director Linda Watts, and Kara Gebhart Uhl – Thank you. I am doubly blessed to have Linda Watts as graphic designer at Home Shop Books to make me look good in print. Always.

Finally, a big thank you to business partners Eric Pintar and John Kellogg (retired), and all others at the Home Shop including Dale Dodds and Pat Weston, who have been so helpful in making supplies for the box trade. Thank you also to those who share my passion for teaching, including Keith Cole, Carl Huth, David Abeel, Gil Chesbro, and Eric Pintar, who teams up with me for classes on the road.



Introduction

On our vacation to Yellowstone National Park I delivered an order of supplies to a customer along the way. Like all of us, Pete Kurth is similar in some ways and unique to the rest of us in other ways. He began making oval boxes after retirement. As age limits other activities, he finds boxmaking still meaningful for himself and others. What is unique is the mission Pete has of providing remembrance boxes to families who experience the loss of a newborn child. The gifting of a lovely box says to them that the life cut so short was worth the care and love they felt, and the loss is shared. The remembrance box is a place where small things which together are so meaningful can be treasured. A tall No. 5 shown on page 20, which was also the cover photo of Volume I, can serve the need.

I was reminded at the time of my conversation with Pete of many topics covered here in Volume II. For instance, what the numbers assigned to Shaker oval boxes are and where they came from. What about the variations to the standard nesting sizes and how did they come about? For instance, was it a request for a button storage box that is more useful when rummaging for the right button, or did this shallow box happen when a standard band partially broke in construction and a cut-down box size was the result? Maybe a unique design was simply a curiosity to make something new. It doesn't matter, really. Whether it was necessity, accident, or curiosity, the results have added to the inventory of Shaker oval boxes that include both historical examples and recently derivative innovations.

I know Pete Kurth joins me in wishing you a long and meaningful life making and gifting boxes.

Projects, Plans, Processes

The title is straightforward enough, *Shaker Oval Boxes*, and *Volume II* pointing to a previous book overviewing various examples, and hinting at the possibility of a Volume III to come. However, the subtitle needs a little help. "Projects" is OK, "Plans" are understood, but what exactly are "Processes"?

The Meaning of "Processes"

Looking at Part II about design will give you a hint of what I mean about processes. It may help to know that at one point I was going to use "Production" instead. That focuses mainly on construction, building steps and the like. Process is a bit different. Let me quote from the section on design:

> *In the Mind of the Maker*
> *Focusing on design instead of replication does more than avoid arguments about exact measurements. It keeps us engaged in the lively pursuit of craft excellence within an understood tradition. Shakers in their wood shops understood this, practiced this, and so can we. The difference is between process and product, the sense of a thing and the object, the mind of the maker and what he made that day.*

Enjoy your journey. Thanks for joining me.

John Wilson
May, 2017

Projects Historic and Derived

The subtitle of *Shaker Oval Boxes, Volume I,* "A Craftsman's Guide to Original, Derivative and Diverse Forms of the Oval Box," distinguished between examples from the inventory of Shaker craftsmen's work and that of contemporary craftsmen, as Shaker-inspired derivatives. This volume is no different. You are provided with plenty of examples of both.

For those captivated by replication of original Shaker work, look no further than the set of five standard boxes in Chapter 1. But Shaker craftsmen were innovative as well as holding to the tried-and-true. Examples of this are found in abundance. Br. Delmer's delicately elongated ellipse in Chapter 9 comes to mind, and Daniel Crossman's rimmed open round box, named here a crown box, in Chapter 15. The most intriguing rendition of a carrier is by an anonymous craftsman at Canterbury Village shown here for the first time in Chapter 16. It combines two different ellipses in one project.

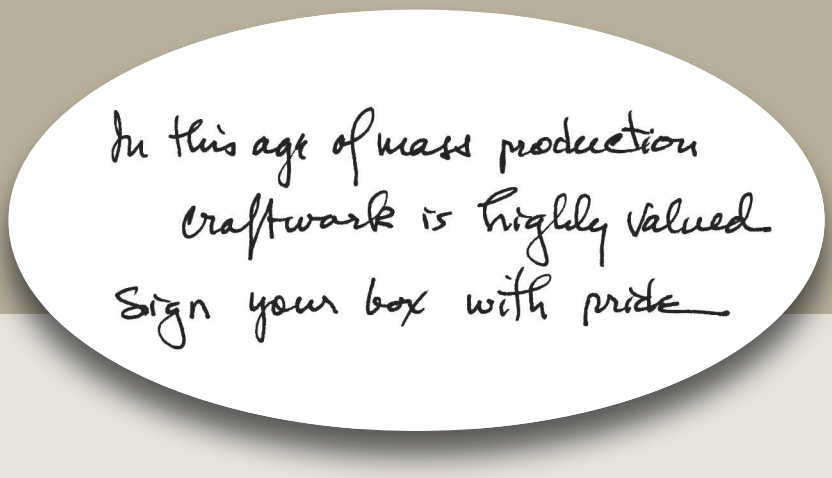
Old standard, and unique. Examples abound. Read on.

Beauty, grace and utility combine in presentation boxes.

PHOTO BY AL PARRISH

PART I

Oval Box Projects



1

The Basic Set of Five Oval Boxes

There was a time when households had few belongings, when clutter from too much stuff was not an issue. Basics such as matches, glue powders and paint pigments, and sugar, coffee, tea and spices needed containers. Before the age of canisters and Tupperware, the Shaker craftsmen made and marketed their oval boxes.

The place for boxes in the home has changed throughout time. Modern metal and plastic containers have displaced the traditional preeminence of wooden boxes in the pantry. Today they are more often seen on the coffee table in a more decorative setting. Along with the change in use has come a change in finish so that varnish rather than paint is preferred. Cherry is more common for bands than plain maple. Yet this is still a box for all occasions, utilitarian as well as decorative. Its charm and grace make a difference for whatever role it plays.

These beautiful boxes were first made from hard maple and white pine. In an age before machines, thin wood strips were rived from a straight billet of wood and made ready for bending by handplanes and scrapers. Hot water soaking makes this sturdy wood pliable, and bending gives a complete oval shape in a single motion. Tacked and made secure by oval shapers, this efficient process impresses me every time I do it.

PHOTO BY AL PARRISH

Getting Started

You will need two pieces of bending stock, a top and bottom board, small tacks, and wood pegs for each box. Part II of this book gives detailed instruction on obtaining suitable bands and boards as well as construction details. Refer to those pages when making your own materials and for additional tips. Purchase of boxmaking supplies is available from the Home Shop (ShakerOvalBox.com) as well as tacks, pegs, forms, jigs and water trays for boxmakers.

While making everything from scratch

Teaching First-Time Boxmakers

It was Friday evening and a group of a dozen expectant oval boxmakers gathered to learn the tradition begun by Shaker craftsmen over two hundred years ago. They will hear some things they know and some things new to even those shop veterans among them. For the group is diverse, spanning men whose avocation is woodworking to women relegated to Home Economics in a high school when hands-on classes were gender specific.

