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AUGUST 2011 ■ #191

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— David Charlesworth, http://www.davidcharlesworth.co.uk/

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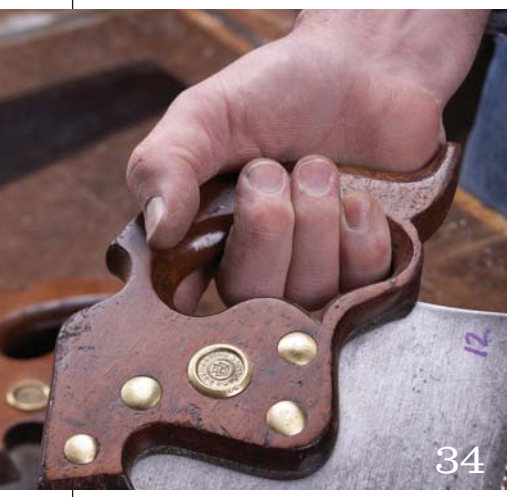

FEATURES

SAW HANDLE GRIP, COFFEE TABLE & TAI CHI PHOTOS BY AL PARRISH;
LARGE DOVETAILS PHOTO BY FATHER JOHN ABRAHAM; COVER PHOTO BY AL PARRISH

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CONTRIBUTORS

Mag Ruffman

"Lap Desk," page 24.

Mag Ruffman is a woodworker, television producer, writer, comedian and actress; she's known to audiences worldwide as Olivia Dale from "Road to Avonlea," a role she played for seven years, and in Canada as the host, creator and producer of "A Repair to Remember," a fix-it classic that ran for 78 episodes, as well as the workshop series "Anything I Can Do," which now airs worldwide.

Mag also is the author of Toolgirl, a weekly syndicated home projects column: "How Hard Can It Be?," a book collection of beginner projects and home repairs, and "We're All In This Together," an unconventional biography of Steve Smith (a.k.a. Red Green).

She is also a celebrity spokesperson for Habitat for Humanity Canada.

To find out more about Mag, visit her (very funny) blog at toolgirl.com.

Don Williams

"Royal Flooring in Appalachia," page 54.

Don Williams is a Washington D.C.-based conservator, educator, author and finisher who has worked on preserving and restoring some of the most interesting objects in our nation's public and private collections. He's written and demonstrated on an array of subjects related to conservation, woodworking and historical wood finishing.

Among Don's many projects is his almost-finished relocation and reconstruction of a 19th-century timber frame barn at his remote mountain retreat (complete with its own micro-hydropower system). He's also hard at work on "To Make as Perfectly as Possible," two annotated volumes of André Roubo in translation (the first is due around Christmas 2011).

To read more about Don, visit popularwoodworking.com/Aug11.

Dean Jansa

"The Naked Apprentice," page 22.

Dean Jansa has been traveling down the ever-winding path of learning traditional woodworking for nearly a decade. He is most drawn to 18th-century furniture, for he sees the surviving pieces as silent testament to the skills of the past. His goal is to try to understand these skills, their origins and the relationship with the culture of the period.

He is convinced that working exclusively by hand is a viable method for hobbyist woodworkers to create beautiful furniture, and that anyone can obtain the basic skills.

Dean is a member of the Society of American Period Furniture Makers, the Minnesota Woodworkers Guild and the Mid-West Tool Collectors Assc. – despite which, he considers himself a tool user – not a collector.

Visit the Society of American Period Furniture Makers' web site to learn more about the organization: sapfm.org.

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BY CHRISTOPHER SCHWARZ, EDITOR

Two Vessels, One Treasure

After a year of research and design I built a traditional tool chest for my workshop at home. My goal with this chest was to fix everything that I disliked about my first tool chest, which I built for this magazine more than a decade ago.

But in the process I got more than I bargained for.

While researching tool chests, it became obvious that tool chests cannot be separated from the tools we put in them. And that the tools we put in our chests speak volumes about how we approach the craft.

That's because tool chests aren't just for the woodworker who built them. They are time capsules that carry an important message about our craft to our children. The chest is a vessel. And while the vessel is important, the message inside is even more so.

The tools can reflect an insatiable desire to collect shiny objects. Or they can show a careful selection of only the things needed to do good work. They can reflect a reliance on jigs and specialty equipment. Or they can demonstrate a mastery of simple tools that require real skill to wield.

And finally, the tools are linked to a second vessel that is just as important to the craft: the woodworker. No matter how many tools we acquire; no matter how many books, magazines or DVDs we consume; and no matter how nice our shops are, it's all for naught if we have failed to acquire the hands-on skills that link the generations behind us with the generations ahead.

That's because our hands and our hearts are the only storage devices capable of accumulating the ability to build things of great beauty with incredible efficiency. No book or magazine can capture that. And we woodworkers are the only storage devices that can disgorge this data to future woodworkers in an efficient way.

So what does this have to do with my tool chest? Plenty.

As I built this chest, I realized that I had far more tools than would fit inside it. I had more tools than I needed. And so I spent months paring down my working set of tools until I had three tills and three bins filled with tools that would allow me to build almost anything my imagination could conjure.

But like I said before, this chest and this set of tools isn't just for me. It's for my kids, cousins or grandchildren. The chest will hold the tools and protect them as they pass through future decades. I'll protect the knowledge of how to use them. And when asked, both the chest and I will share all our treasures. PWM

PHOTO BY THE AUTHOR

POPULAR WOODWORKING MAGAZINE

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Safety Note

Safety is your responsibility. Manufacturers place safety devices on their equipment for a reason. In many photos you see in *Popular Woodworking Magazine*, these have been removed to provide clarity. In some cases we'll use an awkward body position so you can better see what's being demonstrated. Don't copy us. Think about each procedure you're going to perform beforehand.

Highly Recommended

If you do any fretwork or remove dovetail waste with a fretsaw, then you know that finding a good one can be tough.

Knew Concepts, which has long made fretsaws for metal workers, now makes versions of its saws for wood. These saws weigh almost nothing (thanks to their aluminum or titanium frames) yet can tension a blade to a very high level.

The saws ($95 to $195) also feature a way to easily rotate the blade and to add or release the tension quickly. All in all, the Knew saws are the Lexus of the fretsaw world. Visit knewconcepts.com or call 831-234-4652.

— Christopher Schwarz

PHOTO BY THE AUTHOR

Hand-cut Stopped Dados

I need advice on cutting stopped grooves and rabbets, especially those stopped on both ends. I have two projects on the drawing board.

The first is a wall cabinet with Greene & Greene finger joints, where I want to enclose the back in rabbets that do not show. This project also requires shelf dados that are stopped at the front end.

The second project is a box with a frame-and-panel top; through grooves for the panel are fine on the rails but on the stiles they run between the mortises, which begin 1/4" from each end so the joint is not visible from the outside.

All of the above are easy to do with a router but I would like to be able to do all of them by hand. I think I have the dado figured out, but need some advice for cutting the grooves and rabbets. How would you suggest I proceed?

William Smith
Montreal, Quebec

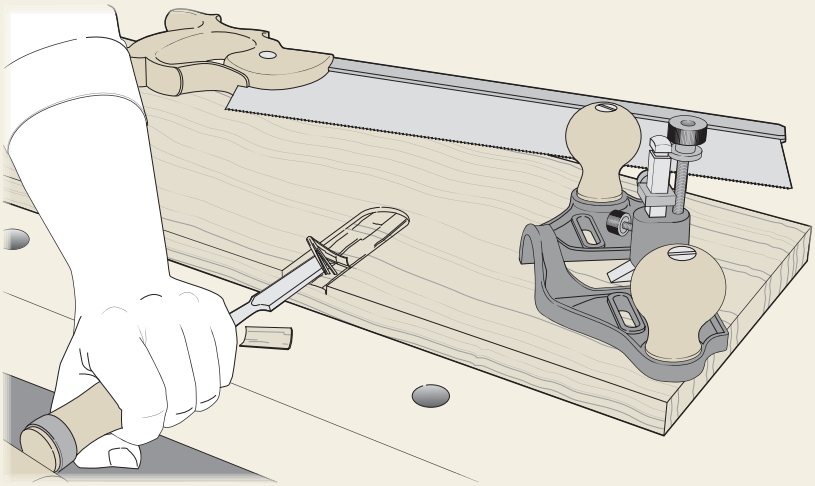
William,

Stopped grooves and stopped rabbets are quite rare in traditional work. Consider redesigning the joinery of your projects instead. Backs can show at the top and bottom of a wall cabinet. Use haunched tenons to fill the gap left by a through-groove.

Stopped dados are usually cut like this:

Bore a shallow hole at the terminus that is the same diameter as the dado's width. Use a sash saw to define the walls of the dado. Chisel out most of the waste. Clean the bottom of the dado with a router plane. Chisel the two round corners square.

Christopher Schwarz, editor



Surfacing Glued-up Panels

I have access to a lot of red oak that I use to do most of my woodworking. I've been having an issue with my smoothing plane as I work with glued-up panels. It seems like red oak planes better in one direction than the other.

I always glue up boards with the grain running in a way that looks the best – but I seem to have trouble when I am planing them if the "best planing direction" of each board is different. If I am running my smoothing plane down one board and I cross the glue line (which is hard to see if done right) by even 1/4", I will get tearing in the other board. The tearing on sections of red oak can be as bad as .020", and it happens so fast that I cannot control it.

I really do believe my plane setup is good – very tight mouth, flat sole and incredibly sharp iron. I am worried that the 45° bed angle on my old Bailey No. 4 may be a small problem, but I was hoping that you would let me know if buying a high angle (62° or higher) plane would solve my problem completely or just help a little?

Would you suggest planing the boards before I glue up to find the best planing direction and line them up to give me the best workability regardless of wood grain? Any other tips you can offer?

Dan Sutterlin
Painesville, Ohio

Dan,

Planing glued-up panels can be tricky. Like you said, you want the panel to look its best, regardless of the grain direction. What I try to do, and I succeed most of the time, is to fuss with the arrangement of the boards until the panel both looks good and has all the grain running in the same direction. This requires me to pick through more wood, but it pays off when planing.

Sometimes, however, the wood you have forces you into a situation where you have reversing grain in your panel. Here, in order, are the solutions I use.

1. Sharpen the iron of a higher pitch plane. Somewhere up to 62° will help eliminate some (but not all) tearing.

2. If the tearing is localized and shallow, I remove it with a card scraper.

3. If the tearing is significant, I'll use a scraper plane, such as the Stanley No. 80, to remove the tearing.

4. And if those solutions fail me (and they almost never do) then I break out the sandpaper.

CONTINUED ON PAGE 12

ILLUSTRATIONS BY MARY JANE FAVORITE

CONTINUED FROM PAGE 10

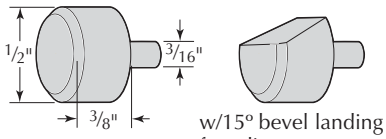
While you could plane your boards before you assemble your panel, it is almost impossible to get them perfectly flush. Panels that show will almost always need to be dressed after assembly.

Christopher Schwarz, editor

Jack Plane Blade Mechanism

I like the design and the appearance of John Wilson's jack plane in the April 2011 issue (#189). But one question I have is, how does the 10-32 rod work? Is there a hole drilled in the plane blade at a 75° angle, or is there a piece attached to the blade? The article calls this area a "rest button." I don't know what that is. Everything looks wonderful; I just don't understand how the blade mechanism operates.

Sam Gwin
via e-mail



Sam,

The term "rest button" comes from the mill-supply trade; it was new to me as well. It is a metal stud, or short dowel, ½" in diameter with a 3/16" stem that allows it to be attached to the blade. If you look at the picture of the blade being heated for hardening (page 49), you will see the rest button in place.

The one adaptation made for the jack plane is to grind a 15° surface on which the adjustment rod lands. See the drawing (on page 52 in the story) for details. The rest button was left white by the drawing's illustrator, and the stem is indicated by two lines through the blade.

John Wilson, contributor

Sawcut Cleanup on Inside Surface of Roubo Bookstand

I just got to watch the video you made for the Roubo bookstand and wow. It really makes me want to try to make one. I have one question: How do you clean up the inside after you cut it apart? Or do you? Do you just leave it rough?

Kelly Anderson
Joplin, Missouri

Kelly,

Here's how I cleaned up the inside of the bookstand: I first flattened the inside by working across the grain with a block plane, being careful to not splinter the outfeed edge.

Then I dressed the surfaces using a card scraper. This allowed me to get right up against the hinge. There was a little bit of junk at the hinge corner, and I cleaned that up with a chisel.

Christopher Schwarz, editor

"Write without pay until somebody offers to pay you. If nobody offers within three years, sawing wood is what you were intended for."

— Mark Twain (1835 - 1910)
nom de plume of American writer and humorist Samuel Clemens

Sanding Woes

I made a rocking chair out of cherry for our daughter-in-law who is expecting a baby. The chair has no stain on it and I am using General Finishes semi-gloss as the finish. I sanded the project to #400 grit (and in some cases #600 grit) before finishing. I sanded the finish between coats with #400-grit wet/dry sandpaper.

Now, in raking light I see very small sanding scratches on the arms. I presume they are in the finish because of the care I took in sanding before finishing. Is there something I'm doing wrong or is this due to the semi-gloss finish?

Ted Rea
Leavenworth, Kansas

Ted,

There could be a couple causes. The first to look at is the sanding. When sanding, even through #400 and #600 grit, it's important to step through grits. If you began sanding at #120 grit then jumped to #220 grit, there is a possibility that you have scratches from the #120-grit sanding still in the surface. One reason I wet my projects before my final sanding is complete is to raise the grain and to highlight any potential problems – in this case the scratches.

If scratches in the surface are not the problem, then you have to look at the finish itself. Gloss and semi-gloss finish tend to show scratches, especially in raking light – it could be something as slight as a scrape from a ring on one's hand. This is one reason why I use a dull-rubbed finish – with less gloss, minor scratched aren't as noticeable.

If you wipe the arm with #0000 steel wool or a man-made abrasive equivalent, I expect the scratches would disappear.

Glen D. Huey, senior editor

'On the Level' is On Target

I liked Christopher Schwarz's editors' column in April 2011 issue (#189) about furniture stores.

Seems most furniture these days is designed for "serial decorators" – every 5 to 7 years, they start over. PWM

Keith Mealy
By Hammer and Hand, LLC

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EDITED BY KARI HULTMAN

THE WINNER:

Slide-out Tool Storage

I needed an easy-access storage unit that wouldn't take up a lot of room but would hold a large number of tools. My solution was a wall-hung tool cabinet with slide-out vertical pegboard drawers.

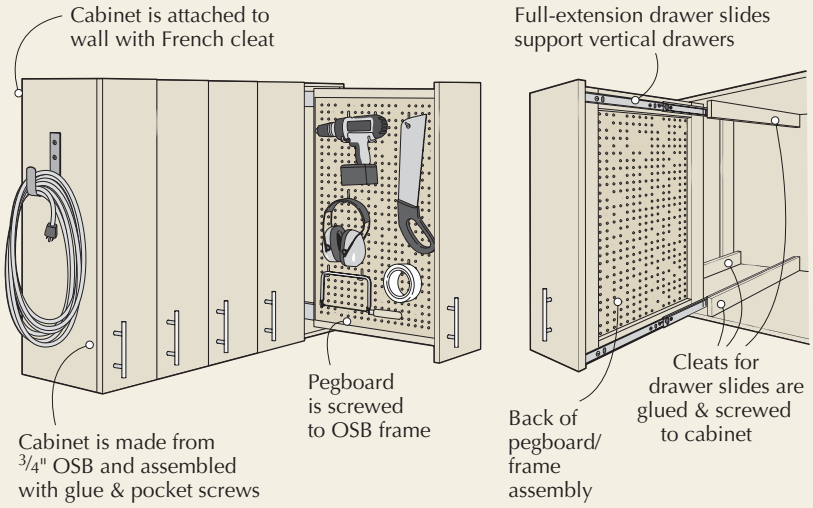
I used 2' x 4' sheets of pegboard and a sheet of 3/4" oriented strand board (OSB). The outside dimensions of the cabinet, minus the face-mounted doors, is 28" wide x 28" high x 17" deep. It's assembled with glue and pocket screws, and hangs on a French cleat.

The five drawers are 16" deep, framed with 2"-wide pieces of OSB and attached to Lee Valley 16" full-extension slides rated at 100 pounds. (#02K30.16). The pegboard tool hooks are from a local hardware store.

Metal garden hose hooks are screwed to both sides of the cabinet, and hold extension cords and vacuum hoses.

Dyami Plotke
Islip, New York

Editor's note: See popularwoodworking.com/aug11 for a link to images of the construction process.



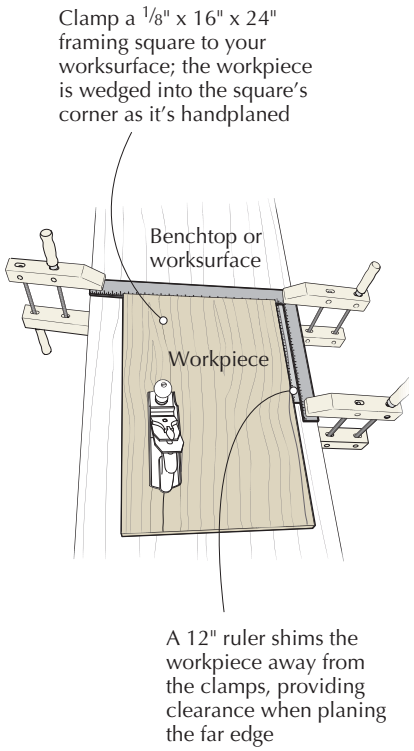
Framing Square Planing Stop

I'm in the process of building a Roubo-style workbench that does not yet have vises, dog holes or legs; it's just a flat worksurface on sawhorses. I was working on a cherry side table top and needed to find a way to keep it stationary on my benchtop while I handplaned it.

I noticed my 1/8"-thick, 16" x 24" framing square hanging on the wall and thought I'd give it a try. I attached it to my benchtop with clamps on both ends of the square and one on its vertex. Bingo! This is a perfect workholding device to use while flattening and smoothing a large board.

The force of handplaning keeps the board wedged into the corner of the framing square. A 12" steel ruler can be used to shim the workpiece away from the clamps, providing clearance for planing the far edge. Now, I can tell my wife that I've actually used my new bench for something.

Colin Hayward
Newton, Massachusetts



Sandpaper 'Hold-down'

Securing thin or small boards for handplaning can be a problem. My solution is to join two sheets of #150-grit sandpaper back-to-back with spray adhesive, glue or double-sided tape. Lay the joined sandpaper on your workbench and place your workpiece on top. As you handplane the board, the sandpaper sticks firmly to your bench and the workpiece sticks firmly to the sandpaper.

In order for this method to work well, I use very sharp plane blades, take very thin shavings and apply strong downward pressure. The board does not move at all. If your workbench surface is slick and the sandpaper slips, you can adhere sandpaper to a board, then clamp the board to your workbench.

Alejandro Balbis
Longueuil, Québec

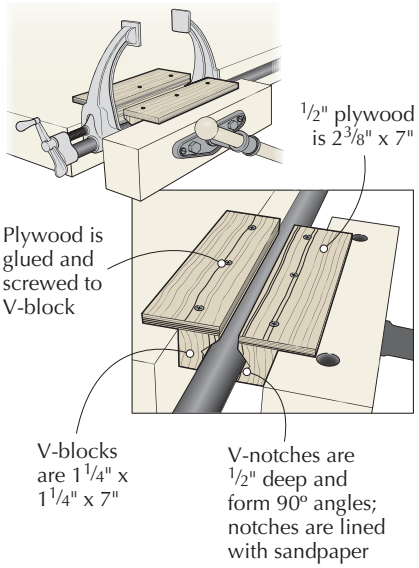
ILLUSTRATIONS BY MARY JANE FAVORITE

Deep-reach Clamp Vise

I made a pair of identical V-blocks to secure a deep-reach clamp in my bench vise. I use this setup for shaping cabriole legs and other in-the-round projects. The thickness of the V-blocks provides clearance between the movable parts of the clamp and the vise as I'm clamping a workpiece in position.

