

TAUNTON'S

December 2017 No. 264

Fine WoodWorking

Picture-frame fundamentals • Turn scraps into gifts • Fast panel glue-ups
Add spark with iridescent inlay • Designing a dresser



Elegant bookcase, top to bottom, p. 58

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16"
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20"
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24
115



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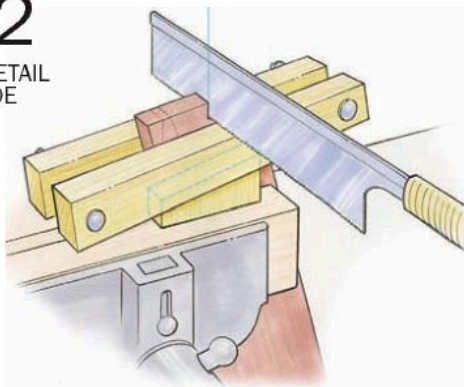


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on the web

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Visit FineWoodworking.com/264 for online extras, available September 27. And don't miss the collection of free content on our website, including tool reviews, an extensive project gallery, and must-read blogs.

VIDEO

Dovetails in minutes

Christian Beckvoort (p. 44) knows dovetails better than anyone. In this short video, he unveils his tricks for dovetailing a drawer quickly from start to finish.



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VIDEO

Tame that tiger

Tiger maple like that in Mike Korsak's bookcase (p. 58) can be a challenge to work with. Bob Van Dyke shows you how he gets a smooth surface using a low-angle plane and a specially honed blade.

VIDEO

Framing artwork in style

Michael Cullen (p. 66) shows you how to make beautiful frames, but you also need glass to show off your artwork properly (p. 82). Web producer and ex-hardware store clerk Ben Strano shows you how to cut it at home.

VIDEO

First look at Veritas's new plane

The Veritas combo plane (p. 18) is creating a lot of excitement these days. See it in action in this "First Look" video.



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VIDEO WORKSHOP

Arts and Crafts bed

Modeled after a Stickley bed, Kevin Rodel's version features Glasgow-style inlay, pierced carving, and tapered posts. As you build it, you'll learn how to:

- Use templates to shape the bedposts and top rails
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- Create a decorative piercing with a carved relief



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contributors

Native Londoner **Philip Morley** ("Smart Technique for Gluing Thin Panels") attended the Traditional Carpentry and Joinery program at London's North Barnet College, earning his certificate in 2003. In 2001, he spent a summer in Maine teaching at a camp for children from Boston's Inner city. While there, he met his wife, Carmen. After that summer, he came back to the States, following his wife from Rhode Island to Florida, where he worked for a design company for four years. From Florida, they went to Texas, where Morley served an apprenticeship with furniture maker Michael Colca. He opened his own shop in 2014. It's located just outside his home in Wimberley, Texas, so he can see his wife and four young children with no traveling required.



Before **Ray Finan** ("A Classic Spin on Curved Aprons") became a professional furniture maker, he was a suit-and-tie guy, working in offices around the country and spending far too much time flying between them. Now he is a graduate of the Center for Furniture Craftsmanship's Furniture Intensive program and sometimes teaches at the school in Maine. When he and his wife built their home in Arlington, Vt., he made sure to have a standalone shop constructed, too. Aside from classy modern furniture, often with striking veneer, he also makes some darn fine maple syrup.



Craig Thibodeau ("Iridescent Inlay") has been a professional furniture maker in San Diego for 17 years. Each year brings new challenges and new skills to learn. Recently he has begun incorporating metal inlay and intricate puzzle mechanisms into his commissioned furniture. Early this year he began work on his most complex piece to date; it has a variety of interactive puzzle components, mechanical movement, and both floral marquetry and geometric parquetry veneer work. In between furniture commissions, Thibodeau does an assortment of woodworking as a subcontractor for a local yacht company.

Next to his shop, **Chris Gochmour** ("Dovetail Saws: The Cream of the Crop") has a showroom of sorts. He doesn't use it as a formal display of his furniture, but walk in and you'll see an outstanding display of his ability. Even in the face of the imposing French-style armoire with carvings and the commanding Tige Frid-style chair in a corner, Gochmour is rather unassuming about the space, which looks like a dream living room. "Yeah, a lot of furniture's in there." You'll probably spot a longboard or two, too.



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Publisher **Renee Jordan**
rjordan@taunton.com

Director,
Advertising Sales
& Marketing **Alex Robertson**
203-304-3590
arobertson@taunton.com

Director of Digital
Advertising
Operations **John Maher**
jmaher@taunton.com

Advertising Sales
Assistant **Diana Edwards**

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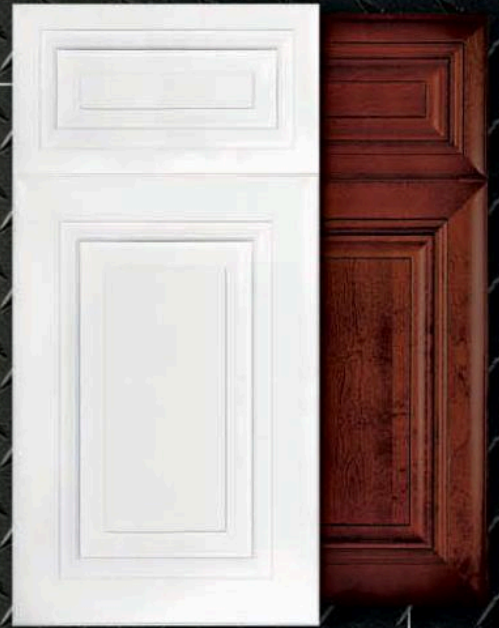
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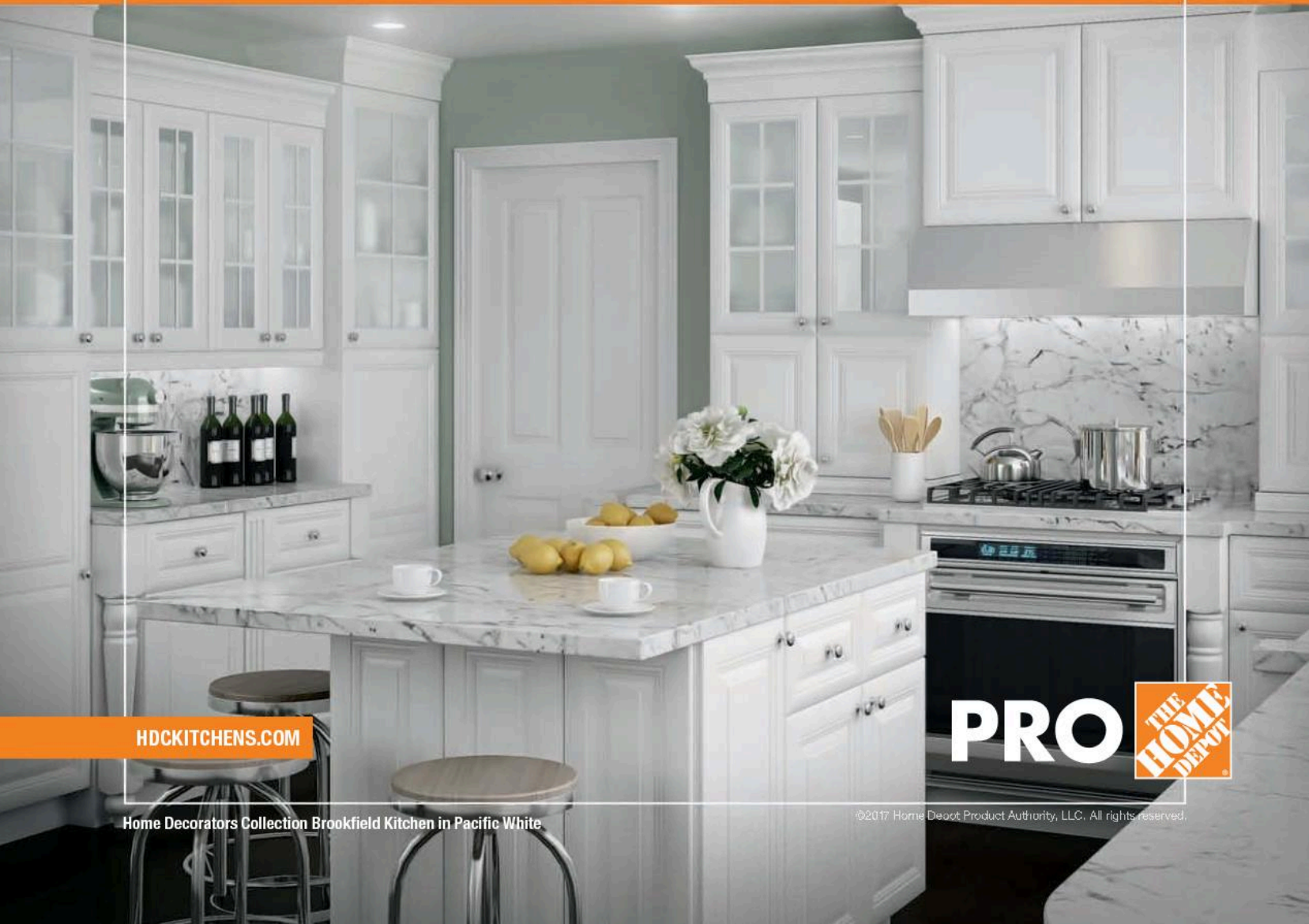


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Save the Date

Working wood in Williamsburg

If you're a woodworker looking for a fun getaway this winter, check out Colonial Williamsburg's annual Working Wood in the 18th Century conference. The event is now in its 20th year, and they're commemorating the anniversary in style, with a program that celebrates the diverse heritage of woodworking shops and tools.

"Workmanship of Risk: Exploring Period Tools and Shops" features keynote speaker Roy Underhill, host of the PBS series *The Woodwright's Shop*, and instructor at The Woodwright's School in Graham, N.C. He will be leading what's sure to be a lively discussion on hand-tool traditions of the past and present.

You'll also be inspired by guest presenters Peter Follansbee and Cartouche Award winner W. Patrick Edwards, who will share their knowledge of 17th-century furniture and French marquetry techniques, respectively. Top it off with well-respected conservator Donald Williams, who will talk about historic shop practices and traditional finishing methods.

As always, the list of presenters includes the ever-entertaining and knowledgeable woodworking staff of Colonial Williamsburg, including master cabinetmaker Kaare Loftheim, master joiner Ted Boscana, and journeymen cabinetmakers Bill Pavlak and Brian Weldy.

Fine Woodworking's deputy editor Jon Binzen will also be there. Jon will present an after-dinner slide show on shops around the country, giving attendees an in-depth look at where and how modern craftspeople are working.

The conference will take place Jan. 25–28, 2018. For more information and to register, go to www.colonialwilliamsburg.com/learn/conferences/working-wood.

—Tom McKenna, editorial director

Don't forget to raise the riving knife

We designed a riving knife years ago for our old Rockwell tablesaw. It functions similarly to the one Matt Kenney describes on p. 20 of *FWW* #263.

The problem is that, like the Delta ARK Shark Guard, our knife has a very unsafe feature. Since the riving knife is fixed, the tablesaw user is very likely to

inadvertently raise the blade for a cut without stopping to adjust the riving knife. This results in an immediate spray of small metal shards in a line, starting on the lower cheek, passing through the eye, and up to the forehead. It happens really quickly, before one can even blink. I've done it and only have my eyes undamaged because I always wear

safety glasses when the tablesaw is powered.

I'm likely not the only person who will do this, simply because having used the tablesaw thousands of times, raising the blade quickly to make a height adjustment for an operation in progress is an habitually established action on par with tying shoelaces or scratching an itch—you don't even think about it. But with the new manually adjustable riving knife, in spite of conscious purposeful concentration to always stop the saw, adjust the height of the riving knife, and then proceed, sometime or another the old habit is likely to kick in and the operator will make a few rapid clockwise turns of the wheel, only to be startled by the spray of metal.

One hopes the documentation really underscores this likelihood. At least Matt is shown wearing safety glasses.

—MARTIN VENDRYES,
Vienna, Ont., Canada

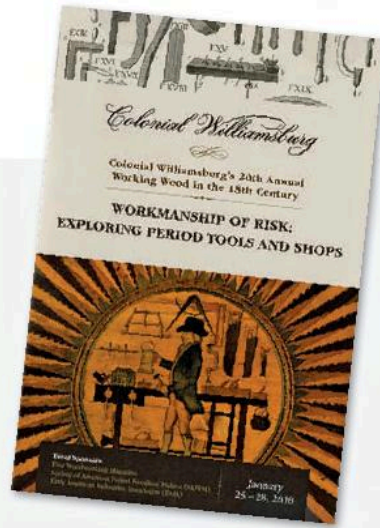
Matt Kenney replies: There's no doubt that raising a spinning blade into the Delta ARK Shark Guard is a bad idea. The manufacturer explicitly warns that you should never raise the blade while it's running, even going so far as to include a warning card that can be hung on the wheel used to change the blade's height.

Chinese woodworking

I wish to thank you for the recent publication of the article by Andrew Hunter on Chinese frame-and-panel construction (*FWW* #262). I hope that many of your readers find this kind of exposure to traditional Chinese woodworking to be very informative.

Although there are many books illustrating traditional Chinese furniture, there is very little published about the joinery and other construction techniques, which typically are invisible in illustrations of the furniture. So I for one would encourage you to publish more such articles in the future and give this great woodworking tradition the attention it deserves.

—WILLIAM SMITH, Montreal, Canada



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To contact us:

Fine Woodworking
The Taunton Press
63 South Main St.
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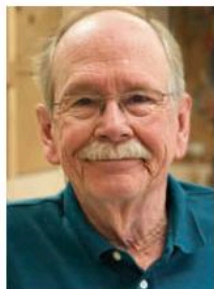
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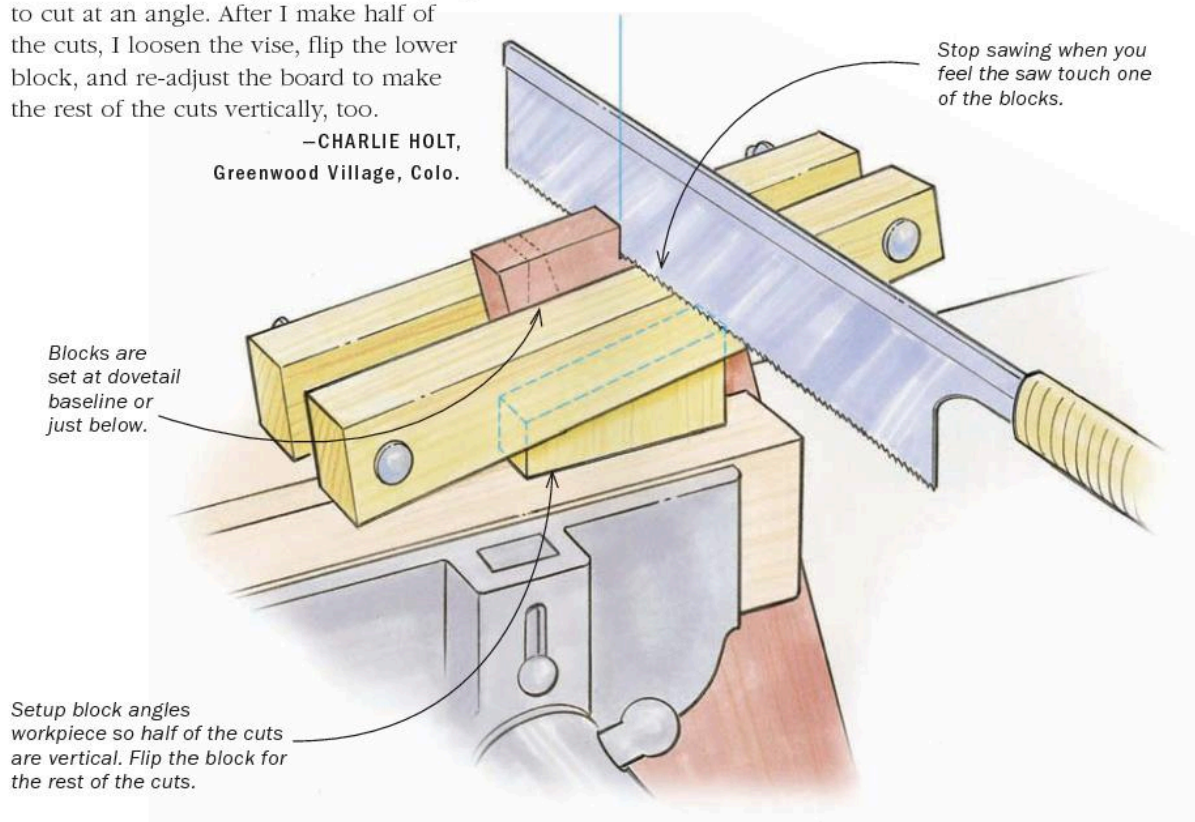
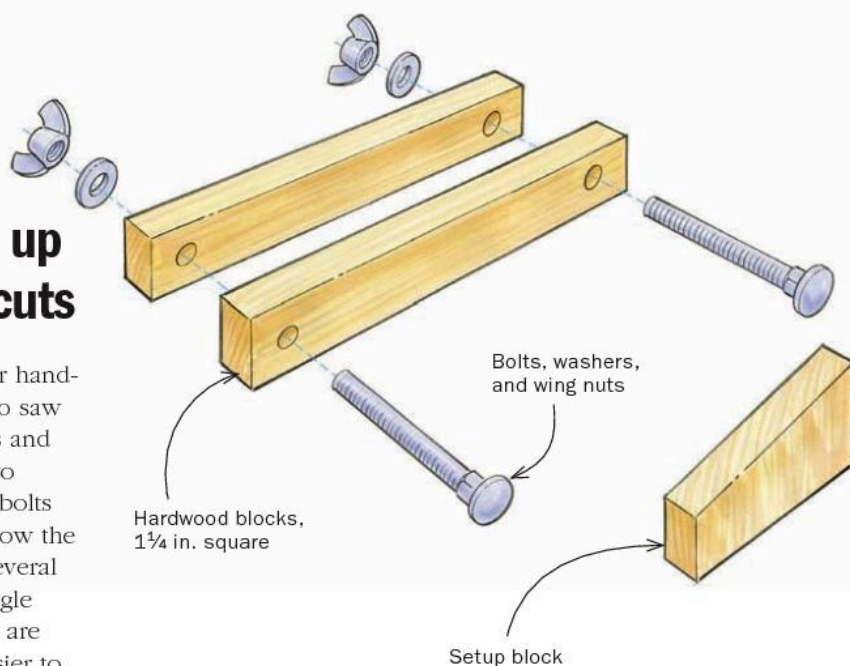


Like his late father, Charlie Holt is an orthopedic surgeon and hobbyist woodworker. After he retired, Holt found much more time for woodworking, building a free-standing shop, taking classes, and gaining the confidence to tackle a wide range of projects, from jewelry boxes for his grandkids to full-size furniture and cabinets.

Two simple jigs add up to perfect dovetail cuts

I have been using these two jigs for hand-cut dovetails. Because it's so easy to saw past the baseline when cutting tails and pins, I made a simple stop from two blocks of hardwood attached with bolts and wing nuts. Clamping it just below the baseline works best. I used it for several years, and then added the small angle block that ensures that the tail cuts are perfectly vertical. I find it much easier to cut to the line that way, rather than trying to cut at an angle. After I make half of the cuts, I loosen the vise, flip the lower block, and re-adjust the board to make the rest of the cuts vertically, too.

—CHARLIE HOLT,
Greenwood Village, Colo.



A Reward for the Best Tip

Send your original tips to fwtips@taunton.com. We pay \$100 for a published tip with illustration; \$50 for one without. The prize for this issue's best tip was a set of IBC's new bench/paring chisels.



Tech Tip Let Siri do the math

As an organ craftsman, I design and work in metric but frequently need to convert to and from inches. My tip is simple: Ask Siri. If you don't have an iPhone, you can use one of the various personal-assistant apps on Android phones, or try it on smart-home devices such as Amazon Echo. It's also very useful for converting decimals to fractions and vice versa.

—JOHN STUMP, Portland, Ore.

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workshop tips continued

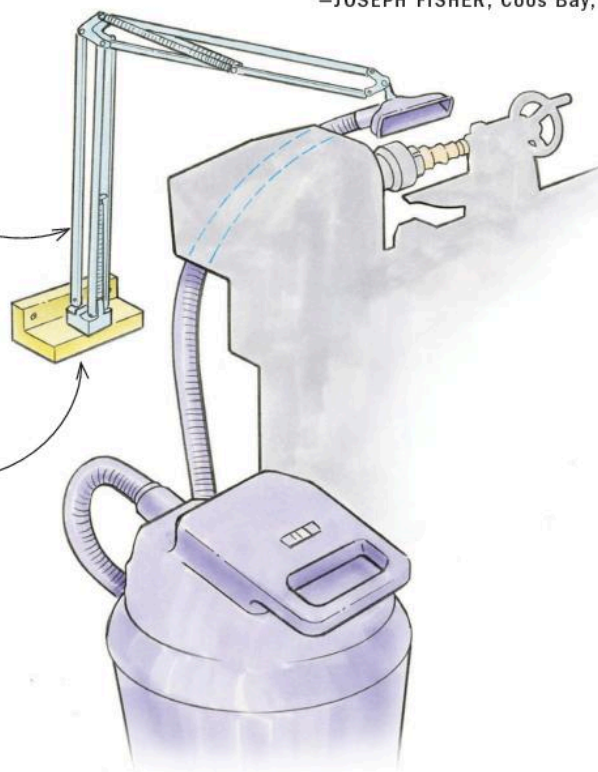
Lamp arm positions vacuum hose perfectly

I enjoy wood turning, and have always cleaned up the piles of chips with my trusty shop vacuum. But sanding on the lathe is troublesome, as a large volume of dust settles everywhere and invades my sinuses. So I combined the swing arm of an old drafting light with the floor attachment for my shop vacuum. The lamp's head was bolted to the swing arm, so I used that same bolt to mount the vacuum attachment. The new dust port is easy to adjust and works beautifully, letting me detach the vacuum hose when I need it elsewhere. A similar approach would work for any fitting on the vacuum. And you can drill a hole for the base pin of the swing arm almost anywhere, letting you collect dust from router tables and other tricky spots.

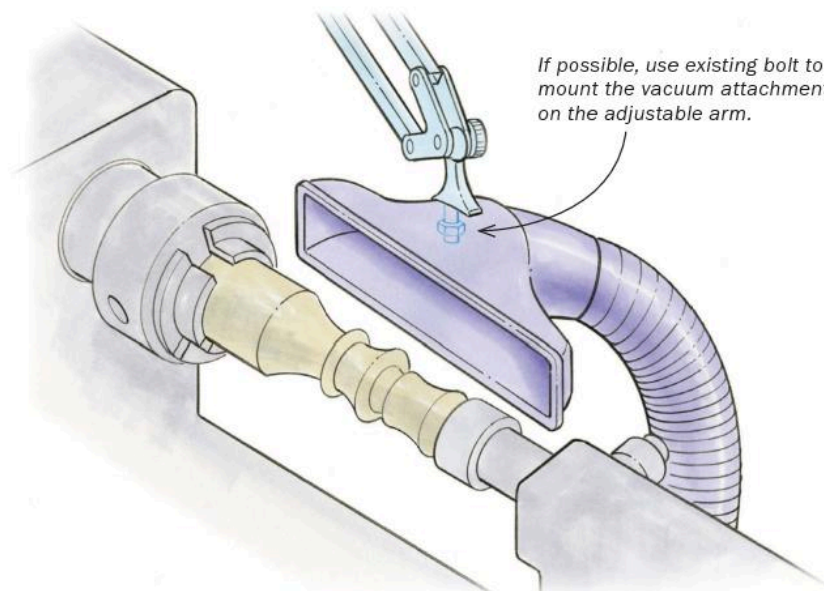
—JOSEPH FISHER, Coos Bay, Ore.

