Classic crackle finish, p. 78

TAUNTON'S

Fine WoodWorking

June 2017 No. 261

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Unleash the power of your hand screws • Mid-Century credenza

Make a better marking gauge, p. 40

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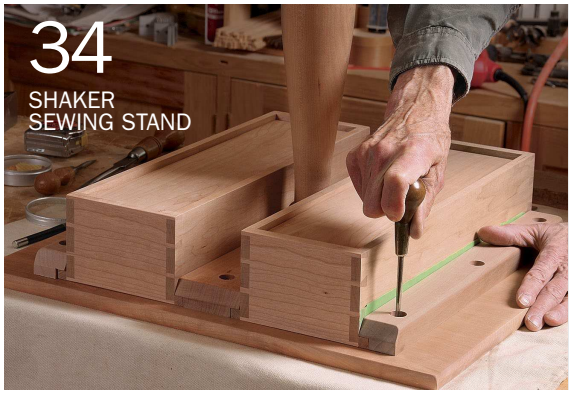

features

Cover photo: Michael Pekovich

in every issue

74 GALLERY: ARTS & CRAFTS ARMOIRE

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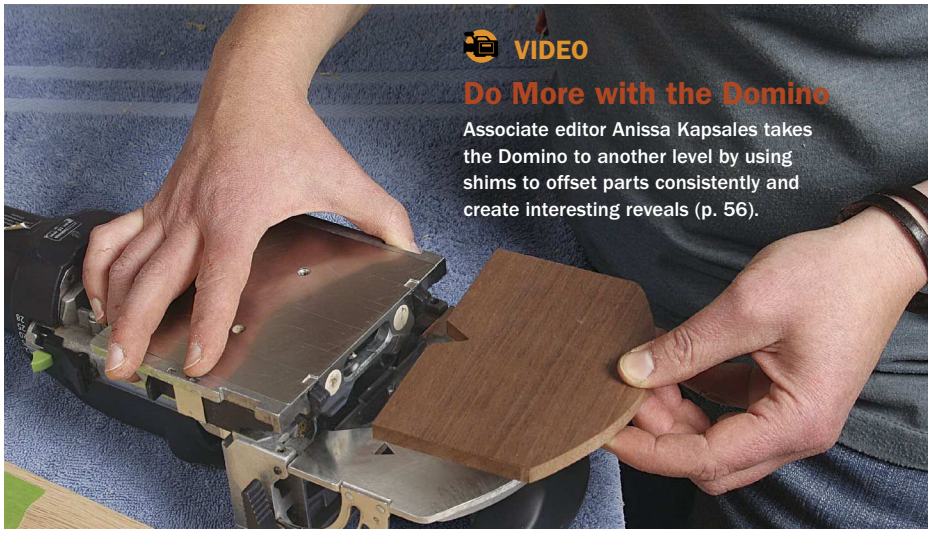

VIDEO

Do More with the Domino

Associate editor Anissa Kapsales takes the Domino to another level by using shims to offset parts consistently and create interesting reveals (p. 56).

VIDEO

Score Every Time!

Bob Van Dyke (p. 40) demonstrates how to sharpen a marking gauge and how to get perfect scribe lines every time.

VIDEO

Watching Paint Dry (and Crackle)

A crackled milk paint finish (p. 78) adds an attractive visual effect to a piece, but its textures are just as appealing. We'll show you what the process looks like.

VIDEO

Hand-Screw How-to

Wooden hand screws are versatile (p. 46), but they can be confounding to use. We'll help you eliminate frustration and show you a few tricks to get the most from these clamps.

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Fine Woodworking: (ISSN: 0361-3453) is published bimonthly, with a special seventh issue in the winter, by The Taunton Press, Inc., Newtown, CT 06470-5506. Telephone 203-426-8171. Periodicals postage paid at Newtown, CT 06470 and at additional mailing offices. GST paid registration #123210981.

Subscription Rates: U.S., $34.95 for one year, $59.95 for two years, $83.95 for three years. Canada, $36.95 for one year, $63.95 for two years, $89.95 for three years (GST included, payable in U.S. funds). Outside the U.S./Canada: $48 for one year, $84 for two years, $120 for three years (payable in U.S. funds). Single copy U.S., $8.99. Single copy Canada, $9.99.

Postmaster: Send all UAA to CFS. (See DMM 707.4.12.5); NON-POSTAL AND MILITARY FACILITIES: Send address corrections to *Fine Woodworking*, PO Box 37610, Boone, IA, 50037-0610.

Canada Post: Return undeliverable Canadian addresses to *Fine Woodworking*, c/o Worldwide Mailers, Inc., 2835 Kew Drive, Windsor, ON N8T 3B7, or email to mnfa@taunton.com.

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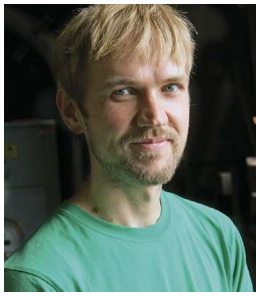
contributors

Libby Schrum (“Mid-Century Credenza”) took a slow, steady path into woodworking. About 15 years ago, she took the 12-week intensive course at the Center for Furniture Craftsmanship in Maine. She followed that up with a master’s degree in furniture design from Rhode Island School of Design. She went back to CFC for a year as a studio fellow, and then spent some time building boats. Now she builds furniture in her shop in Camden. “Most days,” Schrum says, “I feel as though I know what I’m doing. The rest of the time, I know I have the skills to problem solve, which is almost more valuable.”



Jon Billing (Designer’s Notebook: “Kumiko coffee table”) completed a two-year guitar-building program in his home state of Minnesota before moving to New York City to study sculpture at Hunter College. He runs a one-man furniture business, Big Sand Woodworking, out of Liberty Labs, a co-op woodshop in Brooklyn. His affection for Japanese aesthetics extends to tools as well as furniture: Last year he won the Japanese handplaning contest held at Yann Giguere’s Mokuchi Studio in Brooklyn with a 6-ft.-long shaving that measured 8 microns thick.

Nancy Hiller (Finish Line: “Traditional crackle finish”) was born in the United States but trained as a furniture maker in England, where she lived in her teens and twenties. She builds furniture in a shop beside her house in Bloomington, Ind. With a deep, scholarly interest in English and American furniture of the 19th and 20th centuries, she often builds furniture and built-ins with an Aesthetic Movement or Arts and Crafts flavor. Her book *The Hoosier Cabinet in Kitchen History* (Indiana University Press, 2009) presents a detailed view of a familiar but fascinating piece of furniture.

Timothy Coleman (“Clever Clamping Tricks”), who studied under James Krenov in the 1980s, works in the shop he built beside his house in Shelburne Falls, Mass. In addition to making highly acclaimed original furniture, he has also built exacting reproductions of furniture by Frank Lloyd Wright for a house museum in Buffalo, and recently completed a suite of reproductions for Dwight and Mamie Eisenhower’s house in Gettysburg, Pa. Follow him on Instagram @timcolemanfurniture.

We are a reader-written magazine. To learn how to propose an article, go to FineWoodworking.com/submissions.

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letters

From the Editor

WHAT'S NEW AT FINEWOODWORKING.COM

Since its redesign and relaunch last winter, the new FineWoodworking.com has been a great success. The site is cleaner and easier to navigate, but getting that foundation built is just the beginning. Guided by Ben Strano, web producer extraordinaire, we have great plans for innovative videos and features that are sure to satisfy any woodworker's curious eyes.

One of the most popular new features is our blog Talking Tools with Rollie Johnson. In this space, Rollie answers reader questions and rolls out tool advice and stories, garnered over decades of working in woodshops in his native Minnesota. And Rollie really shines here. He's not afraid to give his opinion, but most of all he's not afraid to share his inner tool geek.

Here's an excerpt from his blog on the radial-arm saw, a tool that some may consider the Model-T of woodworking (but not him!).

"There's a lot of controversy about the attributes of a radial-arm saw and I'm a proponent of them. There's simply no better tool for accurately and cleanly crosscutting lumber. There, it's in print, let the responses begin!

"Radial-arm saws have a reputation as being dangerous, overly aggressive-cutting saws, but the real culprit isn't the saw, it's the blade. Radial-arm saws require a negative-hook-angle blade, just like a chopsaw. Standard positive-hook-angle blades simply cut too aggressively for a pullsaw."

To read the full blog and to chime in on the comments, check out the Talking Tools section at FineWoodworking.com. And if you have a tool question for Rollie, send it to talkingtools@finewoodworking.com.

—TOM McKENNA, editor

Show us your shopmade tools

There's something really satisfying about using a tool that you've made. With that in mind, we're putting together a gallery of shopmade tools for this year's *Tools & Shops*, and we'd like to see yours. To be considered, fill out the form at FineWoodworking.com/rg and send it, along with photos of your shopmade tools and machines, to fwgallery@taunton.com by July 15.

When metric makes no sense

I got a real chuckle from the "When metric makes sense" letter (*FWW* #260), complaining that the unusual measurements of 50½ in. width and 2⅛ in. thickness in a workbench project came from a "hard" conversion of metric to "imperial" units. Perhaps he didn't check, but it's more likely, I think, that our Canadian friend was spoofing us south of the border folks. 50½ in. = 128.27 cm and 2⅛ in. = 5.4 cm. Those "hard" centimeter equivalents seem actually more unlikely than the inch dimensions.

The big push to go metric in the United States came just a few years after the British went metric, but in those few years the electronic pocket calculator came to be an everyday item. The original major advantage of metric—that everything was easier to hand-calculate because all the units went by factors of 10—disappeared, and so did the U.S. transition to metric.

—DAVID DUNTHORN, Oak Ridge, Tenn.

Tall order for a short trammel

Michael Cullen describes using a pencil and trammel to strike the arcs for his tabletop ("Sleek and Shapely Coffee Table," *FWW* #260). The plan drawings show the arc for the length of the table has a 30-ft. radius. Does he enlist a helper, or pin the pivot point in some manner so he doesn't need to be near it? Or does he just have really long arms?

—BILL HOUGHTON, Sebastopol, Calif.

Michael Cullen replies: I make a trammel by screwing together narrow offcuts of plywood. I add a pencil at one end and a pin at the other. In this case, since the radius was so large, I set up the trammel on the floor with the pin held securely in a piece of plywood tacked in place and then simply swept out the arc on a piece of ¼-in.-thick MDF.

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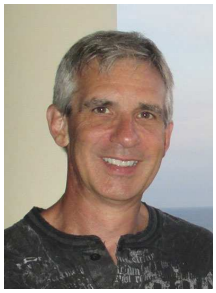
workshop tips

Best Tip



Brad Cort's grandfather was a carpenter who took him along to job sites, stoking his interest in woodworking. He completed his first cabinetry project at 19 with his grandfather's guidance and has been a hobbyist woodworker ever since. Cort's day job is wood-related, too: He sells industrial equipment for pulp and paper.

Pointy screw makes it easier to install pulls

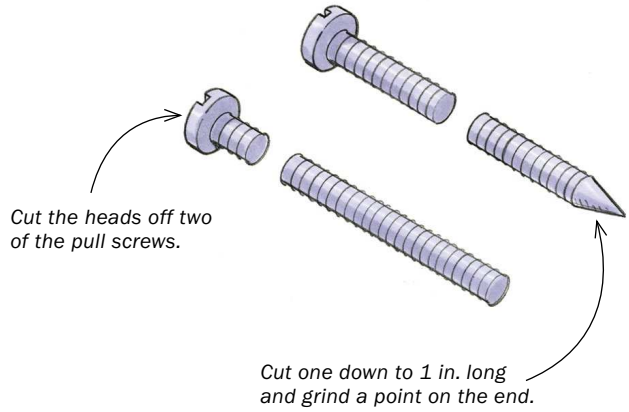
I've installed a lot of drawer and door pulls, and it's amazing how many of the pulls say that their screws are 3 in. or 3¾ in. apart but are off as much as ⅛ in. You can measure the pull itself, of course, but if you are off just a little, the screws will be hard or impossible to insert in the pull. The only alternative will be to drill a larger hole at one end, leaving you worried that the pull will become loose or misaligned.

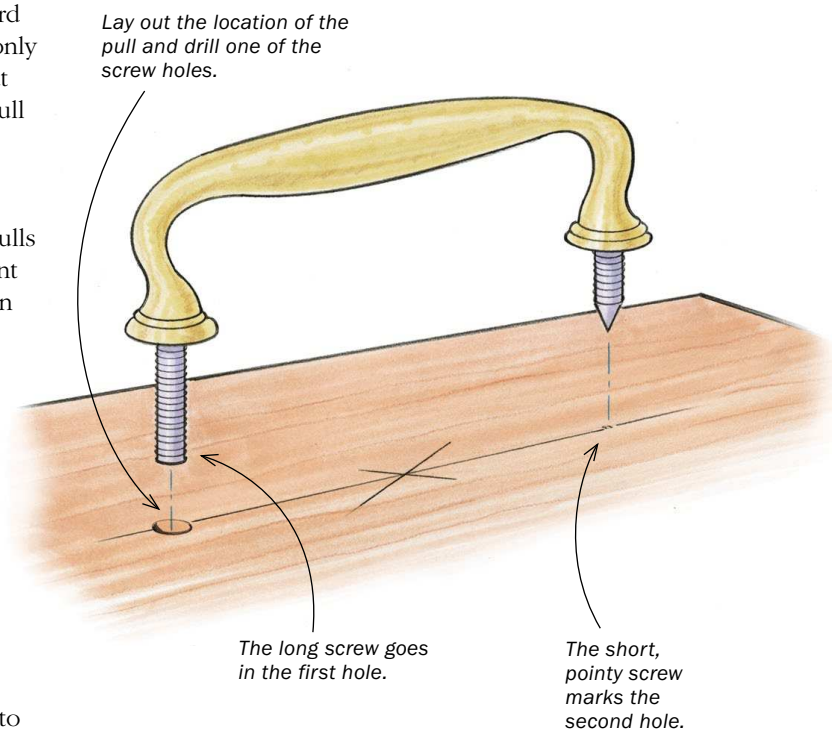
I found a way to align these holes quickly and precisely using a couple of extra pull screws as a layout jig. Most pulls come with two sets of screws of different lengths. Pick the pair that you don't plan to use for your project and cut off the heads. Cut one of them down to roughly 1 in. long and grind a point on its tip, being careful that the point is centered.

Then do your usual layout on the drawer face or door stile, marking center lines in each direction, but drill just one of the holes you need. The longer screw goes in one end of the pull and into that drilled hole. The pointy one goes in the other end of the pull. Now you simply push the point into your centerline to mark the second hole location. Start the drill bit in that dimple and your pull will fit perfectly every time.

Save these cutoff screws. Even though the span of drawer and door pulls varies, many use #8-32 screws.

—BRAD CORT, Lawrenceville, Ga.





A Reward for the Best Tip

Send your original tips to fwtips@taunton.com. We pay $100 for a published tip with illustration; $50 for one without. The prize for this issue's best tip was a Senco FinishPro 21LXP pin nailer.

Quick Tip

Upholstery foam makes good brushes

After using cheap foam brushes for years, I found an alternative in the foam that upholsterers use for seat cushions. I cut it into blocks 3 in. square or smaller if needed. Then I put on my usual disposable vinyl gloves and hold the blocks by hand. The stiffness of the foam allows for an ergonomic grip, and the foam holds paint and finish without much dripping. I get mine free from a local upholsterer, who is more than happy to get rid of her scrap pieces.

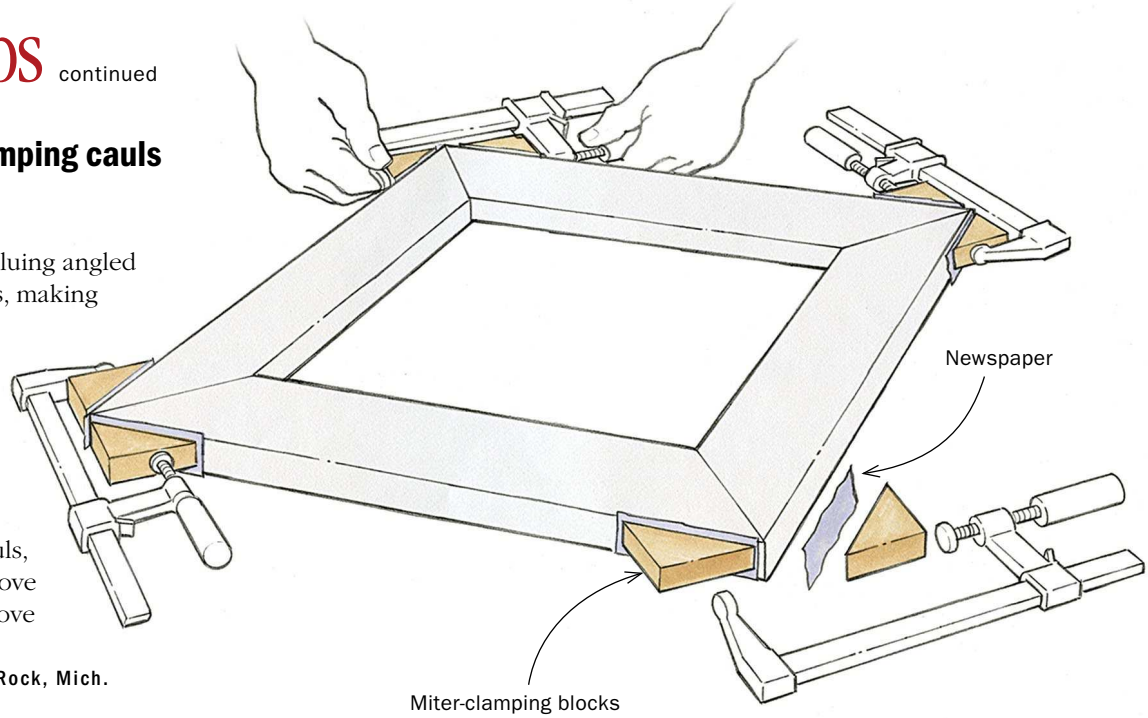
—KURT SWANSON, Beulah, Mich.

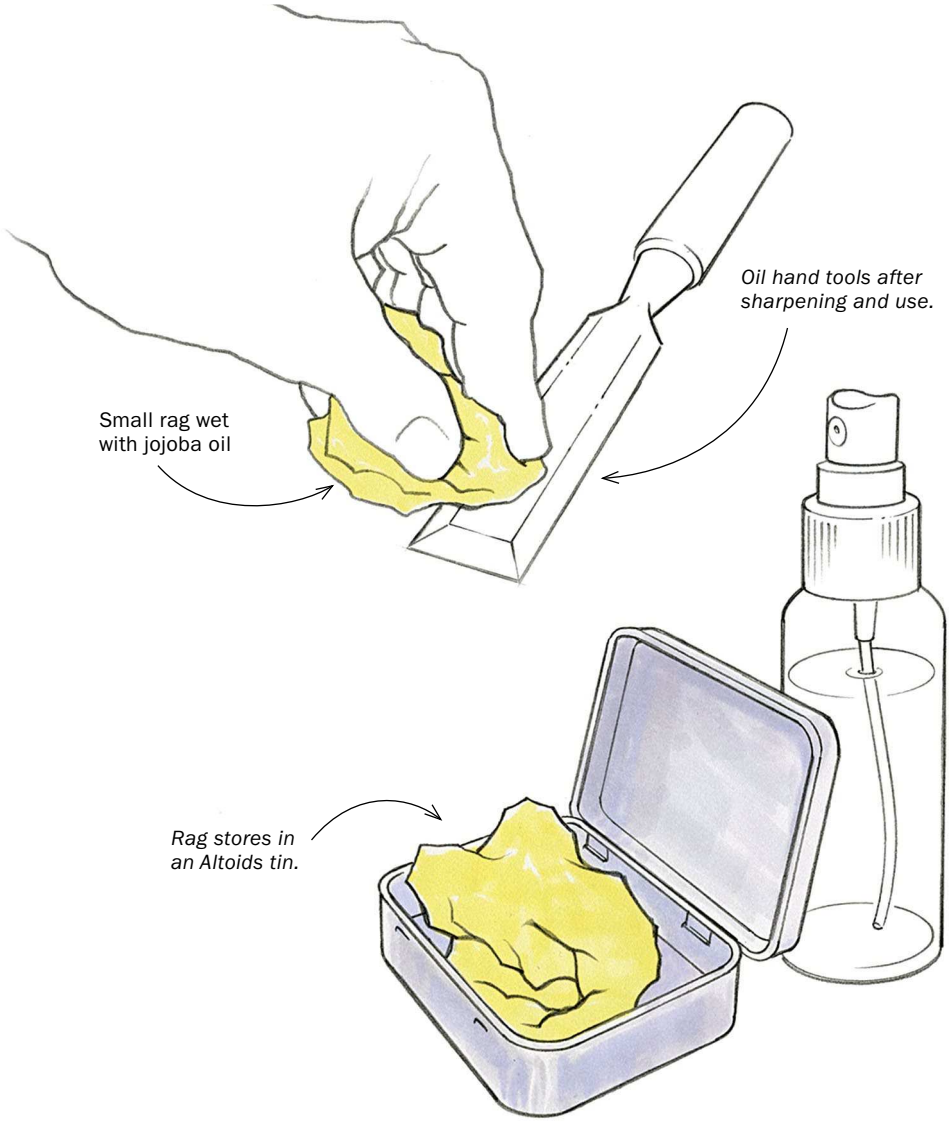
Drawings: Dan Thornton

Newspaper lets miter-clamping cauls snap off after use

I use the time-tested method of gluing angled blocks onto mitered frame pieces, making them easy to clamp tightly. To make the blocks easy to remove, however, I use a wood turner's trick. I place a layer of newspaper between the cauls and workpieces. Once the miters are glued and dry, instead of sawing and planing off the cauls, it takes only a sharp blow to remove them and a bit of sanding to remove the paper and glue residue.

—CRAIG RITCHIE, Flat Rock, Mich.





Candy tin stores small rag for oiling hand tools

I avoid corrosion on my hand tools caused by finger oil or moisture in the air by wiping them down with oil after I use or sharpen them. But sometimes I can't be bothered to put oil on a new rag or clean the wood chips off my old one. So recently I cut up a few rags to fit in the rectangular tins that Altoids mints come in. I wet the rags with jojoba oil, my favorite rust preventer. Now I have oily rags clean and ready to go in a few key spots in the shop. I'm aware of the danger of oily rags spontaneously combusting, but I haven't noticed these tins getting even slightly warm in the six months I've used them.

—DEAN VANDE GRIEND, Story City, Iowa

Editor's note:
Jojoba, like mineral oil, evaporates and dries very slowly, so its potential for generating heat is lower than the oils and oil blends more commonly used for finishing.

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Marc Spagnuolo,
Content Producer and Woodworking Instructor

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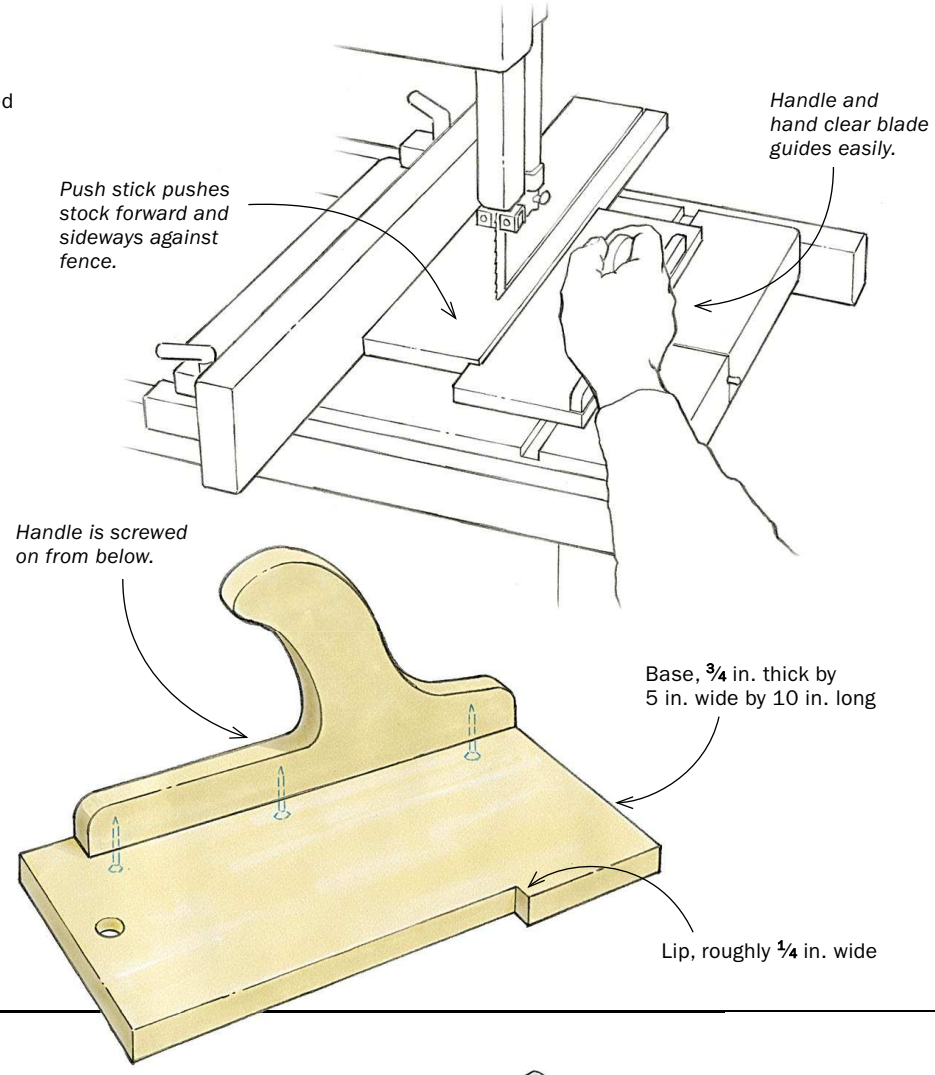
Better push stick for ripping on the bandsaw

Some folks use standard push sticks for keeping fingers safe on the bandsaw, and others don't bother. I find that this push-stick design gives me better control, helping me push the piece forward and against the fence at the same time, with enough width so that its handle (and my hand) passes easily to the right of the blade guides. Make the handle to fit your hand comfortably and screw it on from the bottom. The lip is about ¼ in. wide. It gets chewed up after a while, but it's easy to cut a new flat edge and lip and renew the stick. By the way, I use similar handles and bases as push sticks for the planer, jointer, and router table, varying the location of the lip from the side to the bottom of the base.

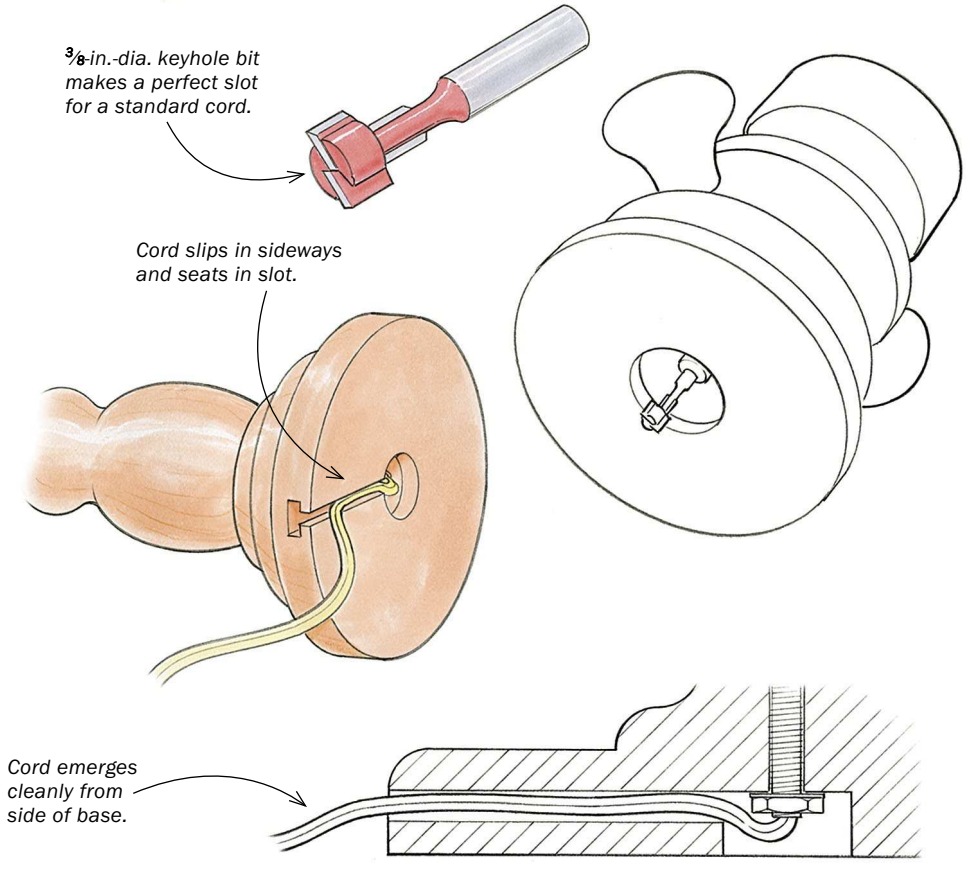
—ANDY WESTERHAUS, Burnsville, Minn.