They were shown oval boxes in an array of sizes and styles, made of materials as diverse as pine and birdseye maple, some finished clear, some painted. They saw the oval box in its practicality as well as in a sparkling beauty. They came to understand its iconic representation of the Shaker community as well as being a living tradition with modern diversity.

Tonight they are introduced to a set of boxes in cherry. The shop is where they hone new skills in bending and oval board fitting. By tomorrow afternoon the five boxes represented here will become theirs.

PHOTO BY KELLY MEHLER

A diverse group of first-time boxmakers.

requires a full hobbyist's shop, the setup for making oval boxes once you obtain dimensioned wood is quite modest. Benchtop machines such as a 10" bandsaw or scroll saw and a combination 4" x 36" belt and 6" disc sander will be adequate for making most box sizes. Both tacks and pegs need pilot holes that can be drilled by hand or with an electric drill. Hand tools such as a coping saw, block plane, scrapers, rasp and knife will work for those who either by necessity or inclination wish to do it the traditional way.

Soaking Bands and Using Forms

The shop photos and captions summarize your work of bending, tacking, fitting and pegging. While wood can be made supple by any temperature of water – cool, hot or steam – hot water is preferred by most boxmakers past and present. A tray facilitates the 15-minute soak in near boiling water and can be made special, or adapted from a length of eaves trough.

Cores and shapers are the key to forming and drying the wet band. Cores are obvious, but the shapers need some explanation. They are the key to Shaker production, and in their absence a variety of awkward, inefficient methods are employed that we need not go into. Shapers are used in pairs and define the shape of the box which will dry in a day or two. The shapers I use are oval corks with an edge beveled 10° and holes for ventilation and handling. Sand the inside smaller and the outside larger than the core pattern so they will enter the wet band partially. You need one core and multiple pairs of shapers when making more than one of any size box. The alternative shapers use 1/4" wood or 1" rigid foam board and are discussed in Part II.

Wet wood once shaped on the core and marked for circumference needs to be tacked with small copper tacks clinched on the inside of the wet band over a pipe anvil. Engage the cork shapers, but do not press too hard which will flair the band edges.

PHOTO COURTESY OF *FINE WOODWORKING* MAGAZINE

Five oval boxes follow patterns in Ejner Handberg's Shop Drawings of Shaker Furniture and Woodenware, Vol. I (1973) *with the addition of the smallest.*

Fitting Tops and Bottoms

Once the band is dry you are half done. In an evening you can expect to bend up the five box sizes shown above. Fitting the tops and bottoms will occupy another evening.

Here is how you can achieve a seamless fit. The dry band is the template for its top and bottom. First, after lightly sanding the inside, use a .7 mechanical pencil to trace an accurate line around the inside. Cut to this shape leaving the line as reference to sand up to. Second, raise the disc sander deck 2° to provide a slight cork edge to match the slightly flaired edge from the shaper imprint. Third, sand accurately just into the line. One, two, three, and you have a perfect fit when pressing the oval board into place.

Just as bands are tacked, boards are pegged to hold them in place. Pilot holes 5/64" d., 1/2" deep, every 2" to 3" around the perimeter receive the pegs (half-toothpicks) which are

tapped securely into place, trimmed and sanded smooth. Alternatively, use cut copper pegs using 1/16" holes 3/8" deep.

Suggestions for finishing are given in Part II (see page 146). Remember to leave the inside plain to avoid residual odors. Sign and date your new creations. You are part of an old tradition with modern craftsmen.

Handberg and the Basic Box Sizes

What has become the hallmark of our boxmaking basics class is a nest of five boxes numbering on the Handberg scale from No. 0 to No. 4. Over 5,000 people have been introduced to the craft through making them in these hands-on events since I taught the first one in 1983.

It was Ejner Handberg in his book *Shop Drawings of Shaker Furniture and Woodenware, Vol. 1,* Berkshire Traveler Press, 1973, that illustrated the fingering and ellipse size for each of six boxes. He numbered them to help in making clear his illustrations. There was no historic intent to ascribing these numbers. In fact, Shaker numbering series had the largest box as a number one. When Handberg found his readers assuming significance beyond an illustrator's convenience, he deleted the numbers from the 1980 edition. However, the numbers have stuck and Handberg's book, still in print forty years later, continues to inform would-be boxmakers. Finding the box numbers to be a common sense ordering of standard box sizes, as well as widely in use when I started out and still today, I have used them throughout this book.

Teaching has always been central to my involvement in boxmaking. Materials for class presentation need to be affordable, manageable, and instructive. Larger box sizes challenge the beginners' manual skills, as well as involve greater costs than smaller boxes. For those reasons the No. 0 size box was added to make a five-box set, while dropping the two largest ones to be made if desired later in an advanced class or at home. If an abbreviated set is needed, then the No. 1, No. 2 and No. 3 sizes are used. The No. 2 box alone serves a short course.

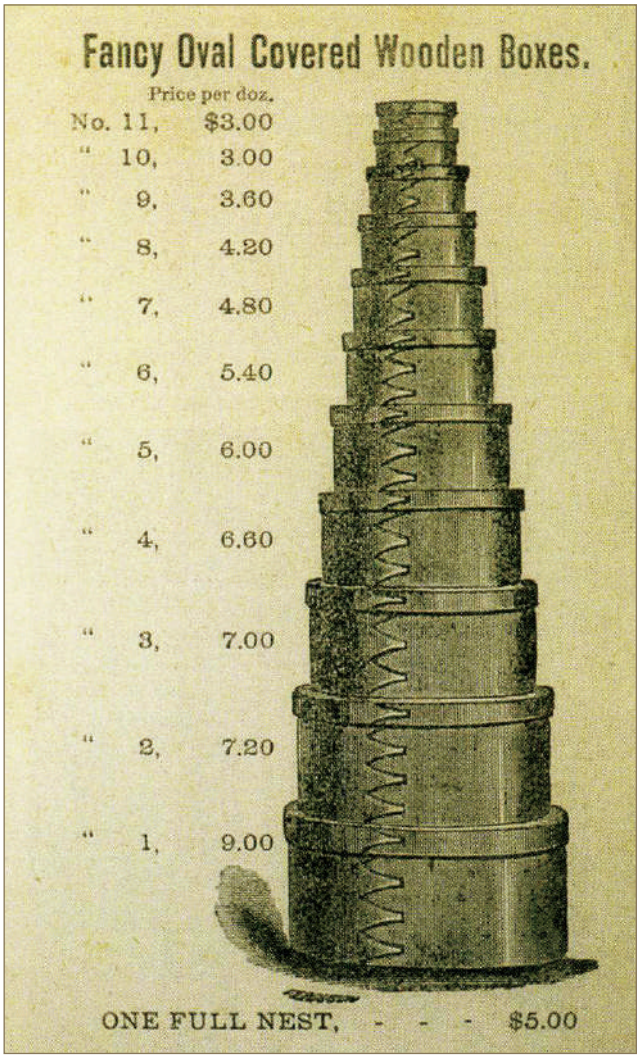


IMAGE COURTESY OF JERRY GRANT AND BOYD A. HUTCHISON

A full set of oval boxes the Shakers made for their wholesale trade at Mt. Lebanon Village around 1870. Boxes were numbered and sized differently over time, but always the largest was No. 1.

