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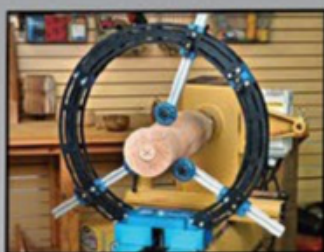
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Build your joinery and decorative detailing skills while crafting a classic piece that will brighten any room.

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Get around linear work with this clever bandsaw sled.

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Affordable, full-featured machines are bringing computer-controlled woodworking to small shops everywhere. Check out this helpful advice from successful CNC users.

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Bring out the depth and beauty of figured maple with a shop-made mixture and a special technique that calls for two separate applications.

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Contributors



Larissa Huff has secrets to share. As an instructor at the Lohr School of Woodworking, she recently designed a course in “concealment furniture making” that yielded the Top Secret Table on page 34. We’re not saying anymore, except to note that she can be trusted to help you if you have something to hide. For more on her adventures in furniture making and classes, visit lohrwoodworkingstudio.com.

Bill Schneider

has more time for woodworking these days since retiring from teaching photography at Ohio University in Athens, Ohio. When not in his shop, you can find Bill under the stars with his telescopes. Building a new telescope led him to construct the circle-cutting jig on page 52 as an easy way to make round parts. Bill and his wife inhabit an area of Athens perfect for stargazing.



“I’m always looking for new sources of inspiration for Arts and Crafts style projects,” says **Willie Sandry**. “Sometimes it’s a walk through an antique shop with my wife, or flipping through an old furniture catalog printed over a century ago.” Whatever the inspiration source, we’re grateful for the results. With its decorative inlays, proud pegs and traditional joinery, the mirror that Willie built for this issue (p. 23) could easily be mistaken for a fine antique.



Rob Spiece has become quite a regular on our pages. In recent years, he has shared his expertise on making small boxes, flattening slabs, recovering from woodworking mistakes, and more. In this issue’s contribution (The Breadboard End Joint, p. 46), he shares his particular take on a classic technique for keeping a solid wood panel flat while allowing it to expand and contract seasonally. In addition to teaching classes at the Lohr School of Woodworking, he and fellow instructor Larissa Huff stay busy designing and building custom furniture commissions. Oh yeah, and there’s that great tattoo of a 6” ruler on his forearm!



In his 16 years as a professional woodworker, **Chris Hedges** has built award-winning furniture, and appeared several times on the cover of this magazine. As this issue goes to print, he’s busy developing a cabinetmaking curriculum for a major technical school in Ohio. Somehow he also finds time to teach college-level sociology. Woodworking inspiration often comes from one of his favorite classroom topics—the Shaker communities who created so many beautiful furniture pieces. Check out Chris’ dye stain article on p. 56.



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Ingenuity in woodworking

I recently had occasion to refer to the dictionary definition for “woodworking.” What I found was a disappointing snooze: Merriam-Webster’s defines woodworking as “the act, process, or occupation of working wood into a useful or desired form.” Well, true enough. But that doesn’t begin to hint at the elaborate, complex heart of our craft. The beautiful stuff we’ve chosen to work with can also be pretty troublesome and idiosyncratic. Success at executing joinery, managing seasonal movement, wrangling countless cutting tools, applying finishes, and a million other challenges require patience, understanding, and perseverance. And that’s just for starters.

As I leaf through this issue of *Woodcraft Magazine*, I realize that there’s another intrinsic element to good woodworking: Ingenuity. Webster’s defines the word as meaning “Skill or cleverness in devising or combining; inventiveness; aptness of design or contrivance.” Now we’re talking woodworking!

Take the breadboard end joint on p. 46, for example. This brilliant engineering solution prevents a panel from cupping, while allowing for the wood’s natural seasonal expansion and contraction. That’s no small design feat. And, as you’ll read, it has plenty of applications for your own work. As for clever tooling solu-

tions, flip to p. 23 to learn a creative inlay technique, and see p. 52 for an inventive jig designed to cut discs at the band-saw. On p. 30, we tip our hat to three contemporary craftsmen’s use of CNC machines, one of the more innovative developments in modern woodworking.

All that said, my vote for the “Ingenuous Award” this issue goes to Pennsylvania woodworking instructor Larissa Huff, who designed and built the “Top Secret Table” on p. 34. This lovely, tricky little piece incorporates a number of covert compartments, created by clever use of commonly available hardware. Ingenious indeed. Even if you don’t build the table yourself, the article is a mini-course in designing secret spaces for your own projects.

So tap into your own inner genius, and adapt the bright ideas presented here to your own way of working wood. We know you will. You’re a woodworker. Keep the ideas flowing, and be sure to share them with us; we’re all in this together.

P.S. Put your ingenuity to work for *Woodcraft Magazine*. We’re seeking a full-time staff editor to join our ranks. See the ad on p. 10 for further information.



Share your ideas.

We love hearing from readers! And there are all kinds of reasons to get in touch with the crew at *Woodcraft Magazine*. Check out the details below.

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Important: Please include your phone number, as an editor may need to call you if your trick is considered for publication.

Have a tough woodworking question?

We’ll do our best to find the expert and provide the answer. Email us at editor@woodcraftmagazine.com and put “Expert Answers” in the subject line.

News & Views:

This catch-all column is where we do our best to correct mistakes, publish feedback from readers, and share other noteworthy news items. It’s easy to participate in this discussion. Just email us at editor@woodcraftmagazine.com and put “N&V” in the subject line.

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magazine

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Well seated

Thanks so much for the Art of Seating article in the Aug/Sept issue. Not only was it beautifully done and highly informative, but it also revealed that the exhibition was in my town. I wouldn't have known about it otherwise. I was able to visit the gallery and show off to my friends a little of what I learned from the article.

—**Betty Miller, Omaha, Nebraska**

The right tool for the job

Well done for highlighting the shoulder plane in last issue's Great Gear column.

That's one tool that doesn't get its due, as far as I'm concerned. Too many woodworkers don't understand how important it is for creating precise mortise-and-tenon joinery.

—**Kathryn Gale, Ottawa, ON**



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Turn for troops

We encourage volunteer woodturners to support the troops this Veterans Day weekend, November 9-10, for Woodcraft's 16th annual *Turn for Troops*. Last year's event, which took place at Woodcraft stores all over the country, produced 17,097 unique pens. These gifts were sent to active duty or recovering military personnel around the globe. Since the program's inception, volunteers have crafted 175,224 pens for the troops. Woodcraft president Jack Bigger said, "Our brothers and sisters in uniform who serve for all of us will benefit by knowing someone else cares about the sacrifices they make." No experience is necessary, all materials are provided, and all ages are welcome (minors should be accompanied by an adult). Check your local Woodcraft store for event dates and times or visit woodcraft.com. ■



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Reader Showcase



DAN MARTIN, GALENA, OHIO

Box and cart. This Gerstner-style machinist's chest is built from walnut, with poplar drawer sides and solid brass hardware. The roll-around cart is constructed using $\frac{3}{4}$ " maple plywood with walnut accents and soft-close, full-extension drawer slides.



PATRICK SCHMITT, STREATOR, IL

Barrel chest. A few friends gifted some old whiskey barrels to Patrick on the condition that he make something cool from them. The result is this $17\frac{1}{2}$ " $\times$ 32" $\times$ 19" rolling chest with a barrel lid inset in the top. The chest's bottom is raised to conceal casters underneath.



PAUL BLACKWELL, MACEDON, NY

Almost done. Blackwell built the Storage Ottoman from our June/July 2019 issue using walnut, with stained oak plywood for the panels. He finished the piece with polyurethane and paste wax. Blackwell's upholstering pal has agreed to make the cushion for the top.



NICHOLAS BRUNO, LOWER ALLOWAYS CREEK, NJ

Birthday box. Bruno found the Collector's Showcase from April/May 2010 while searching for gift ideas for his granddaughter's sweet 16. He used walnut and oak ply for the case, and white oak for the drawer fronts. Bruno added a drawer to make room for his granddaughter's growing jewelry collection.

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2. How does Larissa cut dovetails?
3. Which story references Harry Potter?

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Axiom Stratus Ambient Air Cleaner

Ceiling-mounted air filters can help control airborne dust, but the microscopic particles posing the greatest risk to your health reach your lungs before the ceiling. Axiom's freestanding Stratus air filter reduces dust at the source. Unlike wall or ceiling mounted units, this portable, 3-foot tall chimney-looking device slides where it's needed. A 360° filter draws in dust from all directions and then a central fan propels clean air upward into the shop.

The Stratus stands tall in the dust-busting arena with its two-stage filter. A ½"-thick open-cell foam pre-filter catches larger particles. (Clean this sleeve with a vacuum or a quick water rinse.) The second filter is a 1-micron cylindrical-pleated canister offering 15x more surface area than a standard box-style air filter. When this filter eventually clogs, clean out the caked-in dust with a blast of compressed air.

This unit proved its worth in the warehouse shop that I share

with several woodworkers. Even though the 66-pound unit was sturdy enough to withstand an accidental bump, the wide polyethylene base was easy to slide around. The 3-speed fan-generated less noise than a sander, even at its highest setting. My shopmates enjoyed the one-button control but missed having a remote with an auto-stop timer for scrubbing the air at the end of a workday.

Shipped fully assembled, the Stratus Air is available in two models.

We tested the Stratus which has a powder-coated steel body and the pleated canister filter. The Stratus Pro features a stainless-steel body and active charcoal filter for more challenging applications.

—Tester, Joe Hurst-Wajszczuk

Overview

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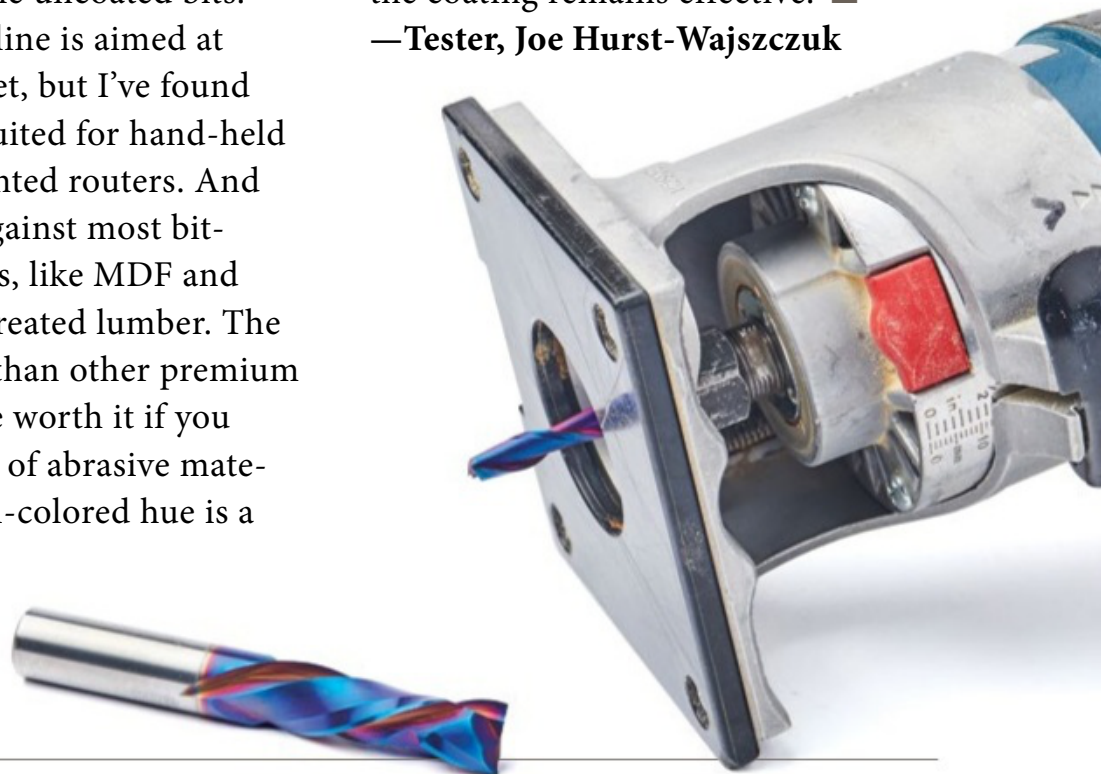
Amana has devised a way to protect the complete bit. The company's Spektra-line features a proprietary nanocomposite (nACo) coating that completely covers the carbide in a micro-thin ceramic skin. In addition to setting up a slick surface that prevents resin build-up, the nACo coating increases the hardness of the carbide.

According to manufacturer tests, Spektra bits last up to $2\frac{1}{2}\times$ longer than comparable uncoated bits.

The Spektra line is aimed at the CNC market, but I've found them equally suited for hand-held and table-mounted routers. And they hold up against most bit-eating materials, like MDF and wet, pressure-treated lumber. The bits cost more than other premium bits, but they're worth it if you work with a lot of abrasive materials. The multi-colored hue is a

result of the application process and will dissipate with use, though the coating remains effective. ■

—Tester, Joe Hurst-Wajszczuk



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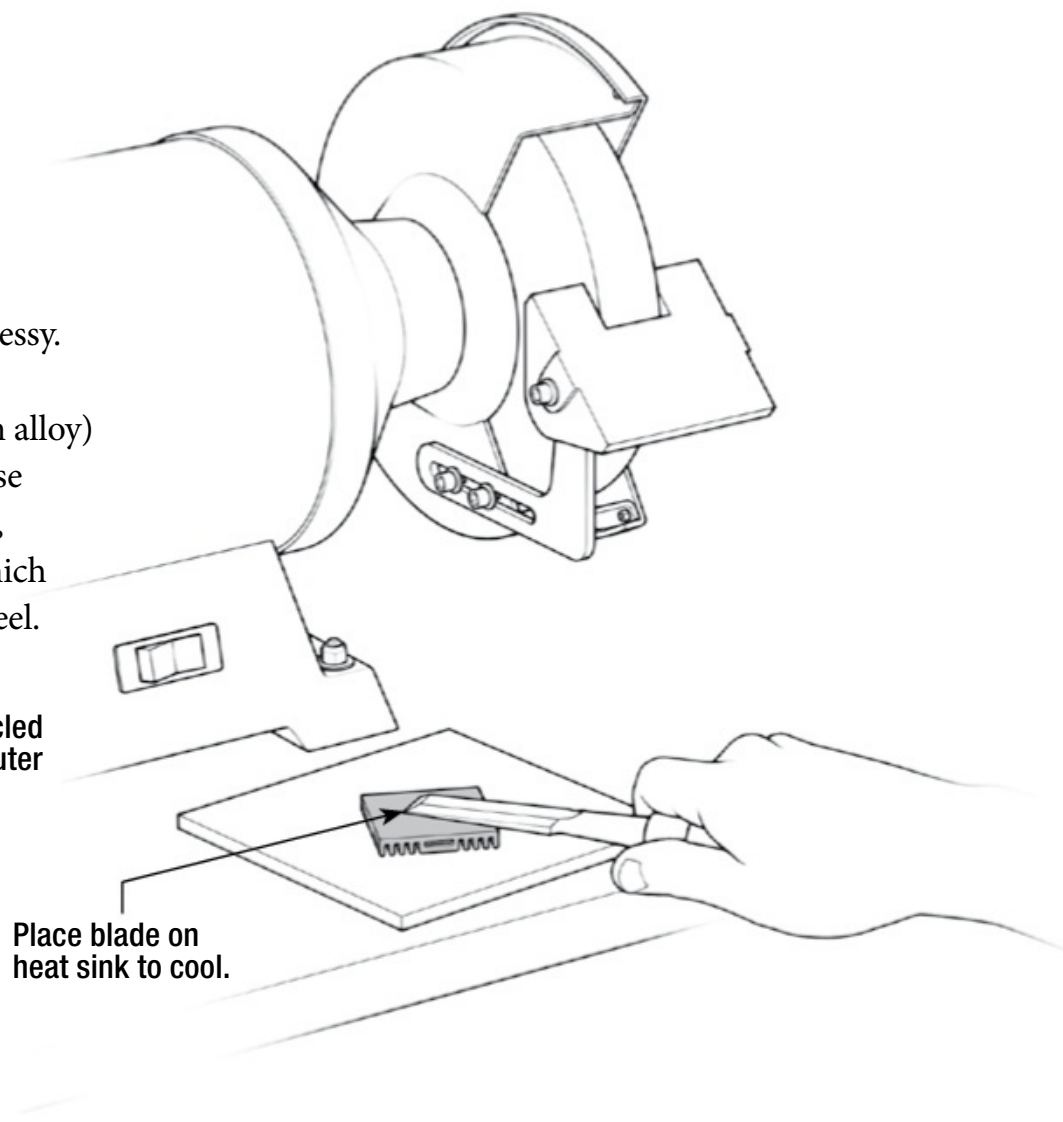
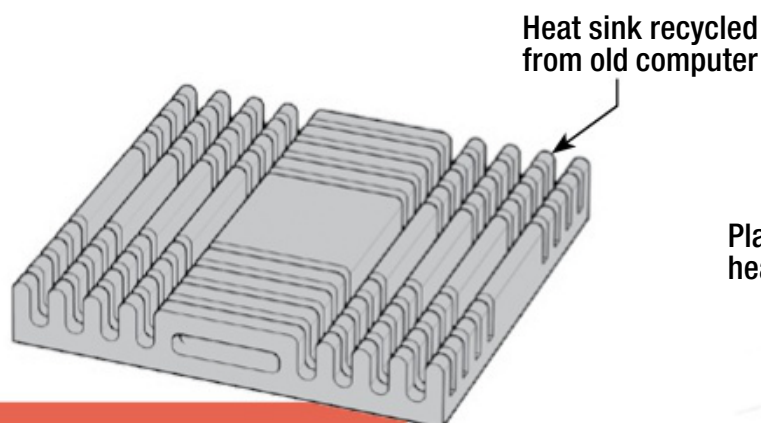
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TOP TIP

Heat sink for sharpening

Grinding a chisel or plane iron generates a lot of heat, and quenching the blade in water can create minute fractures that can affect the quality of the cutting edge. Oil will cool the metal more slowly and safely, but it's messy. Instead, try a passive heat sink scavenged from a computer motherboard. This small square of metal (typically aluminum alloy) is deeply grooved on one face, creating "fins" that help disperse heat quickly. Before your tool gets uncomfortably hot to hold, cool it down by pressing the flat face against the heat sink, which will dissipate the heat in short order without damaging the steel.

—Hunter Clyde, Lancaster, Kentucky



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Inner tube clamps

Woodworking often requires glue-ups that traditional clamps can't handle, so sometimes you need to think outside your wheelhouse. Inner tubes can apply pressure where ordinary clamps can't, making them invaluable for nonlinear assemblies, such as curved or twisted work. To turn a trashed tube into a valuable clamp, cut off the valve stem and slice the tube into $\frac{3}{4}$ "- to $1\frac{1}{4}$ "-wide strips to suit your needs. Wrap a strip around the assembly as necessary, tucking each end under a previous wrap to secure it. If you don't have any old tubes hanging in your garage, check out your local bike or motorcycle shops. Regular tubes are thin and stretchy, while heavy-duty tubes are made from thicker material, which stretches less but is more durable.

—Andy Rae, Asheville, North Carolina

Scrap inner tube for clamping non-linear work.

Tuck end under previous wrap to secure.

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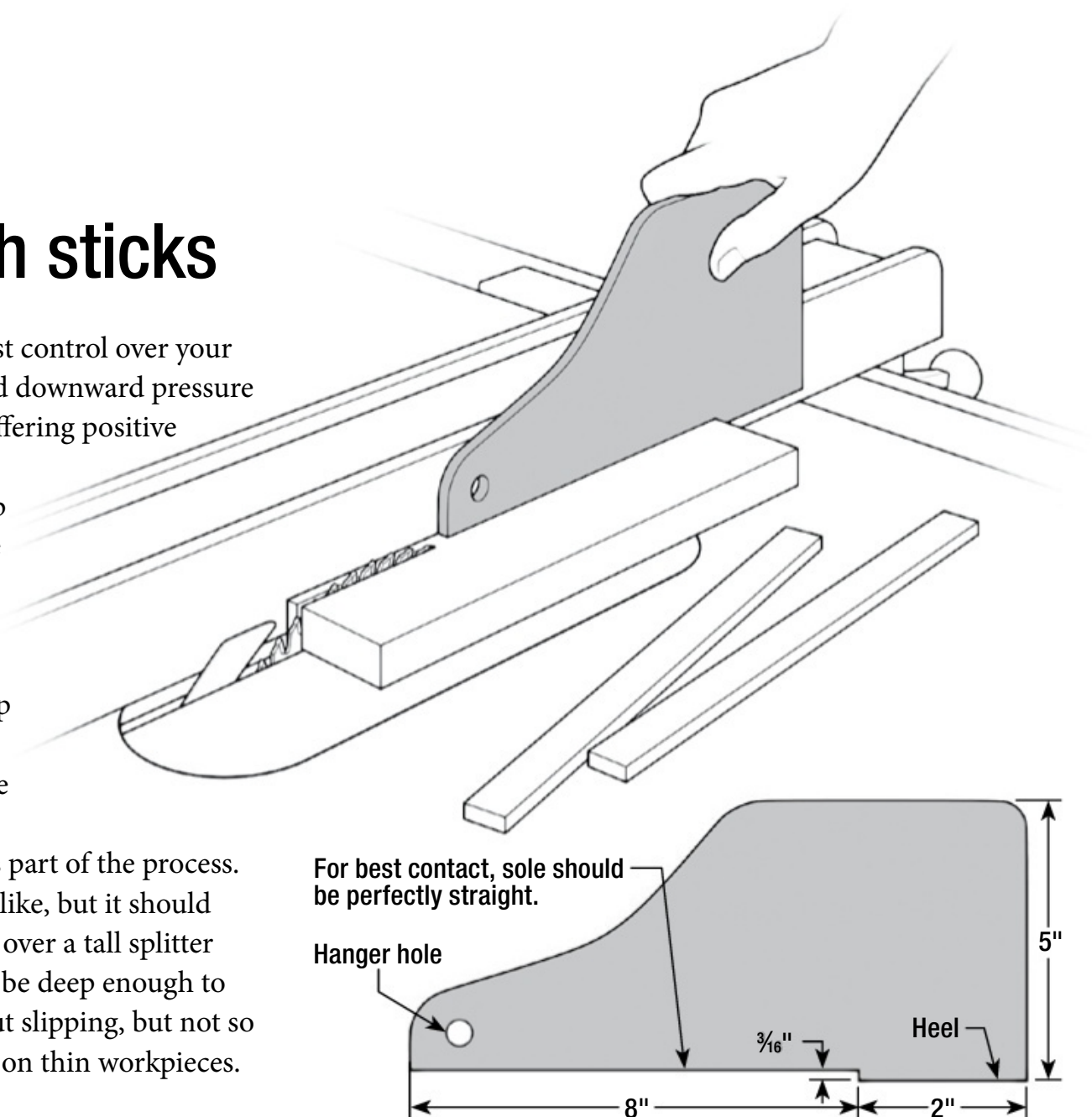
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—Paul Anthony, senior editor



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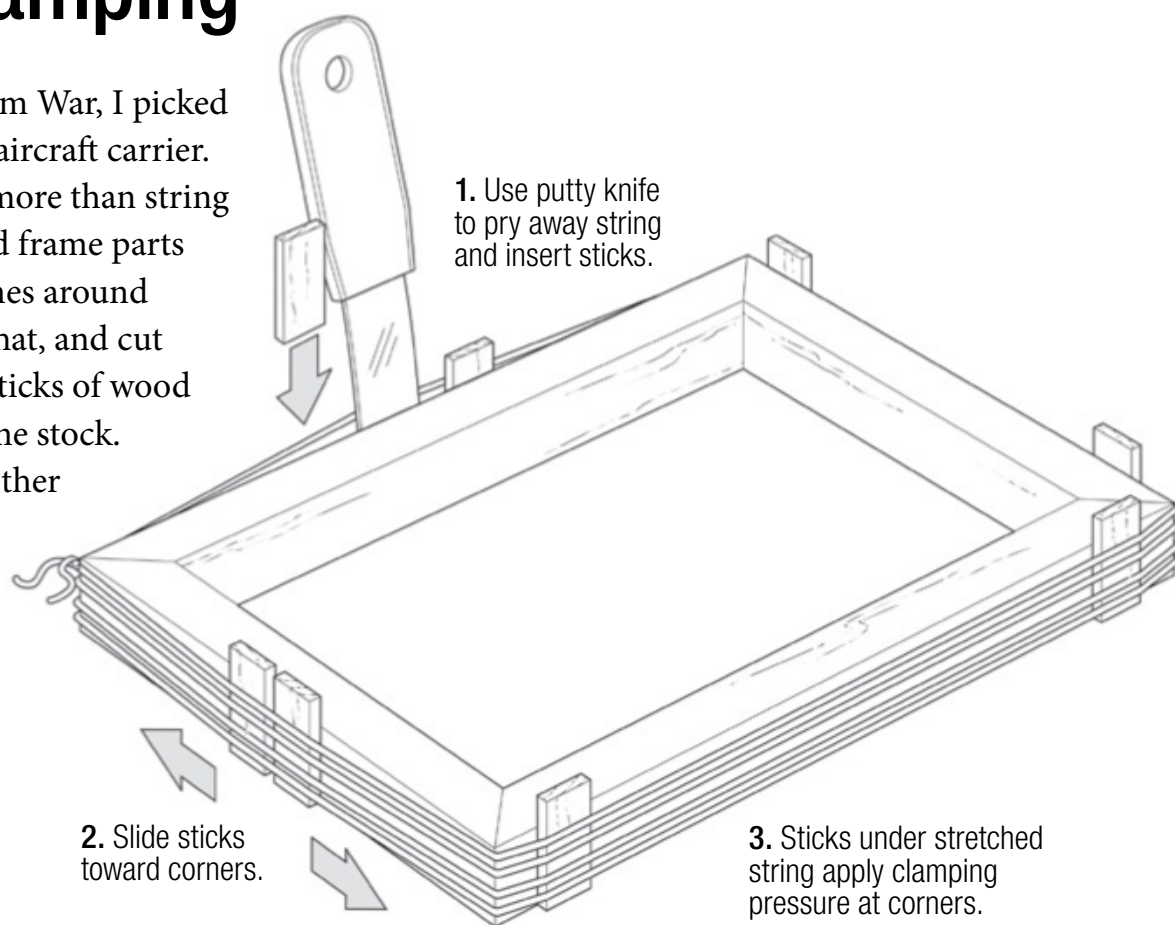
CLASSIC TIP

String-and-sticks clamping

While serving in the US Navy during the Vietnam War, I picked up this tip working in the carpenter shop on an aircraft carrier. It allows you to clamp up a frame with nothing more than string and sticks. Begin by placing the unglued finished frame parts together. Next, wrap stout string at least four times around the perimeter of the frame. Add a foot or so to that, and cut the string to length. Now crosscut eight $\frac{1}{4} \times 1$ " sticks of wood to about $\frac{3}{4}$ " longer than the thickness of the frame stock.