Keyhole router bit conceals a lamp cord

I turn wood lamp bases sometimes, and I've found that a standard keyhole router bit (the large diameter is just over ⅜ in.) cuts a perfect slot for a standard lamp cord. After the turning is done, I cut the slot freehand, starting in the counterbored area in the center of the underside of the base. The bit wanders a little but not enough to matter, and I've never had a problem with chipout at the edge if I make sure the bit emerges slowly. The cord goes in sideways and then seats nicely in the bottom of the slot. I usually glue flannel or cork over the bottom of the base to finish the job.

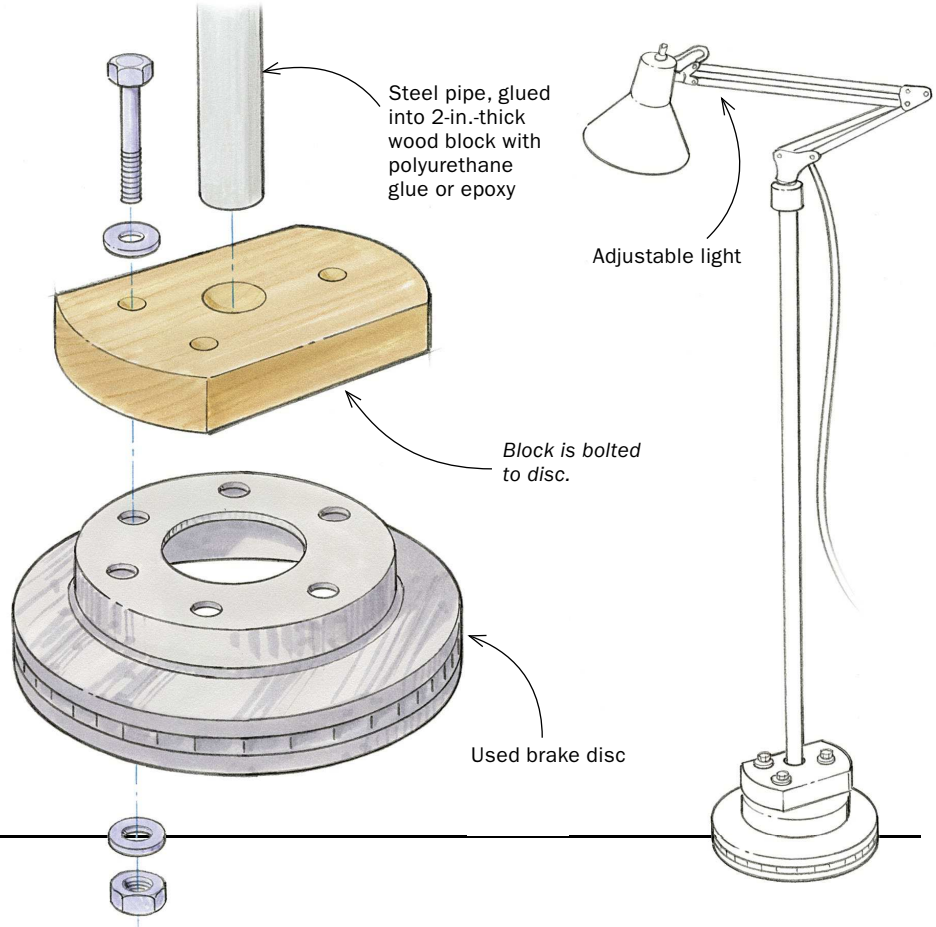
—GEORGE McCUNE, Chico, Calif



Used brake discs make great bases for shop stands

The best and cheapest bases for workshop support stands I have found are scrap vehicle brake discs. They come in a range of sizes and weights, and have threaded holes for mounting the upright. Shops that service brakes discard piles of them and usually you can get them for free. I got mine just by stopping in and asking. I've used a larger disc for a floor-standing light and a smaller one for a benchtop version of the same thing. A large disc could be used as a base for a workshop seat, and an even larger and heavier one as a base for a grinder stand, for example, taking up minimal floor space.

—BRUCE DUDMAN, Hobart, Tasmania, Australia

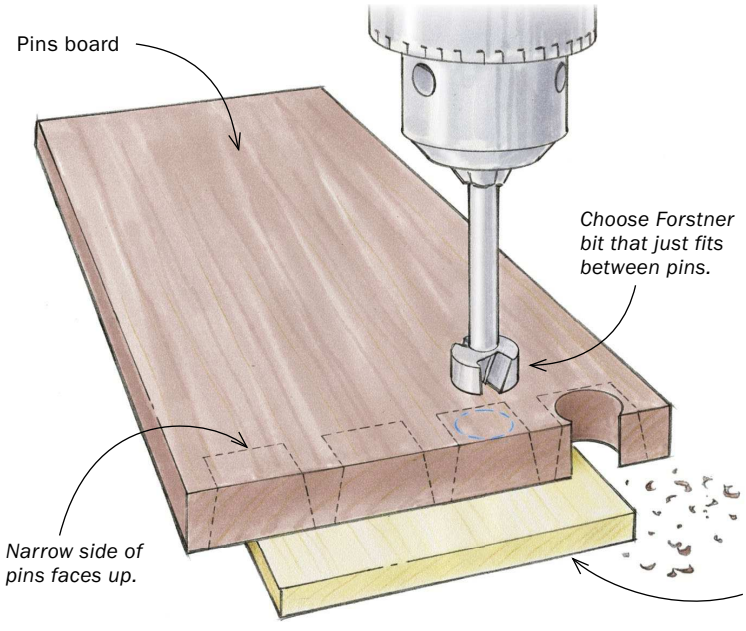


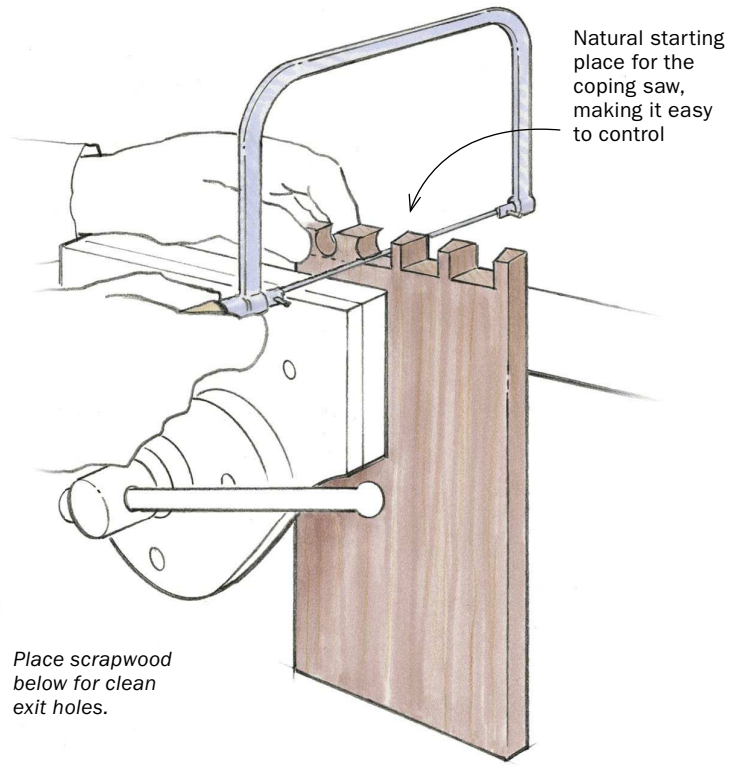
Drill out waste between dovetail pins

When making through-dovetails, I find it laborious to chisel out all of the waste between the pins, and cutting it out with a coping saw is only slightly better. With the saw I'm anxious not to cross the baseline while making the long cut, so I leave a lot on the waste side of the line to be chopped and pared. And for half-blind dovetails, the coping saw isn't an option.

Nowadays, what I do in both cases is remove the bulk of the waste with a Forstner bit in a drill press, set at a slow speed for good control. On through-dovetails this leaves a small amount to cut out with the coping saw, with a natural spot in the middle for starting the cut in each direction. For half-blinds, it leaves far less chisel work to do. I set a depth stop for drilling those. Obviously when you choose the drill bit, you need to measure on the narrower side of the waste.

—HUGH SAXTON, Stockbridge, Hampshire, England





Kumiko coffee table

A GOOD LESSON IN LESS IS MORE

BY JON BILLING

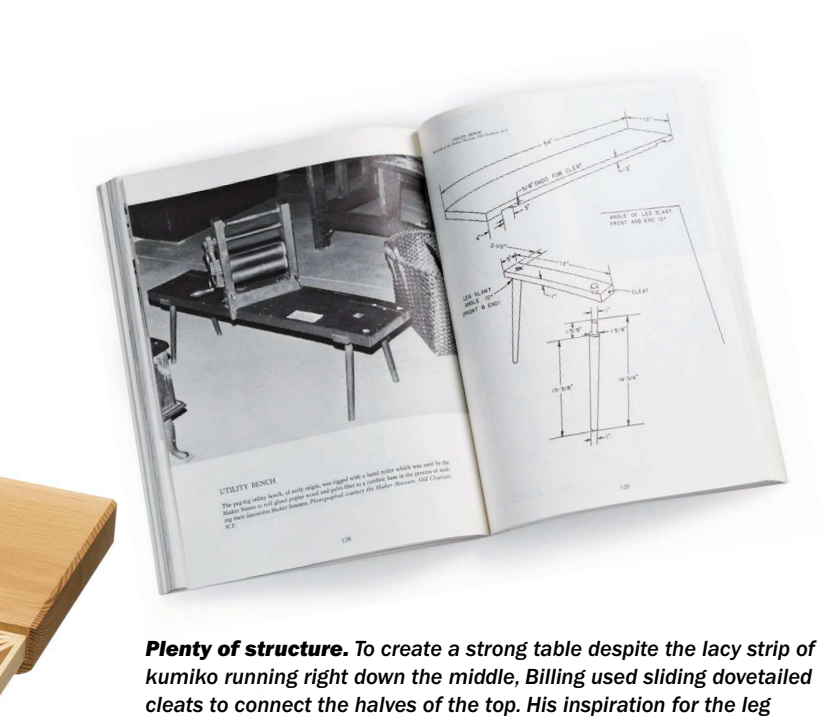
I've always been attracted to the quiet gridwork of shoji screens as well as to the delicate decorative patterns that often embellish them. Wanting to use the potential of these patterns in a new way led me to think about how I could incorporate kumiko—the thin strips of wood within a shoji's frame—in the surface of a table.

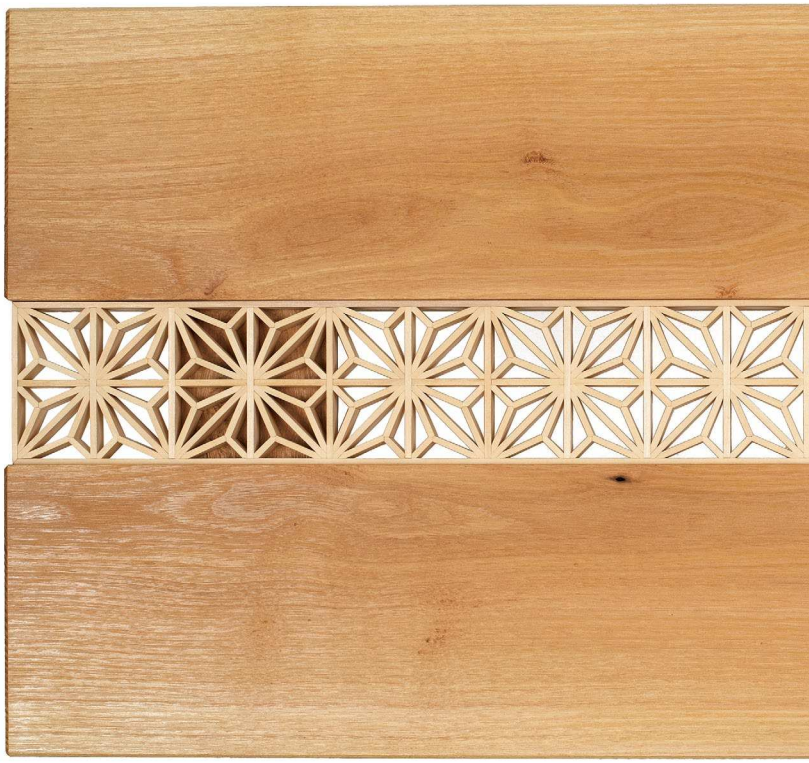
My first attempt turned out to be a false start. For that table I envisioned essentially laying a shoji screen flat and sticking legs onto it. Since the only real structural part of a shoji screen is the surrounding frame, it was a challenge to find a way to attach the legs. My solution was to push the legs to the outside edges of the table. This plan never quite sat right with me, but I proceeded nonetheless, doing drawings both by hand and in SketchUp, and building a partial mockup. In the end, I decided that the table was too complex.

Mulling what I had learned from that initial design, I sat down to do some more sketches. I also started scouring through books looking for inspiration. In a book on Shaker furniture, I found a simple utility bench that really struck me. The bench had splayed legs attached to cleats, and the cleats were dadoed into a plank seat. I really liked the legs, which looked much more graceful and dynamic than the legs in my previous design. The simplicity of both the design and construction of the utility bench appealed to me.

Returning to SketchUp, I started to redesign the coffee table, incorporating ideas from the utility bench and toning down

Photos: Jon Billing





Plenty of structure. *To create a strong table despite the lacy strip of kumiko running right down the middle, Billing used sliding dovetailed cleats to connect the halves of the top. His inspiration for the leg and cleat design came from a table in John G. Shea's book,* Making Authentic Shaker Furniture *(Dover Woodworking, 2012).*

the kumiko pattern. I found that a single strip of kumiko down the center of the table reduced the busyness that I disliked in my original design and actually focused more attention on the pattern. It was a good lesson in less is more. Reducing the kumiko to a narrow strip also meant that I could use wide boards to make up the rest of the table surface, giving me more structure and better options for attaching the legs.

While mulling over these new ideas for the table design, I was also thinking about the wood I wanted to use. I had a few nice boards of black locust in my shop that I had been wanting to put to use. Black locust is an incredibly hard and tough wood, and I figured it would be great for a high-use piece of furniture like a coffee table. The wood for the kumiko pattern is Alaskan yellow cedar, a common wood for kumiko work because it planes beautifully and has very even grain.

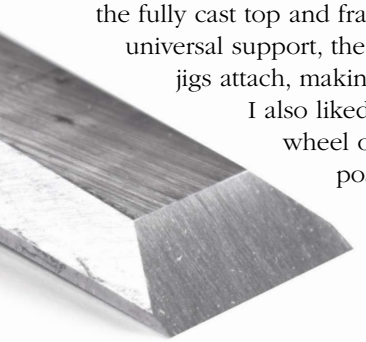
Structurally, the table is closely modeled on the Shaker utility bench. The legs are tenoned and wedged into cleats, and the cleats are dovetailed into the two halves of the top. The cleats do all the structural work, holding the two halves of the top and the legs together, while the kumiko pattern simply rests in place on a shallow rabbet cut into the inner edge of each half of the top. The strip of kumiko is set ¼ in. below the surface of the table to accommodate a piece of glass that protects it and makes the whole top of the table usable and easy to clean. The traditional kumiko design I chose is the *asanoha*, or hemp leaf, pattern.

Since you can see through the kumiko, I needed to size and space the cleats so that they would end up underneath the asanoha pattern in a clean way. I decided to make the cleats the same width as one leaf of the asanoha pattern, and placed them directly below the second leaf from each end. That way, when you look down on the table, the cleats coordinate with the kumiko pattern instead of clashing with it. □

Jon Billing runs Big Sand Woodworking in Red Hook, Brooklyn, N.Y.

SHARPENING

Wet sharpener excels at hollow-grinding blades



Ready for honing. *The T-8 creates a clean hollow grind while maintaining a perfectly square edge.*

FOR MANY YEARS I'VE HOLLOW-GROUND my chisel and plane blades before honing the cutting edge with waterstones. I prefer a slow speed wet-grinder to create the hollow grind. I've used many different ones, but they all fall short of the Tormek T-8, which Tormek describes as a water-cooled sharpening system. It makes grinding a bevel perfectly square to the blade's sides a simple and quick job.

Unlike previous models, the T-8 has a fully cast zinc top and frame. This eliminates welds as potential weak spots where rust can form, and the zinc is more resistant to corrosion than steel. The remainder of the body is ABS plastic. Another benefit of the fully cast top and frame is that there is very little play in the universal support, the arm to which the tool-holding jigs attach, making accurate grinds easier.

I also liked the height-adjustment wheel on the universal support's post, which was helpful when setting the support's height to match the bevel angle on the blade. It came in handy when setting the truing tool to flatten the stone as well. The truing tool does a great job flattening the stone, by the way.

After adding water to the trough, I ground the bevels of every blade in my shop. Using the redesigned square-edge jig, it was a fast job.

Two small knobs on the square-edge jig allow you to adjust the jig for a square bevel on oddly shaped blades. This worked great for a short chisel that tapers in width. When the knobs are fully loosened, the jig can be used to camber a blade.

Two other great features are the magnet scraper and the rack-and-pinion height adjuster for the water trough. The magnet does a great job of clearing steel particles from the water, and the adjuster allows you to raise and lower the trough without spilling water. Small things like this make the T-8 a joy to use.

It's pleasing when a tool not only does what it's supposed to do, but does it very well. The Tormek T-8 is such a tool.

—Kelly Dunton is a furniture maker in Terryville, Conn.

T-8 water-cooled sharpener by Tormek

$699

Precise height. *A turn of the thumbwheel makes small and accurate adjustments to the universal support arm, so it is easy to set up the T-8 to grind blade bevels.*

Jig accommodates any blade. *Neither narrow chisel blades nor ones that taper in width presented a problem for the square-edge jig.*

Create a camber. *The square-edge jig can also be used to create a rounded cutting edge on plane blades.*

Photos: staff

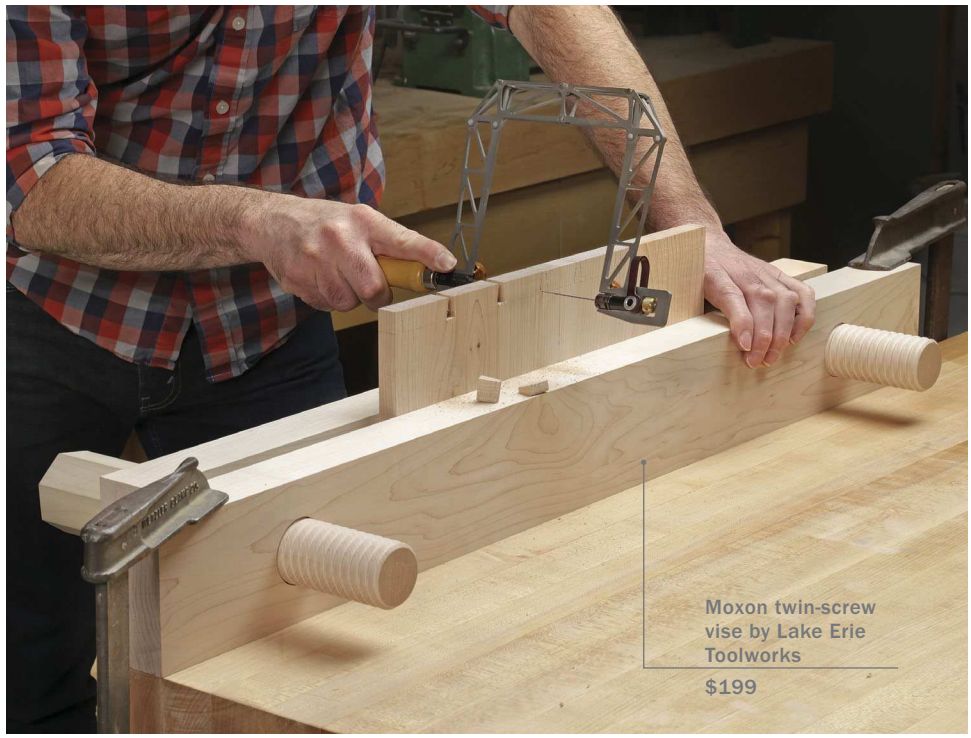
ACCESSORIES

Twin-screw vise raises work to a comfortable height

I BELIEVE TWIN-SCREW VISES are the best vise for a woodworking bench. They handle edge-planing with ease, excel at clamping boards and wide panels for dovetailing, and are perfect for planing drawers to fit. However, they are difficult to retrofit to an existing workbench. The perfect solution here is a Moxon-style vise. I've been using one made by Lake Erie Toolworks, and have been very happy with it. The vise consists of two jaws and two screws, and is clamped to the top of the bench. The screws are 24 in. apart and the jaws can be opened 4½ in., so this vise can hold big boards and panels.

Because the vise sits on top of the bench, it's not well-suited for edge-planing furniture-size stock, but it's perfect for cutting joinery. I found it very comfortable (and easy on my back) to have my workpiece several inches higher than normal, and when I was paring between tails and pins, the extra height allowed me to see layout lines more easily. The vise's higher position also proved beneficial when working on small parts, such as planing the edges of small drawer sides and backs. Over all, it's a great vise, and would be a wonderful aid to any woodworker whose bench has only a cast-iron (or similar) face vise, or a leg vise.

—Matt Kenney is the special projects editor, and co-host of FWW*'s podcast, Shop Talk Live.*



Dovetail helper. *With a secure grip and 24 in. between screws, the Lake Erie Toolworks Moxon vise can handle wide panels that need dovetails.*

HARDWARE

Hinges are beautiful and easy to install

VERTEX ROUND STOPPED BRASS HINGES are a lovely alternative to normal hinges for medium to large wooden boxes. They are well made and look classy on the outside of a box. They provide a 95° stop, making support arms and lid stays unnecessary.

The hinges can be mounted on the surface, or slightly inset using a 35-mm Forstner bit, but each leaf has only one screw, so you have less opportunity to adjust the fit. I drill a 35-mm hole centered between the lid and body of the box with those parts held tightly together. I do this at the drill press. This gives a firm place for each leaf to nest as the hinges are installed. The hinges are attractive, and require less work to install than other brass hinges with built-in stops.

—Doug Stowe is a boxmaker and furniture maker in Eureka Springs, Ark.

IBC reimagines bench chisel design

WHEN I FIRST LOOKED AT THEM, IBC's new bench chisels reminded me of Stanley Everlasting chisels. Like the Everlasting series, IBC chisels have solid metal running from the strike cap through the handle and down to the cutting edge. In size and feel, they are comparable to the Stanley 750 chisels. But this is where their similarities to traditional chisels ends.

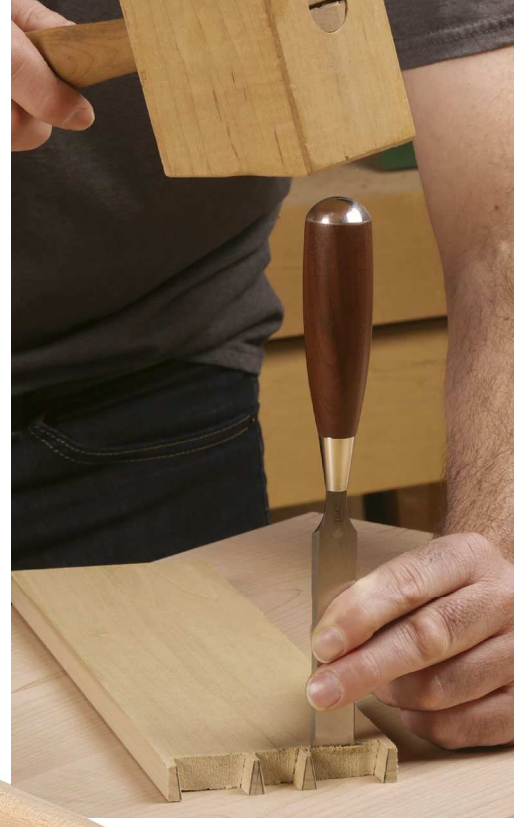
IBC's chisels have five components: blade, ferrule, threaded handle core, striking cap, and handle. The ferrule fits onto the blade, and the blade's tang slides into the handle, where the threaded handle core screws to it. The striking cap threads into the core from above, capturing the wooden handle in between. This allows you to take the chisel apart. Why do that? Well, there are two handle lengths, 3½ in. and 7⅝ in. The short one is great when you want to strike the chisel with a mallet. Want to pare? Replace the short handle with the longer one and you have a paring chisel. This may sound a bit odd, but I liked it. It takes 20 to 30 seconds to switch handles. The removable blade also makes it easy to lap the blade flat, without a ferrule or handle in the way.

Bench chisels by IBC
$64–$88 for one
$391 or $523 for a set of six
(depends on handle length)

The blade is made from AISI High Vanadium A2 tool steel. It's finely ground and flat with beveled edges to facilitate clearance. The beveled edges terminate with a minimal flat on the chisel edges. The blades are not lapped at the factory, but they are ground so well that I polished the backs in about 10 minutes.

I used the chisels in both configurations when building dovetailed drawers and they performed very well. The chisels are light, with a solid feel and great balance. The handle is comfortable. Over all, IBC's bench chisels are excellent.

—Chris Gochnour is a contributing editor.