The No. 3 box has two versions, one with two fingers and one with three. Handberg illustrated the two-fingered No. 3 and I followed suit. It is easier for the beginner to curve than the three-fingered version. However, the three finger style sets it off from the smaller ones when doing the Nos. 1, 2 and 3 nest, as well as being more classic when the No. 3 is used alone, as in the Jewelry Box for Molly (page 54).

The Search to Find Wood that Bends

Today we are not likely to go to the wood lot for a straight-grained section of log to split stock for the bands. Few of us have a wood lot nearby, and technology has separated us from skilled hand-tool use. But the need for bendable wood to flex around the box core remains the same. This capacity to flex is not always apparent in wood. While straight-grained stock is the place to begin to look for bending material, brittleness can cause the best looking piece to snap. One condition that causes brittleness is drying out. It's a consequence of the fact that we live some distance from the wood lot. Green wood, which bends best, isn't readily available.

In your search for materials for bending wood you will find hard maple a good species. Cherry, while it makes a fine box, is prone to changes in growth direction and unexpected brittleness. I sometimes imagine Shaker craftsmen watching my frustration with ornery cherry boards and sighing, "Ah, the price of vanity. Stick to the utility of maple, and it would go well."

Strange as it seems, the same things that make for suppleness in the human body (age and nutrition) apply to wood. Freshly cut boards do better than old dried ones. Also, the conditions of favorable growth will yield better results. Ample nutrients and sunlight make for faster growth as evidenced in wider annual rings. This is a favorable sign in selecting wood for bending. And, of course, straight growth, and not picturesque gnarled figure, is ideal.

Cutting Band Stock

Where will you find such wood for your box bands? The wood you use may be recently cut for firewood, or you may have luck with an old board of unknown species. The real test is to try it. Dimension a piece and slab off thin bands on your table saw or band saw. Photos 1 and 2 show it being done. The table saw needs a zero-clearance insert to reduce the gap next to the blade to prevent the thin band from disappearing down the slot. Avoid short stock. Small box bands 12" to 20" long are cut more effectively and safely when sawn double length, 24" to 40" long. The blade is the key. I use thin-kerf 10" 40-tooth blades with alternate top-bevel design. Try a new blade to see what factory sharp can do.

When the table saw, blade and wood are in sync, the result is a finished band ready to use with little or no sanding.

The band saw needs a steady rest as a guide for thickness. A sharp blade is important here as well. I use a ¼" four-tooth-per-inch Timber Wolf. Others prefer a ½" or ¾" carbide-tipped blade for their band saw. A thicknessing drum sander will reliably finish the band to the specifications given in the table on page 18. The planer may not work well for thicknessing because of the thinness of the bands. They can catch in the blades and shatter. When planing just a few bands, try sticking them on a shooting board with double-stick tape to stiffen them.

However you cut your wood, be patient and be prepared to try again. You can get a feel for flexibility in the wood as it comes off the saw. I heat my shop with what doesn't work.

Sliced Veneer Stock

Veneer is another source for bands. This is wood dimensioned by slicing at a veneer mill. It is an efficient use of the best grade of logs as there is no saw kerf waste. Successive sheets of uniform thickness make it attractive. Great quantities are sliced for the furniture trade for high-quality face veneers.

Most of this is cut to 1/42" (.024") thickness making it too thin for our use in boxes. The other common thickness is 1/16", which works for smaller boxes, and you can expect reasonable bending results from hard maple. (One commercial source is Constantines: 954-561-1716 or constantines.com.)

When the log is sliced, the knife leaves one side of the veneer with slight crack lines. This "open side" face needs to be inside the box when

The table saw is my tool of choice for resawing bands up to 3" wide, although things slow down appreciably when nearing the capacity of the 10" blade. A sharp blade is a must. The zero-clearance wood insert shown here will prevent the thin wood from dropping through the table. When your setup is cutting effectively, there is little sanding required.

bent. Otherwise, the surface will be rough and could splinter. Gently flexing the veneer prior to preparation for soaking may reveal a side with these slight crack lines. Placing it in water will always show this. What happens is the wood takes a slight curl across the grain when wet. The rule is this: *The inside of the curl is the outside of the box.*

I have built my business during the past 34 years on meeting the needs of the oval box trade (ShakerOvalBox.com). I use veneered band stock selected and dimensioned specifically for bending. While I welcome your business, I know that cutting bands in the manner described above can be both rewarding and of high quality. For instance, there is no bias side in sawn band stock. Many of you have the capacity to do your own cutting. It is worth the effort. Try widths of 2" and narrower that cut easily on the table saw. Wider stock has been known to be more difficult.

Top and Bottom Boards

The other materials needed for boxmaking are the oval boards for the top and bottom. These are 1/4" to 7/32" thick and not bent. Unlike the stock for the bands, these are readily available. The oval shape sets off some interesting figures and features. It is an opportunity to use small sections of boards that accumulate from other work.

The one factor you need to consider in tops and bottoms is wood expansion. If the oval board expands too much in humid weather, the band will crack. Breakage is serious stuff, and is ever present in a box. The larger the box size, the more likely it is to occur. The reverse of this is the board drying out after you make your box. That will result in gaps where it meets the band, spoiling your nice tight fit. Where possible you want quarter-sawn stock to minimize the future effects of humidity change.

One solution to wood movement in larger box sizes is to use plywood. The cross banding of alternative plies stabilizes the wood. For appearance sake, pick plywood without a joint in the veneer face, and be careful not to sand through the very thin face veneers.

It is also a fact that different tree species expand and contract differently. Softwoods are

more stable than hardwoods. The Shakers used quarter-sawn eastern white pine because it is a very stable cut of wood. You can find a table listing wood behavior as moisture changes in R. Bruce Hoadley's *Understanding Wood* (Taunton). Based on variation in species movement, I opt for plywood when maple tops and bottoms reach 7" wide, cherry at 8" wide and pine at 12" wide.

Whatever your species and growth orientation, be sure the moisture content of the tops and bottoms are similar to the inside environment of your home. If you are uncertain of that, and do not own a moisture meter, never fear. Boards ¼" thick will adjust to your home's humidity level in a few days. Bring the top and bottom boards inside before you make your box and expose all the surfaces equally for a few days to allow this to happen.