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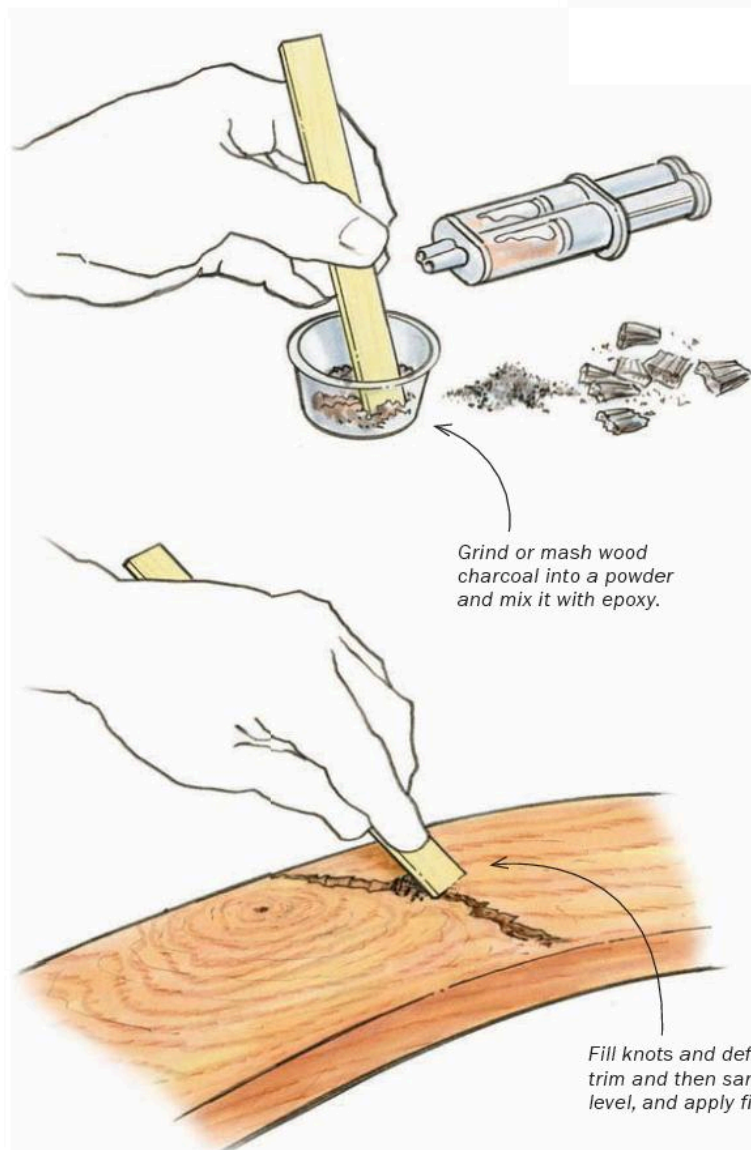
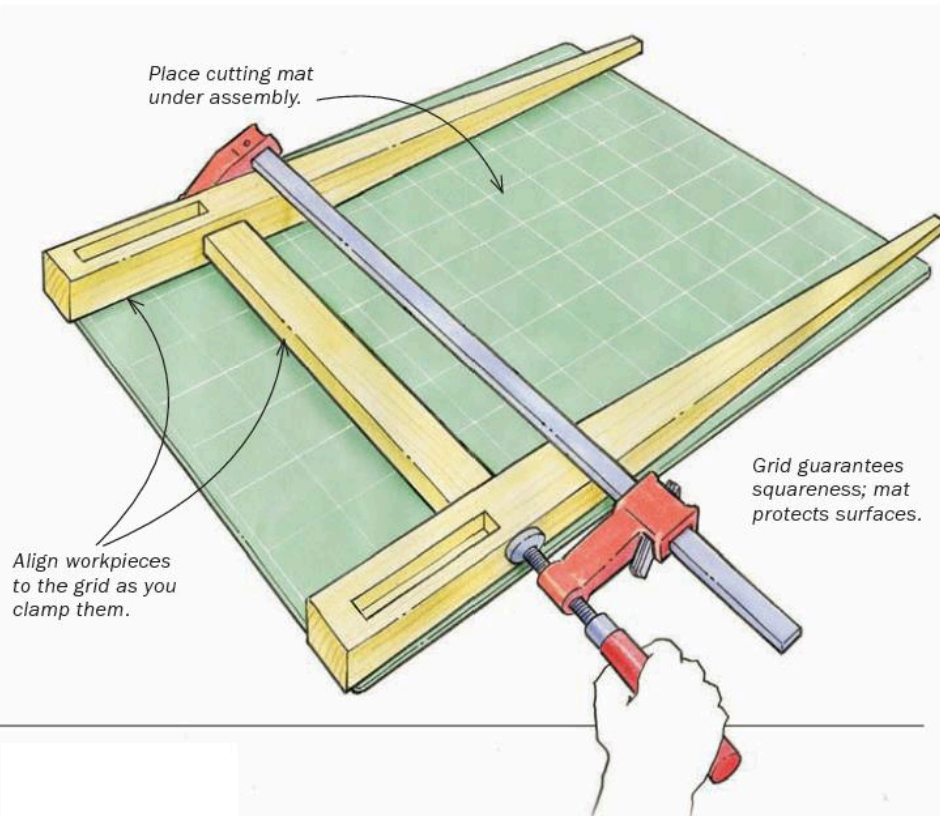


workshop tips continued

Use a PVC cutting mat for better glue-ups

While gluing up mortise-and-tenoned legs and rails for a side table, I realized my self-healing cutting mat had an accurate grid printed on it, which I could use for alignment. By aligning the workpieces to the grid on the mat, I was able to guarantee a square assembly and protect their surfaces at the same time. The mats are widely available in sizes up to 3 ft. by 4 ft., which is big enough for most glue-ups.

—TIM BROSANAN, Metuchen, N.J.



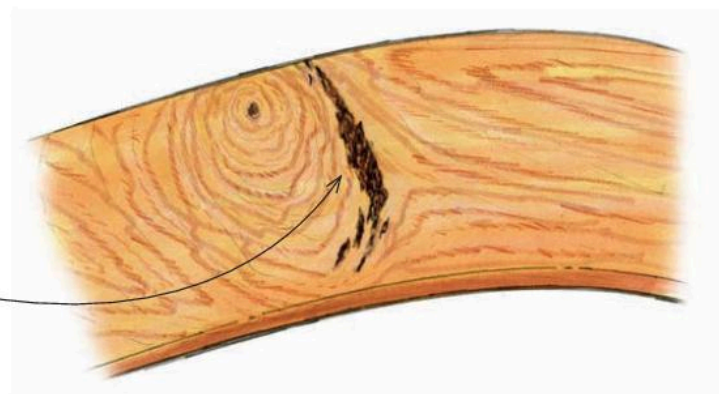
Jet-black filler looks like a natural pitch pocket

I've discovered a simple way to fill voids in medium-to-dark woods that costs next to nothing. I grind charcoal from my woodstove or fire pit into a powder, and then mix it with 5-minute epoxy to create a great filler for knot holes, worm holes, voids, and cracks. Cyanoacrylate glue works well for smaller voids.

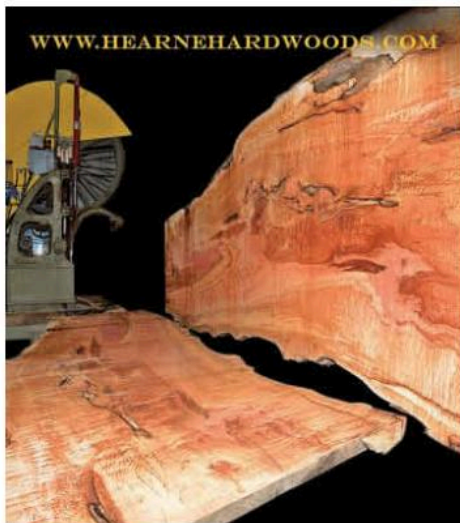
I grind the charcoal in an old blender (finishing in pulse mode) or crush it with the head of a hammer against a metal plate, or both. The charcoal is porous, so chunks up to 1 mm in size are fine. A little powder turns the epoxy jet black—a 25% ratio is about right—while keeping it liquified and easy to work into the cracks. If the mixture is too thick (like peanut butter), it can be a struggle to use as the epoxy starts to set up, and air bubbles in the filler can be a problem.

While the glue is still setting up, I trim the excess with a chisel, and once it has fully cured I sand it level. The filler is jet black, like the pitch in cherry, and looks beautiful under any film finish.

—JOE MORGAN, Park Rapids, Minn.



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■ HAND TOOLS

The combination plane done right

WITH THE HAND-TOOL RESURGENCE well into its second decade, it's not surprising that the combination plane has been reintroduced. The Veritas combination plane cuts grooves, rabbets, dadoes, beads, reeds, and flutes. Although patterned after planes like the Stanley 45, it's not simply a reproduction of a classic, but a refinement of and improvement upon a type of plane that many woodworkers find confounding. It's a great plane that's far easier to use than those old combination planes.

Knurled brass knobs dominate the plane's appearance and function. The many moving parts can seem confusing at first, but they are the plane's greatest virtue. Every adjustment, except for one (the cross-grain nickers), is toolless and easy. Everything slides evenly, stays parallel, locks down positively, and can be dialed in precisely. The blade-locking mechanism is exceptional and yields a chatter-free surface—no small feat for a blade that's not supported across its full width. My chief complaint with the overall design is the tote, which puts the user's hand high above the blade instead of right behind it.

I used the plane in each of its many configurations. For making grooves and rabbets with the grain, this tool is excellent. Its heft provided extra muscle, while its ample



Veritas combination plane
\$399



fence made it easy to keep things square. I could work efficiently, taking a fairly aggressive cut without choking the plane.

Likewise, it cuts tongue-and-groove joints well. Because a combination plane can't handle skewed blades, cross-grain rabbets and dadoes typically present a greater challenge. Veritas compensates for this with substantial nickers ahead of the blade. A brilliantly placed set screw behind each nicker allows the user to nudge them in or out to align them with the blade. Unfortunately, the nickers are too close to the plane's toe, making them difficult to engage at the start of each cut.

For relatively simple molding tasks the Veritas also performs well. There was some tearout in mahogany and walnut, but that's not surprising since one side of the blade cuts with the grain while the other cuts against it.

If you're in the market for a combination or plow plane, I highly recommend this tool.

—Bill Pavlak is a journeyman cabinetmaker in the Anthony Hay Shop at Colonial Williamsburg.



A plane that really works. One of the ways Veritas has improved the combination plane is by making it easy to adjust. Everything glides smoothly and the knobs lock securely (left). The plane also is a joy to use. With a sharp blade (right) it cuts just as well as a single-purpose plane.

➤ Online Extra

For a "First Look" video of this plane in action, go to FineWoodworking.com/264.

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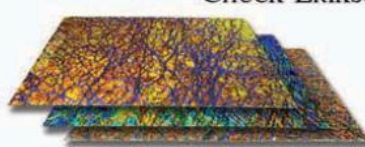


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■ POWER TOOLS

Compressor whispers rather than roars

I USE A VACUUM PRESS for veneering and to create curved doors. My press is a simple machine, but it requires a fairly large compressor to work efficiently and effectively. The compressor I currently use does the job, but is so loud that I must wear hearing protection when it runs. It also vibrates like mad, and you can feel it throughout the house. Because of these problems, I used the vacuum only during the day. That's tough, because it's nice to leave glue-ups in the bag at night when the shop isn't in use. So I've been on the hunt for a compressor powerful enough to run my vacuum press, but quiet enough to be used overnight and without hearing protection when I'm in the shop.

I've found it. The CAT-10020C air compressor from California Air Tools has a 2-hp motor, a 10-gal. tank, plenty of cfm to run my vacuum press (4.40 cfm at 90 psi), and is unbelievably quiet for a compressor this size. Standing next to the compressor and taking readings at ear level, I measured its noise at 70 db. The noise level dropped to 68 db when I measured it from 10 ft. away. It's quiet enough that you can have a normal conversation standing next to it, and I was able to hear the music playing over my shop radio with no problem while it was running. With the CAT-10020C, my press pulled air from the vacuum bag just as quickly as it does when hooked up to the screaming beast of a compressor I've been using.

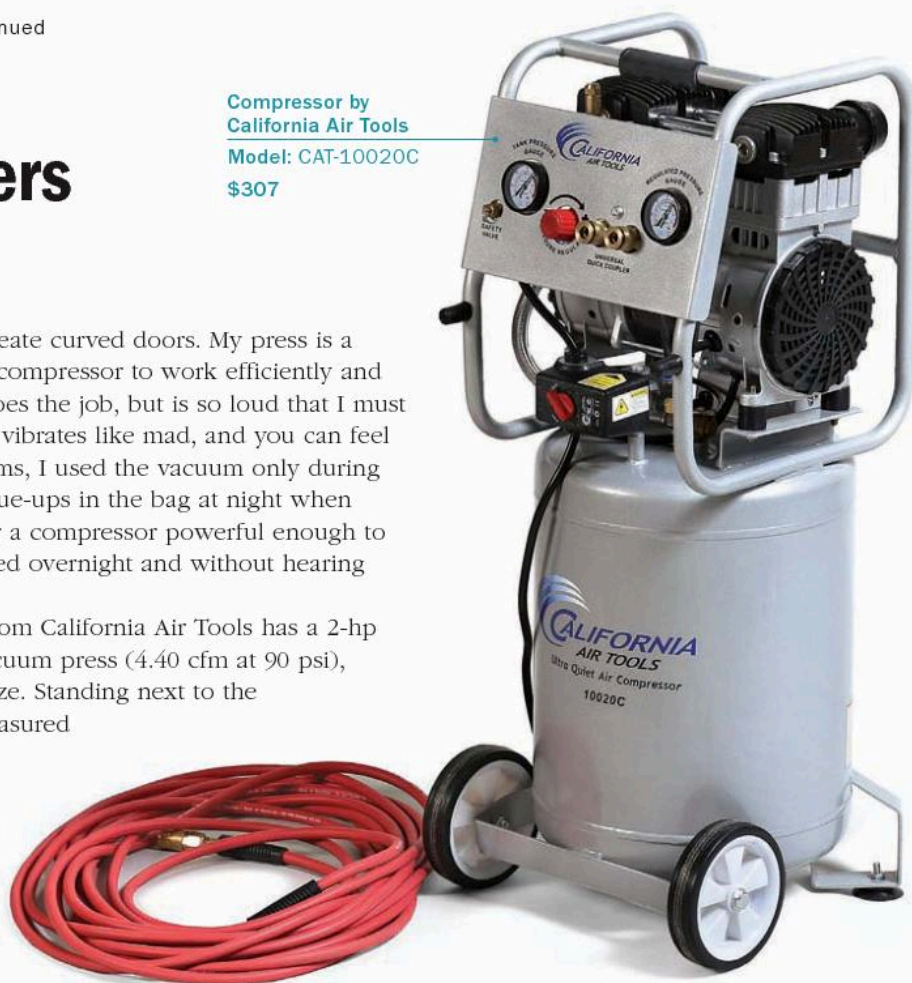
The CAT-10020C also has convenient, user-friendly features. With two universal 1/4-in. quick connectors, simply push in the hose fitting and the connector holds it tight. At 86 lb., it's also fairly light for its size, and the weight is well-balanced when the compressor is wheeled about. The drain valve is tool-free, opening and closing with the turn of a handle. This truly is the compressor I have been looking for.

—Matt Kenney is the special projects editor.

One-handed hookup. There's no need to pull back the collar on the quick connectors. Just push in the hose.



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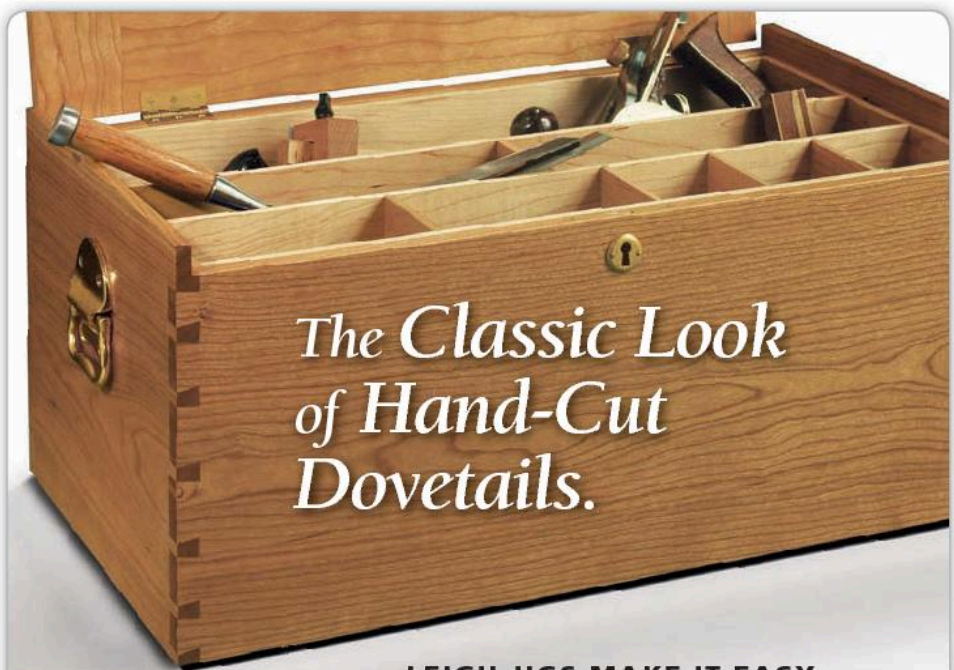
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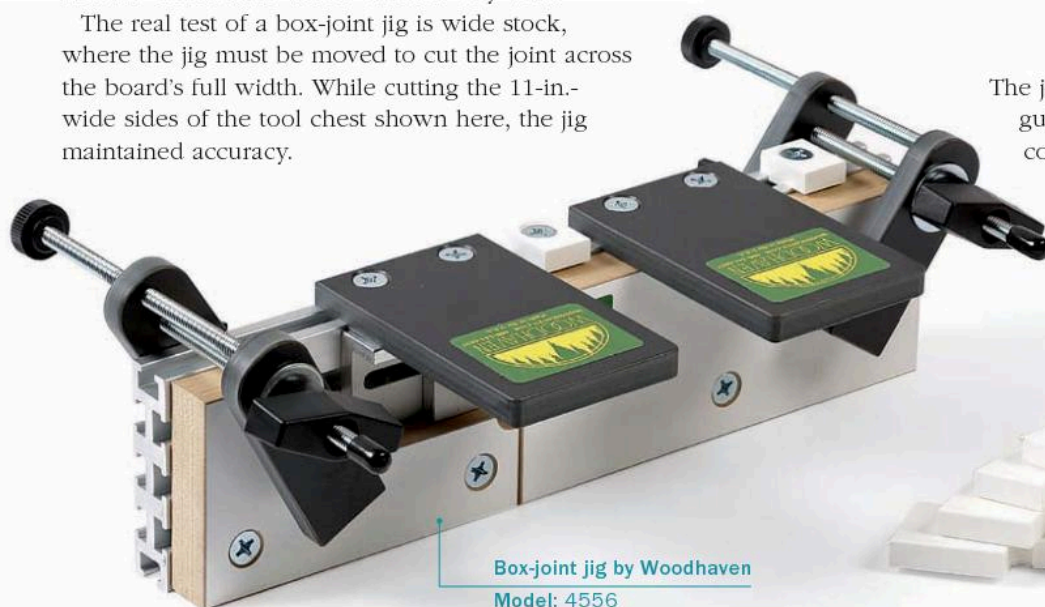
■ ACCESSORIES

A jig for big box joints

BOX JOINTS, ALSO KNOWN AS FINGER JOINTS, are often cut using a tablesaw or router, and are modest in size, with fingers between $\frac{1}{8}$ in. and $\frac{3}{4}$ in. wide (the limits of a dado blade). They were originally used in cigar boxes, which had “locked” corners, but have become a popular joint for many small boxes, as they offer great strength and are attractive.

Larger finger joints are also a key element in Arts and Crafts furniture. Woodhaven’s 4556 portable box-joint jig is designed to cut these larger joints. The jig clamps to the end of a board. It’s designed to be used with a handheld router, but I also used it at the router table and it worked very well.

The real test of a box-joint jig is wide stock, where the jig must be moved to cut the joint across the board’s full width. While cutting the 11-in.-wide sides of the tool chest shown here, the jig maintained accuracy.



Box-joint jig by Woodhaven
Model: 4556
\$120

The jig, which requires a Porter-Cable-style guide bushing mounted in the router table, comes with setup blocks that work quite well for establishing the proper spacing of joints. Using a $\frac{1}{2}$ -in. spiral cutter in the router, you can easily make fingers ranging in width from about $\frac{5}{8}$ in. to about $1\frac{1}{2}$ in. After you’ve dialed in the fit of the joint, you can go to town with the Woodhaven jig, joining corner after corner with a perfect fit.

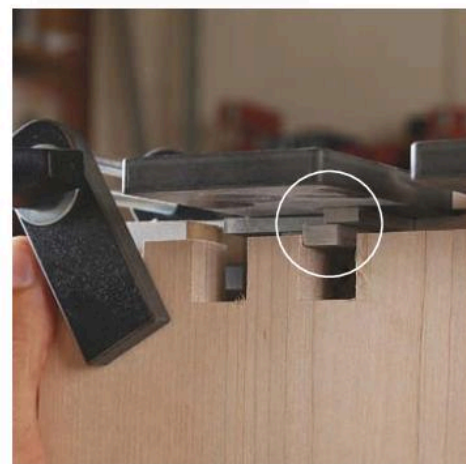
—Doug Stowe is a well-known box maker in Eureka Springs, Ark.



No-measure setup. The jig includes setup blocks that align the template guides and the adjustable stops used to index the workpiece as you cut successive notches.



Guided rout. A guide bushing in the router follows the jig’s black template guides, ensuring that all of the notches are identical and accurately sized.



Accuracy assured. A stop on the jig’s face adjusts to match the size of the notches being cut. The jig is moved along the workpiece a notch at a time, cutting fingers the right size.

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Make a small chisel for delicate detail work

BY CRAIG THIBODEAU

The small size of most inlay and stringing can require delicate tools to do tasks like cleaning and squaring up routed corners and edges. Even a $\frac{1}{8}$ -in. chisel is often too big, so I make my own small chisels, using jeweler's files for the blades.

The two I use the most are a $\frac{1}{16}$ -in.-thick by $\frac{1}{4}$ -in.-wide flat chisel and a $\frac{1}{8}$ -in.-square chisel. Their diminutive size allows me to pare inside narrow grooves for stringing without damaging the walls of the grooves.

These chisels are not difficult to make. All you need is a grinder to remove the teeth from the file, shorten its length, and create a cutting bevel that is then honed on waterstones. Like all chisels, these shopmade ones need handles. Any small piece of hardwood will do. After drilling a hole for the chisel tang and shaping the handle, I secure the chisel in the handle with cyanoacrylate glue. I do not bother hardening and tempering the blade, because the work these tools do isn't demanding. But if you decide to do so, make sure to do it before attaching the handle.

Craig Thibodeau is a professional furniture maker in San Diego.

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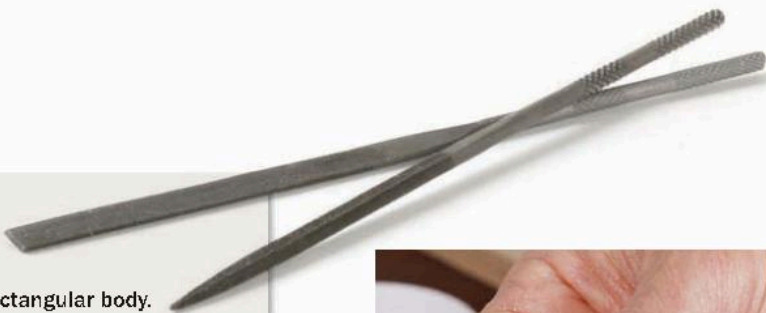
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Jeweler's files come in a variety of shapes and sizes, but the two most useful are a small, square one and one with a flat, rectangular body.



Get rid of the teeth. Gently hold the file flat against the side of a fine-grit grinding wheel. Let the wheel do its work to remove the teeth.



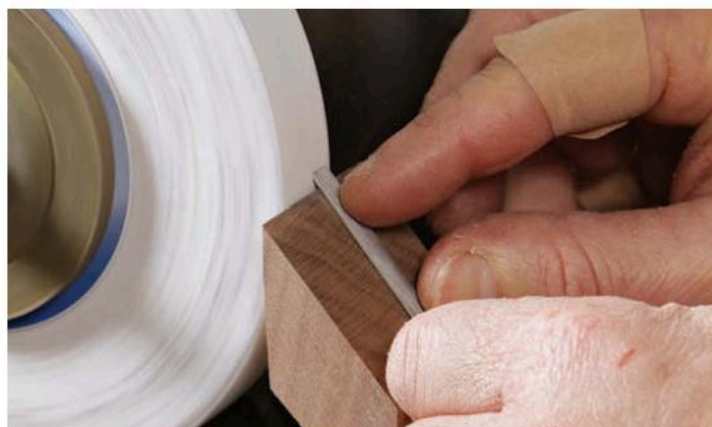
Score the blade. Use the wheel's corner to cut a notch in the blade, using a light touch and allowing the wheel to cut at its own speed.



Snap it short. Hold the file on either side of the notch and give it a crisp bend.



Square the cutting edge. Hold the file square to the wheel to create a blunt edge that's perpendicular to the sides.

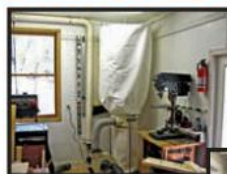


Grind the bevel. The exact angle isn't critical, but one between 25° and 35° works best.



Hone with a stone. Because of the hollow grind, there's no difficulty in polishing the bevel freehand.

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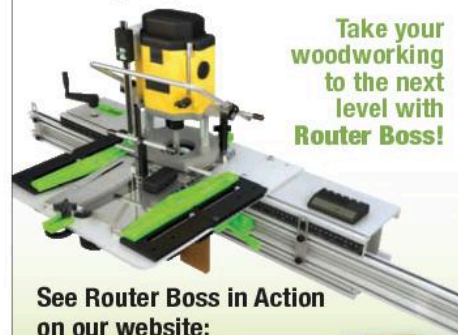
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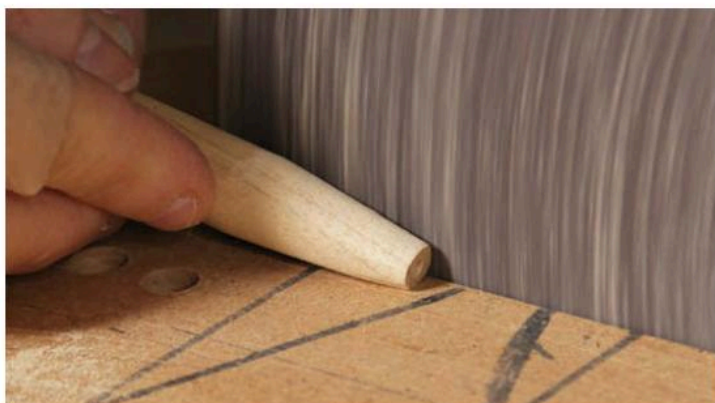
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GET A HANDLE ON IT

Any piece of scrapwood works for the handle. Start with a blank about ½ in. dia. by 3 in. long.