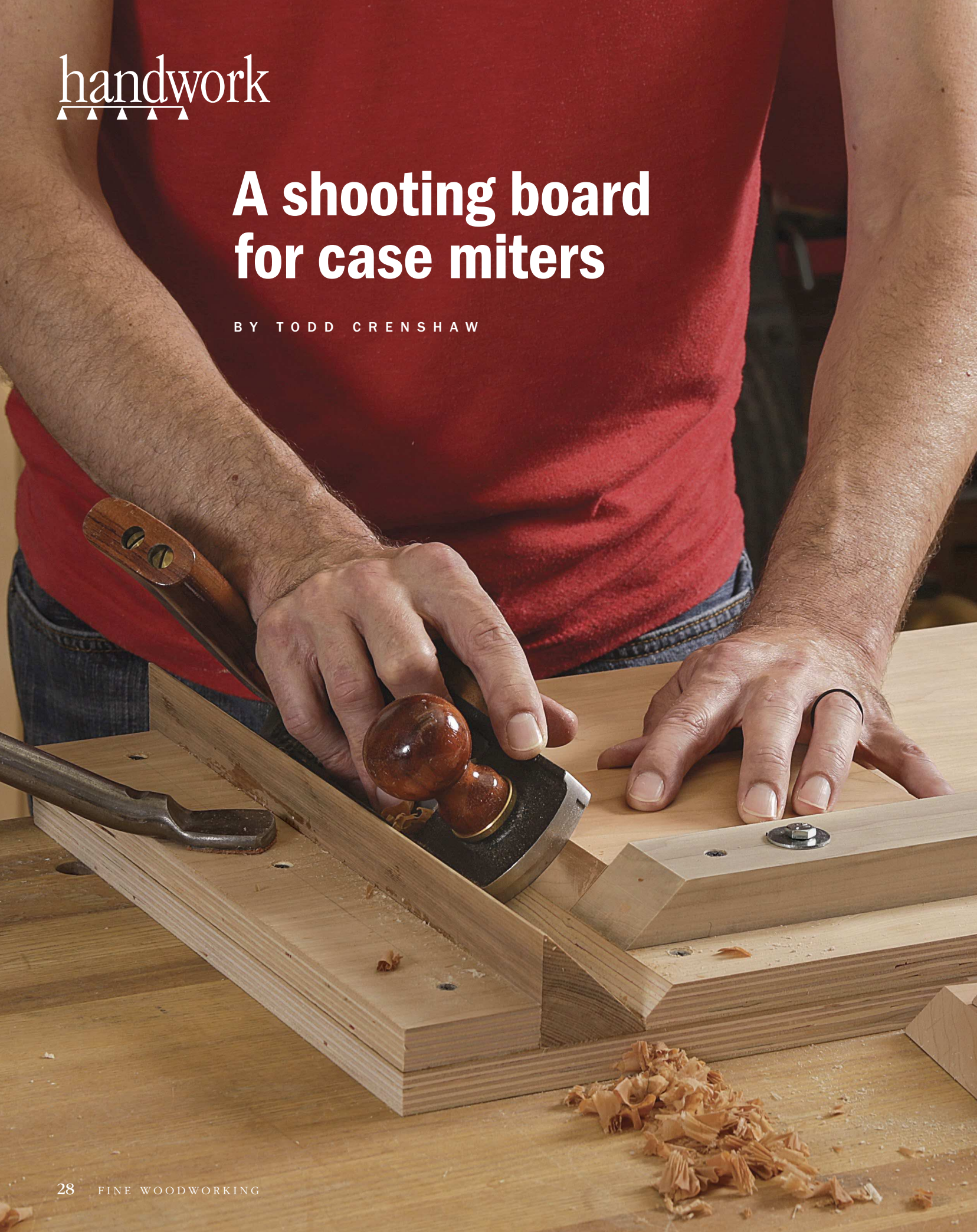
Bangproof. *Equipped with a short handle, IBC bench chisels are ready for chopping out waste. The striking dome transfers the force through the handle and down to the cutting edge.*

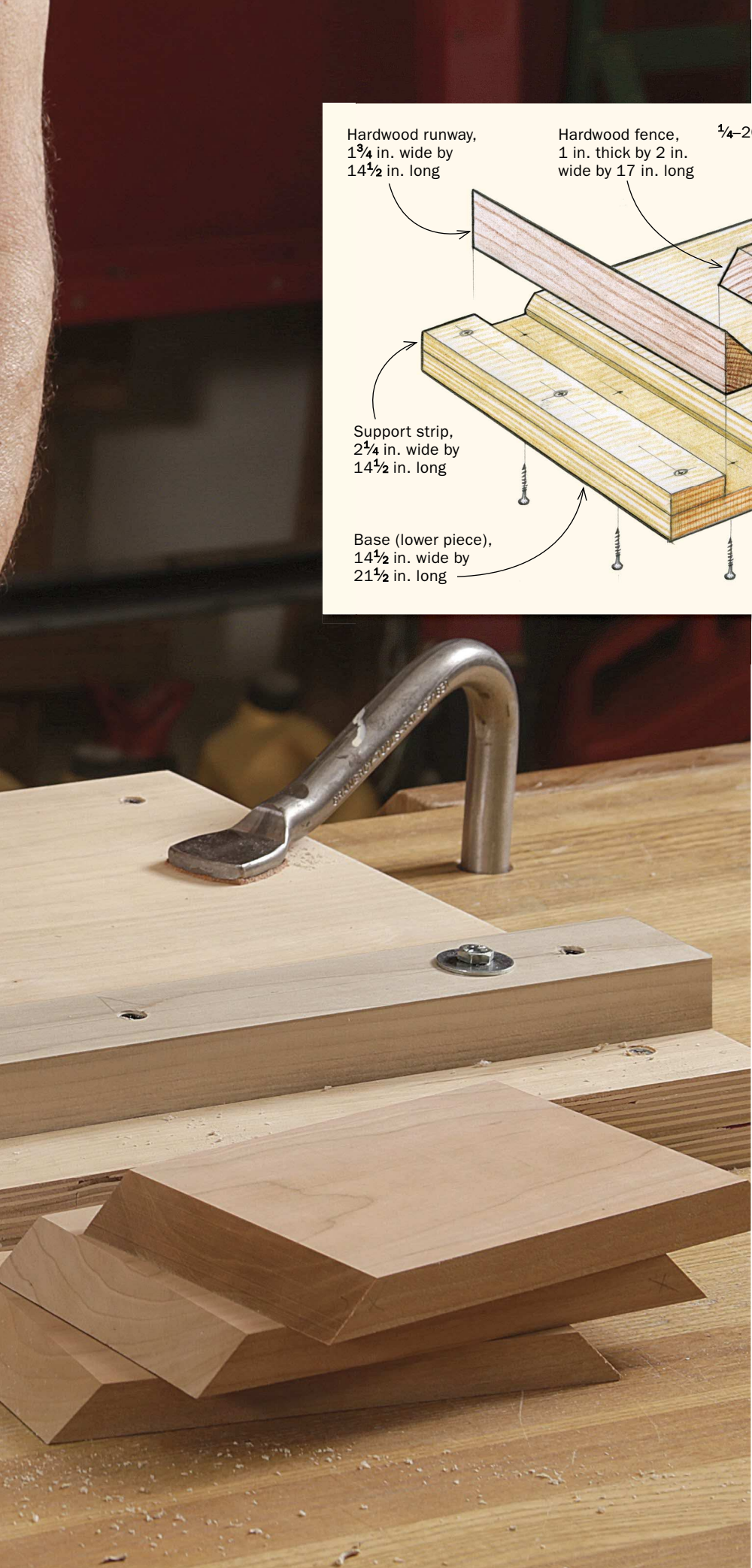
Refined. *A long handle attached to the blade improves control, converting the tool into a paring chisel.*

handwork

A shooting board for case miters

BY TODD CRENSHAW





I've always had trouble cutting long case miters accurately with a tablesaw. But I've had success roughing out square cuts and frame miters with the tablesaw and then refining them with a shooting board, so I thought the same process would work for case miters. After a few sleepless nights working out the details, I made this shooting board. I'm happy to say that it works perfectly.

This shooting board is easy to make, easy to store, and easy to adjust. I rough out case miters at the tablesaw and then plane them to perfection with the shooting board. I use a smoother, but a jack plane would do a great job, too. Here I'll give you the plans and instructions for building it, and show you how to dial it in for perfect miters.

Accurate runway is the key to success

There is no doubt that the most challenging step in building this shooting board is making a runway with a perfect 45° reference face. The best way is to first rough-cut the angled face with the tablesaw and then perfect it with a handplane.

Start with a hardwood blank that's much wider than the runway's final width. This way, you can recut the face on the tablesaw if you make a mistake. When planing the face, check your work with a combination square. You want the face to be 45° and the

Start with the base

To create accurate miters, the base must provide a flat, stable surface and the runway must be a true 45°.

RUNWAY HOLDS THE PLANE AT 45°

Start with a wide blank. This affords you plenty of material to work with when planing the runway's 45° face.

Rough out the miter. *This cut is meant to remove the waste quickly, not to produce a perfect miter. Crenshaw uses a push stick to ensure that the offcut clears the underside of the blade.*

Refine it with a plane. *Hold the runway in a clamp so that its face is parallel to the benchtop, and then pinch the clamp between benchdogs. Check your progress with a combination square.*

Cut the runway free. *Make the cut just behind the spot where the 45° face meets the blank's top face.*

ASSEMBLE THE BASE AND RUNWAY

Made from two pieces of plywood screwed together, the base provides a big, stable platform to hold workpieces.

Miter the base. *This cut is not critical because it doesn't affect the angle at which the plane cuts.*

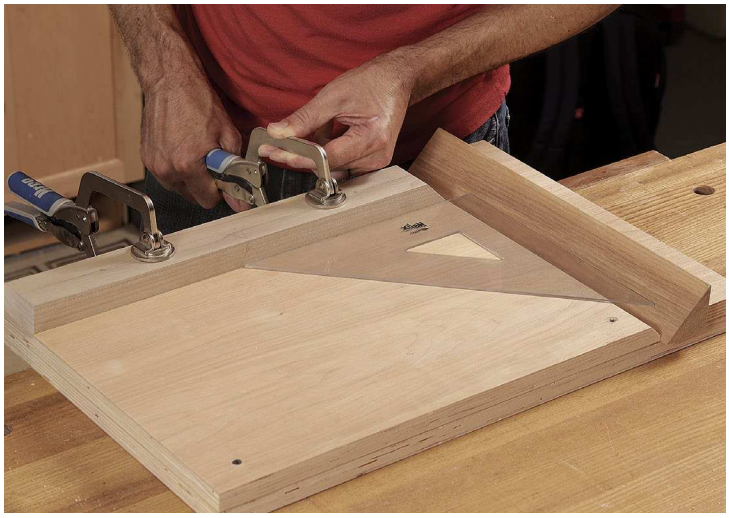
Screw the base together. *One screw at each corner is all it takes, but drill a pilot hole and countersink before driving them in.*

Attach the runway. *After placing the runway on the base and setting it against the base's 45° edge, glue and screw a piece of plywood behind it to act as a support (left). Then, working from under the base, use three screws to secure the runway in place on the shooting board (below).*

Photos: Matt Kenney

Attach the fence

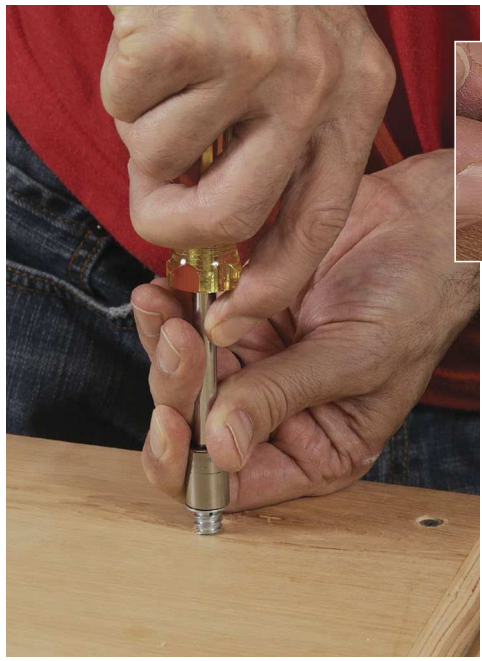
The fence must be exactly 90° to the runway. The first step to getting it there is to bolt it to the base. Oversize holes allow for small adjustments.



Clamp the fence down square. *Check it against the runway using a drafting square. The two long sides work better here than the rule and head of a combination square.*

Drill a clearance hole. *Make the hole a bit oversize so that you can adjust the fence after bolting it to the base. Use a depth stop so that the tip of the brad point just makes it through and marks the base beneath it.*

Make room for the threaded insert. *Drill where the bit dimpled the base when drilling clearance holes in the fence. Use a square to help keep the drill square to the base.*



Drive the insert. *Put a short bolt in the insert. A washer beneath its head makes it easier to back it out after seating the insert (inset). It's easier to keep the insert square with a screw driver than with a ratchet.*

Bolt down the fence. *Drive in the two bolts, check that the fence is square to the runway, and then tighten them down.*

Drawings: John Tetreault

Square the fence and lock it down

The drafting square gets you close, but you won't truly know if the shooting board is accurate until after you've made a few miter joints.

Shoot two miters to check for square. *After roughing them with the tablesaw, use the shooting board to refine them (1). Set the edges against the fence and then bring the miters up to one another. There should not be a gap between them (2). If there is, you'll need to adjust the fence, and then retest it. When the fence is dead accurate, lock it in place with three screws (3).*

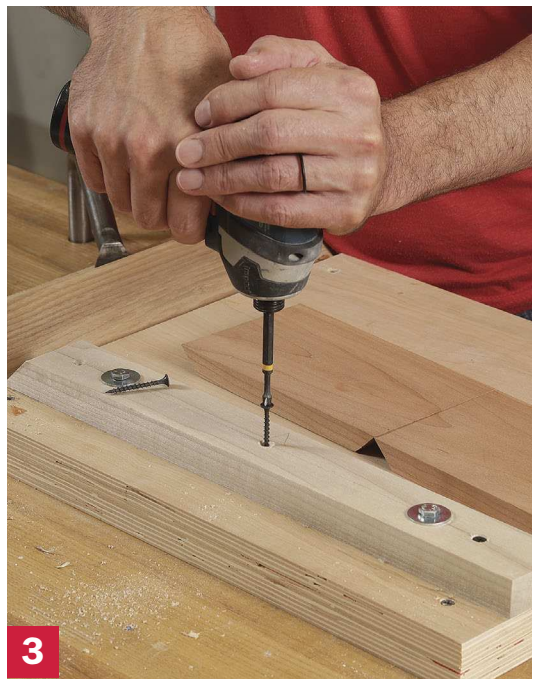
runway to be flat along its length. After you've planed the runway's mitered face to 45°, rip it free from the blank.

Dial it in for perfect joints

After you've made the runway, the rest of the shooting board will seem like a walk in the park, but you do need to spend some time ensuring that the fence is exactly 90° to the runway. I do this by making a series of test joints. If the fence isn't square, I adjust it and try again.

Here's how I do it. Start with two workpieces that are at least 6 in. wide. Rough out a miter on the end of each one, then use the shooting board. When all of the sawmarks are gone and the plane takes a full-length and full-width shaving from the miter, place the two workpieces flat on the shooting board and pressed against the fence. The points of the two miters should touch with absolutely no gap between them. If there is a gap, adjust the fence. Repeat this process until the two miters align with no gaps. □

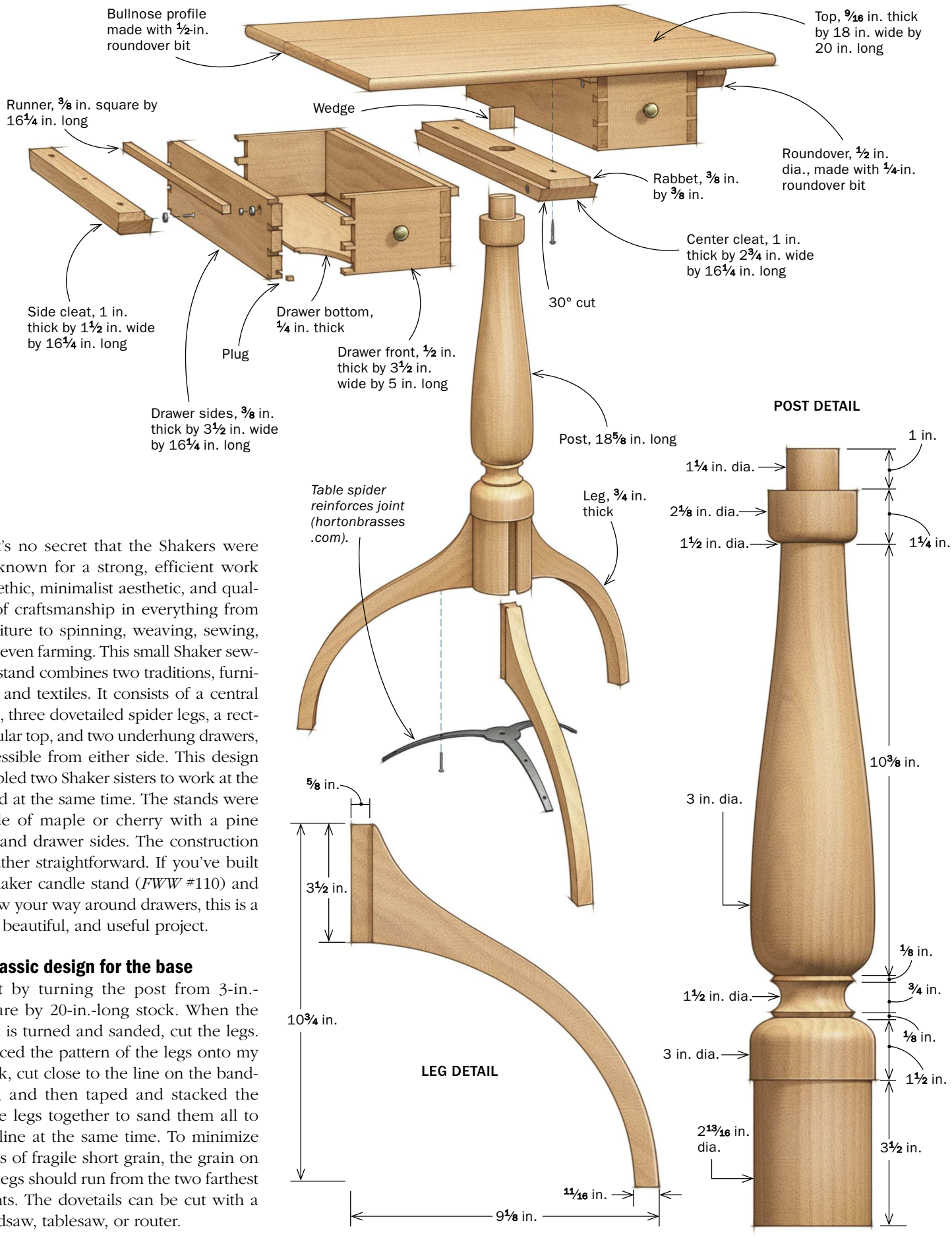
Todd Crenshaw, who lives in Durham, N.C., produces furniture and accessories for his own home. See what Todd is up to at toddswoodwork.org.



Shaker Sewing Stand

This classic piece is steeped in tradition

BY CHRISTIAN BECKSVOORT



It's no secret that the Shakers were known for a strong, efficient work ethic, minimalist aesthetic, and quality of craftsmanship in everything from furniture to spinning, weaving, sewing, and even farming. This small Shaker sewing stand combines two traditions, furniture and textiles. It consists of a central post, three dovetailed spider legs, a rectangular top, and two underhung drawers, accessible from either side. This design enabled two Shaker sisters to work at the stand at the same time. The stands were made of maple or cherry with a pine top and drawer sides. The construction is rather straightforward. If you've built a Shaker candle stand (*FWW* #110) and know your way around drawers, this is a fun, beautiful, and useful project.

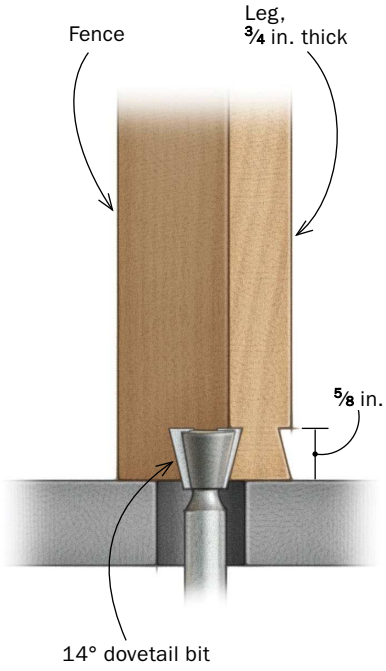
A classic design for the base

Start by turning the post from 3-in.-square by 20-in.-long stock. When the post is turned and sanded, cut the legs. I traced the pattern of the legs onto my stock, cut close to the line on the bandsaw, and then taped and stacked the three legs together to sand them all to the line at the same time. To minimize areas of fragile short grain, the grain on the legs should run from the two farthest points. The dovetails can be cut with a handsaw, tablesaw, or router.

Photos: Anissa Kapsales; drawings: Christopher Mills

DOVETAIL THE LEGS TO THE POST

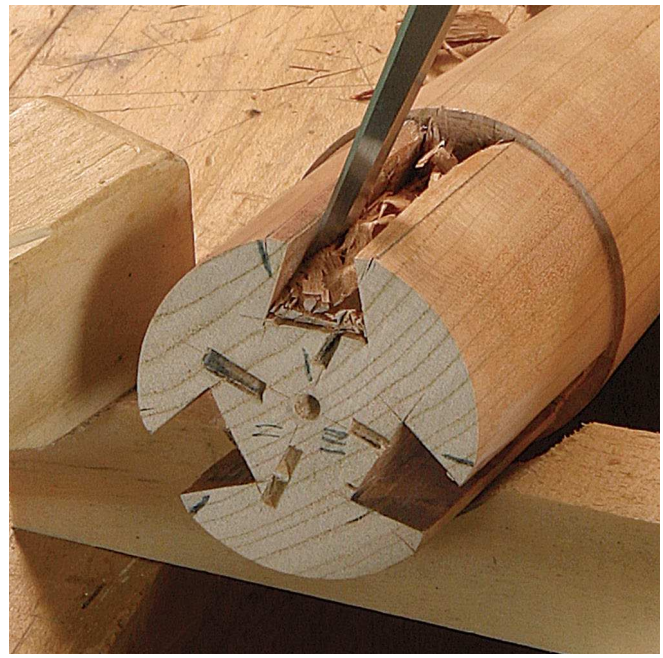
Router and handwork combine to create this sturdy joint.



Rout and transfer the tails. *Cut the sliding dovetail keys at the router table, using a dovetail bit and a tall fence. Then, with the post inverted in the vise, scribe around the dovetail key. Finally, use a small square and a pencil to carry the scribed lines down to the shoulder.*

Clamp the post upside down in the vise, using pine pads to cushion the turning. Before marking the dovetail slots for the legs on the bottom, decide whether you want to undercut the dovetail shoulders to conform to the round post, or flatten ⅛ in. of the area on both sides of the dovetail. Either method is acceptable. Divide the bottom of the post into thirds, using a compass or wrapping paper around the circumference. Place each leg, one at a time, on the same side of the marks, making sure that the dovetail shoulders touch the circumference of the post at the bottom. While holding the leg, carefully mark around the dovetail with a knife. With all three legs marked, use an adjustable square to bring the edge of the dovetail marks down the post to the shoulder.

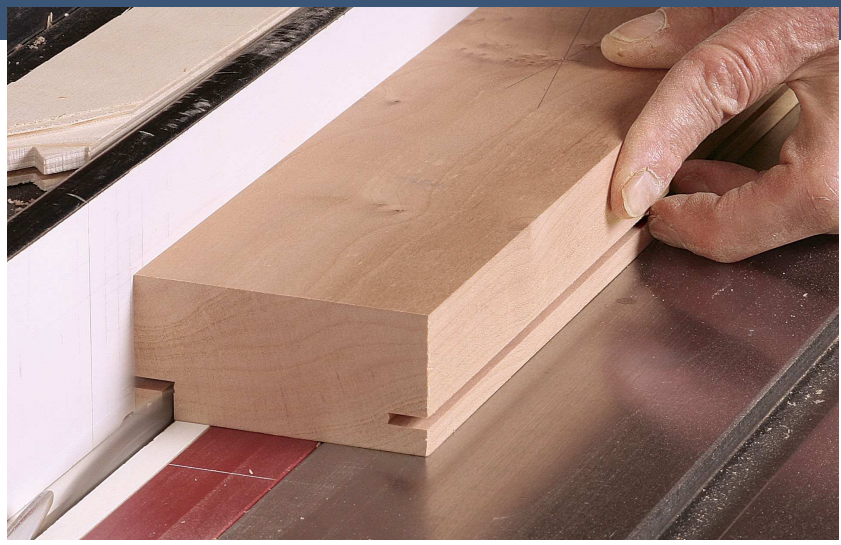
Reposition the leg in the vise. Carefully saw between the pair of lines for each leg, down to the shoulder but not beyond. Chisel out as much of the waste as possible. Pare the outline of the dovetail at the bottom to get the first part of the leg inserted into the slot. Mark the leading edge of the leg dovetail with a pencil, and re-insert it into the slot, shoving it in as far as possible. Carefully pare the darkened areas in the slot, and repeat until the leg is fully and securely seated up to the shoulder of the post. Repeat with the other two legs. Glue in the legs, and when dry, rasp, file, and sand the dovetails flush with the bottom. I add a table spider



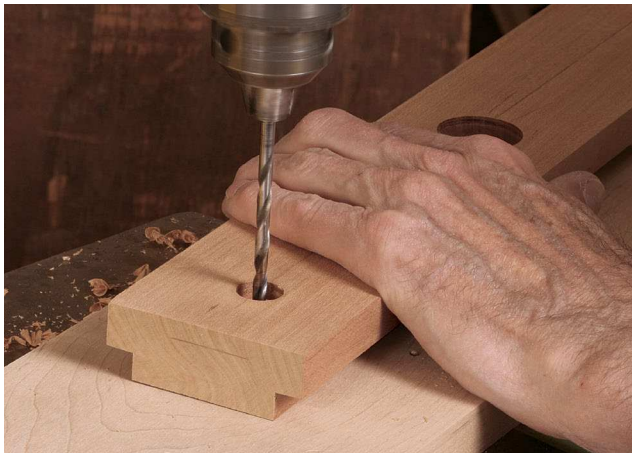
Saw and chop the sockets. *Cut a kerf just inside the pencil lines and as deep as you can without hitting the shoulder. Establish the shoulder of the socket with a chisel and several mallet hits, then chisel away the waste.*

CLEATS DO MORE THAN CARRY DRAWERS

A center cleat and two side cleats support the drawers and allow them to open from either side. The cleats also keep the top flat and attached to the base.



A rabbet to run on. *Two quick rips on the tablesaw create the channels for the drawer guides to sit in (left). The outside edges of the side cleats are exposed, so knock off the sharp edges with a roundover bit (above).*



Drill and attach the center cleat. *Use a Forstner bit to cut a through-mortise for the post in the center cleat (top). Each cleat also gets a hole on each end (above). Elongate the holes with a file to accommodate wood movement. Finally attach the center cleat to the post (right). Glue and wedge the mortise-and-tenon joint, aligning the cleat so it's centered with one of the legs. Then trim it flush.*

DRAWERS OPEN ON EITHER SIDE

The drawer runners ride the cleats. They are simply glued to the drawer sides.

Two-faced drawers. *Through-dovetails are visible on the fronts and sides of these drawers. Because there are two fronts, a rabbeted drawer bottom gets inserted during the glue-up (above). Use an end-grain plug to fill the exposed drawer bottom grooves on the drawer faces. A simple long-grain to long-grain glue joint is strong enough to attach the runner to the side of the drawer (below).*

(Horton-Brasses.com, no. TS-5) to the underside of the base. The spider reinforces the leg-to-post joint.

Top and cleats create the framework for drawers

After you glue up the top, cut one center cleat and two side cleats out of hardwood. The center cleat is wider than the side cleats and has a mortise drilled in the center for the tenon on the post. The two side cleats have a rabbet along one edge, and the center cleat has a rabbet on each side. Round the opposing corner of the side cleats, and cut an angle on the front and back of all three.

Drawers run in both directions

The drawers on the original Shaker stand have through-dovetails on all four corners, and that's what I do. Half-blinds will also work. Use quartersawn pine for the bottoms; in this case the grain runs front to back. Glue and sand the drawers and then make and attach four knobs. Glue a hardwood strip along each top edge of both drawers. These rails on the drawer sides will guide the drawers in the corresponding notched cleats.

Glue the center cleat to the post tenon, aligning it with one of the legs. When the top is trimmed to size and sanded, screw the center cleat to the top from underneath, positioning it in the center and perpendicular to the grain. With the stand upside down, position the drawers against the center cleat and place the side cleats against the outside of the drawers. Leave about 1/16 in. of clearance, then screw the side cleats to the top.

Magnet catches

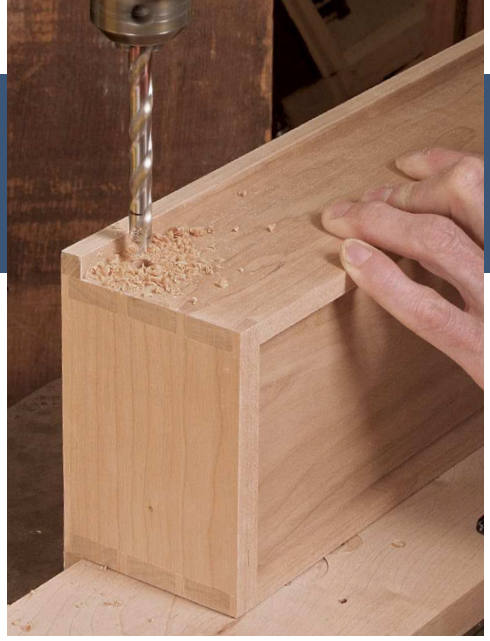
For the magnet catches, I use a rare-earth magnet, cup, and washer set from Lee Valley (no. 99K33.10). The magnets are set into the outside faces of the drawers. Once the drawer is made and fitted, the location of the magnets is carefully transcribed onto the corresponding locations on the outside of the drawer sides. Holes for the washers are drilled and the washers screwed into place on the sides of the center cleat.