Setting Up Your Bench

To dimension bending stock and top and bottom boards takes the resources of a full shop. Many craftsmen choose to purchase dimensioned materials and thus simplify their operation. The equipment and shop space to do the actual boxmaking is quite modest. Even those without access to a wood shop can do it.

I always have used a combination of hand and power tools. Standard floor-model sized machines are fine, but smaller ones work well. A 10" band saw and a 4" x 36" belt sander with 6" disc, both benchtop machines, are suited to boxmaking. An electric drill rounds out the power equipment. If you wish to do the cutting, shaping and drilling all by hand, that should not be too much of a challenge either. After all, original boxes predate these modern conveniences.

To set up your shop for this project you need a few jigs that are easy to make or find. You need a tray for soaking the bands. Normally, it needs to be long enough to fully immerse the largest size, 32" for the No. 5 box.

However, alternating ends for soaking can allow you to get by with something shorter. Boxmakers traditionally use hot water for this process. The alternatives to hot water are cool water and steam. All three methods work, but there are some differences in technique that go with each.

If you are already set up for steam bending, then by all means use it. If you can obtain a metal tray at least 4" x 32", then you are ideally set for hot water soaking. Set the tray on a stove or electric hot plate with stabilizer blocks under each end (photo 7). A length of steel gutter (the modern flat-bottom style) with end caps attached together with a ¾" plywood cover will serve for this.

When hot water is used, soaking takes 15 minutes. The wrap itself goes quickly with a few motions around the core.

Cool water will be the option when neither of the above is available, as you can co-opt the bathtub. Understand that flexibility comes from both soaking and heat, and when only one condition is involved, as in cool water, soaking you must allow 12 to 24 hours of soaking and use more finesse when bending. A forward then back motion to bending in small increments as you go around the tight end of the oval will flex the wood under circumstances such as this.

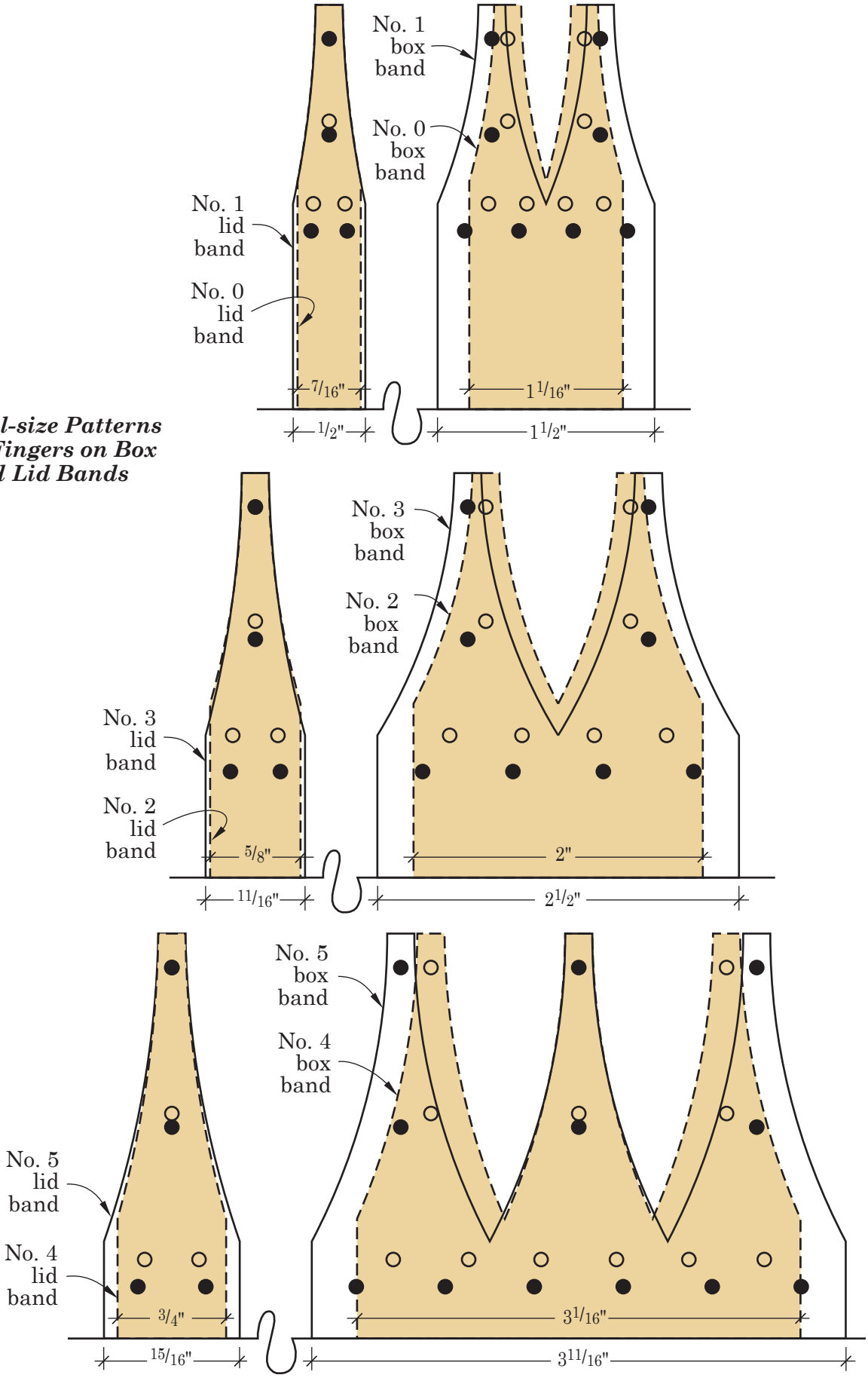
When tacking the lap, you will need an anvil for clinching the points of the tacks. This can be made from an 8" length of 1" or 1¼" galvanized pipe bolted to a wood cradle and clamped to your bench (photo 9).