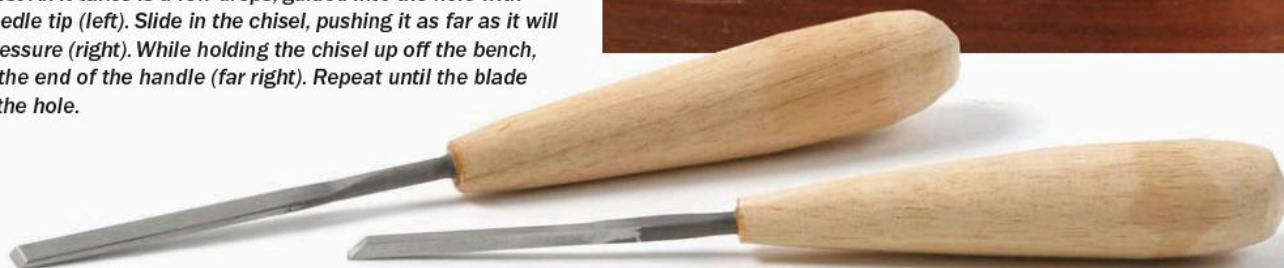
Handle gets a hole. Clamp the handle into a notched block so that it doesn't move while being drilled.



Sand to shape. Thibodeau tapers the front end to create a comfortable grip, then rounds over the back end.



Drop in the glue. All it takes is a few drops, guided into the hole with the help of a needle tip (left). Slide in the chisel, pushing it as far as it will go with hand pressure (right). While holding the chisel up off the bench, rap it firmly on the end of the handle (far right). Repeat until the blade bottoms out in the hole.





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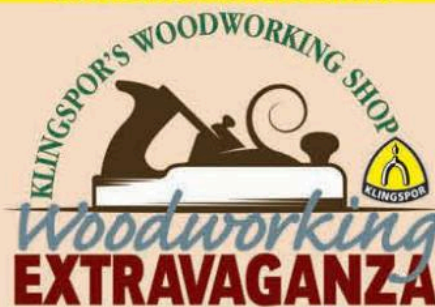


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Design, slowed down

DREAMING UP A TALL DRESSER

BY JOHN REED FOX

For me, design evolves slowly. I am not enamored of newness. Instead I use a familiar vocabulary of line and form that I attempt to refine within each piece. My goal is to make furniture that is functional and elegant and helps create a quiet, centered, contemplative environment.

When I designed this piece, I had it in mind to build a dresser with a not-so-typical front elevation. Originally I was thinking of a long, low piece but in the end I went for something tall. The idea of mixing sliding doors with drawers was inspired by seeing kitchen tansu on a trip to Japan. To my eye the combination creates a very interesting visual rhythm. The doors also gave me a chance to add texture to what is usually a large, flat surface. And people find them very inviting. Almost everyone who sees this piece opens or at least touches them. They make the dresser somehow less formal or standoffish.

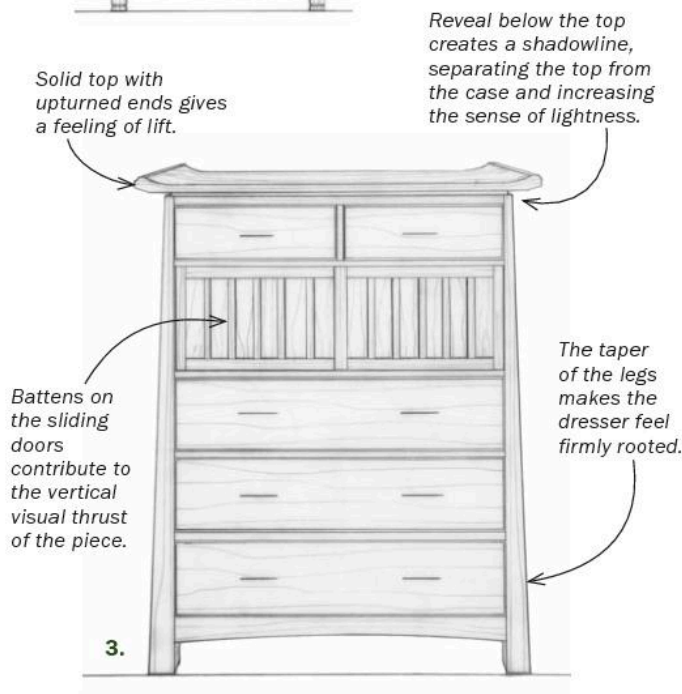
I arrived at the size and location of the doors by playing with the different elements of the front on paper. I made the three lower drawers all the same size, rather than graduating them, since I felt there was already plenty going on in the piece. The dresser stands just over 4 ft. tall, so one can see over and around it, which helps keep it feeling friendly and intimate.

I want the dresser to have a solid but graceful transition to the earth. This imparts a certain sense of stillness. But I also want the piece to have lightness and delicacy. The legs taper slightly wider at the bottom to give the dresser a solid stance, and I hope the taper adds to the lightness of the piece and keeps it visually tall and narrow. The legs are proud of the sides, which makes them look less massive and emphasizes the length and narrowness of the side. To me, the strong vertical lines of the sliding doors add another element of lift. Of course the shaping of the top also imparts lightness to the dresser, as does the small reveal below the top, which adds interest and makes the top float.

The process I use for designing a piece of furniture is one I learned from a friend and fellow furniture maker, Craig Stevens, who studied under James Krenov. Usually I start with a sketch. Given my drawing skills, this is very rough. But it is enough for me to visually understand what I am working toward. At this point I am only thinking about form. I try not to think about construction details. I work with a 5b pencil in a bound notebook; no erasing allowed. Next I draft the sketch in scale. If it is a commission, I do a simple single-point perspective drawing for presentation and to be sure that the idea is in keeping with real-world parameters.



Fox presents his design ideas to clients in one-point perspective drawings, each a well-resolved concept. His third drawing here includes nearly all the elements in the final piece, though he adopted the proportions of the sliding doors in his second drawing. His overall aim was to make a piece that felt light yet rooted.



Finally I do a full-scale mockup. This is where I work out the fine details of curves, tapers, shadowlines, reveals, etc. I use whatever material is available, easy to use, and cheap—blue foam, cardboard, wood scraps. During the mockup process it is important not to get married to a certain design element or detail. After all, that's the point of the mockup.

The mockup sits where I'll see it as I enter the shop, and I keep working on it until my initial impression, when I walk in, is that the design is spot on. At that point the mockup becomes my shop drawing; as I build I take all my major measurements from it. Occasionally I'll need to sketch out some complicated joinery, but usually I just need a few notes.

John Reed Fox builds custom furniture in Acton, Mass.



A Classic Spin on Curved Aprons



Round bistro table is a great way to try a traditional brick-laid construction technique

BY RAYMOND FINAN

I occasionally do repair work on antiques, which has given me the opportunity to examine up close the construction techniques used centuries ago. One that really intrigues me is the old method for making curved table aprons. These days, with modern power tools, vacuum systems, and high-tech adhesives, curved work is often accomplished using bent lamination. Without the benefit of these modern methods, the craftsmen of yesteryear used a straightforward bricklaying process to form curved aprons; then they applied beautiful veneers on the show side to hide the brick wall.

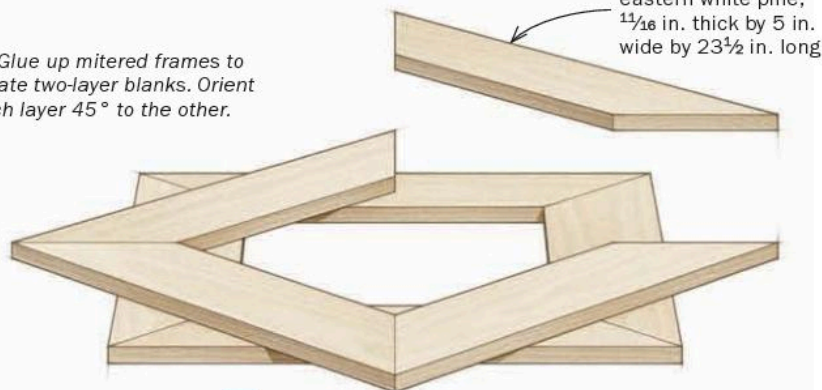
I've used this process on circular and elliptical aprons, and it can even be used in forming compound curves. In this article, I'll show you how I've modernized this traditional technique using a router and router table, plus a little MDF, to build a circular table apron. I'll also show you how I cut the bridle joinery to attach the legs to the apron, and I'll demonstrate a simple process for applying veneer to a curved surface. The result is a bistro table that's a great place to sip your morning brew.

A cue from masons

Masons typically build brick walls with a running bond, in which the bricks in each course stretch across the end joints in the course below. This layout creates more "long-grain" bonding, hence more strength. The principle holds true for wood, too.

BRICK-LAID APRON, START TO FINISH

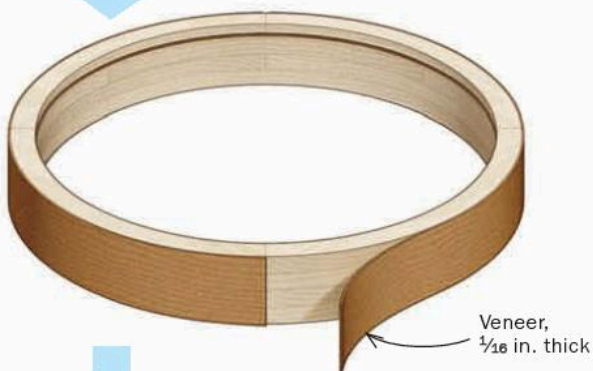
1. Glue up mitered frames to create two-layer blanks. Orient each layer 45° to the other.



2. Saw and rout the first blank to a ring, add the second, and rout that round as well to create the brick-laid apron core.



3. Veneer the outside face in four sections. Position the seams at the leg locations.

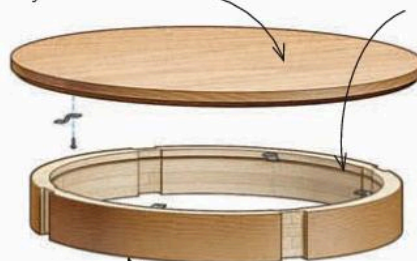


4. Dado the apron for the legs. The inside and outside faces, as well as the bottom edge, get dados.



Top, 7/8 in. thick by 24 1/2 in. dia.

Groove for tabletop fasteners



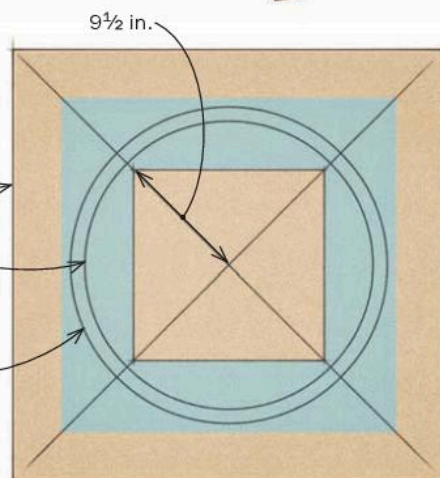
Apron, 1 1/16 in. thick by 2 3/4 in. wide by 22 1/8 in. dia.

Outside face of leg tapers to 1 1/2 in. wide at top.

Leg, 1 5/8 in. thick by 2 in. wide by 45 3/8 in. long

Stretchers, 1 in. thick by 1 3/4 in. wide by 23 3/8 in. long

Tenons, 1/2 in. thick by 1 1/2 in. wide by 2 1/32 in. long



ASSEMBLY TEMPLATE

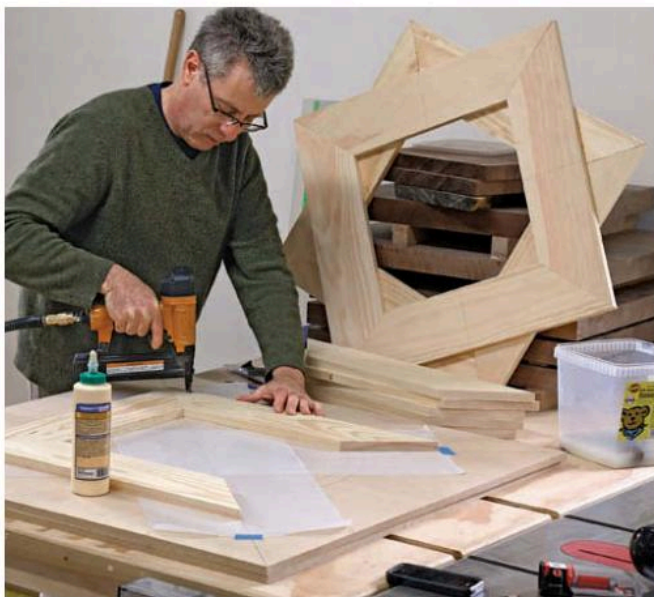
LAYER UP THE APRON

Start with an assembly template.

After drawing diagonals on a square sheet of MDF, Finan uses a beam compass to mark the apron location.



Glue up two layers at a time. Tack down the first layer to the template (right), using the diagonals as a guide for positioning, and gluing only the end grain. Then glue and tack the second layer in place (below). Be careful not to nail in the finished ring area.



When I brick-lay an apron, I use eastern white pine for the bricks for a few reasons. First, it's abundant and cheap, which is good since this process generates a fair amount of waste. Second, it is very dimensionally stable, making it an ideal substrate for veneering. It is also very lightweight compared with hardwoods, so it does not add a lot of unnecessary heft to the piece.

Make the assembly and ring templates

To make the apron, you'll need two MDF templates: an assembly template and a ring template. For the assembly template, start by cutting a 30-in.-square piece of MDF and drawing diagonals from corner to corner. Then, using a beam compass with its point at the intersection of the diagonals, draw two circles: the inside and outside faces of the apron. Finally, make a mark on each diagonal $9\frac{1}{2}$ in. from the intersection. Connect the marks to create a square within the inner circle. This will serve as a reference for laying out the first layer of bricks.

To make the ring template, first tack a square of $\frac{1}{2}$ -in. MDF to a backer board using a brad nailer. Lay out the diagonals and the apron circles as you did with the assembly template. Add some brads between the two circles, then outfit a router with a $\frac{1}{4}$ -in. spiral upcutting bit and mount it to a trammel. Screw the trammel to the MDF where the diagonals intersect. Set the depth of cut to about $\frac{9}{16}$ in. and rout the inside diameter of the ring. The brads keep the pieces from shifting once you rout through the template. Reset the trammel and rout the outside diameter. Carefully pry off the ring template and remove the brads. Don't erase the diagonals on the ring. You'll use them to mark the leg locations on the apron.

Stack the bricks, build the apron

For this project, the apron is $2\frac{3}{4}$ in. wide, and I build it up using four layers of bricks in a running bond. The brick blanks are flatsawn, so when stacked and sawn out they produce a ring of wood that is quartersawn



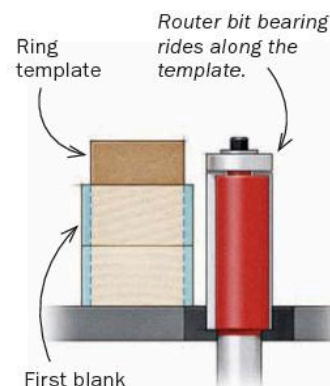
ROUT IT TO SHAPE



Make a ring for routing. Mark out a ring template to match the assembly template. Then rout out the ring using a shopmade router sled screwed to the center of the MDF sheet.



Rough out the ring. Trace the ring profile onto the blanks (left), and cut away most of the waste. Use a jigsaw on the inside of the ring, then turn to the bandsaw for the outside (above).

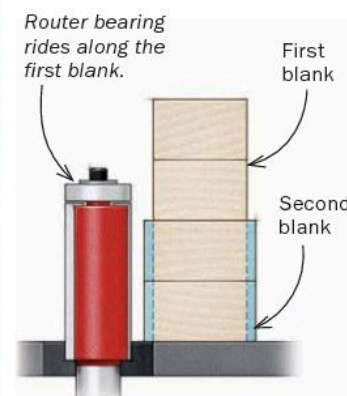


Use the ring template for routing the first blank. Tack on the template and use a bearing-guided bit to flush-trim the inside and outside faces of the ring.

in its height, making an excellent substrate for veneering. Cut 45° miters on the ends of each brick. For this table, you will need 16 bricks to create the four square layers. If your table is bigger, you may need to go with six- or eight-sided layers to create a shape that fits the design without resulting in too much waste.

Tape waxed paper to the assembly template so the bricks don't stick. Apply glue to the ends of the bricks, line up the short edges with the square you laid out, and tack the bricks in place, being sure to shoot the brads well clear of the ring. Don't get fussy if the butt joints aren't perfect, as the strength of the apron comes from the long-grain surfaces overlapping the butt joints. Besides, the veneer will cover small imperfections.

The second layer of bricks comes next. With a square, mark the centerline on each brick of the first



Attach the second ring and use the first as a guide. The first ring, glued to the second, now serves as a template.

veneer the apron

TIP

FAST, FLEXIBLE
CLAMPING CAUL



A scrap of white oak with deep sawkerfs makes a bendable caul that can disperse clamping pressure evenly.

Middle and ends first. After Finan secures the middle of the caul, he clamps the ends (right), making sure the veneer stays aligned with the apron. He then adds clamps, working from the center out (below).



frame. These lines will dictate where you place the corners of the second frame. Apply glue to the bottom and ends of each new brick and, using brads to clamp the bricks in place, build the second frame onto the first one. When the glue has set, pry up the two frames from the assembly template and remove the brads. Set the pair aside and repeat the process for the second ring blank, composed of the third and fourth brick courses.

Shape the apron

To cut the apron to shape, start by laying the ring template on one of the blanks. Line up the diagonals of the template with the mitered ends of the second brick course and trace the inside and outside diameters of the ring. Using a jigsaw, cut away the waste on the inside. Be sure to leave a little waste, since blade deflection from the jigsaw could undercut the ring profile. Use a bandsaw to remove the waste on the outside. Repeat for the second ring blank. Be sure to keep the outside offcuts. You'll need them later for the router jig that helps cut the bridle joints for the legs.

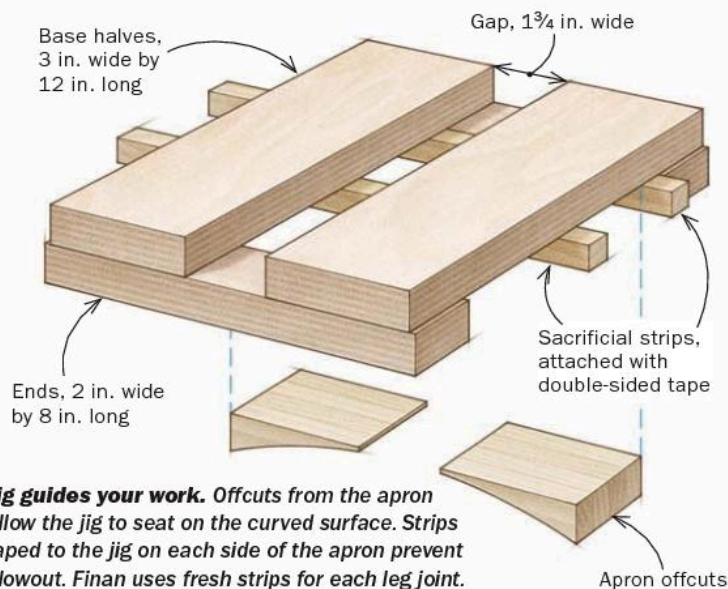
Now, tack the ring template to one of the blanks with a few brads. Using a bearing-guided straight bit at the router table, flush the inside diameter with the template. Next, rout the outside flush and remove the template. Glue the completed ring to the second blank, making sure to align them so that the glue lines alternate in a running bond. Now use the first ring as the template for routing the second ring flush.

Add veneer

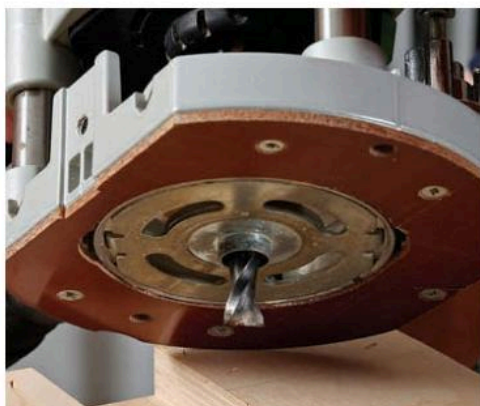
The next step is to apply veneer. Using the ring template, transfer the diagonals to the apron. These marks will be the centerlines for the legs and will be used to line up the router jig. I use four pieces of shop-sawn veneer, approximately $\frac{1}{16}$ in. thick, laid out in sequence for continuous grain. Each piece of veneer covers from one leg to another and extends into the area that will be cut for the bridle joint. This way, when the leg joinery is cut, the fit between the legs and veneer is tight and gap-free.

I begin by making a flexible clamping caul out of a $\frac{3}{4}$ -in.-thick piece of white oak slightly longer and wider than the strip of veneer. Cut a series of kerfs in it, about $\frac{1}{8}$ in. apart and $\frac{5}{8}$ in. deep, so about $\frac{1}{8}$ in. of continuous stock remains. The kerfs

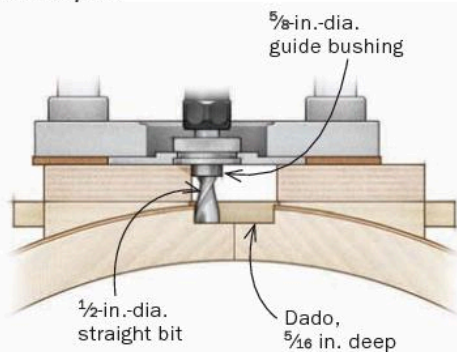
NOTCH THE FACE



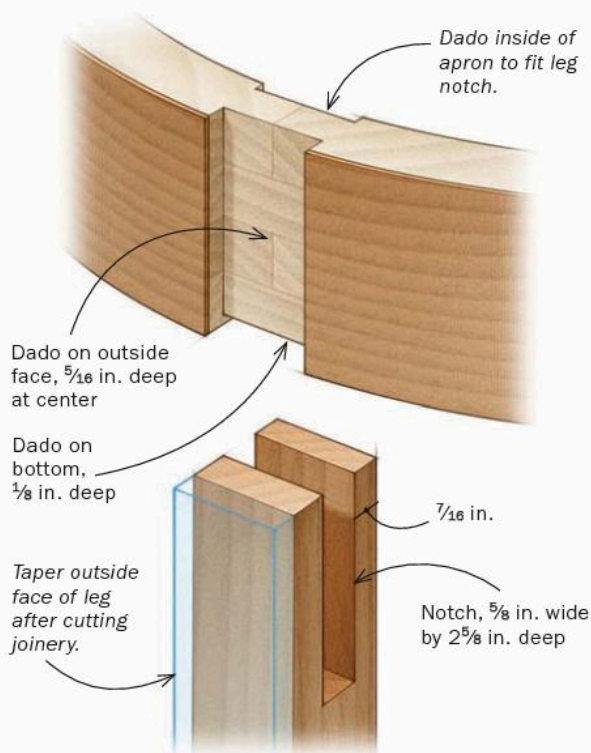
allow the caul to bend freely when clamping the veneer to the apron. Apply yellow glue to the apron between two leg location lines, center the veneer and hold it in place with a single wrap of blue tape around the middle, and then add the caul, smooth side down. Using a series of F-clamps, lightly secure the center of the caul and then clamp the ends. Add clamps, working from the center toward the ends. Let the glue



Clamp and rout. Finan clamps the jig in place and uses a router equipped with a guide bushing and spiral straight bit to dado the outside faces of the apron.



FIT THE LEGS



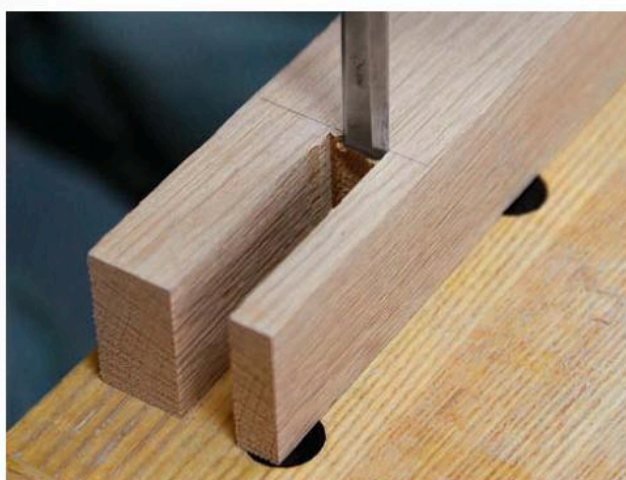
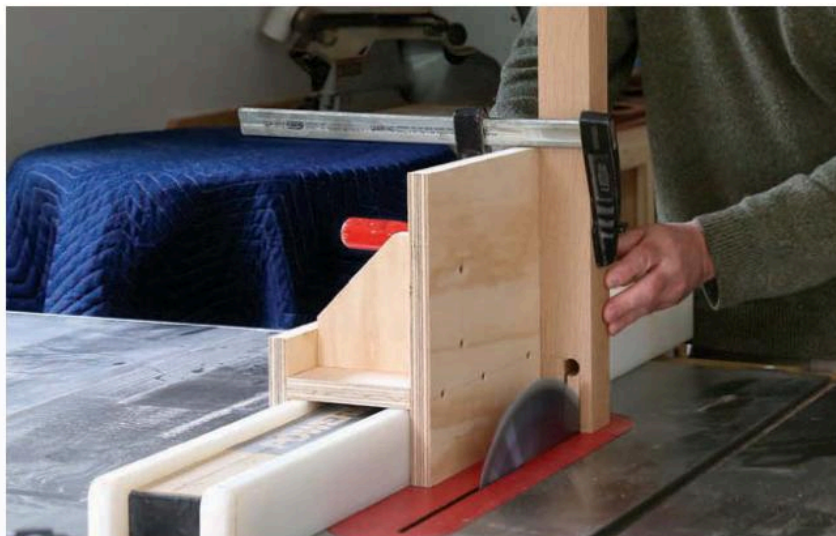
cure for a few hours before repeating the process for the next piece of veneer.