Two plywood boards are glued and screwed to the V-blocks. The boards keep the V-blocks suspended so they don't fall through the vise before it's tightened. This enables me to adjust the clamping pressure on my workpiece while the V-blocks loosely support the clamp.

For more gripping power, line the V-blocks with sandpaper. My deep-reach clamp is 36" long. Because my jig is 7" long and the clamp arms extend over that space, I can clamp something as short as 5" or 6" (such as chisel handles) or as long as approximately 32". Shop Fox makes 7" deep-reach pipe clamps for 3/4" pipe (but regular pipe clamps will also work).



Bill Anderson
Chapel Hill, North Carolina

Beveling Dowels With a Pencil Sharpener

Sometimes dowel ends protrude as part of the design in a finished piece. Because of this, they need to look good. I use a multi-hole pencil sharpener to create smooth, consistent bevels on the visible ends. It's easier and faster than using a knife, chisel or sandpaper, and the result is more uniform.

This method also works well when using dowels to peg mortise-and-tenon joints; the bevel makes it easier for the dowel to slide into the hole. The number of holes in the pencil sharpener not only accommodates a wider range of dowel diameters, it provides optional bevel angles. By sharpening a small-diameter dowel in a larger hole, the bevel angle is less steep.

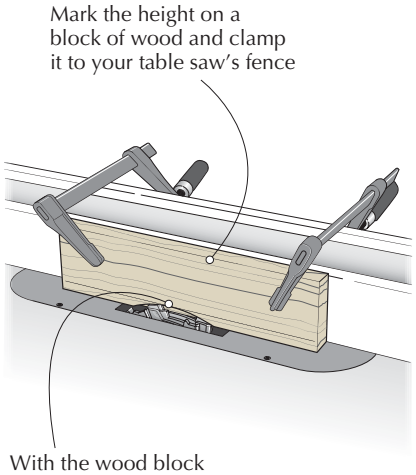
Jonathan Vigier
Bassendean, Western Australia

A Better Dado Setup

It can be difficult to determine the apex of a dado stack's revolution with a combination square or height gauge. Here's the fail-safe method I use: Mark a line at your desired height along the length of a scrap block and clamp it to your table saw's fence.

Lower the blades beneath the table's surface and slide the fence toward the blade until the scrap block will barely touch the inside blade as it's raised. Turn the saw on and raise the stack slowly until it just reaches your marked line. Turn off the saw, remove the block, set your fence to the correct position and start cutting.

Daniel Freeman
Dardanelle, Arkansas



Get a Handle on Sheet Goods

I use a lot of pre-finished plywood and melamine sheet goods in casework. In order to move the heavy sheets around easily, I use dual suction cup lifters from Harbor Freight Tools (#46134). However, they do not work with unfinished plywood.

Make sure the surface of your sheet goods are sawdust-free, then position the suction cups anywhere on the sheet for maximum comfort and grip. PWM

Charlie Riccardella
Springboro, Ohio

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VIDEO: *Tricks-in-Action shows you a free video of one of this issue's tricks in use in our shop. Watch "A Better Dado Setup"—as well as a few of our other favorites.*

WEB SITE: *Visit the new Tricks of the Trade page online.*

BLOG: *Tricks editor Kari Hultman writes about woodworking on her blog, The Village Carpenter.*

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Each issue we publish useful woodworking tips from our readers. Next issue's winner receives a $250 gift certificate from Lee Valley Tools, good for any item in the catalog or on the web site (leevalley.com). (The tools pictured below are for illustration only, and are not part of the prize.)

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BY THE EDITORS

Festool CXS Drill-driver

A mighty small and mighty compact drill.

According to Apple's Steven Jobs, "Innovation distinguishes between a leader and a follower." If you ask me, he could have been talking about Festool, which is, in my opinion, the most innovative tool company out there.

Take a look at the company's new compact drill-driver. It's lightweight at just less than two pounds, and with the possible chuck changes, it is effectively three drills in one. It could be your everyday drill around the shop.

Included with the drill is a keyless chuck, Festool's Centrotec chuck, a bit holder and bit, two batteries and a charger, all packed in a T-Loc systainer.

For an additional $50 – money well spent in my opinion – it's beneficial to grab the right-angle chuck. With it, CXS covers most drill-driver uses.

Smooth-shank drill bits are handled with the keyless chuck. The chuck grabs bits as small as 1/32" with a maximum opening of 5/16", which is smaller than the 3/8" found on most drills.

CXS Compact Cordless Drill

Festool ▪ festoolusa.com or 888-337-8600

Street price ▪ **CXS Plus,** $225
▪ **CXS Set** $275

BLOG: *Read about new tools from Festool at popularwoodworking.com/aug11.*

Prices correct at time of publication.

Sitting pretty. *Festool's CXS features a slim body, and a comfortable and balanced grip. It's ergonomically designed to feel like an extension of your hand. And it sits upright on your workbench.*

Festool's quick-release Centrotec chuck makes changes between drill bits, driver bits and accessories quick and easy. And for long-term use, the Centrotec cuts nearly a half-pound from the total tool weight versus the keyless chuck. That adds up throughout the day.

A CXS with a right-angle head may be the best setup for this tool. Essentially, this arrangement turns the drill-driver into a tool for super-tight work areas. Properly arranged, you can drive screws in openings as tight as 3". Try that with an 18-volt behemoth.

The 10.8-volt CXS develops 0/400 rpm in first gear and 0/1,200 rpm in second. There is also a 12-position clutch for precise control, and a separate drill setting position. It takes only about 30 minutes to fully charge the (1.3 Ah) lithium-ion batteries. Unless you're going at it full tilt, the charge time is more than enough to keep you running.

Change it, arrange it. *Other chucks snap on the right-angle chuck for expanded shop use.*

The CXS is small, lightweight and easy to use. There is plenty of power and torque, and the ability to convert this drill for work in super-tight spaces makes this tool a keeper.

— Glen D. Huey

CONTINUED ON PAGE 18

PHOTOS BY AL PARRISH

CONTINUED FROM PAGE 16

Lie-Nielsen Shoot Board Plane

The Stanley No. 51 chute-board plane is prized by both collectors and by users who live and die by their shooting boards.

And that, right there, is the problem. Many of these vintage planes are in the hands of collectors and serious users – and not a whole lot are left over.

Lie-Nielsen has stepped in to change the equation. The Lie-Nielsen No. 51 is far more robust and simpler than the Stanley original, which makes it the clear choice for users.

Lie-Nielsen No. 51

Lie-Nielsen ▪ lie-nielsen.com or 800-327-2520

Street price ▪ $500

VIDEO: *See a video of the tool in action at popularwoodworking.com/aug11.*

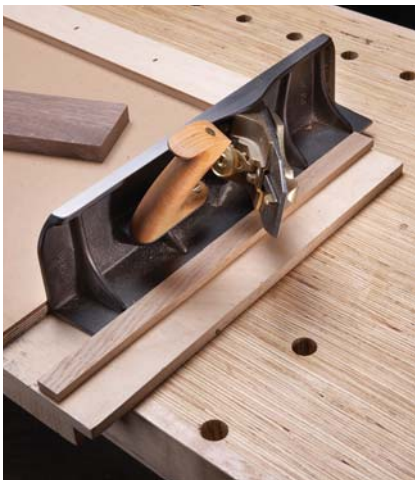
Price correct at time of publication.

But it begs the question: Do you really need this tool? The No. 51 is designed to be used on a shooting board only – it doesn't have any other uses. So it is an expensive single-purpose instrument. But when it's riding on a shooting board, it outclasses every other tool I've used on a shooting board. So its charms are difficult to resist.

The tool looks like an enormous piece of angle iron, which is one of its virtues. The long and straight edge of the plane rubs against a fence on your shooting board, which prevents the tool from drifting out of the cut.

And if the tool won't drift, then your cut will be square.

Also, the blade in the No. 51 is skewed, which makes the tool noticeably easier to push through tough end grain. This allows you to take a bigger bite and speeds your work. It also leaves a nicer finish, in my experience.



Most woodworkers will be content to shoot with their jack or jointer planes. But woe be unto them if they try the No. 51 at a woodworking show. Then they, like me, will be doomed to buy it.

— Christopher Schwarz

Jet's New Spin on Dust Collectors

For the first time in years, possibly since the introduction of home shop dust collection, a company has made improvements beyond filter bags. Vortex Cone Dust Collectors from Jet are better.

What makes the Vortex line different from other single-stage collectors – including Jet's earlier machines – is a cone-shaped piece of metal that hangs in the housing just below center.

As debris is pushed through the steel impellers and housing section, the airstream is forced into the lower bag. Large particles drop out as they do in most collectors, and the airstream creates a violent swirl that normally pushes finer particles into the top bag or canister, your filter. That clogs the filter, reduces air flow and stalls performance.

Jet's cone reduces that vortex created by the airflow. The finer dust knocks against the cone, then falls into the collection bag to keep the filter cleaner.

The cone also improves the packing density of the collector bag – lower air movement allows chips to pack tighter for less frequent bag changes.

We tested the DC-1100VX-CK both with and without the cone in place. A smaller debris vortex and less dust in the upper canister was evident with the cone positioned.

Jet's Vortex design is available in three 1,100 cubic feet per minute (CFM) and four 1,200 CFM models. PWM

— GH

Vortex Cone Dust Collector

Company ▪ jetwilton.com or 888-804-7129

Street price ▪ $650

BLOG: *Read more on Jet's Vortex collector at popularwoodworking.com/aug11.*

Price correct at time of publication.

BY GEORGE R. WALKER

Color Value

Contrast can be used to tell a visual tale.

A study in contrast. *The ebonized legs on this half-round table contrast beautifully with the mahogany top and figured maple panels.*

Every season writes its own story in color. Winter has its stark contrast between snow-covered fields and crisp cobalt skies. Spring gushes neon green under foot while the treetops sprout pastel pinks and reds from the end of every twig. Summer is a whole box of crayons spilled out before us. But autumn, that's when nature paints with abandonment. No holding back. Reds are deeper, and golds and yellows have a richness that took the entire year to create.

Color as a design element can create a connection and add life to our designs. Cabinet woods, in particular, have a universal appeal in their ability to add richness and warmth to our interior spaces. Traditional artisans made use of a wide range of color options, from bold painted surfaces in every imaginable hue, to spirit varnishes and dyes that emphasized warmth and richness, to the simplicity of raw scrubbed pine. (My own preference is more toward finishes that enhance the natural color of wood.)

In spite of limitless color options available today, it's still appealing to take advantage of the inherent beauty of wood to warm up a room. Whole books have been written about color, but the question I hear most has to do with pairing different woods together. Why do some woods, such as cherry and maple, seem to pair well and complement one another?

Earth Tones & Color Value

With few exceptions, wood in its natural state occupies a narrow color palette. A narrow palette just means the hue or color is confined to a limited range of browns or earth tones. Cherry and mahogany are browns that veer toward red; other woods, such as oak and maple, are browns that tend to be more yellow or amber.

At first blush you might think that this poses a limitation; in reality it's just the opposite. It's quite common for painters to confine themselves to a narrow color palette yet still create stunning works of art. What it does mean is that in practice, our color decisions often are between different hues of brown, but more importantly different shades or values of brown.

Autumnal range. *Deep rich colors mark the onset of autumn.*

Relative values. *Running the color value gamut from black to white are (top to bottom) ebony, walnut, cherry, maple and holly, underscored by dark, rich mahogany.*

LEAD PHOTO BY DAN MOSHEIM; AUTUMN & VALUES PHOTOS BY THE AUTHOR

Value is a term used to describe how any color can be gradually darkened until it becomes black or lightened until it washes out to white. This can be seen in the picture to the immediate right, where we have the black and white value extremes of ebony and holly flanking a range of mid values from the dark walnut, lighter cherry, and on to amber maple. It's important to understand that pairing up colors close to each other in value will be very different than pairing values that are far apart.

Masterful Application

So it goes with wood pairings. Cherry and maple often pair nicely because they are far enough apart to contrast but close enough to complement. Walnut and maple are farther apart in value and require more care to create a successful marriage. The half-round table pictured in the opening photo presents a color scheme at the darker end of the value range, starting with the ebonized legs. The deep, rich mahogany top is paired with curly maple veneers, but dyes were employed to pull the maple in closer in value toward the mahogany.

Contrast that with the small end table shown at right where the value range is tipped in reverse, using lighter maple legs darkened to a slight amber tone, paired with the darker top and drawer panel. Both are good examples of contrast in color value between dark and light.

But wait –hold up! What about that black and white stringing paired together on the drawer front? What does that say visually, pairing extremes together from each end of the color value range?

Speak softly. *Even quiet contrast adds visual interest to a piece.*

A matter of scale. *Decorative bandings often can handle vivid color contrasts because of scale.*

Small scale. *This band of inlay pairs black and white together but works because of the small scale.*

No Right or Wrong Answers

There's no right or wrong here. It's about understanding the results you are after. Making extreme jumps in color value, such as bright white to deep black, does creates a bolder, sometimes jarring visual statement. For that reason, when holly and ebony are paired together in stringing or inlay, the scale is reduced to a narrow accent strip. If this banding with its bold contrast of color value were scaled larger, the effect would be noticeably different.

If there are some generalities it would be that when pairing different woods, they tend to complement if they are far enough apart to contrast, yet not so far that they compete for attention. Having said that, there are many examples of great cabinetmakers who exploited bold color contrasts masterfully, most notably John and Thomas Seymour in early 19th-century Boston.

And I'm sure there are many individuals today who love to color outside the lines and can't help but experiment. I look forward to seeing what new rainbow combinations you come up with. PWM

George is the author of the DVDs "Unlocking the Secrets of Traditional Design" and "Unlocking the Secrets of Design: Moldings" both from Lie-Nielsen Toolworks (lie-nielsen.com).

Switched up. *Light-colored legs with a darker top and shelf (that match the central area of the drawer fronts) helps the contrast between the different parts to jump out at the viewer.*

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About This Column

If you have a thirst to hone your creative skills, Design Matters dives into the basics of proportions, forms, contrast and composition to give you the skill to tackle furniture design challenges with confidence.

BANDINGS PHOTO BY DAN MOSHEIM; SUBTLE COLOR, CONTRAST & DRAWER INLAY DETAIL PHOTOS COURTESY LIE-NIELSEN TOOLWORKS

BY DEAN JANSA

The Naked Apprentice

To understand, you must do.

Just because. *Shop practices, such as the way glue blocks were installed behind bracket feet, can help us identify the maker. Why did different shops have different practices? Because the Master said so.*

Working by hand is a viable way for hobbyists to create beautiful furniture, yet it is often seen as slow, odd and antiquated. I choose to work by hand because I enjoy the process and the adventure of learning.

Learning traditional hand-tool work by reading books, blogs and message boards is a challenge. The difficulty lies in having both too little and too much information. Information without context, or viewed in the wrong context, is not helpful and may even be misleading. Art historians rely on historical context to understand works of art, and learning traditional hand-tool skills is no different. Books, blogs and message boards need to be placed within a context and read with a wary eye and thoughtful mind.

Writers are faced with a difficult task: to communicate using only words what is best understood by seeing and doing. This is like describing how an apple tastes; until you bite into an apple, no amount of words will convey its taste. Writers use precise quantitative descriptions, with the risk the reader will treat these descriptions as absolutes. Grinding angles, honing angles, plane blade camber radii and dovetail slopes have all been described using exact numbers. Joseph Moxon (in the 1678 book "Mechanick Exercises") describes shavings as thick as an old groat, a descriptive term; this has led to people measuring their shavings and old groats! These numbers, without context, are not meaningful; they simply attempt to transfer an idea.

Leonard Lee did the best job of describing honing angles on chisels when he wrote, "Keep the included angle (bevel angle) of the chisel as low as possible consistent with edge retention." I use similar terms when

No micrometer needed. *The period apprentice would be exposed daily to the tools of his trade, including the fore, try and smooth planes. He would have no need to measure the thickness of a shaving; he knew what they should look like.*

PHOTOS BY THE AUTHOR

I describe shaving thickness: "Take the thickest possible shaving consistent with resultant surface quality and expended effort."

Too Much, Yet Not Enough

There is much written about singular slices of shop practice, and very little of a codified whole. Take bench planes as an example.

There is far more written about the plane I use the least than the planes I use the most.

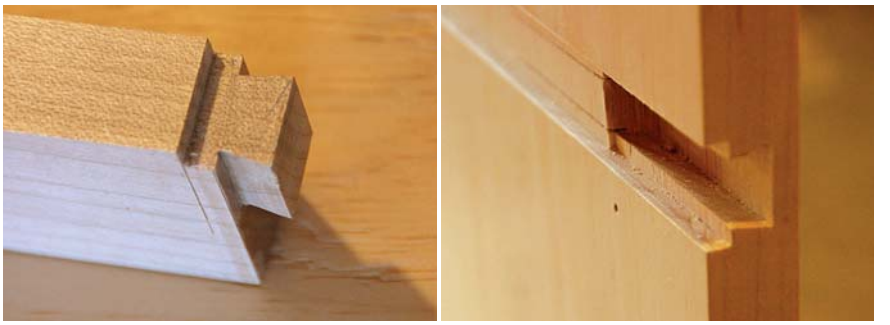
"The Smoothing plane … must have its iron set very fine, because its office is to smoothen the work from those irregularities the fore-plane made," wrote Joseph Moxon, in "Mechanick Exercises."

Contrast those 25 words to the gallons of ink spilled about the smoothing plane in modern woodworking literature. In the modern context, the smoothing plane is used in shops that use power tools to do stock prep; it may be the user's only bench plane. But in a hand-shop context, by the time you get to the smoothing plane you need no more information than Moxon offers. The use, tuning and setting are obvious following the work you've done with the fore plane and try plane.

Each shop has its own set of shop practices. There isn't necessarily a right and wrong, rather just different ways of doing each thing. For example, when building a case piece with drawers, one task is to build and install drawer blades (horizontal case dividers, sometimes called drawer dividers). Looking at period pieces reveals many construction methods. Which should you choose? Why?

A recent blog post by the Hay Shop (you'll find a link to it on the online extras page) states: "Sometimes the answer to 'Why?' is simply, 'Because.'" Because that was the way of the shop. There isn't a right or wrong answer. Apprentices, immersed in the practices of the working shop, would not have had to choose from several methods; they would have been shown the way. These shop practices allow us to identify where a piece was built, and sometimes even the exact shop it came from.

Shop practices provide a context for learning. Watch someone, and really observe. The sights and sounds in a working shop teach more than any book. The sound of a sharp plane, the smooth rhythm of a good sawyer and even the sound of a worker chopping a mortise is easy to hear and to see, but difficult to describe in words alone.



Drawer blades. *A dovetail fits neatly in a dovetail socket to divide one drawer from the next. But there are many methods of achieving this joint using hand tools. Do as your "master" teaches you.*

Alone in your shop the best you can do is guess how hard to strike a mortise chisel. Once you hear a sharp plane and its "whisk-whisk" song you'll immediately know if your planes are sharp. There is no need to measure a shaving once you have seen the shavings from the journeyman's fore, try and smoothing planes.

"A dog with no master learns few tricks."

– Silence Dogood
pseudonym of Benjamin Franklin

Learn of the Skillful

There is little opportunity to observe these things today, outside of Colonial Williamsburg and a handful of other living-history shops.

The hand-tool Olympics seen at the Woodworking in America conferences offer a taste of hands-on training, but it is largely without a larger shop practice context. Dovetail races are not representative of shop work – although they do help increase your speed.

Take advantage of any opportunity to observe skilled hand-tool craftspeople. Seek out others who work by hand. Find a local chapter of the Society of American Period Furniture Makers, investigate local woodworking clubs and guilds, and keep your eyes and ears open for any demonstrations in your area.

While you observe, try to place things in the larger context. Remember:

18th-century shop practices were driven by economics and local traditions.

Back in your shop, try to expand and unify the individual slices of information you have gathered. Explore and create your own shop practices. While exploring uncharted territories attempting to solve a piece of the puzzle, you may find yourself thinking, "There is no way they did it this way." More often than not, after further research you'll find your gut was right. And remember that the answer to "Why?" may be "Because."

