

TAUNTON'S

Fine Woodworking

February 2018 No. 266

Tips for holding work at the bench • Safe ripping at the tablesaw
Simple, shopmade hinge jig • Technique for elegant inlay

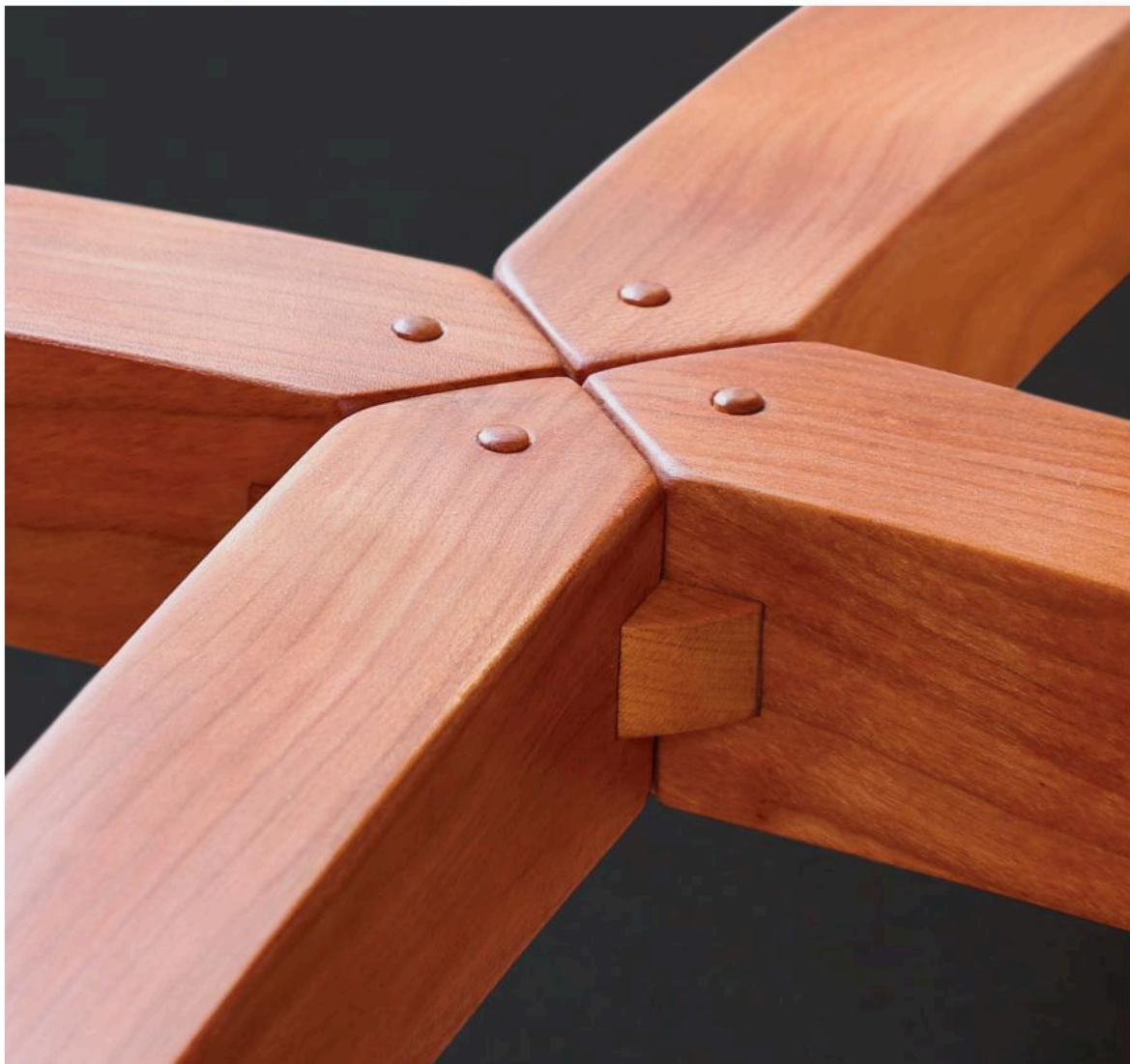


Table puts joinery on display, p. 32



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The background of the advertisement is a rustic wooden surface. Various power tool accessories are scattered across it: a clear plastic case for bits at the top left, a blue bit holder filled with many different sized bits in the center, a blister pack of 10 #2 x 2-3/4" Combo Power Bits at the top right, a gold-colored bit holder with a black handle in the middle right, a silver screwdriver with a black handle at the bottom right, a silver drill bit, a black drill bit, a metal nut, and a small black bit holder. The text 'MORE THAN JUST SCREWS' is overlaid on the left side in white capital letters on blue rectangular backgrounds. At the bottom, contact information and a call to action are provided in white capital letters.