Bridle joints connect the legs and apron

To allow the legs to lock into place, material must be removed from both the outer and inner surfaces of the apron. The outer dados can be completed with a special jig and a router with a spiral upcutting bit. The inner dados are best cut with hand tools because of the tight radius on the inside of the apron.

The router jig's top surface, a platform for the router to ride on, is made from two pieces of plywood. The halves are spaced apart and their inside edges provide the bearing surfaces for the router's guide bushing as you cut the joint. On the jig's underside are off-cuts from the apron's outside diameter. These curved wedges help stabilize the jig when it's clamped to the apron. The jig also has a centerline on one of the end pieces to line it up with the leg marks on the apron. I set the depth of the router bit to remove $\frac{5}{16}$ in. from the outer face of the apron. This allows the leg to sit $\frac{1}{8}$ in. proud of the apron surface. After I rout all four outside dados, I focus on the legs before completing the inside dados.

I mill the legs to a strong $1\frac{5}{8}$ in. by 2 in. and cut them to length. Milling them a little wide allows me to fit the legs into the apron dados tight and gap-free. Next, lay out the bridle joints on the legs. Using a $\frac{5}{8}$ -in. Forstner bit, drill through the leg at the bottom of the



Notch the legs. After drilling a $\frac{5}{8}$ -in. hole at the bottom of the joint, Finan uses a shopmade tenoning jig to cut the cheeks at the tablesaw (above). He then chisels to the baseline (left), working in from both sides to avoid blowout.

TIP

MAKE A LAYOUT BLOCK FOR THE INSIDE DADO



Short leg handles a tall task. Notch a block and shorten one of its cheeks by about 1 in. Slide the longer cheek into the outside dado in the apron and use the shorter end to mark the width and depth of the interior dado.



Saw and pare. After kerfing the inside of the apron with a handsaw, chisel in from both edges to remove the waste. The goal is a snug fit that's easy to bring together. When the inside's done, turn to the dado at the bottom edge. Kerf that before slicing lightly from the outside in. This dado makes sure the joint looks clean.

joint. Cut the cheeks at the tablesaw and square the joint with a chisel. Now cut the through-mortises for the lower stretchers. Once the leg joinery is complete, taper the legs.

Returning to the apron, I'll mark the location and depth of the inside dadoes. I repurpose a test leg—used previously to dial in my tablesaw setup for the leg bridles—as a layout aid. With the joinery accurately cut on the test leg, I saw about 1 in. off of the top back portion of the bridle joint. Use this piece to mark the dadoes on the apron's interior. Because there is only a shallow dado to cut, I just make a series of kerf cuts with a handsaw and chisel away the waste. When the leg can slide on easily but fits snugly, I use the same handsawing and chiseling technique to create the dado at the bottom of the apron that connects the inside and outside dadoes.

Attach the legs

After making the half-laps that join the stretchers and dialing in the mortises and tenons joining the stretchers to the legs, it's time to assemble the table. The assembly must follow a specific sequence. Glue each stretcher to its corresponding legs. You will have two leg assemblies, one with the open portion of the half-lap facing up and the other with it facing down. Fit the pairs together and attach them to the apron as a single unit. Clamp the bridle joint tightly. Finally, attach the top with table-mounting clips, sometimes called Z-clips, which are slipped into a groove routed in the apron and screwed to the underside of the top. □

Raymond Finan is a professional furniture maker in Arlington, Vt.



Assemble the base. After gluing the legs to the stretchers in pairs and letting them cure, glue the stretchers to each other and the legs to the apron all at once. Afterward, Finan drives a screw into the half-lap joint of the stretchers from below.



Dovetail Saws: The Cream of the Crop

We pick seven of the best and explain what sets them apart from the rest

BY CHRIS GOCHNOUR

Thirty-two years ago, when I hung out my shingle as a furniture maker, it was hard to find an excellent dovetail saw. Today, we have it good—maybe too good. There is a bounty of great saws on the market, saws that are well-tuned and ready to cut fine dovetails right out of the box. But that can make picking the right one daunting. For such an essential tool, a test seemed in order. To narrow the field, I focused on Western-style backsaws (to learn more about Japanese saws, see Andrew Hunter's "The Power of the Pull Stroke," *FWW* #249).

It's amazing how differently one dovetail saw can perform from another. It's a simple tool—a blade with rip teeth, a back, and a handle—yet the details can really set a saw apart. Even so, individual elements such as plate thickness, set (and the resultant kerf), hang, pitch, rake,

weight, and length are far from acting individually. Instead, what matters most is the sum of the parts in practice—in other words, how well the saw cuts.

Because these tools are so personal, I invited seven skilled woodworkers, all proficient in dovetail joinery, to my shop for a few hours on a Saturday morning to test the dovetail saws. We made multiple cuts in ½-in.-thick cherry and oak with every saw and took copious notes along the way, noting elements like ease of start, tracking, ergonomics, and speed. In the end, of the 13 dovetail saws we tested, the seven listed here led the pack. Any one of these saws could be a great choice.

Contributing editor Chris Gochmour is a professional furniture maker and woodworking instructor in Salt Lake City, Utah.



With a little help from his friends. For a broader perspective on the saws, seven fellow woodworkers came by Gochmour's shop to test the lot. Their opinions pretty much agreed with his.

Dovetail saws

No two saws here share identical stats. While there isn't an algorithm for the perfect saw, understanding these terms may help you define what's right for you.

GLOSSARY

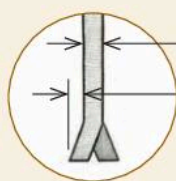
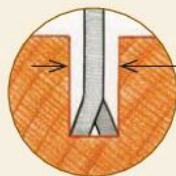


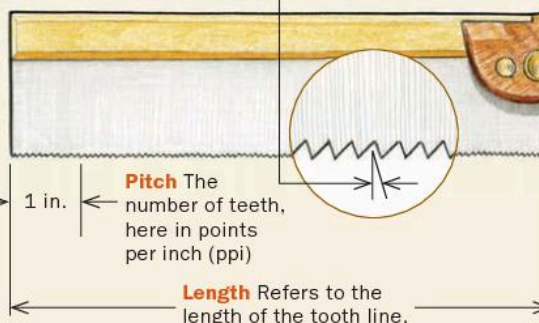
Plate thickness

Set The amount the teeth are bent to the sides.



Kerf The width of the cut, which is the thickness of the plate and set combined.

Rake The angle of the front of the saw's teeth. On a saw that has 0° rake, the front is vertical. As the angle increases, the front of the tooth leans back, becoming more relaxed.



Pitch The number of teeth, here in points per inch (ppi)

Length Refers to the length of the tooth line.

Hang The angle of the saw's handle relative to its tooth line. The lower the hang, the more toward vertical the handle is.

BAD AXE STILETTO

Price: \$245–\$357.50; \$347.50 with options shown
Pitch: 15 ppi
Plate thickness: 0.018 in.
Kerf: 0.025 in.
Rake: 10°/8°
Length: 12 in.
Hang: 30° (low)
Weight: 15.2 oz.



This saw **cut with ease, accuracy, and speed**. Its tooth pattern is fairly complex: a 10° rake for the first 2 in. and 8° for the rest, with bevels of 10° on the first 2 in. and 5° on the rest. Bad Axe will size the handle and suit the appearance to your preferences. This saw is my top choice, with the highest marks from most reviewers. One called its performance in both cherry and oak “amazing overall.” Another said, “This saw cuts like you imagine a dovetail saw should cut.”

GRAMERCY

Price: \$240
Pitch: 19 ppi
Plate thickness: 0.018 in.
Kerf: 0.026 in.
Rake: 0°
Length: 9 in.
Hang: 53° (high)
Weight: 7.2 oz.



This saw is the **lightest and shortest of the group**. It also has the highest hang, and its tote feels the most petite. It started well and, once going, cut smoothly most of the time. Although the saw was a bit catchy for some in white oak, one person noted it “cut really well” in the wood. People with larger hands tended to be put off by the small handle, but others thought the shape was great.

LIE-NIELSEN

Price: \$125
Pitch: 15 ppi
Plate thickness: 0.020 in.
Kerf: 0.026 in.
Rake: 5°
Length: 10 in.
Hang: 42° (medium)
Weight: 12.7 oz.



This saw **performed beautifully on multiple tasks**, such as starting a cut, traveling smoothly, and tracking a line. It's well balanced, although the handle was a little tight for larger hands. Many of the other testers agreed the tool is great all around, but a few had issues with tracking. Still, one noted, “Very easy to start and use in general.” Most reviewers said this saw offers the best value.

PAX 1776

Price: \$138
Pitch: 21 ppi
Plate thickness:
0.020 in.
Kerf: 0.030 in.
Rake: 1° to 2°
Length: 10 in.
Hang: 37° (low)
Weight: 16 oz.



One of the most noticeable features of the Pax is its heft, which is, in part, due to the saw's sizable brass back. The saw **starts with ease and cuts steadily and fast**, and the sawing itself feels rigid. The tool also comes in 8-in. and 12-in. lengths. Aside from the wide kerf, I found the Pax to be excellent.

Most reviewers felt the saw started well. Some, though, said cutting oak was a bit of a challenge.

SKELTON

Price: \$318
Pitch: 16 ppi
Plate thickness:
0.018 in.
Kerf: 0.022 in.
Rake: 8°
Length: 10 in.
Hang: 50° (high)
Weight: 12.8 oz.



It's difficult to say anything negative about the Skelton dovetail saw. It **excelled at every task** in both oak and cherry, from beginning the kerf to tracking a line quickly. It took me a little while to adjust to the higher hang, but that's because I'm used to saws with low hangs. The company also offers custom sizes for its handle. Others loved the saw, too. One person remarked, "This saw makes the user look like a pro."

VERITAS STANDARD

Price: \$74
Pitch: 15 ppi
Plate thickness:
0.020 in.
Kerf: 0.027 in.
Rake: 14°
Length: 9¼ in.
Hang: 43°
(medium)
Weight: 12.6 oz.



Of the group, this saw provides the **most bang for the buck**. It cut extremely smoothly and was quite maneuverable. While the other saws on the list use metal spines, the spine of the Veritas is a composite that conserves weight. Reviewers noted the saw's ease of use and speed of cut, and some said it performed as well as pricier saws. Some with larger hands commented on the tight fit between the top and bottom horns of the handle.

WINSOR

Price: \$165
Pitch: 15 ppi
Plate thickness:
0.020 in.
Kerf: 0.025 in.
Rake: 8°
Length: 10 in.
Hang: 41°
(medium)
Weight: 12.6 oz.



This saw deserves high praise. It cut fast and easily tracked a line. Its only downside was a tendency to be a bit grabby in the white oak. Of the saws reviewed, it had the **most comfortable handle** for my large hands.

Another reviewer with large hands noted the Winsor's handle was his favorite.

Another chose this saw as the top pick. Winsor also makes 8-in. and 9-in. versions.



HANGING
MIRROR

TWO-PIECE
DESK SET

Handmade Gifts



FLATWARE
CARRIER



TEA LIGHT
CANDLE
HOLDER



4

Tasteful projects made quickly from scraps

BY CHRISTIAN
BECKSVOORT

A woodworker's friends and family always want to see the results of all that time spent in the shop. Small, quick-to-make gifts are a good way to show them. We've all made our share of cutting boards and keepsake boxes; here are a few suggestions for other quick pieces you can make. This is a great chance to use up those accumulated scraps and make a lot of people happy.

Contributing editor Christian Becksvoort makes furniture in New Gloucester, Maine.

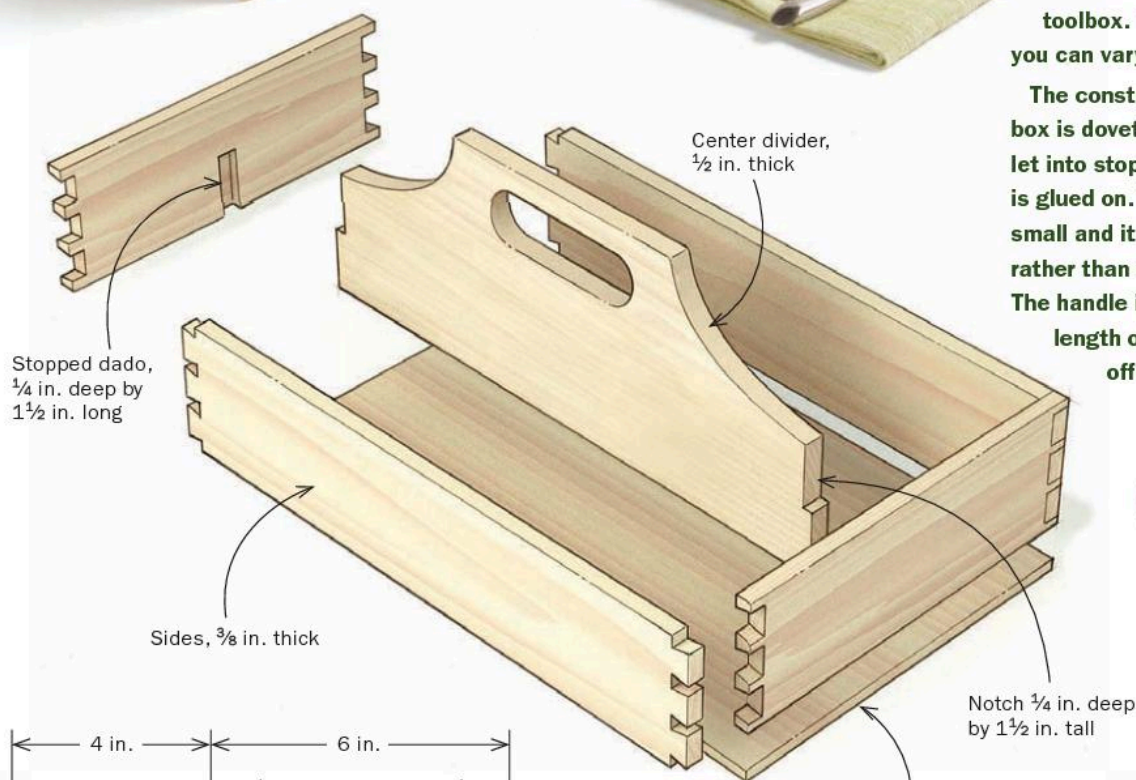
1 Flatware carrier is versatile



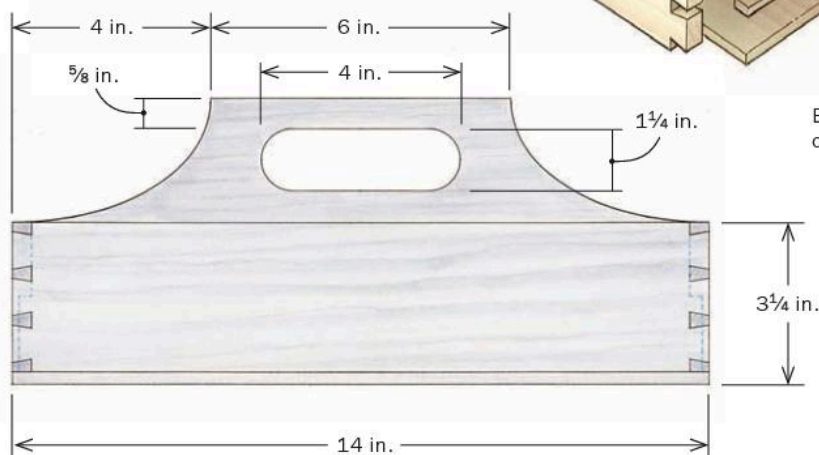
This sweet caddy can be made with hand tools, power tools, or a combination. It is a variation on a Shaker dining room tray. The original was 18½ in. long, but I find that most flatware and kitchen utensils will fit easily into this smaller version. Build it to whatever size you find most useful.

It can also be used for incoming and outgoing mail, to hold cords and chargers, as a tea caddy (with dividers added), as a desk organizer, or as a small toolbox. This version is white pine, but you can vary the wood, too.

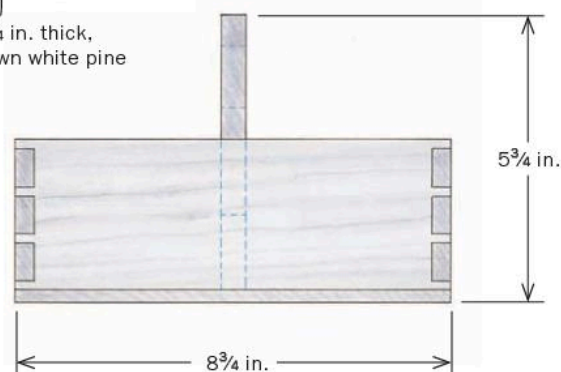
The construction is straightforward: The box is dovetailed, the center handle is let into stopped dadoes, and the bottom is glued on. The stopped dado is pretty small and it is faster to cut it by hand rather than with a router or dado blade. The handle is ½ in. longer than the inside length of the box, and ¼ in. is sawed off the top half of each end.



To purchase expanded plans and a complete cutlist for these 4 handmade gifts and other projects, go to FineWoodworking.com/PlanStore.



SIDE VIEW



END VIEW



Cut a stopped dado. Because the stopped dados are small, Becksvoort cuts them by hand. He scribes the line with a knife, chisels out the sides and waste, and cleans it up with a router plane (right).



The handle is also the divider. After drilling both ends of the hand-hold with a Forstner bit, use a chisel to waste out the center. Becksvoort works halfway through one side, flips the piece over, and removes the rest. Then he uses a drawknife (right) to shape the scooped ends of the handle.



Insert the handle and add the bottom. After gluing up the dovetails, slide the handle in from the bottom, trapping it in place when you glue the bottom directly to the box (right).



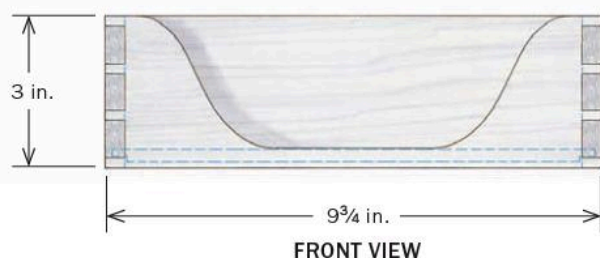
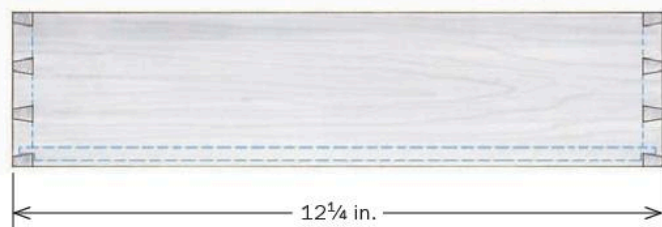
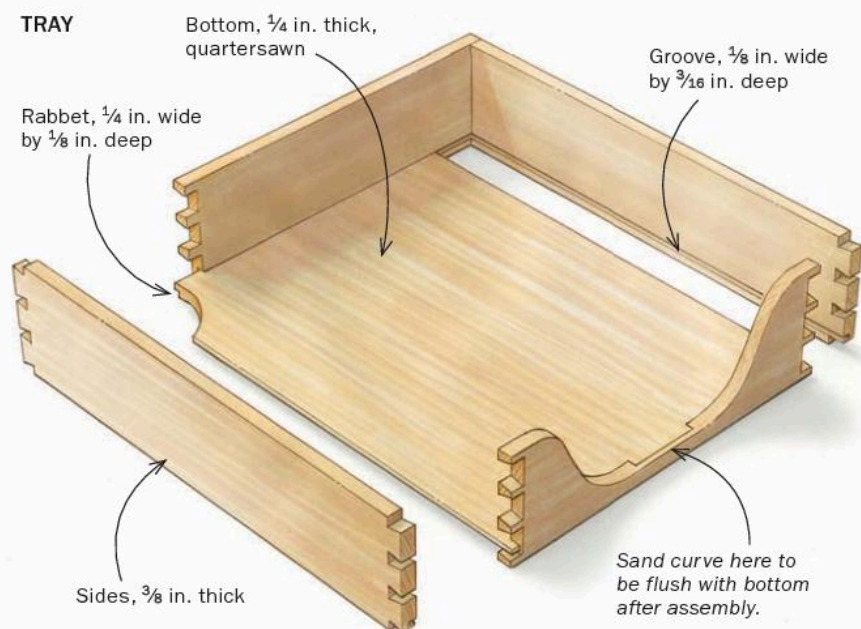
2 Two-piece desk set



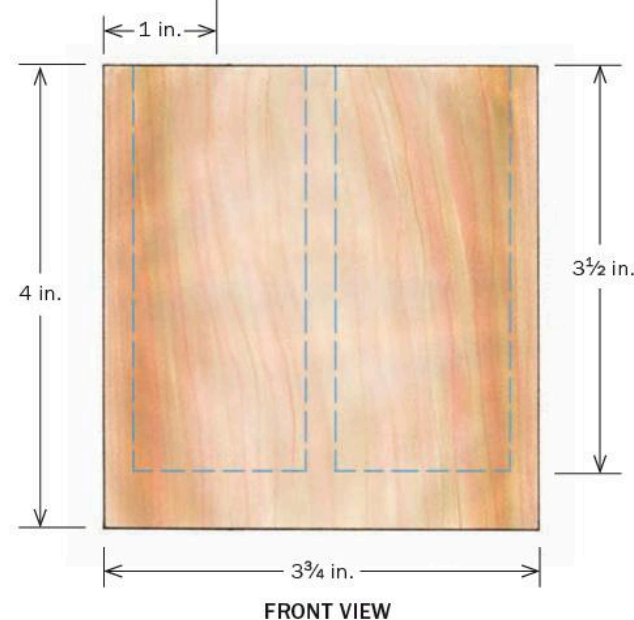
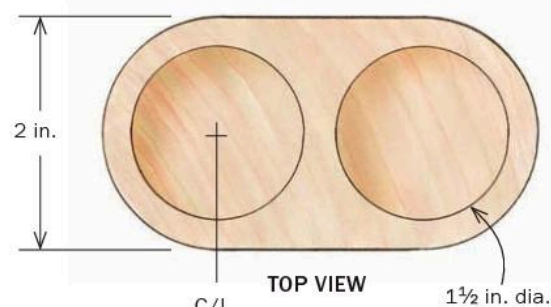
It's nice to be organized, to have your desk uncluttered, and to have all your to-do projects in one place, with pencils, pens, and letter opener at the ready. Paperless society? Not yet. This small inbox with a pen and pencil holder makes a great project.

The box is dovetailed, with a cut-out in the front for easy access to the papers inside. I use a bandsaw for the cutout, but a coping saw would work, too. The bottom can be quartersawn pine, glued underneath, or a floating panel set in grooves on all four sides. The pencil holder is a block of scrap, drilled with two holes. When using such a large bit it's a good idea to hold the block with a hand screw clamped horizontally to the drill-press table. After drilling the holes, I bandsaw the outside shape and plane it smooth. Alternatively, it can be hand-carved for a more textured look.

TRAY



PENCIL HOLDER



THE TRAY

A groove for the trapped bottom. After cutting the dovetails but before gluing up the box, clamp it together and use a trim router with a slot-cutter and bottom-bearing-guided bit to cut the groove for the bottom around the inside of the box.



Bandsaw the cutout in the front. Disassemble the box and cut out the shape of the front. This will leave a thin line of wood just above the groove for the bottom. You can address that after the glue-up by cutting out the center and feathering it toward the outer edges.



Glue up the box but not the bottom. Insert the bottom during the glue-up, but leave it unglued so it can float.

THE PENCIL HOLDER



It starts with a block. Clamp the block to the drill-press table and use a Forstner bit to drill the pencil holes. Because they are large, deep holes it's a good idea to back out the bit and clear the waste before hitting bottom. Use a bandsaw to rough out the outside shape.