Glue the frame joints, and place the parts together on a flat surface. Wrap the string as tightly as you can around the frame, and then tie it off with a square knot at one of the corners. Using a putty knife, pry the string away from the frame, and insert two sticks near the center of each frame side. Then spread the sticks apart as far as they will go while keeping the frame flat. This will effectively tighten the string to apply clamping pressure at the corners. ■

—Earle Darrow, Thousand Oaks, California



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Craftsman-Style MIRROR

Use traditional details to create an instant heirloom that will improve the view in any room

By Willie Sandry

This mirror might be just the thing to brighten up a hallway, bedroom, or bath. The design includes details I've admired in my favorite Craftsman-style furniture: traditional mortise-and-tenon joinery with proud, exposed pegs, graceful curves, shadow lines created by offset connections, and decorative inlay work. Building your own version is a good opportunity to work on your joinery and template-routing skills, and try out a router accessory designed for making decorative inlays.

Resist the temptation to buy a cheap, 1/8"-thick mirror for this project. Thin, bargain-priced mirrors are more prone to breakage and distortion. Since mirror thickness may vary, order yours ahead of time so that it's in hand when you're ready to rabbet the frame.

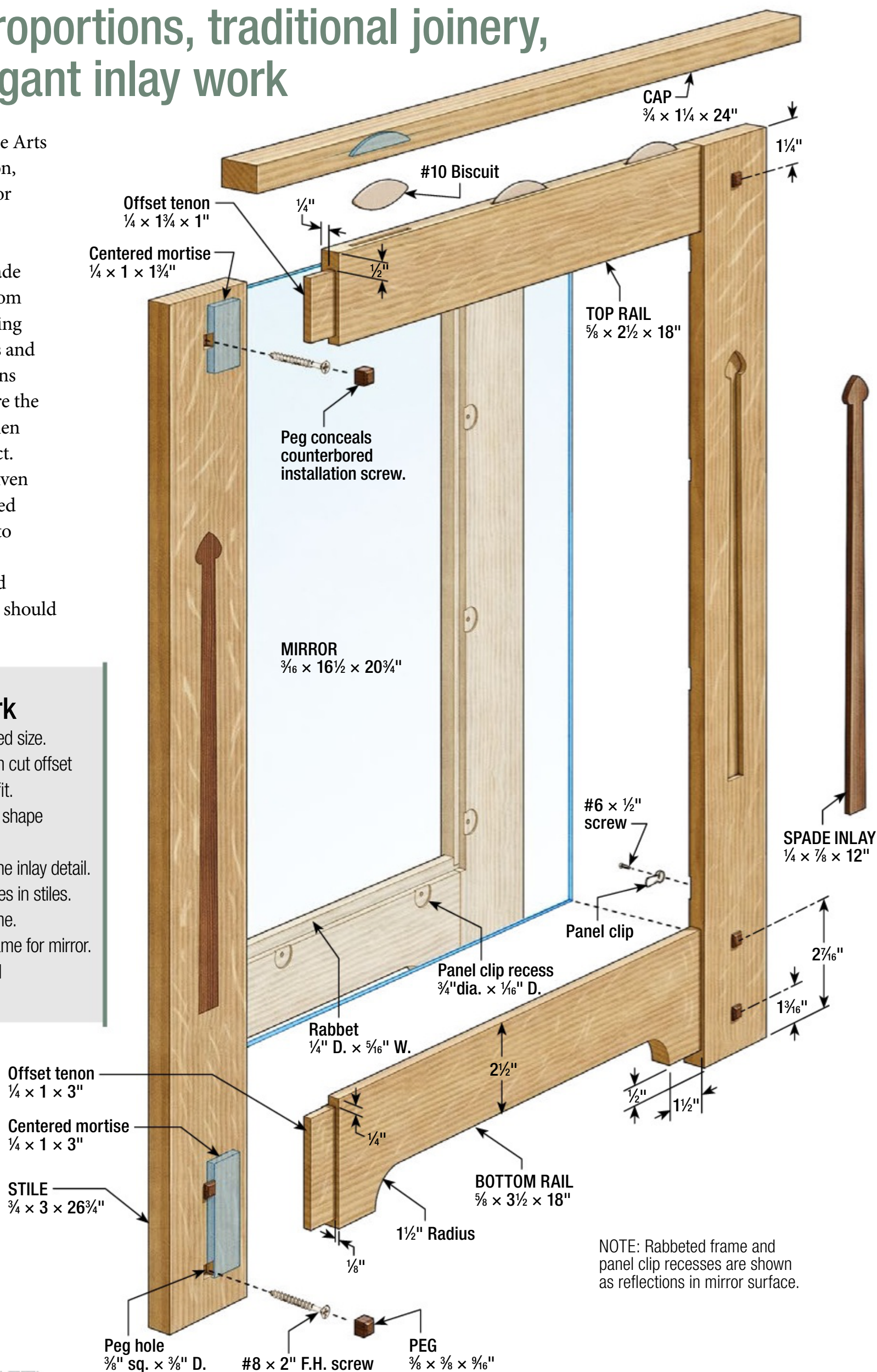


Good proportions, traditional joinery, and elegant inlay work

In keeping with the Arts and Crafts tradition, I made the parts for this project from clear, quartersawn white oak. The spade inlays are made from clear walnut. Making accurate templates and cutting offset tenons that fit correctly are the keys to success when making this project. The dimensions given here can be changed to fit your mirror to a particular space, but the joinery and installation details should remain the same.

Order of Work

- Cut parts to finished size.
- Mortise stiles, then cut offset tenons on rails to fit.
- Make the jig, then shape the bottom rail.
- Make and install the inlay detail.
- Create peg mortises in stiles.
- Assemble the frame.
- Rabbet back of frame for mirror.
- Apply finish, install mirror, and hang.



Make the parts for a sturdy frame

Start by milling stock for the stiles, rails, and cap, then cut your parts to final dimensions. Lay out and cut your mortises next. If you don't have a mortiser like I do, you can mortise the stiles by plunge-routing, or by drilling out the waste and then paring with chisels.

Use some $\frac{5}{8}$ "-thick scrap stock to help you fine-tune the depth of your cheek cuts when making offset tenons on the table saw. As shown in the photo, the miter gauge guides the workpiece, while the rip fence acts as a stop to set tenon

length. Make the top rail's rear-facing, $\frac{1}{4}$ "-deep cheek cuts first, so that the back faces of the rails and stiles are flush. Then adjust dado height to creep up on the bottom rail's $\frac{1}{8}$ "-deep cheek cut for a snug-fitting tenon. Once the tenon's thickness is established, finish the joint by making shoulder cuts with the workpiece standing on edge against the miter gauge.

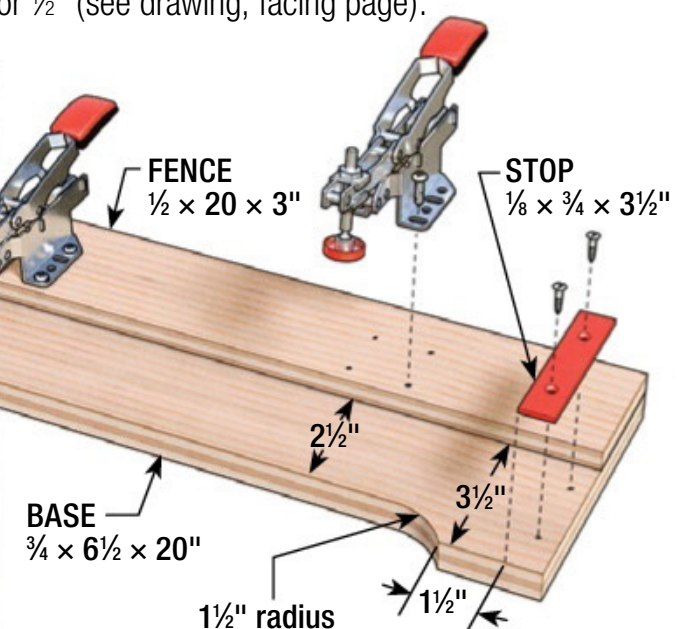
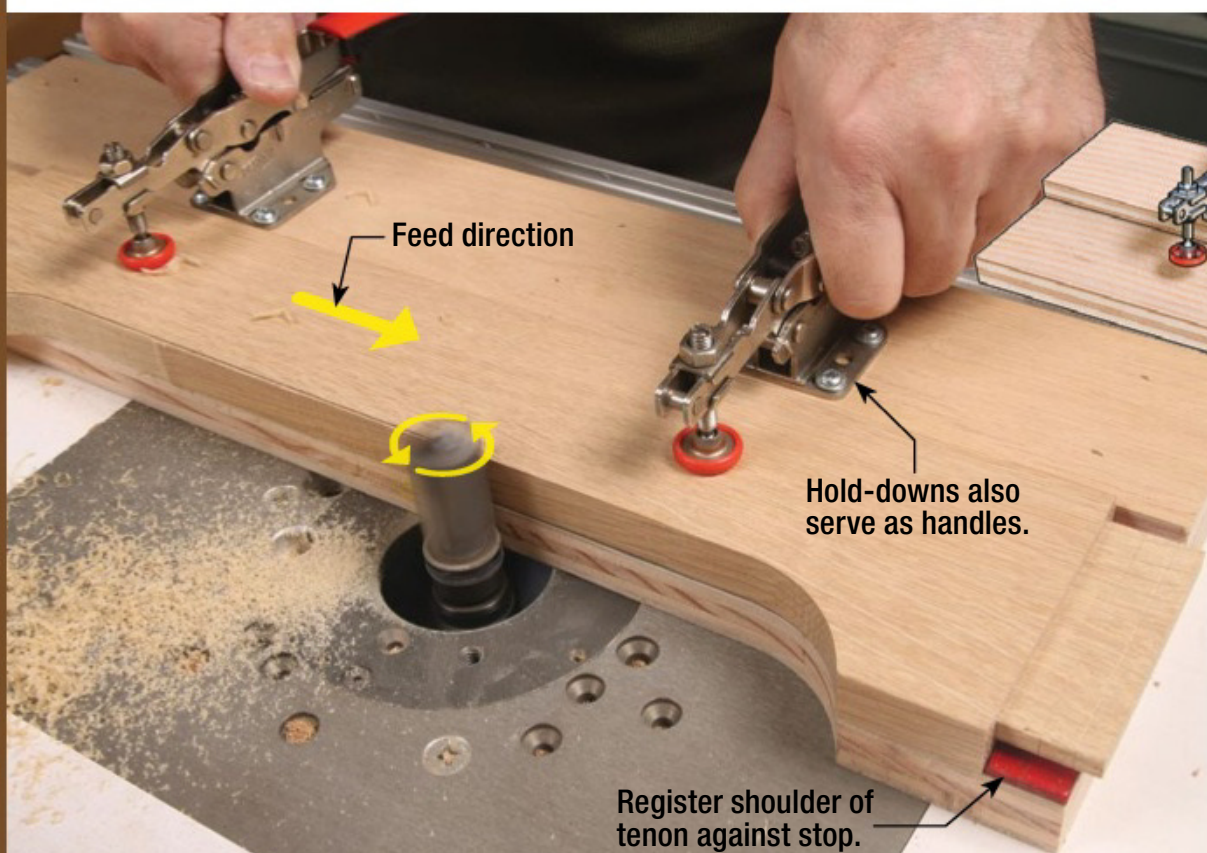
Bandsaw the bottom rail's profile to $\frac{1}{8}$ " outside your layout line, and then complete the curve using a template and top bearing, flush-trim bit as shown.



Centered mortises in stiles. Plunge the ends first, then remove the remaining material with a series of overlapping cuts. Register the front faces of both stiles against the fence to ensure uniform joinery.



Offset tenons in rails. Cut the rear-facing cheeks first, by making one pass with the rail end butted against the fence, and an overlapping pass to remove the remaining waste. Lower the blade and test the cutter height on scrap stock to make sure tenons will fit snugly. Then repeat the two-pass sequence to cut each front cheek. To complete each tenon, stand the rail on edge with the cutter raised to $\frac{1}{4}$ " or $\frac{1}{2}$ " (see drawing, facing page).

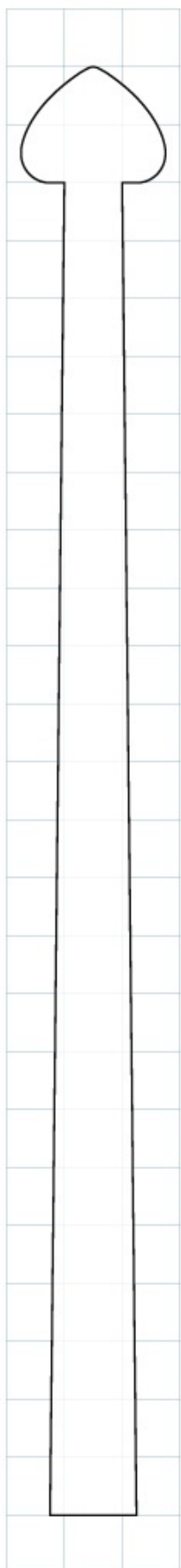


Rout the bottom rail. Build the jig as shown in the drawing. When shaping the bottom rail, avoid chip out by routing one end just past half way, then flip the rail end for end and complete the curve.

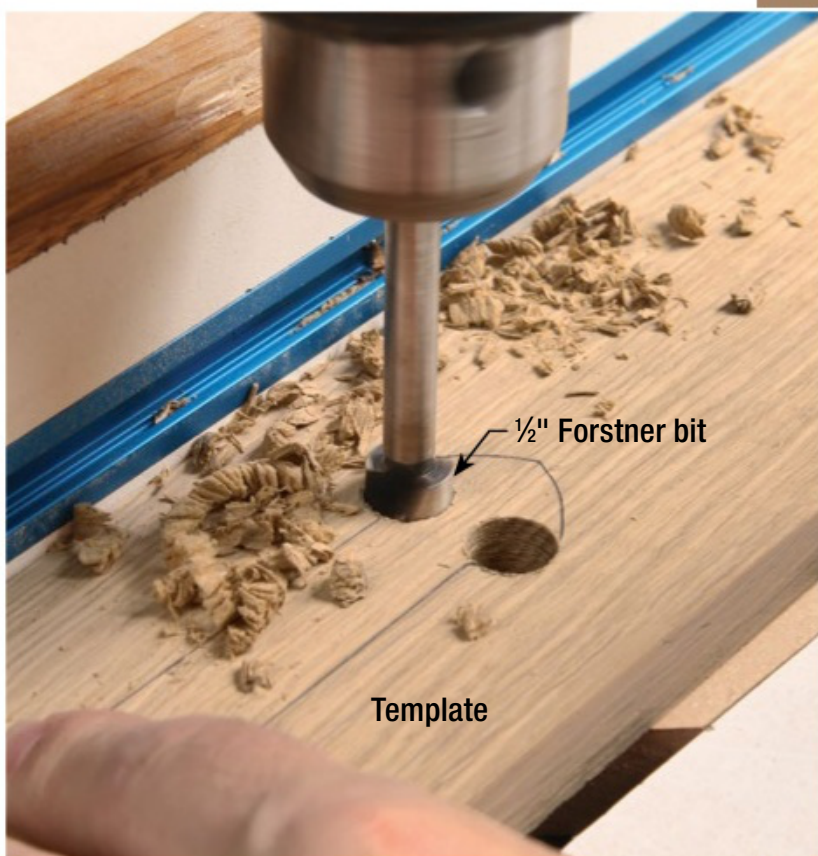
Make the spade template

The $\frac{1}{2} \times 3 \times 35$ " template matches the width of the stiles, and provides some extra length for clamping. After completing the cutout, attach a stop block to the rear face so that the inlay starts about 6" from the stile's top end. The template is used for routing the recess and the inlay, so take your time and get it right.

Template Pattern



1 square = $\frac{1}{2}$ "
Enlarge 200%



Start at the spade. After transferring the template pattern on to your template stock, bore the top lobes with a $\frac{1}{2}$ "-dia. Forstner bit. Complete the cutout with a jigsaw outfitted with a fresh finish-cutting (10-12-tpi) blade. Leave the pencil line.



Finish with a file. Use a mill file and a draw-filing technique to create smooth template surfaces. Keep the file parallel to the bench as you shave to the line.

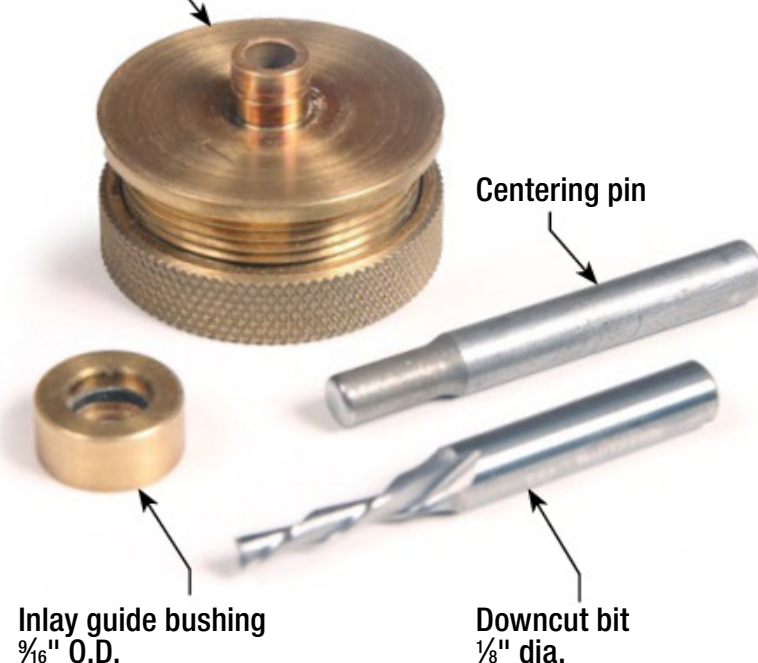
Create an inlay detail with a special bit kit

This inlay kit will make your router even more versatile. It's designed to work with a template, so your first task is to make one, as shown at left. When it's time to rout the recess and the inlay, don't rush your cuts with the tiny bit. Routing the inlay is more difficult than routing the recess, because there's no margin for error. If the bushing veers away from the template edge, your inlay will be ruined. To avoid hang-ups, try lubricating the base of your plunge router with a product like Bostik Glidecote (see Buyer's Guide, p. 69). A few practice runs (with the bit retracted) can also help.

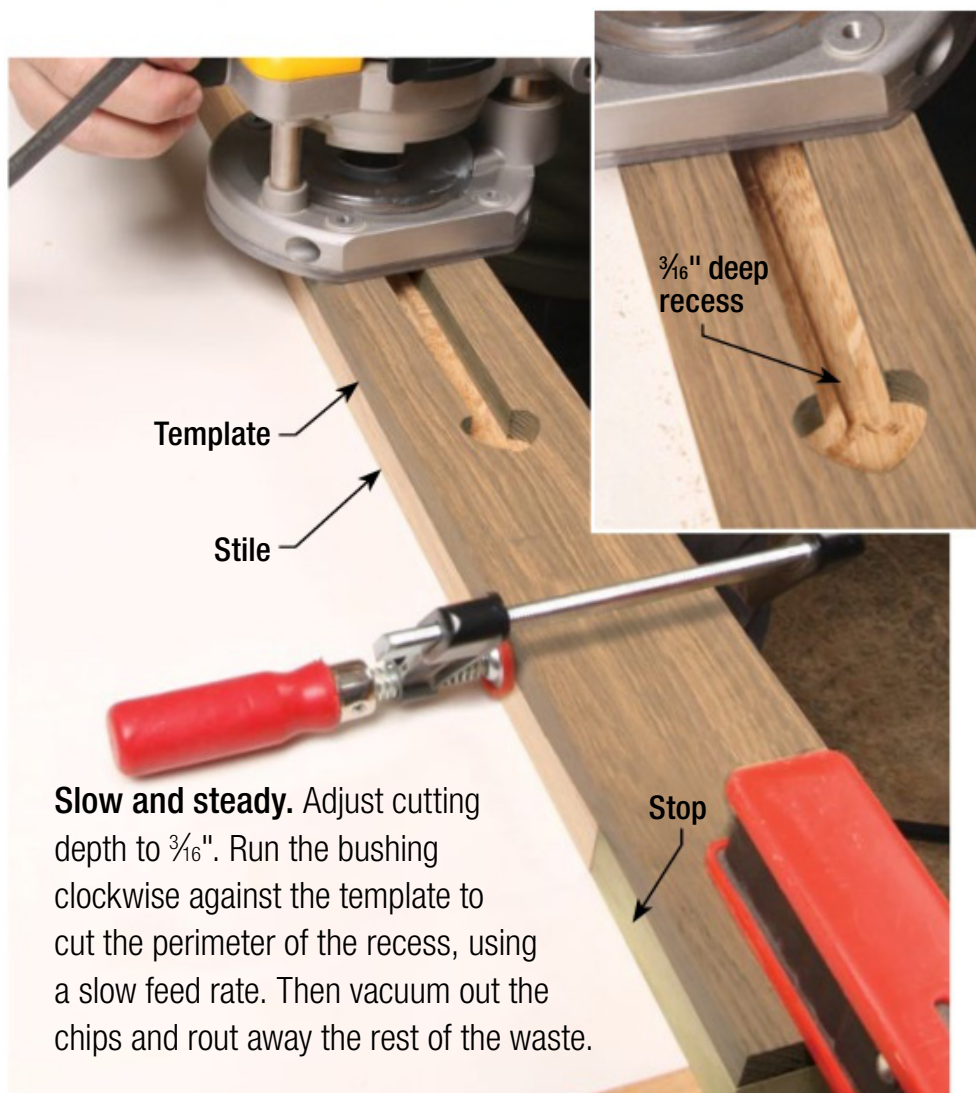
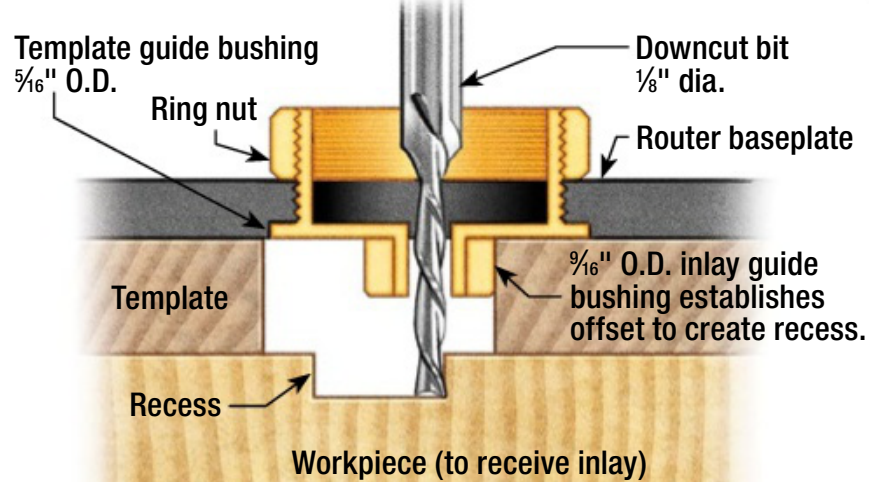
The most difficult times to control the router are when the bit enters and leaves the wood. I find that it's easier to achieve a steady start when bushing is "trapped" against a corner or the top-most point of the spade. When you've worked your way around the template, raise the bit and turn off the router. It's smart to prepare some extra inlay stock in case you need a second chance to rout a perfect pass.