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Inspiration for hands-on living®

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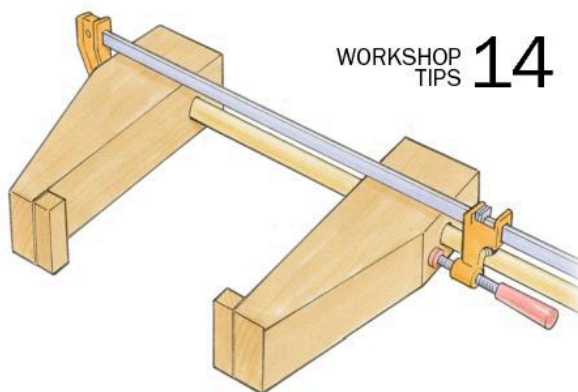
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Visit FineWoodworking.com/266 for online extras, available November 29. And don't miss the collection of free content on our website, including tool reviews, an extensive project gallery, and must-read blogs.

VIDEO

Holding thin stock

In his article on p. 57, Chris Gochnour shows how he uses a hand-screw clamp and tail vise to hold thin stock while planing. Special projects editor Matt Kenney puts this trick to the test.



VIDEO

Little hands, big work

Christian Becksvoort's step stool (p. 52) is sure to be a favorite for the kids around your house. But imagine how much more they'd appreciate it if they helped build it! Watch as our editors build a version of Becksvoort's stool with their own kids.



VIDEO

Behind the design

Tim Coleman's designs (p. 32) are always something to aspire to. Here, he talks about his design process and shows the drawings for a recent cabinet he built.

VIDEO

First look at Veritas marking gauge

Web producer Ben Strano demonstrates the new Veritas micro-adjust wheel marking gauge (p. 51).

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VIDEO WORKSHOP

Carved greenwood bowl

Using tools usually relegated to firewood preparation, Dave Fisher turns a rudimentary log into a refined bowl that brings to light the beauty of the wood within. You'll learn how to:

- Read a log and decide where a bowl lies within it
- Rough-carve the bowl with an ax and drawknife
- Shape the inner bowl with an adze
- Chip-carve a decorative necklace around the rim



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FineWoodworking.com

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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*, P.O. 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.

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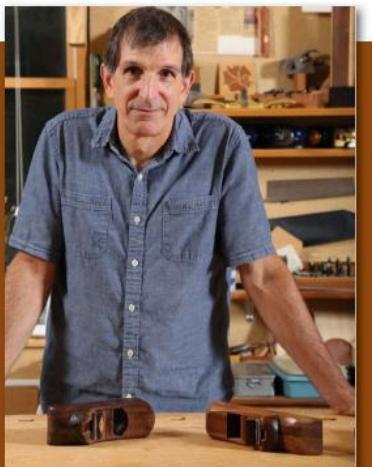
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contributors

Tim Coleman ("Dining Table Shows Off Its Secrets") has been building fine furniture since the 1980s, and the gorgeous sample pieces around his workshop hint at what made the final cut in his labors of love. But one corner is dedicated to another deep passion: cycling. A number of well-tuned, well-loved bikes dominate the wall between his bench area and most of his power tools. Coleman guesses he's ridden most every path in his area, both beaten and less so, since moving to western Massachusetts in 1989.

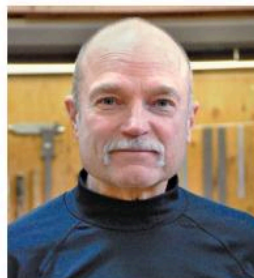


Bob Van Dyke's Connecticut Valley School of Woodworking in Manchester, Conn. has been open since 2000. When Van Dyke ("Ripping Safely on the Tablesaw") was commissioned to replicate mostly high-style furniture for the Strong-Howard House Museum in Windsor, Conn., he and fellow instructor Will Neptune turned a number of the pieces—a highboy, a butterfly table, a tea table, and more—into classes. Students could submit their finished projects to be judged for inclusion in the museum's permanent collection.



Jeff Miller ("Tool Test: Marking Gauges") spends a lot of his time these days working out chair designs. Many of his best chairs started out as stools, which offer a way to explore concepts more quickly. "Learning about furniture design is like learning a language, and there are very few guides to this language available to the woodworker," he says. So he is writing one, attempting to teach others the principles he has picked up over decades. The writing, the building, and the classes he teaches in his Chicago shop and around the country make for a busy but very satisfying career, Miller says.

Ross Day (Designer's Notebook) has been designing and making furniture and teaching for decades. His passion for building furniture began in the late 1970s when he stumbled upon a *Fine Woodworking* article about the British furniture maker Edward Barnsley and James Krenov's book, *A Cabinetmaker's Notebook*. He says, "I didn't know at the time I was looking at some of the best of what is known as studio furniture, objects that are handcrafted in a small shop environment, not factory made." Day later studied with Krenov and then returned to Seattle to begin furniture making full time, where he's still at it today.