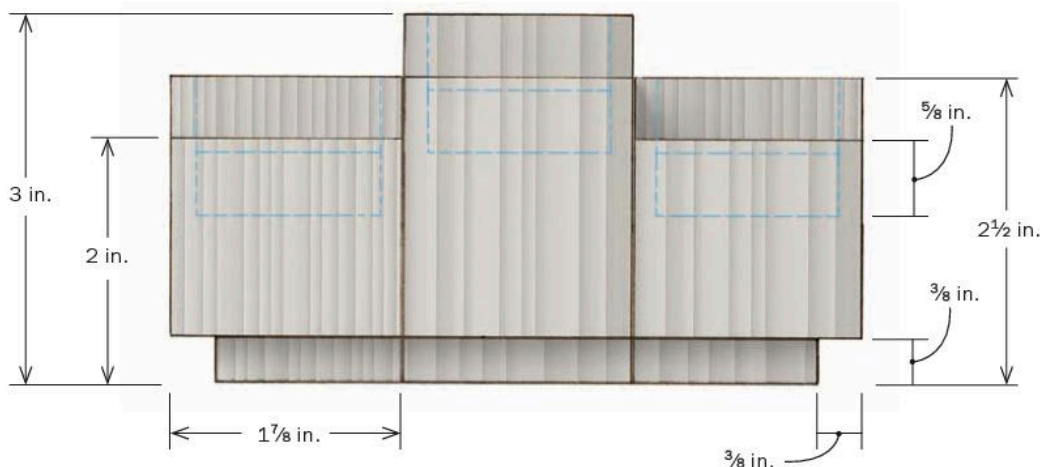
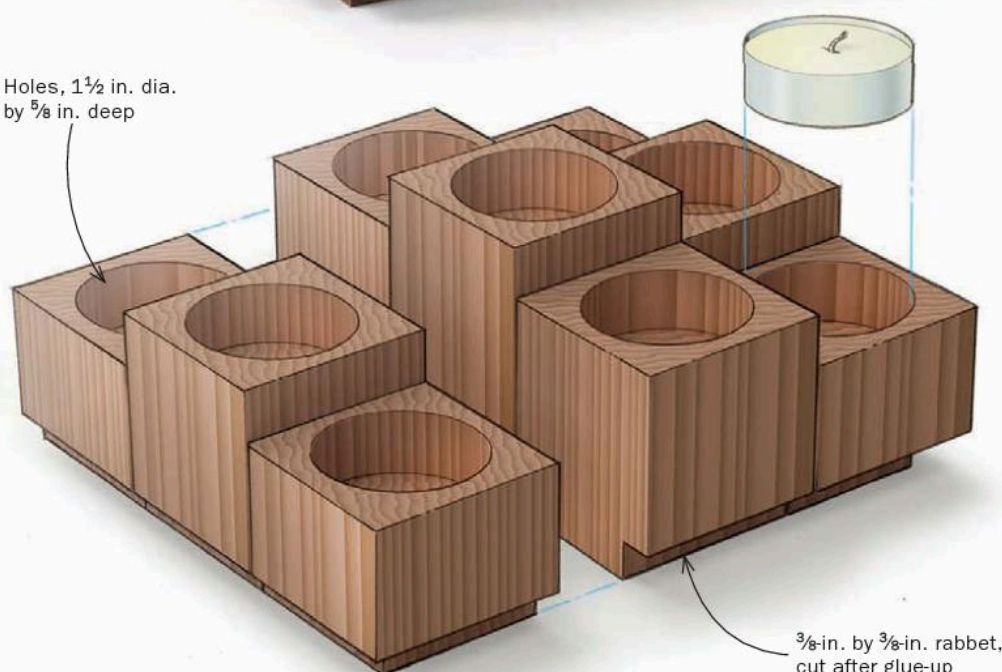


Finish it off. Becksvoort uses a block plane to smooth the bandsaw marks, leaving a hand-planed finish.

3 Tea light candle holder



Holes, 1½ in. dia.
by ⅝ in. deep



Here is a great chance to use scraps, no matter the species. It's also a chance to get creative. Although my tea light candle holders are all tidily rectilinear, feel free to offset the parts and expand the sizes, numbers, shapes, and layouts. If you're a turner, turn a disk and drill holes in it. If you're a carver, shape and carve a nice slab and drill holes to suit. Most tea lights will fit into a 1½-in.-dia. hole. If you want to get fancier (and safer, in my opinion), use



glass inserts. You can turn out a bunch of these gifts in a morning.

For my holders, I milled a stick 1 7/8 in. square by about 12 in. to 16 in. long, and cut it into short lengths on the tablesaw. I drilled one end of each piece with a 1½-in. Forstner bit. Then I glued three together with a hand-screw clamp, keeping them aligned during glue-up by holding them in a bench vise. When the glue was dry, I sanded the sides and planed the bottoms to get the unit perfectly flat. Then I glued the sub-assemblies together, and finally rabbeted around the bottom to create a foot.



Cut and drill. After milling sticks square, use the tablesaw to cut all the parts to length. Then take the parts to the drill press. A hold-down jig keeps the block in place while you use a Forstner bit to drill the recess for the tea light candle.



Glue up in two stages. First, glue together three rows of three. Once those are dry and cleaned up, glue the three rows into one block.



Adding a rabbet creates a base. Use the tablesaw to make two cuts on each side of the bottom. First, with the assembly bottom against the rip fence, make a cut on all four sides. Then with the bottom on the tablesaw top, cut along all four sides again.

4 Hanging mirror

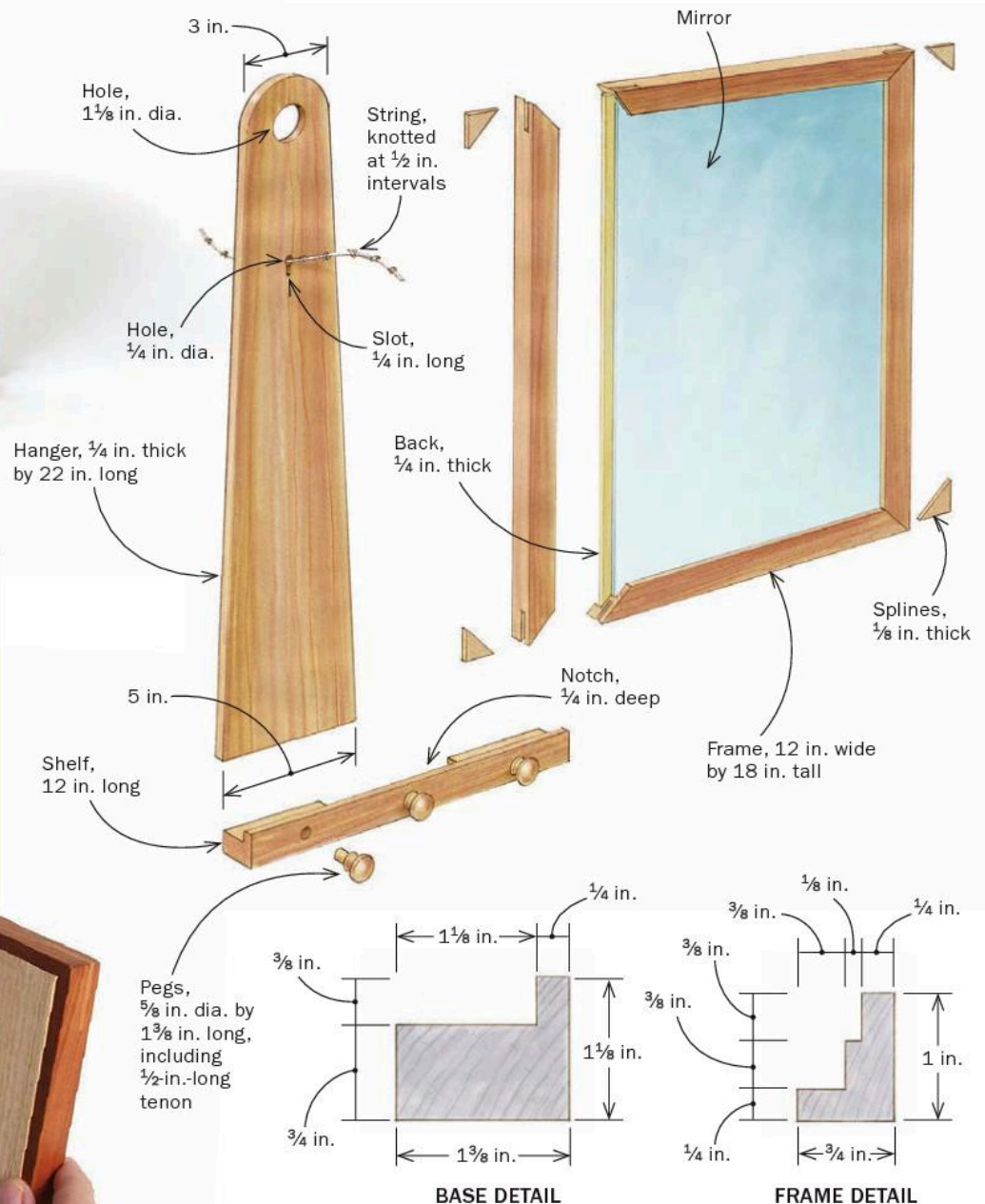


The Shaker wall mirror may take a bit longer than the other gifts, but it is well worth the effort. The mirror rests on a shallow hanging shelf, and its forward angle can be adjusted.

To make the frame, cut a double rabbet into the frame stock. Miter the four corners, glue up the frame using green tape to clamp it, and spline the corners. Add the mirror and the pine back. Near the top of the back, drill a small hole and insert a piece of string, with a large knot at the end to keep it from pulling out. The back is held in place by small brads, nailed

in at a 45° angle, and bent over. The top end of the tapered hanger has a hole that allows it to hang on a peg. At the bottom, the hanger is screwed to the shelf. Measure from the bottom of the mirror to the string, and drill a 1/4-in.-dia. hole at that height near the top center of the hanger. Use a file to cut a slot at the bottom of the hole. To make the mirror adjustable, tie a series of knots in the string and feed it through the slotted hole.

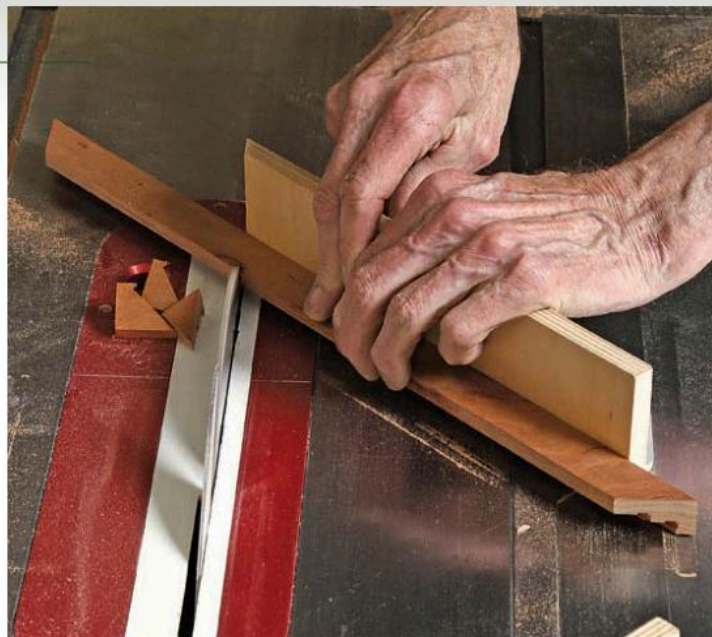
Finally, insert the pegs. You can use them to hang jewelry, trinkets, washcloths, and other items.



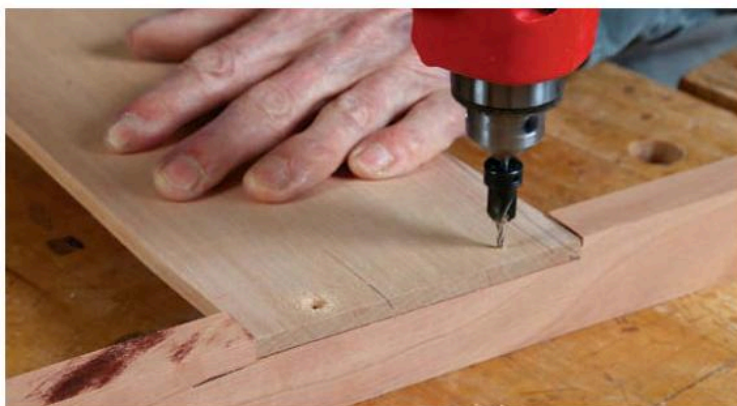
FRAME FIRST



Rabbets, then miters. To cut the double rabbets, Becksvoort first makes two ripcuts in the wide face of the workpiece (left). Then he turns it on edge and makes two more rips (center) to finish the rabbets. With the rabbets done, he uses a miter gauge to cut the miters (right).



ADD A HOLDER



A two-part shelf to cradle the mirror. A shaped back with a hole for a peg hanger screws into an L-shaped shelf with Shaker knobs. When predrilling, use a bit with a countersink so the screws won't protrude.



Add the Shaker pegs. Turn three Shaker pegs, and insert them into the front of the shelf. Becksvoort compresses the tenons with vise grips to make it easier to fit them in the glue-up. A hand screw pushes them all the way in and holds them while the glue dries.



Smart Technique for Gluing Thin Panels



Low-profile clamps and blue tape combine to eliminate buckling during the glue-up

BY PHILIP MORLEY

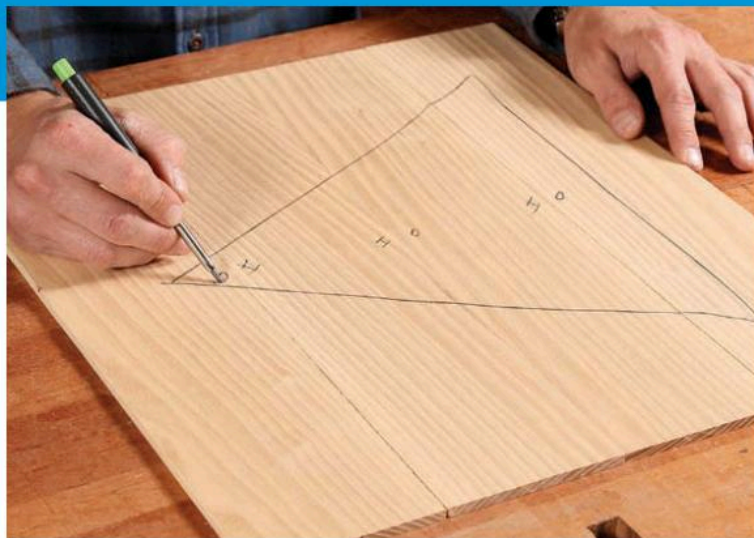
Gluing up thin panels is not easy, because thin boards tend to buckle or shift when clamping pressure is applied. So when faced with the job of gluing up 20 panels, each $\frac{1}{4}$ in. thick, I found a better way. I had been using blue tape as a clamp when gluing up mitered boxes and it always worked well, so I figured it would work well for the edge joints in thin panels, too. Happily, it does.

But to get truly tight taped edge joints on thin panels, you must have pressure applied across the panel as you lay down the tape. The best way I've found to do this is to pinch the boards between a stop and a pair of Veritas Bench Blades, then apply the tape. Bench Blades, which are clamps that fit in your benchdog holes, have a low-

GET READY FOR GLUE-UP



Appearance matters. Arrange and rearrange the individual boards until you've found the most aesthetically pleasing order.

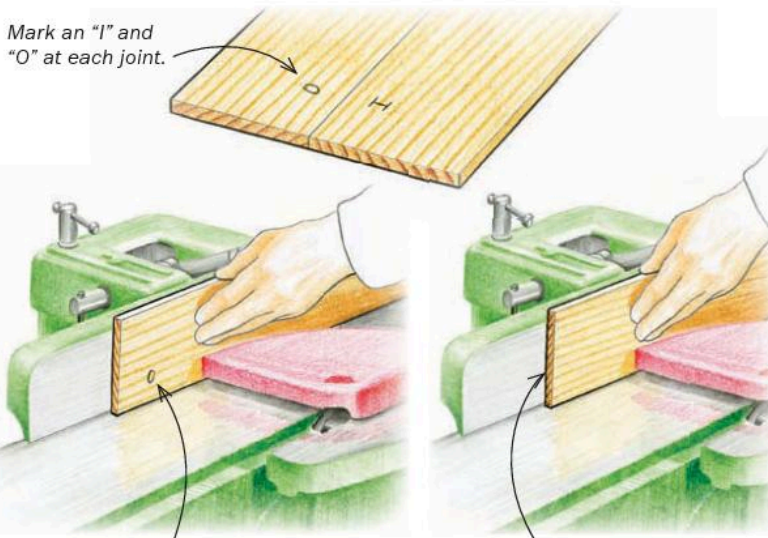


Mark the boards and joint the edges. Draw a triangle across the boards to mark their sequence, then draw an "I" for "in" and an "O" for "out" on either side of each joint. These indicate how the board will be oriented when jointing.



Square joints, guaranteed. No matter how carefully you set up the jointer fence, it always seems to be just a bit out of square. Alternate which face goes against the fence to create edges that complement each other and create seamless joints.

Mark an "I" and "O" at each joint.



Orient the "O" away from the fence.

Orient the "I" toward the fence.

The result is a flat panel even if the angle of the jointed edge is not 90°.



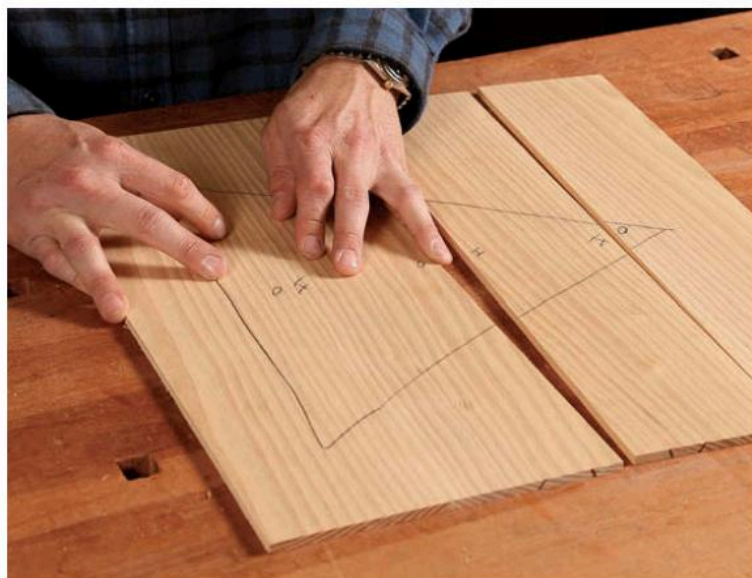
profile jaw activated by a cam mechanism. They apply just the right amount of pressure and do not cause the boards to buckle.

The combination of blue tape, Bench Blades, and a stop makes for a dead-simple, effective technique for gluing up thin panels. It's perfect for these thin door panels, and works just as well for even thinner stock, like shopsawn veneers.

Arrange for looks, then joint the edges

In woodworking, appearance matters. So after I've milled the boards for a panel to their final thickness, I lay them out on my bench and arrange them in different ways, flipping them over and turning them end for end until I find the most pleasing array.

All of the edge joints must close without



Look for gaps. Check along the length of the joint. The boards must close with no space between them.

CLAMP THE PANEL AND TAPE THE FIRST FACE



Secure the stop. Locate the stop so there is $\frac{1}{8}$ in. or so of space between the panel and the Bench Blades (left). If the Bench Blades don't exert enough pressure on the panel, move the stop closer to them. Morley uses a hold-down so that the free end of the stop doesn't flex when clamping pressure is applied to the panel (center). Finally, engage the Bench Blades' cam mechanisms to apply pressure to the panel and tighten the joints (right).

Tape across the joints. Pulling the tape taut as you go, mash it into the wood fibers with a medium-bristle brush (right). Then repeat the taping process along every edge joint (below).



Veritas Bench Blades, \$24.50 to \$32.50 each, leevalley.com

gaps. To help with this I mark both sides of the joint, one with an "O" for "out" and the other with an "I" for "in," and alternate the faces while edge-jointing (see photos, p. 55). Why? Because jointer fences seem never to be perfectly square. Alternating the faces creates mating edges that compensate for any deviation, ensuring that the panel stays flat. After jointing all of the edges, lay the panel on the bench and check one joint at a time. If you need to apply pressure to close gaps, rejoin the edges.

Tape and glue the joints

When all of the joints close tightly, you can glue up the panel. Clamp a stop across the bench. I use a piece of plywood that extends across the bench and has a cleat screwed to one end that fits into the bench vise. Set the stop so the panel will fit between it and a pair of Bench Blades with $\frac{1}{8}$ in. or so to spare. Then apply pressure with the Bench Blades. If the Blades can't apply enough pressure to close the joints tightly, move the stop a bit closer to them and try again.

With the panel secured, it's time to tape it together. Begin by applying strips of tape perpendicular to the joints. To ensure that

GLUE AND TAPE THE SECOND FACE



Spread glue in the joints. With the tape side down, lay one board on top of the bench and drop the remaining ones down to open the joint. Holding the panel near the bottom prevents the other joints from opening as you do this.



Remove squeeze-out and tap the joints flush. Use a wedge of hardwood with a somewhat flexible tip to pick up the glue bead in a continuous motion. This prevents glue from getting into the pores. Then tap all the boards back into the same plane with a rubber mallet before engaging the Bench Blades. Finally, tape the second face (below), using the same technique as on the first side of the panel.

the tape will keep the joints tight, I stretch it as I pull it across the panel, and use a brush with medium-stiffness bristles to mash the tape into the wood fibers. This prevents the tape from slipping or pulling up. Lay down a strip every 4 in. to 6 in. Next, run tape along every joint, using the same stretch and mash technique. Then it's on to glue-up.

Release the Bench Blades and flip the panel over. Place one board on the bench-top edge, holding the remaining boards lower so that the joint opens up. Spread glue. Repeat for all the joints. Lay the panel on the bench and remove any squeeze-out with a wedge-shaped piece of wood. The pointed end of the wedge easily slides under the glue and lifts it off without spreading it around or pushing it into the fibers.

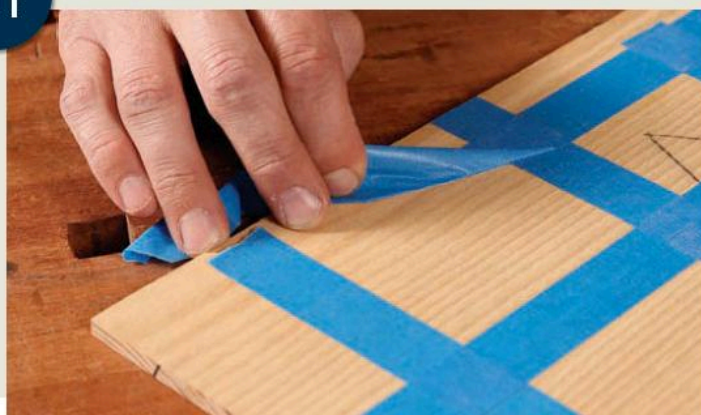
Now clamp the panel between the stop and Bench Blades again, with the taped side down. Tape the second face just as you did the first, then take it out of the clamps and set it aside. Get to work on the next panel. I wait about 45 minutes before pulling off the tape, which is best done at a low angle. Give the panel 24 hours before putting any stress on the joints. Scrape the joints to remove any squeeze-out, and the panel is ready to be cut to size. □

Philip Morley is a professional furniture maker in Wimberley, Texas.



TIP

AVOID TEAROUT WHEN REMOVING THE TAPE



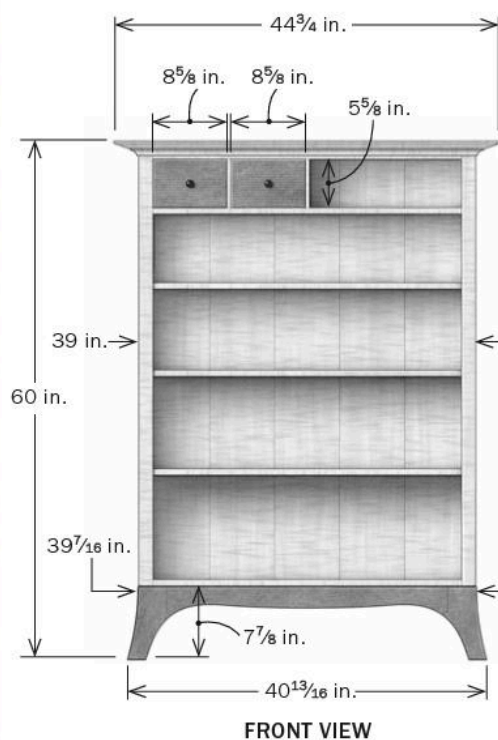
After about 45 minutes, pull the tape at a low angle and toward the side to avoid pulling up wood fibers. Then let the glue cure for 24 hours.

Elegant Bookcase Top to Bottom

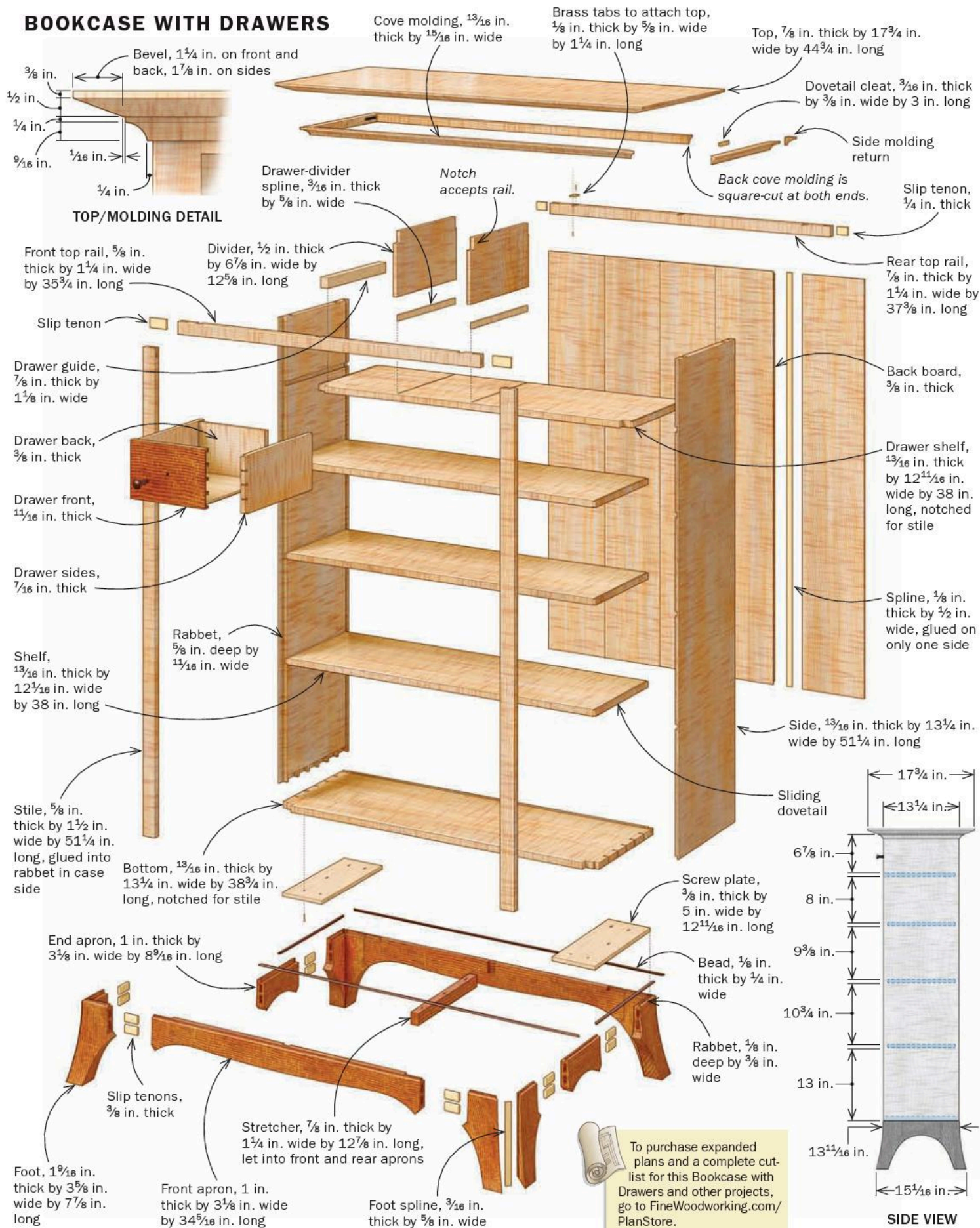
A profiled top
and splayed
base add style

BY MIKE KORSAK

If you read and appreciate books, as I do, then you probably appreciate the functional aspects of a bookcase. If you enjoy beautiful materials and elegant, understated design, as I do, then I hope the design of this piece will appeal to you as well. I built it with a matched set of curly maple boards, which I purchased from Irion Lumber. I paired the maple with sexy, straight-grained bubinga for the base. And I used East Indian rosewood as an accent.