TIP: When you buy an inlay set like the one shown here, it's smart to order an extra $\frac{1}{8}$ " downcut bit, because this tiny cutter is more fragile than larger bits.

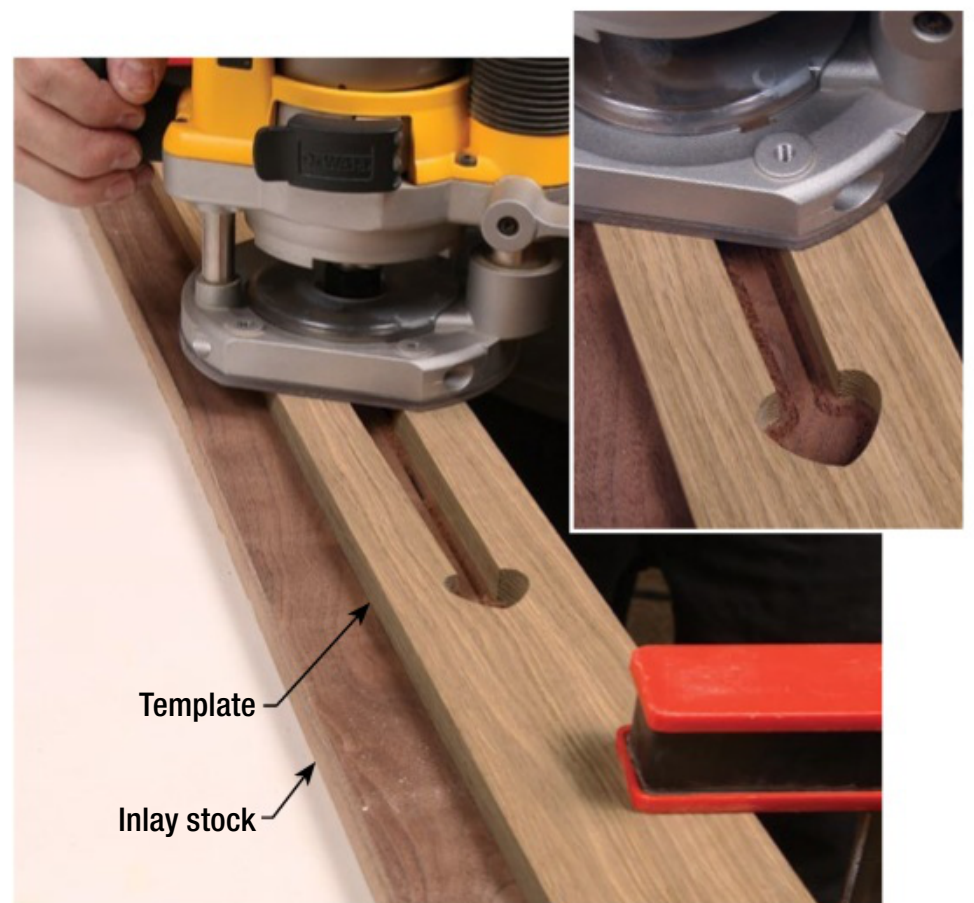
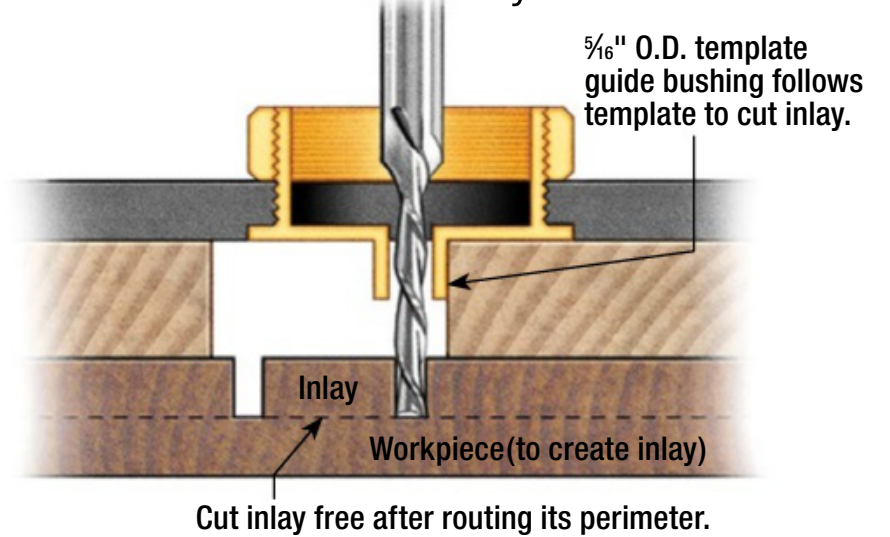
Template guide bushing
 $\frac{5}{16}$ " O.D.



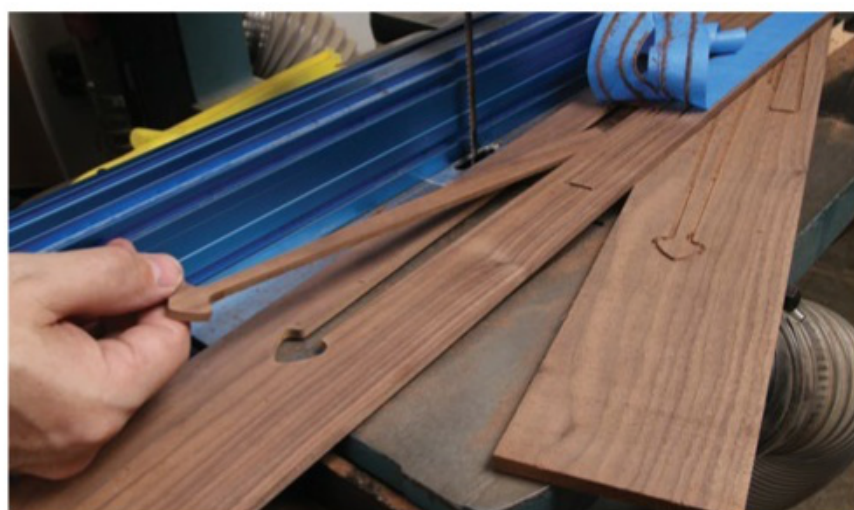
Rout the recess



Rout the inlays



Practice first. With the bit retracted, make a few clockwise practice passes around the template, so you'll be sure to keep the bushing in constant contact with the template. Rout the inlay in a single continuous pass.



Tape, then resaw. Tape over the routed outline to prevent damage, and set the bandsaw fence for a $\frac{1}{4}$ "-thick cut. Run the taped side of the workpiece against the fence to cut each inlay free.



Install the inlay. Hand-sand a small chamfer along the inlay's back edges to ease the fit. Apply glue to the recess, then tap the inlay home with a rubber mallet. Use a clamp if you need extra pressure, but place waxed paper over the inlay before clamping a caul over its surface. After the glue dries, sand the surfaces flush with 120-grit sandpaper, then give the stiles and rails a final sanding with 150 grit.

Assemble the frame, install the mirror, and reflect on a job well done

Four of the frame's six pegs conceal screws that mount the mirror on the wall (see drawing, p. 24). I used my hollow chisel mortiser to create the $\frac{3}{8}$ "-square, $\frac{1}{4}$ "-deep mortises, but you can drill out your mortises, and square them up with a chisel. Then drill $\frac{1}{8}$ "-dia. clearance holes for your four installation screws. Size the square pegs to fit your mortises, but cut them so that they stand slightly proud (about $\frac{3}{16}$ ") of the stiles. To finish them off, round the exposed corners with fine sandpaper.

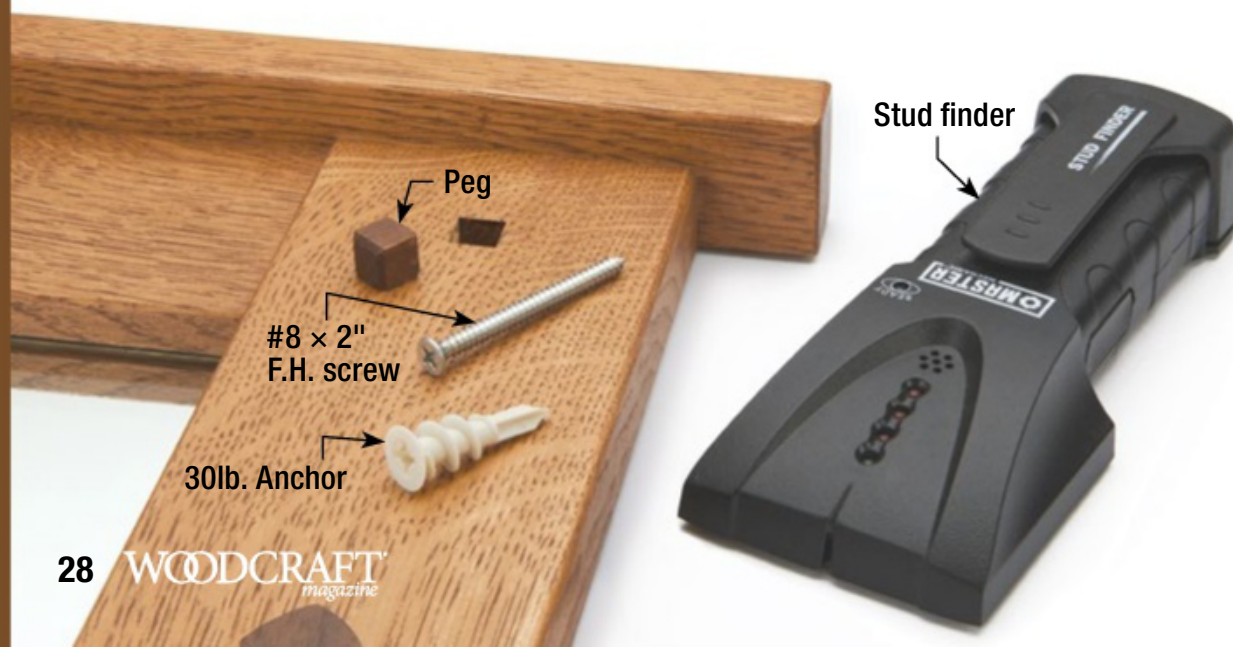
When rabbeting the back to accept the glass, adjust the depth of your rabbeting bit to equal the thickness of your mirror glass plus the thickness of your panel clips. I drill $\frac{1}{16}$ "-deep holes along the edges of the rabbet to recess my panel clips, so that the mirror frame will fit flat against the wall. Complete the frame by gluing on the cap. Biscuits aren't necessary for strength here; they just keep the cap aligned during glueup.

Remove the mirror to finish the frame. To give my project the amber hue of antique oak, I applied "Candlelight" stain from General Finishes, and then topped it off with several sprayed-on coats of satin lacquer. Once the finish has dried, reinstall the mirror and mount it on the wall. ■

Routed rabbets and recessed clips. Routing the full depth of the rabbet in a single pass risks chipping the wood. Avoid this by making several shallow passes instead. Square the corners of the rabbet with a chisel, then drill recesses with a Forstner bit so that your panel clips will sit flush with the back face of the frame.



Basic assembly. Spread glue sparingly on rail tenons to minimize squeeze-out, then tap joints together with a rubber mallet and clamp them tight.



Mirror hanging help. Since mirrors are heavy, it's important to hang them correctly. Drive installation screws into studs or other solid framing if you can. When this isn't possible, drive screws into heavy-duty drywall anchors. Self-drilling plastic anchors like the one shown are easy to install with a cordless drill and Phillips-head bit.

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Three woodworkers share their experiences in bringing computer-controlled woodworking into their shops

By Ken Burton

I started using CNC (Computer-Numeric-Controlled) machines about 12 years ago when I purchased a small Shopbot model for the Tech Ed program in the high school where I teach. It didn't take long for me to see how I could take advantage of the technology in my own shop and I haven't regretted getting my own.

Today getting started with CNC is much less expensive than you might think. You can buy a small CNC router kit for under \$800 or about double that if

you want one that is ready to go right out of the box. This will get you a machine capable of cutting a piece of material about 12" square. The price jumps to about \$2400 for a 12 × 24" model and to about \$6000 for a 24 × 48" version. If you're interested in using the machine for furniture making, this is about as small as I'd consider. Machines capable of cutting a full 4 × 8' sheet of plywood start at about \$12,000.

For the money, you get the router along with the software necessary to run it and

design basic shapes and toolpaths. This software is usually specific to the machine you buy, although most CNC software will accept files from more sophisticated CAD (Computer-Assisted Drawing) programs such as SketchUp or Autocad.

To give you some idea as to how a CNC machine might fit into your shop, I spent time with three woodworkers who have taken advantage of this technology. Their observations and advice can help you answer the question at the top of this page.

Curved moldings done quickly

Justin Strasser

Campbell-Strasser Cabinetry
and Architectural Millwork

4 × 8' Shopbot

Software: Shopbot Partworks
(a form of Aspire)

Favorite bit: 3/4"-dia. × 45° V bit
for chamfering inside frames.



WM: How did you get started with CNC?

JS: At that point I had been designing on the computer with AutoCad for four or five years so it wasn't too big a stretch to move to a machine that actually cut along the lines I was drawing instead of simply printing them.

WM: What do you use your machine for?

JS: The question might be better phrased as: "What don't I use it for?" It's like having an extra guy in the shop. Anytime it's not a straight line, I think about how I can get the router to do it. It makes incredibly accurate templates, so curved work becomes a lot more affordable. Plus we do some ecclesiastic millwork, so we use it for floral carvings, fleur-de-lis, and inscriptions—work that I'm not sure how I would do without the router.

WM: What advice would you offer someone getting started with CNC?

JS: Get comfortable with the software—particularly on the drawing side. If you're comfortable with drawing on the computer, the transition to CNC work is a lot easier.

“It's like having an extra guy in the shop.”

Take the time to make sure your machine is set up right and check this every few months to confirm that nothing has changed. To do so, cut a few squares and check the diagonals to make sure they are actually square. If you use a spoil board, use the router to cut its surface level so your Z cuts are truly consistent.

WM: What did you find most challenging about learning to do CNC work?

JS: As with any tool, you have to learn what it is capable of. The weak point is often the bit. You'll probably break a few before you are comfortable with how hard you can push them. Also, it took me some

time to learn how to sequence the cuts I was making. You'll want to think through the whole series of cuts, so you don't cut away support for a subsequent operation.

For example, if you have several interior cuts to make on a board, do them first before doing the overall cutout.



Computerized carving assistance

Norman Pease

Three Gryphons Carving Studio

Shop Sabre 48 × 96"

Software: Aspire & Enroute

Best bits: 1/8"-dia. ball nose for carving; 1/2" compression bit for clean through cuts.



WM: What made you decide to buy a CNC machine?

NP: I worked as a cabinetmaker for about fourteen years before branching off into woodcarving. After a couple of years as a professional carver, I found I just couldn't keep up with the demand working by hand. To build my business, I had to find a more efficient way of working. CNC seemed to be just the ticket. I was glad I took the plunge because when the recession hit, the CNC part of my business kept me going.

WM: What kind of challenges did you find as you got up and running?

NP: The first year was insane. Getting the machine to work was pretty easy. It was the design part that was tricky—especially setting up to cut 3D shapes. These days, some of that fussy design work has gotten easier. You can actually purchase 3D files online. There are even places that will generate 3D files to your specifications—for a price, of course. You'll pay quite a bit more if you want exclusive use of those files. You can defray some of the cost if you allow the designer to resell the files to other users.

WM: Do you think using a computer takes away from the craft?

NP: I've changed my mind about that. The artistry is still there.

You still have to visualize and design your work. But you're adding to your capabilities by developing a different set of skills. Even if someone wants something "hand-carved," I may rough the piece out on the CNC machine

and then finish it by hand. To those woodworkers who consider that cheating, I ask: "Do you hand-plane all off your lumber, or use a jointer and planer to save a little of the grunt work?" It really is the same thing.

WM: What advice would you offer to someone getting started with CNC?

NP: Incorporate CNC into your workflow with realistic expectations. The software isn't perfect, and it will take time to fully explore the possibilities that exist with CNC. Like any other aspect of woodworking, it takes practice—and more than a few mistakes—to improve your skills. If

“ Even if someone wants something ‘hand-carved,’ I may rough the piece out on the CNC machine and then finish it by hand.”

you're having trouble, you can be sure that there are other CNC users who have already figured out what you're trying to do. So take advantage of the on-line community of users and tap into their collective knowledge.



Personalized presents made easy

Tyrone Hollie

CNC Hobbyist

Laguna IQ HHC (24 × 36")

Software: Aspire

Favorite bits: 1/8"-dia. ball nose for carving; 1/2" straight bit for cutting parts to size.



WM: What prompted you to get a CNC machine?

TH: I got started with woodworking by making pens on a small lathe. With several dozen pens under my belt, I started thinking it would be cool if I could add some graphics to them, which led to the purchase of a small laser engraver. From there it wasn't that big a step to a CNC router which could cut things out as well as engrave them. I've been at it for about two years now.

WM: How did you learn how to run the machine?

TH: I'm pretty much self-taught. There are tons of online resources available, including plenty of instructional clips on YouTube. I also belong to a CNC users club, which is a great source for advice and new ideas. One of the things I like about being a part of the CNC community is how collaborative everyone is. It is so different from the pharmaceutical industry where I make my living. There, everyone seems to be trying to take advantage of everyone else.

WM: Are you happy with the capabilities of your machine?

TH: I upgraded my machine almost immediately, replacing the stock router with a water-cooled spindle. I paid about \$700 for this extra, but I've since seen them online for about \$400. I really like the new spindle. It runs quieter, does a better job of controlling dust, and can handle extended run times with no problem. Some of the carving files I've run can take as long as 12 hours to cut.

WM: What kind of things do you like to make?

TH: Signs, boxes, plaques...lots of wedding presents. I'll stop along the street when I see something I like

it and wanted one. I could probably start a business making things like that.

WM: What advice would you offer to someone getting started with CNC?

TH: Remember the machine will only do what you tell it to do. Take your time and think through each process. You can usually figure out where your mistakes are going to happen, especially if you watch the on-screen simulations carefully. These video previews will show you

“ One of the things I like about being a part of the CNC community is how collaborative everyone is. ”

and just stare at it, trying to figure out how to make it. Nine times out of ten, I just give away the things I make. I hung a sign I'd made up in my office and a lot of people saw

exactly what your toolpaths look like. Until you become confident in your abilities, run them in slow motion so you can really watch what's going to happen. ■

TOP SECRET

A lesson in hidden compartments built into a sweet little table

By Larissa Huff

It's not often "U.S. Government" appears on our shop phone caller-ID. And I was certainly surprised when the voice inquired if we could design a custom course in concealment furniture making for a group of Navy Seals. As an instructor at the Lohr School of Woodworking, I know firsthand that we are not a reputed hub of covert operations, but I wasn't about to pass up the opportunity to change that!

This table, born of that request, provided a fun design challenge. It combines traditional furniture making techniques with commonly available hardware to create surreptitious storage in a finely built, but inconspicuous piece of furniture. The four hideaways include a compartment under the hinged top, a cavity behind each of the two side aprons, and a false back in the drawer. The top is secured with an RFID (Radio Frequency Identification) lock that requires passing an electronic key-card over it to release it. The child-proof lock on the left-hand side compartment disengages with the use of a dowel-encased magnet, while the push-latches in the right-hand compartment require only finger pressure. Pushing the drawer stop up from underneath releases the drawer to expose its hidden back space.

My hope is that building this piece teaches and inspires you to incorporate similar secrets into your own furniture. Just remember—and this is important—never under any circumstances should you [REDACTED]!



RFID key card passed over interior lock area releases top for lifting.



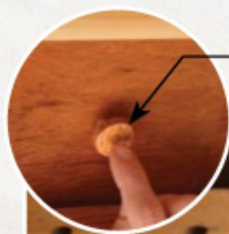
RFID lock box



Magnet (embedded in dowel) held over catch area opens left-hand apron compartment.



Child-proof lock



Raising dumbbell stop from underneath allows full retraction of drawer to expose hidden section at rear.



Dumbbell-shaped drawer stop

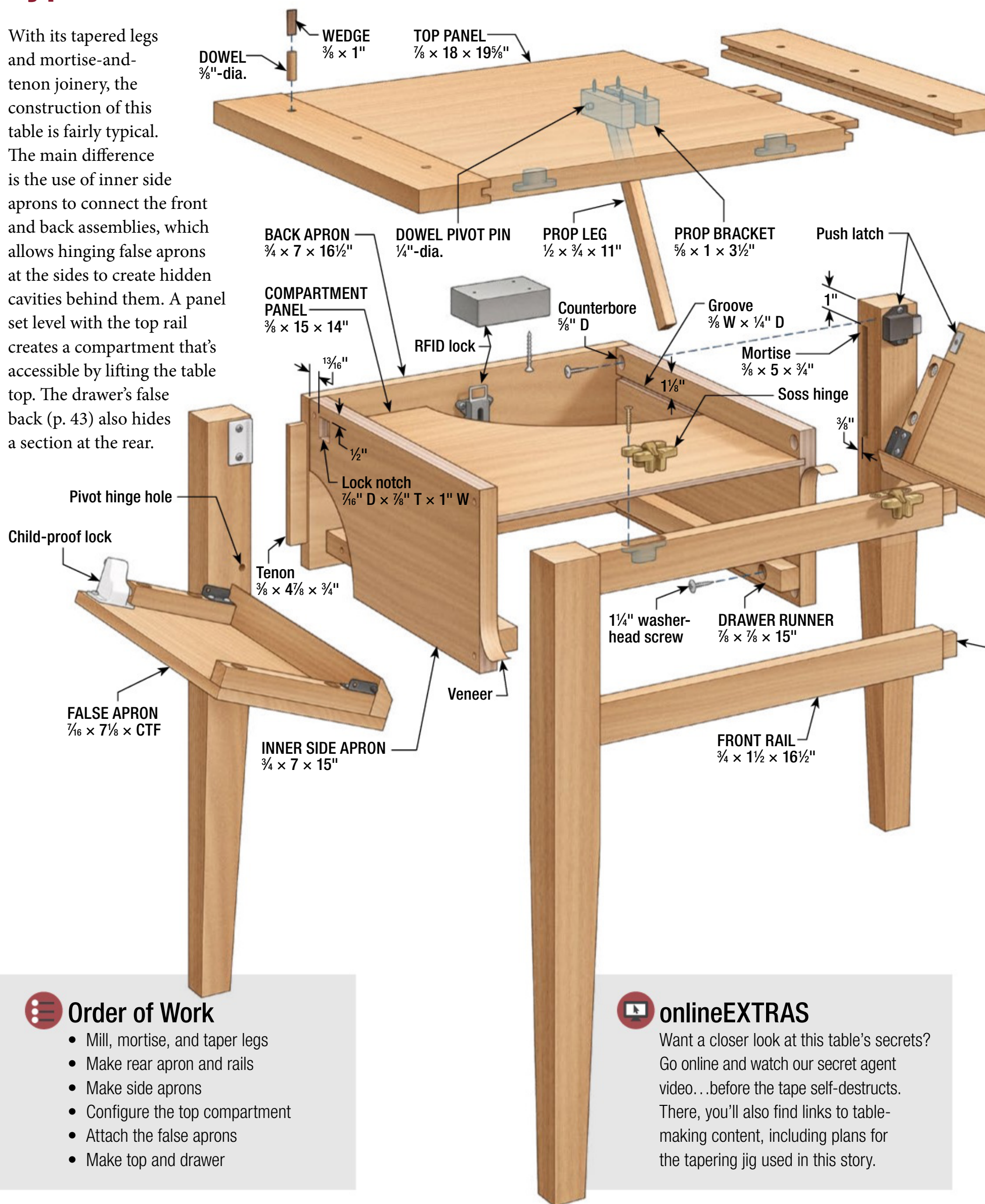
TABLE



To open false apron, press to activate interior push-latch.