The Arts & Mysteries do not exist in books, blogs or on message boards; they reveal themselves as you work. To understand, you must do. **PWM**

Dean is a member of the Society of American Period Furniture Makers and builds using hand tools only.

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BY MAG RUFFMAN

Lap Desk

Portable productivity with a nod to steampunk style.

Not so hot. *This lap desk lets your computer (and your legs) breathe.*

The glorious thing about being self-sufficient is that you can usually figure out ways to create what you need.

My latest need arose after a bad case of Burning Thighs Syndrome, a malady caused by sitting on the couch typing on a laptop computer. With my quadriceps performing as heat sinks for the laptop's toiling battery, I had the hottest legs in Canada.

I switched to writing longhand in a thick journal that never overheated. But to raise the book to a comfortable height for writing I'd have to pile up cushions on my lap, thereby creating a new thermal emergency.

My solution was this perky lap desk, a well-ventilated little unit that adjusts to serve the user's purpose and thigh thickness.

Oaken-hearted

Start by cutting your desk surface to length with a circular saw (or Japanese-style handsaw if you want perky rear deltoids). By the way, you might be tempted to use pine, but I learned the hard way that pine turns to mush around the insert nuts and the side pieces end up with hip dysplasia. Plus if you drop it on concrete, the side pieces shatter. Just sayin'.

Using a hole saw, create a grid of holes in the surface for ventilation. To accommodate a computer mouse, leave approximately one-third of the surface unviolated by the holey grid.

To make the desk surface appear thinner and more elegant, create a subtle ($1/8$") chamfer on the top and bottom edges of the desk using a block plane.

Get Jiggy With It

Next, cut out the side pieces using a jigsaw fitted with a scrolling blade. If you don't like my curvy design, sketch your own version right on the wood. Once you've jigsawed one half of the side piece, you can use the offcut to trace a symmetrical match for the other half.

Scrolling blades tend to scoff at perpendicularity so go slowly to prevent warbles and lumps in your finished side pieces. If you get them anyway, use a rasp to take out the wows. Or you can create The World's Cheapest Drum Sander by gluing sandpaper to one of the cutouts from the desktop holes, and mounting it on a bolt with lock nuts. Install the stem of the bolt in a drill press or a cordless drill and watch this small sanding cylinder erase your jigsawing sins.

Use a contour-sanding flap-wheel to quickly soften all of the edges on the side pieces. A simple sanding sponge works too if you enjoy the meditative aspects of corrective sanding.

Next, sand the desk surfaces lightly, along with the inside walls of the ventilation holes.

Holey grid. *Inexpensive hole saw kits are available at any home improvement store or hardware store.*

Pattern. *Use the offcut from the first half of your side piece to mark the matching shape on the remaining three cuts.*

OPENING PHOTO BY AL PARRISH; STEP PHOTOS BY THE AUTHOR; ILLUSTRATION BY ROBERT W. LANG

Then drill three height-adjustment holes in the side pieces using a drill bit that's just a hair bigger than the size of the post on your clamping knobs.

Black to the Future

Ebonize the pieces, if desired. Ebonizing is fun, cheap and permanent. And because the stain penetrates the wood fibers and creates a chemical reaction with tannins in the wood cells, it doesn't wear as easily as a surface stain.

Oak has a naturally high tannin content but you can accelerate and deepen the effect by pre-treating the bare wood with a concentrated mixture of boiled black tea (for a greenish-black cast), or red wine (for a blue-black tint).

Once the liquid has penetrated and is fairly dry, add a coat of ebonizing "rusty nail" stain (drop a handful of old steel nails, bolts and assorted trail mix – the rustier the better – into a jar of white vinegar. Let it fester for at least two days with the lid off). Enjoy the drama of chemistry as the wood instantly turns deep black. For a deeper hue, add a second coat of beverage followed by more ebonizing stain.

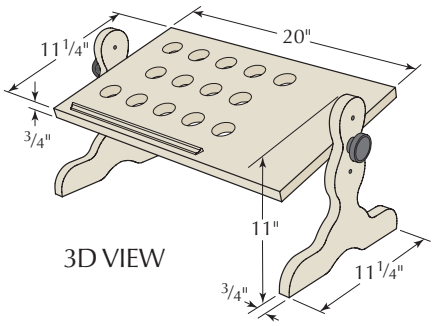
While you're ebonizing, make sure to treat a piece of oak moulding that you'll glue onto the desk surface later to act as a ledge that keeps books and computers from slipping off. Sand the moulding before staining to remove any goop or tool marks from the mill.

When it dries the oak grain will be hairy and splintery, so lightly sand all surfaces with #150-grit sandpaper.

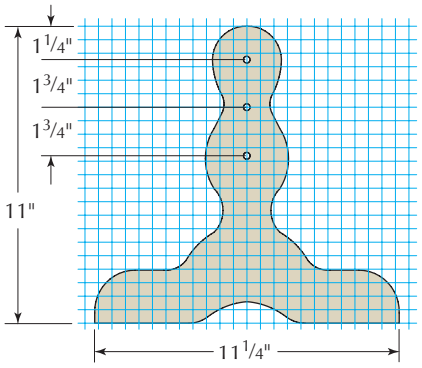
Gloss-eyed

Next, give all pieces a clear coat. (I like acrylic driveway sealer because it's crazy-indestructible.)

On the cheap. *Glue a piece of sandpaper around a hole cutout, then mount it on a bolt with lock nuts – instant drum sander!*



3D VIEW



1 grid square = 1/2"

SIDE PATTERN

The clear coat might raise the grain again, so lightly sand after the first coat dries then apply a top coat. (Acrylic driveway sealer dries a bit shiny so I rub it with #0000 steel wool after it's cured to bring down the gloss.)

Now glue and clamp the moulding ledge onto the lower edge of the desk surface. If there's any glue squeeze-out, let it set up a bit before removing it with a scraper.

Finally, drill holes for the insert nuts using a bit diameter that matches the shaft of the insert nut (not including the threads). Drilling into end grain can be a cheek-sucking adventure in steering. Practice on scrap in a vise, attempting to keep the bit plumb. When you do it for real you might want a helper eyeballing the angle of your drill bit and screaming directional cues. Or not.

Finally, use a large slot-head screwdriver to screw each insert nut into the pilot hole until it's flush with the surface. Then assemble your lap desk with the clamping knobs.

You'll want to take your new lap desk everywhere including car trips, because most passenger seats lack tray tables – critical for navigational responsibilities and assembling snacks for the driver. **PWM**

Mag is a Canadian woodworker, television producer, writer, comedian and actress. Read her (very funny) blog at toolgirl.com.

Supplies

Lee Valley
leevalley.com or 800-871-8158

1 ■ 1/4-20 insert nuts
#00M90.01, $6.90/10

2 ■ 1 3/4" clamping knobs (male)
#00M56.11, $2.30

Prices correct at time of publication.

Lap Desk

NO.	ITEM	DIMENSIONS (INCHES) T	W	L	MATERIAL
❑ 1	Top	3/4	11 1/4	20	Oak
❑ 2	Sides	3/4	11 1/4	11	Oak
❑ 1	Moulding strip	1/2	1/2	12	Oak

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Our "I Can Do That" column features projects that can be completed by any woodworker with a modest (but decent) kit of tools in less than two days of shop time, and using raw materials that are available at any home center. We offer a free online manual in PDF format that explains all the tools and shows you how to perform the basic operations in a step-by-step format. Visit ICanDoThatExtras.com to download the free manual.

Spicy Pennsylvania Box

BY GLEN D. HUEY

Behind a distinctive double-arched door are unknowns and secrets.

Holy cow! *What's behind the door is sometimes a surprise. Here the eye-catching drawer fronts are selected for striking grain, but there are other surprises hidden within. Can you see them?*

While surfing the Internet for examples of spice boxes, I stumbled upon an antique box with a distinctive door. While I'm familiar with arched-door boxes, a double-arched door, at least to my knowledge, is something not often seen.

Information beyond the basic dimensions of the original box plus a determination that the piece dated to around 1770 (establishing it as Queen Anne in period), was not to be found. I contacted a reliable source to see what could be dug up. Again, not much to go on – but I did receive information on when the box was sold at auction. The final hammer price in a 2008 Sotheby's auction was $20,000. Nice.

Unfortunately, the auction catalog included no photos of, or written information about, the interior of the box – I would have to make an educated guess as to the arrangement of small drawers behind the door. (I decided to go with a common drawer arrangement.) Also, there was no mention of secret compartments in the antique box, but spice boxes need a couple extra hiding places. It's the right thing to do.

Spice boxes have captured my attention for many years. When I discover a new box, I immediately, as plans develop in my mind, get the urge to build my version. With all the great features stuffed into this box, who could keep from going directly into the shop?

"Have patience! In time, even grass becomes milk."

— Charan Singh (1916 - 1990)
Indian mystic

Laying the Foundation

As with most spice boxes, the prominent feature on this one is the door. You could easily begin construction there and build the box, drawers and feet around it. But I think it best to begin with the box itself – it's easier to manipulate the door dimensions if need be.

The box sides, top and bottom are joined with dovetails, but because the mouldings match the top and bottom in thickness, regular dovetail joints could be seen in a finished box. In order to hide the dovetails (except when seen from above), create a 1/8" rabbet in the pin areas in both the top and bottom pieces. (Begin and end each layout with a half pin.) This step helps to square the carcase and the exposed dovetail joinery is then 5/8" – that's easily covered with 3/4" mouldings. Cut your pins in the top and bottom pieces then form the rabbet.

LEAD PHOTO BY AL PARRISH; STEP PHOTOS BY THE AUTHOR; ILLUSTRATIONS BY ROBERT W. LANG

(I made rabbets using a table saw, but a router setup would work handily.)

After mating tails are made in the case sides, lay out and mark the locations for the horizontal shelves that divide the drawer banks. Accuracy is a must, so establish the shelf locations at the front edge of one side, then transfer the marks to the second side. Working at the front ensures that any small variations are pushed toward the back.

Rout stopped shelf dados using a 1/4"-diameter bit set to cut 1/4" deep, plus a simple shop-made jig as shown in the photo below. Don't forget the two dados in the underside of the case top (use the plan to establish their locations). Before moving on, use a chisel to square the front edge of each dado.

The lock side of the case has a 3/16" rabbet to catch the door as it closes and the hinge side is rabbeted 1/8" for drawer clearance. The rabbets extend from the bottom edge of the case top to the top edge of the case bottom. Mark those points on the case sides then use a straightedge and pattern bit to cut away the waste. Finish the stopped rabbets using chisels to peel away the waste.

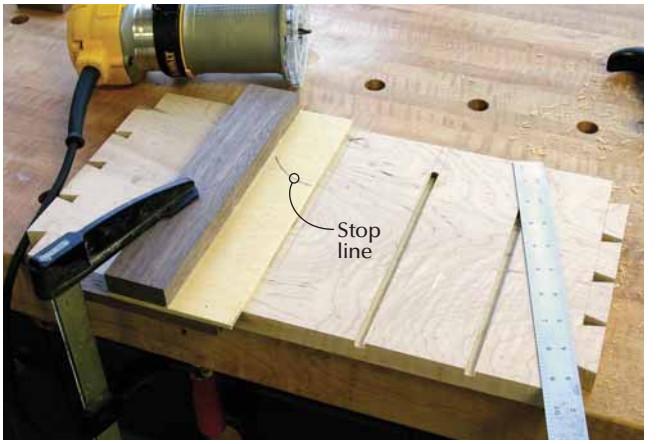
To complete the work on the case pieces, cut a 7/16" x 3/4" rabbet in each side for the backboards, then create a 1/8" x 3/4" rabbet at the back edge of the top and bottom to hide the raw edge of the backboards and to level the transition created by the dovetail step.

Money-saving Feature

Shelves and vertical dividers are made from glued-up primary and secondary woods to save lumber and keep costs down. Mill extra material so you don't have to run through the entire process a second time if necessary. Mill, assemble and bring to thickness all the material for the shelves and dividers. You want a snug fit to the routed dados, but the material also should slide in and out without binding. Prepare stock on the thick side, then sand or plane to achieve a perfect fit.

All the dados in the shelves and dividers are 1/4" wide x 1/8" deep. To keep all the front edges aligned, dado lengths need to be changed. The dados end 1/4" before the mating part's front edge. This holds true for the remaining dados, so find the new stopping point and mark it on the jig.

Lay out, mark, then cut dados in the shelves for the dividers making sure to keep the dividers square to the shelves. (Again, accuracy is key.) I find it best to lay out and cut the divider locations for one shelf, then slip the shelf into the case to locate the matching dados. (A secret compartment fits in the second

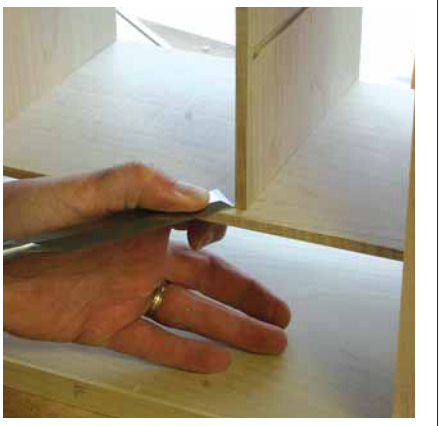


Hit the brakes. *A simple shop-made jig helps in cutting the shelf dados. Accurately hit the stopping point each time by marking where the router base stops on the jig.*

Power & hand. *Assemble the box, mark the start and stop points for the door rabbet, then clean the bulk of the waste using a router. Chisels fine-tune the work.*

New mark. *Divider dados stop 1/4" short of the shelves. Use the same jig, but adjust the stop-cut mark.*

Accuracy is a must. *Keeping dividers square to the shelf is best done using a combination square. Align the square's base to pinpoint the opposite dado.*



Double-duty. *Use the point of a chisel to scribe an exact cutline – the scribe also helps locate your handsaw for the cut.*

More for the money. *Additional cutting surface beneath a bearing is valuable real estate and required to gain the needed profile.*

Second position. *After a height change and fence adjustment, the profile is complete using a portion of the bit.*

level from the top, so there is no dado cut between the top and second shelves.)

With the dados cut in the shelves, cut the dividers to length and slip them into the appropriate dados. The four small drawers that surround the center drawer require shelves that fit between the case sides and the vertical dividers on either side of the larger drawer. To correctly locate those dados, flip the assembly onto one side and use the combination square as before. Cut and fit the small shelves in place then square the ends of all the dados.

The shelves fit tight to the squared ends of the dados, but the dividers are notched at the front edge to slip over the dado and align with the shelf fronts. Slip the divider into position then mark the exact cut. Trim the notches with a handsaw then test the fit.

The Secret's Out

A single divider that is part of the secret compartment divides the second row. Just 3/4" in from the back edge of the divider sits the false back – what you see when the drawers are pulled from the case. The two are joined with an egg-crate joint, so fit that joint first in case it takes a couple shots to get things right. The ends of the secret compartment are rabbeted to slip into 1/8" dados cut in the false back and secret back. Those ends also rest on the secret compartment's bottom that is sandwiched between the backs. To solidify the assembly, add a couple tiny glue blocks inside the compartment where the divider meets the two backs.

One Bit, Two Steps Profile

The upper and lower mouldings are identical. There is no bit profile that duplicates the moulding, but if you pull the bearing from a classical router bit you can maximize the bit's cut to complete the profile in two steps if you reposition the fence and adjust the bit height. Work on wide stock then rip the final moulding to width.

Begin by milling your stock to thickness. Chuck the bit into a router table, then remove the bearing. Position the fence to use the entire cutting surface of the router bit as shown in the photo above left. Don't worry about any burning that comes as the material rubs the non-cutting edge of the bit because it's removed in the next step. Run this cut on all your moulding stock. It's a good idea to run extra moulding because the exact settings are difficult to duplicate if you should make a mistake along the way.

To complete the mouldings, raise the bit and reposition the fence so the roundover part of the bit cuts just at the end of the cove's radius from the first pass, as shown to the left. Rip the moulding at 3/4".

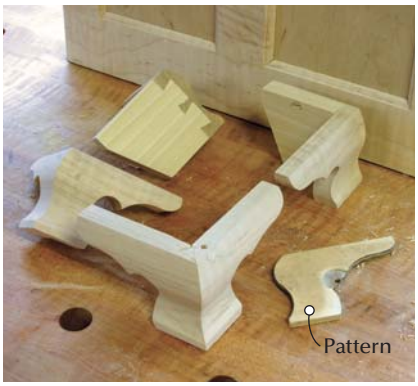
Adding mouldings to the box is simple, but before getting to that, sand the dovetailed area of the box to #180 grit. (Once you attach the mouldings, you won't be able to get into that area again.) Where the mouldings meet at the front, the ends are mitered. Cuts at the back are square. The front piece is glued and affixed to the box with 23-gauge pins. The sides are attached using glue for the first 3" then pinned – four pins over the entire length. To keep glue squeeze-out at bay, make a 1/16"-deep table saw cut along the back of the moulding close to the top edge. Excess glue is captured in the relief cut.

On the level. *To keep mouldings aligned, work with the box and mouldings placed directly on the bench. Remember: Mouldings attach to the box, not to the bench.*

Band-sawn Feet

Due to limited cutting height at my band saw – I have yet to install a riser block – I learned to make ogee bracket feet using a table saw. However, with feet the size needed for this project, the band saw is the perfect machine to use.

The spice box uses two pair of profiled feet joined with through-splines at each front corner, and at each back corner you need a rear foot that's dovetailed into an ogee bracket foot. These



Mitered or dovetailed. *Spice box feet begin with a good pattern. Leave a portion of the spur hole intact so you can easily define the exact drill location on each foot.*

assemblies are attached directly to the bottom moulding (rear feet sit fully under the case bottom). Glue blocks attach behind the feet and under the corner of the case to carry the load.

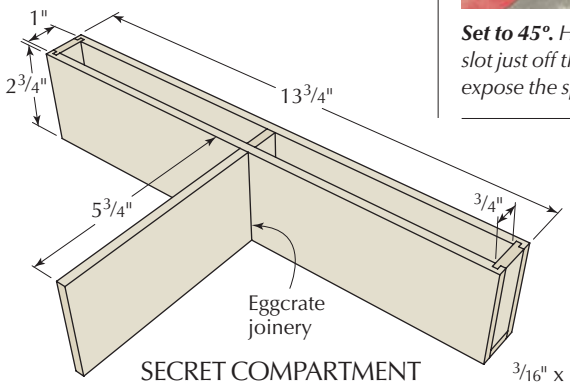
Step one is to develop a pattern. You can use the foot provided in the plans or create your own design, but you should make a pattern on plywood or hardboard to be used multiple times.

Next, prepare your foot stock. Set aside the pieces for the rear feet, then with your saw blade tipped to 45°, miter the ends of the front feet pieces. (You could easily use a miter saw for this step, but to form a spline slot it's best to use your table saw.) Adjust your setup so the angled blade is cutting into the miter cut on the stock as shown below, then cut the slots.

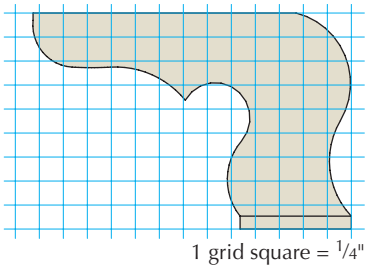
Transfer the pattern onto the stock holding tight to the mitered ends. Mark the centerpoint of the hole used to create the spur, then drill the 3/4"-diameter hole in all six foot patterns. Cut the remaining pattern lines at the band saw, then smooth your cut edges. (I used a spindle sander.)