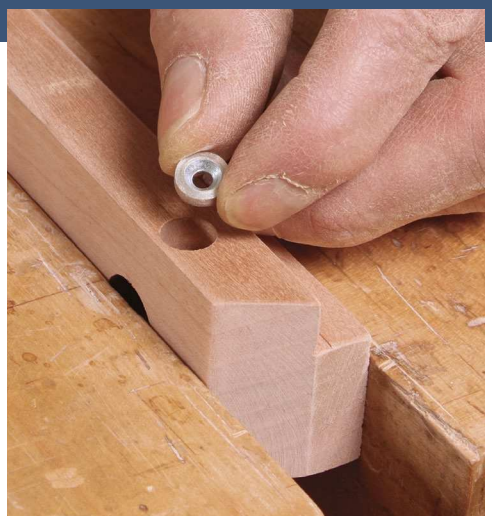
For the finish, I use Tried & True varnish oil, mixed with equal parts spar varnish. □

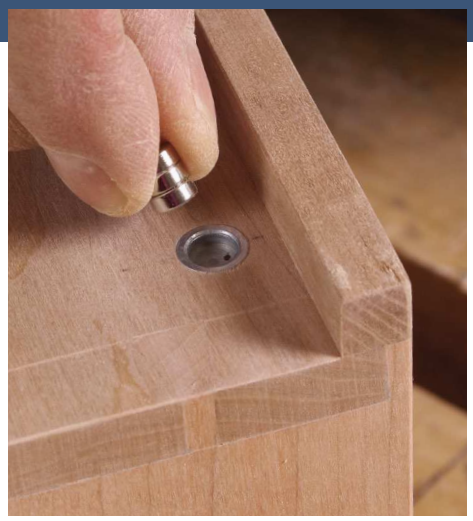
Longtime contributing editor Christian Becksvoort makes furniture in New Gloucester, Maine.

INSTALL MAGNET STOPS BEFORE ASSEMBLY

Traditional sewing tables obviously didn't have rare-earth magnets, but they work perfectly to stop the two-way drawers right where they need to be.







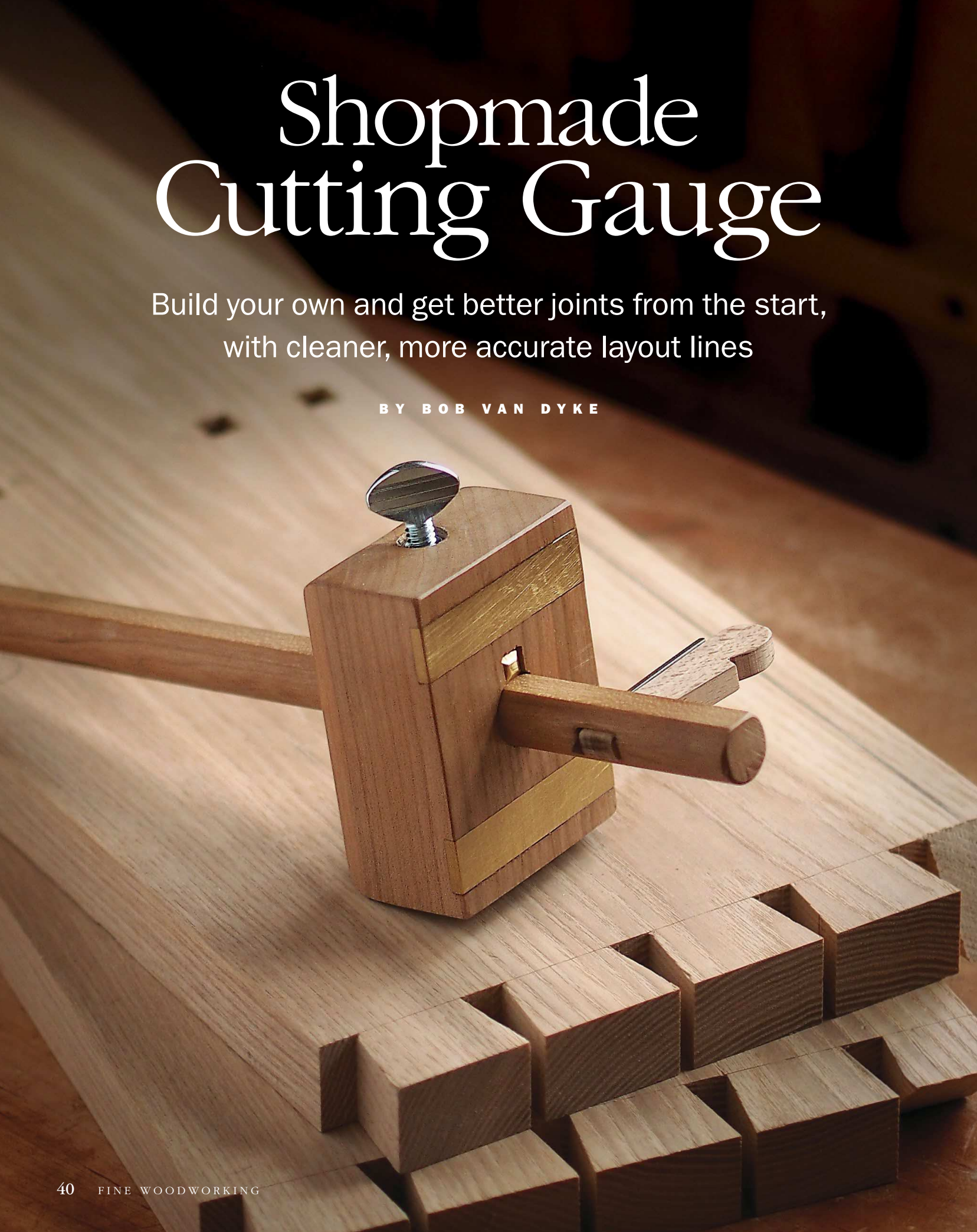
Magnet cups make installation easy. *Drill a shallow hole for the cups in the drawers and cleats (above). Then screw in the cups and washers and drop the magnets in place (right).*

The cleats bring the table together. *Use a square to align the center cleat on the top, and predrill and screw it in place (above). Then place the drawers against the center cleat. Position the side cleats against the drawer, and attach them (right). A strip of tape on the drawer side gives you a little wiggle space once it's removed.*

Shopmade Cutting Gauge

Build your own and get better joints from the start, with cleaner, more accurate layout lines

BY BOB VAN DYKE



A BETTER MARKING GAUGE

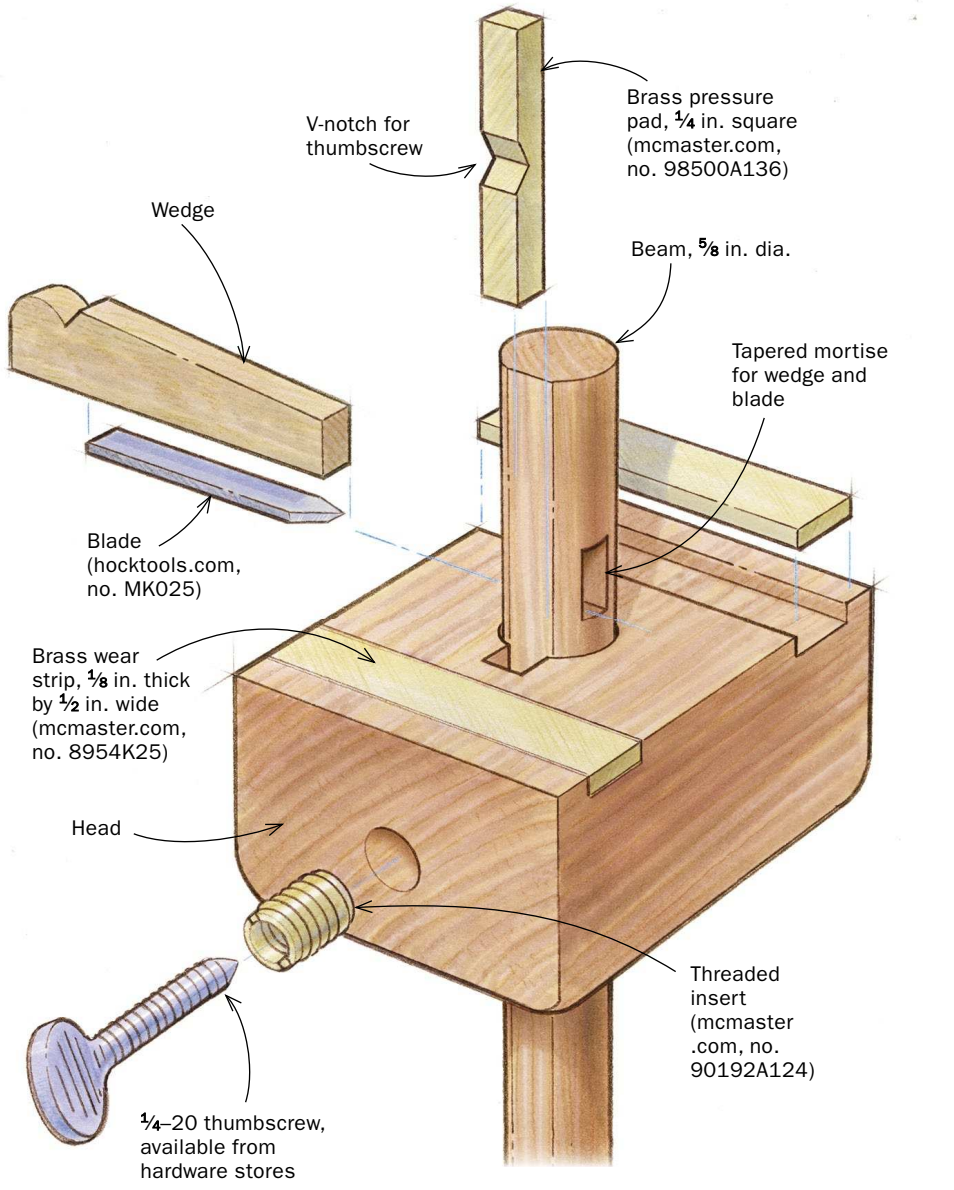
Accurate joinery is a matter of cutting to a line but not beyond it. So it's necessary to begin with precise layout. One of the best tools for this is a cutting gauge. This precision tool severs the fibers on the surface of the board, creating a clean, deep, and well-defined layout line that is easy to see.

The design I prefer is one by my friend Will Neptune, who made his while a student at North Bennet Street School in Boston. It has a good single-bevel knife for a blade, a large and comfortable fence, and a round beam. The round beam has several benefits. First, it's easy to see where you are starting and stopping the cut, and the mortise in the gauge's head is drilled rather than chopped, simplifying construction.

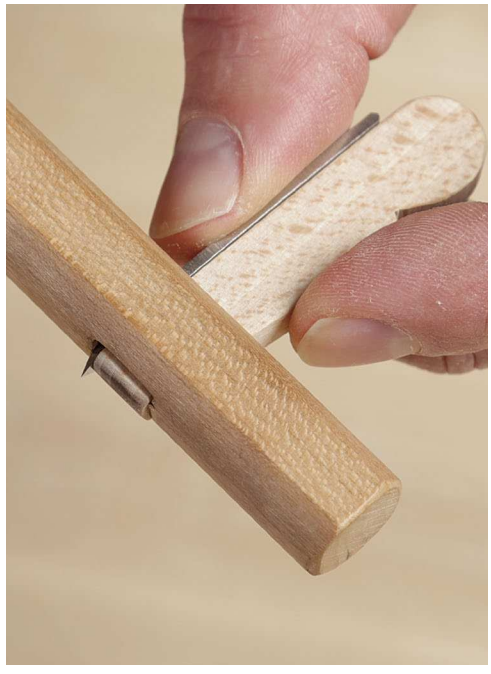
Make and mortise the head

Mill a block of hardwood—cherry, tiger maple, and walnut are good choices—to the head's final dimensions. Mill a setup piece to the same dimensions to help dial in machine settings.

It is important to follow this drilling and mortising sequence: Drill a hole to receive the threaded insert. This should be in the exact center of the end of the head blank and about halfway down. Lay out a ⅝-in.-dia. circle on the face, and then a ¼-in.-square mortise tangent to the circle. I cut the mortise with a hollow-chisel mortiser. I



Design has distinct advantages. *Brass wear strips ensure that this gauge will last for years, while the screw and pressure pad lock the beam securely in the mortise so that it doesn't move during use. The round beam lets you see exactly where the point of the blade is, allowing you to start and stop a cut with great precision.*



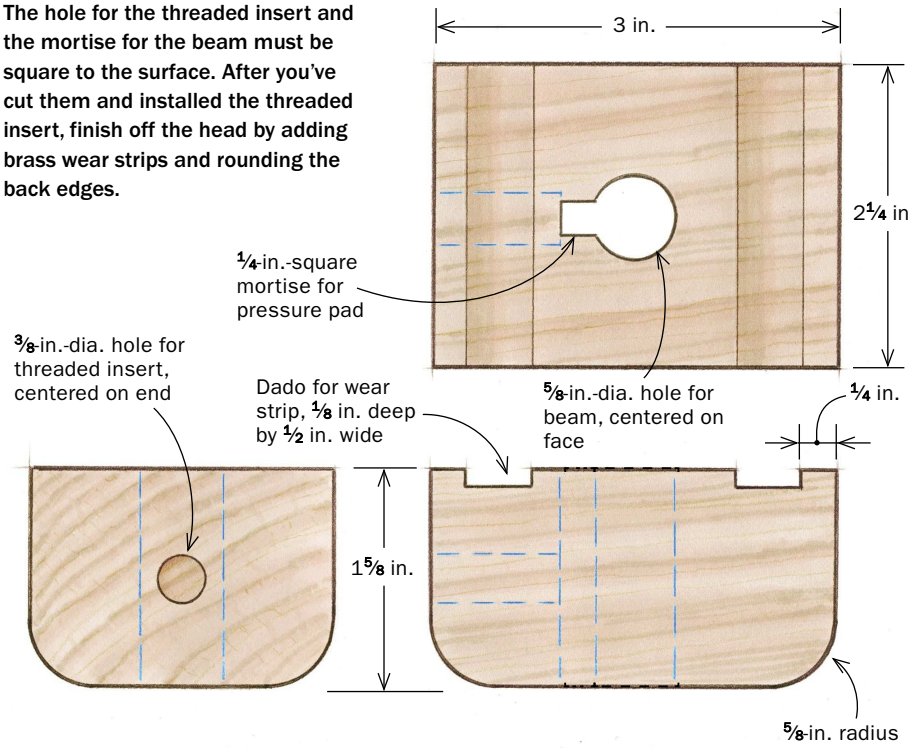
Single-bevel blade is more accurate. *The blade in this gauge cuts a deeper, cleaner, more precise line than either the pin of a traditional marking gauge or the round cutter of a wheel gauge. Orient the bevel toward the gauge's head so that it pulls the gauge tight to the workpiece as it cuts.*

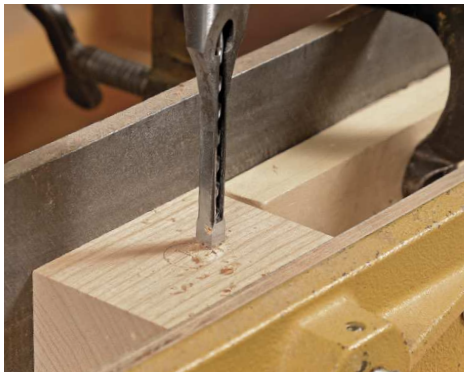
Drawings: Dan Thornton

MAKE THE HEAD FIRST

Drill for the threaded insert. *Centered in one end, the hole extends halfway through the head. To steady the head during drilling, Van Dyke presses it into the corner of a right-angle fence.*

The hole for the threaded insert and the mortise for the beam must be square to the surface. After you've cut them and installed the threaded insert, finish off the head by adding brass wear strips and rounding the back edges.





Mortise for the pressure pad. *To cut the square mortise, go halfway through from one face, flip the head over, and finish the cut. A stop block ensures perfect alignment.*

A hole for the beam. *Again using the L-shaped fence to steady the head, drill completely through from one side, using a piece of MDF beneath to prevent blowout.*

Seat the insert beneath the surface. *To ensure that it ends up square to the surface, Van Dyke uses an unplugged drill press to begin threading the insert. The head is held steady in the jaws of a hand screw (right). Then he puts the driver into a ratchet to recess the insert (far right).*

cut in halfway from both faces, using a stop clamped to the fence to locate the head accurately. Back at the drill press, drill the hole for the beam. Make sure to back up the piece with a fresh piece of plywood or MDF to prevent blowout as the bit exits the hole. For safety and accuracy, use a right-angle fence to support the head.

Install the threaded insert now. I use an unplugged drill press to ensure that it goes in straight. Insert the driver bit and turn the chuck by hand while keeping downward pressure on the drill-press handles. I finish recessing the insert with a ratchet (see bottom photos, left).

Now rout the dadoes for the brass wear strips. Make them shallow enough that the strips sit just proud of the surface. Because these dadoes are routed across the grain, knife the edges of the cuts before running them on the router table. Back up the block so it does not blow out as the bit exits the cut. Glue the brass wear strips into the head with epoxy. After the glue dries, sand the strips flush and remove any squeeze-out. Finally, round over the back side of the head.

Round beam makes gauge user-friendly

The gauge's beam begins its life as a ⅝-in.-dia. dowel. Dowels can be incon-

Photos: Matt Kenney

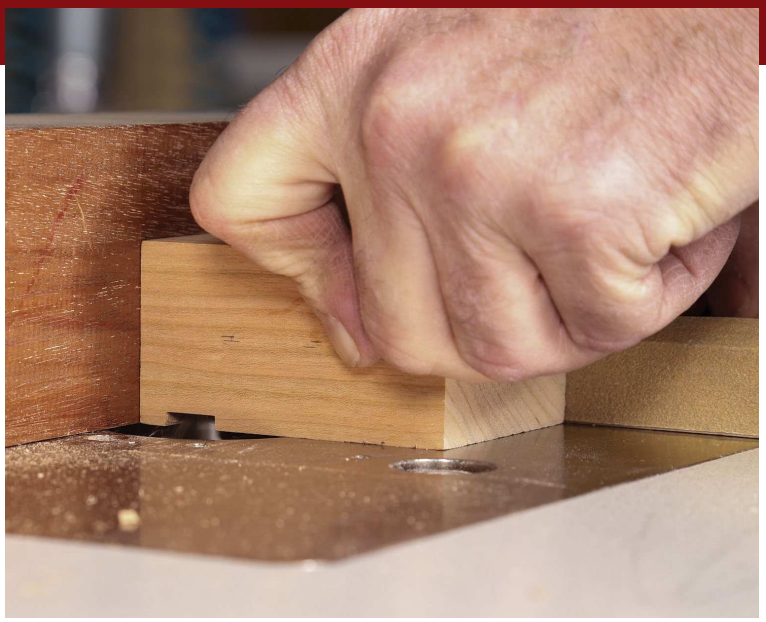
sistent in diameter, so I knock the dowel through a dowel plate, and sand and scrape it to get a tight fit that still slides smoothly.

Clamp the dowel in a bench vise and plane a flat on one side. The flat should be the same width as the brass key stock you'll use later for the pressure pad.

Now cut the mortise for the blade and wedge. The front end of the mortise is angled about 8°. The back end is perpendicular. I cut the mortise with a hollow-chisel mortiser, holding the dowel in a jig (see drawing, p. 44). To make the square end of the mortise the dowel is held in the jig with a wedge underneath. This ensures that the beam is parallel to the mortiser's work table. Remove the wedge to cut the angled front end of the mortise.

To lock the beam in the head and allow for precise adjustments, a thumbscrew presses on a pressure pad made from brass key stock. When tightened, this pad will press against the flat planed into the beam. File a V-shaped groove into the middle of the brass pad, and then grind a matching point into the end of the thumbscrew. The groove and matching point hold the pad in place when the screw is loosened.

Now turn your attention to the wedge and cutter. Make the wedge from a tight-grained hardwood. The blank should slide freely in the mortise, and its angle should



Rout dadoes for the wear strips. *These should be a bit shallower than the brass strips are thick. Use a fresh backer block to prevent blowout and to steady the small block.*

Epoxy for the brass. *Spread a thick layer over the bottom and walls of the dado before setting the brass wear strip into it.*

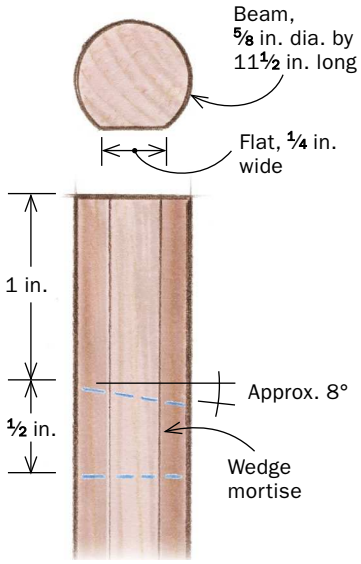
Use a jig to press them in. *Dowels, cut in half and glued to a block of hardwood, direct pressure over the strips. Let the glue dry before leveling the strips.*

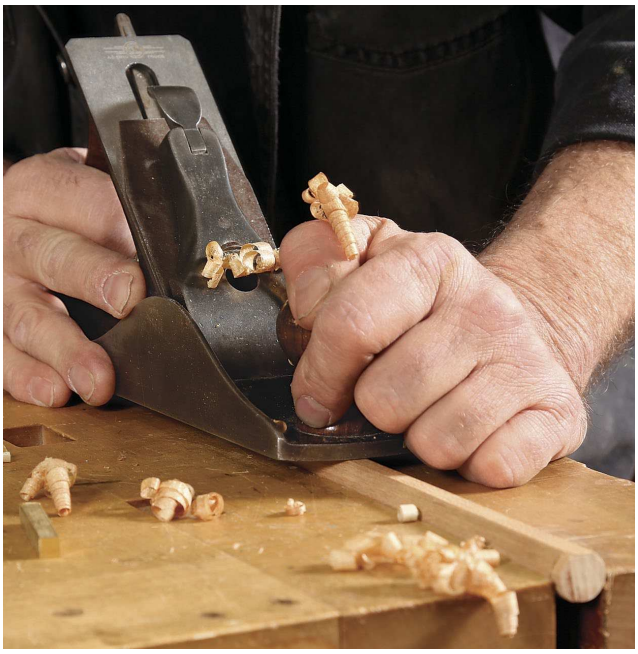
Sand to level the strips. *Start with coarse paper and work up 220 grit. Work on a flat surface, like a piece of ¼-in.-thick glass, or the table of a jointer or tablesaw.*

Round over the back edges. *Van Dyke uses a ⅝-in.-radius roundover bit and guides the workpiece past the bit using a backer board. Shaping can also be done with hand tools. The key is to make the head comfortable to hold.*

MORTISE THE BEAM AND FIT THE WEDGE

The exact angle used for the mortise and wedge isn't critical, but it should be the same for both.

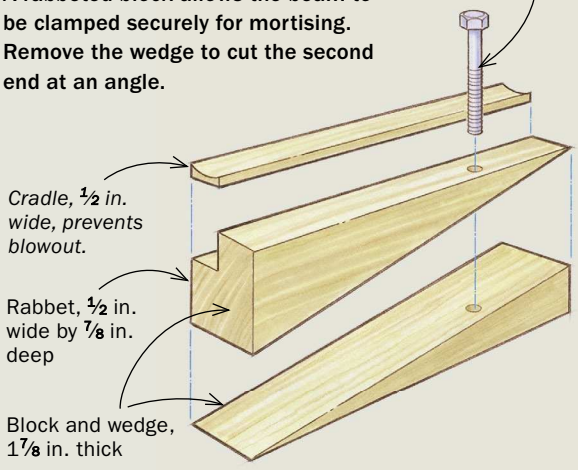


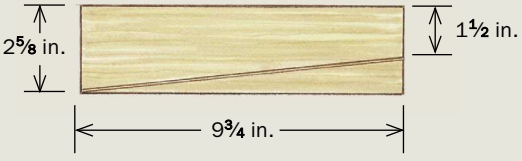


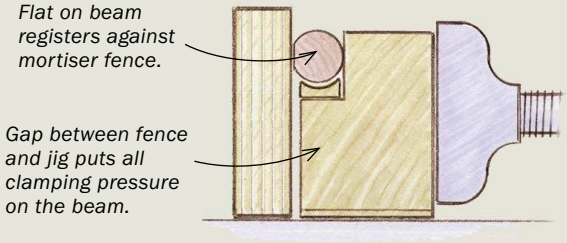
Flatten one side. *Clamp the beam in a bench vise and carefully plane a flat into it (left). Stop when the flat is as wide as the brass pressure pad (above).*

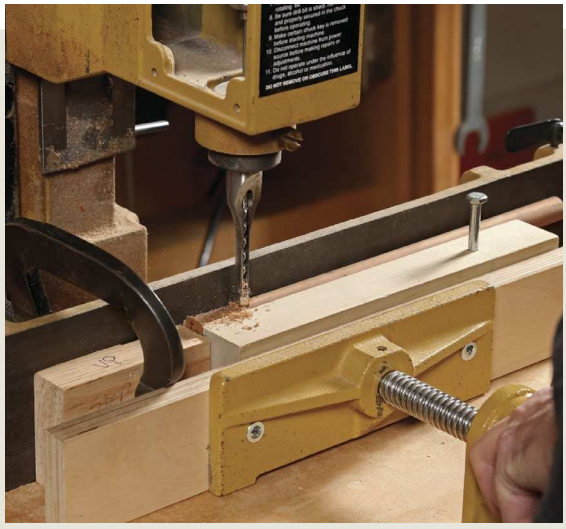
SIMPLE JIG FOR MORTISING

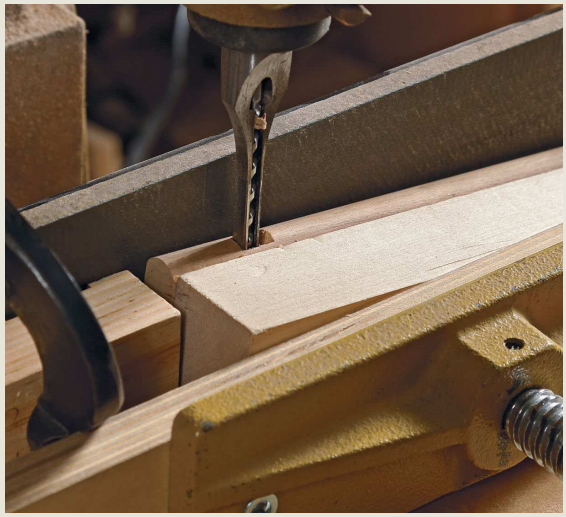
A rabbeted block allows the beam to be clamped securely for mortising. Remove the wedge to cut the second end at an angle.