Typical table construction with a few twists

With its tapered legs and mortise-and-tenon joinery, the construction of this table is fairly typical. The main difference is the use of inner side aprons to connect the front and back assemblies, which allows hinging false aprons at the sides to create hidden cavities behind them. A panel set level with the top rail creates a compartment that's accessible by lifting the table top. The drawer's false back (p. 43) also hides a section at the rear.



Order of Work

- Mill, mortise, and taper legs
- Make rear apron and rails
- Make side aprons
- Configure the top compartment
- Attach the false aprons
- Make top and drawer



onlineEXTRAS

Want a closer look at this table's secrets? Go online and watch our secret agent video...before the tape self-destructs. There, you'll also find links to table-making content, including plans for the tapering jig used in this story.

Table Top Detail

The drawing shows a table top with overall dimensions of $18\frac{1}{2}"$ in height and $16\frac{3}{4}"$ in width. A detailed view of the right edge shows a $3"$ wide strip with a $\frac{3}{8}"$ wide groove. The groove is $\frac{5}{16}"$ deep and contains a $\frac{3}{8}"$ -dia. hole. The distance from the top edge to the first hole is $2\frac{1}{4}"$, and the distance between the first and second holes is $4"$. The distance between the second and third holes is $2"$, and the distance between the third and fourth holes is $4"$. The distance from the bottom edge to the fourth hole is $2\frac{1}{4}"$. The distance from the right edge to the center of the fourth hole is $\frac{3}{8}"$. The distance from the right edge to the center of the third hole is $\frac{3}{4}"$. The distance from the right edge to the center of the second hole is $1\frac{1}{2}"$. The distance from the right edge to the center of the first hole is $1\frac{1}{16}"$. The distance from the top edge to the center of the first hole is $2\frac{3}{4}"$. The distance from the top edge to the center of the second hole is $1"$. The distance from the top edge to the center of the third hole is $1"$. The distance from the top edge to the center of the fourth hole is $1"$.

Diagram illustrating the assembly of a wooden frame, showing dimensions and instructions:

- Top rail width: 2"
- Top rail thickness: $\frac{3}{16}$ "
- Top rail offset from center: $1\frac{1}{8}$ "
- Top rail offset from edge: $\frac{5}{8}$ "
- Side rail width: $1\frac{3}{8}$ "
- Frame width: $13\frac{1}{2}$ "
- Frame height: 15"
- Instruction: Use jig to position stepped mortises in rail and top.

Diagram illustrating the assembly of a door hinge. A vertical wooden batten is shown being cut to fit the hardware. The batten is secured to a door edge using two screws. A pivot hinge is attached to the bottom of the batten. The hinge is angled at 45° . The distance from the bottom edge of the door to the hinge is $1\frac{3}{8}"$. The thickness of the door is $\frac{3}{4}"$.

Technical drawing of a wooden nightstand. The overall width is $22\frac{5}{8}"$. The width of the drawer opening is $15"$. The height of the drawer is $4"$. The thickness of the top panel is $\frac{7}{8}"$. The thickness of the drawer front is $1\frac{1}{2}"$. The nightstand has a single drawer with a round knob and is supported by two tapered legs.

Diagram illustrating the dimensions of the table's top and drawer area:

- Top width: $18\frac{1}{2}"$
- Drawer height: $7"$
- Drawer width: $13\frac{1}{4}"$
- Total height (top to bottom of drawer): $24\frac{1}{8}"$

BATTEN
 $\frac{3}{4}'' \times \frac{7}{8}'' \times \text{CTF}$

CLEAT
 $\frac{3}{4}'' \times 1\frac{3}{8}'' \times \text{CTF}$

Mortise 
 $\frac{3}{8} \times 1 \times \frac{3}{4}$ "

Tenon
 $\frac{3}{8} \times \frac{7}{8} \times \frac{3}{4}$ "

Taper begins 10½" from top of LEG

LEG 
 $1\frac{7}{8} \times 1\frac{7}{8} \times 23\frac{1}{4}"$

- Rear apron and rails lengths include tenons.
- CTF = Cut to fit.
- See page 69 for hardware sources.

Mill, mortise, and taper the legs

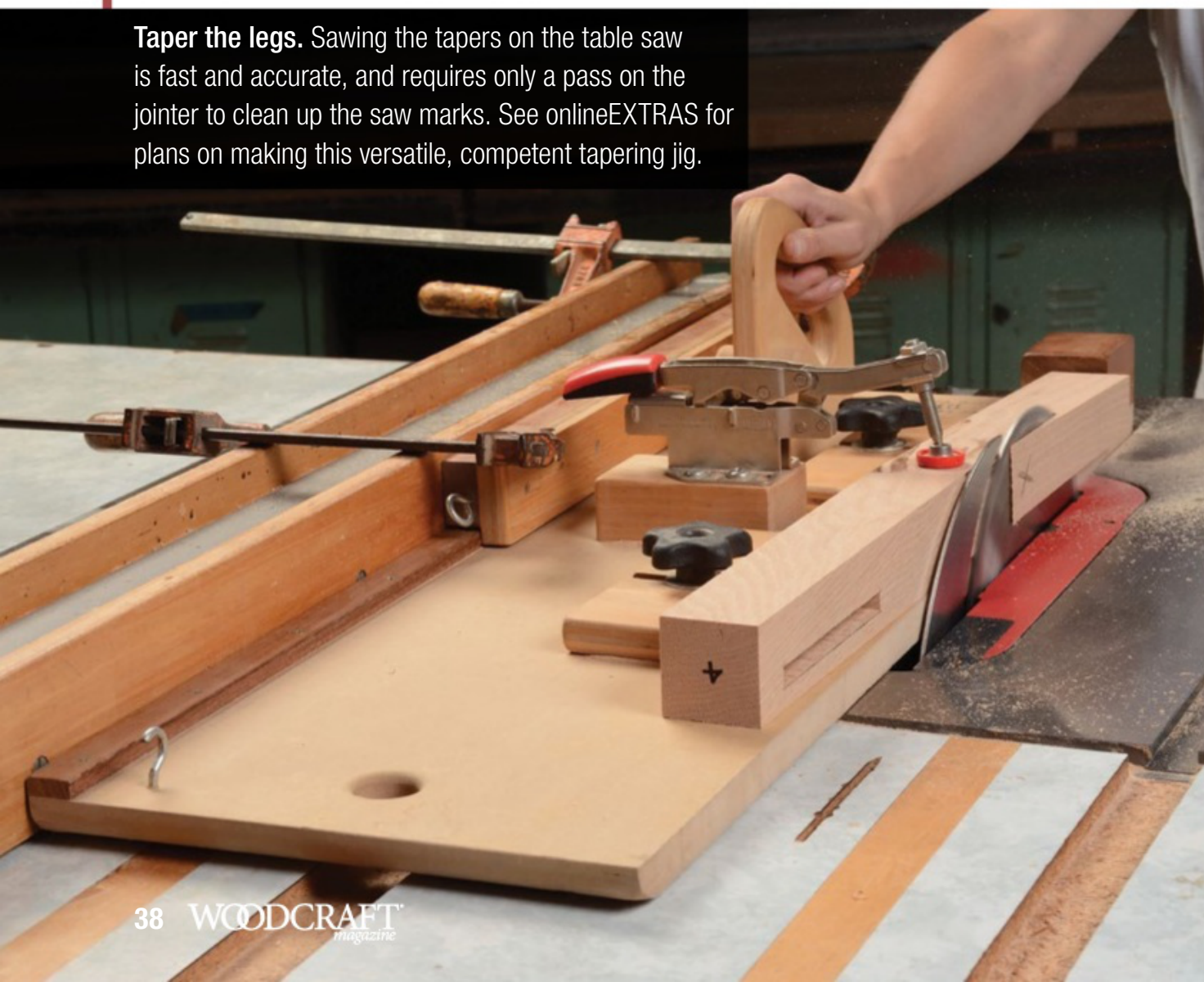
Mill the leg blanks to squared size, cutting them from rift-sawn stock (with diagonally oriented annular rings) to ensure relatively straight-grain on all faces. If you don't have

thick stock, legs can be attractively laminated. (Visit [onlineEXTRAS](#).) Mark them for desired orientation, and then lay out and cut the mortises before sawing the tapers.



Mortise for the rails and rear apron. When using a hollow chisel mortiser, I start with the ends, and then make a series of cuts separated by a distance a bit less than the chisel's width. This approach prevents the workpiece from shifting, keeping the cuts straight and true.

Taper the legs. Sawing the tapers on the table saw is fast and accurate, and requires only a pass on the jointer to clean up the saw marks. See [onlineEXTRAS](#) for plans on making this versatile, competent tapering jig.



Make the rear

Mill the rear apron and front rails to size, then cut their tenons. I do this at the tablesaw as shown. Next, plane each tenon for a perfect fit in its mortise.



Fine fitting. Having cut all the tenons a bit fat, use a rabbet plane to trim the cheeks as necessary to create

apron and rails

The parts should slip together without undue force, and should stay together simply as the result of the friction fit.



Cut the cheeks. Using a dado head and a sacrificial fence, saw the cheeks a bit fat, flipping the stock over to make each cut in turn. Afterward, raise the cutter to saw the narrow shoulders. The resulting tenon width should be about 1/8" less than the mortise length.



a snug fit in each mortise. Number each tenon to match its mating leg. Here, a bench hook holds the stock for quick, secure trimming.

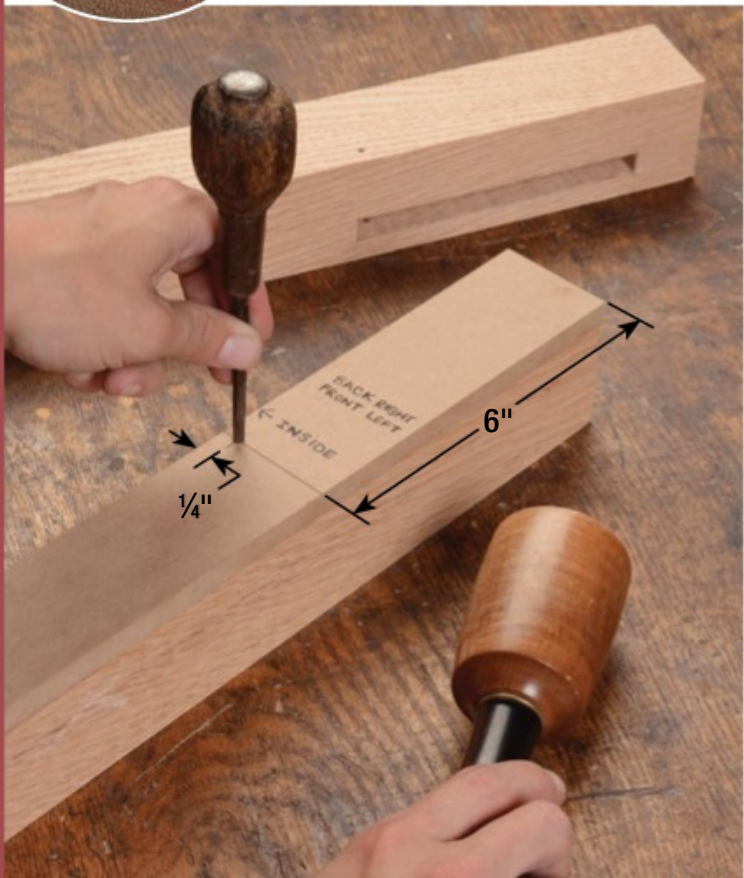
Make the side aprons

Make the false aprons to width, but oversized in length for now, glue on the unbeveled (for easier clamping) cleats, and set them aside. Make the inner side aprons, groove them to accept the top compartment panel, and face the front end of each with a strip of veneer. Then notch the inner face of the left-hand apron as shown. Dry-clamp the legs to the rear apron and front rails, mark for the screw clearance holes in the side aprons, and then drill the holes and counterbores at the drill press. With the side aprons clamped in place, use an awl to locate the pilot hole locations in the legs. Disassemble the parts, and use a

template to mark for the hinge pin locations. Then drill the hinge pin holes and the pilot holes in the legs to attach the inner aprons.



Notch for the left-hand lock. After laying out the 1 x 7/8" recess for the child-proof lock on the left-hand inner apron, rout it out to a depth of 7/16". No need to get fussy with this cut; it just needs to provide clearance for the head of the catch without cutting through to the opposing groove.



Marking hinge pin locations. For precision, locate the false apron hinge pin holes in the legs using a template. Tapping an awl slipped into the template hole does the job. Then drill the stepped holes for the receiver cups at the drill press. A 1 5/32" countersink drilled with a standard twist drill should fit the flange perfectly, and a 3/8"-diameter hole should suit the barrel. But test the fits in scrap first.

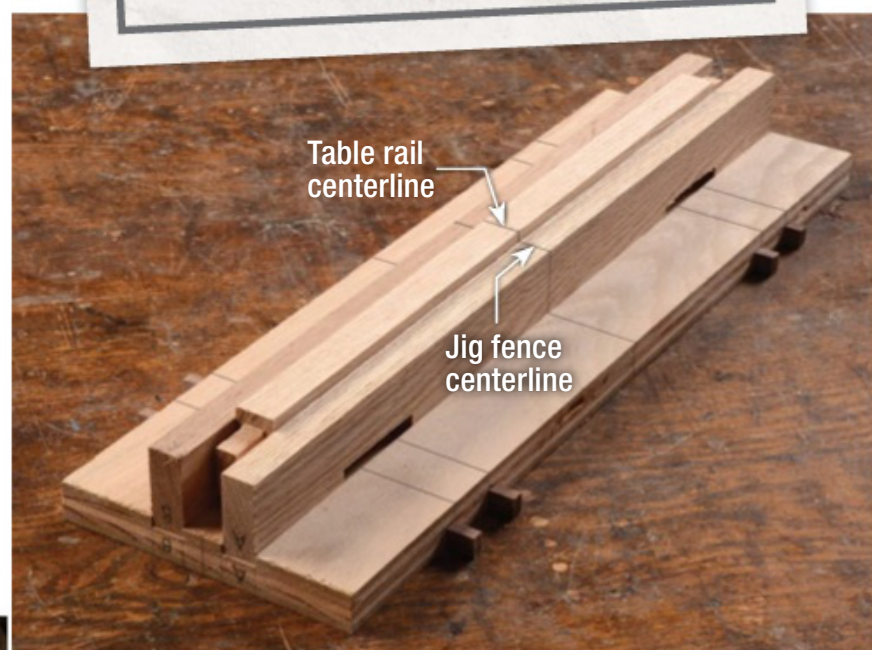
Make a jig to set the Soss hinges

Build the hinge-mortise routing jig, and then rout out the hinge mortises as shown. The jig guides a router for cutting T-shaped mortises for a pair of Soss “invisible” hinges. The fences are screwed in place when mortising the table rail, and are removed later when routing the mating mortises on the underside of the table top. After routing the rail mortises, sand the legs, rear apron, false aprons, and rails, and then glue up the front and back assemblies. Screw the inner aprons to the legs using washer-head screws and a hand driver. Then fit the top compartment panel, and notch it for the RFID lock.

UNDERCOVER GEAR

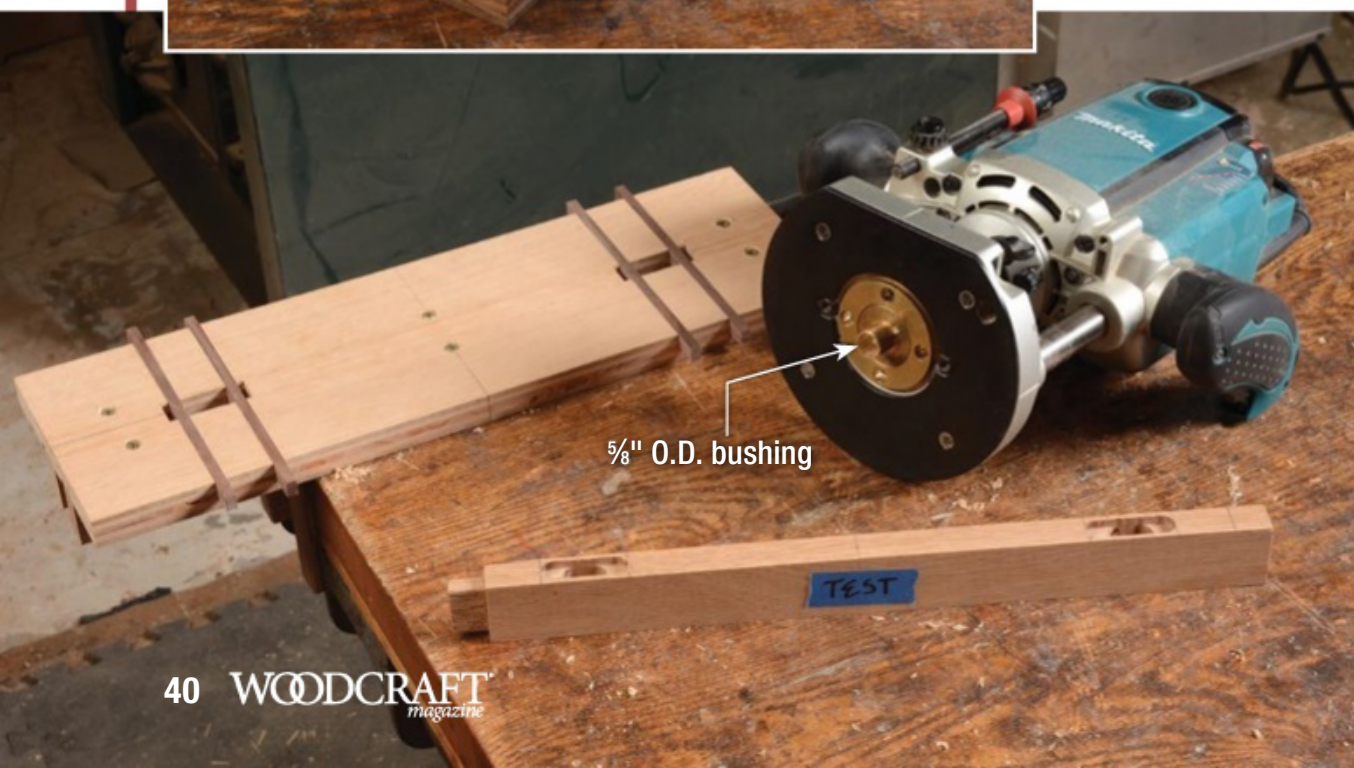


SOSS INVISIBLE HINGES

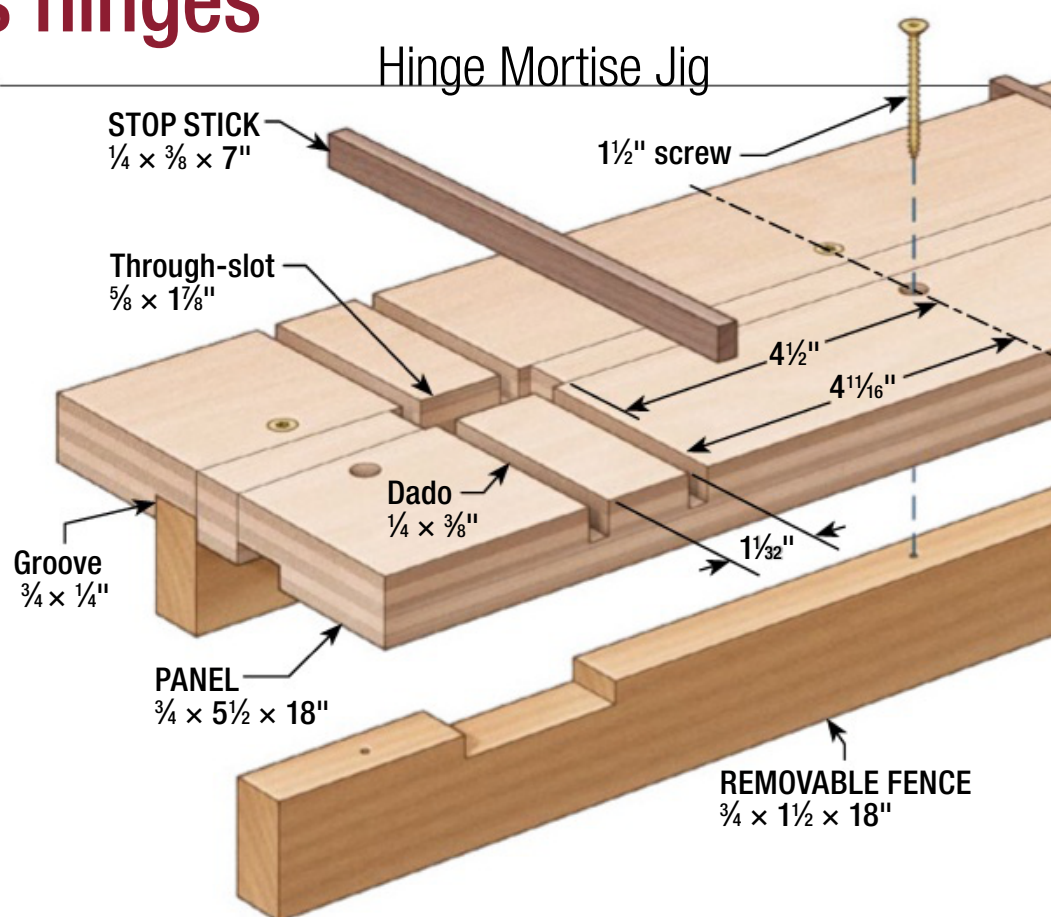


Set up for routing Soss hinge mortises.

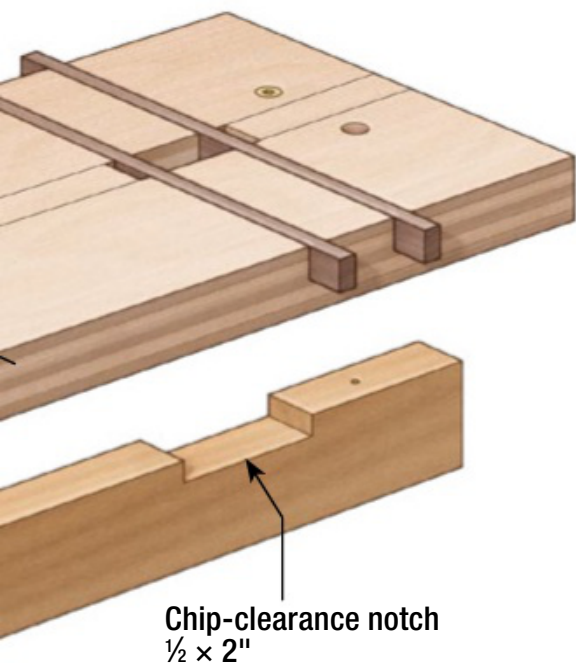
Mount the table's top rail between the jig fences with the centerlines of each aligned. Then clamp the jig in a bench vise.