Cores and Shapers

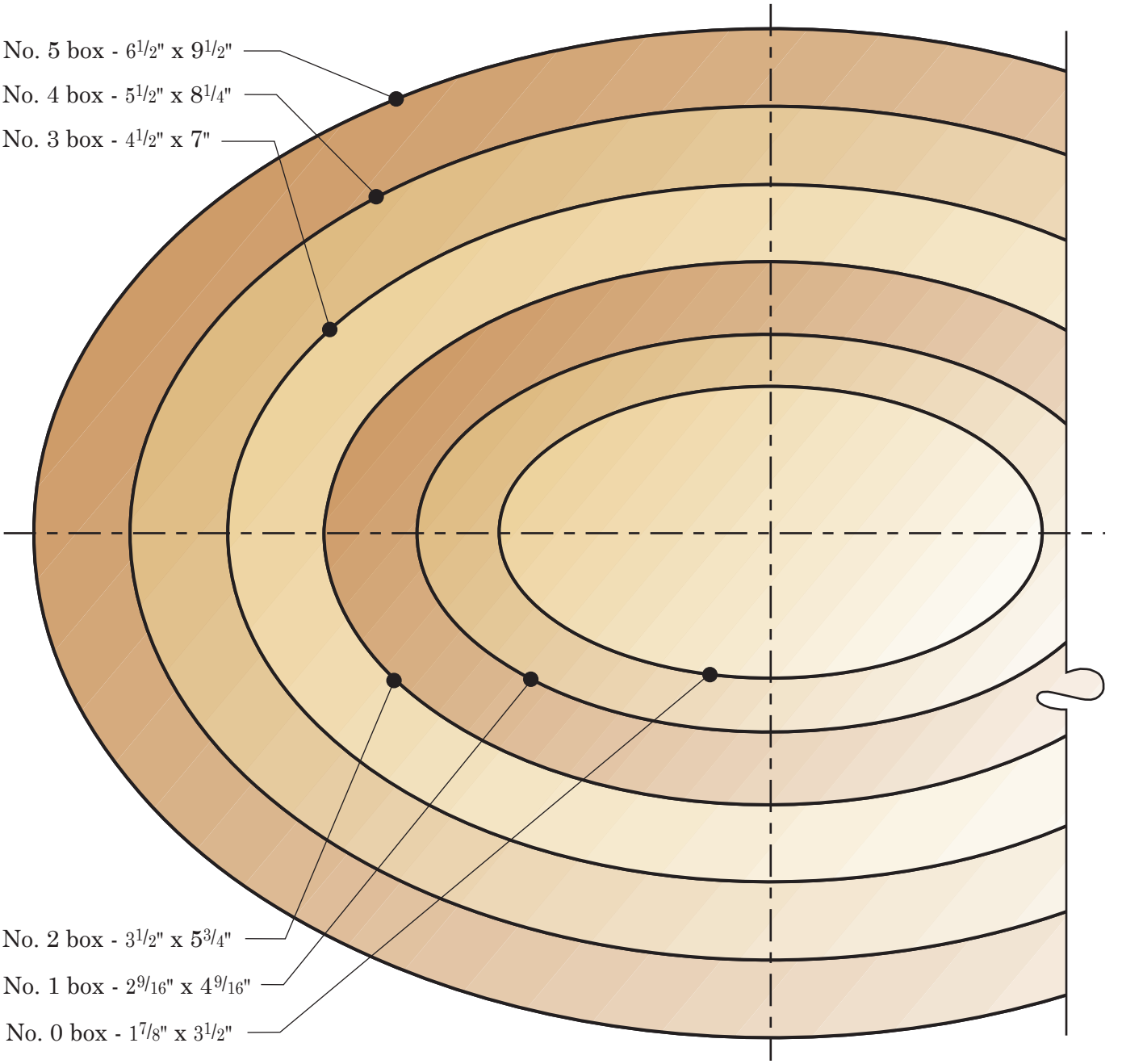
In addition to a soaking tray you need a set of cores and a set of shapers. The core is a wood plug the size of the inside of a box. The hot, wet band is bent around it (photo 8). Made from soft wood (2" foam board also can be used), they are created using the oval patterns on page 11.

The shapers are the key to the Shakers' box production (photo 10). You will need a pair for each box made at one soaking. If you wish to

Full-size Patterns of Fingers on Box and Lid Bands



make five of one size 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, and the thickness varies. The smallest ellipse is 1/2" thick, mid-sized is 5/8" thick, and sizes No. 5 and larger use 3/4" stock.



Oval Patterns for Cores and Shapers

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

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.

The inside end of a band is feathered back 1" to 1 1/2" depending on its thickness. This will provide a fair curve to the inside of the box.

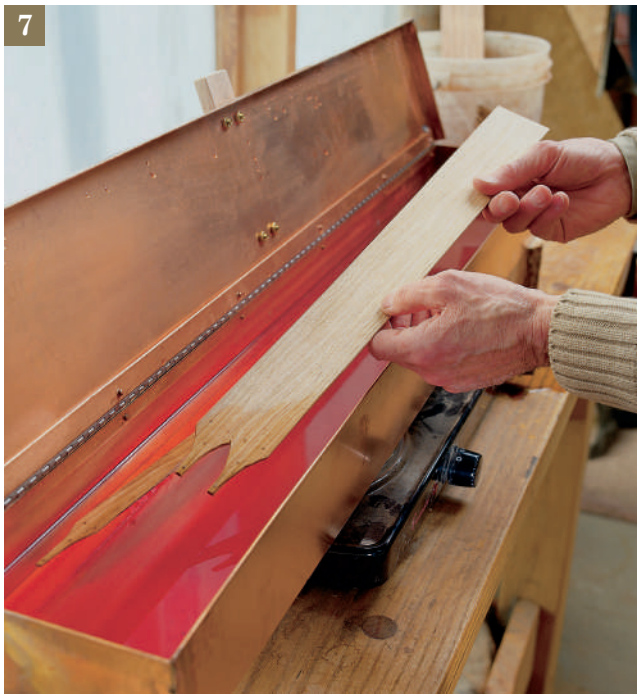
Preparing the Box Band

Now you can begin the boxmaking process. Cut and drill the bands for the fingers. Photo 3 shows the band marked according to the finger pattern for shape and location of the tack holes. The locations of the copper tacks are drilled with a 3/64" or 1/16" bit. The swallowtails, as the Shakers sometimes referred to the fingers, are cut on a band saw, or this can be accomplished completely with a knife. The rough shape is trimmed (photo 4) to the graceful proportions of the finished box. There are three elements to this shape: narrow width, slight bevel to the edges and a curved, gothic shape. I mention these because almost everyone starts by making the fingertips too blunt and too beveled – losing the graceful curve of the pattern in the process of trimming. The fingertip needs to be only slightly wider than the diameter for the copper tack head. This will make wrapping, tacking and drying go well, and achieve a more Shaker look. The beveled edges are trimmed to a slight 10°, not approaching the 45° commonly cut by novices.

Now you should feather back the inside end of the band 1" to 1 1/2" depending on the thickness of the band stock (photo 5). The sander with a block of wood to hold the veneer evenly is used to taper the end (photo 6).

When the band is trimmed and feathered, place it in hot water to soak (photo 7). Water hotter than 180° Fahrenheit will soften the lignin in the wood fiber that allows it to be bent. Upon drying it will hold the new shape. Soaking for 15 minutes is sufficient for ordinary bands. However, double that time for very small box sizes with a tight curve, and for troublesome bending stock.

The 4" x 36" bench sander sees a lot of use when I make a nesting set of five boxes. Here feathering the end of the band is controlled by a wood block to ensure a gradual taper.



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° will effect a softening of the lignin.

Bending the Oval Band

Your soaked band will cool quickly once it is taken 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. This is how you find that mark: The major tack line is centered in the front of the oval. The start mark is left of center. How far left? It's the same distance as the measurement between the main tack line and the tips of the fingers.