Set to 45°. *Hold the 1/8"-wide x 1/4"-deep slot just off the back of the stock or you could expose the spline as you profile the feet.*

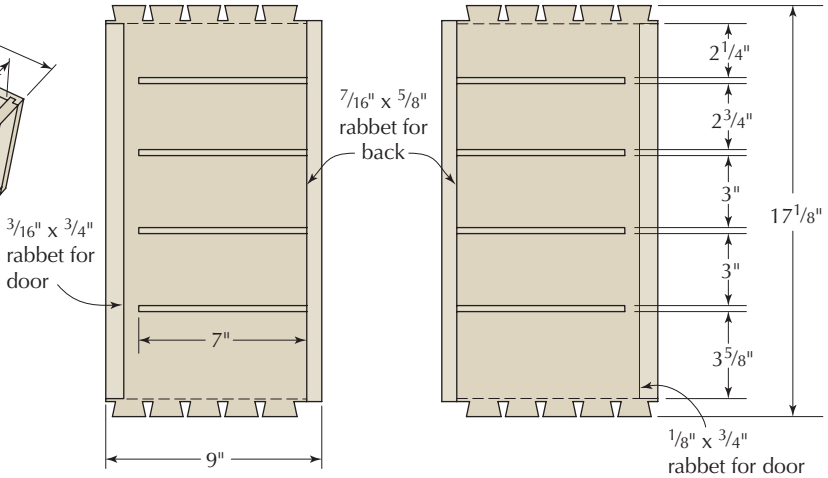
Stay connected. *It's best to work on the feet while they're still in pairs. Separation comes at a band saw.*



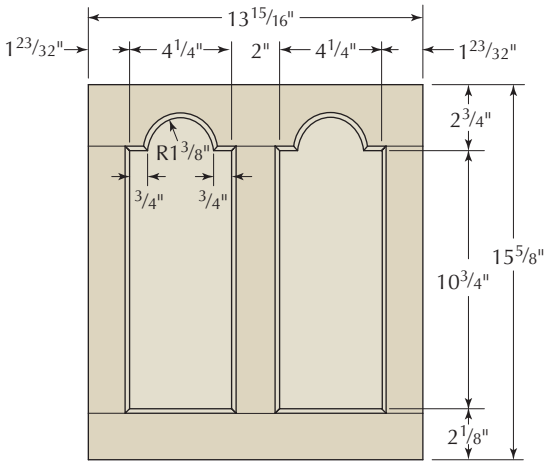
SECRET COMPARTMENT



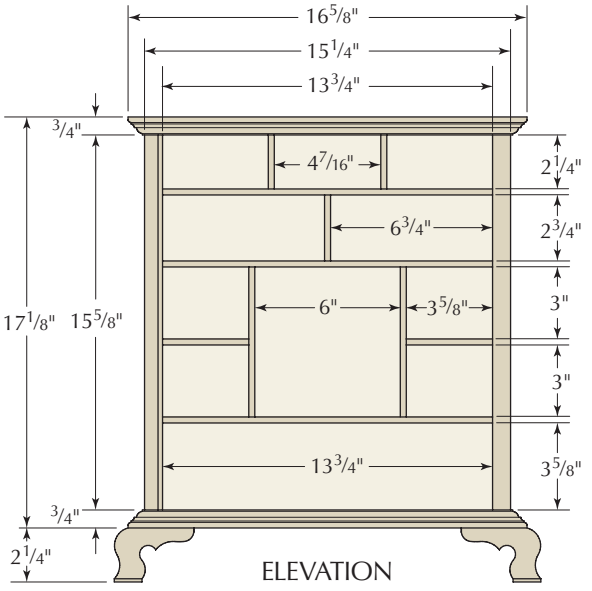
FOOT PATTERN



SIDE LAYOUT



DOOR LAYOUT



ELEVATION

Create a spline to match your slot – this is a great place to use small plywood cutoffs – then glue and assemble the front pairs. A couple spring clamps hold things in place as the glue dries.

The rear feet are joined with dovetails. Cut the pins in the ogee feet and the tails in the secondary feet. Make the joinery loose or you'll damage the feet as you drive the tail board home. When your pins and tails are mated, glue and assemble these pairs, too.

To shape the ogee portion of the feet, you'll need a simple jig that holds the assembly as you cut. Build a holder from shop scraps – two pieces of 1½" x 1½" x 8" screwed together with an offset that allows enough room for a spring clamp to hold the feet as you cut, with a wider piece of ¼" stock added for a more stable base.

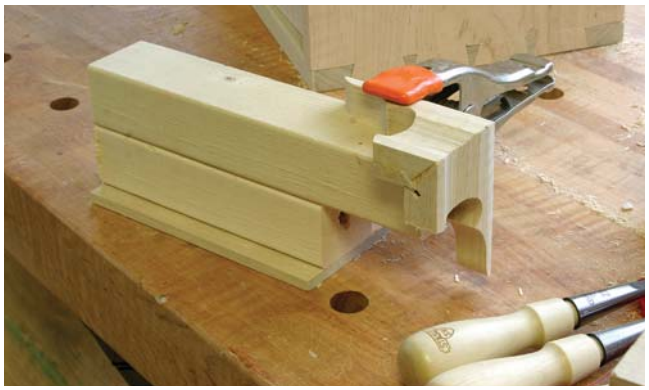
The assembled foot faces have the ogee profile drawn at both mitered ends. Position and secure the feet at the end of your jig with one foot hanging parallel to the band saw blade. Carefully saw the profile, remembering that any rough cuts need to be smoothed. Reverse the feet to cut the second ogee profile. There is no pattern line to cut to on the second foot, but there is a cutline. As you cut the first profile, the miter establishes the second cutline. Complete the ogee profiles on both front foot assemblies. The rear foot assemblies need only be cut on one face.

Clean and smooth the ogee profiles. I use my spindle sander for the majority of this work, but files and rasps also work. With the feet smoothed, attach them to the box so the flat area at the top of the finished foot aligns with the edge of your mouldings. A 23-gauge pin holds the assemblies in place as the glue dries. Small blocks are added for additional support and to carry the load – one block fits behind the miter and two blocks secure the feet to the moulding and case. Each block is pinned.

Drawers Show it All

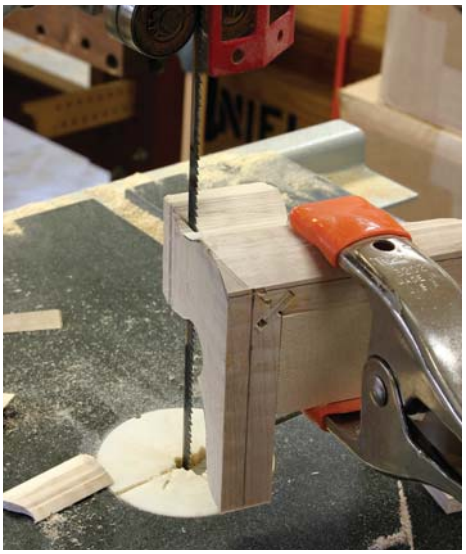
These small drawers present two of the most common 18th-century drawer construction techniques found in period work. While all the drawers have half-blind dovetails at the front and through-dovetails at the back, the small drawers have the bottoms attached directly to the drawer boxes. Larger drawer bottoms are beveled on three sides to slide into ¼" grooves in the drawer sides and front, also a method used in period work. The change in construction, in this case, allows for the second secret compartment.

No matter the technique you choose, or if you elect to use both, it's important to have the drawers look their best. That means continuous grain patterns should



Scrap jig. *I raided the scrap bin to build a jig to hold the feet for band saw shaping. The wider pieces at the bottom help stabilize it as you cut.*

Magical cutline. *As a front foot is sawn to an ogee profile layout line, a cutline for the profile on the second foot appears.*



Plan your work. *Drawers look best if the grain continues across the entire bank of drawers. Plan accordingly then mark the fronts to keep parts in place.*

flow across the drawer fronts (each row should be cut from one board). Carefully cut and fit your fronts to the case, then mark the fronts so you can easily keep them arranged. Other drawer parts are sized off the fronts.

The bottom and center drawers use the second construction method, with the center drawer hiding a second secret area. As you cut the groove for the drawer bottom, move up 1" and make a groove to capture a false bottom. I made the false bottom from plywood to eliminate wood movement concerns, but I doubt that should be a worry. To access the space between the two bottoms, slide out the false drawer bottom.

Finally, the Door

At first glance, you may think this door is built incorrectly in that the stiles are set between the rails instead of the more common design where the opposite holds true. No; I built it correctly. Generally we see stiles extend the entire door height because as a designer/builder we're taught that one's eye should travel toward the center of a piece, then up to the top. Long stiles tend to guide our eyes that way whereas in this door, copied from the original, the stile stops that upward movement. I elected to build the door following its original design.

Not only is the door important to the look of this box, it's also a large portion of the work, if you build the door with mitered sticking (where the moulding is an integral part of the door parts and not an addition). This requires a few extra steps, but the results are top-notch.

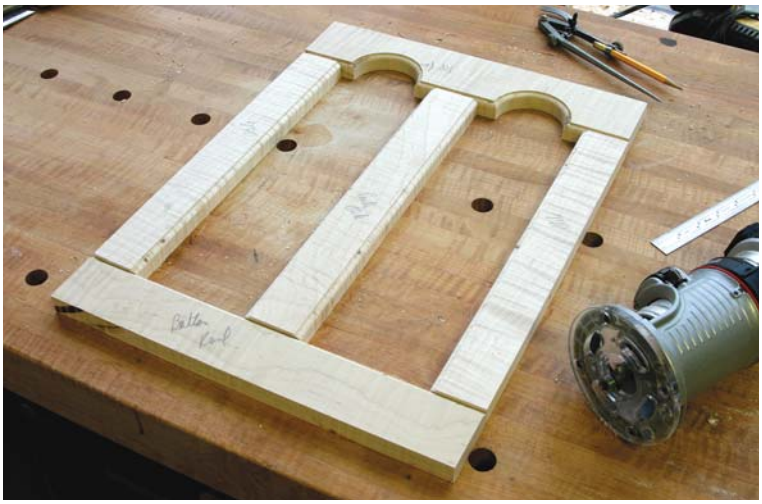
Door construction begins by roughing the door's framework to size and thickness. Lay out, cut and smooth the arch tops in the top rail, then run a $^{3}/_{16}$" roundover bit along each interior edge of all parts.

Lay out and mark the width of the stiles on the moulded edge of the two rails. Also mark the tenon lengths on the ends of the three stiles. Carry the mark to the back face. At your table saw, tilt the blade to 45° and set the blade height to just tip the square shoulder created with the roundover bit. Lock the setting and use it for the next series of cuts.

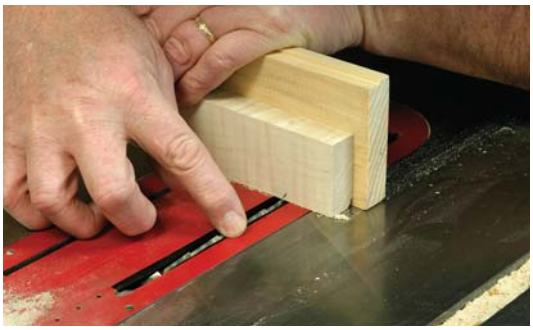
Begin with the rails. As shown in the bottom left photo, use a miter gauge with a sacrificial fence to position your workpiece so the cut exactly hits your line just as the blade levels with the saw's tabletop. When set up, make the first cut with the face against the fence. Rotate the rail so the face is toward the blade and make a second cut.

To complete the inner cuts on the two rails, align the blade with the mark made for the center stile and repeat the process. Nibble away much of the waste so the area is easier to clean.

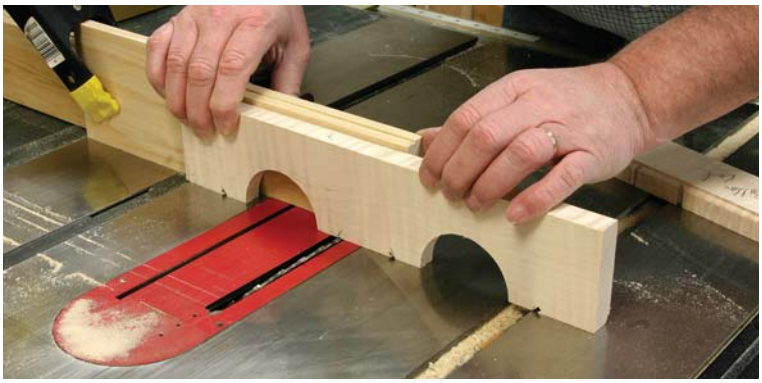
It's not a secret. *In period work, small drawer bottoms were nailed to the drawer frame or slid into grooved sides and fronts. The latter method allows for secret compartments.*



Unusual arrangement. *Fitting stiles between rails is uncommon and wouldn't be done on larger doors – but sizing parts is quicker because they're all the same length.*



On the right side. *Cuts to define the mitered sticking should be on the waste side of your line, or in the stile area. Make sure to use the correct blade tooth when setting the cut.*



Secure setup. *Once the alignment is set, use a stop block to keep the part from drifting as you cut and to accurately locate the second cut.*

Done by hand. *The more waste you nibble away from between the center angled cuts, the easier it is to clean the area.*

Stiles are cut using the same process as with the rail ends.

You can use a tenon jig to remove waste from the outer stile areas of the rails, but the waste for the center stile has to be trimmed by hand. Before moving on, bring the blade back to 90°, set the height of cut at 3/8" then with a couple passes at the table saw, run the 1/4"-wide panel grooves. Groove the stiles at the same time and remember that the center stile is grooved on both edges.

Lay out and cut mortises in the top and bottom rails, then create your tenons. The shoulder cuts align with the bottom of the 45° angled cuts, and the cheek cuts are best completed using a tenon jig, although you could use a dado stack or make the cuts by hand. The oddity is that your haunch offset is 3/16" – the groove is 3/8" deep, but you're removing the 3/16" moulded edge. Finish the tenons and check your fit.

My panel grooves were cut on the table saw, but the top rail arches need additional work. In a router table, install a 1/4"-slot cutter bit that's set to cut 1/2" in depth and align the cutting

Supplies

Horton Brasses
horton-brasses.com or 800-754-9127

1 pr. ▶ solid brass butt hinge #pb407

1 ▶ right-handed half-mortise lock #lk-9

12 ▶ brass interior knob (1/2") #h-42

Call for prices.

Double check. *Because the moulded edge is removed, that amount has to be subtracted from the full-depth groove prior to cutting a haunch. (It's easily forgotten – notice my twin kerfs.)*

Spice Box

	NO.	ITEM	DIMENSIONS (INCHES) T	W	L	MATERIAL	COMMENTS
❑	2	Case sides	3/4	9	17 1/8	Curly maple	
❑	1	Case top	3/4	9	15 1/4	Curly maple	
❑	1	Case bottom	3/4	9	15 1/4	Poplar	
❑	3	Shelves – full	1/4	7	14 1/4	Curly maple/Poplar	
❑	2	Shelves – short	1/4	7	3 15/16	Curly maple/Poplar	
❑	2	Dividers – short	1/4	7	2 1/2	Curly maple/Poplar	
❑	2	Dividers – tall	1/4	7	6 1/2	Curly maple/Poplar	
❑	2	Mouldings	3/4	2	20	Curly maple	Four pieces
❑	3	Feet – show	3/4	2 1/4	8	Curly maple	Six feet
❑	1	Feet – rear	3/4	2 1/4	8	Poplar	Two feet
❑	1	Case back	1/2	15 7/8	14 5/8	Poplar	
SECRET COMPARTMENT							
❑	1	Divider	1/4	7	2 3/4	Curly maple/Poplar	
❑	2	Backs	1/4	2 3/4	13 3/4	Poplar	
❑	1	Bottom	1/4	3/4	13 3/4	Poplar	
❑	2	Ends	1/4	1	2 1/2	Poplar	
DOOR							
❑	1	Top rail	3/4	2 3/4	14 1/16	Curly maple	
❑	1	Bottom rail	3/4	2 1/8	14 1/16	Curly maple	
❑	2	Stiles	3/4	1 3/4	13 1/2	Curly maple	1 3/16" TBE*
❑	1	Center stile	3/4	2	13 1/2	Curly maple	1 3/16" TBE
❑	2	Panels	1/4	4 7/8	12 3/4	Curly maple	
DRAWER FRONTS**							
❑	3	Top row	3/4	2 1/4	4 7/16	Curly maple	
❑	2	Secret row	3/4	2 3/4	6 3/4	Curly maple	Shorter depth
❑	4	Small	3/4	3	3 9/16	Curly maple	
❑	1	Center	3/4	6 1/8	6 1/4	Curly maple	Secret bottom
❑	1	Bottom	3/4	3 5/8	13 3/4	Curly maple	

* Tenon both ends; ** Part sizes taken from fronts. All parts 3/8" thick except applied bottoms that are 1/4".

edge with the existing groove. Watch that the bearing properly contacts your workpiece. Also, you may wish to cut into the middle of the arch, or climb-cut a portion of the arch.

Door panels on the original box were highly figured grain, but the frame was very straight-grained wood. The contrast was strong and that's good. My frames are highly figured, so I chose less figured panels to maintain the contrast. Choose wisely.

To fit panels to the frames, I've found it easiest to measure the panel area, then add 5/8" to the overall length and width to allow for movement; two grooves at 3/8" in depth is 3/4", so there's 1/8" for movement. That's a bit much for panels this narrow, so I cut my panels at 11/16".

Lay out the panel centerline and mark the top edge of the shoulder cutline. Position your compass 5/16" from that intersection. The arch is equal to the radius used on the top rail plus 5/16". Cut to your lines then check the fit.

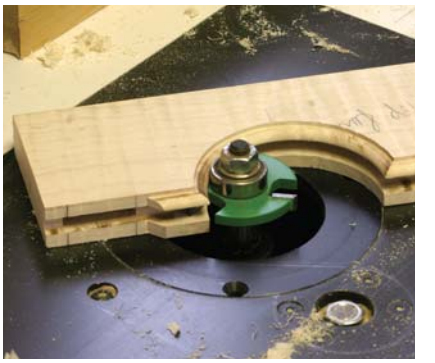
Sand the panels to #180 grit for finishing, then assemble the door using glue for the mortises and tenons; don't glue the panel. Each joint receives a 3/16" square peg. To keep the pegs from drawing too much attention, use the same hardwood as you did for the frame.

Hardware & Finish

With the door complete, take your time as you attach it to the box. Simple brass butt hinges work fine and are true to the original design. (Be sure to check the screw length due to the rabbeted side.) Your door should have an equal reveal on all four edges and it helps to bevel the lock edge for a tighter fit to the case.

Install your lock so the pin is 1/2" above the door center. (This adds the perception of height to the case.) Drawer knobs are installed after the finish work is complete. Each knob is centered to the drawer fronts with the bottom drawer knobs aligned side to side with the knobs directly above.

I dyed my box with a mixture of one-third Moser's golden amber maple and two-thirds brown walnut, then added a coat of boiled linseed oil to highlight the figured grain before adding multiple layers of shellac. To dull the shellac sheen, rub the box with #0000 steel wool then add a coat of wax.



Watch the setup. *If the bearing rides too high on the moulded edge, it might be best to make the slot cut with the rail face down so the bearing contacts the square edge.*

Here's the point. *Increase the radius of the panels' arched tops by 5/16" with the compass point set below the top shoulder by an equal amount.*

Figure-popping tip. *Boiled linseed oil soaks into figured grain adding depth. Give the oil plenty of time to dry before applying a shellac sealer coat.*

After the box is finished, cut and fit a backboard with the grain running side to side. If you use multiple pieces, half-lap the edges. The back is left unfinished and is nailed to the case sides.

I don't think spices are kept in these boxes today. You're more apt to find mementos and keepsakes stored in the drawers, which is why some folks call this design a "valuables box." Valuables or not, I think it's spicy hot. PWM

Glen is senior editor of this magazine and teaches project-based classes at many of the best woodworking schools in the country. Contact him at 513-531-2690 x11293 or glen.huey@fwmedia.com.

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If the Tool Fits ...

BY RON HERMAN

Tools sized to the user lead to more efficient and comfortable work.

One of the first things I do with new employees is fit them to a handsaw. And as a woodworker, fitting tools to yourself is one of the first things you should do, too. Why? If a tool is uncomfortable to use, you won't practice using it – and if you don't practice, you can't master a tool or technique. Instead, you'll look for alternate ways to do the chore. And even if you've already mastered a tool, the easier and more comfortable it is to use, the more precise you'll be. It's like anything else – if it doesn't fit, it doesn't work.

"Temper never mellows with age, and a sharp tongue is the only edged tool that grows keener with constant use."