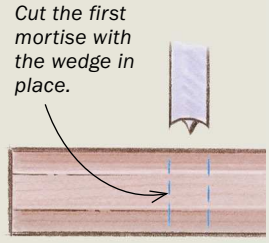




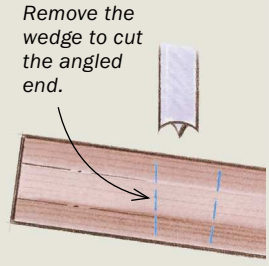


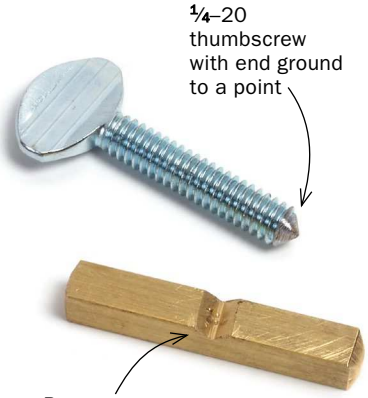


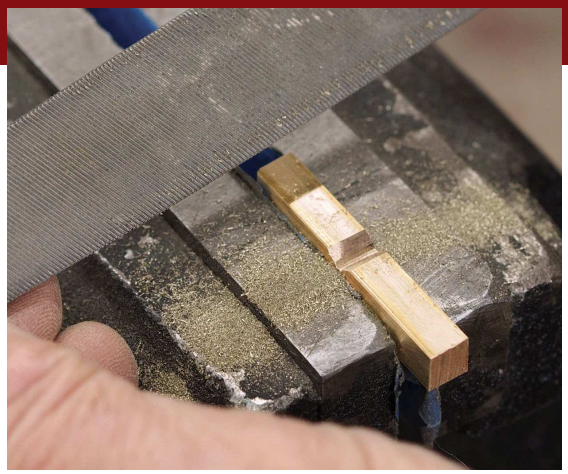


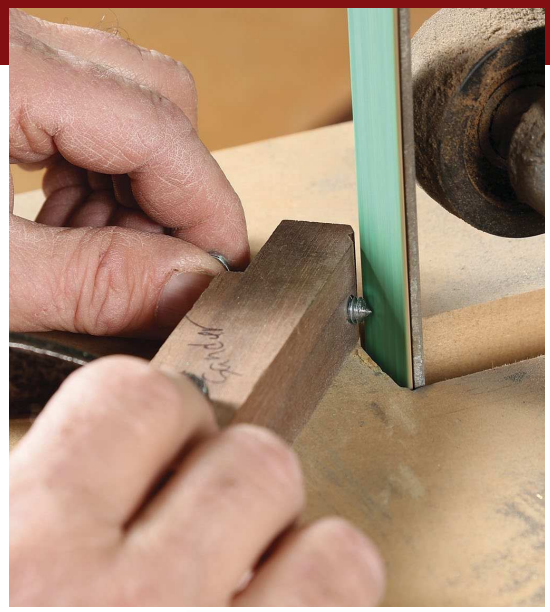


Cut the wedge mortise in two steps. *Begin with the end closest to the head, which is cut with the beam parallel to the mortiser's bed (top). Remove the wedge to cut the opposite end of the mortise at an angle to match the wedge that secures the blade in the mortise (bottom).*

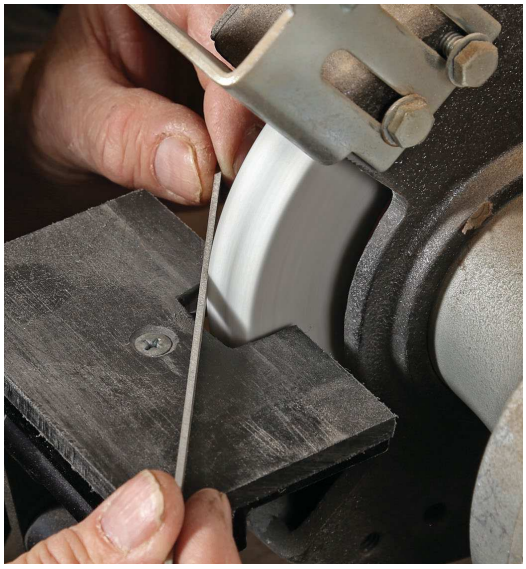








Notch the pressure pad and grind the thumbscrew to fit. *File a V-notch in the brass bar stock (above). Then use a guide block to grind the thumbscrew (right). Angled 45° to the sanding belt, it helps create a point that fits into the V-notch.*



The blade is easy. *Van Dyke uses a ¼-in. marking knife from Hock Tools for the gauge's blade, cutting off the first 2 in. at the grinder.*

Make the wedge. *A simple jig, which holds the blank at the correct angle, ensures that the wedge has the same angle as the mortise in the beam.*

match the mortise's angle. You can use the wedge from the mortising jig to get this angle.

The gauge needs a good blade, and the best I have found begins life as a Hock Tools ¼-in. marking knife. I cut about 2 in. off the end, and grind that to a shallow spear-point profile. Put the blade in the beam with the bevel facing toward the head and the tip protruding about ⅛ in. Lock it in place with the wedge. The bottom end of the wedge probably will stick out too far. Trace around the wedge, pull it out, and cut it down.

After one or two coats of wax, the gauge is ready for use. Always hold the gauge with your hand wrapped around the head and never around the beam. □

Bob Van Dyke is the founder and director of the Connecticut Valley School of Woodworking in Manchester, Conn.

Online Extra

To see Van Dyke sharpen a marking gauge and get perfect scribe lines every time, go to **FineWoodworking.com/261**.

Trim for clearance. *Scribe around the wedge, and then cut it so that it's just proud of the beam. This leaves enough sticking out for you to press the wedge out of the mortise and pull the blade out for sharpening.*

Clever Clamping Tricks

Two simple, wooden clamps hold complex parts for shaping and joinery

BY TIMOTHY COLEMAN

VERSATILITY AT HAND

Wooden hand screws and cam clamps, available from many sources, provide inventive options for holding unusual workpieces. Hand screws, with hefty jaws that can be angled, will grip tapered parts. Cam clamps deliver moderate pressure with lightness and speed.

I find myself continually reaching for a couple of ordinary clamps to address many unusual holding needs. Whenever I need to hold an odd-shaped part and can't justify the time to make a dedicated jig, these two simple, versatile tools, the wooden hand-screw clamp and the wooden cam clamp, are invaluable.

My favorite hand-screw clamp has jaws 12 in. long that open almost 9 in. I often use it on my workbench, clamped between the benchdogs or in the tail vise or shoulder vise. It's especially helpful for holding a part above the bench surface to give more hand clearance when I'm carving or using a spokeshave. The hand screw's jaws can be angled to each other, so it can easily grip many tapered objects that benchdogs couldn't handle. Because the jaws are wood, they're more friendly to an errant carving tool or router bit. The heft of the hand screw and the flat faces of its jaws provide stability on the bench.

Cam clamps don't have huge holding power, but they are light, slender, and very easy and quick to use. Like hand screws, they have flat-sided jaws that make it easy to clamp them to other surfaces; because the cam clamp's jaws are thinner, they can be useful in situations where hand screws are too big. And because

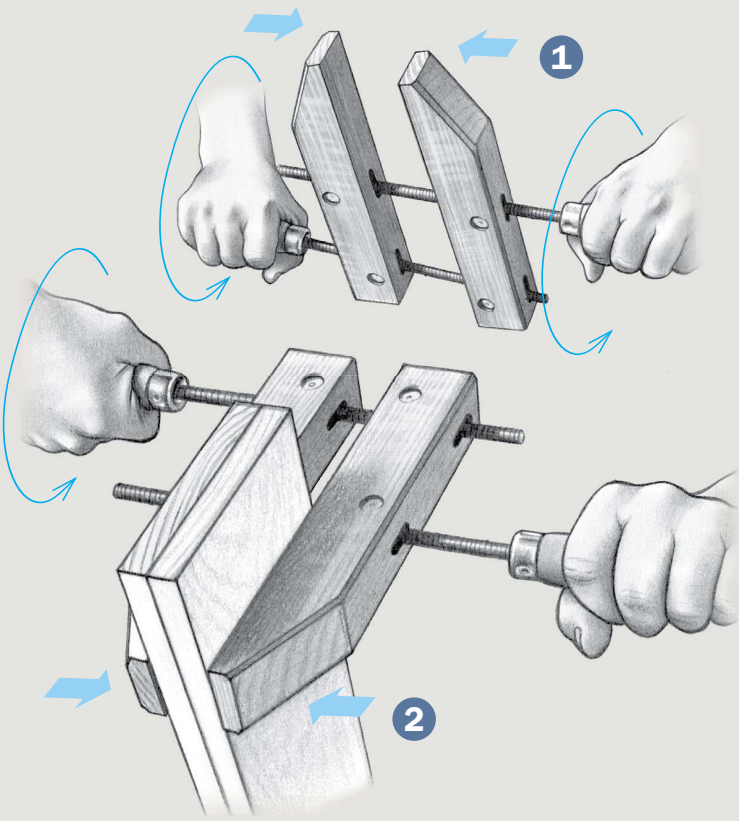
Photo, this page: John Tetreault

the cam clamp's jaws are made of wood, it's possible to modify them or tack other parts onto them for some operations.

Both hand screws and cam clamps are great at the workbench, but they are just as useful and versatile for machine work. I'll use them to hold a part still for joinery or shaping, or as a kind of carriage to hold a part while I slide the clamp along the machine table to make a cut. Finding elegant solutions to tricky problems is the part of furniture making that makes me most satisfied.

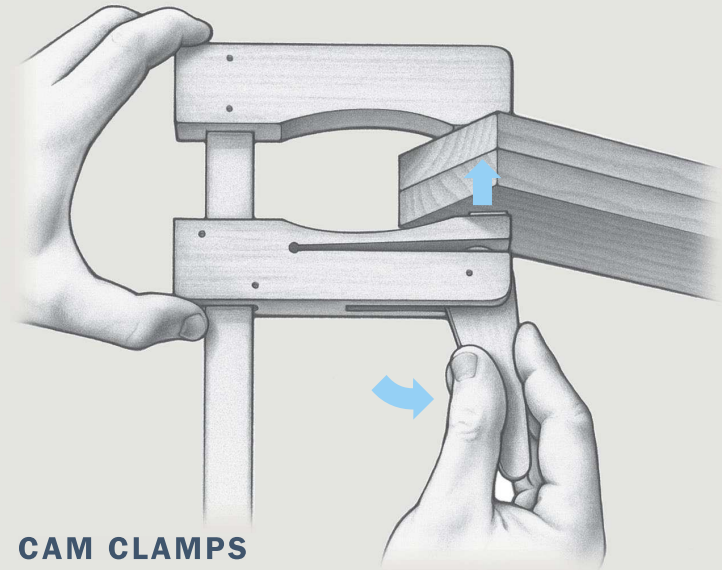
Timothy Coleman builds furniture in Shelburne Falls, Mass.

Get a handle on traditional clamps



HAND-SCREW CLAMPS

Opening or closing a hand-screw clamp is like riding a bicycle: Once you know how to do it, you're off to the races. Hold the handles and crank them as though you are hand-cranking the pedals of an inverted bicycle. The clamp will open or close in a blur (1). To exert pressure with the tips of a hand screw, always open the back screw rather than tightening the front screw (2).



CAM CLAMPS

The cam clamp is activated by flipping forward a cam on the movable jaw. Most cam clamps have cork pads on their jaws to avoid marring the workpiece.

Drawings: Michael Gellatly (top); Chris Mills (bottom)

Clamp odd shapes for handwork

Hand-screw clamps are an irreplaceable supplement to the vises on a workbench. Whether gripped between benchdogs, held in one of the vises, or fixed in place with a quick-release clamp, a hand screw offers a means to grip all sorts of curved, tapered, and irregular parts for hand shaping.

The right grip for curved parts

A hand-screw clamp pinched in the tail vise provides a versatile means of holding a curved workpiece for shaping. By elevating one end of the part, the clamp provides hand clearance and access to the sides.

Hold tapers tight

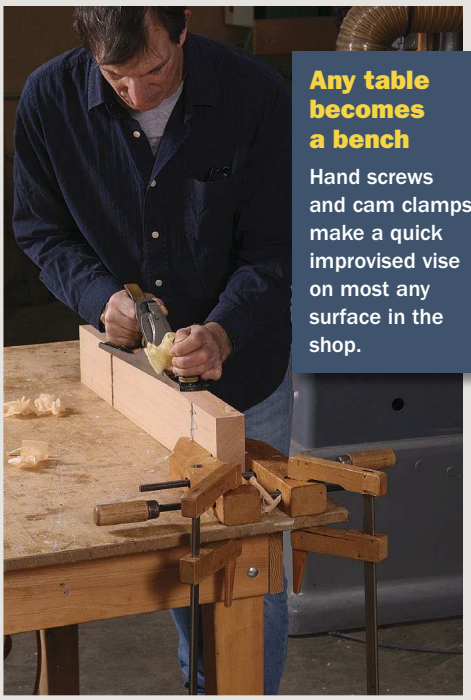
The hand screw's jaws can be quickly adjusted to grip a wedge-shaped workpiece. Here Coleman uses benchdogs to clamp the hand screw in place.

Odd shapes, exposed ends

The hand screw's jaws can grip all sorts of unusual shapes, and it also lifts the workpiece, exposing its ends for shaping.

Stabilize a plank

You can use a hand screw to hold tall boards tight for planing or shaping the top edge. A clamp holds the hand screw firmly flat to the bench.



Any table becomes a bench

Hand screws and cam clamps make a quick improvised vise on most any surface in the shop.

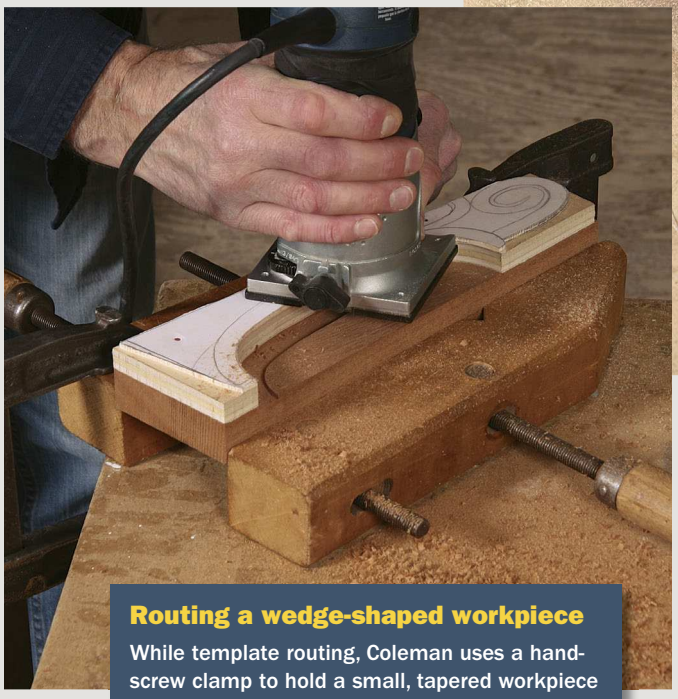
Photos, except where noted: Jonathan Binzen

Wooden clamps amp up the router

The hand screw's versatility is especially evident when it's paired with a router. It can hold an unusual workpiece still, it can hold the router itself, or it can be used as a carriage, moving the workpiece across a router table while holding an odd-shaped piece at an angle. Cam clamps, too, pair well with routers.

Stable but slender

Like hand screws, cam clamps have flat-sided jaws that lie nicely on the bench. Their jaws are narrow, making them the right choice here, as they pinch a workpiece by its tenons without getting in the way of the router.

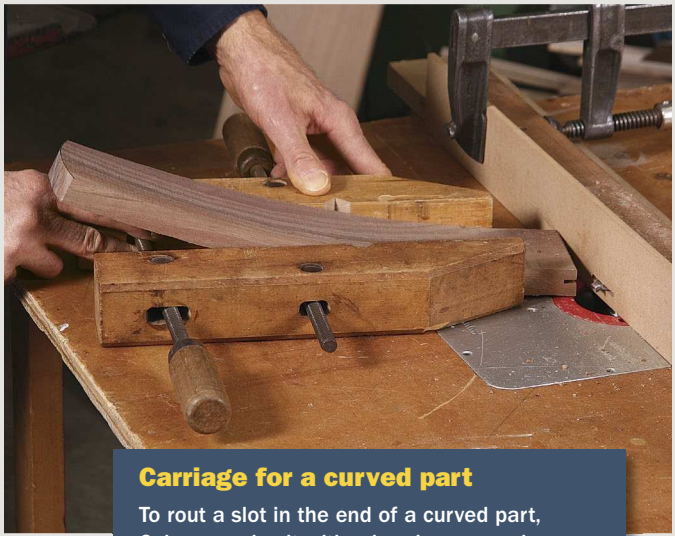


Routing a wedge-shaped workpiece

While template routing, Coleman uses a hand-screw clamp to hold a small, tapered workpiece that affords no extra space for hold-downs.

Instant router table

For routing small parts, Coleman uses an inverted trim router. He locks the router in place with a hand screw, and fixes the hand screw to the bench with a clamp.



Carriage for a curved part

To rout a slot in the end of a curved part, Coleman grips it with a hand screw and moves the clamp across the table to make the cut.

Of clamps and machines

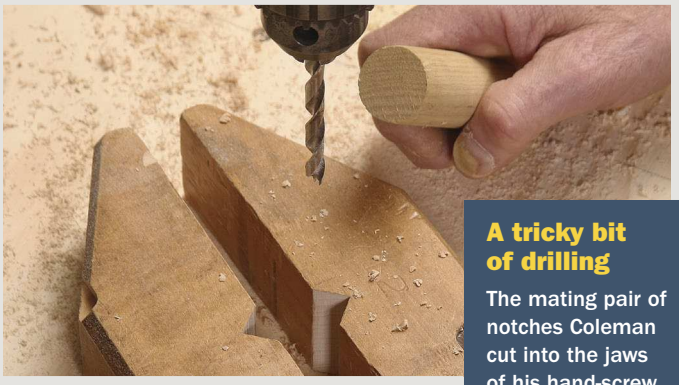
Hand screws and cam clamps are very useful for machine work. Although it's best to cut the joinery on shaped parts while they are still rectilinear blanks, sometimes that's not practical. In those cases, wooden clamps can provide an alternative to building a complicated fixture for cutting joinery on an oddly shaped part.

Holding tight to a sinuous workpiece

To mortise the end of an S-shaped chair arm, Coleman uses a cam clamp in conjunction with his slot mortiser's hold-down. To provide a support for the part at the proper angle, he tacked a scrap across the jaws of the clamp.

Pinching a tiny part

Drilling into a small part with a high-torque bit can be dangerous. Here, Coleman uses a hand screw clamped to the drill-press table to hold a small workpiece safely for drilling with a Forstner bit.



A tricky bit of drilling

The mating pair of notches Coleman cut into the jaws of his hand-screw clamp hold a dowel tight and upright for end-grain drilling.

Bandsaw work at a challenging angle

Using the hand screw as a carriage enables Coleman to accurately and safely make a curved end cut on a curved workpiece.

Online Extra

Find hand screws challenging? For a few tips on how to avoid fumbling with yours, go to **FineWoodworking.com/261.**

Suction where you want it

Coleman uses a hand screw and some cam clamps to hold the dust-collection hose just where he needs it.

Easy Knife Hinges

Trouble-free method for installing this tricky hardware

BY CRAIG THIBODEAU

Knife hinges are perfect for the clean lines of the modern furniture I build. They are barely visible after installation and they're versatile, too. I've used them on small doors, large doors, flat doors, and even curved ones. Installing them can be difficult, because you must fit the door to its opening before you mortise for the hinge leaves, and even the smallest misplacement of the mortises can result in a door that doesn't swing properly and sits askew when closed.

I'll show you a simple method that's taken all the headaches out of the installation. I lay out the location with the hinge leaf sitting on a piece of blue tape. After cutting around the hinge, I pull up the tape to create a perfect template around the mortise that I use as a guide when routing out the waste and then paring the mortise walls. I'll show you how I do it using a straight knife hinge, which is used with doors that sit in front of the case sides.

Proper layout is the critical first step

The right time to mortise for a knife hinge is before the cabinet has been glued together. Make and assemble it dry, then make and fit the door. The gaps above and below the door are determined by the thickness of the washer that separates the leaves of the knife hinge.

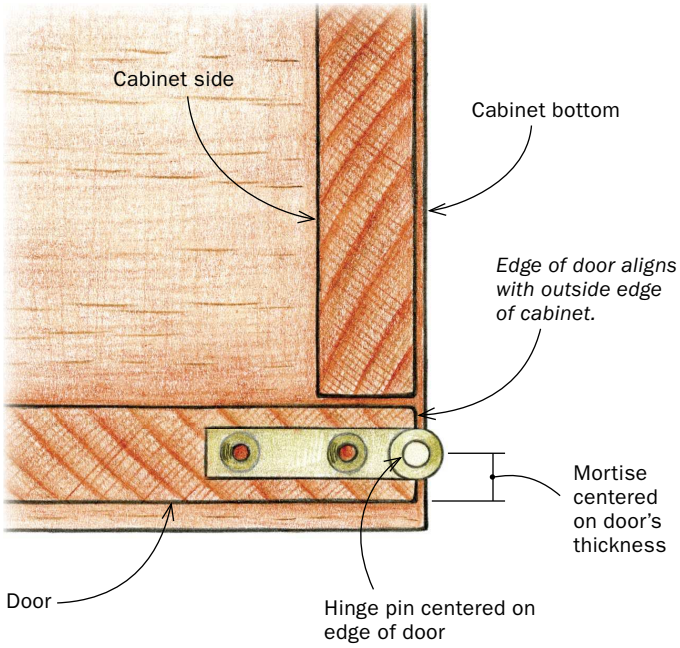
Once the door has been fitted, set it aside and mortise the dry-assembled cabinet. The hinge's

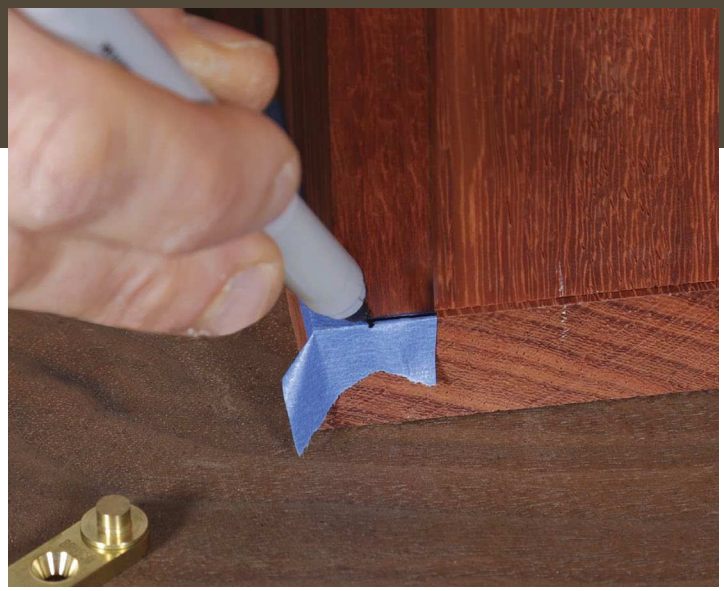
Photo, this page: Michael Pekovich

Tape improves layout accuracy

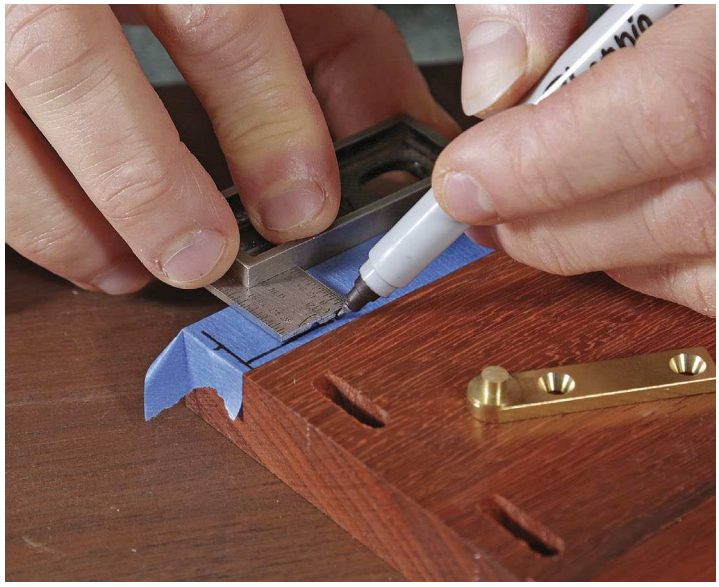
A piece of blue tape on the cabinet becomes a template for the mortise, while double-sided tape ensures that the hinge leaf doesn't move when you cut around it.

Blue tape sets the stage. *Align the tape's back edge with the front edge of the cabinet side. It's OK for the tape to overhang the cabinet, but make sure that it's longer than the hinge leaf.*





Mark for the door's side. *After setting the door in place, trace along its edge. This line bisects the hinge pin.*

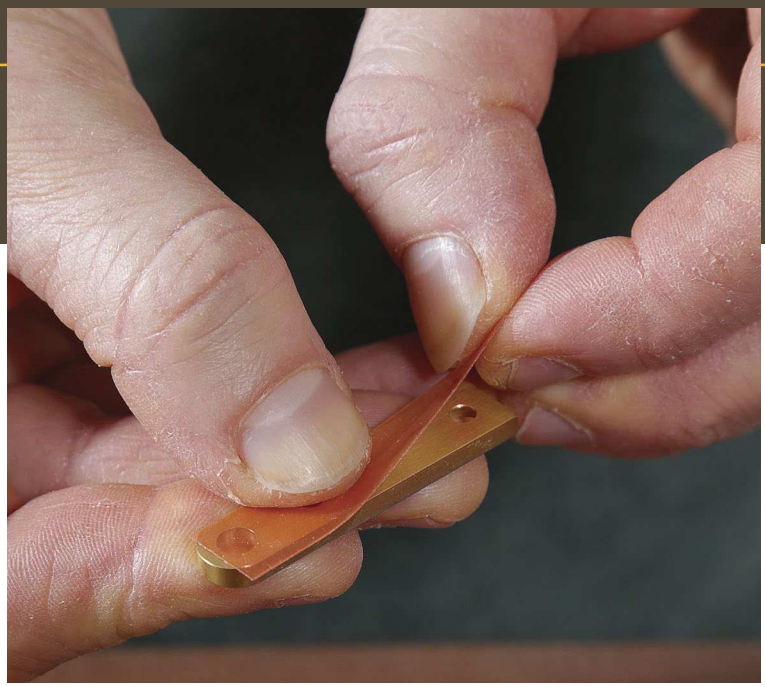


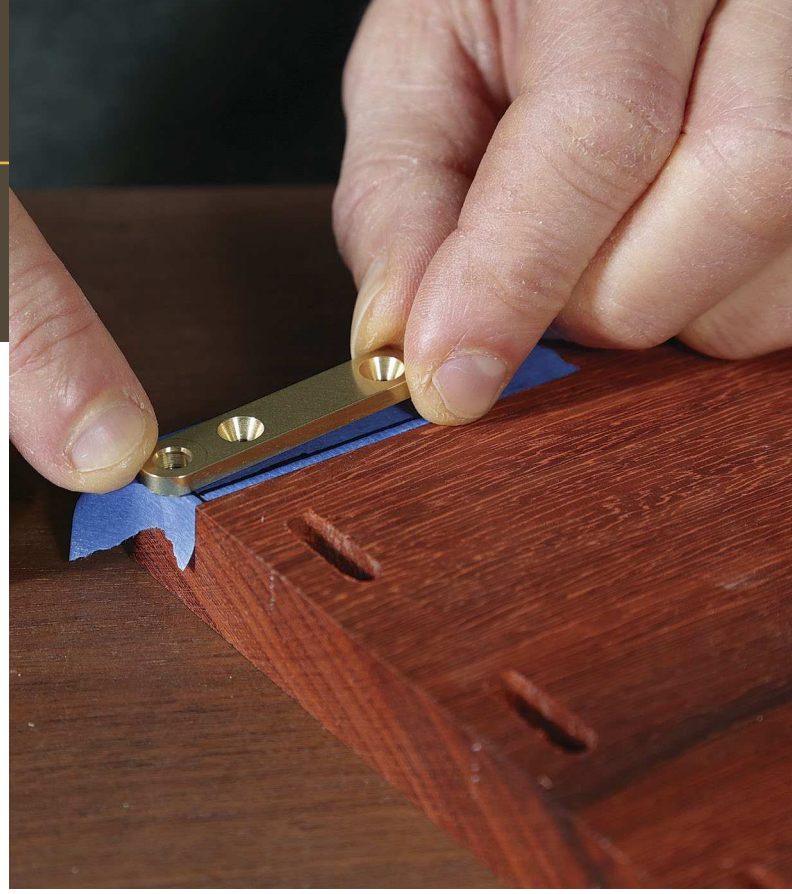
Add a line for the setback. *This represents the back edge of the hinge and mortise. Use a small double square or combination square, and reference off the cabinet's front edge so that you can repeat the setback for every mortise in the cabinet.*

location on the cabinet is determined by the door's closed position in the completed cabinet. Half of the hinge pin should stick out beyond the door's edge, and it should be centered on the door's thickness. Don't forget to allow for a small clearance gap between the front edge of the cabinet sides and the back of the door, so it can swing open without binding.