Copper tacks clinch the band. No glue is needed for this efficient fastening. The tacks are 1/16" longer than two layers of veneer. So two or three sizes of tacks are used for a set of boxes, which has thicker veneer for the larger sizes. Have your tacks, anvil, hammer, a pair of shapers and a core ready when the band is taken from the hot water.

The wet band is wrapped around a core the size of the inside of the box. Here the wrapped band is being given a pencil mark so that the core can be removed and the band returned to its proper size. Note that both fingers are held to prevent splitting between them. The mismatch at the lapped edges of the band is common at this stage and will be made even when tacking.

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 halfway around. Change hands, hold and complete the wrap. Pencil a mark across the veneer lap to register the circumference. Photo 8 shows this step completed. Hold both 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 centered at this stage. Both of these come next.

Open the band slightly to remove the core. Bring the band together so the pencil marks meet. Here is where you align the edges of the lapping band. Then tack the lap (photo 9).

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 the center of 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 inserting the shaper and do not push too hard because this will flare the edges of the bands.

The lid band, which went in to soak along with the bottom band, is next. It is bent on the box itself, which acts as the core (photo 11). Size, alignment and centering are observed for this band as well. When tacked, the lid band goes in place with the fingers pointing the same way as the bottom fingers (photo 12). The first half of box construction will be complete when

Small copper tacks 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.

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 and then returned to the box for drying. Note that the direction of the fingers match the bottom band fingers.

these two bands have thoroughly dried. Allow for normal air flow around the box. Avoid using extra heat, direct sun or fan blowing. Drying too quickly can result in the veneer warping.

Fitting Tops and Bottoms

The oval boards to complete the box are 1/4" thick for mid-sized boxes, and 3/16" and 7/32" for the two smallest boxes.

Draw the oval by using the dry box band as the pattern. 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. 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 box. Check it out in position on the box to make sure that you have the right finger direction to match the bottom.

The construction of an oval box is half completed when it is set aside to dry for one to two days.

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.

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.

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.

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.

An alternative drilling method makes use of a drill press. The jig, which I call a bookend, creates a vertical drilling station.

After band sawing the oval, sand the board up to the line on the disc sander (photo 14). This is not a right angle, but it has a slight bevel to give it a cork effect. To get this, adjust the disc 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 tip up the 2°.

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 with cyanoacrylate (like Hot Stuff Original) 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, giving a matching glue line. Unlike cyanoacrylate that remains clear under varnish, carpenter's glue must be removed from the surface before finishing.

Insert the oval board against the front edge first (photo 15), 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.

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 1/4" top and bottom boards, and are placed 2" to 3" apart around the edge. They keep the oval boards in place. It takes a 1/16" or 5/64" hole drilled 1/2" deep. Two jigs are shown for ensuring that you do not miss the edge of the boards.

Photo 16 shows a small drill held down with a wood yoke to create a horizontal drilling jig. Photo 17 shows an adaptation for a drill press using a right angle 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 tooth-

Wood pegs are made from cutting in half the box of World's Fair Brand toothpicks. The tapered end to these match the 5/64" hole for a secure fit when tapped in place.

Final sanding is done with a 120-grit belt replacing the 80-grit one used for shaping wood before.

picks made by the World's Fair Brand Co. serve for pegs. Cut the box in half on the band saw to double your count of pieces at just the right length. Tap the pegs in securely (no glue needed), and snip off with wire cutters (photo 18).

With the pegs in place, sand the surfaces of the box (photo 19). The finger lap is one area I do by hand to ensure that the curved finger design retains its full relief.

Finishing the Oval Box: Paint vs. Varnish

Boxes need a finish coat on the outside for protection, but remain plain wood on the inside. The reason for this is the neutral nature of wood. Just like the insides of bureau drawers, you do not want the odors from oil or paint finishes to affect food or cloth.

Historically, boxes were painted before the mid-1800s and clear finished after that. Paint was made locally from lime, clay, milk and pigments. Recipes for finishes were a shop tradition. Interestingly, craftsmen of old did not remove the lid when painting the box, so original boxes show a narrow band of plain wood around the top edge. This may be due to the possibility of a lid sticking to the homemade paint.

What do I recommend? First, if you do paint, take the lid off and save yourself the trouble of having to explain "incomplete" outside painting. Second, leave the inside plain. Third, use whatever finish you like, have on hand and are familiar with. There is nothing that is all that special about a box finish that should keep you from getting it done.

Painted boxes use one coat of flat latex wall paint, followed by sanding with 220-grit sandpaper. This will accent the edges of the oval and finger area, and reveal the copper tacks. The new paint is finished with Kiwi brown shoe polish! That's right, I call it old-time patina in a can. Rub it on and brush it off. ***Caution:*** Try a sample of whatever wax finish you use before doing the box to ensure that the solvents in your wax do not "pucker" the surface of the paint.

Clear finishes come in a variety of forms such as shellac, varnish, lacquer, oil and blends of several of these. Some are brushed, some

wiped on. Each has fans. All work. Your choice. For myself, I prefer quick-dry polyurethane for durability in areas where water spatter is likely, such as in the kitchen. This can be brushed on from the can, or mixed 50/50 with painter's naptha (a form of paint thinner) to make a wipe-on finish that avoids the nasty habit of varnishes getting runs or drips. Sand between coats.

Conclude with a rub on a brown paper sack. This is an old painter's trick that has been known to really work – simple, available, quick and effective. Open a grocery sack – the kind the bag boy used to put your groceries into, remember? – so the inside is lying flat open. You want to avoid rubbing on the ink printing on the outside lest it transfer to your fine finish. I have a piece of 1/4" foam (used for carpet underlayment) under the paper to avoid encounters with grit on the bench that pokes through the paper. Then rub the top, bottom and sides. It takes less time to do it than reading about it, and it gives your box a smooth, burnished feel.

Sign and Date Your Creation

When the finish is done, you want to sign and date your handiwork. Did the Shakers sign their boxes? Yes and no. There was a feeling at times that the community was paramount and individual expressions of ownership inappropriate.

In this industrial age, craft work is highly valued. Sign your box with pride.

But there are many examples of boxes that were signed, and many of these were given as gifts, just like yours may be. I think it is a nice touch in this age of mass production to have your individual creation labeled with your own signature and date.

Having finished your first box project, be aware that you will receive both compliments and longing eyes directed to the oval boxes. There is no project in my experience that has such universal appeal as a Shaker oval box. Watch out, you may find yourself joining the ranks of boxmakers!