— Washington Irving (1783 - 1859)
American author

Well fit. *If your tools fit you, you'll be able to work longer, more easily and more efficiently.*

Handsaws

I'm 6'4", and a 28" handsaw is perfect for me – but 28" might be the perfect length for a 5'10" user too, if he or she has very long arms.

The length of a handsaw should be fit to a person's stroke, the length of the arm's push to full extension and retraction, plus the 8" not in use when your hand is against your chest. It does no good to have a saw that is longer than your arm stroke (unless you're cutting very thick stock). And let's say you're using a sawbench of the right height for you (more on that in a minute) but the saw is too long. You could stop your stroke before the plate hits the floor, but it's a lot of work to pay attention to that with every stroke, and you lose the efficiency of your arm motion. Plus, you're pushing (and pulling) unnecessary weight with that unused length of blade. While that little bit of weight might not seem like a big deal, if you have a lot of sawing to do, it will be.

And if your saw is too short for you, the problem is the same in reverse. You can't extend and retract fully with every stroke (and keep the blade in the cut), so you have to use more strokes (and more energy) to get through the cut. Plus, a too-short saw won't pass all the

PHOTOS BY AL PARRISH

way through the wood to release the dust from the gullets.

So how do you size a handsaw to fit your body? Hold out your dominant arm and place the tip of the blade against your chest with the blade extended down the length of your arm. The sawplate should reach to the first joint in your index finger. If the idea of putting sharp sawteeth against your arms scares you, use a tape measure.

So now that you have a saw of the right length, are you ready to start cutting? Maybe not. You also have to make sure the handle fits your hand. Grasp the handle properly – that is, with three fingers inside; your index finger should point down the sawplate. You shouldn't have to jam your fingers in, and there should be enough room for your hand to get good blood flow.

If blood flow is restricted, you raise your blood pressure and your heart has to do extra work; that tires you out more quickly. The handle should feel good in your hand, and the horn should wrap just around your palm. If it digs in, you're in for some painful sawing – and to overcome the pain (really, just relocate it), you'll probably adjust your grip and then have trouble sawing well.

The Indispensable Sawbench

So now you have a saw that's the right length with a comfortable grip. Is it time to start knocking down that stock? Not quite. First, you should build a sawbench.

There are many styles of sawbenches but mine is the best. The height of the bench is even with the bottom of my knees, so when I sit down on it, my feet are flat to the ground and the top edges don't cut into the back of my thighs. It's the same width as my hip bones, so that I can straddle it comfortably. And it's about 3' long, because that's long enough to be sturdy – and fit in my truck.

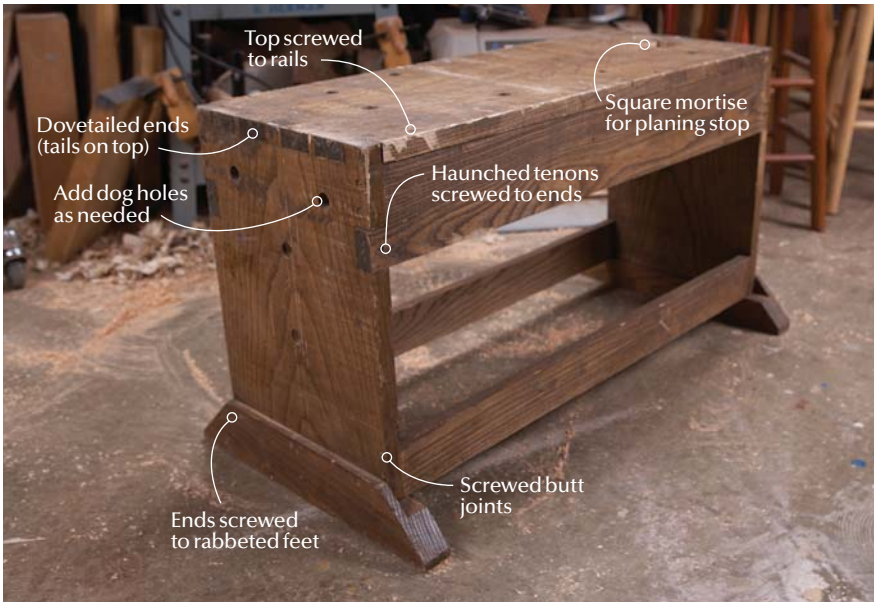
See the dog holes in the top and on the sides? I use holdfasts in those to secure a workpiece for chisel work, tenoning – whatever. And if the dog hole is in the wrong location for whatever I'm doing, I bore one where I need it. Notice the open side and bottom stretchers that are lifted just off the ground – that is so I can stick my legs inside the bench and jam my toes under those stretchers

Perfectly sized. *This picture illustrates the correct length of handsaw for me (it's 28"). Try this with your handsaws – but do it carefully (I'm assuming your saw is sharp!).*

A little short. *This 26" saw is a little bit too short for me – but 26" saws are much easier to come by in the wild than 28" saws, so sometimes I'm forced to make do – and I can tell you, it's not as efficient.*

Comfort grip. *Three fingers should fit comfortably inside the handle, and the horn should wrap around the heel of your palm.*

Discomfort grip. *If the horn digs into your palm, you won't be able to saw comfortably – and you'll try to overcome the pain by changing your grip (to the wrong grip).*



A good sawbench – for me. *There are various types of sawbenches, but this is the style I always build. No, I'm not going to give you dimensions. You have to build one that fits you, not me.*

Toe jam. *The lower stretchers are at the perfect height so I can jam my toes underneath to help keep my body in place as I work.*

Lip service*. With the ends attached in rabbets to the feet, there's a lip at the bottom that I can use to keep workpieces off the floor when I'm working on an end.*

to lock my body in place. The way the ends fit into the feet is also important – they're attached in full rabbets with the lip on the outside. I secure boards against that lip when I'm working on the end of a piece, which keeps the piece from damaging, say, a newly laid floor. For the rest of the particulars on how it's built, see the bottom picture on the previous page.

Hammers

The most important thing in choosing a hammer is that it's balanced. If it's balanced, you can flip it and it will land perfectly in your hand – in other words, the handle should be the right length and weight for the head. And when you put the hammer head down on your bench with the handle straight up, it should rock back and forth across the top.

The hammer should be the right weight to drive the nails you're using with the most efficiency, but without tiring you out. I usually swing a 20-ounce hammer, but I also swing a 16 and a 13, depending on the nails. The muscle mass in your arms also helps determine which hammer is right for you. If swinging a 16-ounce hammer makes you tired, switch to a 13-ounce.

I prefer an octagonal handle to a round handle, because when my hand gets sweaty, an octagonal one doesn't turn as much. And, the handle should be sized to allow me to wrap my hand all the way around it.

It's also important to test the head of

Sandpaper test. *Swing your hammer to hit a piece of sandpaper – the strike should happen when the handle is parallel to the floor – to see where on the head you're hitting. If it's not at the apex of the bell, you're in danger of dinging your work, and you should adjust the head as needed with coarse sandpaper.*

your hammer if you want to avoid dinging the wood as you drive nails (especially if you've changed the handle). A proper hammer for setting nails has a slightly belled head, and you should be hitting the nail with the apex of the bell, which, depending on your swing, may not be the exact center of the face. To test this, put a piece of sandpaper on your bench, and swing your hammer down to hit it as if you were driving a nail (when the hammer head hits the sandpaper, the handle should be parallel to the floor). Now look at the face – you'll be able to tell where your hammer hit the sandpaper (and you might want to do this a few times to make sure your swing is consistent). Use sandpaper to adjust the hammer head as necessary.

Chisels

When you strike a chisel, you should have a secure grip on it with your hand wrapped fully around the handle, but you shouldn't have to squeeze too hard to get that. And I don't think the handle should be much wider than the top of the steel – that way, the energy transfer is straight when you hit the handle with a mallet. If the handle is too wide, it diffuses the blow by absorbing some of that strike, so it's more work in the end to complete the operation.

That's only one of my complaints about stock handles on socket chisels. Not only are they usually too big, there's no contour to them, and that makes them hard to grip. That's why I turn my own handles, in a shape that works for me both in a paring and chopping grip. The swelling at the socket-opening end gives me a place to rest my thumb, and it makes it easier for my arthritic hands to get a good grip on the tool.

Try turning a couple different handles to see what's comfortable for you to grip for most of your typical operations. The butt of the handle should rest comfortably in the palm of your hand. When you find a shape you like and that fits you, make a story stick and hang onto it. (Keep in mind though that the handle transfers the energy of the strike into the steel, and should be no more than 30 percent larger than the socket.)

Custom fit. *I turn my own handles for socket chisels, with a swelling near the socket that allows me to more easily get a good grip on the tool. Also, notice that the butt of the handle fits into the pad of fat in my palm, for comfortable paring.*

Chest height. *With the grinder located at my chest height, I can get good downward pressure on the tool I'm grinding, and I can see what's going on. Everyone else in the shop has to stand on an apple box or stool to use this machine.*

Grinding

You probably don't use your grinder every day, so it might not occur to you to fit this tool to your body. But, if you can see what's going on, you'll do a better job of grinding. I like the grinder to be chest height – because that's where my "point of push" is located – and not more than 18" from my face. If it's much below that, I can't see what I'm doing, so I can't grind an accurate edge.

About Planes & Benches

I know some people suggest making new handles and totes for handplanes for a custom fit. I don't do this unless I have to. Typically, I find that if you buy good tools (vintage or new), the stock handles are fine.

And I'm not going to write about benches. Surely, you've gotten enough of that already. **PWM**

Ron is a master housewright, and owner of Antiquity Builders of Ohio in Columbus, Ohio.

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Coffee with the Brethren

BY MEGAN FITZPATRICK

Build a Shaker-inspired coffee table with through-drawers.

Designed to complement. *This Shaker-inspired coffee table picked up design cues from pieces already in my living room, and thus serves to tie together all the wood furniture therein.*

Coffee tables didn't exist as a furniture form until the 1920s (when they were known as cocktail tables). So while there is no true Shaker coffee table, I needed a table to put in front of my couch that would work well with the other Shaker-influenced furniture in my living room. And to my mind, that's one of the best things about being a woodworker – the ability to design and make exactly what you want. So that's what I did.

This table has the same turned feet and post-and-rail base construction that I used for my stepback (from the February 2009 issue, #174), I used the same hardware as on the "Bibliophile's Bookcase" (from the December 2009 issue, #180) and all three pieces are built from cherry. They're clearly part of the same family, but different enough that they don't look like a store-bought suite.

Best Foot Back

I began by squaring six pieces of 8/4 stock for the legs (my turning skills are at best sophomoric, so I wanted two extra legs in case something went terribly wrong).

I labored over one foot until I was satisfied with its appearance, then set that one directly behind the lathe so I could look at it as I turned the others. Though I used calipers to get the top bead and swelling close to the same size on each foot, they're not identical. That doesn't bother me. They're close enough that, when spread apart to the four corners of the table, you don't notice the differences except with close scrutiny.

After all the feet were turned, I decided on the final leg arrangement, (which was in part dictated by the glaring white sapwood on the corner of one leg that had to face to the inside), then marked out the mortise locations. I cut the 1 1/2"-deep mortises with a 1/4" hollow-chisel mortiser.

"I have measured out my life with coffee spoons."

— T.S. Eliot, 1917
"The Love Song of J. Alfred Prufrock"

Rails, Stiles & End Panels

With the legs done, I moved on to the rails, stiles and end panels. After cutting the four rails, two middle stiles and two end panels to size, it was time to tenon. I wasn't feeling adventuresome enough to cut all the tenons by hand, so I loaded up the dado stack in the table

LEAD PHOTO BY AL PARRISH; STEP PHOTOS BY THE AUTHOR; ILLUSTRATIONS BY ROBERT W. LANG

saw to make the tenons on the rails and end panels. Because the middle stile on each side doesn't have to be as structurally sound, I decided to practice my handsaw skills by cutting the tenons on those two pieces by hand – and they actually fit better right off the saw. I had to clean up the table saw tenons with a router plane, but had very little work to do on the hand-cut ones – next time, it's handsaws for all joinery cuts.

Because the tenons on the end panels traverse 7½", I decided on split tenons (I'd cut the mortises accordingly). I sawed straight down, coped out the majority of the waste, then cleaned up the resulting shoulder with a chisel.

Base Glue-up

With all the pieces for the base done, it was time to get out the glue. I started with the front and back assemblies, and because there are mortises in the top and bottom and on both ends, I had glue dripping everywhere. So much for my sanding-avoidance techniques – I had to wipe off the drips with a damp rag, which raised the grain on my carefully planed surfaces.

After those two assemblies dried, I glued in the two end panels, checked everything for square, then set the completed base aside to dry.

Pleasing arrangement. *I tried a bunch of different leg arrangements until I had all the best faces facing out – the white wood on the front right leg in the picture is on the far side of the table from my couch; only the cats will notice it.*

Top(ic) of Debate

My next step involved some debate amongst the editors. Is it better to attach the top before making and fitting the drawers? Or is it better to make and fit the drawers with the top unattached, so you can easily reach inside the carcase to make adjustments?

I decided to make and attach the top first, perhaps in part because a top made the thing look closer to finished, but also because I had some trepidation about fitting the through-drawers. I was concerned the base might shift a little as I tightened the buttons to secure the top, and that would affect the drawer fit (three out of four editors agreed).

So it was on to the top. I wanted a two-board glue-up to make the 20" panel, and the piece of wood I'd bought with that in mind was 11" wide. But, there was sapwood running at an angle on both edges, so I couldn't simply cut two pieces to length and join them in the middle. Instead, after cutting each piece of the panel a couple inches overlong, with the face that would become the top facing up on the band saw table, I cut off the sapwood where it met the heartwood at what would become the glueline. (The sapwood was wider on the bottom, and I wasn't concerned with a white stripe on the bottom center; nothing except spiders will see it.)

Hand-cut. *To cut a good tenon by hand, it's best to tilt the workpiece at 45° or so in your vise so you can saw to two lines. Then tilt it toward you to saw down to the baseline on the other side. With those two cuts made, there's a V-shape of waste to saw out of the middle, with the workpiece straight up in the vise. Make the shoulder cut using a crosscut saw and a bench hook.*

Front assembly. *It's quite a trick to apply glue and get all the tenons in place before a sticky mess ensues. I've seen it done – but I have yet to achieve it.*

Halfway there. *With the base done, the project is starting to look like a table.*

I then straightened those cuts at the jointer, and glued up the panel. What resulted was a parallelogram, which I squared up at the table saw after the glue was dry.

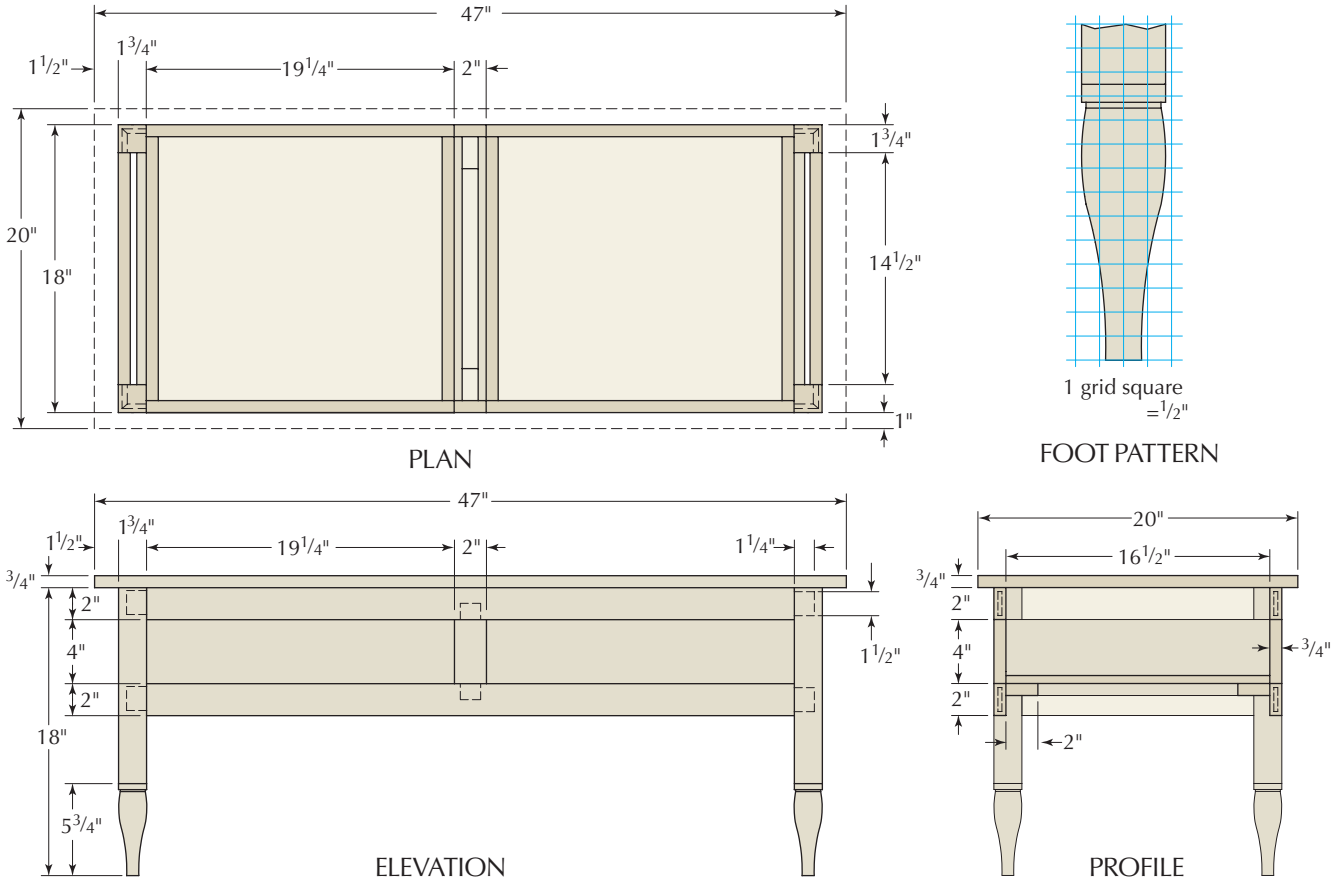
To attach the top, I cut white oak buttons (from scrap that was underneath my bench), drilled and countersunk screw holes in the buttons, then screwed them to the top, with the tongues fitted in 1/4" mortises that I cut on the inside edges of the table with a biscuit joiner. There are two buttons on each side and one on either end (and I have a few extras stored in one of the drawers that I can add later if necessary – say, if in the July heat and humidity it starts to curl up at the corners).

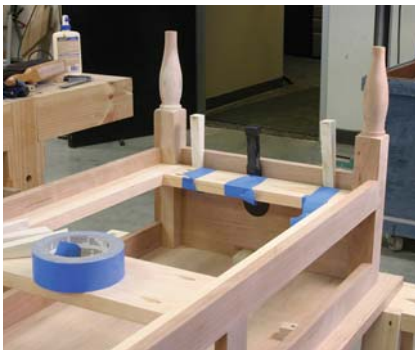
A helping hand. *With a panel this long and no roller stand, it's helpful to have another person support the end of the board through the cut. But if another person isn't around to help, a handscrew attached to the crosscut sled will do (though you have to use more downward pressure to keep the piece flat to the saw table to compensate for some sag).*

Web Frame

Typically, the web frame on which the drawers rest would be notched around the legs. But I'm cheap (and perhaps a bit lazy) and wanted to use the 3/4" pine scraps that were under my bench.

I had no pieces wide enough to work as stiles notched around the legs, and no pieces long enough to use as notched rails. Nor could I use mortise-and-tenon construction without milling some longer pieces. So instead, I used pocket screws to make a web frame that stretches from end to end on the inside corners. It's simply glued in place to the front and back rails. That made it easy to locate the drawer guides on each end. I simply butted a 3/4" x 1 1/4" x 14 1/2" piece in at each end against the frame, then taped and wedged them in place while the glue dried. The 3/4" x 3/4" 16 1/2" interior guides run from center stile to center stile, and were installed with glue after the drawers were done, so I could easily achieve a good fit.