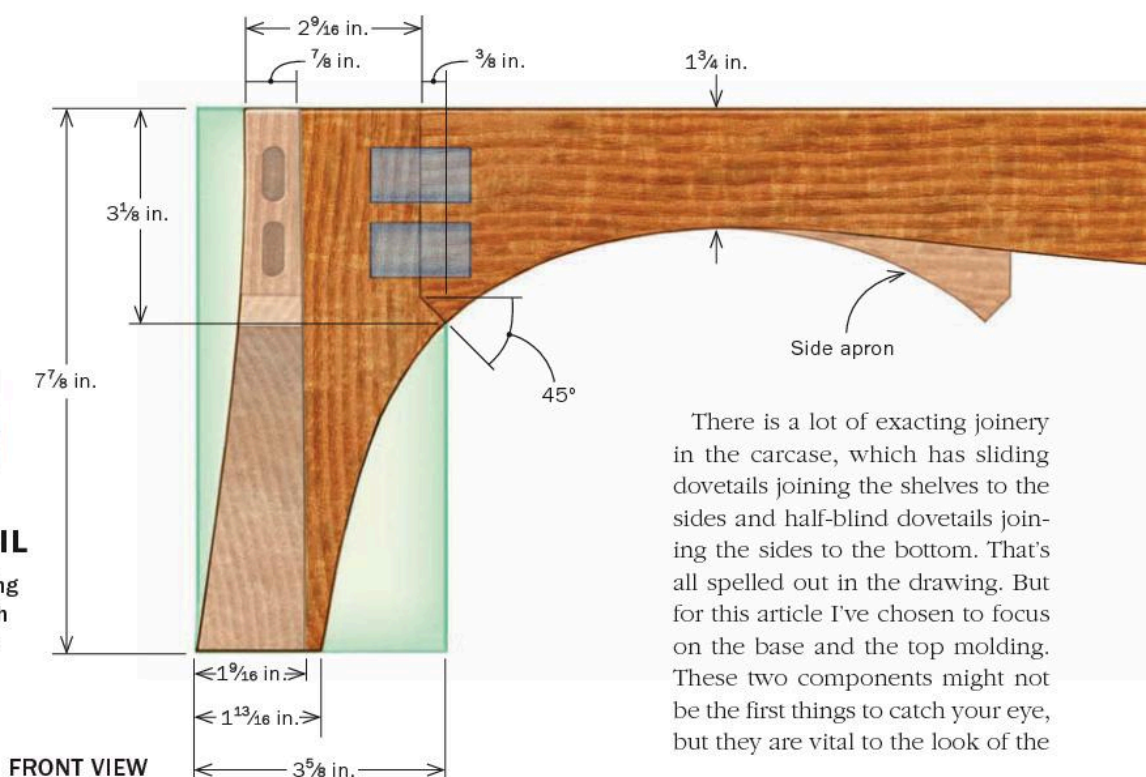
BOOKCASE WITH DRAWERS



**Base joinery
and shaping**

BASE DETAIL
The innocent-looking base is packed with curves and joinery.

The innocent-looking base is packed with curves and joinery.

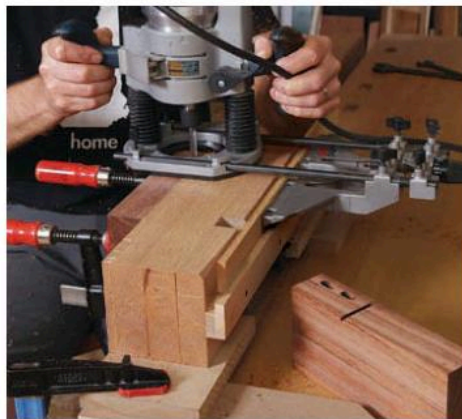


There is a lot of exacting joinery in the carcase, which has sliding dovetails joining the shelves to the sides and half-blind dovetails joining the sides to the bottom. That's all spelled out in the drawing. But for this article I've chosen to focus on the base and the top molding. These two components might not be the first things to catch your eye, but they are vital to the look of the

MAKE THE FEET



Canted kerf. The base joinery begins with a kerf cut in the foot blank at 45° for the gunstock miter.



Sliding jig for slip tenons. Korsak made a router jig that has a channel on the back that captures the router fence, steadying the cut.



Bandsaw the sweep. The face of the foot is bandsawn to a curve.



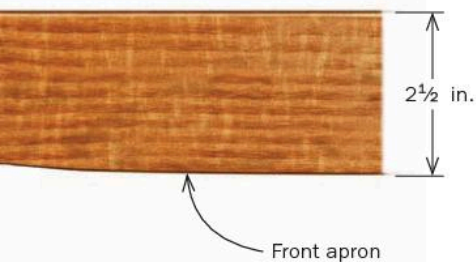
The feet meet in a miter. Korsak miter the feet at the tablesaw, cutting in several passes to reduce pressure on the short workpiece.



Slot for a spline. With the feet mitered and the fence moved to the other side of the blade, cut a groove for the spline.



Finish the gunstock. Korsak roughs out the shoulder on the bandsaw. He'll follow up with multiple crosscuts on the tablesaw.



piece, and they are both a bit more challenging than they might seem.

Feet first

The feet on this base pack a lot of curves and unusual joinery into a small space. I begin making them by cutting the angled kerf for the gunstock miters. These little miters add a bit of refinement to the design, and also eliminate short grain that might be prone to breaking off. I cut them with a miter gauge on the tablesaw. I cut the mating miters on the aprons now as well.

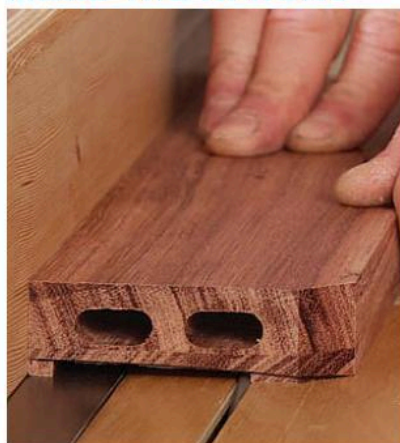
With those cut, I mortise the feet and aprons to accept slip tenons. I do this with a plunge router and a 3/8-in. upcutting end mill bit. I built a jig for the router that makes the mortising go quite smoothly.

The feet flare outward, making the feet and aprons slightly concave on their outer faces. To create that flare, I make a curved template and trace it onto the feet. Then I use the bandsaw to cut the profile. I'll remove some of the bandsaw marks at this point with hand tools, but I wait until the base is fully assembled to finish the cleanup.

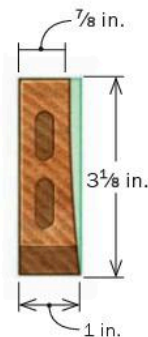
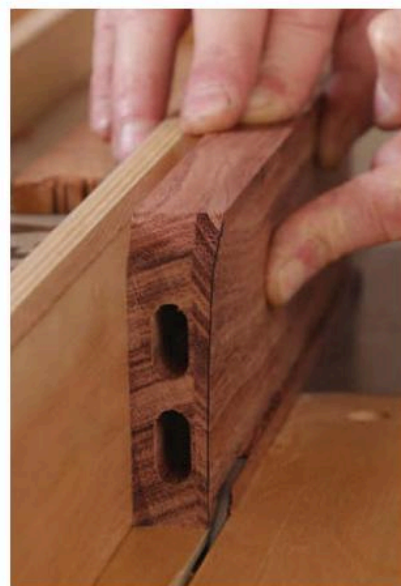
Next I cut the miters where the two halves of each foot are joined. I rip these miters on the tablesaw, with the blade set at 45°. Then, without changing the sawblade angle, I move the fence to the opposite side of the blade and cut spline grooves in the mitered faces.

Finish the joinery by bandsawing away the material above the gunstock miters. These cuts can be cleaned up using a crosscut sled at the tablesaw by nibbling across, taking multiple passes. Do final fitting with a block plane and chisel.

MAKE THE APRONS

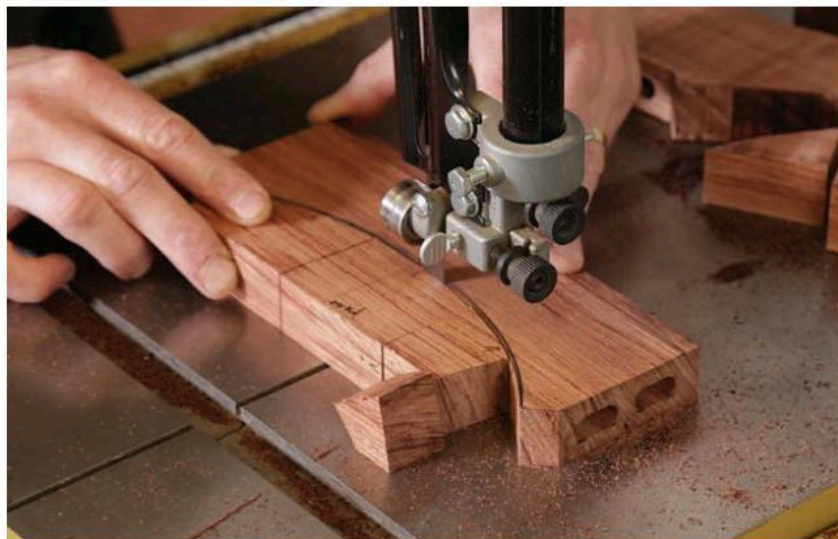


Nibble to a curve. Korsak creates the slight concavity on the outer face of the apron with multiple passes at the tablesaw, adjusting the fence and the blade height with each pass.



Complete the sweep. Having left some wood at the edge of the apron to support it as he cut the sweep, Korsak flips the board on edge to cut that wood away.

FINAL SHAPING



Cut the edge of the apron. Using relief cuts and entering from both ends in turn, Korsak carefully cuts out the curved edge of the apron.

Finish shaping the foot. With the sweep and the miter cut, bandsaw the foot's curved edge. It will get cleaned up after assembly.

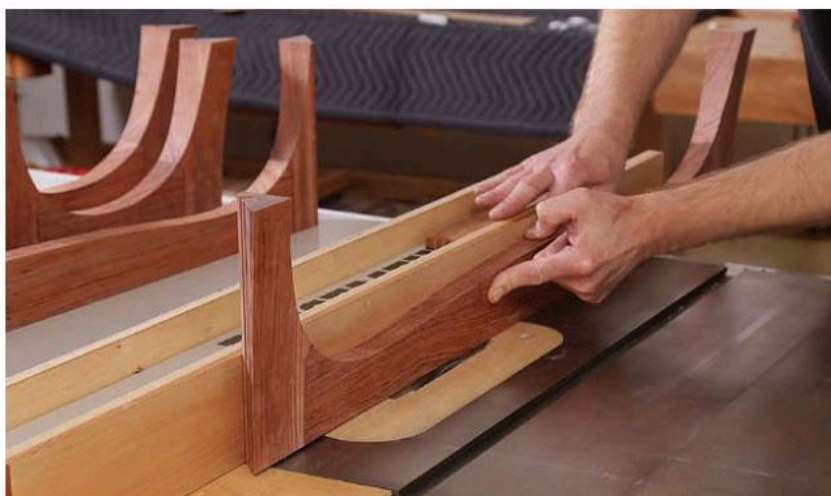


Assemble the base



One foot at a time. Using a mitered cutoff as a caul to protect its vulnerable mitered edge, Korsak glues the foot to the apron.

Interrupt the assembly. After gluing feet to both ends of each apron, cut the rabbet where the decorative bead will be seated.



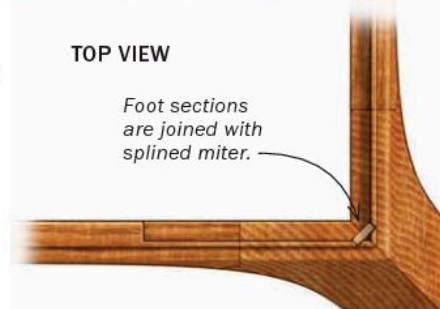
Excellent caul. Using cutoffs from shaping the foot, Korsak makes clamping cauls that fit its face and edge curves and enable him to exert pressure perpendicular to the miter joint.



Careful at the corners. Korsak glues up one corner of the base at a time for maximum control. For the last corner he separates the feet just enough to apply glue to the miter and spline.

TOP VIEW

Foot sections are joined with splined miter.



At this point I rough out the concave face of the aprons. First I dry-assemble each foot-to-apron joint and trace the curve of the foot onto the end grain of the apron. Then, at the tablesaw, I make multiple rip-cuts to waste the bulk of the wood. Afterward, to fair the curve, I use a spokeshave with a convex sole.

Before moving on to assembly, I bandsaw the curved cutout along the edges of the feet and aprons. I leave a little extra material at the gunstock miter, where the transition from foot to apron occurs. I'll clean this up after assembly.

Assembling the base

Base assembly begins with gluing the foot-to-apron joints one at a time. After the subassemblies are glued up, I use a handplane to flush the tops of the feet to the tops of the aprons, and to ensure that the tops of the subassemblies are flat. I also mill a rabbet on the top to accept the decorative rosewood bead that punctuates the transition from base to case.

I take the time now to fine-tune the fit of the foot miters, using a block plane and dry-fitting each joint. With each joint dialed in, I pre-glue a spline into one of the

feet at each corner joint. This saves valuable time during the glue-up, and ensures that the spline won't shift and prevent the joint from pulling together properly.

To help with the final glue-ups, I make custom clamping cauls using offcuts generated while making the feet. Each caul is made with two offcuts—one matching the concave face of the foot and one matching the curved edge. To those two pieces I add a block ripped at 45°, which lets me exert clamping pressure perpendicular to the miter joint. With so much attention on preparation, actually gluing the corner joints is fairly straightforward. I tackle them one at a time.

Beads make everything better

Before attaching the base to the carcass, make and install the rosewood bead. I shape the bead with a scratch stock, working on both edges of a wide blank. Then I rip them off the blank at the bandsaw and refine the bead with files and sandpaper. If I don't have stock long enough for the longest runs, I scarf shorter beads end-to-end.

I thoroughly enjoy installing the beads. Working with hand tools to cut and fit the miter and scarf joints is almost meditative, and the results are extremely rewarding. I



Beads by hand. With a shopmade scratch stock, Korsak cuts beads on both edges of a wide rosewood workpiece.

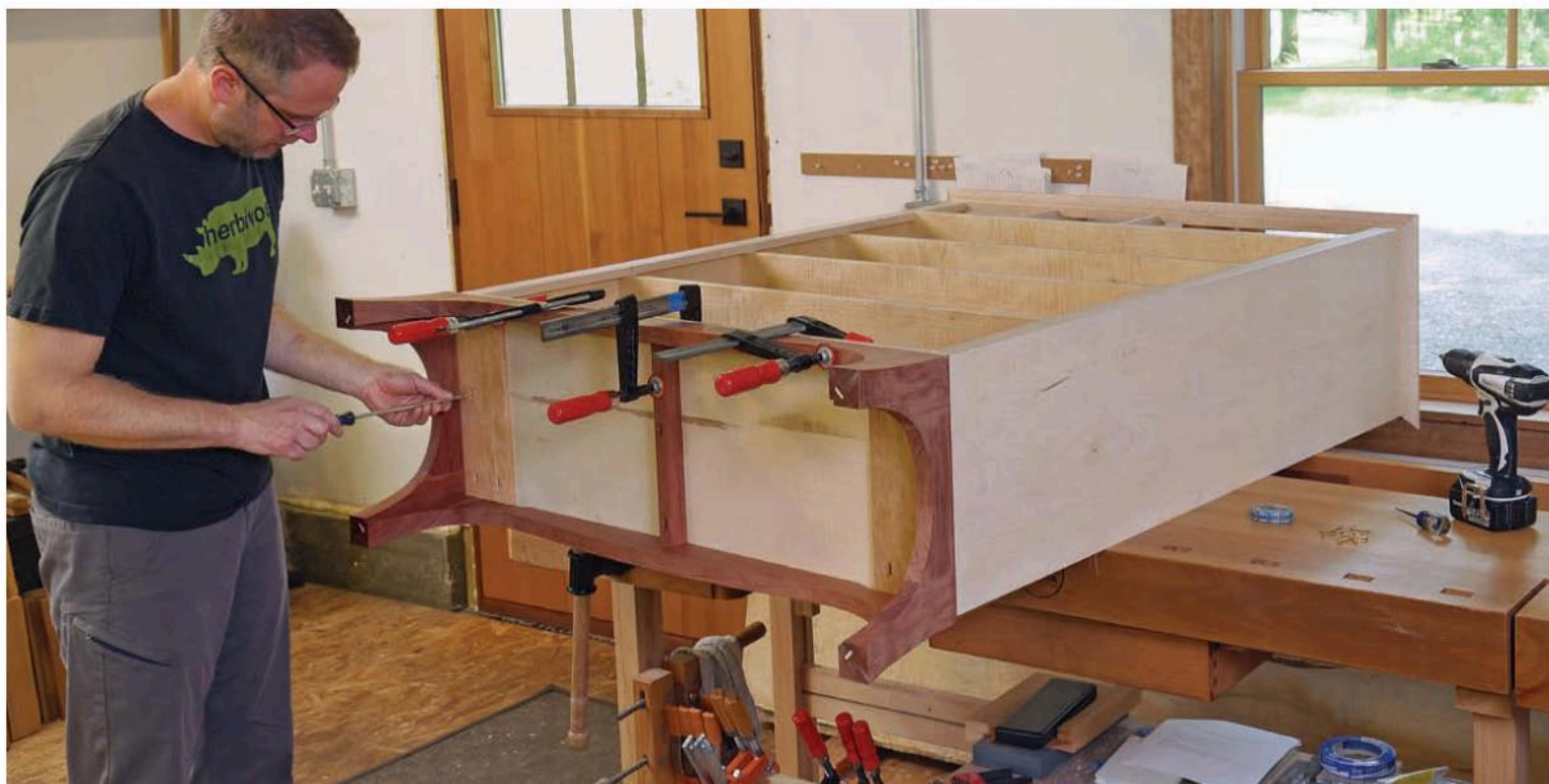


Slit into strips. Cut the beads free at the bandsaw, then smooth the bandsawn face of the bead with a handplane.



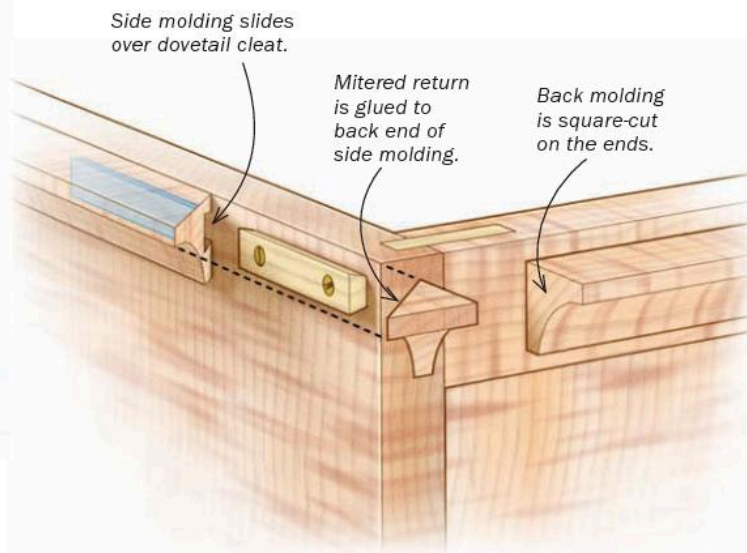
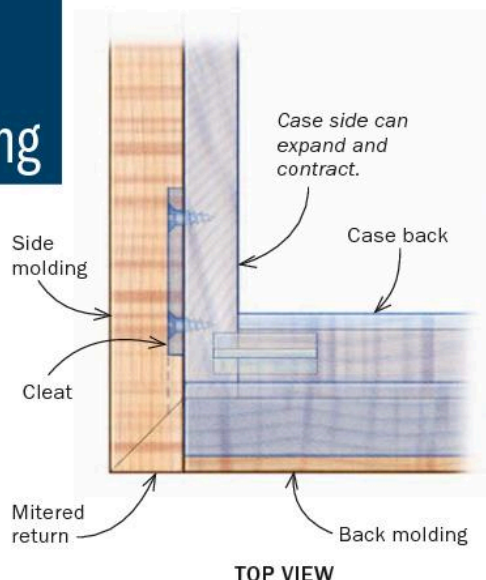
Glue the beads into the rabbet. Korsak uses painter's tape to keep the beads in place as he fixes them with glue and brads.

Screws keep the base in place. Elongated clearance holes permit the case to move with the seasons.

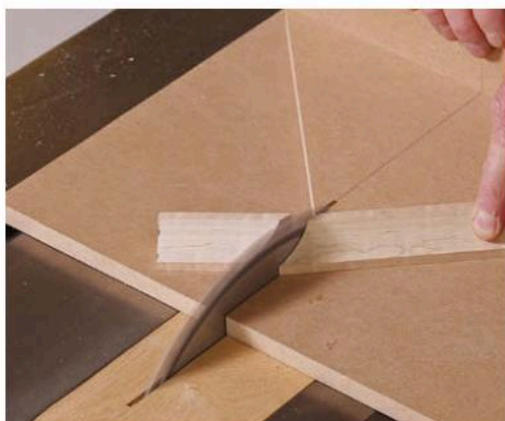


Mount the cove molding

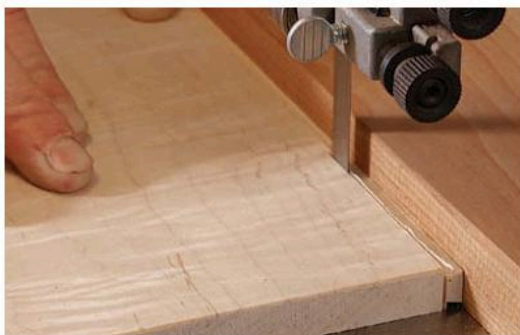
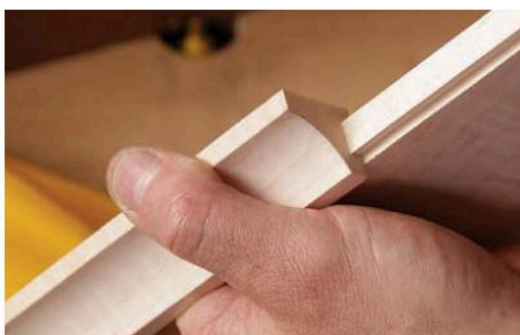
Side moldings are screwed and glued at the front end, but unglued at the back; the dovetail cleat holds them tight but lets the case side expand and contract with the seasons.



Mitered molding. Having routed and scraped the cove molding to shape, Korsak miters it at the tablesaw. He keeps extra molding for setup later.



A socket in the back. Korsak routs a stopped socket in the back of the side molding to accept the dovetail cleat.



Cleat making. With the dovetail bit at the same height as for the socket, create cleat stock on an oversize blank. Korsak routs the cleat to a tight fit, then adjusts it with a plane. When the fit of the cleat is right, cut it off at the bandsaw.

drill pilot holes in the bead to prevent splitting, add a small amount of PVA glue, and fasten the bead with brads. I use glue sparingly, because squeeze-out around a bead can be difficult to remove.

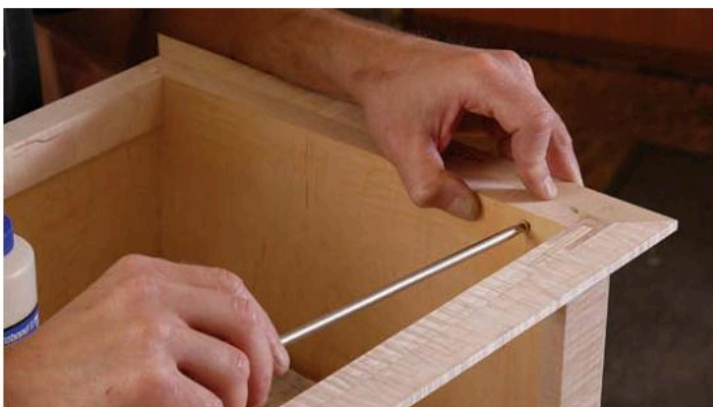
Create the cove molding

Now it's on to the cove molding. I use blanks wide enough to yield two pieces of molding and shape the cove on the router table. To achieve a slightly elliptical cove with a round core box bit, I nibble to the layout line by adjusting the bit depth and fence location for each pass. This leaves a ribbed profile, which I clean up with a curved card scraper followed by sandpaper. Then I rip the moldings to width.