Shaker Oval Box Specifications

BOX SIZE	COPPER TACK SIZE[1,2]	BAND THICKNESS[3]	BOTTOM BAND WIDTH X LENGTH	TOP BAND WIDTH X LENGTH	ELLIPSE WIDTH X LENGTH	TOP & BOTTOM THICKNESS	NO. OF FINGERS & LENGTH TO TACK LINE
0	1	.062"	1 1/16" x 11 7/8"	7/16" x 12 1/4"	1 7/8" x 3 1/2"	.195 – .210"	2 – 1 3/8"
1	1	.065"	1 1/2" x 15"	1/2" x 15 1/2"	2 9/16" x 4 9/16"	.210 – .220"	2 – 1 11/16"
2	1 1/2"	.070"	2" x 19"	5/8" x 19 3/4"	3 1/2" x 5 3/4"	.235 – .250"	2 – 1 13/16"
3	1 1/2"	.075"	2 1/2" x 23"	11/16" x 24"	4 1/2" x 7"	1/4"	2 or 3 – 2 1/16"
4	2	.080"	3 1/16" x 27"	3/4" x 28"	5 1/2" x 8 1/4"	1/4"	3 – 2 1/4"
5	2	.085"	3 11/16" x 31"	15/16" x 32"	6 1/2" x 9 1/2"	1/4" – 5/16"	3 – 2 7/16"

[1]Leave 1/16" exposed end of tack inside, tap to clinch. The #1 tack = 3/16" long, #1 1/2 = 7/32" long, #2 = 1/4" long.

[2]Use 3/64" or 1/16" pilot hole for #1, #1 1/2 and #2 copper tacks.

[3]Band thickness is in thousandths because these small differences are impossible to read with a tape measure and a difference of as little as .006" will change the wood's bending properties; larger changes (.015") can require you to use longer tacks. Purchase an inexpensive steel dial caliper. (Grizzly and Harbor Freight sell digital calipers for under $20.00.)

2

The No. 5 Box in Two Variations

The five box sizes introduced in the previous chapter (No. 0, No. 1, No. 2, No. 3 and No. 4) make a fine stack, and individually they serve many needs. Handberg records a No. 5 and a No. 6 whose additional volume and oval length serve knitters and sewers well.

This project introduces an adaption as well – adding to the height of the standard oval. Cut a wider main band and add a finger to the pattern. This changes both the visual effect of the box as well as its uses. In this case it meets the inside volume size for ashes at the time of burial. A unique and meaningful gift.

Wider bands are a challenge to source. So be cautious in what you expect of your venturing into tall box construction. The No. 2 oval box is certainly the easiest and most reliable both to obtain and make. It is my choice if I take on a project for a wedding party for instance.

Besides larger band stock and top and bottom boards, the second need is for appropriate forms to bend and dry the band. Cores and shapers in the No. 5 size are of the same style as in smaller boxes. We will find this changing later on. Make your shapers from ¾" pine with two 1" d. holes and 10° beveled edges. Tacks and wood pegs are the same, as the band stock .078"–.088" thickness is in range for #2 tacks.

What grows exponentially is the soaking tray. By the time you wish to make a No. 9 box, the band will no longer fit into a bath tub which is normally four feet long. Fortunately the No. 5 at 31" is not so difficult to soak. The same can be said for bending techniques. Your hands can span the width and circumference in much the same way done for Nos. 0, 1, 2, 3 and 4. This will soon change as the larger widths are awkward to hold reliably without splitting the band between the fingers, but not so for the No. 5.

The Tall No. 5

Just as the standard No. 5 is patterned on the previous sequence, taller boxes add a finger's width to the band. In so doing you achieve useful capacity as well as dramatic effect with only a small change in construction. It will be found; however, that attention to controlling the added finger width is required in bending to avoid band splitting between fingers.

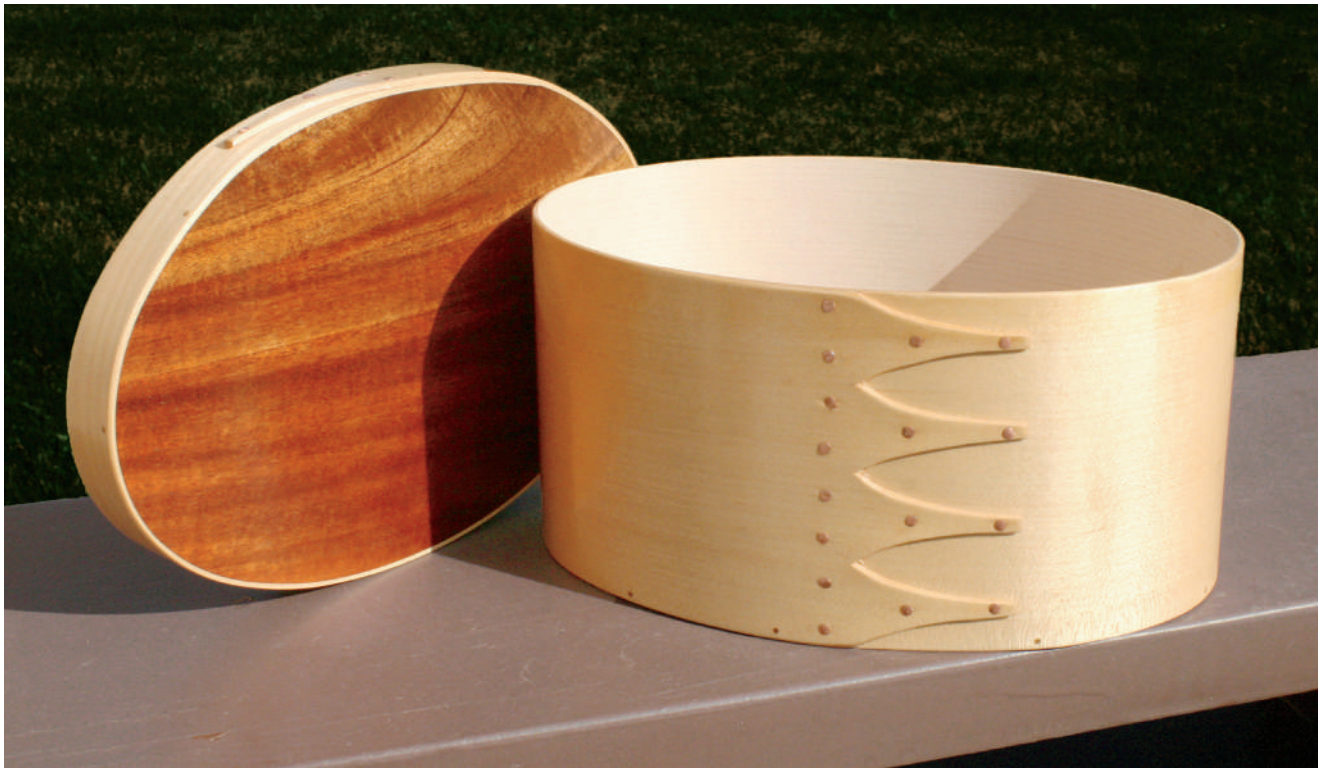
While the standard No. 5 has the role of holding the No. 0 through No. 4 set, the tall No. 5 is known for holding you, or anyone's remains. Being forthright and practical are attributes at times in short supply in the American way of death. A meaningful gesture can be attained in this project.