Wedge, please. *The drawer guides on either end were simply butted against and glued to the web frame. Tape and wedges held them in place while the glue dried.*

Falsies. *The drawers are through-dovetailed with 1/4"-thick pieces of cherry glued to each front. Clamping the glue-up to your benchtop helps to spread the pressure evenly across the face.*

Tails of deception. *You have to look closely at the completed drawers to tell they aren't constructed with half-blind dovetails.*

Drawers

With but two drawers to make, the final steps in the build should have been a cakewalk. Of course, they weren't.

I'd picked out some nicely figured cherry for the drawer fronts; it was a little twisted but it was close to 7/8" thick, so I thought that if I cut the four fronts just a little overlong, I'd be able to take out the twist as I milled each front. Nope. By the time the pieces were flat, they were just a hair under 1/2" thick – too thin for half-blind dovetails.

But gosh was the figure nice; I was determined to use those pieces as my fronts. So instead of cutting half-blinds for the eight drawer corners, I made through-dovetailed pine drawers that were 1/2" too short for the openings, milled the cherry fronts down to 1/4" thick and cut them to size, then glued them on to each pine front. Had I been a little smarter, I'd have used cherry for the front substrate and you'd not be able to tell they weren't through-dovetails. But the drawers were glued up by the time I realized that, and they fit well – it seemed like asking for more trouble to remake them.

One of my drawers was a wee bit short of perfectly square, so I had to add a narrow shim on one guide to even up the reveals. Once everything looked good and fit tightly, I planed a couple thousandths off the bottom side of each drawer and waxed the guides for a smooth ride.

After sanding the base up to #220-grit (the top is planed), I sprayed on two coats of amber shellac topped with two coats of dull-rubbed-effect pre-catalyzed lacquer, then went over it with a brown paper bag to remove any dust nibs and dull the finish a bit more.

While the design picks up on the other pieces in the room, the height was determined by the height of my couch cushions. I wanted to stretch out my legs and not have the edge of the table bite into my calves. But after I got the table in place, my ratty old couch looked even worse in comparison … so I ordered a new one. But I neglected to check the cushion height. I'm waiting for it to arrive, and keeping my fingers crossed. PWM

Megan is managing editor of this magazine. She can be reached via e-mail at megan.fitzpatrick@fwmedia.com.

Shaker-inspired Coffee Table

	NO.	ITEM	DIMENSIONS (INCHES) T	W	L	MATERIAL	COMMENTS
❑	4	Legs	1 3/4	1 3/4	18	Cherry	5 3/4" turned foot
❑	4	Rails	3/4	2	43	Cherry	TBE* (1 1/4")
❑	2	Center stiles	3/4	2	6 1/2	Cherry	TBE (1 1/4")
❑	2	End aprons	3/4	8	17	Cherry	Split tenon ends
❑	1	Top	3/4	20	47	Cherry	
❑	2	Drawers	4	19 1/4	18	Cherry/Pine	Make to fit
WEB FRAME							
❑	2	Rails	3/4	2	40 1/2	White pine	
❑	2	End stiles	3/4	2	12 1/2	White pine	
❑	1	Middle stile	3/4	6	12 1/2	White pine	
❑	2	Drawer guides, ends	3/4	1 1/4	14 1/2	White pine	
❑	2	Drawer guides, interior	3/4	3/4	16 1/2	White pine	

* Tenon both ends

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Tai Chi & Woodworking

BY ROBERT W. LANG

Balance, concentration and the quest for the easy way to work.

Hands steer, legs move. *Proper movement is key to using your body effectively when you work.*

You wouldn't expect a Welsh chair bodger who's teaching how to build a stick chair to mention a Chinese martial art in relation to using a jack plane. And you wouldn't expect the student to get the connection, see the truth in it and relate that to most good techniques in woodworking.

That's the quick version of a conversation that took place a few years ago when Don Weber came to our shop to teach. We often find unusual connections to other woodworkers, and the practice of tai chi was something Don and I had in common.

Tai chi is a way to use your body effectively when you work. When you know how to do that, three things happen: The quality of your work improves; time in the shop is relaxing instead of stressful; and your back doesn't hurt at the end of the day.

Get Along With Your Work

Tai chi is a martial art, but it isn't about fighting. It's a series of coordinated movements practiced in slow motion. If you've seen a group of people moving slowly together in a park, you were likely watching tai chi. It's all about balance and directing your energy in an efficient way as you concentrate on what you're doing in that moment.

When I'm about to push a heavy board through the spinning blade on the table saw, I want the best possible results, I don't want to wear myself out in the process and I don't want to get hurt. Balance, efficiency and total concentration are exactly what I need.

This is true no matter what tool I'm using or what task I'm trying to accomplish. I use the same principles when I'm honing a chisel, planing the face of a board or running the edge of a board over the jointer. I let my largest, strongest muscles do the work by shifting my weight from one leg to the other.

PHOTOS BY AL PARRISH

That allows me to use my hands to guide what's going on and I relax because my mind isn't trying to force my body to work in an awkward way. Instead of trying to control my hand to make a saw cut to a line, I get out of the way and watch the cut happen. If a task becomes a struggle, it's because I'm trying too hard, thinking too much or using the wrong group of muscles. It's amazing what a simple change of body position or motion can do.

The familiar yin/yang symbol is a representation of tai chi – opposing forces in balance with each other. As we move, balance comes from shifting weight from one leg to the other. In most tai chi motions, the emphasis is on having all your weight on the proper leg, then shifting your weight as you move. If you know how and when to transfer your weight you won't have to work very hard; your legs provide leverage and the energy you expend is amplified by that. Follow me down from the mountain and into the shop to look at some real-life examples.

A Practical Experiment

Pick up a tool, any tool, or a chunk of wood and hold it in front of you with both hands. Put all of your weight on one leg then slowly shift your weight to the other leg. What happens to the tool or wood in your hands? It moves in a straight line without you consciously controlling it or even thinking about it.

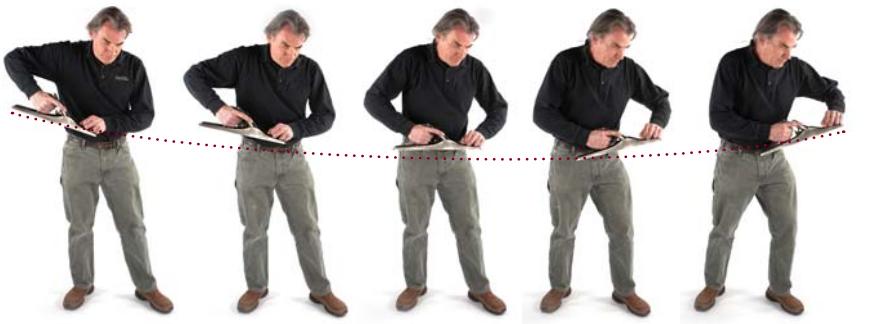
If no one is around to make fun of you, try this in front of a mirror: Bend the leg with your weight on it at the knee before you start. Straighten out that leg as you shift your weight; when your weight is on the other leg, begin to bend that knee. Your hands move farther than before, and in a straight line.

Try the experiment again, but this time distribute your weight evenly on both legs and try to move the tool or the wood in a straight line using only your hands and arms. If you're still in front of the mirror, you'll see that the movement isn't as smooth or as consistent.

If the motion comes entirely from your arms, your hands will tend to move in an arc. Go slowly and you'll see bumpy motions at the start and stop, and if the object in your hands is heavy, you will feel it in your arm muscles. You may have big biceps and triceps but your arms are puny compared to your legs. Use your legs to provide motion, and your arms are free to provide control.

Honing an edge is a small-scale example of this principle. Many people struggle with this and rely on a honing jig. To obtain a good edge, the steel and stone must meet at a precise angle, and that angle maintained as the tool is moved over the stone. If you place the primary bevel on the stone, you can

Fundamental move. *Shifting my weight from one leg to the other allows me to keep my arms and hands in position. At the start, all my weight is on my back foot, with that knee bent for balance. As my weight shifts, I straighten that knee and bend the other one, ending with all my weight on the other leg. My hands and arms move in a nice straight line.*



Fundamental mistake. *The natural motion of the shoulders is to swing in an arc; moving with the arms only makes it difficult to move the tool in a straight line.*

Free from worry. *It's easy to maintain your hands in the right position if you don't move them – and it's easy to achieve that if you concentrate on shifting your weight.*

Freedom to control. *When the arms and hands don't do the heavy work, those muscles are available to control the position and pressure of the tool.*

Power tools, too. *Shifting weight to provide motion provides consistent control at the jointer, as the feet take a step and walk through milling an edge.*

easily feel when it is in contact. And you can raise it up to increase the angle a few degrees by eye and by feel. So far, so good – but here is where how you move becomes critical. Move the chisel forward with arm movement alone and you won't maintain a consistent angle.

If you have all your weight on your back leg when you start, then shift your weight to your front leg as you progress, the tool will stay in position because your arms don't move. You will get better results if you concentrate on shifting your weight instead of thinking about holding your arms and hands just so.

Get in position, relax, then rock your body back and forth and see what happens. The benefits to this are many. You save time because you're sharpening, not messing around setting a jig. You save money because you don't need to buy the jig. Most important, you gain confidence in your own ability and a connection between your body, your tool and the surface it is moving on.

When your arms and hands don't need to do the heavy lifting, they are liberated to do more subtle things. When you want to straighten an edge, be it with a handplane or a powered jointer, you need to apply downward pressure to different places on the board as you make the cut. With a handplane, you push a little harder on the front as you start and a little harder on the back as you finish. On the jointer, you apply pressure on the outfeed table as soon as the leading end of the board is past the cutterhead, then as the cut progresses, you need to maintain pressure in the same place on the machine along the moving board.

These controlled, subtle movements are nearly impossible to make, or be aware of, if your arms are working to move the wood or the tool. When the brain asks the muscles to do something difficult, it overwhelms the ability of the muscles to make fine, precise motions. Paring a few thousandths of an inch off a tenon is difficult if you're pushing the chisel with your arms, but it's easy if your arms relax and hold the chisel just right while a shift of weight from your legs provides the motivation.

"Give me a lever long enough and a place to stand and I will move the Earth."

— Archimedes (287-212 B.C.E.)
Greek inventor of the Yankee screwdriver

Dances With Wood

Old-time woodworkers never heard of tai chi, but they knew how to use their bodies as they worked wood with hand tools. Using a handplane can wear you out in a hurry if you're doing all the work by waving your arms. Get your legs into the process and you'll have more endurance and better control.

You may need to take a step to work a long piece, but shifting your weight can be subtle; you don't need to take a giant step for it to work. In some situations, it's easier to shift your weight from side to side instead of from front to back. It's more like leaning than taking a step.

Awareness of your center of gravity is a main element of tai chi. You don't need to stand on one foot to use the power of shifting your weight. Practice transferring all of your body weight from one foot to the other without moving your legs and you will become aware of where your center is, and how to use it to help power delicate movements of your hands and arms.

That paring cut on a tenon requires careful positioning of the chisel. With your hands in the right position, you want to move the tool without changing that position. Moving the focus from your hands to shifting your weight reduces the risk of an unintended movement – and it helps you relax, so improved results are easy to achieve.

Step Aside Son

There are times when you do need to move your arms, such as when sawing. How your arm moves in relation to your body is the key to moving gracefully, and to using your muscles efficiently. To saw a straight line, your arm needs to move in a straight line, without interference from other parts of your body.

If you push or pull with your arm straight forward or back, the motion you can make is limited, the wrist, upper arm and forearm are all at different angles and it is hard to get your weight behind the arm motion. Your torso gets in the way, or you need to extend your arm and that throws you off balance. If the parts of your arm aren't in a straight line, the arm tends to move in an arc.

Turn the motion 90° so your arm is moving alongside your torso, and it's easier to use your legs in combination with your arms, and to freely swing the arm. The hand, wrist, forearm, elbow, upper arm and shoulder neatly line up with the saw, and there isn't any stress or strain on the joints or muscles. There is a connection between the position of your legs and effective arm motion.

If you're having trouble getting the hang of sawing joinery by hand, change the position of your feet. Don't face the bench; turn sideways to it and extend the foot closest to the bench, pointing it forward. Drop the other foot back, bend your knees a little and point your back foot to the side. This gets your torso out of the way, and your arm can swing from the shoulder. Once again, you're using the large muscles of your upper chest and back to do the hard work, and the hand is now free to steer.

Get the point. *Extending the index finger makes aiming and controlling easier. It also changes the angle of the wrist to make movement effortless.*

See the curve. *Sawing directly from the torso puts the parts of the arm at odds with each other. When they move, it won't be in a straight line.*

Feel the line. *Turn and change your stance, and the parts of the arm naturally line up. From this position the arm swings in a nice line while staying relaxed.*

Just as with big things, the position of your feet can affect little things, and small factors can have a big impact on your work and on what aches at the end of the day. Compare the top two pictures above. Notice that in the second picture, I'm gripping with three fingers and extending my index finger.

One benefit of this is it makes it easier for the eye to tell the brain where the saw is going, and for the brain to tell the arm muscles how to move. The brain doesn't have to process the position of the hand in relation to the tool.

There's a physical benefit to this as well. With the index finger extended, the wrist and forearm are aligned. It's a comfortable position that is easy to maintain, and moving the arm from the shoulder doesn't stress the wrist.

In the first photo, you can see the angle between the hand and arm. That increased angle leads to stress, and that stress leads to loss of control or pain. It's a lot easier to make a good cut when your muscles and joints don't hurt.

Woodworking is a combination of materials, tools and technique. The thread that ties all of these together is how we apply the technique, and every technique will involve our bodies as well as our minds. Woodworking should be fun and easy. Knowing how to work with your body and not against it can make that so. PWM

Bob is executive editor of this magazine, and is not in as good of shape as he used to be.

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A Bright Idea

BY CHRISTOPHER SCHWARZ

This light bulb-shaped lamp requires a little plywood (plus a little geometry) to make it look just brilliant.

Got a light? *With the help of our patterns and a small router, this lamp is an easy weekend project.*

For me, one of the most perfect shapes ever designed is the general-purpose incandescent light bulb. While some people use the word "mushroom" to describe its profile, I've never seen a fungus with such sinuous and perfect curves.

The most elemental light bulb combines a sphere with a perfect ogee. While I'm sure there is some proportioning system embedded in its form, I have yet to decipher it. I just know that if you try to draw it and it's even a little wrong, it looks a lot wrong.

With the advent of the new compact fluorescent light bulbs, the classic incandescent bulb is an endangered species. So to preserve the form of the familiar old-school bulb in my house, I decided to make a desk lamp in its image.

This project requires only a little Baltic birch plywood. The lamp's base is simply laminated discs of 3/4"-thick plywood. The curvy shape of the bulb is created by eight identical "blades" of 1/2"-thick plywood. The only real "joinery" in this project is the eight slots in the base that hold the blades.

Begin With the Blades

The best way to make the blades is to create a pattern in 3/4"-thick scrap material. Draw the shape of the blade using the illustrations as a guide, or print it out using the SketchUp plan on our web site. Saw and sand the pattern to perfection.

Cut out the eight blanks from 1/2" Baltic birch plywood and trace the shape of the blade on each blank. Now nail your pattern to a large piece of scrap that you can secure on your workbench.

Rough out the shape of the blade on your band saw, then affix the blank to your pattern. You can use double-sided tape or even temporarily nail the blank to the pattern. Then use a router with a pattern bit to shape the eight blades.

The Big Discs

The base of the lamp is a stack of seven layers of 3/4"-thick Baltic birch plywood. The top five layers are all discs that are 4 9/16" in diameter. Let's begin with these five.

The top two discs of the base hold the blades of the lamp. Begin by taking two pieces of 3/4"-thick Baltic birch and face-glue them together into a 1 1/2"-thick chunk. Square up this piece and mark out the lines for the eight slots: two lines at 90° to one another, and two more lines at 45°. All the lines intersect at one point.

"... (O)rnamentation is a good servant and a very bad master."
— C. Howard Walker (1857-1936)
"The Theory of Mouldings"

When the glue is dry, scribe a 4 9/16"-diameter circle on one face from the centerpoint. Cut out the circle on the band saw. Sand away the sawblade marks.

Cutting the eight slots is easy with a stack dado set in your table saw and your miter gauge.

First arrange your stack dado's chippers and shims to cut a slot that is the thickness of your lamp's eight blades. Then raise the stack dado to 1 3/8". Now screw a tall sacrificial fence to your saw's miter gauge. Screw the blank to this sacrificial fence so the centerline of the slot lines up with the centerline of the dado stack.

Rotate the blank until the line is perfectly vertical. Then push the blank into the spinning stack dado. Rotate the blank. Confirm the next line is vertical. Cut the next slot. Repeat until you have cut all eight slots. Remove the blank and turn your attention to the other three discs that are 4 9/16" in diameter.

These three discs are supposed to look like the part of the bulb that screws

OPENING PHOTO BY AL PARRISH; STEP PHOTOS BY THE AUTHOR; ILLUSTRATIONS BY ROBERT W. LANG

into the light socket. Saw and sand each disc to round. Then use a router to cut a 1/4" x 1/4" chamfer on the top and bottom edges.

The Smaller Discs

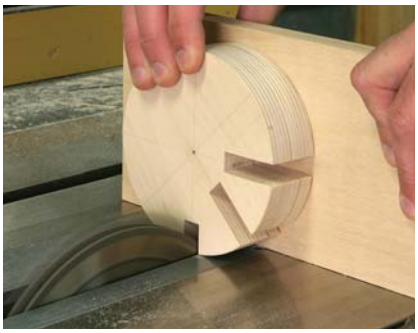
The two smaller discs (3 1/2" and 2 1/2" in diameter) are cut round in the same manner as above. On the 3 1/2"-diameter disc, cut a 1/4" roundover on one edge using your router. On the smaller disc, bevel the edge to 22.5°. The easy way to do this is on a disc sander with a tilting table.

If you are going to use a metal base made from 1/4" x 5" eye bolts like I did, use the photo at right to see how to drill the three holes for your hardware.

With all the discs cut and shaped, drill a 1/2"-diameter hole in the center of each for the wiring. Now glue up the discs into something that looks like the base of a light bulb. You can do this process one layer at a time or all at once. Your choice.

Light Bulb Lamp

	NO.	ITEM	DIMENSIONS (INCHES) T	W	L
❑	8	Blades	1/2	5	15
❑	5	Large disc	3/4	4 9/16 dia.	
❑	1	Medium disc	3/4	3 1/2 dia.	
❑	1	Small disc	3/4	2 1/2 dia.	



Eight notches. *If the center of your blank and the centerline of the dado stack line up, then all your notches will be easy to cut. All you have to do is confirm that your layout lines on your blank are vertical before cutting each notch.*

We Interrupt this Program

Before assembling the lamp, sand and finish all the parts. Mask off the areas that will be glued; stuff packing peanuts into the slots in the base of the light bulb to protect those surfaces for gluing.

Glue in seven of the blades and make sure the eighth fits in its notch with a friction fit – you'll remove that blade to change the bulb when it burns out.

The Metal Bits

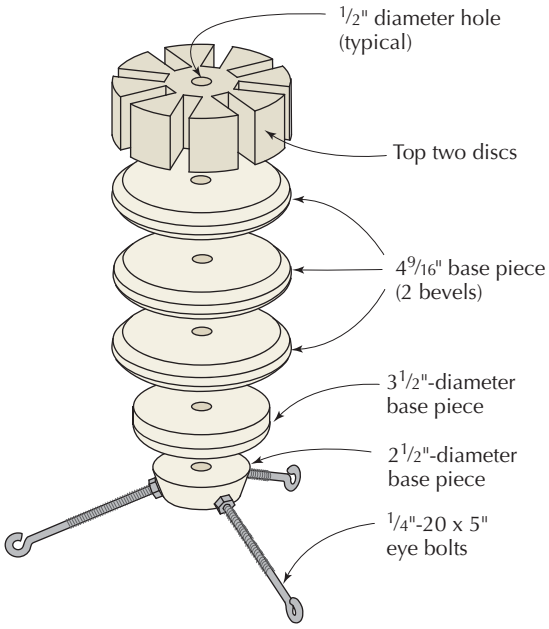
To create the electrical part of this project, I used parts from a lamp-building kit from the home center. The 1/8-IP threaded metal nipple is secured to the lamp base using jam nuts. An electric cord snakes through the nipple up to a light fixture screwed to the nipple. (Follow the lamp kit's instructions for wiring, or call an electrician to help you.)