Hinge Mortise Jig



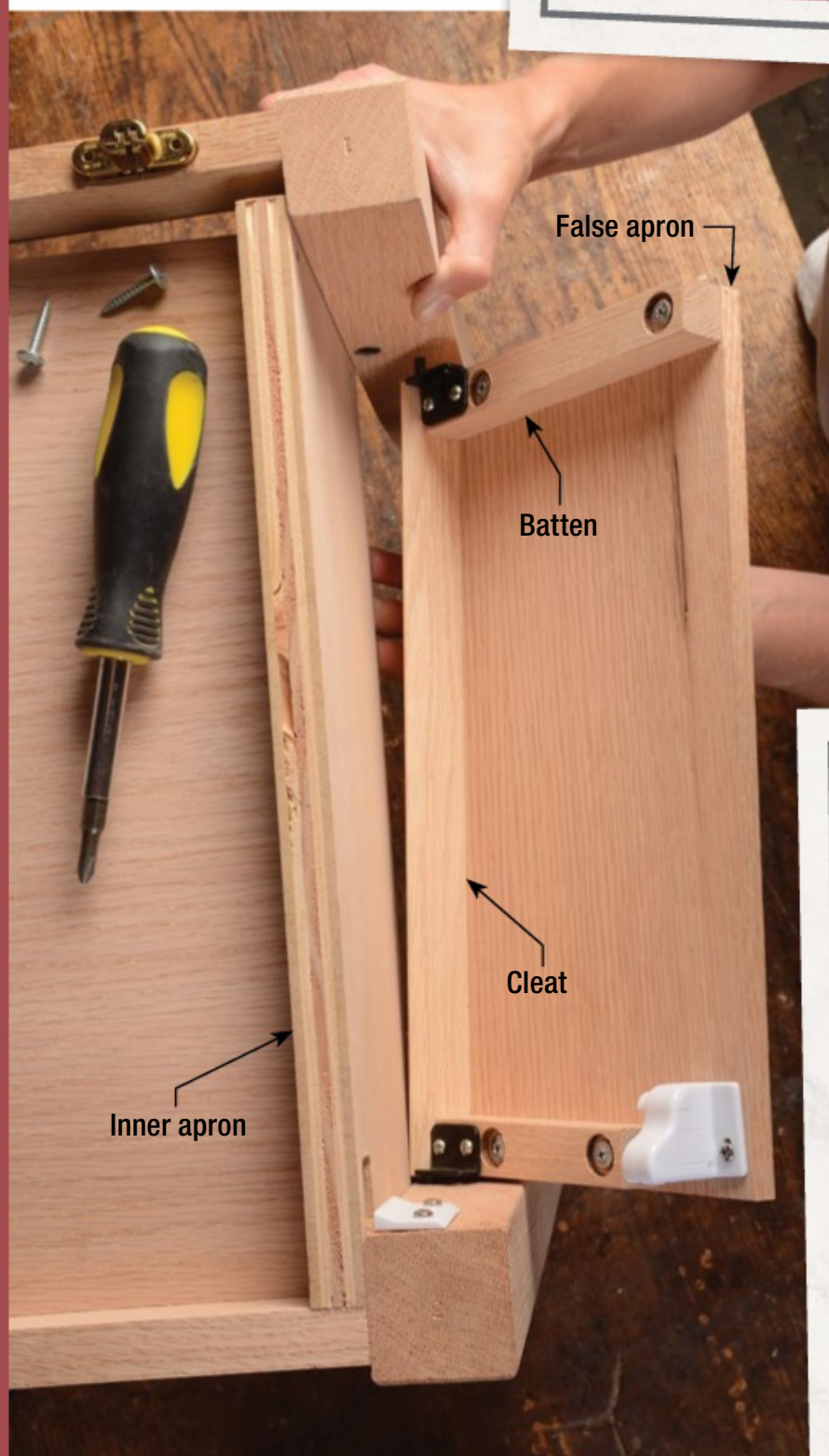
Rout for the Soss hinges. Outfit your router with a $\frac{5}{8}$ "-O.D. bushing and a $\frac{1}{2}$ "-diameter up-cut spiral bit, then rout the deep section of each mortise with the stop-strips in place. Remove them to rout the longer, shallow section of each mortise.



Front assembly glue-up. When gluing up the legs to the front rails, carefully align the top rail with the tops of the legs, and use a pair of 4"-long spacers to ensure that the bottom rail is perfectly parallel to the top rail.

Attach the false aprons

Now you're ready to fit and attach the false aprons. With the inner aprons attached to the legs, begin by crosscutting your previously glued-up false apron-and-cleat assemblies for a snug fit between the legs. Bevel the cleats as shown in the detail drawing on page 37, and make and attach the battens. Also attach the hinges and catches. Then attach each false apron in turn as shown.



UNDERCOVER GEAR



CHILD-PROOF LOCK

Attach the false aprons.

With the front end of an inner apron detached from its leg, slip the rear end of a false apron in place, inserting its hinge pin into its hole. Then pull the front leg away as shown in order to insert the opposite hinge pin. Reattach the inner apron to the leg, and repeat the process for the remaining false apron.

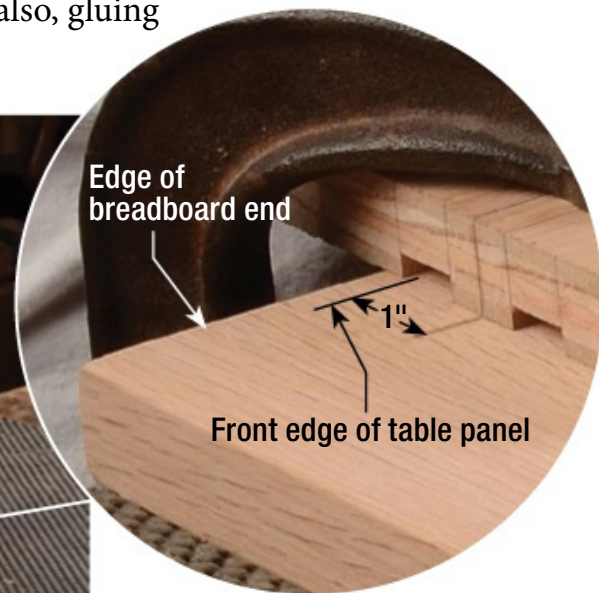
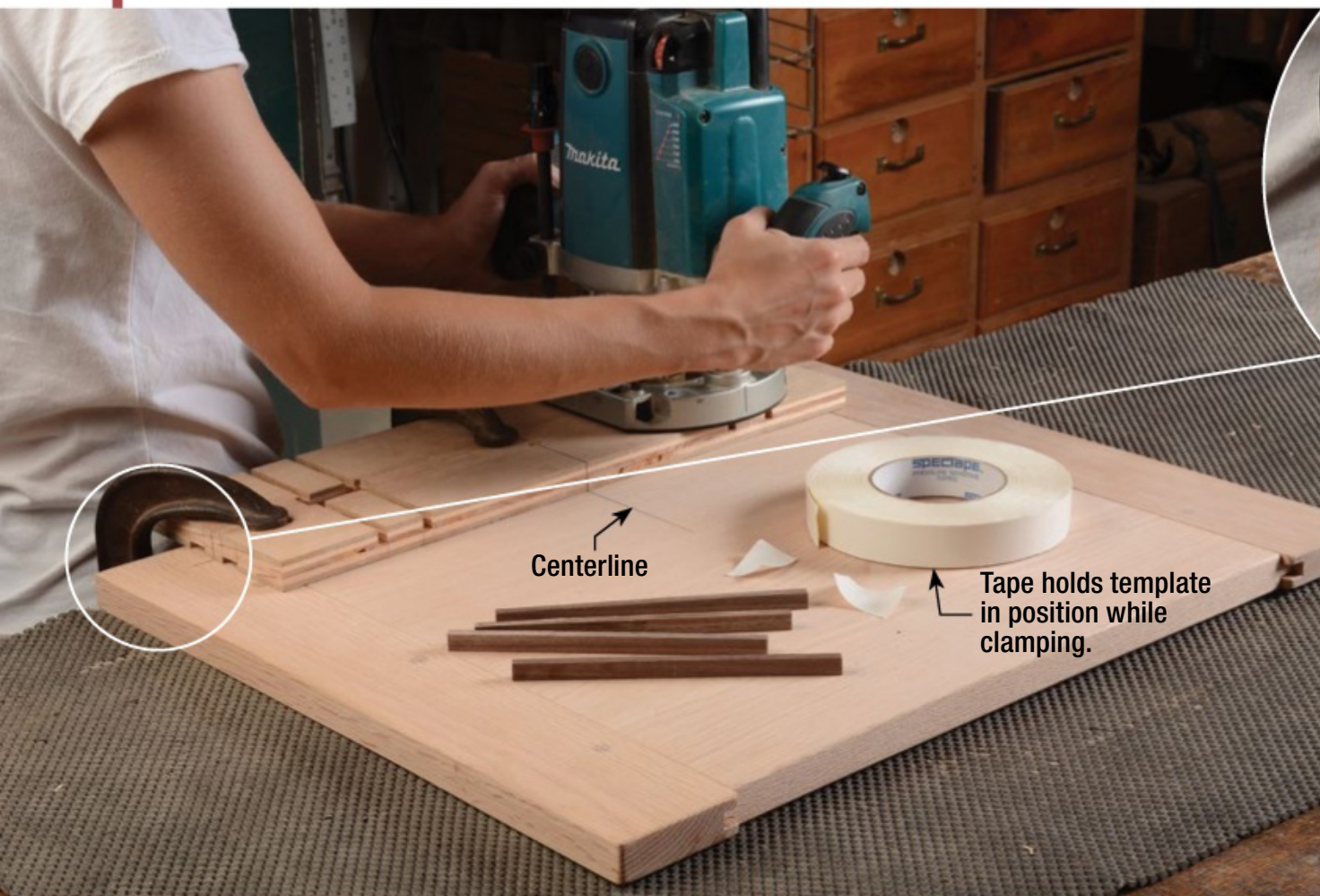
UNDERCOVER GEAR



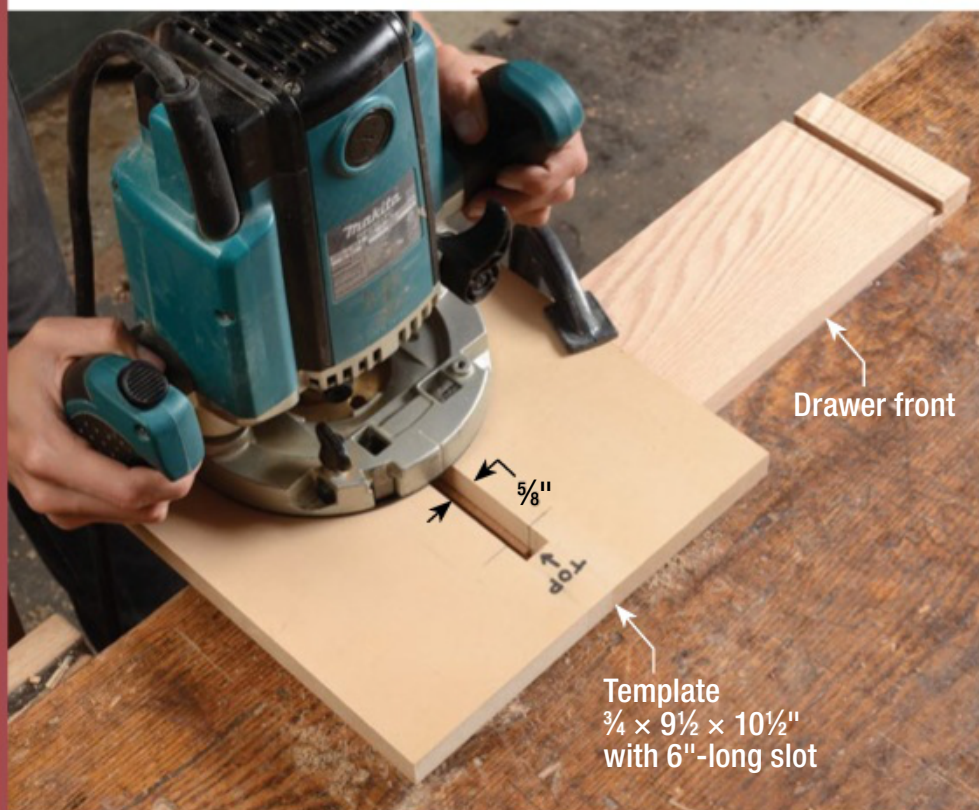
Make the top and drawer

Because this top is not secured to the aprons all around like a typical table top, I made it with breadboard construction to keep it flat. Referring to the dimensions shown in the drawing on page 37, build the top following the instructions beginning on page 46. Then rout the hinge

mortises as shown. Make the drawer using sliding dovetails to attach the front. I rout the socket using a jig, and then saw the dovetail, but you could use a router table instead. Make the drawer stop also, gluing only one end for now.



Rout the hinge mortises in the top. Detach the fences from your hinge mortising jig, and clamp it to the underside of the table top, centering it along the width of the top, and offsetting the center of the jig 1" from the table's front edge (inset). As before, remove the stop strips when cutting the long, shallow section of each mortise.



Rout the dovetail slot in the drawer front. Rout the dovetail sockets in the drawer front using a simple shop-made bushing-guided jig and a router outfitted with a $\frac{5}{8}$ "-dia. bushing and a $\frac{1}{2}$ ", 14° dovetail bit. Clamp and tape the template to the workpiece.

Sawing a Sliding Dovetail

Although many woodworkers cut sliding dovetails on a router table, I find the table saw to be just as effective. All you need is a tenoning jig and a miter gauge to hold the work.



Edge layout. Using your dovetail socket as a reference, lay out the dovetail on the edge of scrap that's the same thickness as your project stock.

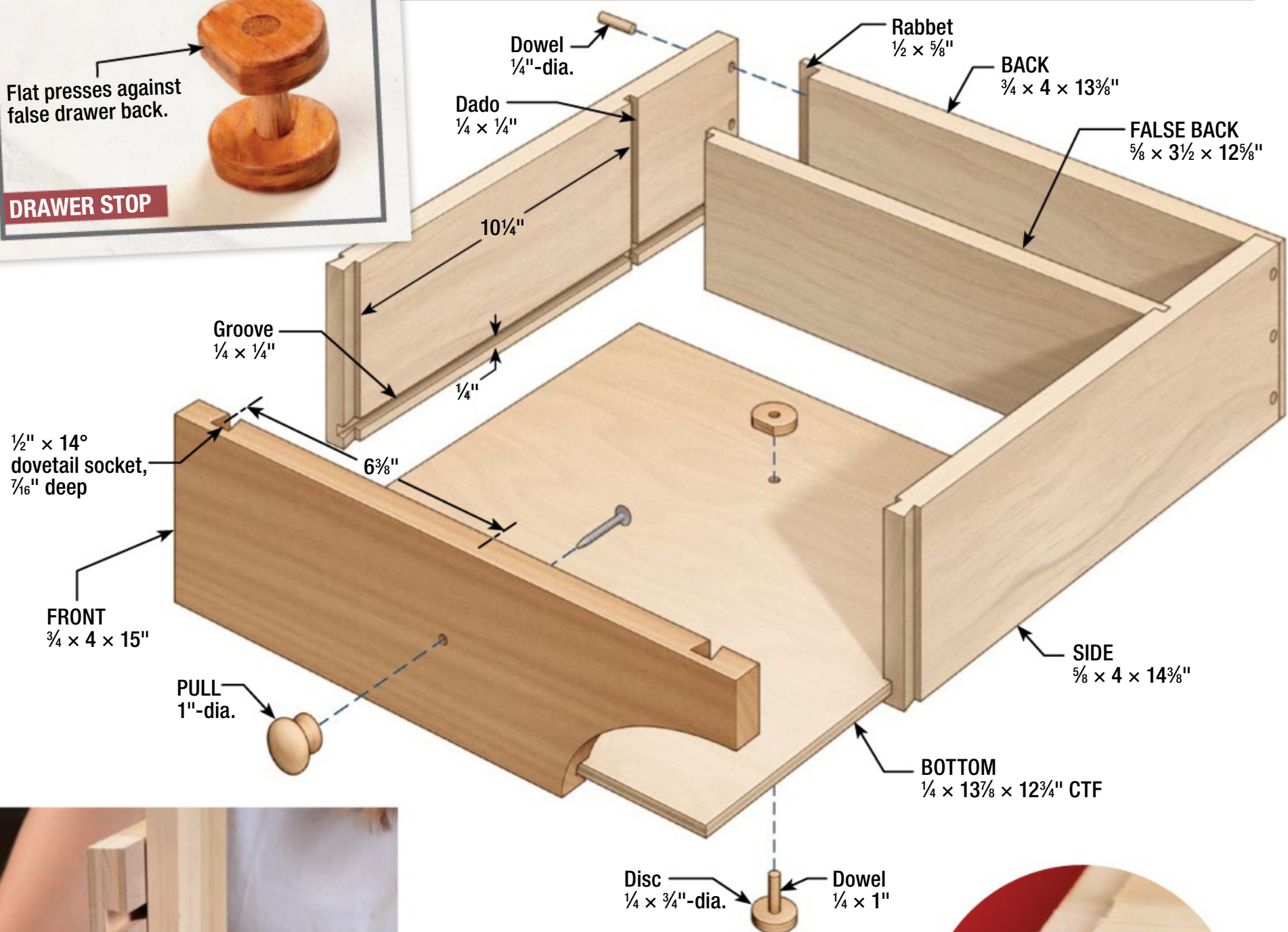
UNDERCOVER GEAR

Flat presses against false drawer back.

DRAWER STOP



Drawer Detail



Saw the cheeks. With the blade tilted 14° and the scrap clamped securely to a tenon jig, adjust for a cut just outside your dovetail cheek and shoulder layout lines. Cut one cheek, then flip the work over on the jig, and cut the opposite cheek.

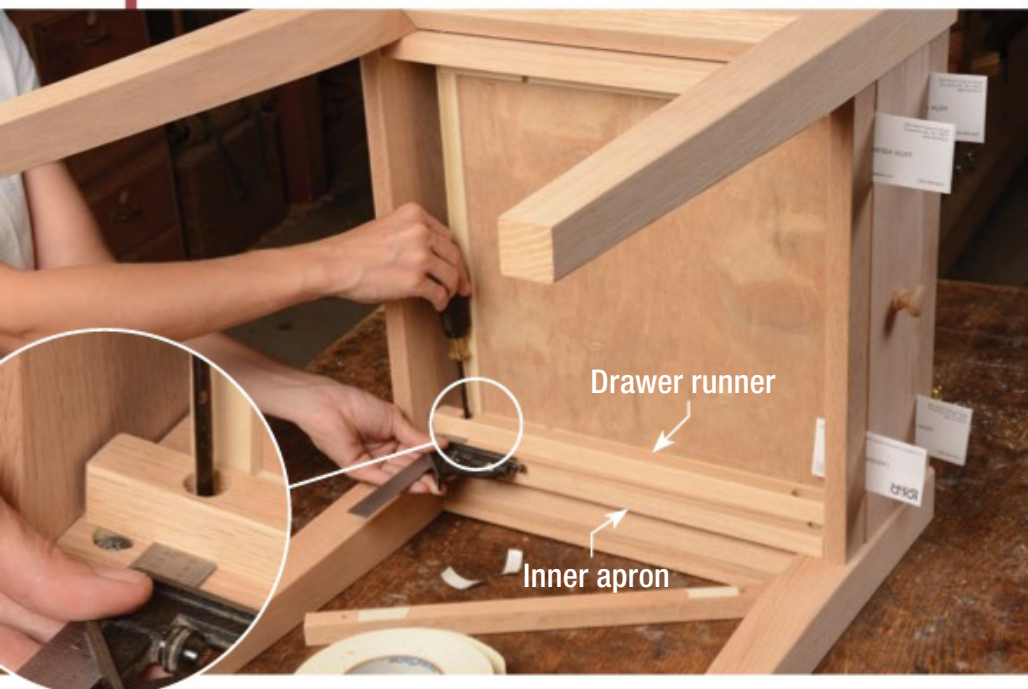


Saw the shoulders. Saw the shoulders, registering the cut against a rip fence stand-off block. Set the blade height just shy of scoring the cheek. After sawing both shoulders, chisel away the waste that remains at the cut intersections. Now check the fit in the dovetail socket. It should be slightly fat. Repeat the cheek cuts, removing tiny amounts at a time until the joint fits snugly. Then cut all your workpiece cheeks with that setting, followed by all the shoulder cuts.

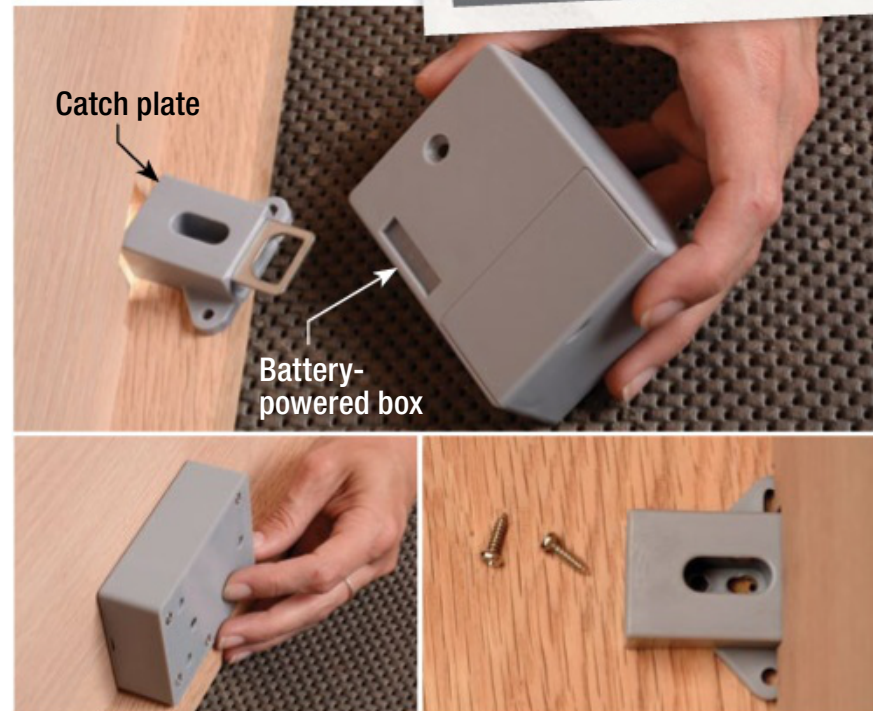
Final assembly and finishing touches

Make the drawer runners, pre-drill them, and attach them to the inner aprons. Use a block plane to cut a 45° chamfer with a 3/16"-wide flat on the foremost top edge of each front leg to allow swing clearance for the top. Make the parts for the table top prop, but don't attach it yet. Remove all the hardware, scuff-sand all surfaces, and apply finish to all the parts. Reattach the false aprons and their hardware, and attach the RFID hook to the rear apron as shown. Then screw on the prop, connect the top with the Soss hinges,

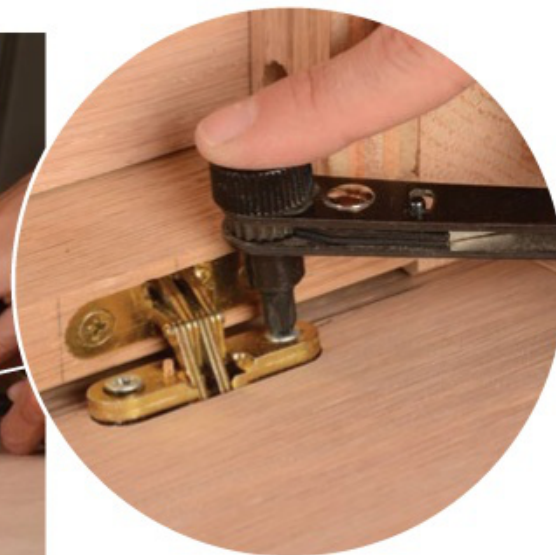
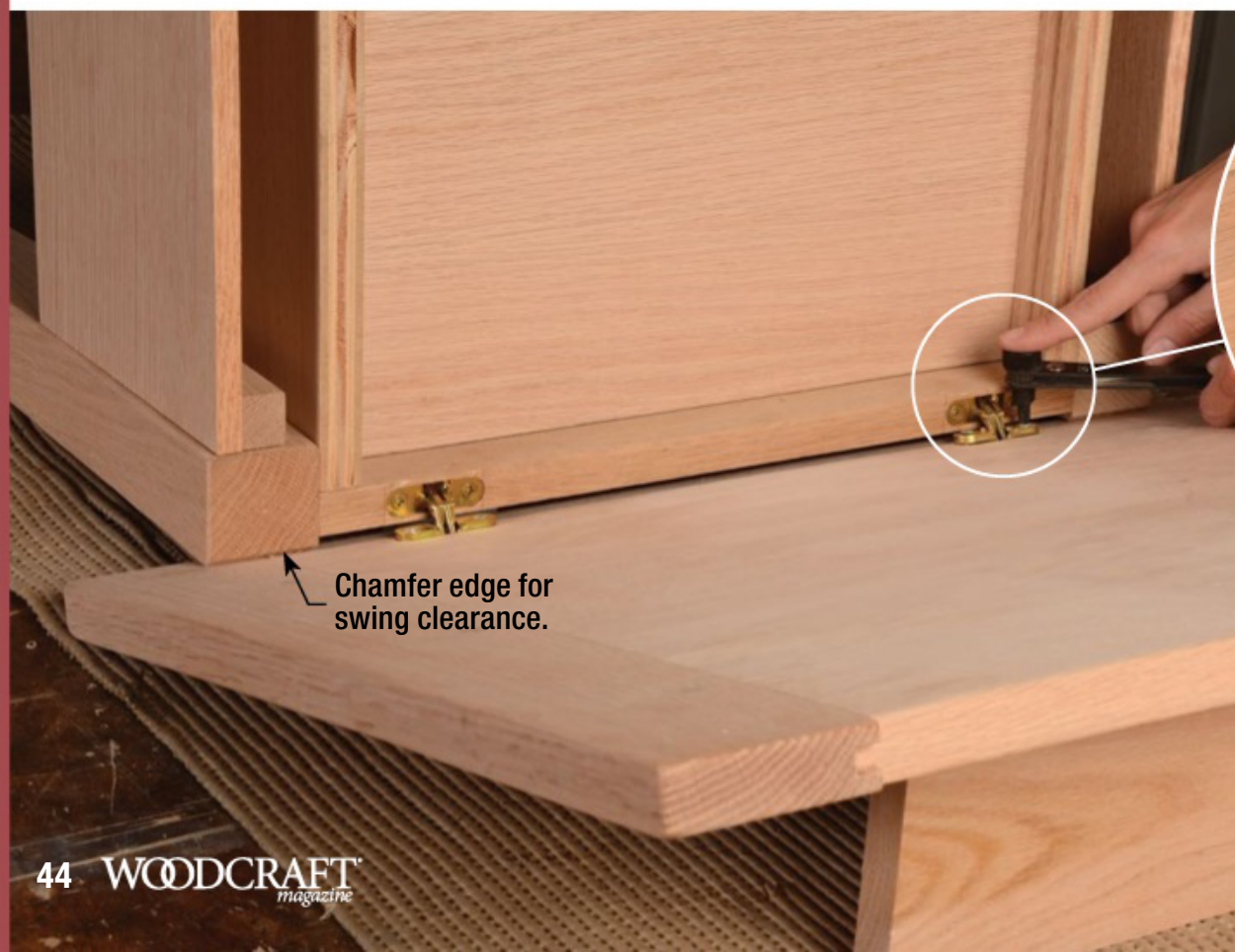
and attach the RFID box to the underside of the top. Finally, attach the drawer stop, inserting it in its hole in the drawer bottom, and then gluing the remaining disc to the dowel. ■



Attach the drawer runners. With the table on its side, and the drawer front shimmed evenly in place, locate each pre-drilled drawer runner against the underside of the drawer. Double-faced tape will keep the runner in place as you use a combination square to adjust the runner parallel to the underside of the inner apron. Then drill pilot holes in the apron, and screw the runners to the inner aprons.