To mark the mortise's location on the cabinet, place a piece of blue tape over the area where it will be. Set the door into the cabinet, and adjust it to its closed position. Trace the door's outside edge with a narrow-tip marker on the tape. Remove the door, and then use

Photos: Matt Kenney; drawings: John Tetreault





Tape the hinge to the cabinet. *Press a piece of double-sided tape to the bottom of the hinge leaf (above). After exposing the tape's second sticky side, place the leaf on the cabinet, making sure that the line for the door's edge bisects the hinge barrel, and that the leaf is on the setback line (right).*

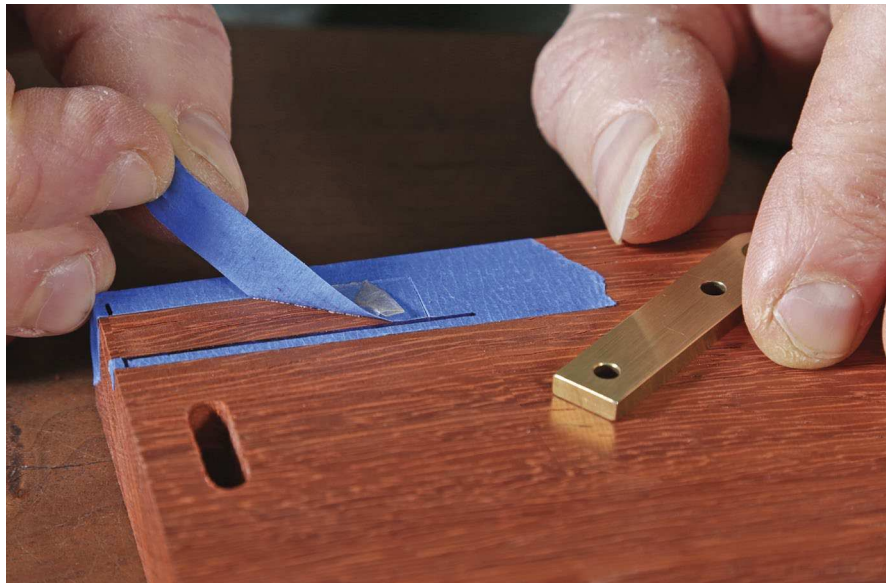
a small double or combination square to mark the mortise's back edge, keeping in mind that the hinge should be centered on the door's thickness.

Now attach the hinge to the cabinet using double-sided tape. The hinge pin should be split by the line marking the edge of the door, and its back edge should sit on the line drawn with the small square. Next, cut around the perimeter of the hinge leaf. Pull up the hinge leaf, and then the area of blue tape that was beneath it. What remains on the cabinet is an outline of the hinge mortise. Disassemble the cabinet.

Clear the waste

I use a trim router with a ⅛-in.-dia. spiral downcut bit to rout the mortises. It's small and doesn't pull in any particular direction, so guiding the router is easy. Set the depth of the router to the exact thickness of the hinge leaf by placing four hinge leaves on the bench, putting the router base on top

Cut around the leaf. *With a marking knife, follow the hinge's perimeter, cutting through the blue tape.*

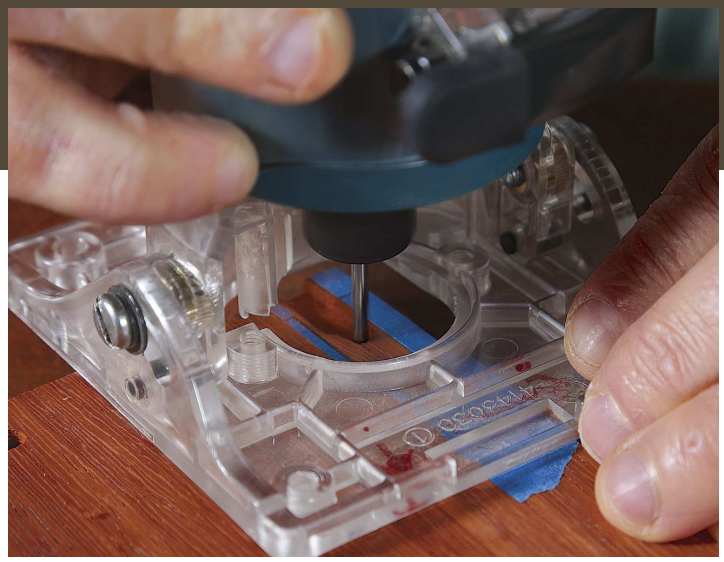


Pull up the tape. *The remaining tape becomes an exact template for the hinge mortise, guiding you when routing the waste and paring the walls.*

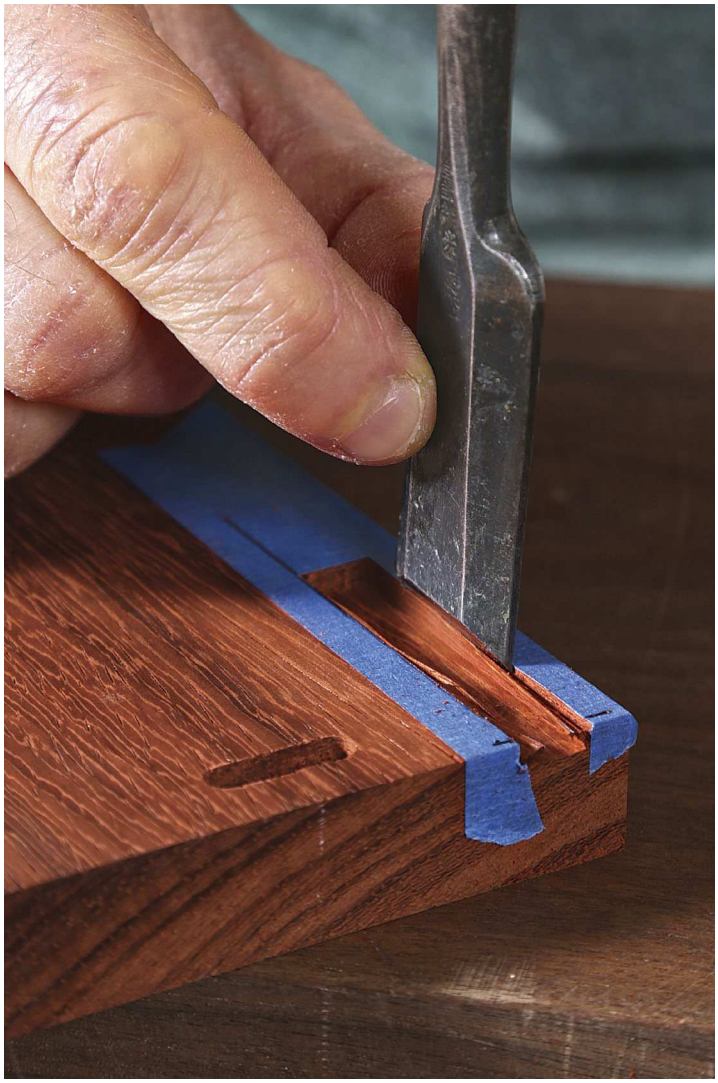
Rout inside the lines

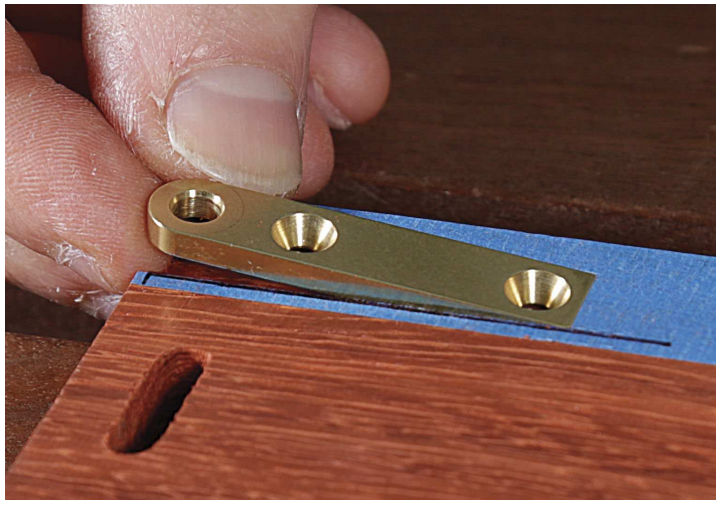
It's surprisingly easy to control a trim router when it's spinning a small bit. Cleaning out the waste is done quickly, and it's a snap to mortise to the correct depth.

Set the cutting depth. *Rest the trim router on four hinge leaves, and then lower the bit to the benchtop. Don't worry about compensating for the thickness of the blue tape.*



Rout the waste. *Use a narrow bit—⅛ in. dia. works well—to clear out the mortise. Get as close to the tape as you can, moving slowly to improve control over the router.*



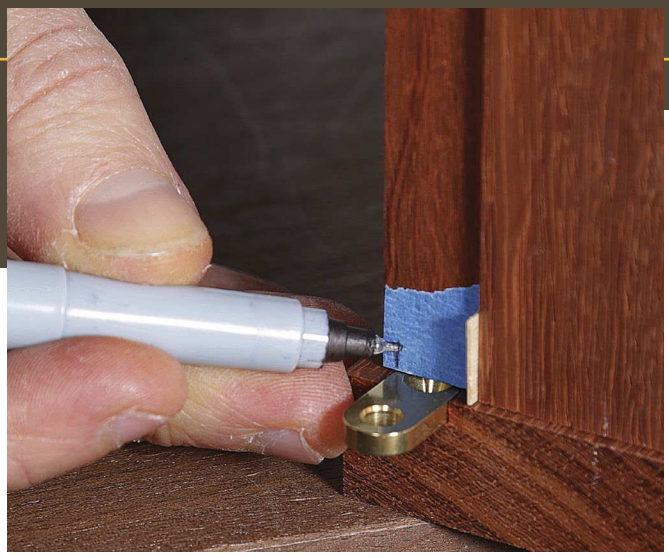


Pare to the tape. *The tape's edge is like the line cut by a marking gauge. Put the back of the chisel against it and pare straight down (left). The hinge should slide in smoothly (above) but still fit snugly.*

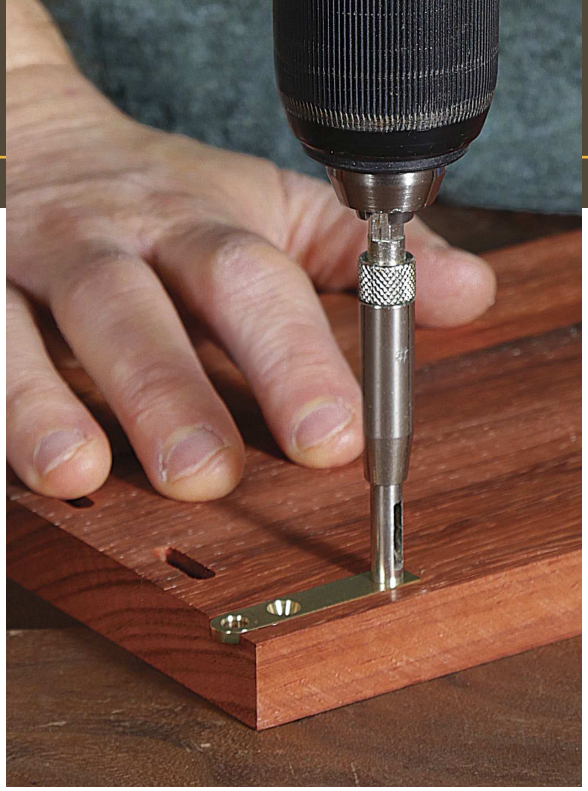
of them, and lowering the bit until it touches the bench.

Start routing in the center of the mortise and slowly work your way out to the perimeter, trying to cut just to the tape's edge. It's OK to play it safe at first and stay a bit inside the tape. After routing, pare the mortise walls with a chisel, using the tape as a guide. Work your way down the edges until you have clean vertical walls, then test the fit of the leaf, paring areas that are tight. Work slowly so as not to overcut any areas. Once the hinge slides in and out with a snug fit, you are done.

After the cabinet mortises are done, cut the mortises in the door. To transfer the mortise location from the cabinet to the door, put blue tape on the top and bottom edges of the door, wrap it around the edge of the door, and put the door in place. Use shims to account for the



Mortise the door. *With the hinge leaf in the mortise and blue tape on the door's edge, put the door in the cabinet and mark directly from the leaf's location. The process is the same as it was for the cabinet: Tape the leaf to the door, cut around it, remove the tape, rout the waste, and pare the walls.*



Drill pilot holes before assembling the case. *A Vix bit automatically centers the hole, ensuring that the screw head seats properly in the hinge's countersunk hole.*

Installing the door. *Start by screwing the case leaves in place, then place the door leaves on the hinge posts (right). Position the door on the bottom hinge with the top of the door tilted out to clear the upper hinge, slide it into place (far right), and screw the leaves to the door.*

gap between the back of the door and the cabinet. Mark the mortise's location on the door's edge, and transfer this line to the door's bottom edge with a square. Follow the same process as for the cabinet mortises.

Do not drill holes for the screws until after you've tested the door's fit on the hinges and in the opening. If the door doesn't close smoothly and line up with the cabinet as it should, adjust the mortises until it does. Think carefully about this. For example: If the door sticks out at the bottom, pare from the front edge of the mortise in the door, and add material to the back edge. This way the adjustments will be hidden. If you adjusted the lower cabinet mortise, the material added to the mortise would be visible.

After the door closes smoothly and aligns with the cabinet properly, drill holes for the screws. You can then continue with the cabinet's construction and finishing. When all is said and done, you'll have a door that opens smoothly and looks beautiful, riding on clean, modern hinges. □

Craig Thibodeau is a professional furniture maker in San Diego.

Mid-Century Credenza

Thoughtful details and modern joinery merge in this sleek design

BY LIBBY SCHRUM

Mid-Century Modern furniture has not been wildly popular since, well, the mid-century. But fashion is cyclical, and with its simple, elegant lines, the style has returned to the limelight at auction houses, on eBay, in woodworking shops, and in the media.

This cabinet's straightforward construction is a perfect application for the Festool Domino joiner. Growing in popularity, the Domino is a great joinery tool for building cabinets. I will explain how to build simple jigs that expand the Domino's capabilities and add personal details in keeping with the style.

Cut the mortises in the sides, top, and bottom

To add visual interest to the cabinet, I created offsets where the top and bottom of the carcase meet the sides. I made the top offset deeper to accommodate a sheet of glass. You can simplify cutting offset mortises by using shims with the Domino.

For the carcase, I made two shims the size of the fence on the Domino, and cut out a notch in each so the guide line would be visible. I made one shim ⅜ in. thick and the other ⅛ in. thick. Using the shims allowed me to offset

Photos, these two pages: Libby Schrum

parts while limiting the number of joinery setups and taking out some of the math.

With the ⅜-in. shim in place, set the Domino's fence so the cutter is centered in the thickness of the top. Then, with the depth of cut set to 25 mm, cut mortises into each end of the carcase top. Remove the shim, reduce the depth of cut to account for the thickness of the sides, and cut the mortises at the top of each carcase side. Repeat these steps using the ⅛-in. shim to cut the mortises at the bottom of the cabinet.

Rout a groove for the back panel, then tackle the center divider

At the router table, using a ¼-in. straight bit, cut a groove for the back panel. The top and bottom pieces get through-grooves, but you'll need to start and stop the grooves on the sides of the cabinet. After each pass, adjust the fence away from the bit a little at a time until the ⅜-in.-thick back panel fits in the groove.

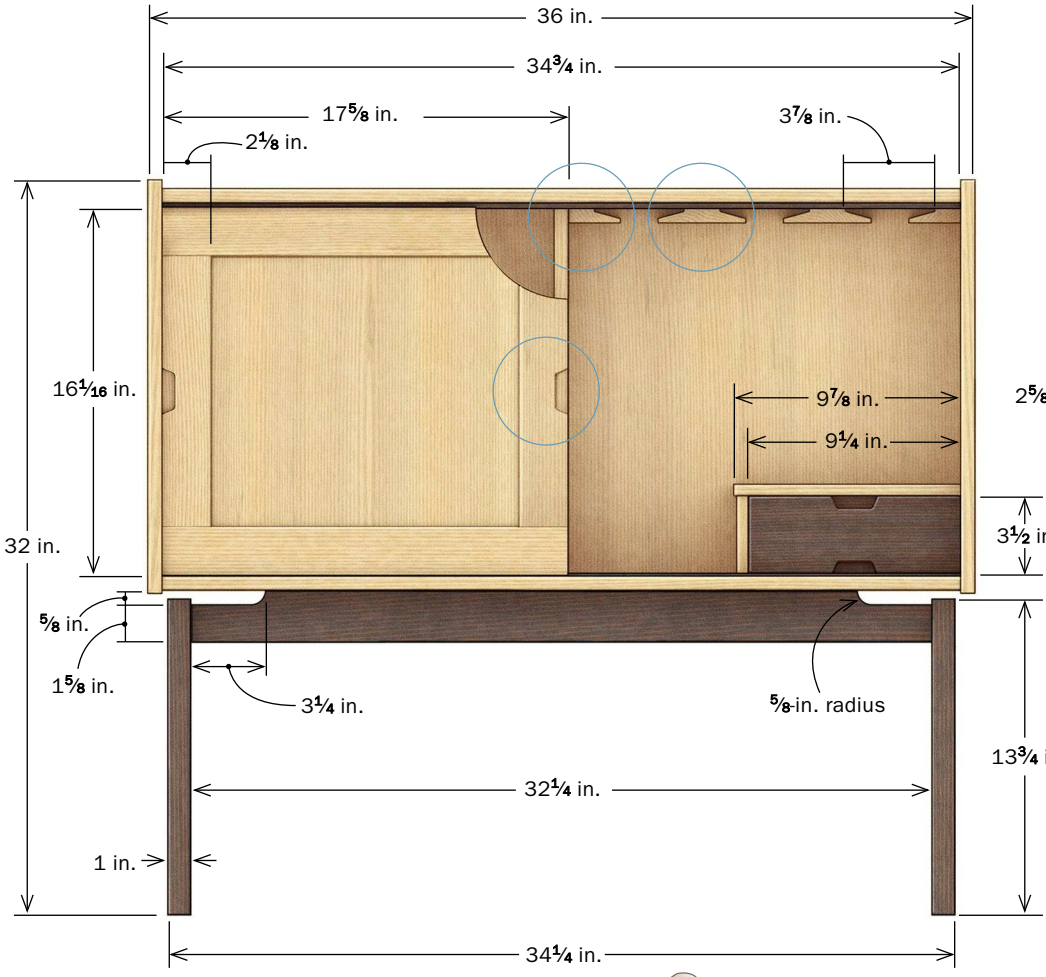
To cut mortises in the carcase top and bottom for the center divider, I clamp a piece of ¾-in. MDF in place as a fence. I draw lines on the fence to guide the mortise spacing. I also transfer those lines from the fence to the divider itself to guide the mortises I'll cut into its ends.

Build the drawer pocket

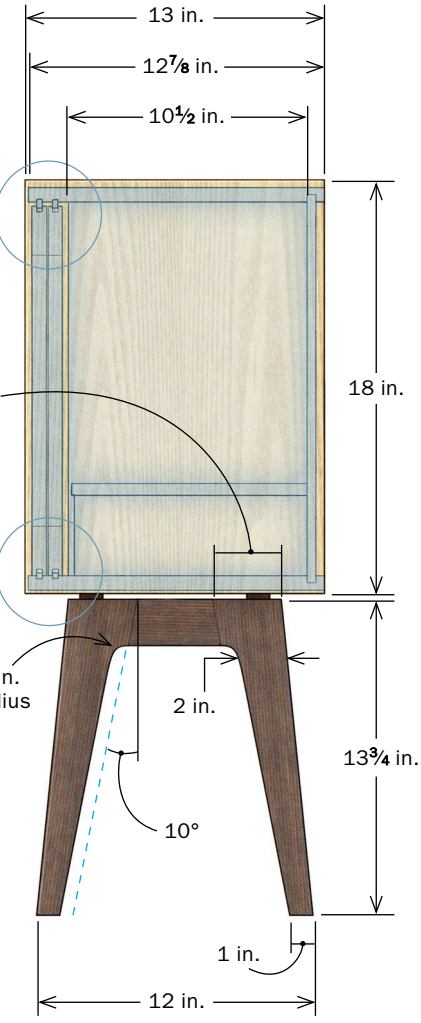
After cutting the top of the drawer pocket to length, determine the placement of the joinery between the top of the drawer pocket and the side of the cabinet.

Cabinet floats on a stand

Schrum added personality to her cabinet by incorporating sliding doors, designing custom door and drawer pulls, and offsetting parts to create interesting reveals. The contrasting angular base offers sturdy support.



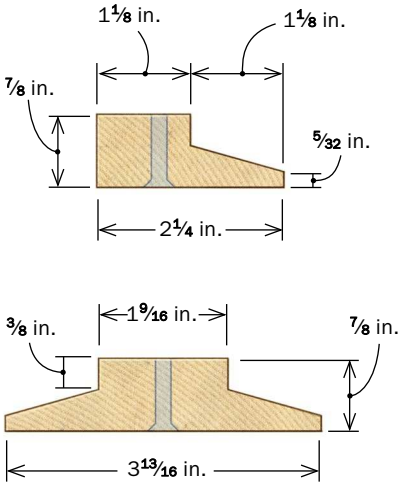
FRONT VIEW



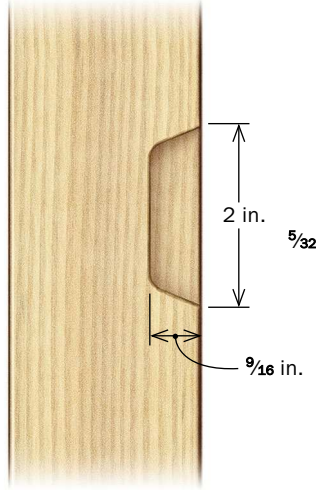
SIDE VIEW

To purchase expanded plans and a complete cutlist for this credenza and other projects, go to FineWoodworking.com/PlanStore.

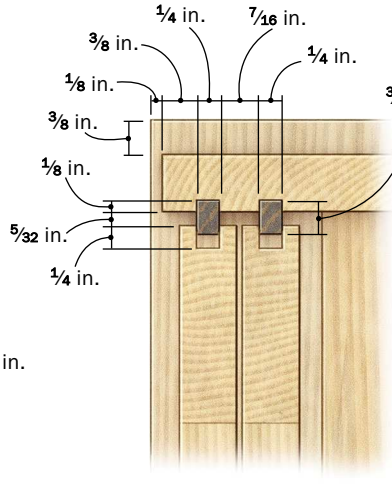
DETAILS



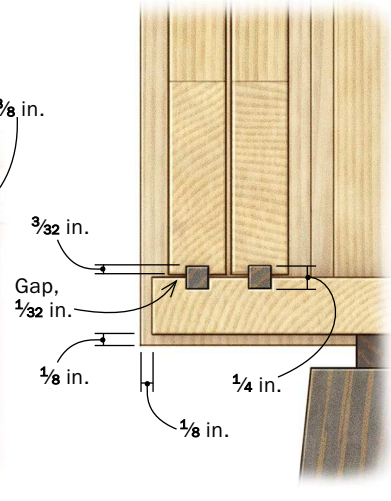
GLASSWARE RACK



DOOR PULL

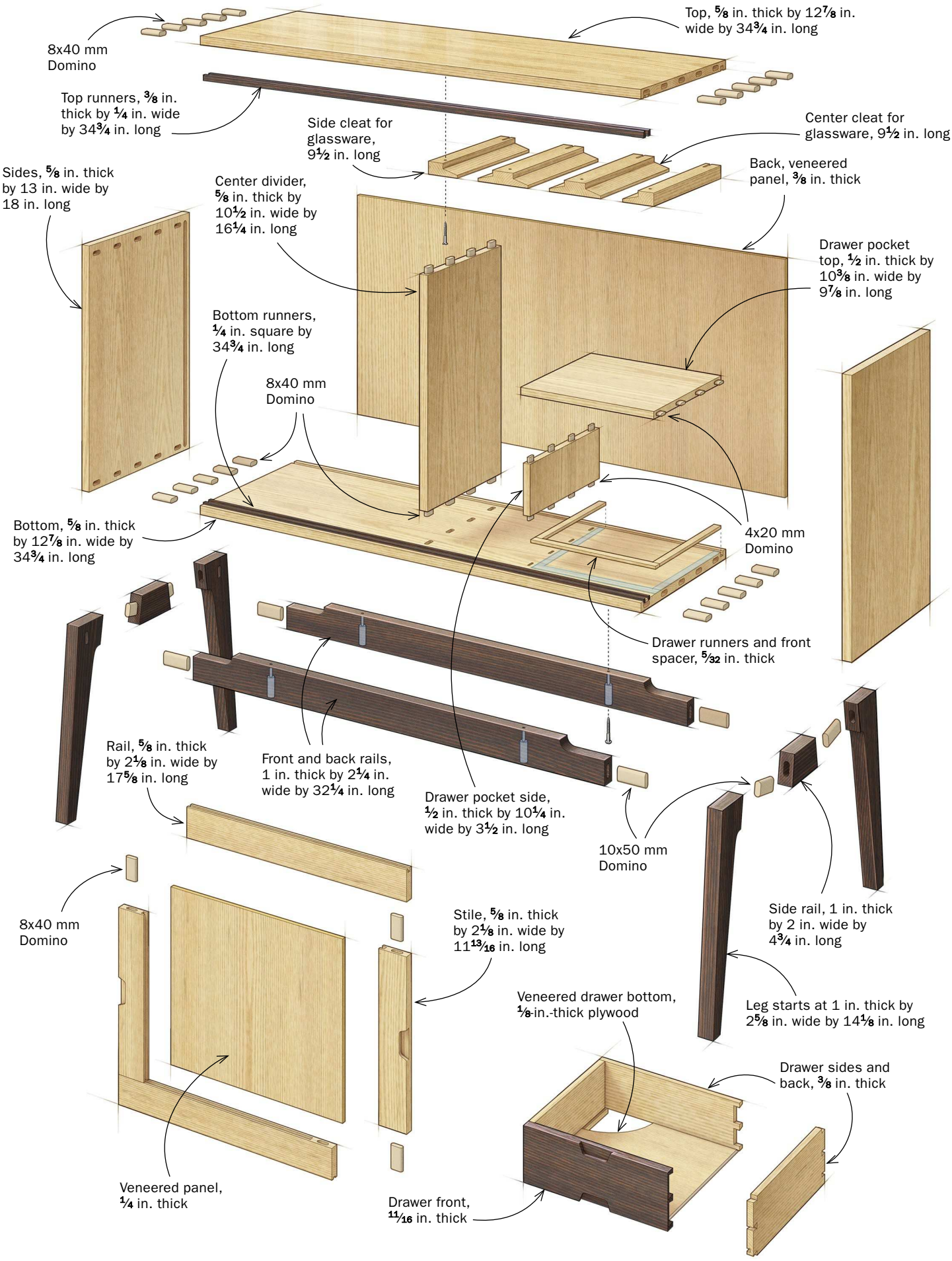


TOP TRACK



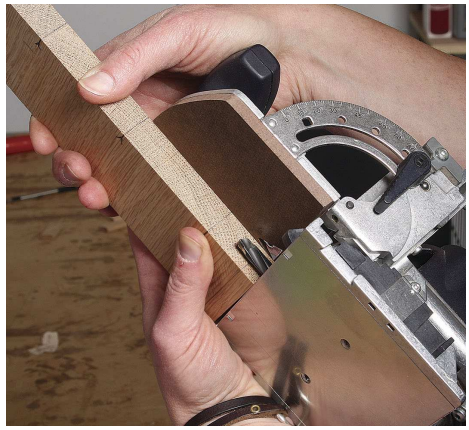
BOTTOM TRACK

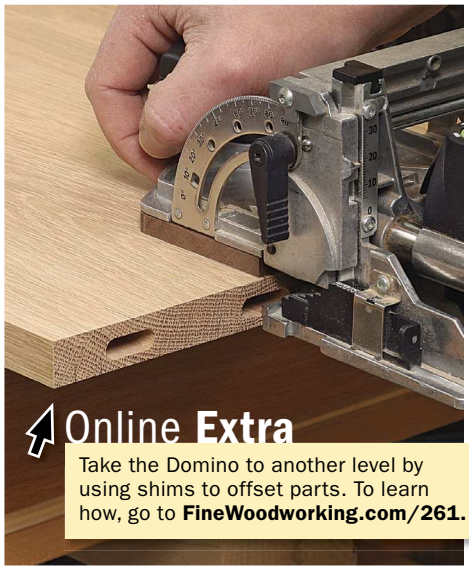
Drawings: John Hartman


8x40 mm Domino
Top, 5/8 in. thick by 12 7/8 in. wide by 34 3/4 in. long
Top runners, 3/8 in. thick by 1/4 in. wide by 34 3/4 in. long
Side cleat for glassware, 9 1/2 in. long
Center cleat for glassware, 9 1/2 in. long
Sides, 5/8 in. thick by 13 in. wide by 18 in. long
Center divider, 5/8 in. thick by 10 1/2 in. wide by 16 1/4 in. long
Back, veneered panel, 3/8 in. thick
Drawer pocket top, 1/2 in. thick by 10 3/8 in. wide by 9 7/8 in. long
Bottom runners, 1/4 in. square by 34 3/4 in. long
8x40 mm Domino
Bottom, 5/8 in. thick by 12 7/8 in. wide by 34 3/4 in. long
4x20 mm Domino
Drawer runners and front spacer, 5/32 in. thick
Rail, 5/8 in. thick by 2 1/8 in. wide by 17 5/8 in. long
Front and back rails, 1 in. thick by 2 1/4 in. wide by 32 1/4 in. long
Drawer pocket side, 1/2 in. thick by 10 1/4 in. wide by 3 1/2 in. long
10x50 mm Domino
Side rail, 1 in. thick by 2 in. wide by 4 3/4 in. long
8x40 mm Domino
Stile, 5/8 in. thick by 2 1/8 in. wide by 11 13/16 in. long
Leg starts at 1 in. thick by 2 5/8 in. wide by 14 1/8 in. long
Veneered drawer bottom, 1/8-in.-thick plywood
Drawer sides and back, 3/8 in. thick
Veneered panel, 1/4 in. thick
Drawer front, 11/16 in. thick

SHIMS HELP WITH CASE JOINERY

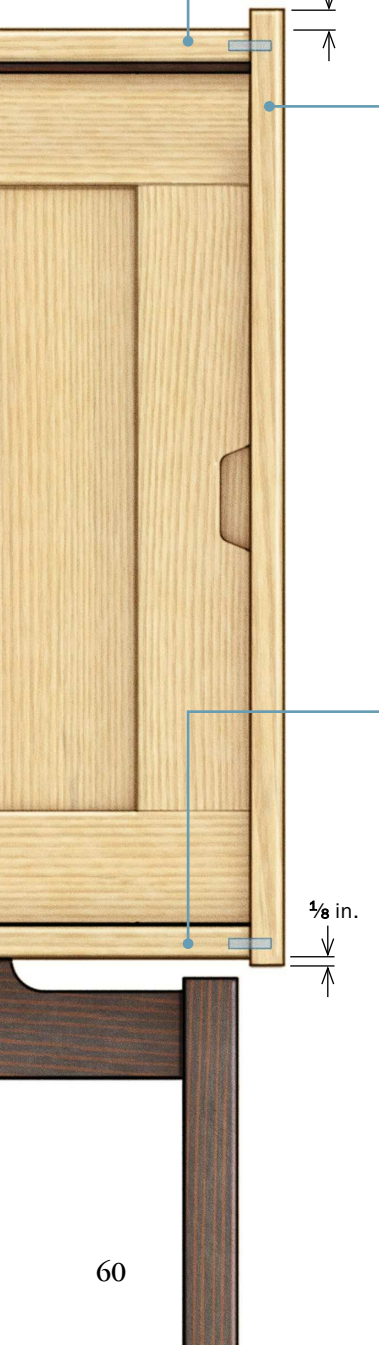
Schrum adds shims of two thicknesses to the Domino fence to create a larger offset at the top, a smaller one on the bottom. Shims make the joinery math-free.