Holes for hardware. *The edge is angled at 22.5°. Cut that angle on a piece of scrap and hold your small disc against it. Line up your layout line with a line on your scrap or (in this case) a lamination line in the plywood.*

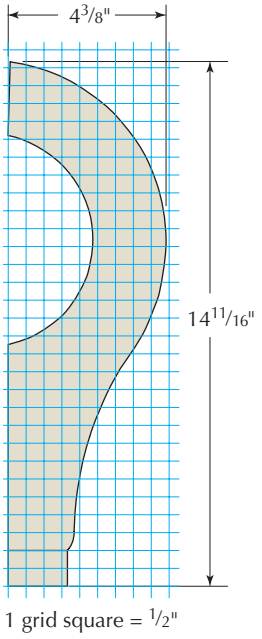
About the Base

I made the base of this lamp using 1/4" x 5" eye bolts, though I had other aspirations at the outset. I wanted to use shielded metal electrical conduit to create a somewhat pose-able base – like a light bulb crossed with a spider. Or perhaps even hang it as a chandelier. PWM

Chris is the editor and the author of several books on workbenches, handplanes and hand work.



BASE – EXPLODED VIEW



BLADE PATTERN

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How to Make 'Condor Tails'

BY JAMEEL ABRAHAM

An ingenious way to combine routers, a band saw and hand tools for big dovetails.

Enormous perfection. *Cutting large-scale dovetails, such as for this workbench, can be a challenge. This technique makes it straightforward.*

I know what you're thinking: "Another opinion on how to cut dovetails." I hear you. But this one's different. I promise. No back and forth over pins or tails first. No Rob Cosman vs. Frank Klausz. Well, actually a little Klausz.

When I built my first serious workbench in the 1990s I practically memorized Scott Landis' "The Workbench Book" (Taunton) and like many woodworkers I was attracted to Frank Klausz's beautiful bench, especially the large, crisp dovetails that joined the parts of the tail vise. Klausz told us what tools he used to cut the joints, but didn't elaborate much on technique. I suppose with a lifetime of skill at your command, you just pick up the tools and the joint emerges. I wanted the crisp look of Klausz's joints without waiting 20 years to develop the skill. After building several large benches over the past few years, this technique emerged.

Best of Both Worlds

I'm a big believer in making dovetail joints that fit right off the saw. That's a skill that's easy to learn with some practice. But not so with the beefy members of a workbench, or large-scale furniture. When you need to cut tails on the ends of an 8' board, how do you hold the workpiece? I've seen people stand on top of their bench, climb ladders, even clamp the board to a second-story deck railing just to get the thing vertical so they can use a backsaw to cut the joint. Instead of that drudgery I lay the piece flat, and use the band saw and router to cut this joint, utilizing the strengths of those machines. I also use hand tools where they excel. This is truly blended woodworking.

This technique uses the same sequence of layout and cutting as if you were making the joint by hand, and all the critical fitting is done by hand, using

PHOTOS BY FATHER JOHN ABRAHAM

accurately scribed lines. The machines provide some precision, but none of the fit is dependant on super-precise machine setups. This technique works equally well with half-lap or through-dovetails.

Layout

To get started, lay out the tails in the typical fashion. I'm cutting a half-lap (also called half-blind) joint for a workbench's front laminate (the tail board) where it joins the end cap. Both boards are 4" wide, with the tail board 1½" thick. Because this is a half-lap dovetail I set the marking gauge to leave about ⅝" of material on the pin board past the tails. This isn't a critical dimension, so I go for looks – beefy for a workbench. Scribe all the way around the board.

After scribing, use a bevel gauge and pencil to lay out the two tails. Set the gauge to about 7°.

Here's an important point: When laying out the tails, make the width of the tail's base about 3/16" wider than your router bit. Later, you'll be routing away the tail sockets in the pin board with this bit, so it needs to easily fit between the pins. My pins' base is about ¾" wide.

Cutting Tails

The tails are cut on the band saw using a foolishly simple angled spacer that takes about three minutes to make. Cut a piece of wood (I used a plywood off-cut) to about 16" long and 5" wide. The dimensions aren't critical. Now take your bevel gauge and draw a line along one long edge of the spacer. I use a long steel ruler to "extend" the blade on the bevel gauge. Cut to this line on the band saw. If you've cut straight and true, you don't even need to bother cleaning up the edge.

"He felt the love of beautiful things made by hands and by cunning and by magic moving through him ... ."

— J.R.R. Tolkien, (1892 - 1973)
English author

Next, drive a screw near the end of the tapered edge and let it protrude about ⅜" or so. This will be the stop for the tail board.

Leave a space. *Size your tails so the base is wider than the router bit's diameter.*

To set up the cut, keep the tail board pressed tight to the screw and the edge of the spacer, then approach the blade to set the fence. (Make sure the screw stop isn't in the path of the blade.) Adjust the fence so the blade is on the waste side of the line. You don't have to be too fussy here. Just like for a hand-cut dovetail, we're going to use the tails as a pattern for cutting the pins. You will want to set up a roller stand to support long workpieces. To make the cut, slide the spacer and workpiece along the fence. Stop just short of the baseline.

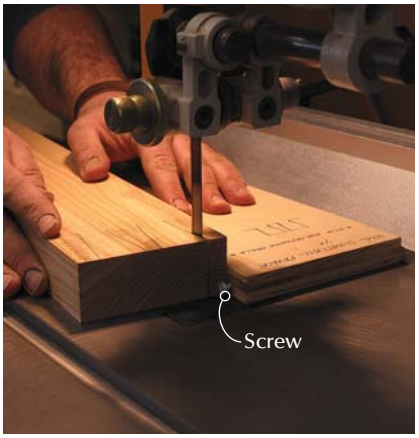
To cut the outside edge of the other tail, simply flip the board over and repeat. Don't worry about nailing your layout line, this will automatically size and center the tails on the board. And also don't fret if your angle is off a tad (you can see in the pictures that mine is). It doesn't matter one bit.

To cut the opposing angle on the tails, remove the screw stop, flip the spacer end for end, and replace the screw in the opposite end. Cut the remaining edges, flipping the board as before.

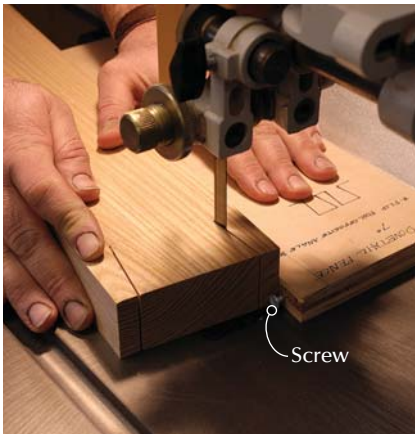
Next, I remove the spacer and use the band saw to nibble away some of the waste from between the tails.

Next, move to the bench and use a backsaw to remove the waste from the half-pin area. Here you want to maintain an absolutely crisp arris, so don't saw right to the scribe line. Stay away from it just a little.

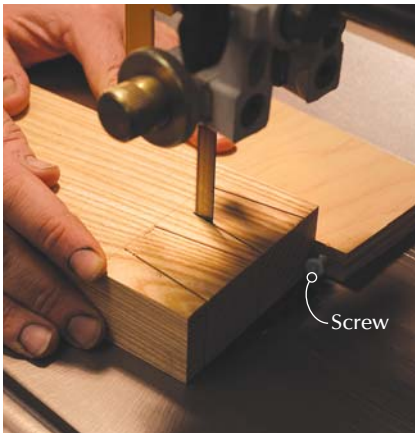
To chisel the end grain precisely I drop the edge of the chisel into the scribe line and tap firmly once. This pops out a small amount of material. Do this on



Tandem slide. *Slide both the spacer and workpiece along the fence to make the cut.*



Mirror image. *Flipping the board cuts the opposite tail perfectly without measuring.*



Opposing angle. *After changing the screw stop, cut the opposing angle, flip and repeat.*

Chop by hand. *Chiseling the end grain allows controlled precision.*

Flat shoulder. *Use a wide chisel to test for flatness.*

A 17 percent rebate. *Cut away about 1/4" to form the rabbet.*

Mark tight. *Mark the pencil lines tight to the sides of the tails.*

Shift right, scribe left. *Scribe lightly. You don't want to make a grand canyon here.*

both faces of the board (look close, you can see those areas I've removed). Then I flip up the workpiece onto its edge and chisel away the shoulder with a series of cuts, using a 1/2" chisel. I find that if I try to cut the entire shoulder with the workpiece on edge, using a chisel that's wider than the thickness of the board, I will almost always cut past the scribe line on the faces of the board as the chisel reaches the inside bottom of the shoulder. Cutting away a little ledge on the faces first allows me to establish that crisp arris, thus I can stay away from it as I chisel the center portion of the shoulder, with the workpiece on edge. This also allows me to focus my attention on keeping one scribe line crisp as I chisel, instead of all three. Using a relatively narrow chisel also allows more control and precision. I don't chop aggressively, rather I make several lighter taps to maintain control of the chisel.

To make sure I don't have a hump in the middle of the shoulder I check it with the back of a wide chisel. I rock it back and forth. It should click down positively on each arris as you do this. Chisel out the waste between the pins the same way, getting 95 percent of the waste out of the way before you take your final pass with your chisel registered in the scribe line.

I use a router to cut a rabbet on the back side of the tails. This aids in laying out the pins, and it also relates to the cutting length of the router bit. More on this later. I stay away from the baseline with the router, then clean up the baseline with a chisel.

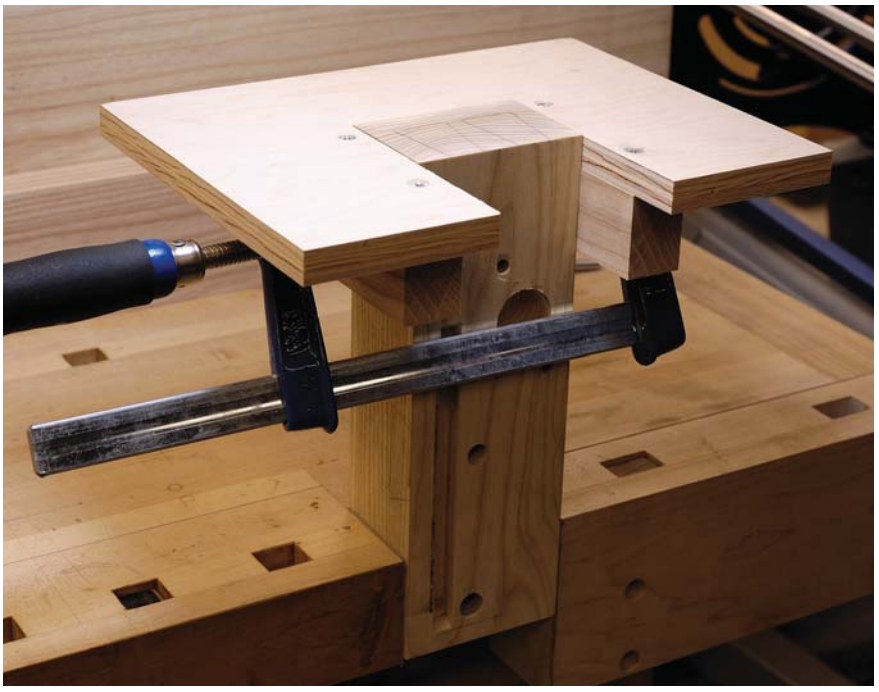
Mark the Pins

Begin laying out the pins by smoothing the end grain of the pin board. I use a sharp block plane set for a light cut to remove the saw marks, then block sand a little with #220 grit so I can make clean, crisp pencil lines. Make sure you keep the end flat and square. Next, place the tail board onto the end of the pin board, butting the shoulder of the rabbet on the back side tight to the inside face of the pin board. Using a 0.5mm mechanical pencil, place the lead tight to the edge of the pins and draw a single line about 1/2" long, alongside each of the four edges of the tails. Make sure you've marked right up to the edge of the tails. Don't let the body of the pencil push the lead away from the edge.

Just like when I hand cut a dovetail, I scribe the position of the tails onto the end grain of the pin board with a marking knife. But unlike when mak-

Mark the ends. *Use a marking gauge to establish the length of the tails on the pin board.*

Rout the waste. *A trim router with a 1/4" upcut spiral bit gets rid of most the initial waste.*



Make a platform. *A quick support platform helps to keep the router from tipping.*

Ready to chop. *Get close with the router and the chiseling will be easier.*

ing a hand-cut joint, I don't have the ability here to slightly shift the position of my backsaw to compensate for the thickness of the scribe line. Just as when chiseling the shoulder of the tail board, I want to be able to drop my chisel right into a scribe line to crisply establish the location of the pins. If I scribe with the tail board in one fixed position, I'll actually be marking outside the boundaries of the tail's socket, thus the socket will end up too large. So I'll need to shift the tail board left and right in order to get my scribe line exactly where I want it. The 0.5mm pencil lines provide a way to observe minute movements of the tail board, which greatly helps in positioning the tail board for scribing.

The measurement of 0.5mm is about 20 thousandths of an inch. I find that my marking knife, when used with light pressure, leaves a line about 10-thousandths wide. So in order to get that scribe line on the inside of the tail's socket, I'll need to shift the tail board over by about half the pencil line. This is where the pencil line is quite precise. You can tap the tail board over in small increments and watch as the tails begin to cover the pencil lines. You can adjust the offset by just a few thousandths with each tap, and more important, observe how much you're moving. For hardwoods such as this ash, I'll move the tail board over so it covers about half the pencil line. For softer woods, or for joining a hardwood tail board to a softwood pin board, you can move farther. The more pencil line you cover, the tighter the joint will be.

To scribe the tails onto the pin board, shift the tails to the right and observe the movement by watching how much of the pencil line gets covered by the tails. Now scribe just the left sides of each tail.

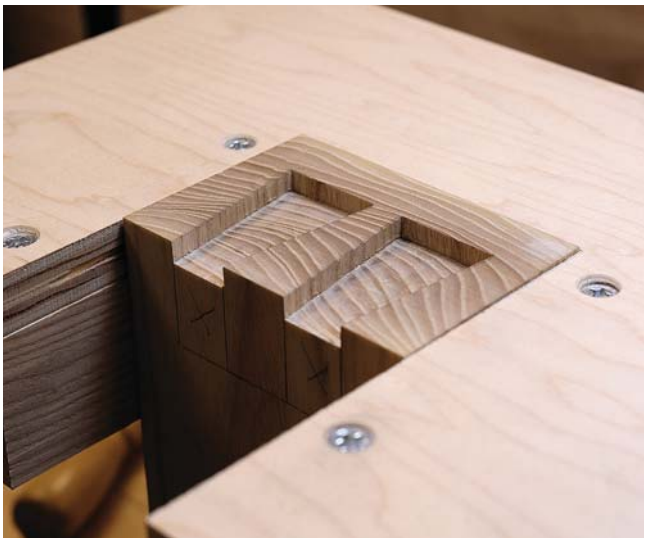
Now shift the tails to the left, using the same offset as before, and scribe the right sides of each tail. You've now placed the scribe lines precisely in the same plane as the sides of the tails, plus or minus a few thousandths.

Now use a marking gauge to define the length of the tails on the pin board. Close up the fence slightly (a few thousandths) so you end up with a nice tight fit here.

Rout This Way

Now that the position of the pins is established, the waste can be routed out. I usually just rest my router on the end of the pin board, but it's a good idea

Chisel the pattern. *Paring down establishes the final shape of the tail sockets.*



Pattern maker. *Clean work yields precise results.*

Socket set. *Set the router to mill the socket to full depth.*

First pass. *Get rid of most the waste on your first pass.*

Second pass. *Let the bearing rub the pattern for the final cut.*

to make a platform around the pin board to help support the router. I position the top of the platform to be just a hair under the pin board surface. The platform is just there for security; you want the router to register off the top surface of the pin board. Use a marking gauge to define the rest of the tail sockets on the pin board.

Use a router to remove about 1/4" depth of material from the waste areas. Stay about 1/32" away from the scribe lines.

This is where this technique really shines. Unless your pin board is cut from dead-perfect straight-grained stock, you'd never be able to pare down into this joint without splintering. After cutting the side that's with the grain, you might consider opening your own woodworking school. With the other side you'd be chucking the pin board through a picture window! And if you cut across the grain from the inside of the pin board, it would be difficult to keep a flat surface without lots of guide blocks and fussy setting. By paring out the last sliver of waste, only 1/4" deep, you basically eliminate any grain direction issues. You also establish a nice exact pattern for the rest of the socket.

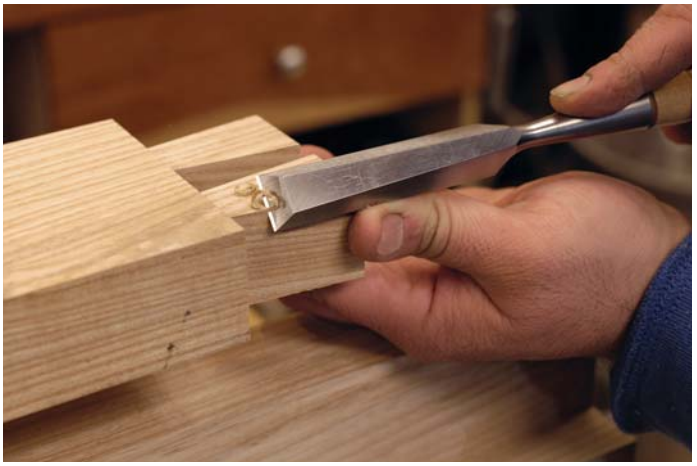
To pare out the waste, drop your chisel right into the scribed line all around and tap down. If you routed close, you don't even need a mallet. Be diligent here. This is the make-or-break moment. If you chop outside your scribe line, it will be glaringly obvious. Also, work carefully around the pin board now – those sharp arrises are easily damaged.

Here's the neat part. The pattern you just established will mean easy cutting of the rest of the socket using a top-bearing pattern bit. This is why we kept the base of the tails wider than the width of the router bit. The bit I'm using has a 5/8" cutting diameter and a 1" cutting length. You can easily get pattern bits in various configurations that work with this technique.

Because the bit is cutting parallel to the long grain, the router works easily,

Corner chisel. *You don't need a corner chisel to chisel the corners.*

The finished sockets. *Everything is crisp, flat and where it's supposed to be.*



Easy now. *Ease the back corners of the tails so they don't bruise the pins.*

Like it grew that way. *You'll know immediately if you've nailed it.*

making long, straw-like chips. You can take a full-depth pass, although you do have to be aware of your feed rate. Take it slow so the bit doesn't get out of control. You might want to practice on some scrap. I like to waste the bulk of the material first, staying away from the "pattern" at the top of the socket.

Once the majority of the waste is removed, I let the guide bearing lightly follow the pattern, just letting it kiss the chiseled surface. Do not be tempted to press the bearing hard to the pattern – you could dent it and ruin the fit of the joint. The router is removing very little material, so it's easy work, and you can use a light touch.

Use a chisel to clean the waste from the rounded areas in the corners where the bit couldn't reach. These are easy areas to work because they are below the surface; you don't have to fuss with making them perfect. Be careful to not split out the pin board. The platform here helps to prevent this.

To help ease the joint together, cut a chamfer on the back corners of the tails. I once cut the chamfer on the fronts of the tails. Once.

If you've done everything carefully, the joint will slide together sweetly, requiring just a few taps with a hammer. Don't fully seat the joint. If it's going in well at the beginning, the rest should be fine.

Pride of the flock. *The rest of the world's dovetails will be jealous when you plane the finished joint.*

The final satisfaction comes after the glue dries. Use a sharp handplane to reveal the crisp details. PW

Jameel is a woodworker, luthier and icon painter. He also makes high-quality bench hardware he sells through benchcrafted.com.