Attach the RFID lock. The RFID lock consists of a battery-operated box that attaches to the underside of the table top, and a catch plate on the rear apron (top). To locate the lock, connect the two parts, and push the box against the compartment panel (left), which properly locates the catch plate underneath the panel (right). Install a screw in the slot, test the lock operation, and make any necessary adjustments before locking the unit in place with a screw in the hole.



Connect the top. After screwing the Soss hinges to the front rail, attach them to the table top. Because the top won't fully open 90°, you'll need to prop the lid on a board, and use a right-angle screwdriver to do the work.

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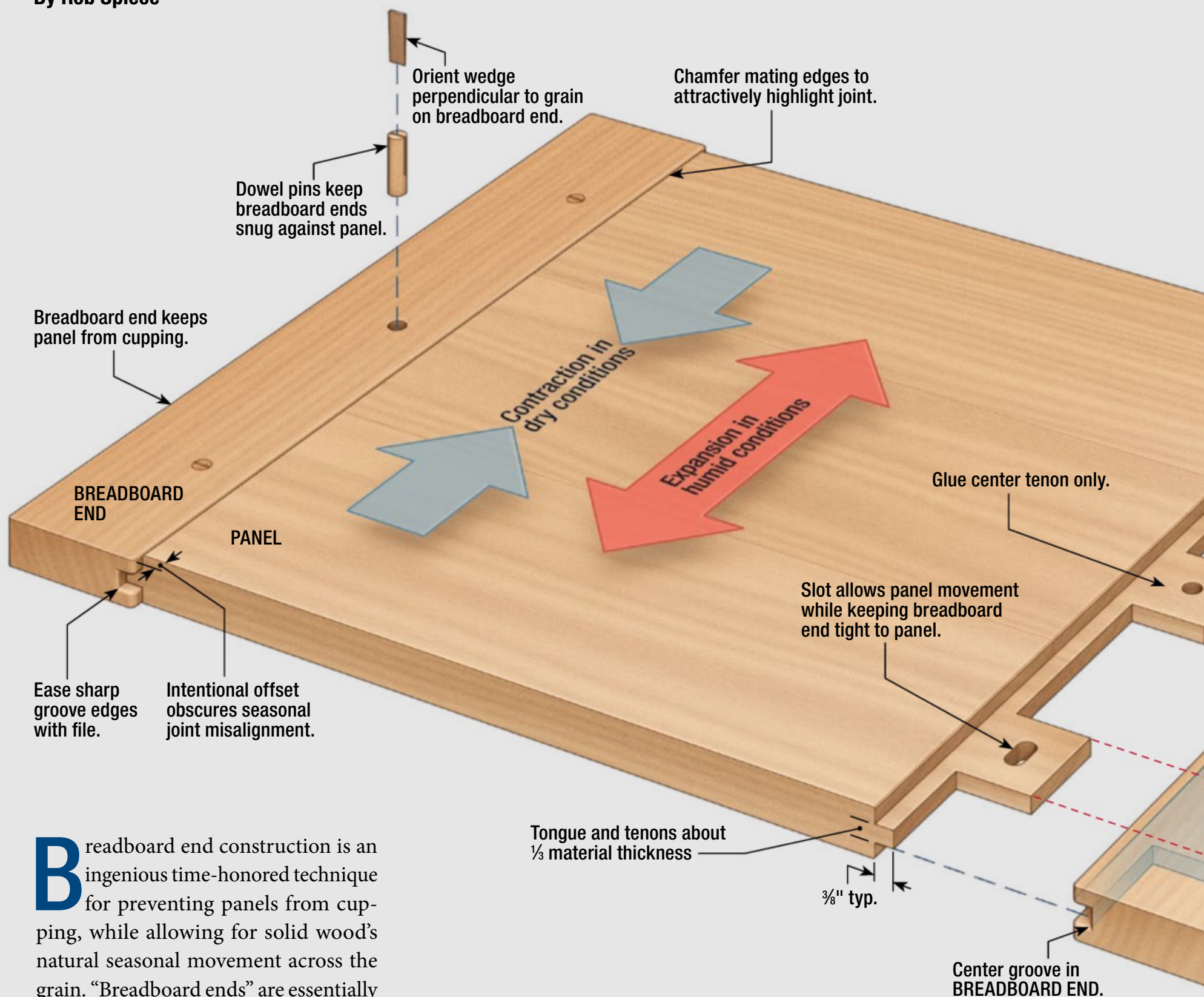
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The BREADBOARD END Joint

A pretty and practical solution for keeping panels flat

By Rob Spiece



Breadboard end construction is an ingenious time-honored technique for preventing panels from cupping, while allowing for solid wood's natural seasonal movement across the grain. "Breadboard ends" are essentially grooved rails with oversized mortises that accept tenons on the end of a panel.

The joint is often used on furniture with a hinged lid, such as a blanket chest, tool chest, or specialty piece such as the "Top Secret Table" on page 34. It may also be found on the dangling ends of a drop leaf table or the long, cantilevered ends of a trestle table. Because I also like the joint simply for its looks, it is my favorite treatment for most tabletops,

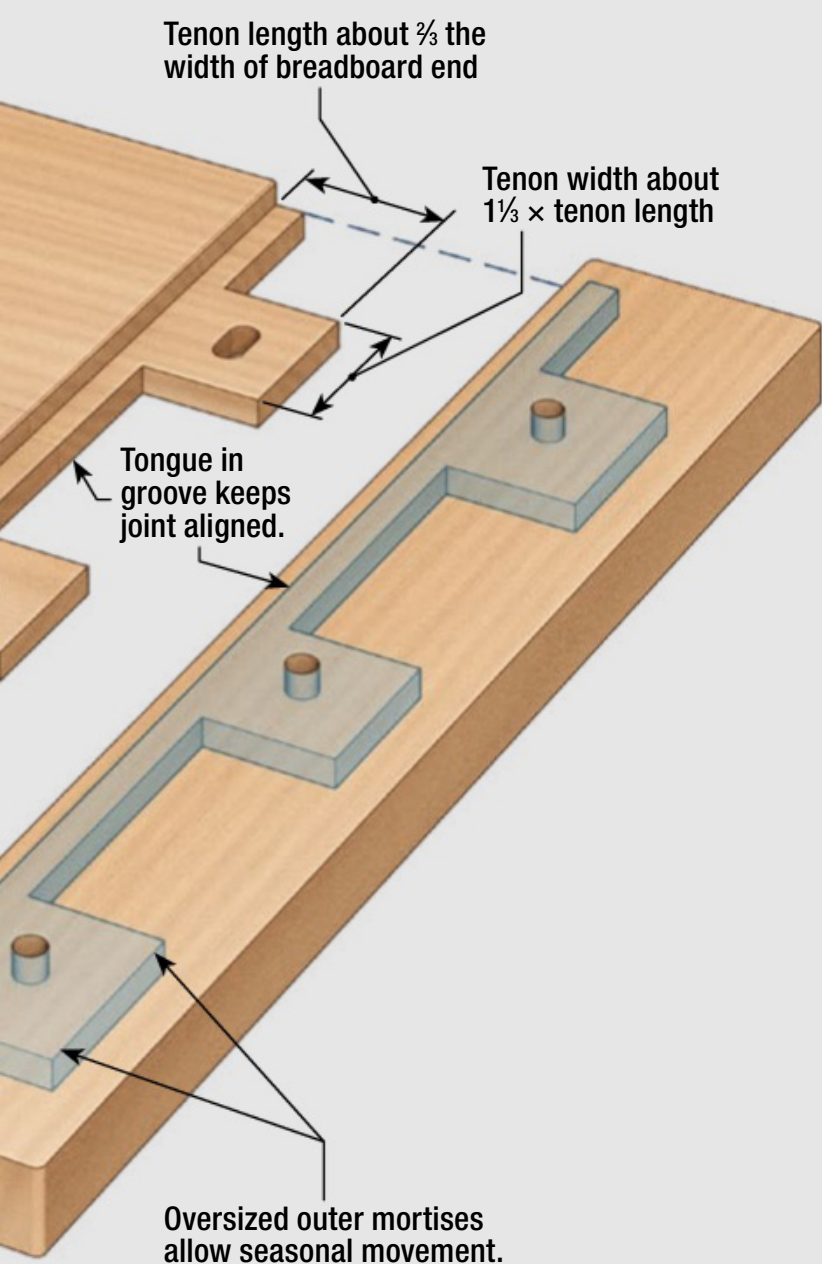
whether they need them or not. It can be made to look elegant and refined, or bold and rugged. It provides interesting detail without excessive ornamentation, and exudes fine craftsmanship if done well.

In addition to the tongue-and-groove and mortise-and-tenon aspects that are essential to the joint, I often like to add a few aesthetic flourishes. For example, I incorporate a tiny V-shaped groove at the intersection of the panel and bread-

board end to highlight the joint. And, because breadboard ends will not remain flush to the panel edges during seasonal movement, I extend them past the panel about $\frac{1}{4}$ " so that the offset will always look relatively the same. Finally, I like to wedge my dowel pins with a contrasting wood, which just looks cool.

onlineEXTRA

- Shoulder Plane (issue 44)
- Ten Table Top Tips (issue 84)

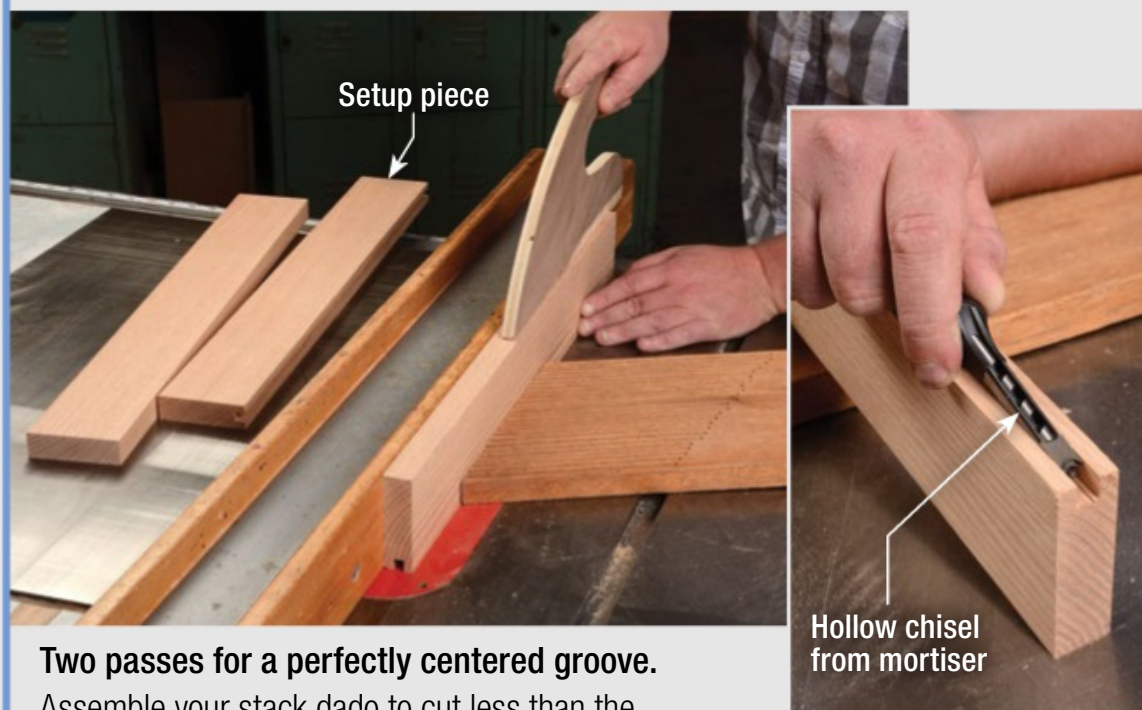


Order of Work

- Groove and mortise breadboard ends
- Saw tongue and tenons
- Fit ends and drill for pins
- Make pins and wedges
- Assemble panel and breadboards

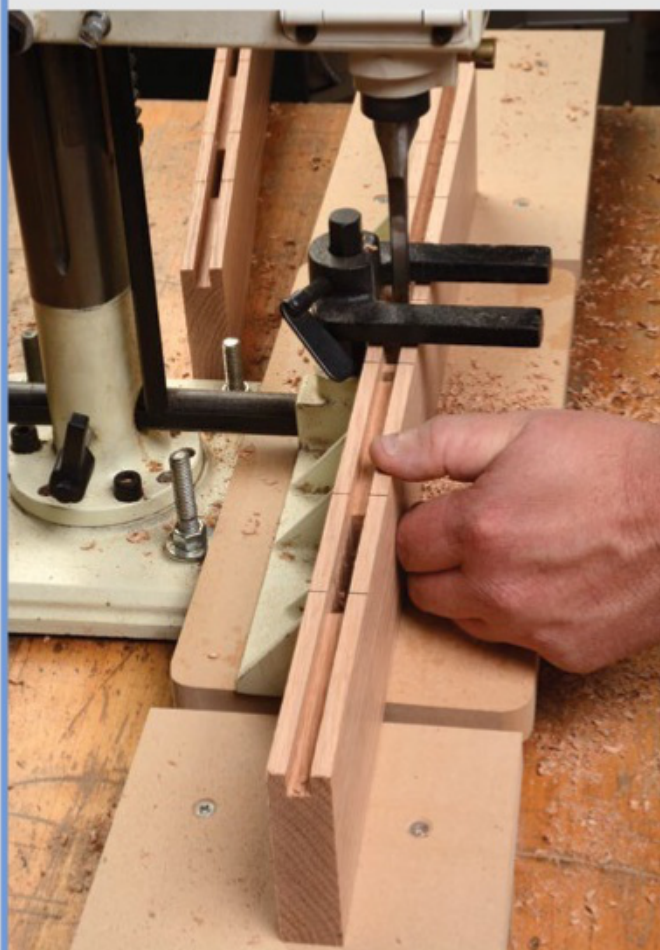
Making the breadboards

Mill the material for the panel and breadboards together, as it's critical that all pieces are identical in thickness. Process extra material for machine setups. Rip the breadboard ends to width, but leave them about 4" over their finished length for now. Saw a centered groove in one edge of each breadboard end, using a setup piece to sneak up on the exact width. Then lay out and cut the mortises; I use a hollow chisel mortiser for the job, as shown.



Two passes for a perfectly centered groove.

Assemble your stack dado to cut less than the width of the finished groove. Then adjust the cut height to match the groove depth. Set your rip fence so that the blade is roughly centered on the setup workpiece. Plow the groove in two passes, rotating the board end-for-end, and then check the width with a hollow chisel. Adjust the fence until the chisel fits perfectly. Now saw your breadboard ends.



Cut the mortises. After laying out the length of each mortise on the edge of the breadboard end, set the mortiser fence to perfectly center the chisel within the groove. Check by pressing each face of the stock against the fence in turn, making sure that the chisel doesn't cut into the groove wall either way. Set the machine depth stop to cut slightly deeper than your planned tenon length, then make the cuts as shown.

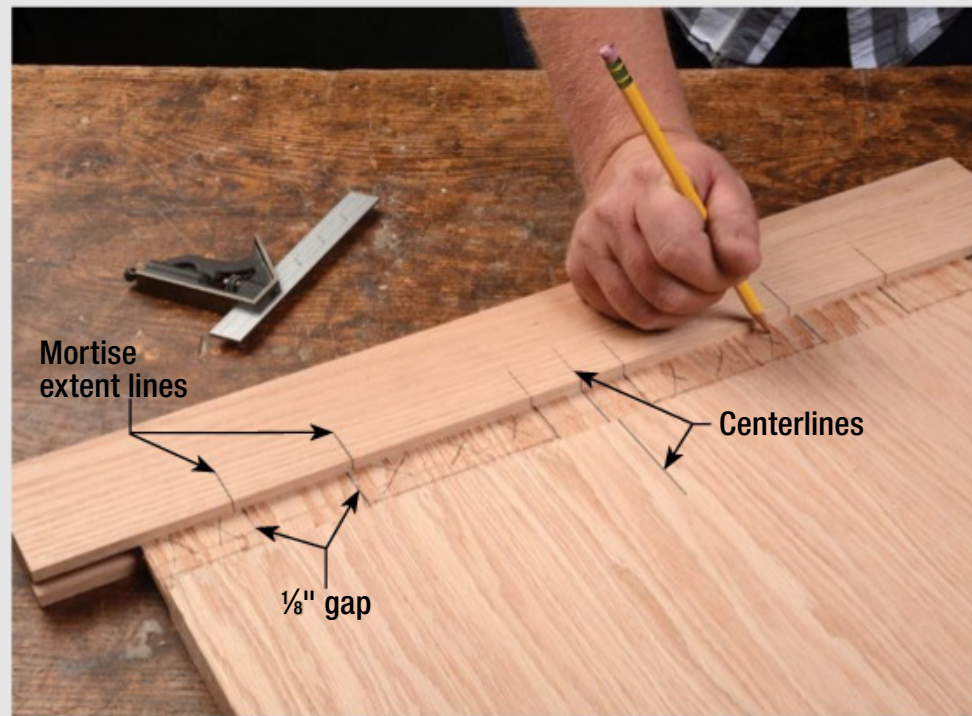
Cut the tenons

To set up to saw your tenon cheeks, rest a breadboard end on your table saw, and raise the blade to a hair below the lower edge of the groove. Then saw the tenon cheeks as shown. Lay out the tongues and individual tenons, and remove the waste at the bandsaw.

Tap the breadboard ends onto the panel to check the fit. If the joint won't seat fully, check the tongue length, shortening it with a file if necessary. Note that the breadboard ends' excessive overhang allows tapping them free harmlessly with a mallet for fitting.



Saw the tenon cheeks. Using a wide dado head configuration and a sacrificial fence, saw the tenon cheeks in multiple passes, initially making them just a bit too thick for their mortises. Set the fence, and take a maximum-width cut from both faces at the far ends of the panel. Then reset the fence to saw the tenons to final length as shown here. Use push blocks to apply consistent downward pressure on the panel.



Tenon layout. After transferring the mortise extents across the edge of each breadboard end, tuck the tenon section into the groove, centering it on the breadboard end. Then lay out the individual tenon widths, as well as the tongue. Incorporate a 1/8" gap on each edge of the outer tenons to allow for wood movement.

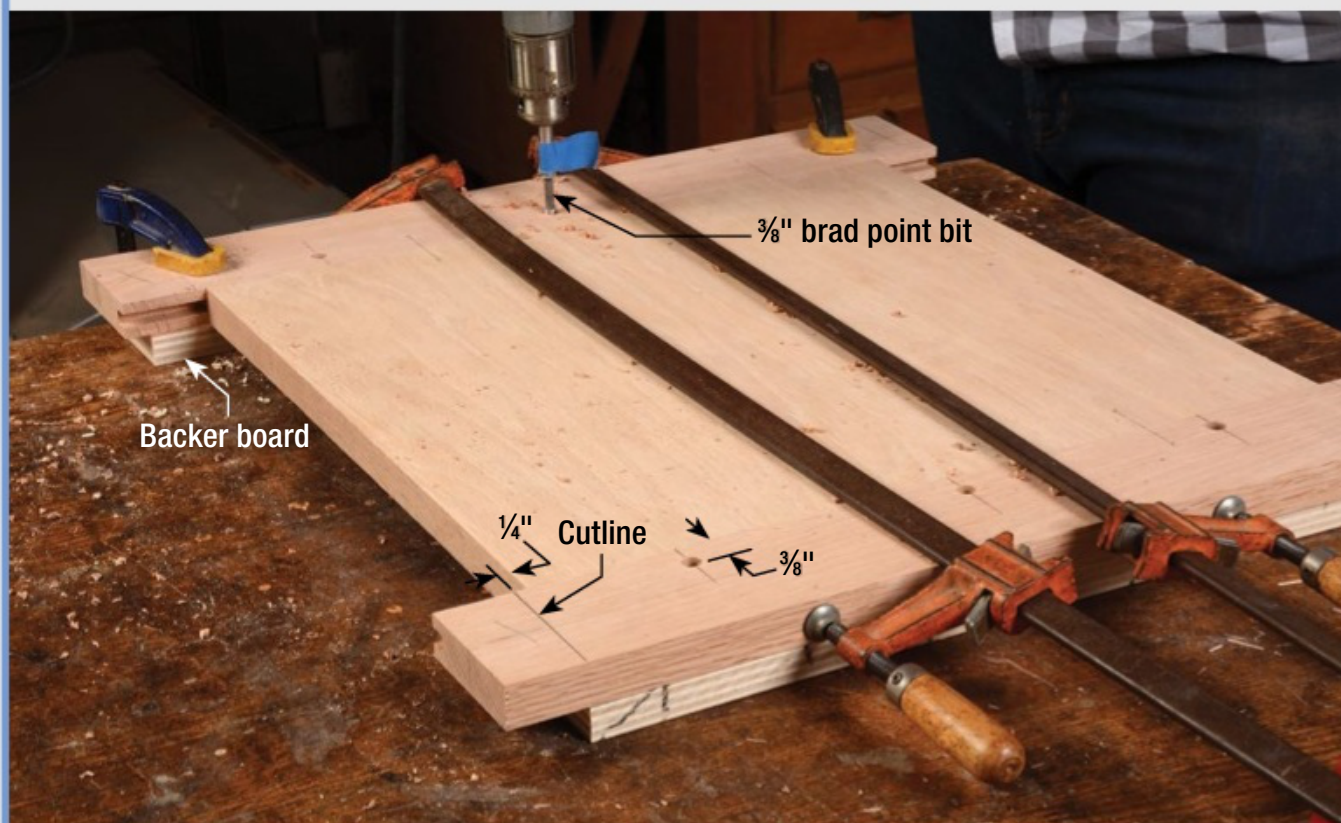


Plane to fit. Use a shoulder plane or a rabbet block plane (shown here) to cut equal amounts off both tenon cheeks as you trim them to fit. The tenons should slide into their mortises snugly without using excessive force.