Online Extra

Take the Domino to another level by using shims to offset parts. To learn how, go to **FineWoodworking.com/261.**



Cut mortises in the ends of the top first. *Attach the thicker shim to the Domino fence with double-sided tape (above left), and then center the bit in the thickness of the top (above center). Register the shimmed fence on the outside face of the top (right).*

Go shimless. *When the shim is removed, the offset is automatically 3/8 in., the thickness of the shim. A scrap block clamped to the workpiece adds support for the Domino.*

Different offset on the bottom. *Attach the thinner shim to the fence, and reset the fence to center the cutter in the thickness of the stock.*

Then cut the mortises in the right end of the pocket top. Make a fence similar to the one you used for the center divider, mark the mortise spacing on it, and cut the drawer-pocket mortises in the side of the cabinet.

Now dry-assemble the bottom of the cabinet, the top of the drawer pocket, and the cabinet side. Cut the side of the drawer pocket to height. Cut mortises in each end of the drawer-pocket side, working from the same face each time. Then cut their mating mortises in the underside of the pocket top and in the carcase bottom.

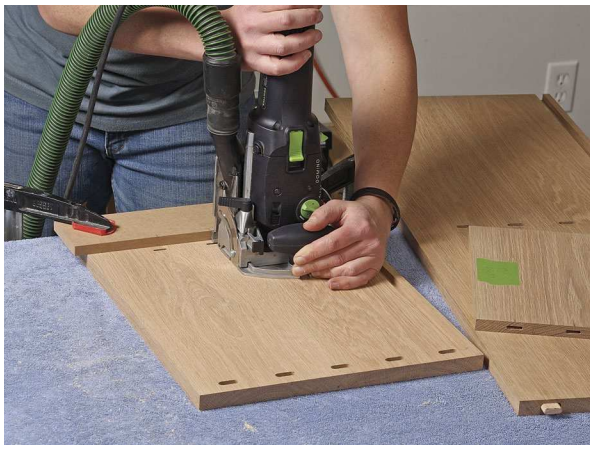
Consider the grain in the door parts

I always take the time to look for wood grain that supports the form rather than working against it. In this case, super-straight, consistent grain emphasizes

USE A FENCE FOR THE DIVIDER

The rest of the mortises for the center divider and drawer box are straightforward and can be cut by registering on the base of the Domino.

Mortise for the center divider. *Determine the placement of the center divider by measuring and adjusting from each end. Clamp on a fence marked with the mortise locations. Be sure to work from the same end of the cabinet and the same face of the divider to maintain consistent placement.*



Drawer pocket joinery. *First, cut the mortises in the edge of the pocket top. Then use a fence to locate the mating mortises (above) and cut them in the side of the cabinet.*

the straight lines and right angles in the door frames, drawer front, and base.

The door rails should be long enough so the door, when closed, will overlap the divider. The stiles should be cut to allow for about a ⅛-in. gap at the top. Lay out the pieces and cut mortises for each door frame.

At this point I make preliminary grooves for the door runners; I'll cut them to full depth later. These shallow grooves will help me when I'm locating the runner grooves in the case. At the router table, using a ¼-in. bit and fence, center a cut in a test piece or cutoff from the door-frame stock. Use the setting to cut a 1/16-in.-deep groove in the top of each top rail and the bottom of each bottom rail.

With the bit still centered, rout a groove for the floating panel in each of the stiles. Do the same for the top and bottom rails, remembering to stop the groove at each end. Start with a shallow groove and raise the bit in

Now the other side. *Dry-assemble the cabinet side to the cabinet bottom and the top of the drawer pocket. Measure for and cut the drawer pocket's side, and then cut the mortises in its top and bottom edges. Finish with the mortises in the underside of the top and the top side of the cabinet bottom.*

Photos, except where noted: Anissa Kapsales

A THREE-PHASE GLUE-UP

Break the gluing sequence into three steps. But at each step, dry-fit and clamp the whole carcase to ensure everything remains straight and square.

Glue the drawer box. *Using a spacer to hold up the right side, glue the L-shape together and to the bottom of the cabinet. Dry-fit the top and the sides and let this assembly dry completely before moving on.*

Glue the center divider and the back to the top and bottom. *Schrum adds a bead of glue to the veneered back panel where it meets the center divider. Dry-fit the sides to the assembly.*

1/16-in. intervals. Once you reach a depth of 1/4 in., adjust the fence away from the bit in small increments, flipping the workpiece to run each face against the fence, until the groove is wide enough for the veneered panel. Square up the rounded ends, and leave the doors oversize for now.

Lay out the door runners

To lay out the spacing for the door runners, place a rail from the front door 3/16 in. back from the edge of the bottom. Place a rail from the back door behind it, with a 1/16-in. spacer between the two, and secure the pieces with a clamp.

Use a knife or a super-sharp pencil to make a mark at the front edge of each groove and place an X on the side of the mark that will be removed. Using a test piece, set the fence to rout the first groove. Routing no deeper than 1/8 in., cut the first groove in the

Add the sides. *The final stage of the glue-up is to glue the sides to the top and bottom.*

carcase top and bottom. Use the test piece to reset the fence for the second groove and repeat.

Mill stock for the runners to the width of the grooves and use a bandsaw to cut the runners to height. Keep in mind that the bottom runners should sit about ⅛ in. proud; the top, about ¼ in. Leave the height a bit oversize; you'll fine-tune the runners and doors later.

It's important to remember that the drawer must travel over the door runners. To make that happen, build a three-sided spacer to elevate the drawer. Two pieces will act as runners beneath the drawer sides; the third piece simply sits beneath the drawer front, filling a visual gap.

Sand and prefinish, then glue up in stages

Sand all carcase pieces except the door runners and prefinish all inside surfaces. Sand and finish both door panels and any surfaces adjacent to the panel. Final sanding and finishing of exterior surfaces and doors happens after glue-up. For this piece I used Minwax Wipe-On Poly. It is easy to apply, and the built-up film is more protective than an oil-rubbed finish.

Rehearse the steps of the carcase glue-up with several dry runs to make sure you assemble each piece in the right order. Also, work in stages. Don't glue in the door runners yet.

Fine-tune the fit of the doors on the runners

When the cabinet is glued up, the doors are glued up and rough-sanded, and the runners fit in the grooves perfectly but are a bit oversize, it's time to fine-tune. Starting with the runners, trim and sand them to ⅛ in. proud at the bottom and ¼ in. proud at the top.

Back at the router table, use a ¼-in. straight bit to deepen the runner grooves in the top and bottom edges of the doors. Be sure the grooves are slightly wider than the runners so that they slide freely. They should not be so loose that they rattle but also not so snug that they bind. The groove on the bottom of each door should only be as deep as to allow the doors to sit about 1/32 in. to 1/16 in. above the bottom of the cabinet. The groove at the top must be deep enough that the door does not bottom out when you lift it upward and swing it into place over the bottom runners. Hand-planing the top of each door and putting

INTEGRAL DOOR PULLS ADD FLAIR

To keep with the unadorned aesthetic, Schrum designed and cut a stylish but subtle pull into the door stile.

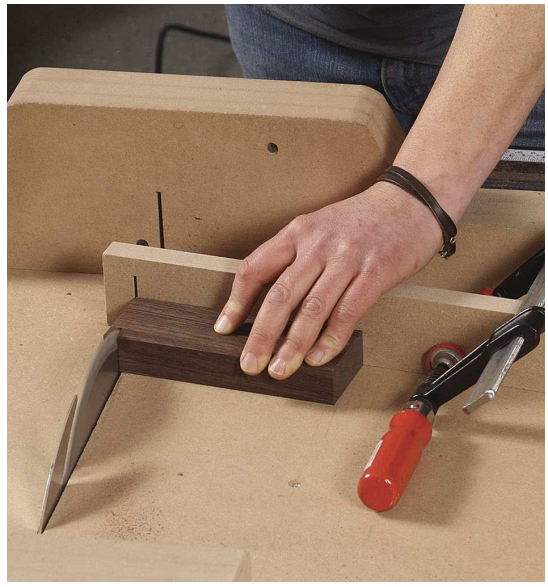
Start with a template and a straight bit. *Rout most of the waste with a straight bit and rub collar in a handheld router.*

Go back over it with a dovetail bit. *This creates an angle along the inside of the pull. Use a chisel afterward to fine tune the shape.*

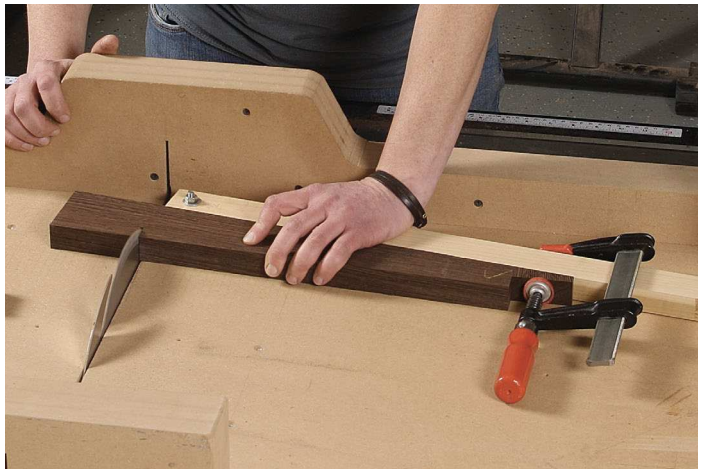
Glue up the door. *With the mortises, panel grooves, preliminary runner grooves, and drawer pulls all cut, it's time to glue up the door parts and the veneered door panels.*

MID-CENTURY MODERN AESTHETIC

The tapered legs and scalloped rails “lift” the cabinet from the stand.



Angle legs and rails. *After tapering the legs, use a skewed fence on a crosscut sled to cut the top and bottom angles (left). Also using a skewed fence, cut the angled ends of the short rails (right). Finally, mortise the parts.*



Legs are tapered and curved. *Having ripped the initial taper into the legs with a jig on the tablesaw, use the bandsaw to rough-cut the secondary taper and curve. Glue the legs to the short rails, then template-rout the unit to final shape.*

Final base assembly. *Glue the legs to the short end rails first (above right), then link them to the long rails (right).*

FINISHING TOUCHES

All the little details make this piece special: wenge door runners, glass racks, custom door pulls, and a base that floats the case.

Door runners. *Sand and fit the four runners (two in the top and two in the bottom of the case) in their grooves, and glue them in place.*

Glass racks. *Simple angled strips screwed into the top hold stemware. The strips have slotted screw holes to accommodate wood movement.*

a slight bevel on the front edge of the groove on each door can help perfect the fit. Once the runners are glued in, a wax-only finish will keep the doors moving smoothly.

Add glass racks

It's best to have the glasses and stemware that will be stored in the cabinet available when designing. The racks should be tailor-made to fit the stemware. Remember, like the drawer, each glass that hangs will have to pass the runners, so design the racks to hang low enough for the glasses to slide in smoothly.

Cut custom pulls into the doors and drawer

First, make a template to guide the router in shaping the pull. Use the tablesaw to make the angled cuts, and then connect those angled cuts on the bandsaw and use the side of the blade to then shave off the last little bit. Using double-sided tape to secure the template, rout most of the waste with a flush-cutting straight bit and rub collar in a handheld router. Then use a dovetail bit with a rub collar to create an angle along the inside of the pull, making sure to leave the edge square. Use a chisel to fair the dovetail angle into the square edge. Once you've created the pulls on each of the doors, trim both sides of each door the same amount until both doors perfectly overlap the divider.

The final stretch

Now tackle the wenge drawer and stand. Wenge is a beautiful wood with a striking contrast to white oak. I created a template for the legs and used the Domino to cut the mortises. Glue the legs to the short end rails first, then cut the joinery for the long rails.

Finally, sand and finish the outside of the carcase as well as the doors and the other components. □

Attach the base to the case. *Schrum screws the base to the case. The front and back rails have a curved cutout on the ends and are wider than the short end rails. This creates an illusion of lift.*

Add the drawer and doors. *Slide the drawer in place, and add the doors. They slot in at the top (the grooves in the top of the doors are deeper than at the bottom) and rest on the bottom runners.*

Libby Schrum teaches woodworking and builds custom furniture out of her studio in Camden, Maine.

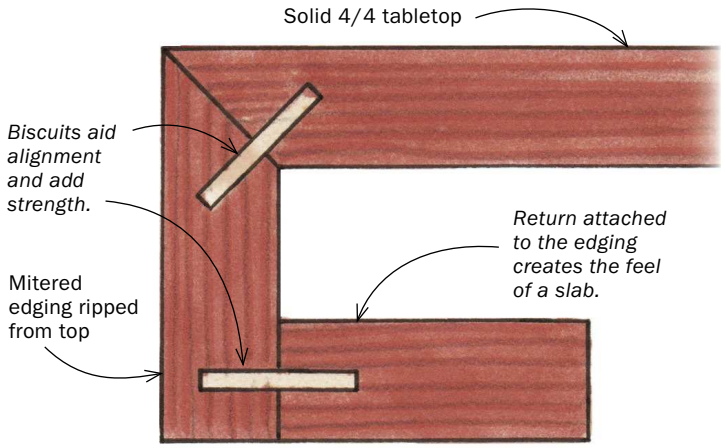
Thick Tabletops from Thin Stock

Create lightweight panels with a heavyweight look

BY MARK EDMUNDSON

MIND TRICK

You can use 4/4 boards to make what appears to be a solid slab top. Glue up an oversize panel, cut strips from all four sides, miter them, and reattach them as edging to give the top an apparent thickness of up to 4 in. Add a return underneath to complete the illusion.



Whether it will stand in a stark modern house or in a rustic timber-frame, a table with a massive solid-wood top can be a powerful presence in a room. I often get requests for such tables, but here in Idaho there's no local supply of big hardwood trees, and getting 12/4 planks means ordering very expensive, very heavy slabs from far-off places, sight unseen, and paying for shipping. So once when a client asked for a 3-in.-thick tabletop it occurred to me I could make one from 4/4 solid stock. I could glue up an oversize panel, cut off strips along the sides and ends, and then miter those offcuts and fold them down to create the appearance of a solid slab.

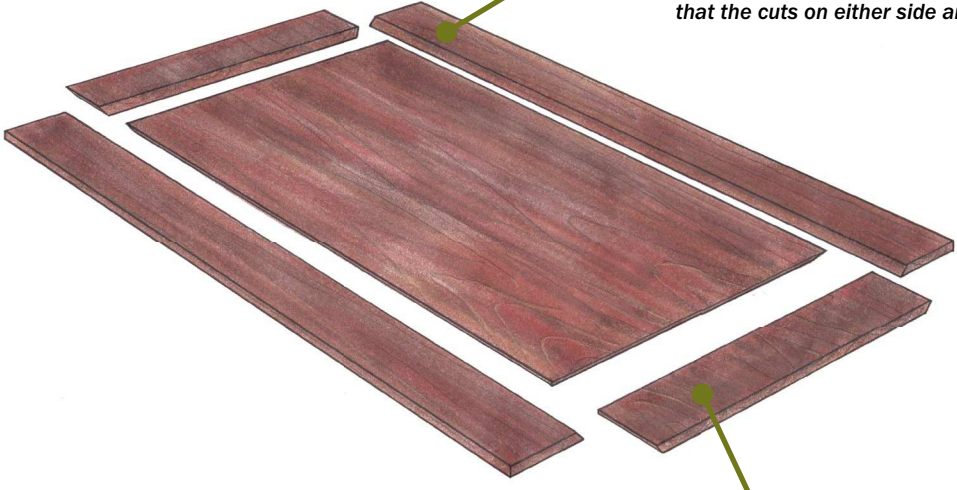
After I glued up my first faux slab tabletop and cleaned the glue joints, a timber-framing buddy stopped by the shop. His

BEVEL THE TABLETOP

Use a guided circular saw to miter all four edges of the oversize panel. The offcuts will become the edging and the return underneath.

1

Long edges first. *With a sacrificial panel placed beneath the workpiece to support the offcuts, Edmundson uses a track saw with a long track to make smooth, accurate miter cuts along the length of the table. He's careful to ensure that the cuts on either side are parallel to each other.*

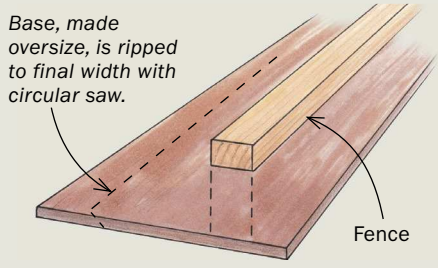


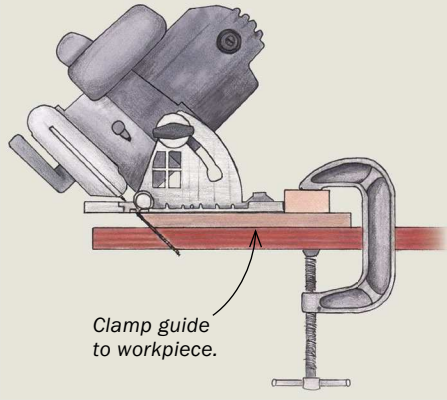
2

Now square the ends. *Square the track to the long miter cuts you've made, and then make the miter cuts across the width of the workpiece.*

NO TRACK SAW? NO PROBLEM

You can use a good standard circular saw to cut clean miters by making a simple guide. Glue a fence to a plywood or MDF base, then tilt the sawblade to 45° and make a cut along the base to create a zero-clearance guide. Clamp the guide to the panel to make the miter cuts.

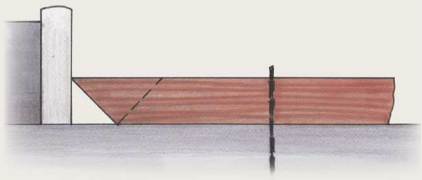




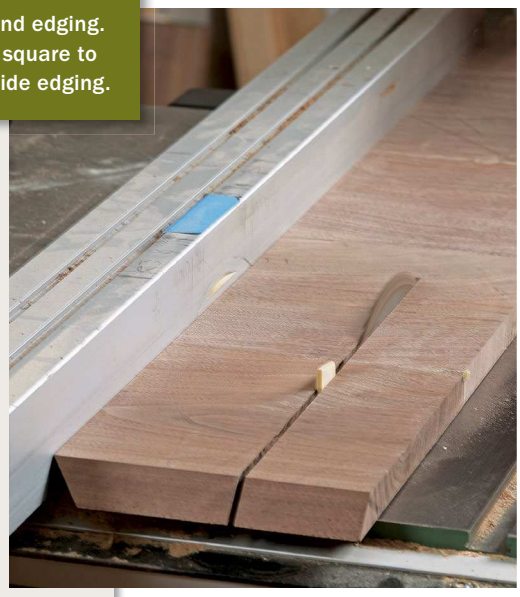
Photos, except where noted: Asa Christiana; opposite page: David Marx

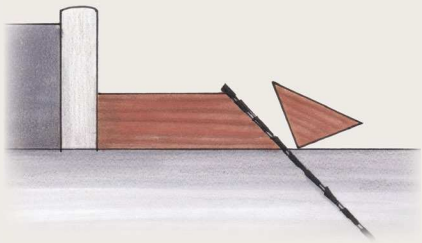
MAKE THE END EDGING FIRST

Trim and re-miter the cutoffs to make the end edging. At glue-up, ensure the face of the edging is square to the top surface; this simplifies adding the side edging.



Rip one edge parallel. *At the tablesaw, with the blade vertical, run the tip of the cutoff's miter against the fence and rip the other edge square. Cut close to final width, so you get a good-sized offcut to use for the return.*





Recut the miter. *Set the blade to 45° and cut a miter in the other direction. Because you're using offcuts from the panel, the ends of the edging are already properly mitered.*

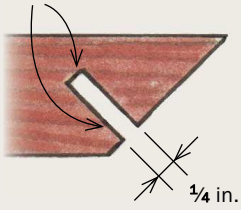
first words were to ask me where I got the 12/4 black walnut for it. Even after examining the top, he didn't realize it was all 4/4. That's when I knew the faux version was a great alternative to the real thing.

To make the illusion even more convincing, I glue return strips inside the bottom of the edging, so if you grab the tabletop and feel underneath, it seems like a full-thickness slab. There was one hiccup, though. The first time I added those strips underneath, I noticed that the top of the table gave off a deep echo when thumped. I solved that problem by adding a piece of ¾-in.-thick plywood to the underside. That deadened the noise completely. It also made the top easier to attach to the base, since I could screw the plywood to the base and then attach the solid top through slotted holes that accommodate seasonal movement. If you choose not to add the return strips, you won't get the drum sound and you can forego the plywood. One other note: Using this technique, the miter where the side and end edging pieces meet is a cross-grain joint, so I wouldn't make one of these tabletops more than 4 in. thick.

Cut the main miters

To cut the miters on the top panel, it helps a lot to have a track saw; I use a Festool 55. But you can get by with a good circular saw and a shopmade guide (see drawing, previous page). You could also cut these

Offset the biscuit toward the bottom of the workpiece to prevent the slot from cutting through the surface.



Biscuits reinforce the joints. *Be sure to place a biscuit very close to the end of the joint to keep that area aligned.*

Drawings: Kelly J. Dunton

miters on a tablesaw with a sliding table, if you have one. As to the miters on the edging pieces, I cut those on my tablesaw.

The project starts with a good selection of 4/4 stock. Choosing boards with lots of vertical grain makes it easier to produce a look at the ends of the table that mimics end grain. To create a seamless match of color and grain between the top panel and the side edging, I use wide boards for the first and last boards in the panel glue-up. To account for the edging and the return strips underneath, figure on gluing up a top panel about a foot longer and perhaps 8 in. wider than the finished top. Less overage is required on the sides, as the side returns can be cut from unmatched stock.

Once the top panel is glued up, cut the miters on the long sides. If you use a track-guided saw, make sure the cuts are parallel. Next cut the miters on the ends of the panel. Use a square to align the track perpendicular to the sides, and mark each offcut to match the end it came from. The beauty of using these offcuts as edging—apart from the perfect grain match—is that they are already just the right length and have miters on the ends that will mate with the side edging. But they still need work.

First, at the tablesaw, with the blade vertical and the point of the miter riding against the fence, rip a clean edge parallel to the long miter (and save the offcut if you are planning to add return strips underneath the table). Then tilt the blade to 45° and run the clean edge against the fence to recut the miter. For a good grain match, you want to remove as little wood as possible from the top of the edging.

Test the fit of the miter joint to see that the edging forms a 90° angle with the top panel. If it doesn't, make a slight angle adjustment on the tablesaw and recut the miters. When the miter is right, rip the edging to width to create the faux table thickness you want.

Attach the end pieces first

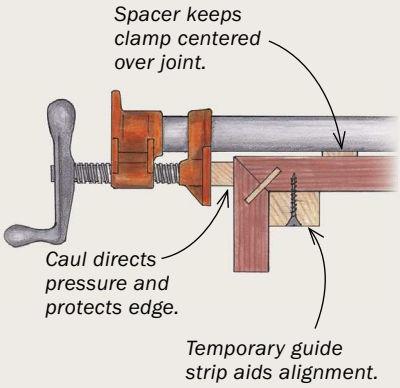
I use biscuits in these joints, both for reinforcement and to help align the pieces during glue-up. The ends of the edging must line up correctly, so I place the first and last biscuits fairly close to the ends. For further help with alignment, I temporarily screw a strip of wood to the underside of the top, just behind the miter.

At glue-up I apply vertical pressure with quick-release clamps and horizontal pressure with bar clamps running the length of the tabletop. I use Gorilla glue for its longer open time. To play it safe, I glue one end at a time, dry-fitting the opposite end to protect the beveled edge. If I see gaps during the glue-up, I use the back of a chisel to burnish the corner slightly, crushing the grain so that the joint looks tight. It rounds the corner a bit, but no more than I will when I sand before finishing.

The side edging is the next step, and it's a bit trickier. I use test pieces while fitting

GLUE ONE END AT A TIME

For maximum control of the miter joints, Edmundson glues on one piece at a time. He dry-clamps the opposite end for clamping purchase and to protect the sharp edge.



Ensuring a square glue-up. *It's key that the outside face of the edging and the top surface of the table form a 90° angle. Using biscuits helps with this, as does using both vertical and horizontal clamps. Edmundson screws on a temporary guide strip just behind the miter to seal the deal.*

TIP

Use a guide strip. *Screw down a straight strip right at the edge of the miter. This will help keep the edging at 90° as you clamp it on, and also help to keep it from shifting inward.*

SIDE PIECES REQUIRE TEST-FITTING

The trick here is to use a test piece to gauge the actual miter angles at the ends of each side, which might not be perfect. Note the angles for each joint and then cut the real edging.