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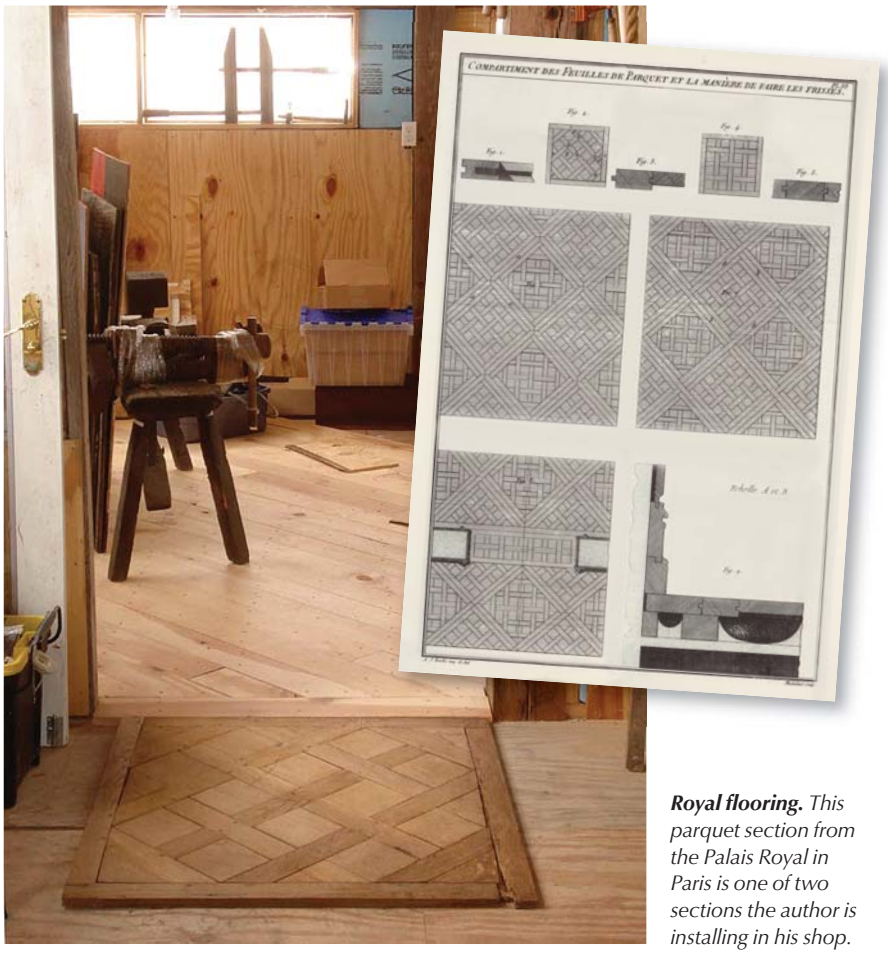
Royal Flooring in Appalachia

BY DON WILLIAMS

Paris parquet finds a new home in a rural Virginia woodshop.



Royal flooring. *This parquet section from the Palais Royal in Paris is one of two sections the author is installing in his shop.*

The convergent threads of life are sometimes amazing, coincidental things.

My earliest and most important mentors in the restoration arts were Pop and Fred Schindler, the remarkable father and son of an eponymous shop, who first introduced me to Monsieur André Roubo nearly 40 years ago. Their roles in shaping me as an artisan cannot be overstated.

Pop died many years ago; I saw him last when I went to introduce my new bride to him almost three decades ago. But I kept in touch with Fred for many years, until the sad occurrence about five years back when our annual Christmas letter was returned, "addressee unknown," indicating to me that he had died. That was that. With my own father having died the previous March and my master in the foundry pattern shop having died a couple years before that, the last of the men who mentored me into adulthood were now gone.

A Welcome Surprise

As my Roubo translation project was building a head of steam, I thought of these men often. At one point last winter I felt compelled to contact anyone in Pop and Fred's families to tell them about the project, and how their loved ones had been such a source of encouragement and learning. After searching assiduously on the Internet, I found a tax record in a nearby town that sounded promising. I wrote a note, thinking I was sending it to Fred's widow.

Imagine my astonishment when a couple weeks later my phone rang and a familiar voice reached out across the miles and years, and for a moment, I thought it was across the dimensions. It was Fred. I think he and his wife had moved early in that particular year and the "Mail Forwarding" had expired by the time Christmas came around. What a happy day that was, to catch up with my dear friend, who had been dead to me lo those many years. Our correspondence and communications continue to this day.

So a few months ago we were on the phone and Fred asked, "Do you remember those old floors from the mansion?"

"Sure."

"Well, Pop left a couple of sections with me before he died and I never did get around to using them. You want 'em?"

"Uh-h-h-h-h …"

Rewind the tape.

A Storied Past

When I worked for Pop and Fred almost 40 years ago, their main client was a renowned patron of the arts who spe-

"It is to be hoped that perfection results from the care and zeal with which I created these volumes."

— André Roubo (1739 - 1790)
author of "L'Art du Menuisier"

PHOTOS BY THE AUTHOR; ROUBO PLATE PHOTO BY AL PARRISH

cialized in classical French art and decorative arts. As I understand the story, after World War II they had obtained a large quantity of antique flooring from Paris. Pop and Fred spent months, maybe years, installing it in their mansion.

These sections of dense white oak parquet were from the Palais Royal, the king's city crib, and were probably installed in the 1670s at about the same time Versailles, the king's modest country getaway, was being fashioned with acres of the same flooring. In fact, the parquet is known as the "Versailles pattern" and I'm guessing the city and country floors were made by the same shops. By the time Roubo featured the parquetry in his section on residential carpentry, most notably in Plate 53, it was a flooring pattern more than a century old.

Wind the tape forward a little. In the late 1700s, monumental figures such as Benjamin Franklin and Thomas Jefferson called on the French royal court at the Palais Royal, seeking support for the new American Republic. I can almost hear the creaking of the floor underfoot as they paced back and forth awaiting their audience with the king or some other moneybags. (It creaks a little more loudly under Franklin.)

Then suddenly, a crate with two one-meter-square sections of parquet floor from that place and that time showed up on my doorstep, deposited by a delivery man struggling under the weight.

From palace to barn. *The barn into which the royal flooring is being incorporated is a late 19th-century timber frame barn I bought on eBay; it was in the middle of a field near Quincy Ill., and was probably built as a kit in the Deep South (it's all Southern yellow pine heartwood), then shipped up the river. It was disassembled and arrived on the back of a giant flatbed truck six months later. I began re-erecting it on Thanksgiving in 2006.*

A New Resting Place

The flooring needs a little TLC, then it should last another 350 years.

For now I mostly just admire them, but I have decided that one section will be a fitting entrance to my shop and the other to the classroom at my rural Virginia retreat, a reconstructed late 19th-century barn I bought cheap on eBay from a broker in Quincy, Ill. It may be the only workshop for many miles with flooring documented by Roubo and built for the king of France.

One square will be named the Benjamin Franklin Memorial Floor and the other the Thomas Jefferson Memorial Floor, because in my own mind these two men might have trod on them. On closer reflection, not "might," but "probably." In fact, now that I think about it, I am absolutely certain some dust from their shoes is embedded in the crevices of the parquetry. No doubt about it.

That's my story and I'm sticking to it. **PWM**

Don is a leading expert on furniture conservation, with a world-renowned specialty in historic coatings.

Fancy. *The palace parquet won't look out of place, because the rest of the barn's flooring is fancy, too. Here, I'm installing madrone flooring with an oak surround (all salvaged stock, of course).*

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BY BOB FLEXNER

Refinishing Furniture

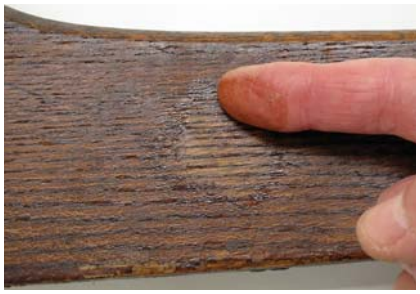
Repair, strip and refinish to restore old pieces.

Stripper types. *There are five categories of strippers. From left to right: high-percentage methylene chloride, low-percentage methylene chloride, strong solvent and no methylene chloride, refinisher (no methylene chloride and no wax), and NMP (n-methyl pyrrolidone).*

Refinishing is a topic worthy of an entire book. In fact, restoring furniture includes all of woodworking and finishing because all skills may be called into play. In lieu of a book, here are some not-so-random thoughts.

1 ■ Refinishing is a good thing, not bad as suggested by the "Antiques Roadshow." Furniture with a deteriorated finish usually ends up in a city landfill.

2 ■ There are three broad approaches to refinishing: Make the furniture look new (as the maker or factory intended it to look); make the furniture look old but in good shape (usually with a satin or flat finish and maybe some glaze in recesses); or make the furniture look like something else (for example, change the color). All three are legitimate approaches.



Test for finish. *To determine if an old finish is shellac or lacquer, dab on some denatured alcohol or lacquer thinner. Alcohol dissolves shellac. Lacquer thinner dissolves lacquer. I used alcohol here, so clearly, this is shellac.*

3 ■ In most cases, the first step is to do as much of the wood repair, including regluing, as possible so glue seepage and minor damage occur on top of the old finish rather than on bare wood. Glue seepage and damage are then totally removed with the old finish. An exception is when paint has to be stripped first to see what wood or veneer exists underneath, so it can be matched.

4 ■ Stripping is messy, but it's almost always a lot easier than sanding off an old finish or paint. Stripping also does less damage to the wood and to color that may be in the wood – color that is the result of the wood aging or a stain that had been applied.

5 ■ There are two broad categories of products that can be used to strip old paint or finish from furniture: paint stripper and the solvent for the finish. (Heat guns and caustic lye strippers are very risky on furniture because of the damage they can cause to the wood, veneer and glue joints.)

6 ■ There are five large categories of paint strippers. The primary differences are strength, speed and toxicity, which tend to correspond. From strongest, fastest and most toxic, the categories are:

- High in methylene chloride (labeled "non-flammable" an d noticeably heavier).
- Low in methylene chloride (labeled "flammable" with methylene chloride listed as an ingredient).
- Strong solvent, but no methylene chloride (labeled "flammable" with no methylene chloride listed).

Note: Each of the above contains wax that rises to the surface and slows evaporation. This wax has to be washed off the wood with a solvent or strong detergent after the coating has been stripped, or there may be bonding and drying problems with the newly applied finish.

- Refinisher (very similar to strong-solvent, non-methylene-chloride strippers, but without wax to slow evaporation).
- NMP (packaged in plastic containers with n-methyl pyrrolidone listed as an ingredient).

7 ■ Denatured alcohol will dissolve and remove shellac, which was used on almost all furniture finished between the 1820s and 1920s. Lacquer thinner will dissolve and remove lacquer, which was used on almost all furniture finished after the 1920s. Keep the solvent in contact with the finish using wetted rags or paper towels. When the finish has dissolved, wipe it off.

8 ■ It's rare that much sanding is required after the finish has been stripped. Sanding with fine sandpaper is necessary only to check that all the finish has been removed. Any remaining finish will gum up the sandpaper, telling you that more stripping is necessary. Usually, the less sanding the better.

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PHOTOS BY THE AUTHOR

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9 ■ Don't be tricked by remaining stain in the wood. No stripper will remove all the stain, and it's not necessary to remove the stain unless you want to make the color lighter.

10 ■ Use oxalic acid, sold in crystal form as "wood bleach," to remove dark watermarks. Dissolve the crystals to a saturated solution in hot water and brush the solution onto the entire surface. After the solution has dried back into crystal form, wash (don't brush) the crystals off the wood. The crystals are toxic to breathe.

11 ■ You can use stain to create whatever decorative effect you want. But it was rare that pre-20th-century furniture was stained. The darker colors associated with most old mahogany and cherry furniture is the result of oxidation (age). Old walnut usually lightens a little.

12 ■ The most efficient method of applying stain is with a rag or spray gun. Wet the surface thoroughly, then wipe off the excess with a dry cloth.

13 ■ Most 20th-century mahogany, and some walnut and quartersawn oak, had its pores filled when the furniture was made. You need to repeat this filling using paste wood filler (not the same as wood putty), especially on tabletops, when you refinish or the wood will look too raw. Just as with wood putty, it's best to use a colored filler because it doesn't take stain well after it has dried.

14 ■ It's best to apply a thin sealer coat under the wood filler to make the excess filler easier to wipe off and to create a cushion that allows you to sand off any streaks you may leave without cutting into stain or the color of the wood below.

Finish residue. *When stripping a finish, don't be fooled by stain that isn't removed. It's rare that all the stain comes out of the wood. Instead, look for remaining shiny areas that indicate you haven't removed all the finish.*

15 ■ A common refinishing problem is "fish eye." The newly applied finish bunches up into ridges or crater-like depressions caused by silicone (which is found in most furniture polishes) having gotten into the wood through cracks in the old finish. Silicone is a very slick oil and isn't fully removed in the stripping process.

There are three ways to deal with silicone contamination: Wash the wood many times with a strong detergent or solvent such as mineral spirits to thin and remove the oil from the pores; seal the wood with shellac to block the oil from getting into the finish; or add silicone ("fish-eye eliminator") to the finish to lower its surface tension so it will flow out level.

Fish eye. *It's usually easy to spot the potential for fish eye by brushing the surface with mineral spirits, water or any stain. To avoid fish eye when the finish is applied, the silicone that causes the problem has to be washed out of the wood or blocked with shellac, or silicone has to be added to the finish to lower its surface tension.*

16 ■ The final step is to apply a finish. Shellac is a good choice if you want to be consistent with the original finish used on 19th-century furniture. Lacquer is much more versatile than shellac if you are spraying. Varnish, including polyurethane varnish, is the most durable of all consumer finishes. Water-based finish provides easy brush clean-up and reduced odor, but creates a "washed-out" look on darker woods unless you use a stain underneath the finish.

Oil finishes rarely look good on old furniture because oil finishes are too thin on the wood. PWM

Bob Flexner is the author of the new books "Flexner on Finishing" and "Wood Finishing 101."

Stripping with alcohol. *Shellac can be removed by placing alcohol-soaked rags in contact with the finish for a short time until it's easy to simply wipe off the finish. Lacquer can be removed the same way using lacquer thinner.*

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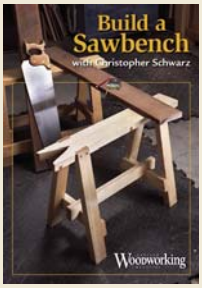

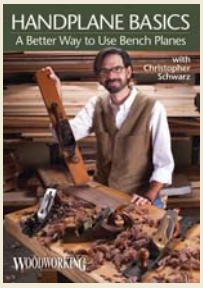

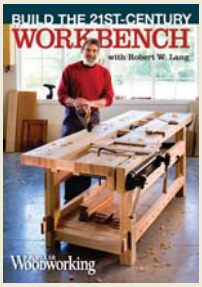

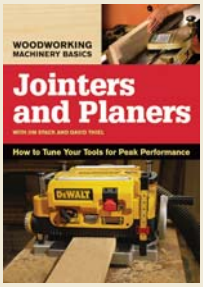

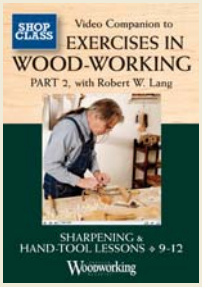

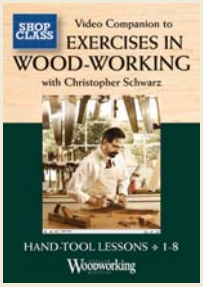

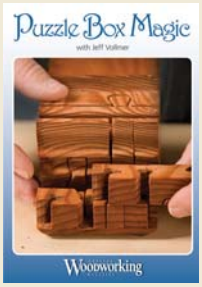

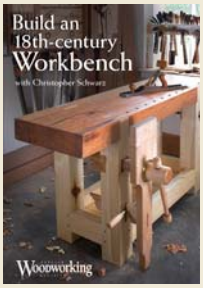

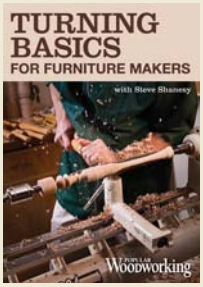

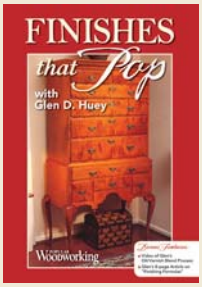

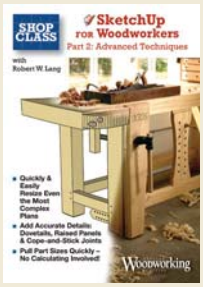

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Editor's TOP PICK

'Carve a Ball & Claw Foot' *with Charles Bender*

I've never carved a ball-and-claw foot – heck, I've barely carved anything, much less this high-style period foot. But, after watching Chuck's video, it doesn't seem as daunting a task as I thought.

Sure, there's a lot to learn to get it right, but Chuck makes it look easy and sound pretty simple, with tricks to help you maintain symmetry and carve a ball that's actually round. The techniques are surprisingly straightforward and the steps are easy to follow, and it can be done with just a few gouges and flat chisel.

Chuck has carved hundreds of these feet in his career, so I don't expect my first attempt to look anywhere near as good as his – but I think, with his help, it at least will be recognizable as a ball-and-claw!

Megan Fitzpatrick

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BY GLEN D. HUEY

My Design, Dad's Tools

A proper chest to store prized chisels.

The most prominent piece of furniture in my mom's living room is a Queen Anne lowboy my dad built. As you can imagine, the piece is coveted by family members, as it was the first piece he tackled as a furniture maker. Dad had experience in home construction, but was new to furniture making. Right out of the gate he chose cabriole legs and a carved fan – that's the way he approached woodworking and life.

The lowboy has highly shaped cabriole legs with an odd pad foot, yet they were made exactly as drawn in the plan from which he worked. As a newbie, dad called the legs "caribou" only to later find out the word was really cabriole. The mispronunciation was an inside joke that we laughed about many times throughout the years.

As dad's first foray into carving, the lowboy's center drawer has a fan that's both simplistic and crude. He bought the needed carving tools then went at the fan straight on. I don't know how many tools he bought, but he wasn't one to make unnecessary purchases.

As his carving experience progressed, the number of tools in his possession increased. Upon his passing, he had collected 42 carving tools, a collection he housed in a three-level, construction-grade plywood box.

Because I'm the only woodworker in the family (though one brother dabbled at woodworking for a while), the carving tools were passed to me. Of course, I would have fought for those tools if need be because each time I use them I think about dad and the times we worked together, including for an article in the February 2000 issue of *Popular Woodworking* (#113). The article's opening photo shows the two of us in front of a couple stepback cupboards. The caption began, "Quite a pair …" I consider that a compliment.

People store cherished items in special places. As woodworkers, those places tend to be fancy boxes built with our own hands – the more decorated the box the better, if history is any indication. Because dad's carving tools deserve more than an ordinary plywood box, I set about to design an appropriate chest. After numerous iterations, I arrived at a design I felt was worthy.

The chest isn't a reflection of its proposed contents. It's not adorned with fans, shells or acanthus leaves created with the tools to be stored inside. No, my design is Federal in appearance because that's the style that, today, captures my interest.

Attributes of the design, such as the three ovals on the chest front, mimic dad's use of the three plywood trays. That, along with a few other personal reminders, make this chest important to me. I look forward to building the project in the solitude of my shop – just me and the memories. I look at this chest as my contribution to dad's collection. Would this be a design he would have chosen? Probably not. He was OK with the plywood.

In August, I'm teaching a week-long class at the Connecticut School of Woodworking. This chest is the class project, so I intend to take my chest, filled with dad's carving tools, with me. I'll add a few tools along the way, sharpen away steel from his tools, and maybe, when the chest and its contents are passed to the next generation, I'll be able to pass along memories of dad. That's how woodworkers live forever. PWM

Glen is senior editor of this magazine. He was his dad's shadow as a youngster and had the privilege to work side by side with his dad in the business of home building and woodworking.

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ARTICLE: *Read about Seaton's tool chest.*

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PHOTO BY AL PARRISH; CHEST ILLUSTRATION ON BENCH BY ROBERT W. LANG

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