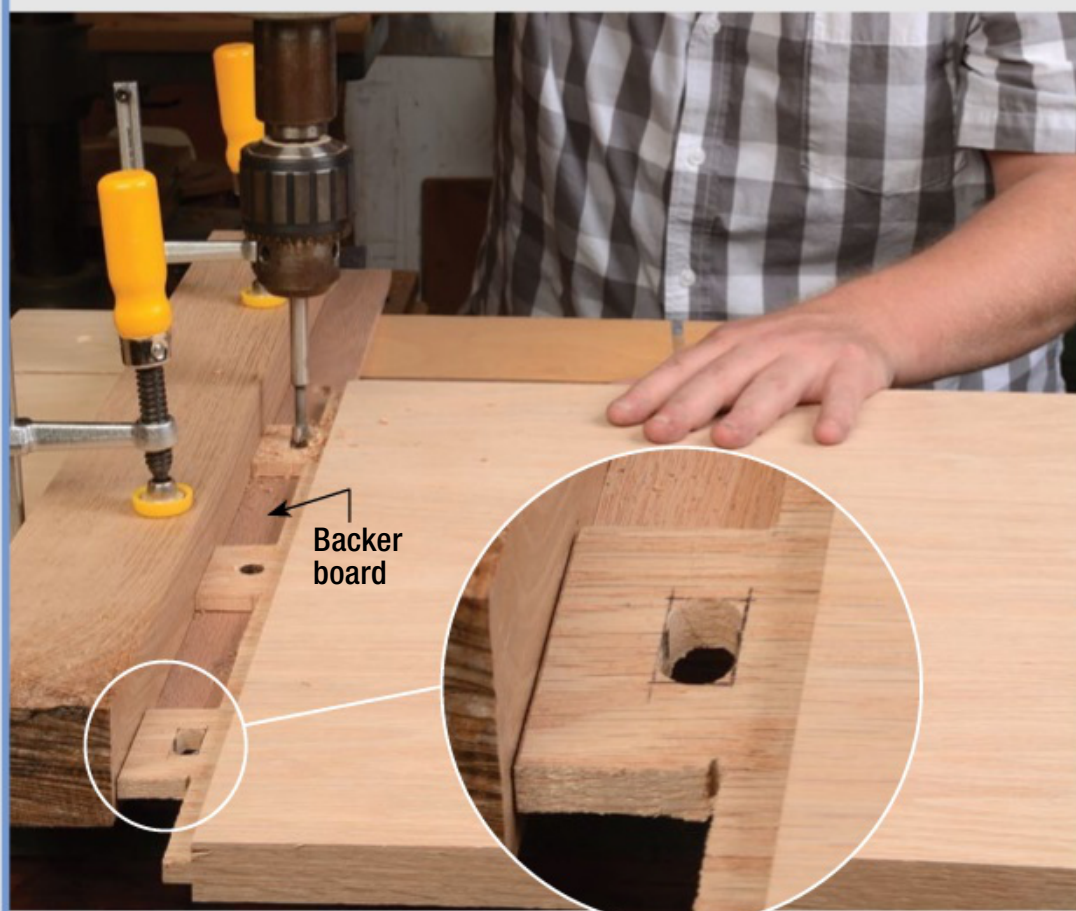
Drill, sand, and shape

Extend each tenon centerline onto its breadboard end, and use an awl to mark a dowel pin hole center on the line $\frac{3}{8}$ " in from the edge of the breadboard end. Dry-clamp the whole assembly together, and drill the dowel pin holes as shown. Remove the breadboard ends and elongate the outermost holes at the drill press to create slots. Dry-assemble the parts again and sand them, starting with 80

grit to flush them up and remove machine marks. Then move through progressively finer grits up through 220 to smooth everything. Cut the breadboards to final length, and finesse their ends as shown. Finally, use 220-grit paper and a hardwood backer to sand mating 45° chamfers on the edges where a breadboard end meets the panel. Aim for creating a V-groove that's about $\frac{1}{16}$ " wide and deep.



Drill for pins. Dry-clamp the assembly and use a $\frac{3}{8}$ " brad point bit to drill through a breadboard end and panel tenon at the same time to create the dowel pin holes. Use a backer board to prevent exit tearout. Also mark a cutline on the end of each breadboard end $\frac{1}{4}$ " past the panel edges.



Elongate the outermost holes. Chuck a $\frac{3}{8}$ " Forstner bit in your drill press, lower it into the previously drilled hole in one outermost tenon, and then clamp your fence against the end of the tenon. Drill an overlapping hole to each side of the original hole to create a $\frac{3}{4}$ "-long slot. Then repeat for the remaining outermost holes.



Finesse the breadboard ends. Use a mill file to soften the sharp edges at both ends of each breadboard end groove

Assemble and glue-up

To prepare for glue-up, start by making the $\frac{3}{8}$ "-diameter dowel pins, cutting them about $\frac{1}{4}$ " longer than your top is thick. Chamfer one end of each pin by chucking it in a drill and spinning it against fine sandpaper at a 45° angle. The chamfer makes for easier insertion, prevents exit blowout, and—when left to project from the table's underside—provides a nice

surprise for exploring fingertips. I also like to wedge the dowels, primarily for added visual interest, so I slot them at this point too.

To make the wedges, mill a piece of contrasting species to $\frac{3}{8}$ " thick, then use the table saw to rip $\frac{1}{16}$ "-thick strips from the outer edge of the board. Afterward, crosscut and pare the individual wedges to shape as shown.

To glue up the assembly, clamp the breadboard ends to the panel after applying glue to only the center mortise-and-tenon joints. Then install the pins and wedges, trimming them flush afterward. ■



Slot the pins for the wedges.

Using a back saw and a simple shop-made guide, saw a kerf perpendicular to the dowel's end grain and a little more than halfway down the length of the pin.



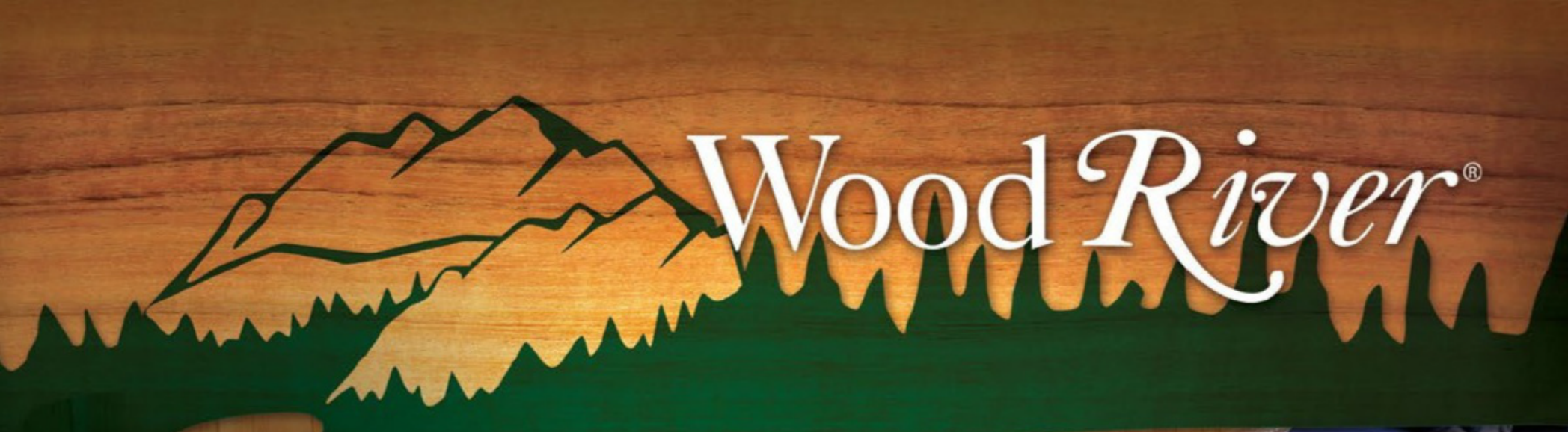
Point the wedges. To shape a wedge, I place it against the fence on my bench hook, and pare forward and downward with a sharp chisel.



Pin and wedge. Install each pin and wedge in turn, beginning with the center pin, which is the only one to receive glue. Tap the pin in first, orienting its slot perpendicular to the grain on the breadboard end. If a pin starts to rotate during tapping, wrap a paper towel around it and grip it with pliers to correct the slot orientation. When the pin projects $\frac{1}{8}$ " from the underside, apply a little glue to the wedge, tap it home, and move on to the next hole.



Saw the pins flush. When the glue dries, use a flush-cut saw to trim the pins flush to the surface. I encircle the pin with a punched scrap of file folder as insurance against saw marks, then pare and sand away what little remains.



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Circle-Cutting Jig

Round out your shop with this bandsaw sled

By Bill Schneider



Order of Work

- Size sled to fit your saw.
- Rout slot and drill holes.
- Make pivot bar and mount miter bar.
- Make and mount travel stop.
- Prep for use.

When it comes to making circular discs, I find routers outfitted with trammels to be loud and messy. I prefer to use my bandsaw, which I have outfitted with this very versatile jig. Basically a plywood sled that registers in my saw's table slot, the jig makes for fast, safe, reliable work. In use, the workpiece rotates on a pivot pin that projects from

a sliding bar, allowing lateral adjustment for circles of varying diameters. On my Laguna model 14-12 saw, I can cut disks from 3" to 30" in diameter. I use a 1/4" blade for most cuts on this jig. Capacity may vary, depending on the size of your saw's table.

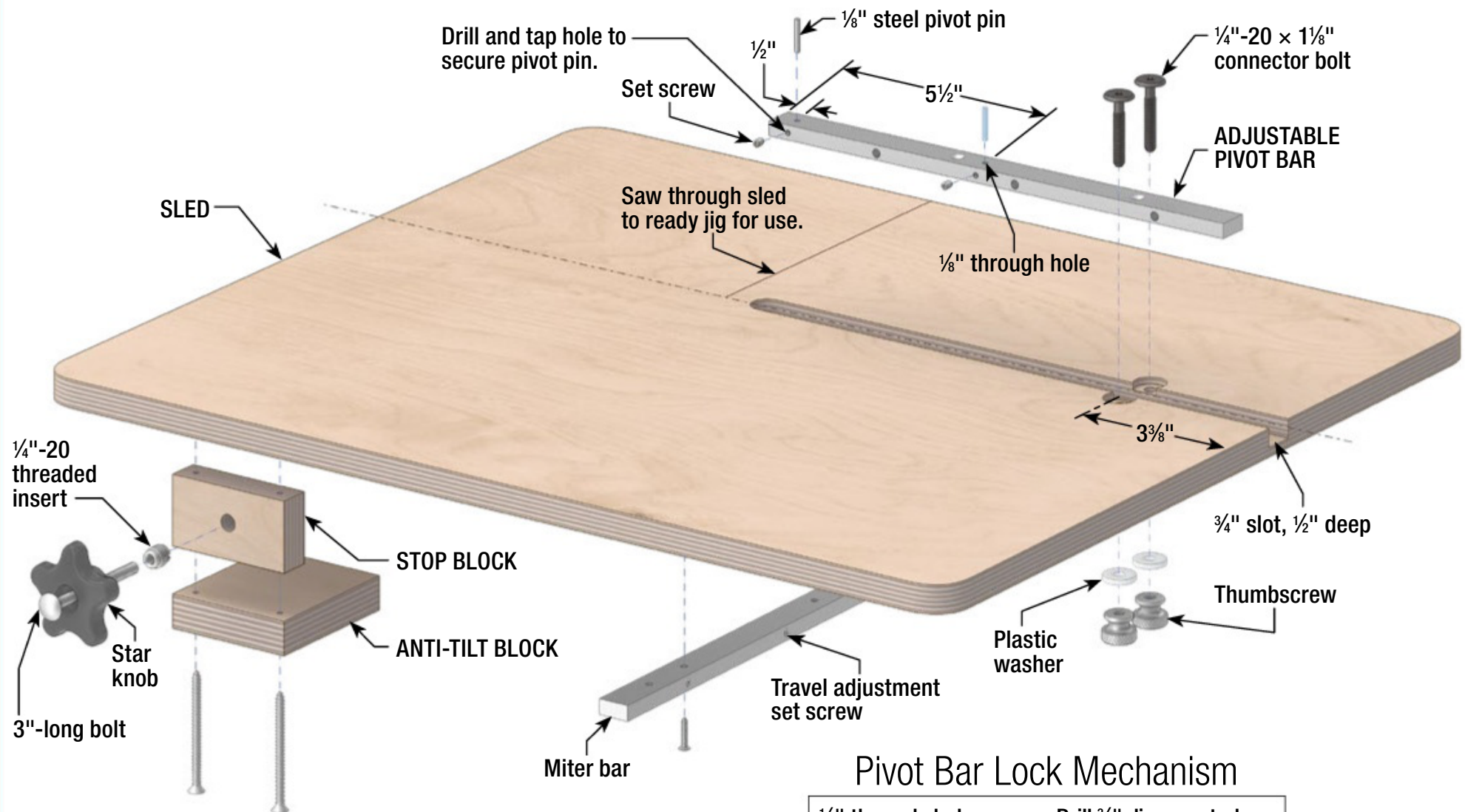
The jig isn't hard to build, and it will be an afternoon's work well spent toward expanding your woodworking capabili-

ties. I've used it to make cutting boards, tabletops, and circular steam-bending forms. A recent large telescope project required 23"-diameter disks for its rotating base. In another project, I made round ice-skate drying racks for a local club's fundraiser. With this sled in your shop, you'll have the excuse to explore the world beyond rectangles.

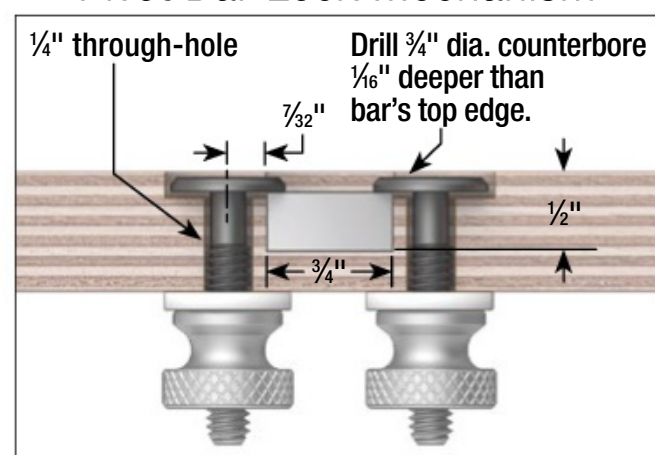
Simple construction, big benefit

This jig consists of a $\frac{3}{4}$ " plywood sled, the Kreg Jig and Fixture Bar (cut in two), and a handful of additional hardware (See Buyer's Guide, p. 69). Part of the bar screws to the underside of the sled to serve as its runner, the other part serves as the pivot bar. The pivot bar houses a $\frac{1}{8}$ "-dia. pin that projects into a hole on the underside

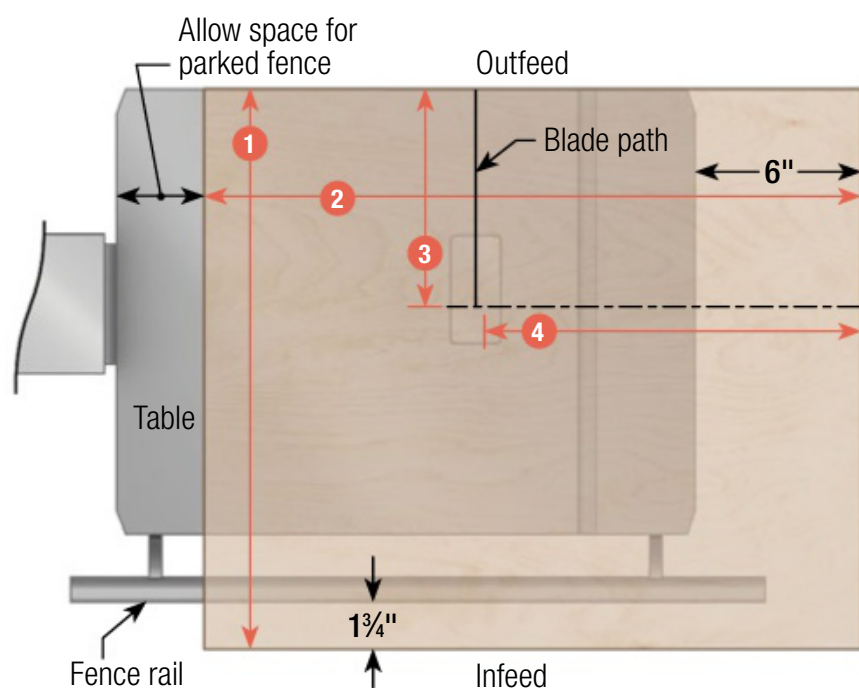
of a workpiece to act as a pivot point. Connector bolts with thumbscrews lock the pivot bar to locate the pivot pin at the desired distance from the blade. The star knob and bolt in the L-shaped anti-tilt/stop block allows fore-and-aft fine-tuning of the sled location to ensure precise positioning of the pivot pin in relation to the blade teeth.



Pivot Bar Lock Mechanism



Sizing the Jig for Your Saw



- 1 Determine length.** Measure from fence rail to outfeed end of bandsaw table, then add $1\frac{3}{4}$ " (overhang on rail).
- 2 Determine width.** Measure from the table's outside edge toward inside edge (right to left), leaving room for a parked fence. Then add about 6" to accommodate cutting larger circles.
- 3 Find pivot slot centerline.** Measure from outfeed end of table to teeth of blade.
- 4 Find pivot bar slot length.** Measure from the right edge of your planned sled to $\frac{1}{2}$ " from the blade.

Rout the slot, drill the holes, and mount the hardware

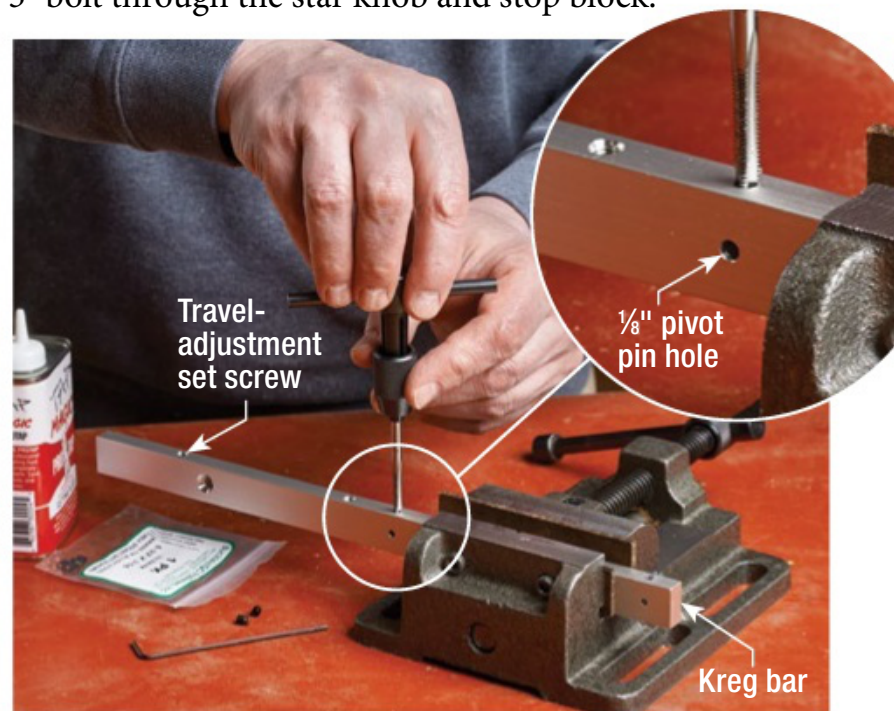
Rout the slot as shown. Then drill counterbores for the pivot bar lock $3\frac{3}{8}$ " from the edge as per the drawing on page 53. Slide the bar in the slot to ensure that its top sits above the counterbores' depth. Drill $\frac{1}{4}$ " holes through the counterbore centers. Round the sled corners, then ease the edges with sandpaper.

Next, cut a 12" length from the aluminum bar, and drill two $\frac{1}{8}$ " holes for the pivot pins, locating them $\frac{1}{2}$ " and $5\frac{1}{2}$ " from one end. (You'll use the endmost pivot point for small discs, and the other for larger discs.) Now, drill and tap

holes into the bar's edges. Then adjust the plastic screws in the offcut section of the bar so that the bar slides in your bandsaw's table slot freely but without slop. Measure for the stop block as shown. From $\frac{3}{4} \times 3\frac{1}{2}$ " stock, crosscut one piece to your stop block measurement plus $\frac{1}{16}$ ". Also cut a 4"-long piece for the anti-tilt block. Install the threaded insert in the stop block at the center of your fence rail, and mount the stop assembly. To finish up, sand the top surface smooth, then shellac and wax it to minimize friction. Then insert the 3" bolt through the star knob and stop block.



Rout the slot. Attach a fence parallel to the pivot slot layout, and on the left side of the router. Position a stop so the slot ends about $\frac{1}{2}$ " from the blade's path and rout the slot in several light passes, pushing the router forward.



Tap the bar. Cross-drill through the bar with a #29 bit at the two pivot pin locations, then use a #8-32 tap to cut threads. Install brass-tipped setscrews to anchor the pivot pins.



Mount the bar. Place the sled on your saw's table to mark the table slot location. At the bench, mount the bar squarely and flush with the outfeed edge.



Measure for the stop. For round fence rails, set your combination square to an even measurement and rest it on the table. Then use a smaller square to gauge the distance between the top of the table and the lower edge of the fence rail.



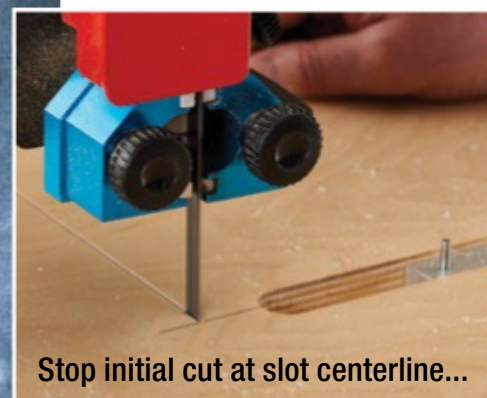
Mount the stop. Set the stop assembly on the sled bottom about $\frac{1}{8}$ " in from the infeed end, and mark and drill the pilot holes. Counterbore the anti-tilt block so that the screws reach $\frac{5}{8}$ " into the sled.

Set up the sled, then cut a circle

To prepare the sled for its first use, make the initial cut and set the stop. To setup for a cut, place the sled against the stop, set the pivot point away from the blade the distance equal to your desired radius. (For very large-diameter work, reverse the bar to locate the pivot points outboard.)

Drill a $\frac{1}{8}$ "-diameter hole, $\frac{3}{8}$ " deep in the center of the underside of your disk blank. With the sled pulled away from the blade, place the blank on the pivot pin. Turn on the saw and advance the sled until the stop contacts the fence rail. Then rotate the work in a complete circle. ■

Initial setup



Stop initial cut at slot centerline...



...and then set stop screw.

Make initial cut, and set the stop. Mount and carefully advance the sled into the running sawblade. Stop when the teeth intersect the center of the slot. Hold the sled steady, turn off the saw, and adjust the stop screw to contact the rail. Then lock that position with the knob. The anti-tilt block should tuck snugly under the rail to prevent the sled from tipping with large work.