The carcass is designed so the sides can expand and contract with the seasons. The cove moldings on the case sides have to permit this movement, so I fix them



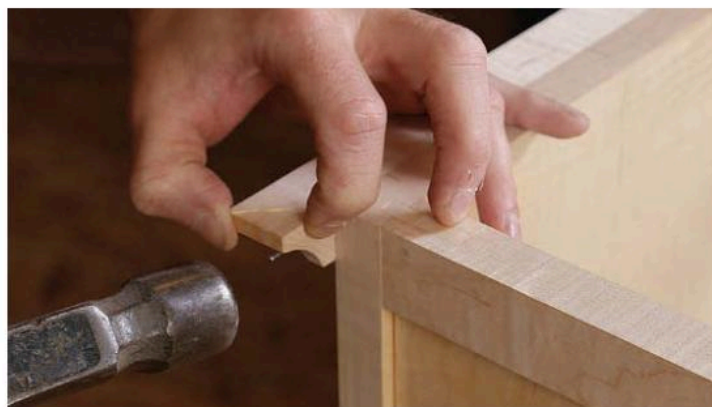
Invaluable scrap. A piece of scrap molding with a dovetail socket guides attachment of the cleat. Clamp the scrap flush to the top of the case, slide the cleat into the socket, and drill and screw it into place.



Fixed at the front. The side molding is screwed and glued at the front end, but not at the back, where it is held tight to the case by the cleat.



Slide on the side molding. Having already cut and fitted the front miters on the side molding, Korsak unscrews the front molding and slides the side molding onto the cleat to mark for the rear miters.



Tiny return. Because of the seasonal movement of the case sides, the side molding can't be joined to the back molding. For a clean seam, Korsak glues tiny mitered returns to the back end of the side molding.

at the front end with screws and glue, but attach them at the back with sliding-dovetail cleats.

With my molding stock made, I miter both ends of the front piece and screw it in place from inside the case. Then I cut and fit the mating miters on the front ends of the side molding pieces. I leave the back ends of the side moldings long for now. Next I mill a stopped dovetail socket in the back end of each side molding piece on the router table. I also mill a socket in a length of scrap molding.

To make the cleat stock, I reset the router fence and creep up on the size, using the scrap molding to check the fit. Then I rip the cleats off the blank, and cut them to

length (about 3 in.). To help install the cleats, I use the same piece of scrap molding. Cut to about 4 in. long, notched and drilled with two access holes, this scrap is now a jig for accurately locating, drilling out, and screwing in the cleats.

With the cleats installed, unscrew the front molding, slide the side moldings onto the cleats, and then reattach the front molding. Check the fit of the miters, then mark the back ends of the side moldings for length. After cutting the back miters and reinstalling the moldings, glue on a mitered return at the back end. This will mate with (but not be joined to) the back molding. Once the cove molding is complete, attach the top and start thinking about filling this case with books.



Mike Korsak makes custom furniture in Pittsburgh, Pa.

Online Extra

To learn how to avoid tearout when planing tiger maple, go to FineWoodworking.com/264.

Build a Perfect Picture Frame

The key to success
is mastering the
splined miter

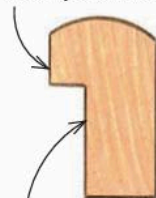
BY MICHAEL CULLEN

When I was starting out in furniture making in the 1980s, some of my first commissions were for picture frames. I made frames mostly for artists, and they appreciated the care I took selecting choice wood, cutting spot-on miters, and reinforcing them with exposed splines. And I really appreciated the commissions—for the money, which I was in dire need of, but also for the opportunity to consolidate some of the fundamental skills I was learning. In the years since then I've built many more frames, tweaking my technique along the way and arriving at solid methods for building strong, understated, elegant frames.



A BASIC MOLDING

Frame stock, $\frac{3}{4}$ in. thick by $1\frac{1}{4}$ in. wide



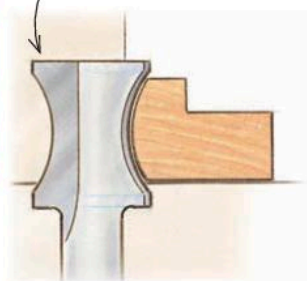
Rabbet, $\frac{1}{4}$ in. wide by $\frac{3}{4}$ in. deep, holds artwork package.

Run the rabbet. Two ripcuts on the tablesaw shape the rabbet that will hold the art.

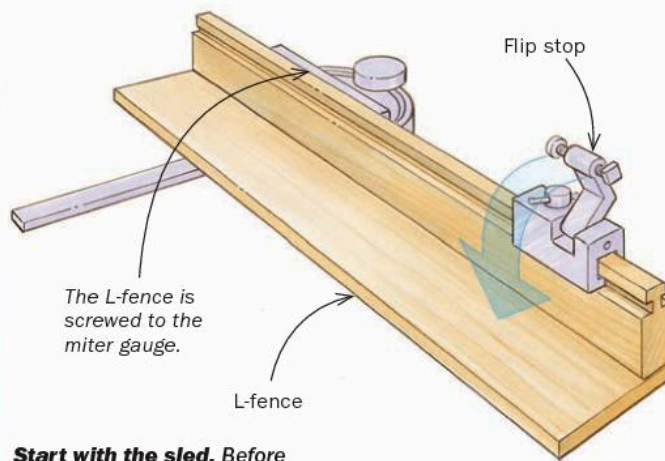


Time for molding. An oval edge bit on the router table produces in one pass the slightly pillowed surface Cullen wants on the front of the frame.

Oval edge bit (Whiteside #1478)



MAKE SURE OF THE MITER



Start with the sled. Before angling the blade, check to be sure the miter gauge is set exactly at 90° to the line of cut.



Testing, 1, 2... Cullen dials in the blade angle by making test cuts in two extra pieces of frame stock (far left). Using a miter clamp to hold the joint and a framing square to test the resulting angle, Cullen zeros in on the table saw blade's tilt angle (left).

Laser focus on the miter

Developing a method for cutting flawless miters without a fuss is a key milestone for a furniture maker, and a steady source of pride and pleasure once it's mastered.

Whenever possible, I cut my miters with the table saw's blade tilted and the workpiece in regular cross-cut position, either on a sled, a miter gauge, or a sliding table. I think this approach produces a better cut, because the cutting action is less labored and doesn't tend to move the workpiece. It also enables you to use stop blocks more easily, and it works just as well for long workpieces as short ones.

Cutting at exactly 45° is non-negotiable, of course. Some joints might have a little margin for error, but not miters; over time the flaw will tell. To get a perfect 45°, I use scrap stock milled at the same time as the real parts. With a miter clamp to hold the test miters and an accurate framing square to assess the outcome, you can quickly dial in the right blade tilt.



Miter the real molding. Cutting miters with a crosscut setup and a tilted blade makes for clean cuts and easy use of stop blocks. A sacrificial spacer fills the rabbet, stabilizing the workpiece during the cut.

MITER GLUE-UP



Keep some cutoffs. Cullen uses scraps of the frame stock as clamping blocks, adhering them with glue and finger pressure. Just before assembly, they serve as stands while he applies glue to the miters (right).



Pressure in the right place. The clamping blocks enable you to exert pressure perpendicular to the miter joint (above). Be sure they are placed so you can keep the tips of the miters tight. After the glue-up, bandsaw away the bulk of each block (right). Then remove the rest with a handplane.



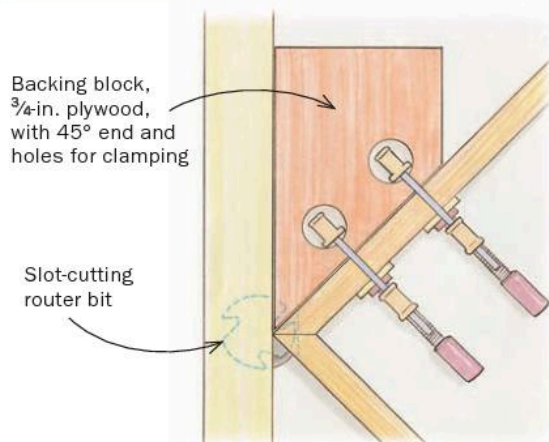
Sometimes special gizmos are good

To glue up my best frames I use clamping blocks, but if I'm in a hurry or have a batch to do I sometimes reach for my Merle band clamp (\$29.95, mlswoodworking.com). You just wrap the band around the assembly and tighten. You can't apply pressure directly across the joints or adjust pressure for each corner as you can with clamping blocks, but still it works quite well—and it's hard to beat for speed.

—M.C.



INSERT THE SPLINES



Slotting for the splines. Cullen cuts spline grooves with a slot-cutter at the router table. A piece of scrap stock cut at a 45° angle and drilled to accept clamps guides the frame through the cut.



Spline insertion. The splines, made from the same wood as the frame, are cut so their long grain crosses the miter joint. Cullen rough-cuts the excess at the bandsaw, then planes the splines flush.

Splines for strength

Most commercial frames are held together with nails or corrugated fasteners, but if you want to keep solid-wood miters tight for the long term—and give your frame a furniture maker's flourish—I recommend using splines to reinforce the miter joint. I usually cut the grooves for them with a slot-cutter at the router table, which produces a perfectly flat-bottomed kerf. For wide frames that require grooves too deep to cut with the router, I'll use a cradle jig at the tablesaw, then square up the bottom of the groove with a chisel.

Once the splines are glued in, all that remains is the pleasurable task of flushing them off, and your frame is just about ready for art (see Fundamentals, p. 82). □

Michael Cullen makes custom furniture, sculpture, boxes, and frames in Petaluma, Calif.



Finished frame. Cullen pads on shellac in thin coats, building to a low luster.

Iridescent Inlay

Flexible strips of shell bring a sparkle to your work

BY CRAIG THIBODEAU

Rout, trim, and glue

Installation is not much different than traditional inlay. A groove is cut with a trim router, then the strips are trimmed to fit. Finally the inlay is glued in place with cyanoacrylate glue.





String inlay has been used for centuries as a decorative detail on fine furniture. Traditionally, furniture makers have used woods like ebony and holly to create delicate yet beautiful stringing. There are, however, more exotic materials that have been developed in recent years that can be used for inlay, and these complement modern furniture designs wonderfully, adding more visual interest and complexity to my furniture than traditional wood stringing.

One of the most interesting new materials I've been using for string inlay is called ZipFlex, manufactured by Advanced Shell Technology. It's a flexible version of the straight strips of shell-based material used by luthiers. ZipFlex is available in a variety of colors, including white, gold, and black mother-of-pearl, blue and green abalone, and others in a variety of widths.

ZipFlex is made from a laminated shell material called Abalam, which is sliced into narrow strips and then cut into roughly 1/8-in. lengths. These little pieces are held together on a flexible black tapelike material called the matrix (which looks a bit like electrical tape). I've found ZipFlex to be extremely useful when doing curved inlay because it is quite easy to bend around even very tight curves. It works equally well in straight sections and the cost is comparable to straight shell strips, though it is much more costly than wood strips.

Collecting shells. ZipFlex, from advancedshelltech.com, comes in a variety of sizes, and in colors ranging from solid color mother-of-pearl to blue and green abalone.



Trim router cuts accurate grooves

Installing ZipFlex and similar inlay is much the same as installing traditional inlay: Cut a groove the width of the inlay, glue it in, and trim it flush to the surface. However, before you do any of that, you'll need to seal the surface surrounding the inlay with several washcoats of shellac (or lacquer). The best glue for this type of inlay is cyanoacrylate, and the shellac protects the wood from being discolored by the glue.

Next is layout, which requires just a few tools. A small adjustable square and a sharp pencil do the job, marking lines parallel to the edge and laying out accurate corners.



Rout the grooves

Match the bit's diameter to the inlay's width. Bits small enough likely will have a $\frac{1}{8}$ -in. shank, which means your trim router will need a collet reducer.

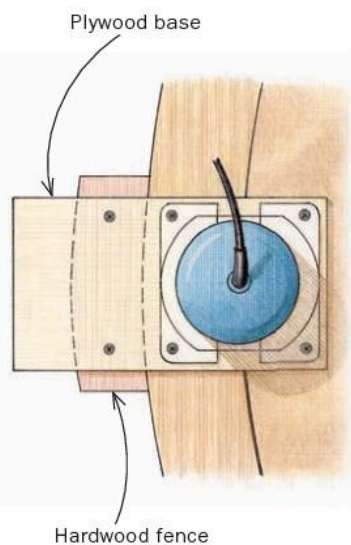


Set the bit's cut depth. After placing the router on two pieces of inlay, lower the bit until it is just shy (0.005 in. to 0.010 in.) of the benchtop.



Fence keeps the bit on course. A short, straight piece of hardwood screwed to a long base ensures that the groove is parallel to the edge.

Curved edges require a curved fence. Cut the fence to match the edge. This reduces the chance that the router will wander.



Square the corners. Thibodeau uses a shopmade chisel (see p. 24) with a profile that's thin enough not to damage the wall opposite the one being pared.

Cut the stringing

ZipFlex inlay is made from small segments butted end to end. This is not a problem for square cuts, but miter joints should be cut entirely within a single segment.



Lay out for length. Before cutting the inlay to length, place pieces beside the grooves, overlapping the ends, to get a sense of how much inlay is needed and where joints will fall.



Cut miters with a model-maker's saw. A guide kerf in the fence against which the inlay is held ensures an accurate cut.



Slice and snap. Square cuts are best made with an X-Acto blade. After marking the inlay's length, score across its top face with the blade (left). Then gently bend the inlay upward, supporting it on both sides of the score line (right). This creates a clean break, bringing the inlay to final length.

After layout is complete, it's time to cut grooves for the inlay. I use a trim router for this. ZipFlex and similar inlay are very narrow, so you'll need at least one specialty bit. I've found that the solid carbide spiral downcut bits from Stewart-MacDonald (stewmac.com) cut well with minimal tearout. The bits have 1/8-in.-dia. shanks, so you also need a collet adapter.

ZipFlex is typically 0.055 in. thick, and because it should be inlaid slightly proud of the surface, I rout grooves that are a hair shallower than that. To set the bit, I place the router on top of two strips of inlay and lower the bit until it's just above the benchtop.

With the bit's cutting depth set, rout the grooves. For grooves along straight edges, a simple wooden straight-edge attached to the router base is all it takes to guide the router. When routing along curved edges, I make a fence shaped to match the edge. The bit leaves round corners, so square them with a small shopmade chisel (see Handwork, pp. 24–28).

Cut corner joints, then trim to length

Clean out any dust or chips in the grooves, and then lay strips of inlay alongside the grooves, with their ends



Glue

Cyanoacrylate is the best glue for modern inlay materials like ZipFlex. It bonds well with the inlay and dries very quickly.



Glue goes in the groove. Use a medium thickness cyanoacrylate glue. A needle tip on the bottle gets the glue into the groove without getting it on the table's surface.

overlapping. This extra length leaves room for cutting the strips to length.

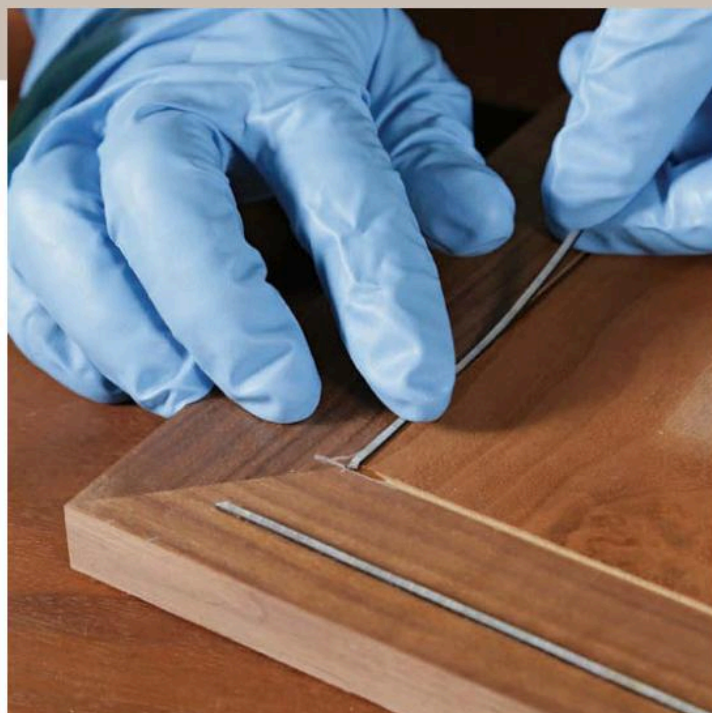
Start by cutting the miter joints in the corners. ZipFlex is made from short segments butted against one another, so when cutting a miter it's important for the joint to be contained within a single segment. It just looks better than when the cut spans two segments.

I use a model-maker's handsaw and a small saw hook to cut the miters. Start the cuts with a light stroke, and exert pressure on the inlay as close as you can to the kerf so that it doesn't move during the cut. Cut all of the miters and fit them together in their grooves to ensure the joints close tightly.

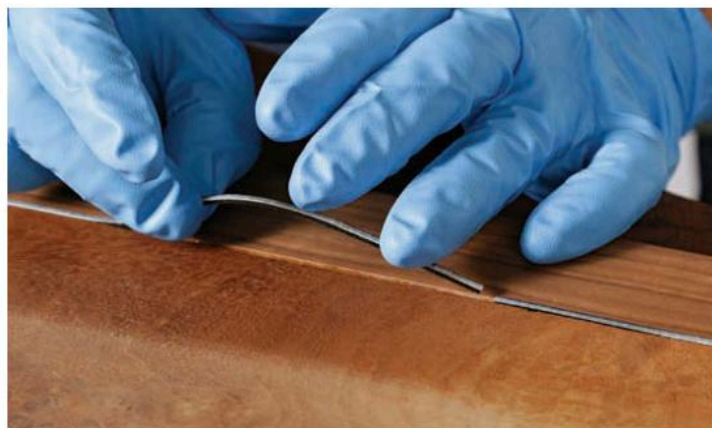
When two pieces of inlay meet somewhere other than a corner, I cut them to length by first scoring the top face with an X-Acto knife and then snapping them at the score line. I do this with the strips dry-fitted into the groove, lifting the end of the inlay and placing a scrap of wood underneath when I score it.

Quick-drying glue secures the inlay

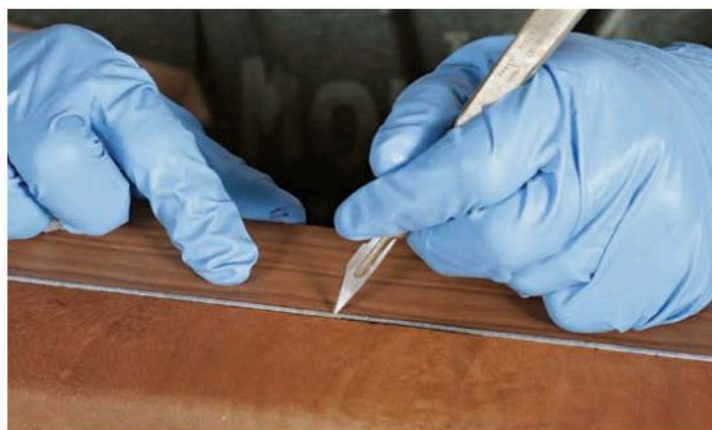
After all of the inlay has been mitered and cut to length, you can glue the strips into the grooves. The best glue for these modern materials is cyanoacrylate. Lay down a small bead of glue in the bottom of the groove. Insert the inlay strips, starting at the corners, working toward any butt joints in the middle. Take care to press the strips down fully into the groove. If the inlay gets caught on the edge of the groove, gently lift it, smooth



Press the inlay. It should take no more than finger pressure to seat the inlay fully in the groove.

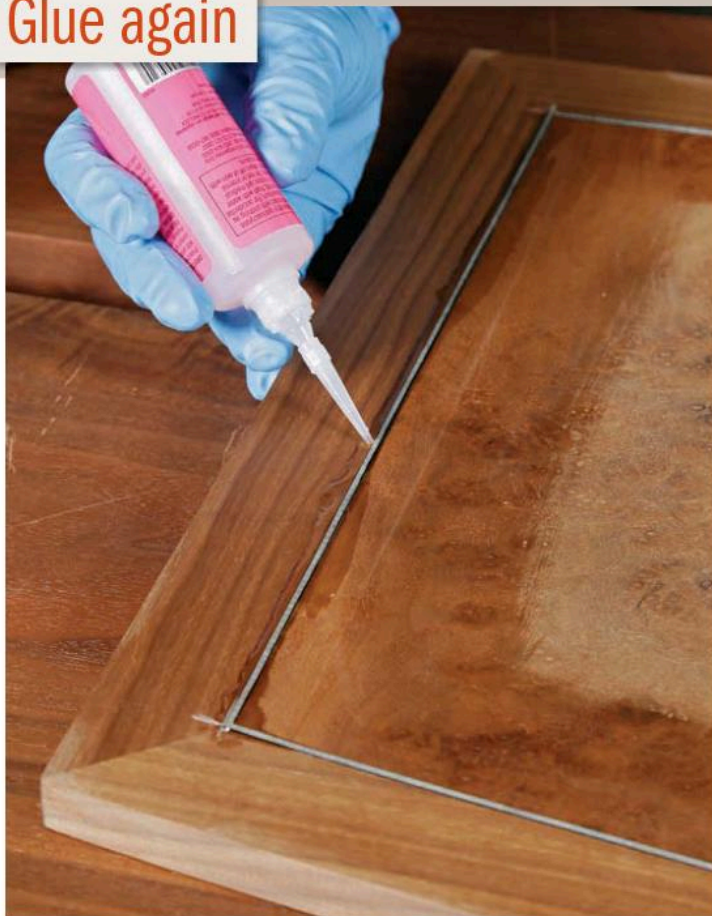


Flex the last piece. Butt the end of the last piece against the end of the adjoining piece, and then press down on the inlay. This technique pushes the two ends together tightly, making for a gap-free joint between them.



Seat unruly inlay. Should the inlay rise up, press it back down with the point of an X-Acto blade. The cut made by the knife is so fine that it doesn't show up after a finish is applied.

Glue again



Flood the surface with glue. Complete the glue-in by flooding the surface with a thin cyanoacrylate glue. A thin-tip nozzle keeps the glue on top of and immediately next to the inlay.



Speed up the drying. Holding the can about 12 in. above the table, spray accelerator over the glue to set it immediately.

the inlay, and press it back into the groove. Next, flood the surface with a thin cyanoacrylate glue, using a fine-tip nozzle to direct the glue onto the top of the inlay. Try not to touch the inlay with the tip. There should be a full layer of glue over the inlay. It often takes several passes to get full coverage. Check that all of the inlay is still completely seated in the groove. If it's pulled up anywhere, press it back down with the tip of a scalpel. Now, spray a fine mist of accelerator over the inlay, and leave it to cure overnight.

Sand flush



A hardwood block wrapped in 100-grit paper makes quick work of the dried glue. If the inlay is more than a hair proud of the surface, you'll need to change paper often, because ZipFlex can contain pearl and abalone, both very hard materials.



Sand the inlay flush. Wrap blue tape several times around one end of the sanding block (top). This raises the taped end off the surface and focuses the sanding on the inlay, keeping the sandpaper off areas that don't need sanding. Thibodeau uses a vacuum hose to collect dust as he sands the inlay level with the top (above).

The following day, it's time for cleanup. I use 100-grit sandpaper glued to a block of hardwood that's 1 in. thick by 2 to 3 in. wide by 10 in. long. Wrap tape around the sandpaper and block at one end. This keeps the sandpaper off the surrounding surface so that you're sanding only the dried glue. Vacuum the dust frequently. After all of the glue has been sanded off, you can prep the surface and finish as you normally would. □

Craig Thibodeau is a professional furniture maker in San Diego, Calif.

Inspiration for our readers, from our readers

NICHOLAS VANARIA

Romeoville, Ill.

After seeing a Queen Anne version of this cellarette in the collection at Winterthur Museum in Delaware, Vanaria decided to design and make a Federal-style version for his wife. The fan and bellflower inlay was one of the biggest challenges—"along with the wood selection to get the right color matching. This was my first attempt at inlay this intricate, but I used the techniques from guys like Steve Latta that I found in the pages of *FWW*."

SAPELE, 16D X 32W X 38H



LARS JONSSON

Karlstad, Sweden

Jonsson had been studying our Master Class about kumiko gridwork (*FWW* #259) when a church in a small village near his home requested he build a shoji screen for its hall. "I was really excited to start making my first kumiko." He used local woods for the screen—pine for the framework and linden for the grid.

PINE AND LINDEN, APPROX. $\frac{3}{4}$ D X 75W X 43 $\frac{1}{2}$ H

Photo: Unni Jonsson



MARSHALL LARRALDE

San Antonio, Texas

A hobbyist woodworker with a degree in architecture, Larralde knows a lot about curves and geometry, so he used parts of a golden rectangle to design the shape of this chair and footstool. "The chair and stool are mathematically proportional to each other in profile. Their curved radii, combined, form part of the golden spiral."