An Ashes Box

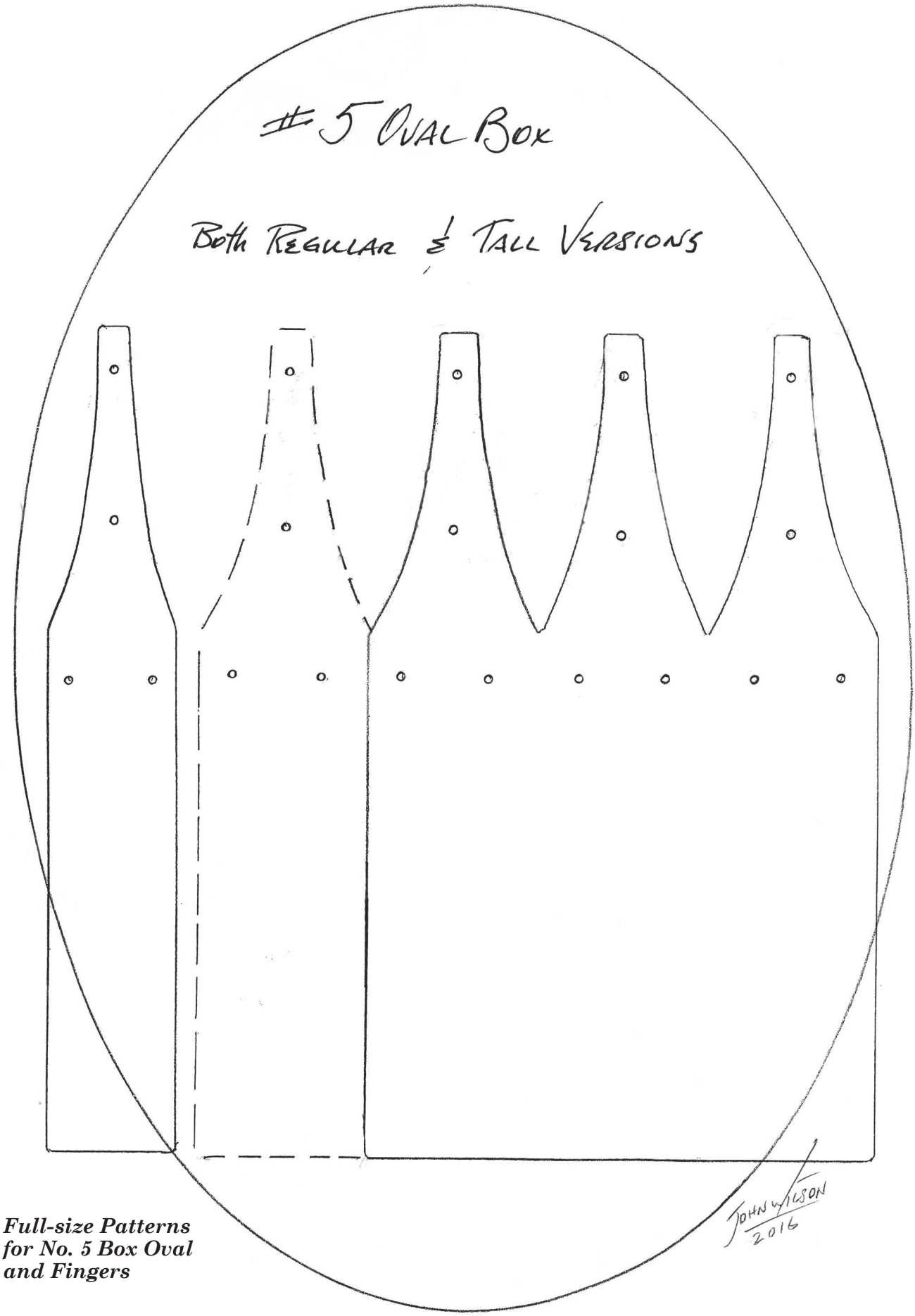
There are very few things you can give that are of practical use to someone facing death. One thing is a box to hold the ashes, that physical remainder of who we are. It is a testimony to the utility of the Shaker oval box that it finds place at such a time of life.

The first occasion for me to provide an ashes box was for my oldest brother who died at age 59, too young for a good man. I took some boxes with me on the trip to his funeral. Among them a No. 5 size. When arrangements were being made, it was offered as a box for the ashes. I had no idea how large a container would serve the need, so I took it with me when we talked with the funeral director. He said with practical good sense when asked if it was large enough that he could "level off the top if there was any remainder."

Besides a No. 5 from the nesting set (band width 3 11/16"), a tall version is shown which adds one finger width to the regular band (4 15/16"). That way you can simply step over your regular pattern when making the wider one. Urns made for the mortuary trade are



The tall No. 5 shown here is pleasing in its appearance as well as functional. It serves a range of uses from a sewing box to an ashes urn.



Full-size Patterns for No. 5 Box Oval and Fingers

sized by volume. The regular adult size is 200 to 210 cu. in., one for a child is 90 cu. in. They are made to fit with room to spare. The tall No. 5 box is 224 cu. in., while the regular No. 5 is 164 cu. in. A double companion urn can be made from a partitioned No. 7. Ashes will be transferred to your box still in the plastic bag from the crematorium.

You may wish to put a name or verse on your box. The verses are ones that appeal to my sense of meaning in life and death. The first comes from Job, and is an opening scripture from the service for the burial of the dead in the Book of Common Prayer.

> *I know that my Redeemer lives … He will raise me up, and in my body I shall see God. I myself shall see, and my eyes behold him who is my friend.*

The second comes from reflections on life by Robert Fulghum in his book, *From Beginning to End.*

> *I have never liked the phrase that says we're just made of dust and return to dust. We are energy, which is interchangeable with light. We are fire and water and earth. We are air and atoms and quarks. Moreover, we are dreams, hopes, and fears held together by wisdom and driven apart by folly. So much more than dust. The biblical verse should say, "Miracle thou art, and to Mystery returneth."*

A Tall No. 5 for Memorabilia

Add a middle section to the tall No. 5 and provide a place for photos and letters. Death is both an end and a beginning, a time for celebration and embarking on remembrance. So it is fitting that an ashes box contains the substance of memories.

The middle section can be arranged in two ways. The one shown here provides the opportunity to seal the main part if desired while opening the section above. The alternative is to make the main band taller by another finger width, and make a tray insert in the manner of the jewelry box project No. 9.

The middle section band is bent on the box in the same manner as a lid band which is done as well over the middle band. Then the inside board is fitted inside the middle of the band as a tray bottom.

A middle section added to the tall No. 5 serves for memorabilia.