Regular use



Cut a circle. Adjust the pivot point to your desired radius from the blade and mount the blank. Push the sled forward until the stop screw meets the fence. Then rotate the blank to complete the cut, using push blocks for a good grip on the top surface.



Looking Ahead

In the next issue, I'll describe the spindle sander jig I devised to smooth the edges of bandsawn discs. See ya next issue!

Transform Curly Maple with DYE STAIN

*Here's how to add color without sacrificing clarity,
and make figured grain really POP!*

By Chris Hedges



Early in my woodworking career, I lived by the maxim that I would never artificially color the wood I was using. It was my firm belief that the wood should speak for itself and any attempt to add color was unnecessary. In a large part, that belief stemmed from bad experiences that I had with pig-

ment-based stains. Too often I would see the wood grain obscured by a stain application, rather than enhanced.

My feelings about coloring wood changed when I decided to give dye stains a try. Dye stains allow me to achieve the deep rich browns on a piece of mission furniture or the won-

derful amber tones on classic Shaker pieces.

The difference between dye stains and pigment-based stains is all about particle size. In a traditional pigment-based stain, each pigment particle is 1-2 microns in size. Dye particles are roughly 60% smaller. The larger pigment particles tend to

stay on the wood's surface. This results in obscured grain, and distracting contrast on open-grained woods. Dye stain, on the other hand, can penetrate more deeply and allow more grain detail to show. This creates a color effect that can be deep and intense, without blocking grain patterns.

Dye stain options

I like to work with concentrated liquid dyes for several reasons. For starters, I like the range of colors and wood tones that are available. Ease of use is another positive, especially with regard to making custom colors. But dye stains come in other forms that may be more suitable, depending on your needs. Premixed dye stain is the easiest type to use, but it's also more expensive. Powdered dye offers the same advantages as concentrated liquid dye, but for accurate mixing with water or alcohol, you'll need a digital scale.



Get set to work with dye stain

The gear shown here is what I use to color wood with concentrated liquid dye stain. The color wheel comes in handy when you want to combine colors to create a custom blend. Paper cups are useful for mixing and making small test batches.



The ability of dye stains to penetrate more deeply makes them especially effective at emphasizing the natural chatoyance of figured woods like curly maple. The dye stain technique shown here has become my standard treatment for showing off figured grain.

Surface prep is the first step

Sanding has an extra purpose when using dye stain: In addition to smoothing the wood surface, it needs to enhance the penetration of the dye. Sanding with too fine a grit can actually reduce penetration.



Medium grit for maximum penetration.

Prior to making the first application of dye stain, sand the wood with a medium-grit like 120. If necessary, sand by hand to remove swirl marks. Then go over the wood surface with a shop vac to make sure all sawdust is removed.

Mix and apply

When you're working with dye stains, it helps to think about concentration, formulation, and experimentation. The concentration, or mixing ratio of dye to water, will determine the intensity of your stain. To alter a standard dye color, create a different formulation by blending in another dye color. By mixing small test batches, as shown at right, you can experiment on scrap wood, and fine-tune your concentration and formulation. ■



Flood on the color. I use a lint-free, 12" square cotton rag to apply dye stain. Flood the wood surface with dye to ensure maximum penetration. Work quickly to avoid lap marks. If they do occur, applying more stain should remove them. Wipe off all excess after a few minutes.





Make a test batch. I rely on a calibrated syringe to get the mixing ratios right when using concentrated liquid dye. It's wise to make a small quantity of dye first to test the color effect.



Blend your brew. To make a quart of my favorite stain for maple, I combine equal parts of "Vintage maple" and "Honey amber" to make an ounce of concentrated dye. Then I add distilled water. A mason jar with a positive-sealing lid will prolong the shelf life of your dye.



Sand lightly with 180 grit. This final sanding step removes raised grain and the topmost layer of stain. The dye that has penetrated deep into the pores remains in place. After sanding lightly with my random-orbit sander, I remove the swirls by lightly hand-sanding with 180-grit on a sanding block.



Apply the second coat. Flood on the color again, then wipe off any excess. When the dye dries, it will look dull. Don't worry—the pop returns when you apply clear finish.



Protect and beautify. Using a water-based clear finish over water-based dye stain can result in some bleeding of the dye. To avoid this, I apply a thin coat of shellac after the stain has dried, then topcoat with a water-based varnish.

Results to dye for. Keep your samples! By creating a catalog of dye effects (record your mixing formula on the back of each piece), you'll know just what to aim for on the next project.



REDHEART

Hardwood in Technicolor

By Ken Burton

Redheart really lives up to its name. Its scarlet heartwood resembles something Walt Disney would have dreamed up. To those accustomed to the subdued tans and browns of North American lumber, redheart's vivid color may seem garish. But to those intrepid woodworkers who embrace the bright hue, the wood has a lot to offer. As tropic hardwoods go, redheart accepts finishes readily and is easy to work with both hand and power tools. Its density is midway between hard maple and cherry. The only real drawback is that the color drastically fades with exposure to sunlight.

Where the wood comes from

Redheart comes from three botanically unrelated trees (*Erythroxylum havanense*, *Cosmocalyx spectabilis*, and *Sickingia salvadorensis*), all of which grow from southern Mexico down through Brazil and Paraguay. The trees are small, reaching diameters of 1½' and barely 60' tall. Despite their genetic differences, these trees share the distinct red hue with similar grain and working characteristics. As of this writing, none of these trees are listed in the CITES Appendices, meaning their current populations are in good shape.

History in woodworking

Redheart certainly has been a part of human activity for several centuries, the Mayans called it chakte kok ("Chock-tee cuck"). But redheart doesn't play a significant role in western woodworking, possibly because the supply has never been that big or consistent. These days, you'll find the wood used mostly as an accent, or as the primary wood in

small projects and turnings. Redheart is tricky to dry properly, even with modern technology, which may contribute to its limited popularity.

Selecting the best stock

Much of the redheart that makes it to North America is processed into turning blanks – 1 × 1s, 2 × 2s, and even 3 × 3s, as well as pen blanks. But boards suitable for furniture making are available from several online wood merchants, though in limited quantities. Most pieces are about 4" wide. These boards are usually 4/4 S2S with thicknesses varying from ¾" to 1⅝". Coming from smaller trees, the boards aren't very wide or long; a 1 × 9 × 60" board is a BIG piece of redheart. Most sites list individual boards for sale with their dimensions. Smaller pieces thinner than ½" thick are ideal for boxes, inlay, or musical instruments.

As with any species, it's best to select your stock in person, but if you're shopping online, search for sites with plenty of photos and clear descriptions. You



Red alert. The name redheart is no exaggeration. Freshly cut pieces look like they were dipped in cherry Kool-Aid.

Redheart Quick Take

DENSITY	40 lbs./cu. ft.
HARDNESS	Medium
STABILITY	Moderate
ROT/INSECT RESISTANCE	Moderate
TEXTURE	Fine-Medium
TOXICITY	Low
USES	Turnings, boxes, small gift items, accents in furniture



Sanguine spectrum.

As with most woods, redheart boards can vary in color. Expect everything from a light orangish-pink to a much darker brownish-red.

may be able to call the merchant so they can help you purchase pieces appropriate to your project. The drying process may leave many boards with checks and other defects, so inspect carefully or ask pointed questions, especially if you need larger pieces. Expect to pay \$20/board foot and up.

Working redheart

Once it's properly dried, redheart is well-behaved; it saws, planes, turns, and sands nicely. If not for the radiant red, you'd think you were working a fine-grained species like cherry. Redheart also glues well and accepts fasteners provided you drill pilot holes. The only thing to note is the wood does give off a distinct odor as it's cut.

Finishing

Redheart accepts most common oil and water-based finishes. However, it will quickly lose its crimson color when exposed to sunlight, fading to a dull brown. The trick is to forestall that fade as much as possible. Faded redheart isn't unattractive, but it's certainly not as eye-catching as when freshly worked. To preserve the color, you'll need to use a finish with a UV inhibitor built in such as Epifanes gloss varnish, or Minwax's Helmsman Water-Based Spar Varnish. (The latter is crystal-clear, so it won't darken the wood as other finishes tend to. Even with such precautions, the color will eventually shift with exposure to UV light. Perhaps redheart is best saved for projects that aren't intended for permanent display—candle holders that get stored in a cabinet between uses, or a box that comes out in time for the holidays.



Beauty within.

Unfinished redheart will quickly turn as brown as this raw board shows. A few swipes with a plane or some sandpaper will reveal the color within.



Redheart working notes

Obviously, the reason to use redheart is the color. My sample boards came out of the box looking like plastic. I thought there might be some kind of coating on them for shipping, but it was the wood itself. I wondered for a while what to make from such a brightly colored wood and eventually decided on the lamp below. One of the sample pieces was a $3 \times 3 \times 12$ " chunk that I split in half to cut the wire channel. The piece glided through my table saw blade with only a minor problem.

In one of the Harry Potter books, author J.K. Rowling describes a botched potion as smelling like burning underpants.

I'd always wondered about this description, but now I understand.

As you machine redheart, an acrid stench fills the air. Some online forums liken the odor to scorched rubber, but I'm sticking with burning underpants. Smell for yourself but wear a dust mask.

Aroma aside, redheart is a nice wood to work. It is hard, so you'll want to use sharp tools. My jointer knives are due to be replaced and chattered when tapering the lamp's center column. I cleaned up the machine marks with my block plane, and

a freshly sharpened card scraper left the surfaces smooth. The wood sanded well without loading up the paper, and polished to a nice sheen using 220 grit. Even redheart's detritus is striking. The dust looks like some exotic spice, and shavings seemed like the packing material you might find in an expensive gift box. I'm not sure I'd make an entire piece of furniture from redheart, but I look forward to accenting future projects with its bright hue. ■



Fairing the curve

I frequent flea markets and antique shops searching for vintage tools to add to my collection. One such find is the Stanley #113 compass plane. Manufactured from 1877-1946, the #113 smooths curved surfaces such as the stool seat shown here. The long adjustable sole makes it simpler than using spokeshaves to achieve a fair curve, especially across broad surfaces. After decades of using a spokeshave for such operations, I was delighted to discover a compass plane in good working order. If you don't enjoy the local hunt, try eBay, where they often pop up for \$100-\$150. Or try a vintage tool dealer like *antique-used-tools.com*.
—Ken Burton



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Tough as leather

When I pulled the “Walnut Bison” leather apron from its packaging two years ago, it was as stiff and straight as the board I was about to cut. I felt like I was walking around my shop with a sandwich board swinging from my shoulders. But after a few weeks of heavy use, the apron began to settle and fit me better. And this thing takes a beating. It’s covered in glue, finish, and snacking debris, but why wouldn’t it be, right? It’s a shop apron. Woodcraft sells the Tobacco model for \$180 but check *CalaveraToolWorks.com* for a variety of styles and colors. The chest pocket is the perfect size, as I don’t carry much around with me in the shop. Just the essentials. ■

—Chad McClung



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Build a Classic **SPICE BOX** Part 1

Master challenging joinery details to create a masterpiece

By Chris Hedges

Today you could easily use a spice box to store many things besides spices. But to appreciate the importance that this classic creation has for woodworkers, you have to go back several centuries, when spice boxes were true to their name. Back then, spices were a luxury that only the wealthy could afford. A family in Colonial America with financial means to purchase spices from around the world could also afford to have an exquisite storage cabinet designed and built by the best woodworker in the community.

Just as the spice box became a symbol of affluence for wealthy colonists, it also became a crowning achievement for a woodworker. It's easy to understand why. With its dovetailed case, molding details and intricately divided interior, this piece showcases challenging joinery as well as beautiful wood grain.

This article is the first in a two-part series that explains how I build a classic spice box from start to finish. Associated articles are also part of this ambitious project—to cover special jigs and techniques.

Building the spice box from start to finish—a big project with 6 major construction steps

Covered in this issue (Spice Box, Part 1):

1. Make the case (sides, top, bottom)
2. Make and install interior dividers
3. Make and install the cornice and base

Covered in April/May issue (Spice Box, Part 2):

4. Build and install the drawers
5. Make the door, install lockset, and then hang the door.
6. Make and install the back, then sand and finish



Dovetailed base



Lap-jointed poplar back



Half-blind dovetailed drawers



Bird's-eye maple door panel

Excellent elements. From bottom to top, this small case makes a big statement about fine design and quality construction.

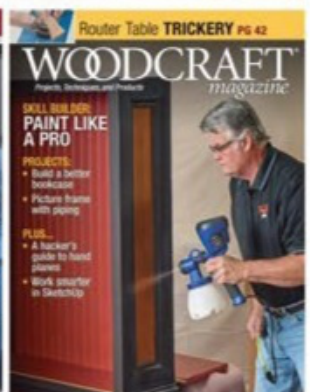
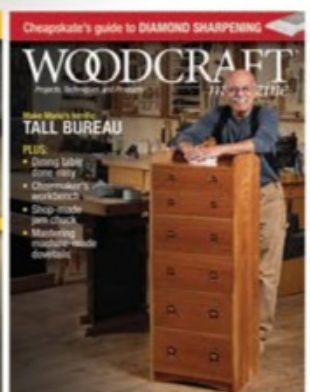
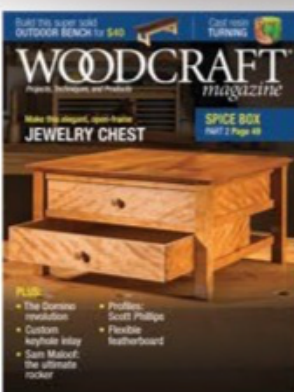
Track your progress!
The Project Tracking icon provides an easy way to see where you are in the overall construction process.



progresSTRACKER

Photos: Larry Hamel-Lambert; Illustrations: Christopher Mills

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Best uses for biscuit joinery

Q: Does biscuit joinery improve the strength of edge-to-edge joints when gluing up panels? If not, why bother spreading glue in the slots or on the biscuits? Just how strong are biscuit joints, anyway? Are they stronger than joining with dowels?

Bob Whiteman
Highland Park, Illinois

A: The fact that a well-prepared and glued edge-to-edge joint will break not at the glue line, but adjacent to it confirms that such a joint needs no reinforcement. The only reason to use biscuits in an edge joint is for alignment purposes; it's a good approach when dealing with bowed boards. Gluing biscuits in their slots isn't necessary.

Biscuits can be effectively used in butt joints. But because of a biscuit's relatively shallow penetration into mating workpieces, it won't be as strong as a proper mortise-and-tenon joint. When it comes to reinforcing miter joints, biscuits are very easy to install, and typically plenty strong for the job. That's the application I mostly use them for.

It's hard to draw strength comparisons between biscuits and dowels because strength depends on the type of joint and the size and number of biscuits or dowels used. Because dowels can more deeply penetrate the joining parts, they typically offer better mechanical strength. On the downside, dowel joints are fussier to make and don't offer nearly as much long-grain to long-grain glue surface as biscuits. Thus, they tend to pull apart over time in heavy use. I've repaired lots of 'em over the years. ■



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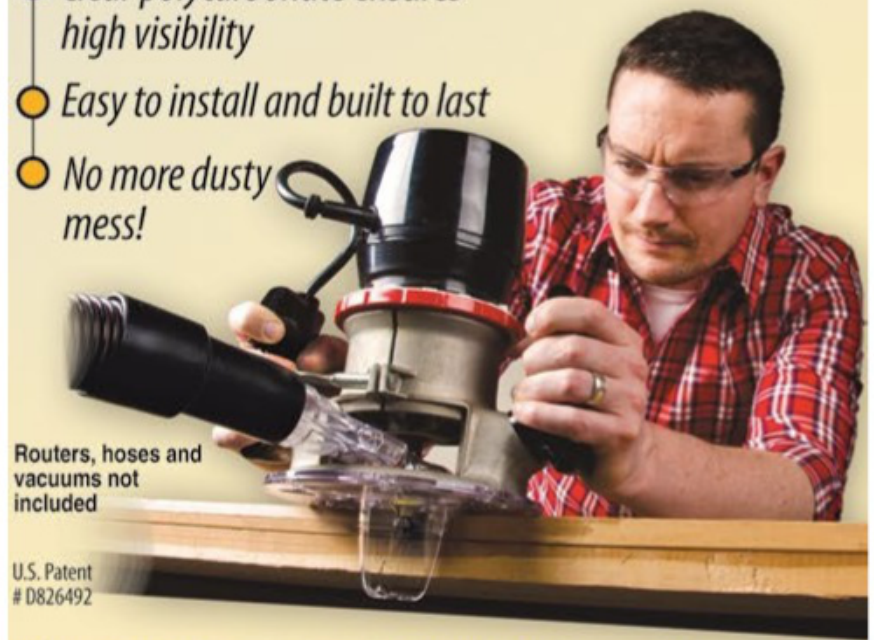
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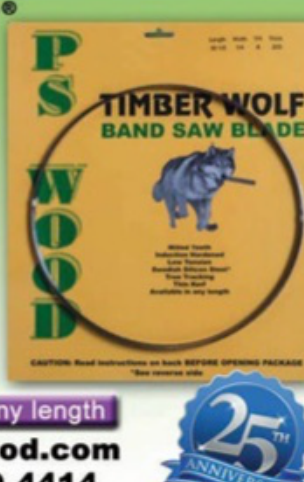
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- 1. Whiteside 9500 Solid Brass Router Inlay Router Bit Set #09116, **\$45.99**
- 2. Whiteside Rabbet Bit, 1 3/8" D, 1/2" CL, 1/2" SH #405487, **\$26.56**
- 3. Bessey Auto-Adjust Horizontal Toggle Clamp, (2 needed) #418559, **\$21.88**
- 4. Whiteside Bearing Template Router Bit, 1 1/8" D, 1 1/2" CL, 1/2" SH, #24A63, **\$42.99**
- 5. Freud Precision Shear Forstner Bit, 1/2" D #832873, **\$9.47**
- 6. Bostik GlideCote Tool Surface Spray Lubricant, 10.75 oz. #124627, **\$27.99**
- 7. General Finishes Candlelight Stain, qt #828275, **\$21.99**
- 8. Watco Spray Lacquer, Satin, 11.25 oz. #146950, **\$10.99**
- 9. Hillman 3/4" Flush Panel Clips, 30 pack *Lowes.com*, **\$12.12**

Are You Ready for CNC? (p. 30)

Woodcraft sells a full range of CNC machines, with prices starting under \$2000.00. Bits and accessories are also available. Visit a Woodcraft store for more information (and a CNC demonstration), or check out Woodcraft.com for details.

Top Secret Table (p. 34)

- 1. Soss Invisible Hinge, 1/2" x 1 3/4", (one pair needed) #06B44, **\$27.99**
- 2. Highpoint Oak Knob, 1" Dia #130263, **\$2.97**
- 3. Magnetic Push Latch (SKU: 33636; two needed) *woodworkerexpress.com*, **\$2.66**
- 4. Pivot Hinges (SKU: 13164; two pair needed) *woodworkerexpress.com*, **\$1.05**

Items above available at Woodcraft stores, at *woodcraft.com*, or by calling (800) 225-1153, unless otherwise noted. Prices subject to change without notice.

Top Secret Table (cont.)

- 5. RFID Electronic Cabinet Lock (SKU: B075QF1VPR) *amazon.com*, **\$14.49**
- 6. Baby Proofing Magnetic Cabinet Locks (SKU: B073WN9QHV)..... *amazon.com*, **\$16.99**
- 7. Mini Ratcheting Offset Screwdriver (SKU: 03044A) *amazon.com*, **\$7.95**

Circle-Cutting Jig (p. 52)

- 1. Kreg 30-Inch Jig and Fixture Bar #145830, **\$25.99**
- 2. Steel Dowel Pins, 1/8" Dia., 3/4" L., box of 50 (SKU 98381A473).. *McMaster.com*, **\$8.27**
- 3. Setscrews, 8-32 Brass Tipped, pack of 10 (SKU 91381A189) ... *McMaster.com*, **\$9.60**
- 4. Through-Hole Threading Tap, #8-32 (SKU 2522A668) *McMaster.com*, **\$5.07**
- 5. Highpoint Knockdown Joint Connector Bolts, 1/4-20 x 1 1/2" long #163128, **\$4.75**
- 6. Woodpeckers 16-Piece Knurled Thumb Nut Kit #147919, **\$9.99**
- 7. Highpoint Threaded Brass Inserts, 1/4-20, 8-piece #159290, **\$6.99**
- 8. WoodRiver Knob, Five Star with Through Hole, 1/4"-20 Insert #27R13, **\$1.75**

Transform Curly Maple with Dye Stain (p. 56)

- 1. TransTint Dark Vintage Maple Concentrated Dye, 2 oz. #821825, **\$21.99**
 - 2. TransTint Honey Amber Concentrated Dye, 2 oz. #128481, **\$21.99**
- NOTE: Many other concentrated dye wood tones and colors available.*
- 3. Large Plastic Syringe, 4 pack *amazon.com*, **\$6.99**
 - 4. Zinsser Bulls Eye Shellac, Clear, qt #140700, **\$17.99**
 - 5. 5. Cox Color Wheel 133343 *amazon.com*, **\$7.19**

Great Gear (p. 62)

- 1. Calavera Tool Work, 30" Leather Shop Apron with X-back #163410, **\$180**
- 2. Stanley #113 Compass Plane *ebay.com*, **\$150-\$250**

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Since 2008, Jory has designed and built custom furniture for his own company, Jory Brigham Design, as well as offering classes in furniture building. He uses mostly domestic hardwoods and time-honored techniques to craft unique furniture at his San Luis Obispo, California, studio.

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www.JohnMalecki.com

Woodcraft is proud to partner with John Malecki, a former NFL offensive lineman turned self-taught woodworker and furnituremaker. John crafts custom furniture in Pittsburgh, PA, as well as producing tutorials and videos on his website, JohnMalecki.com and YouTube channel, JohnMaleckiBuilds.

John attended the University of Pittsburgh and played four seasons in the NFL. After wrapping up his NFL career, he began building and selling furniture in 2014. Since then, he has worked with brands like Lululemon and West Elm Workspace PGH to build high-end industrial and reclaimed style furniture. John emphasizes the use of metal and wood in almost all of his furniture, pairing modern and industrial styles brilliantly.

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Tuned In

Searching for the soul of wood

By David M. Freedman

I recently read a book about wood-working in which the author reverently offered this stunning divulgement: “You can look deeply into the soul of a board and it will tell you what it wants to be, whether a carved figure, a jewelry box, a Windsor chair, or whatever. If you tune in to it, the wood will speak to you.”

Intrigued, I immediately slipped down to my basement shop and attempted to penetrate, soul-wise, a cocobolo board I had just received as a gift from a fellow woodworker. I hadn’t yet decided on a project for it, so I thought maybe I could induce it to tell me what it wanted to be. Actually, I started by trying to figure out where its soul resided, so I could look deeply into it. It wasn’t as simple as I had hoped. As it got to be late in the evening, I decided to resume the quest the next day.

Lying in bed pondering the soul of dead flora, I floated off to sleep. I woke up in the middle of the night in a mild stupor, and felt compelled to drift back down to the basement in my pajamas. In the darkened shop, the board lay there in an eerie glow that gave me chills. Then I realized I had left it sitting under the nightlight above my bench. Anyway, trying to shake off my stupor, I stood looking down at the softly lit board, endeavoring to “tune in to it.” I implored the board, addressing what I hoped was its soul: “Tell me, what sort of

furniture do you desire to be? Into what form shall I masterfully craft you?”

To my astonishment, the wood responded, and with less delight than I might have expected. “That’s a bit presumptuous, wouldn’t you say, Mr. Master Crafter? Truth is, I’d rather still be standing in the forest, with woodpeckers making of me what they will.”

I had never apologized to lumber before, but did my best to convey my sympathies to wood cut down in its prime. I explained that the best I could do would be to honor its existence by bestowing upon it a new, useful form, and that I wished to thank it for

its sacrifice in the same way some American Indians thank and honor the game they slay for meat.

“Well here we sit, then,” the board acknowledged. “Things being what they are, I guess I wouldn’t mind being a small, sturdy stool of some sort.”

“Splendid!” I replied. “A stool it is. I’ll make you proud!” To underscore my good intentions, I reached for my favorite smoothing plane and took one satisfying, full-length pass with it. The board yelled “Ow!”

I may have to rethink this tuning-into-the-wood business. ■

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