ASH, 26D X 25W X 26H (CHAIR)



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CHARLES DURFEE

Woolwich, Maine

Durfee has made two of these sideboards. The original, built 14 years ago, was a companion piece to an expanding, oval-top dining table. "My client liked curves, as do I—I began woodworking as a boatbuilder, so working with curves comes naturally and has stuck with me." The drawer fronts and door rails are bent-laminations, while the door panels are shaped from thick stock. The back is frame-and-panel. "There is a complicated set of notches, dovetails, and tenons connecting the internal framework to the six legs."

FIGURED AND QUARTERSAWN CHERRY,
21D X 62W X 35H

Photo: Guy Marsden



RALPH BREYMAN

Santa Clarita, Calif.

Inspired by the work of James Krenov with a nod toward Asian influences in furniture design, Breyman started this chest-on-stand as many furniture makers do, by finding the perfect wood. "I discovered this highly figured sapele, then set out to design for the best display of the woods." This piece won the Best Furniture Design award at Design in Wood 2017.

AFRICAN MAHOGANY, SAPELE, 17D X 33W X 38H



MICHAEL SUTTON

Maresfield, East Sussex, U.K.

Sutton was experimenting with cantilevers when he designed these shelves. The three curved elements, which are steam-bent, penetrate the pair of angled legs and support the shelves from below. Stainless-steel rods anchor the shelves from above. "My intention was to use the cantilever principles to locate and hold surfaces without any physical fixings."

MAPLE, 9½D X 38½W X 38½H

WERNER PYKA

San Diego, Calif.

This game table was inspired by Ed Stuckey's Federal card table in the gallery of FWW #206, but Pyka had ambitions far beyond that design. As well as opening once to reveal the typical card table, his version opens a second time to display backgammon, chess, and cribbage boards. Chinese checkers can be found on the underside of one drawer, and Scrabble under another. He added marquetry pictures including a hummingbird and flower, and carved his own chess figures in the shapes of different birds.

SAPELE AND VARIOUS VENEERS, 18D X 36W X 31H CLOSED, 36 DIA. X 30H OPEN



EVAN BOYLE

Kailua, Hawaii

Boyle said he loves Danish design, especially chairs woven with Danish cord. Looking for something more durable than cord, he tried paracord. "It is similar in size but has much greater strength, durability, and endless color options. I thought it would be a great opportunity to combine Danish modern design with colorful paracord for a bold yet tasteful piece." The credenza was featured in the gallery of student work this past spring at the Center for Furniture Craftsmanship in Maine.

BLACK WALNUT, 19D X 54W X 21H

Photo: Mark Juliana



MICHAEL HILL

Sugar Grove, Ill.

Hill modeled this Greene and Greene style desk after Darrell Peart's Aurora Table Desk, but originally set out to build it with four legs. "I decided it looked too weak for a desk of this size, so I adapted the eight-leg design—an example of making major design changes as you build, or failure to work off of a mockup." He added inlay to the breadboards as a variation on Peart's design.

SAPELE, 29D X 61W X 30H



NORTHERN WOODS EXHIBITION 2017

Each year, the Minnesota Wood Workers Guild sponsors Northern Woods, its exhibition and competition for local woodworkers. This year's show featured more than 60 entries. Here is a small sample. To see more, go to mnwwg.org.

RON AUSEN

St. Paul, Minn.

Ausen learned how to make a Windsor chair by watching Curtis Buchanan's YouTube videos. He modified the traditional design with forked back spindles, which fan evenly into the rail, and spindles on the sides that resemble field corn from the farm where he grew up. "Under the handholds are a peace symbol and a smiley face. While sitting, grasp the handrail and press your fingers against these two spots. It then imprints 'peace and happiness unto you.'" Ausen's chair was chosen as Best Traditional Piece.

MAPLE, PINE, AND RED OAK, 20D X 18W X 40H

Photos, this page: Ramon Moreno



THOMAS SCHRUNK

Minneapolis, Minn.

Schrunk chose etimoe, sometimes called African rosewood, as the primary veneer for this table because of its luster and variegated color. "I am very interested in luster (chatoyance) and arranging the etimoe segments with the grain at essentially 90° from the adjacent pieces gives a significant brightness change. It changes as one walks past, or around, the piece. Using a dark veneer for the perimeter causes the eye to go directly to the inner segments." This table won the award for Best Detail.

ETIMOE, MAPLE BURL, AND MACASSAR EBONY, 28 DIA. X 24H



TONY KUBALAK

Eagan, Minn.

This small dressing table is a reproduction of a Chippendale-style piece in the Minneapolis Institute of Arts (c. 1760–1780) attributed to the Garvan Carver. The carving was what attracted Kubalak, who says it was some of the finest he'd ever seen. "As I was building it I knew that this was some of my best work. This was also my first real attempt to add age with the finish." Kubalak's piece won the Best Handwork and Peer awards.

MAHOGANY, 21D X 34W X 31H



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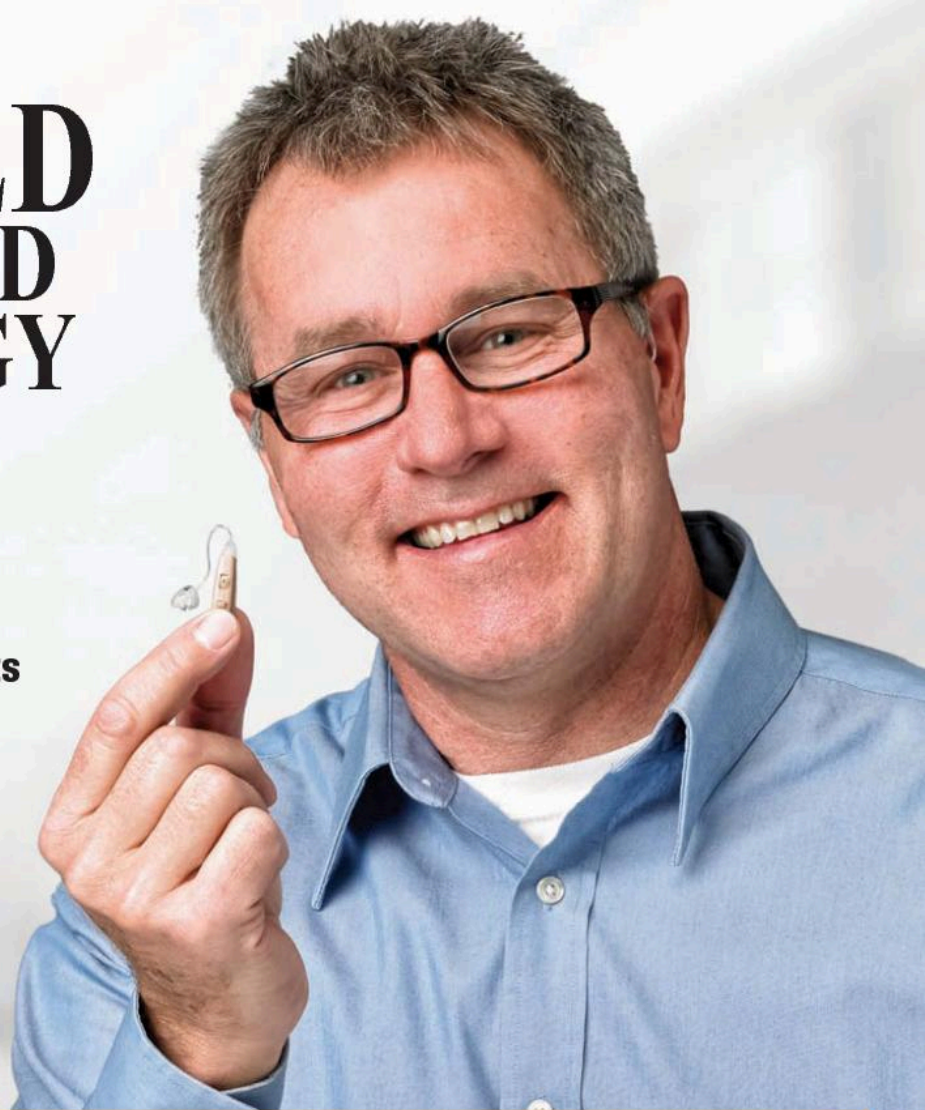
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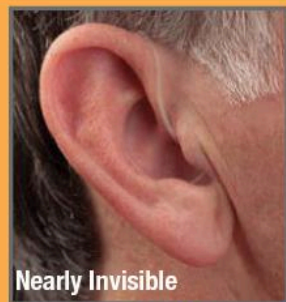


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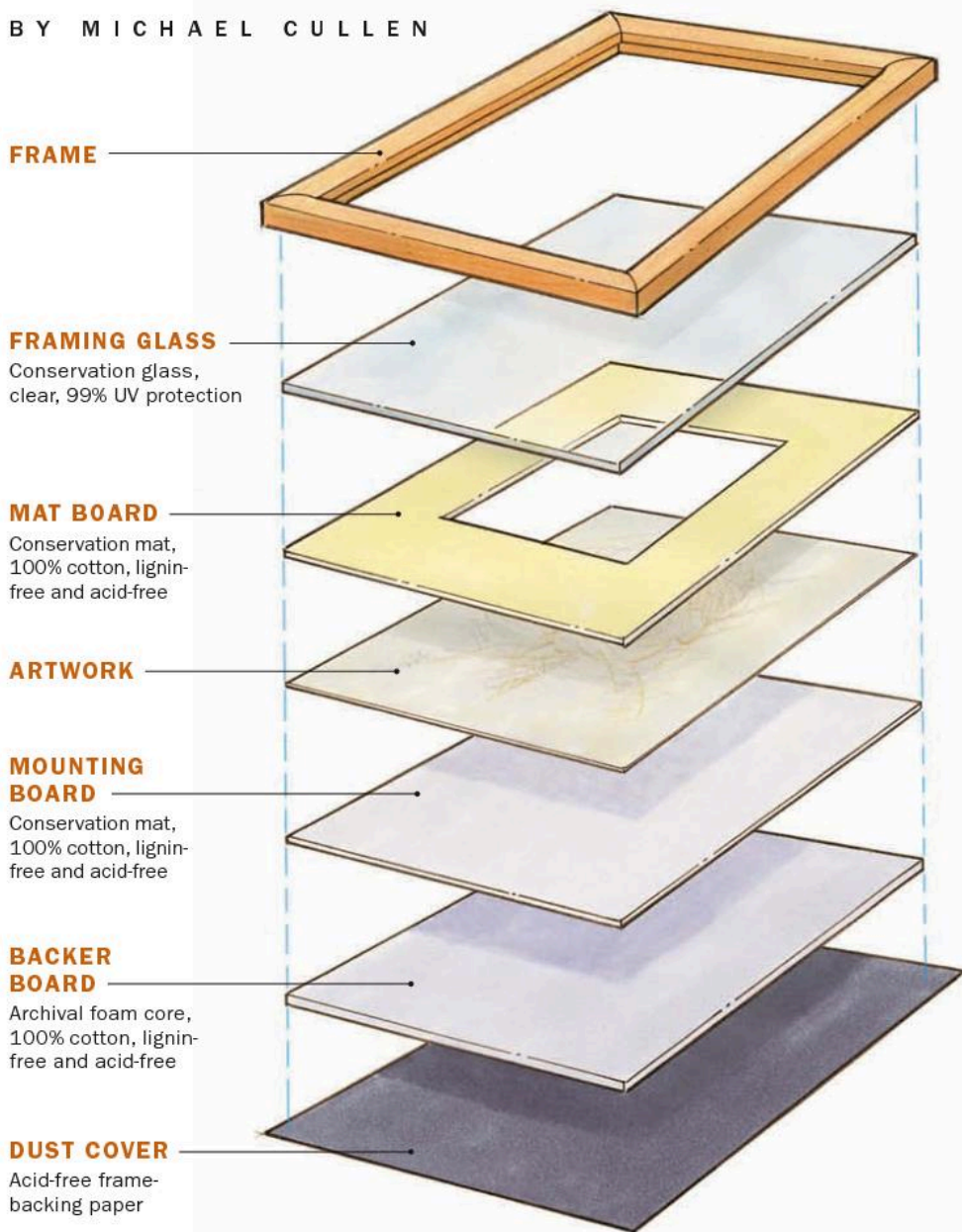
As a woodworker, you might think that once you've built a well-crafted frame for a piece of art (see "Build a Perfect Picture Frame," pp. 66–69), you're finished. But even with the frame in hand, there are important steps to take and nuggets of information to know to be sure the art looks great and stays protected for the long term.

Selecting the right glass is the first step. Almost any glass will do the main job—protecting the art from being touched or affected by dust. But rather than buying window glass from the hardware store, consider glass made specifically for framing. It's perfectly clear and is free of distortions. Depending on what kind you buy, framing glass can also prevent fading caused by ultraviolet (UV) rays and can limit glare and reflections that make it harder to view the art. Anti-reflective (AR) glass has an optical coating that reduces reflectivity. It doesn't provide extra protection from UV rays, however. Conservation, or museum, glass comes in several varieties, including one that blocks 99% of UV rays but does not decrease reflection, and another that blocks 99% of UV rays and also dramatically cuts reflectivity. Regardless of what glass you select, it's wise to hang the artwork out of direct sunlight and bright reflections.

How to frame a picture

WHAT YOU NEED—AND NEED TO KNOW—ONCE YOU'VE BUILT THE FRAME

BY MICHAEL CULLEN



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Brad puller
Archival adhesive transfer tape, acid-free
D-rings, Vinyl-coated wire
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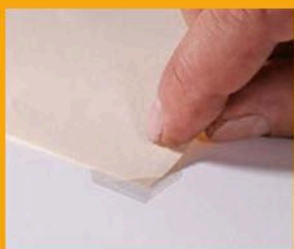
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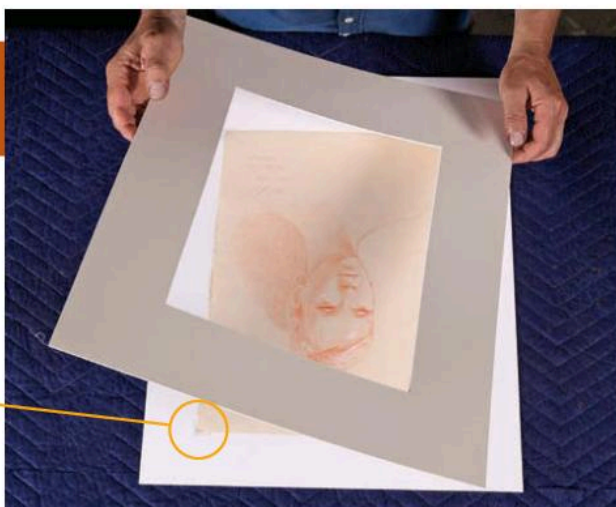
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ASSEMBLE THE ART PACKAGE



Clever corners. Self-adhesive polyester photo corners applied to a piece of mat board keep the artwork situated without tape or glue.



Mat board is the first frame. Cullen chose RagMat, an all-cotton, acid-free mat board, to avoid discoloring the artwork over time.

The mat board you choose is equally important. The wrong sort of mat, which could contain lignin if it's made from wood pulp, can discolor the artwork dramatically over time. The best mat board is labeled archival and acid free; I used RagMat, which is made from 100% cotton. Also, the color of the best mats is produced with light-fast, non-acidic pigments rather than conventional dyes, which are more prone to bleed and fade. You'll want two sheets of mat board, one to mount the artwork on, and another to frame it with. Behind the artwork you'll

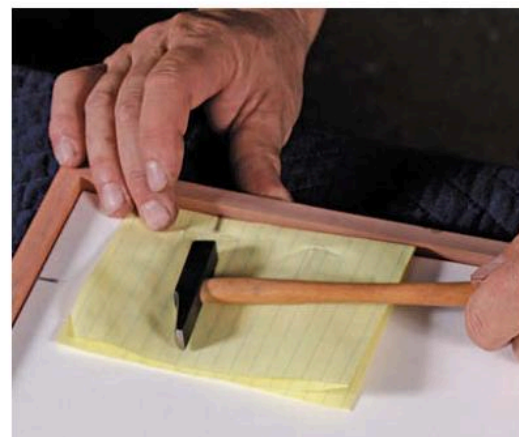
Online Extra

For tips on cutting your own glass, go to FineWoodworking.com/264.

Onto the glass. Before laying the mat board and artwork into the frame, Cullen cleaned the glass meticulously, since this would be his last opportunity to do so.



Foam core stiffens the package. The foam-core backer, like the glass, should be cut $\frac{1}{8}$ in. smaller in length and width than the total opening at the back of the frame.



No hammer needed? Cullen uses a brad puller to clinch the package into the frame (left). A small hammer will do the job (above), but the brad puller works like a charm and is a bargain at about \$15.

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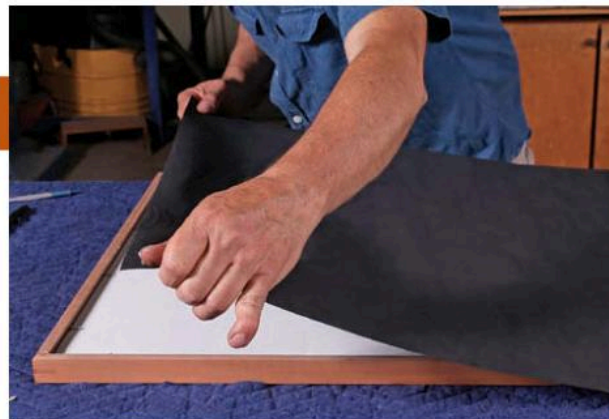
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ADD A DUST COVER AND HANG IT UP

Sealing the package. A paper cover glued to the back of the frame keeps dust and bugs from penetrating the art package. Archival double-stick tape holds the dust cover in place.



need a backer board to keep the art package rigid and to press the mat against the glass. Foam core is a good choice; it's stiff, yet soft enough to conform to minor inconsistencies in the mat and artwork. Here again you want to avoid material with any lignin or acid content. I used $\frac{3}{16}$ -in. foam core labeled archival and made of 100% cotton.

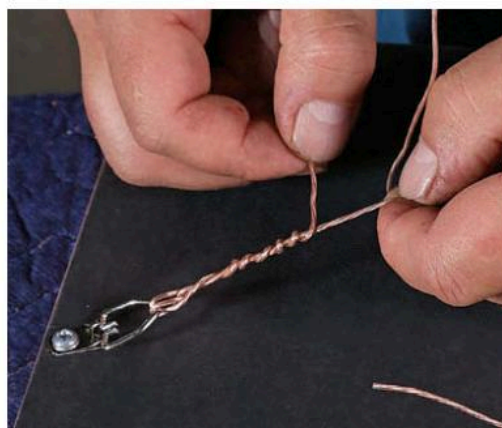
Once you've secured the backer board in the frame with brads or points, you'll add the last layer of the sandwich, which is the dust cover. It gets stretched over the back of the frame to seal the whole package from dust and bugs. Kraft paper is often used for this, but my framer recommends acid-free frame backing paper, which won't crack and tear over time the way a kraft-paper dust cover can.

You apply an oversize piece of the backing paper, adhering it to the back of the frame with archival double-sided ATG transfer tape. Then you cut it flush to the outside of the frame with a mat knife.

You can cut the glass, the mat board, and the backer board yourself, but I prefer to have a professional framer cut mine. They do this job all day long and are fast and excellent at it. The total cost for providing and cutting all the materials was \$84. With the frame complete, there's just one last task: deciding where to hang it. □

Michael Cullen builds frames and furniture in Petaluma, Calif.

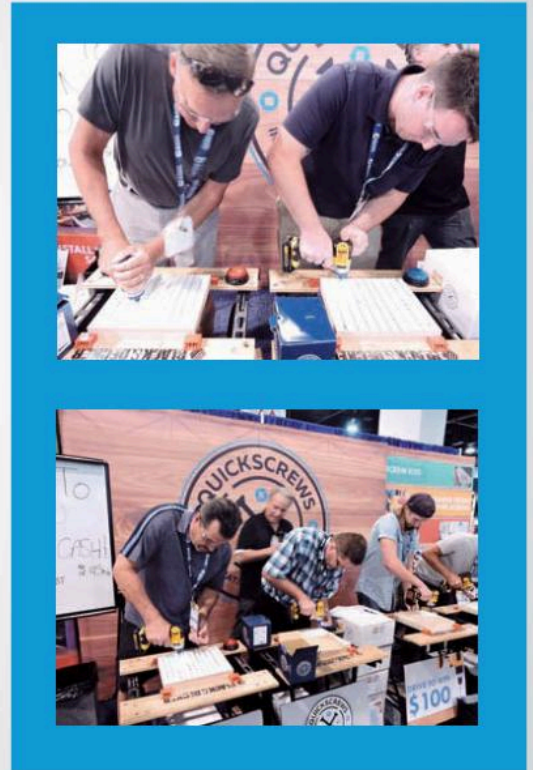
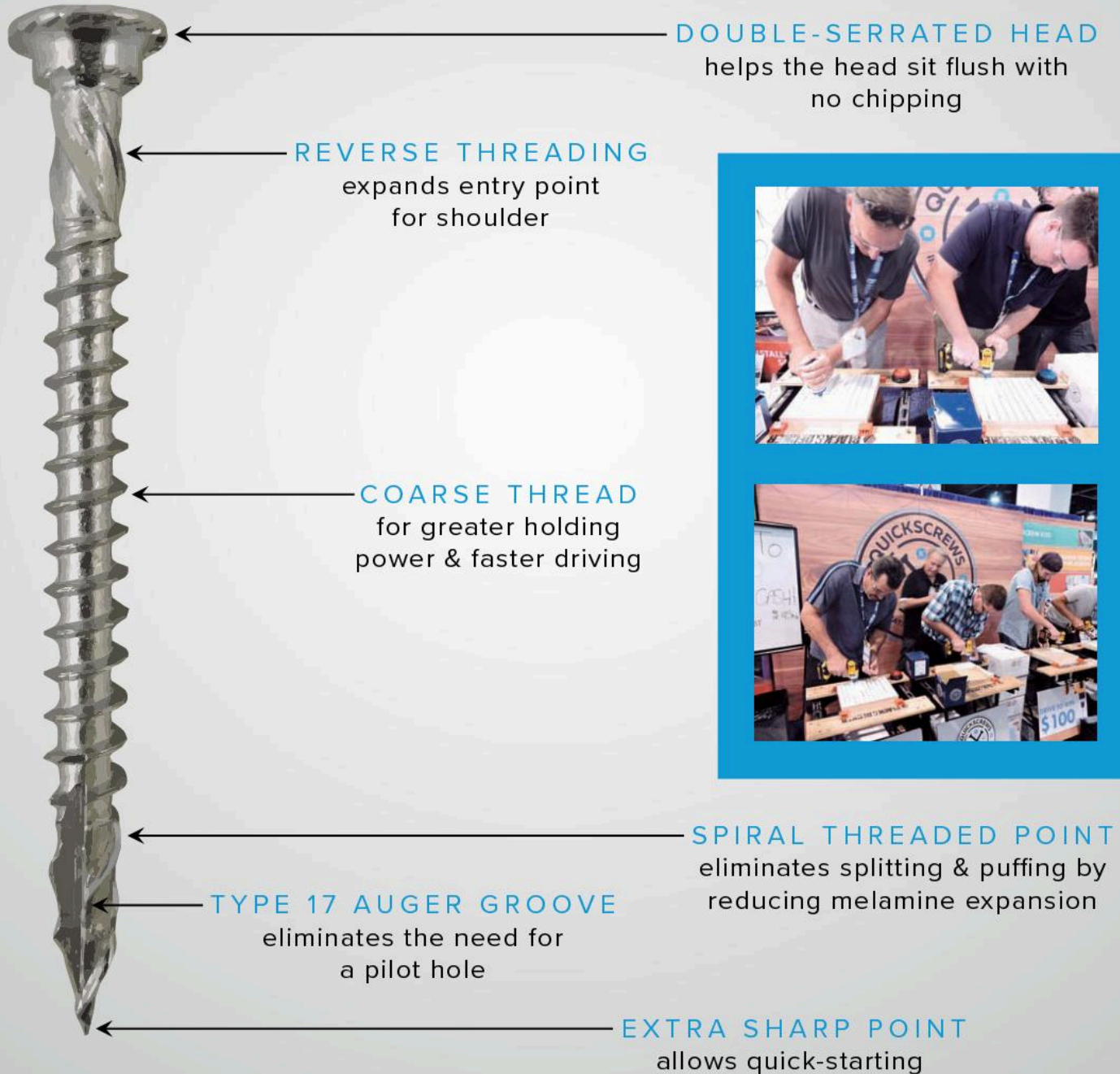
Special thanks to Mary Fassbinder for sharing her framing expertise.



Hanging hardware. Cullen installs D-rings about one-third of the way down the frame. Vinyl-coated copper wire is strong, simple to twist, and easy on the hands. At the bottom corners of the frame he applies felt bumpers, which keep the frame from marking the wall.

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Australian Windsor

After serving a four-year apprenticeship in carpentry and joinery in his hometown of Melbourne, Australia, Bern Chandley went on to build sets and all sorts of furniture for movie studios there and in Sydney for *Star Wars* and other films. Pretty exciting stuff. But his career really took off when he met American chairmaker Peter Galbert, who was teaching a Windsor workshop in Australia. “Fireworks went off in my brain when I built my first Windsors,” Chandley says. “I loved the directness of it. I had to let go of the perfectionism fostered by flat work. In Windsors, if it looks right, it is right.” He’s been building Windsors that look right ever since. His recent black dining chair illustrates the hybrid nature of his designs. It brings together the wide-splayed undercarriage of vintage American Windsors, cigar-shaped legs that echo Shaker pieces, a crinoline stretcher borrowed from period English chairs, and an overall cleanliness and sparseness of line inspired by Mid-Century Modern work. “You’ve seen all these shapes before,” Chandley says, “just not in the same chair.” Merging them successfully is the trick. Asked how he arrives at the final design, Chandley says, “I try not to let myself get satisfied too quickly.”

—Jonathan Binzen