Fitting the test piece. *On a test piece that's mitered along the top edge, cut one end at a 45° angle, sawing at 90° to the length. If that fits perfectly, great. If not, make an adjustment to one or both of the angles at the chopsaw. Using the other end of the test piece, repeat the process to find the correct angle for the joint at the opposite end. Then cut the side edging to length.*

Biscuit and glue the edging. *Mark and biscuit the tabletop and edging. The glue-up process is the same as before: one piece at a time, with the opposite piece dry-fitted to protect the mitered edge.*

it. They let me dial in the angle of the miters on the ends of the edging, which may not be exactly 45°. The test pieces don't need to be full length, just long enough to be safely cut on the tablesaw. Repeat the procedure from the end edging to produce edging and test pieces that are beveled on the top edge and ripped to width.

Now cut a 45° miter on both ends of your test piece, and slide one end into place on the table to see how it mates with the end edging. I make adjustments on the chopsaw until the fit is tight and then make notes on the angle. It might require a compound-angle cut. Repeat this process for the other three corners.

Now that you know the miter angles, you can cut one end of a piece of side edging, cut the other end a little long, and sneak up on the fit. Remember that at glue-up you'll be able to close small gaps by crushing the corner of the miter slightly.

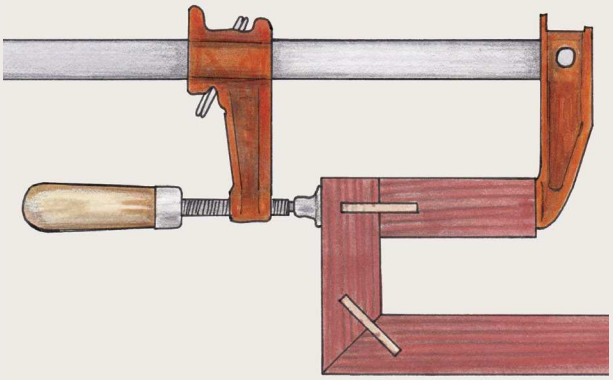
When you've fitted both sides, cut biscuit joints and glue one side into place at a time, just as before. You don't need a guide strip this time, because the end edging will keep the side edging at 90°.

To add the return strips underneath the table, I start by gluing on a 2-in.-wide strip the full length of each side edging. Then I fill in the gap between these two strips with the offcut from the end edging. Last, I cut a piece of ¾-in.-thick plywood to fit roughly into the opening in the bottom of the faux slab—it doesn't have to fit perfectly. I screw the plywood to the

base, and then, through slotted holes, I use pan-head screws with washers to attach the plywood to the underside of the tabletop.

Once your table is finished, I think you'll find that with a little cunning and some clean miter joints, you've made a massive-looking tabletop without breaking your back or your bank account. □

Mark Edmundson builds custom furniture in Sandpoint, Idaho.



Complete the illusion. *When someone reaches under the tabletop, the return strips make it feel like a solid slab. Glue on the side strips first, then fill in between them at the ends. For the end returns, use offcuts from the ends of the panel so they expand and contract with the edging and the tabletop.*

gallery

Inspiration for our readers, from our readers

ROBERT J. GODBOUT

Port Charlotte, Fla.

Having admired a secretary built out of curly maple, and having always wanted to build a block-front unit, Godbout set out on this ambitious project. Drawings and photos from a fellow member of the Society of American Period Furniture Makers gave him enough information to start building. More than 500 hours later, this secretary was a reality.

CURLY MAPLE, 23D X 43W X 102H

CRAIG THIBODEAU

San Diego, Calif.

This table was inspired by a Stickley table that Thibodeau's client owns. To add interest and a bit more color, he added line and medallion inlays of sterling silver and copper. "The colors of the silver and copper blend nicely with the walnut and maple."

CLARO WALNUT, MAPLE BURL, AND WALNUT, 14D X 33W X 30H

Photo: Craig Carlson

DERRICK BURKE

Snohomish, Wash.

Burke calls this his "Floating Leg Entry Table" because the legs appear to float below the top. The front apron, which is split into three pieces to create a drawer, is reinforced with a brace under the top that's glued and doweled to the side aprons.

CHERRY, WALNUT, MAPLE, 14D X 55W X 35H

DANIEL GILL
Galway, Ireland

Gill's butler's chest was inspired by the furniture designs of Garrett Hack and by Christian Becksvoort's "Desk in a Drawer" (*FWW* #243). "The piece contains over 200 hand-cut dovetails," Gill says. "The construction is similar to that of the Shakers, with sliding dovetails, web frame, and moldings held with dovetailed keys to allow for seasonal movement."

OLIVE ASH, CEDAR OF LEBANON, 20D X 36W X 46H

Photos: John Howard

JIM COX
East Aurora, N.Y.

After admiring an old drop-leaf table at Hildene, the historic Vermont summer home of Robert Todd Lincoln, Cox made this table largely from memory. The biggest challenge, he says, was "to design the table to look nice when folded down and to be sturdy and stylish when the top was in the up position."

CHERRY, 27D X 32W X 28H

JUSTIN MRAZIK
San Francisco

"Sweet, simple, small, and solid" were the four criteria for this end table, which came about during Mrazik's time as a student at the College of the Redwoods. It started life as a small MDF cubby on four small legs and evolved from there "through prototyping, discovering new wood species, learning joinery, and exploring forms." The front legs are tapered to resemble a foot with a shaped "heel" at the base of the leg.

ELM, KWILA, WHITE OAK, 12D X 19W X 17H

JOHN OLENIK
Ballston Spa, N.Y.

Built in the style of Greene and Greene, Olenik's armoire has bookmatched doors, a top with breadboard ends with ebony inlay and splines, bookmatched side panels that feature a small surprise in the form of a marquetry spider, and drawers joined with proud finger joints.

MAHOGANY, EBONY, MAPLE, SYCAMORE,
19D X 35W X 60H

AL SPICER
Bessemer City, N.C.

There are 20,400 hand-cut pieces used in the pattern on this tilt-top table, which is carried through the entire piece. Spicer made the base from MDF using a boat-building method called "stitch and glue" before veneering it. The pattern is mahogany, bloodwood, and fumed eucalyptus, and the waterfall edge is quartered sapele.

MAHOGANY, ASSORTED VENEERS
30 DIA. X 30H

ALEX MAGNIN
New York, N.Y.

Magnin made this desk before moving to Manhattan. The design is modern, to fit in with his new apartment. It has three-way lap joints at the back corners, a shouldered through-dovetail in the front, and "a nifty spring-loaded drawer stop, which hides a secret compartment behind the drawer."

GONCALO ALVES AND WENGE, 26D X 52W X 29H

Photo: Bill Truslow

Show your best work

For submission instructions and an entry form, go to FineWoodworking.com/rg.

CHIP BEACHLER
Louden, Tenn.

Chip and Margie Beachler worked together on this railing, starting with wood harvested from the site of their former home. They hired a portable sawmill to cut the logs into boards, then cut the boards into strips and steam-bent them to make the handrail. They carved the field from cherry. Says Chip: "Margie did almost all of this hard, repetitive work."

WALNUT AND CHERRY, 3D X 86W X 37H

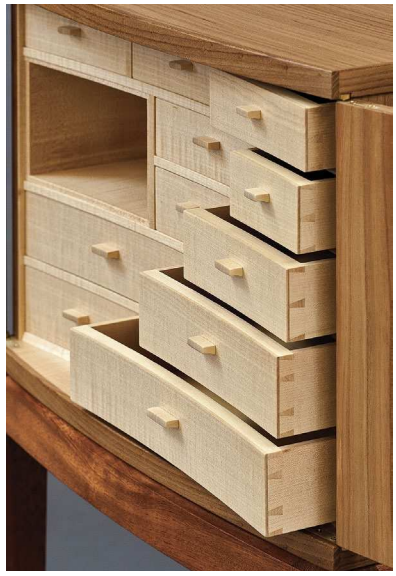
Photo: Craig Nowiki-Barnes

MIKE FUCILE
Madeira Beach, Fla.

Fucile started this Federal card table during a one-week class with Steve Latta at the Marc Adams school and continued working on it for several months back home in his own shop. The table won best in show at the 2016 Florida State Fair.

MAHOGANY, WITH SYCAMORE AND HOLLY INLAY, 35½ DIA. X 29½H

Photo: Zane and Heather Bond



MATT MECARO
Escondido, Calif.

When Mecaro saw the last cabinet James Krenov made while at the College of the Redwoods, he was inspired to build his own version. It has a convex curve on the doors and an inward curve on the drawer faces. "This creates a nice swooping sensation when the doors are opened."

ELM, EUROPEAN SYCAMORE, AND KWILA, 12D X 18½W X 48H

Photo: David Welter

ANDREW KEIM
Santa Fe, N.M.

Keim, a violin maker, made this case to hold one of his finished instruments. “In the past, wealthy collectors would commission woodworkers to build elaborate cases to house their precious instruments.” His version has a curved top with a floating panel that has a vine carving in the shape of the violin’s “f-hole.”

WALNUT, 9¾D X 31W X 4½H

T. MICHAEL WHITE
Northampton, Mass.

This dovetailed piece has a very down-to-earth purpose. White made it “to guide my family to sort and organize our mail.” Each drawer has a function, whether it is to hold a specific family member’s mail or to organize bills, magazines, or recycling. “No more piles of mail on the kitchen counter. Fine furniture for trivial purposes.”

WHITE OAK, HARD MAPLE, 14¾D X 46½W X 51⅛H

Photo: John Polak

DEREK McDONALD
Rochester, N.H.

McDonald made this side table while he was a student of Phil Lowe’s at the Furniture Institute of Massachusetts. “It was inspired by the work of 18th-century craftsman Thomas Seymour. While the turning, reeding, and carving stay true to the original, the oak burl fan pattern gives the piece a more contemporary look.”

MAHOGANY, OAK BURL, PINE, EBONY, 15D X 36W X 30H

BAY AREA BOUNTY

Here are three of our favorite pieces from the Bay Area Woodworkers Association's 5th Fine Woodworking Show, held last October in San Carlos, Calif. This guild has been serving woodworkers in the San Francisco Bay area for more than 30 years.

BRUCE POWELL
San Francisco

"I have always loved the elegance and simplicity of the Chinese round-corner cabinet," says Powell, who has built several traditional versions. This cabinet is a modern interpretation of the style and has octagonal legs. It won first prize in the Advanced Cabinet category at the show.

JATOBA, WALNUT VENEER, AND MAPLE, 16½D X 28½W X 44½H

JON KAPLAN
Palo Alto, Calif.

Kaplan, who describes himself as a weekend woodworker, said he viewed building a chair as "the ultimate woodworking challenge." This design came from plans by John Olson. "It was my first time attempting many of the operations required, and I'm thrilled with what I learned and how it turned out."

MAPLE, 20D X 20W X 40H

STAN BOOKER
Alameda, Calif.

Booker was lucky enough to find some beautiful African mahogany in the waste pile at a window and door manufacturer in Oakland. His bench turned out to be the perfect project to show it off.

MAHOGANY AND BLOODWOOD, 14D X 42W X 16H

Photos, this page: Jamie Buxton

Traditional crackle finish

BY NANCY HILLER

Photo, this page: Kendall Reeves

If you're looking for a painted finish that's different from the norm, consider crackled milk paint. Though it's most often used in Shaker or Colonial style furniture, antique reproductions, and restoration work, you can add crackle finish to almost any piece to create an eye-popping effect. And it has an added bonus: It's non-toxic.

Producing a crackle finish is surprisingly simple. It's brushed on in three steps: a base coat of milk paint, a layer of crackle medium—essentially, thinned hide glue—and last, the topcoat of milk paint. Then get ready to watch the show. As the top layer of milk paint dries, the hide glue layer underneath, with its glasslike surface providing little purchase for the paint, causes it to break apart and form the crackle pattern. Depending on the type and strength of crackle medium you use, you can achieve anything from a fine, filigreed crackle pattern to a much coarser and bolder one. By choosing contrasting colors for the two layers of milk paint, you can emphasize the crackle effect.

Once the topcoat is dry, you can either use your piece as is or seal it with a clear coat to protect the finish from staining by water, oil, and dirt. To arrive at a satisfying crackled finish, it's critical that you experiment and make color samples using the entire process before applying it to a piece of furniture.

Prep the wood and brush on the base coat

Milk paint adheres best to raw wood. Sand the wood to the fineness you desire, and remove dust thoroughly after sanding. Mix the milk paint in a non-metallic container following the proportions recommended by the manufacturer. Apply the base color with a natural-bristle brush or a foam brush. You may need two to three base coats to ensure adequate coverage, depending on the color you are using and the porosity of the wood.

Next comes the hide glue

When the base coat is completely dry, brush on a layer of crackle medium. Franklin Titebond cold hide glue works well, as do The Old-Fashioned Milk Paint Company's Antique Crackle and the Real Milk Paint Company's Natural Crackle.

Thin the crackle medium with water to produce a finer pattern, or leave it at full viscosity for a bigger, bolder pattern with wider cracks, revealing more of the base color. Thinning by 1:3—one part warm water to three parts liquid hide glue—and applying a thin, brushed-out layer should result in a fine crackle pattern.

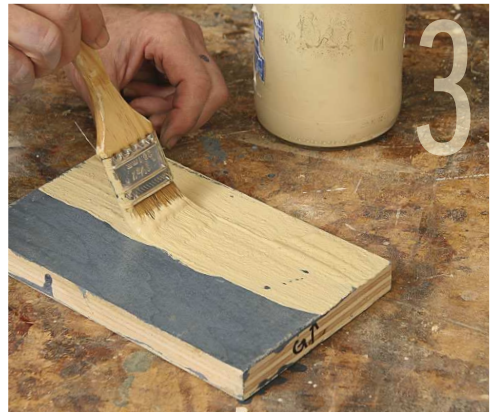
You can adjust the pattern not only by changing the viscosity of the crackle medium, but also by controlling the thickness of the film, and the pattern in which you apply it. Brushing the crackle medium in straight lines, especially at full strength, will typically create a more linear crackle pattern. Stippling with a brush will produce a pattern with fewer rectilinear cracks.

The amount of crackle medium required will vary depending on how thickly you apply it. Expect to use

THREE STEPS TO UNLEASH CRACKLE

Undercoat
Brush a coat of milk paint onto bare wood.

Glue coat
When the undercoat has dried, brush on a layer of hide glue, the crackle medium.



Topcoat
When the glue coat is dry, apply a topcoat of milk paint. Because it doesn't adhere completely to the slick surface of the glue, the paint dries in a crackle pattern.

Bold or fine. *Use contrasting colors of milk paint for the undercoat and topcoat to emphasize the crackle. Hiller applies the glue coat full strength for a coarse crackle pattern, and thins the glue for a fine crackle.*

FIRST CREATE THE UNDERCOAT

Mix up the colors. *Mix fresh milk paint from powder at the start of each job. Hiller used Federal Blue for the base coat of her cabinet and Buttermilk for the topcoat. Several coats may be required to achieve the depth of color you desire.*

NOW GO WITH THE GLUE

Go thin for a finer crackle. *The crackle medium—either standard liquid hide glue or a proprietary product like Antique Crackle from the Old Fashioned Milk Paint Co., can be used full strength for a coarse crackle or thinned with water for a finer crackle.*

The glue goes on thick. *Use a wide brush for quick coverage and straight strokes for a rectilinear crackle pattern. Stippling will produce a more random crackle pattern.*

approximately the same volume of crackle medium as you used milk paint for your first base coat. You may use a foam brush or a bristle brush. It's important not to brush out the glue too much, as it can reduce the effectiveness of the crackle.

Allow the crackle medium to dry completely. This will take at least two hours. You can leave it overnight, or even a week or more, without reducing its effectiveness.

Brush on the top coat

You only get one shot to apply the top color of milk paint, so practice on test pieces. The powder-to-water mixture for this coat of milk paint should be at least 50% powder. Less than that results in foaminess, inadequate coverage, and less crackle. Brush on the milk paint quickly and rather thickly, in straight strokes; if you applied the crackle medium in one direction, brush on the topcoat perpendicular to those strokes to facilitate coverage. You will see the crackle pattern beginning to develop within a few minutes. Once it forms, do not brush over it, as doing so will pull the topcoat off the surface, leaving you with a patch of bare crackle medium ending in a big blob of topcoat.

Clear coat keeps it safe

Allow the topcoat to dry for at least 24 hours. If you plan to apply a protective coating, use a solvent-based finish such as oil-based polyurethane or Danish oil. Don't use water-based protective coatings over a crackle finish—the water will

Photos, except where noted: Jonathan Binzen

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ADD THE TOPCOAT FOR THE CRACKLE

One shot at good crackle. *Apply the topcoat in long strokes with a good-quality brush, well loaded to avoid having to go back.*

Best brush for the job. *Using brushes sized to the part you are painting makes it easier to cover the area quickly and apply just the paint you need.*

reactivate the crackle medium and leave cracks in the clear coat. Unlike with a regular milk-paint finish, you shouldn't scuff-sand a crackle finish before you apply the protective clear coat; sanding will completely change the look of the crackle, producing a mottled effect. To ensure you end up with the look you want, be sure to include the clear protective coat in your test samples.

Finally, bear in mind that a crackled finish will be hard to dust with a rag, since the texture will catch in fabric. Instead, to keep a crackle-finished piece clean, use a feather duster or a vacuum cleaner with a brush attachment. □

Nancy Hiller builds custom furniture in Bloomington, Ind.

For bigger crackle, don't thin the glue

Hiller applied cold liquid hide glue full strength to achieve the coarse crackle pattern she wanted for the back boards inside her cabinet. The undercoat color she chose is Mustard, and the topcoat color is Sea Green, both from the Old Fashioned Milk Paint Co.

WOODWORKERS MART

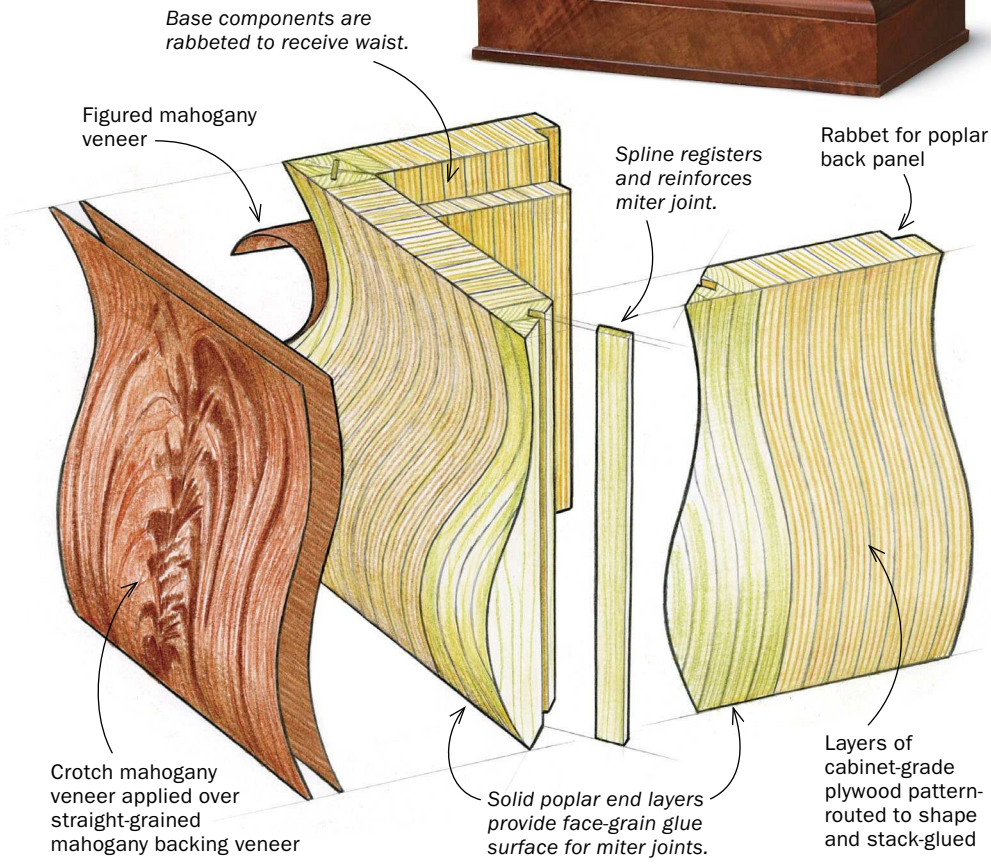
A clock as master class

BY JONATHAN BINZEN

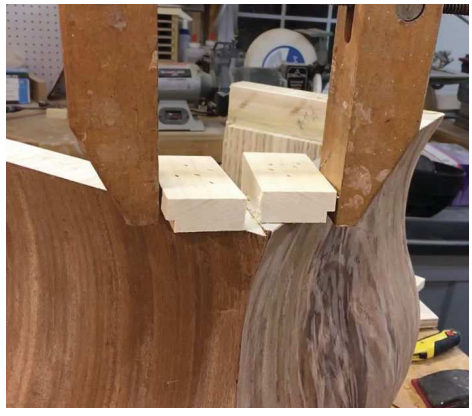
From a technical point of view, building this tall clock was quite a tall order. It combined complex shaping with vacuum veneering, turning, inlay, circular bent lamination, and carving. Yet Dan Strout (see the back cover) describes the build as "well within the ability of the serious amateur furniture maker." To make the project more approachable, Strout thought of it in four main parts: the bombé base, which conceals two secret compartments; the central section, or waist, with its turned columns and crotch-mahogany veneered door; the neck, shaped from poplar, veneered with mahogany, and inlaid with holly stringing; and the drumhead, with its bent-laminated case and circular glass door.

The base, he says, "required the most finesse." Once he had shaped and veneered the parts for its three sides, he was faced with mitering the two front corners. The curves had to match exactly at the points of the miters, or he would have gone through the mahogany veneer in fitting them. He began the miter cuts

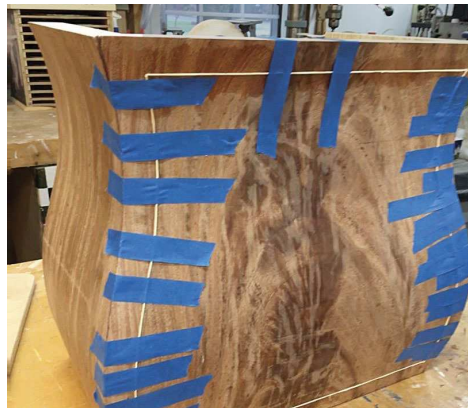
The bombé base



Stacked and shaped. *Strout shaped the bombé base by bandsawing pieces of plywood to rough shape, face-gluing them, and then pattern-routing one from the next.*



Tight squeeze. *After veneering the curves and cutting the miters, Strout glued up using hand-screw clamps and clamping blocks to close the joints, then added band clamps.*



String clamp. *With the base miters glued up, Strout used painter's tape as a clamp while he inlaid holly stringing into the crotch mahogany veneer.*

Photos, except where noted: Dan Strout; this page (top): Jonathan Binzen

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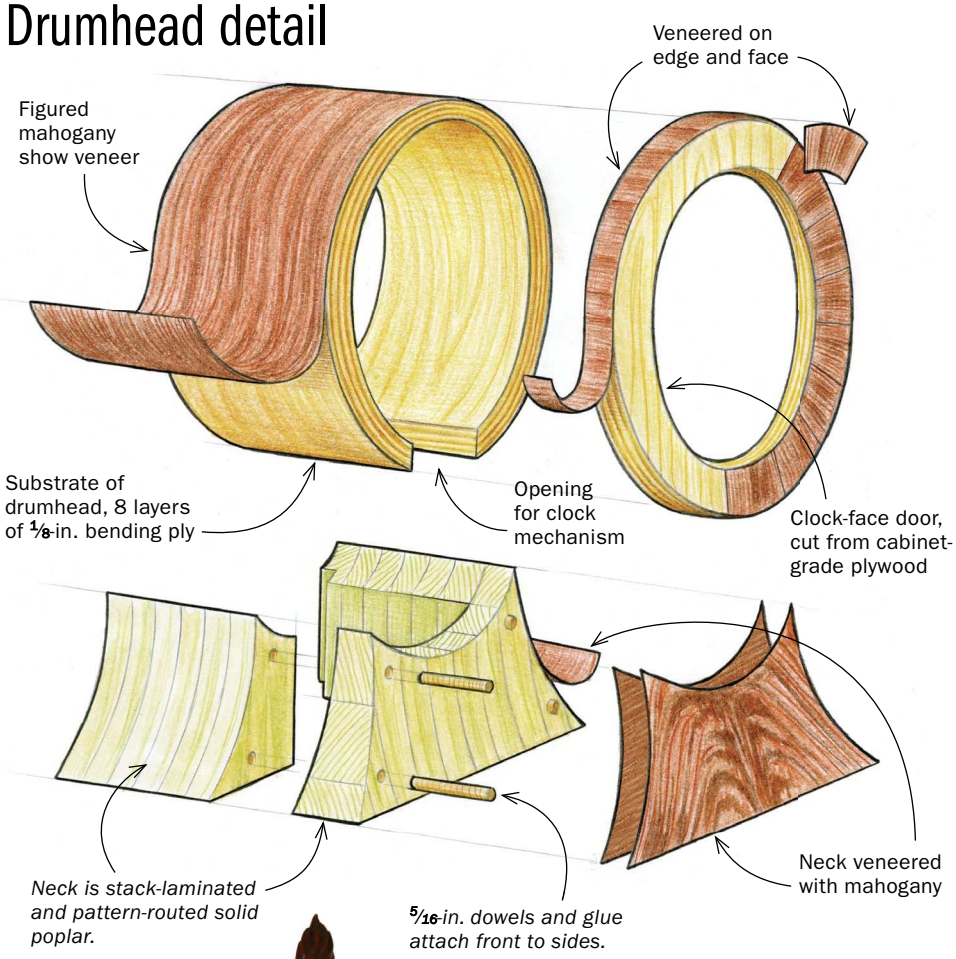
Drumhead detail



at the tablesaw, but didn't have enough blade height to cut them completely, so he finished the cuts with a handsaw and then cleaned up the miters with a block plane.

Strout veneered the front surfaces of the clock with crotch mahogany, which he first de-wrinkled by spraying the sheets with a veneer softener and clamping them between pieces of melamine.

After all the work he put into the clock, he did not skimp on the finish. He began by darkening the mahogany with potassium dichromate, or pot ash, and followed that with a coat of Danish oil "to pop the grain." He did some grain filling with thinned shellac and pumice, and then applied 10 coats of clear shellac. He rubbed out the final coat of shellac with Danish oil and 0000 steel wool, and then polished the piece with amber furniture wax. □

Circular assembly. *To create the drumhead, Strout built a cylindrical form and laminated eight sheets of ⅛-in.-thick bending ply around it, gluing them one at a time.*

Veneer on the drumhead. *With the substrate cured, Strout applied mahogany veneer to the exterior. Later, he cut the drumhead to width and cut out the bottom segment of the circle.*

Decorating the door frame. *Having already veneered the back of the drumhead door frame, Strout wraps veneer around the perimeter. Last, he'll veneer the face of the frame, using wedge-shaped pieces to create radiating grain.*

Photo, this page (bottom left): Jonathan Binzen; drawings: John Tetreault

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Period Imperfect

Dan Strout discovered his passion for woodworking in the early 1990s when he was laid off from a job in engineering and scrambled to make money by building cabinets, millwork, and furniture. He's long since returned to the corporate world, which he says can sometimes feel a bit "plain vanilla." But he's remained immersed in woodworking as a hobby, and in the garage shop behind his house in Milton, Mass., things get pretty interesting.

Strout has an eye for period furniture, but he doesn't build fastidious reproductions. He based his recent tall clock primarily on traditional 19th-century Scottish clocks, adopting their circular "drumhead" on a curved neck, full-round columns at the waist, and figured mahogany veneer. But in place of a rectilinear Scottish base, Strout grafted on a bombé base like those in French and Dutch tall clocks. And as a nod to American furniture, he added some Federal-flavored string inlay in holly, and crowned the piece with a Philadelphia-style flame finial. In the realm of period furniture, Strout acknowledges, such heresies are not taken lightly. "Why would I blend period characteristics that would make a clock purist cringe? Simple. It's what I wanted to build."

—Jonathan Binzen

How They Did It Turn to p. 84 to see how Strout constructed the top and base of his clock.

Photos: Jonathan Binzen