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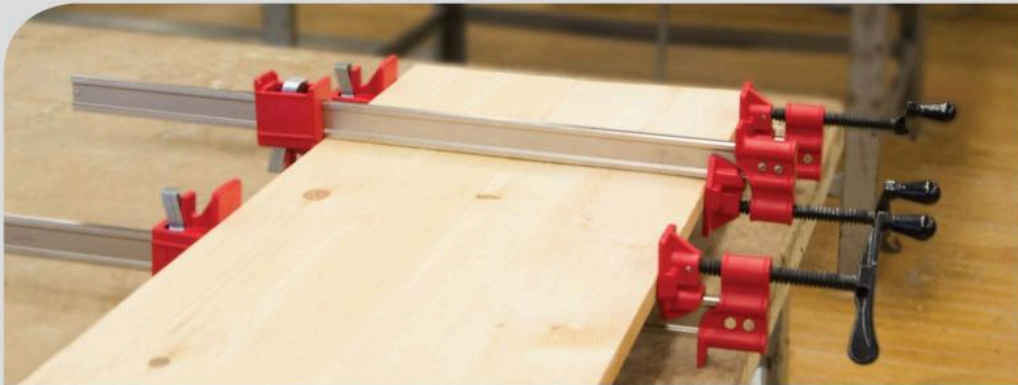
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What's Happening

Exciting year ahead for *Fine Woodworking* and you

Every year the *Fine Woodworking* staff deals with a hideous deadline crunch in the late summer and early fall. This issue, our January/February edition, is the last of this year's cycle. But there's no time for a rest. We have already started planning exciting events and content for 2018.

First, we have introduced a new department in this issue, called *From the Bench*, devoted to inspirational woodworking stories (see p. 86). I can't imagine a better way to roll it out than with our own Mike Pekovich, who eloquently explains why he designs and builds with a purpose—and why you should, too. But this isn't an insider show. We want to hear from you: Tell us your personal tales of why you work wood, about your inspirations and influences, or key turning points in your woodworking journey. You can send stories to Bench@taunton.com; we'll pay for any we publish.

I'm also very happy to announce that *Fine Woodworking Live* is coming back in 2018. It will be at the same great location, the Southbridge Hotel and Conference



Center, in Southbridge, Mass., April 20–22. Last year's event sold out, and we're looking for another packed house. In addition to a robust lineup of vendors, we have a completely new schedule of classes, and some great new events, including an exhibition

showcasing work from two of the country's top woodworking schools, hands-on classes, woodworking trivia, and more. We also will welcome some new faces to the show, including Peter Galbert, Marc Spagnuolo, and Mary May. For more details and to register, go to finewoodworkinglive.com.

Finally, we are partnering to bring *Rough Cut* to public television stations across the country. The popular TV show has a new host for 2018, Tom McLaughlin, a longtime woodworker and teacher and a member of the New Hampshire Furniture Masters. Tom will be demonstrating a variety of techniques as he builds close to a dozen projects.

So stay tuned. There's a lot more. At FineWoodworking.com you'll get great new video workshops, including one on shop machine maintenance and setup and a hand-tool-only project by Chris Gochnour. You'll also get a chance to win great tool prizes throughout the year. So while it's cold and miserable outside this winter, keep warm in your shop, and rest assured there's a great season of woodworking ahead.

—Tom McKenna, editorial director



The best school for woodworking

Over the years, I have eagerly viewed the Readers Gallery and gained inspiration and challenges for potential projects. I note that occasionally you feature the works of the students from various schools and colleges—The College of the Redwoods and North Bennet Street School come to mind. So far, I do not recall you featuring “The Students of The Taunton Press,” of which I am one.

My woodworking journey began quite inconspicuously around the turn of the century when my mother-in-law gave me a copy of *The Basics of Craftsmanship*, where the article “Cutting Through-Dovetails” presented “Tage Frid: I cut pins first” vs. “Christian Becksvoort: I cut tails first.” I favored Christian’s tails-first approach because I liked the fact that he had challenged the tradition of his father. My first attempt was very shabby, but I said to myself, “If I do 10 of these, I might get good.” And I was away!

Some better hand tools were acquired, books were taken from the library, and I read my first issue of *Fine Woodworking*, #162, April 2003. My mother-in-law somehow sensed what was happening and came visiting with a very heavy suitcase. In it was *The Complete Illustrated Guide to Woodworking* in three volumes.

My subscription to *Fine Woodworking* began with issue #170, June 2004, shortly after we had moved to Australia. The family needed beds, and Jeff Miller’s book, *Beds*, became an invaluable resource (I have since built six beds). I acquired a few electric tools, the biggest being a bandsaw as a 50th birthday present to myself (based on advice from Michael Fortune).

My table and chairs featured in the Gallery (see p. 69) have direct links to many *FWW* authors and indirect links to countless other contributors. I remain a student of The Taunton Press and see no hope of ever graduating. But it is the most enjoyable and rewarding school I have ever attended! Thank you for adding this richness to my life.

—WILLIAM A. ANDERSON,
Queensland, Australia

Fine Woodworking

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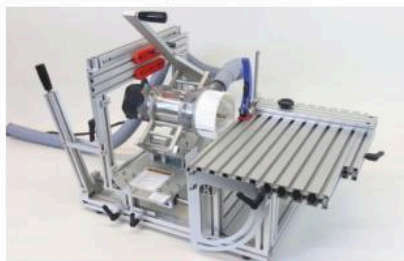
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workshop tips

Best Tip



Dan Sweeny has warm childhood memories of woodworking with his dad, and these days he has his own dream shop, a 700-sq.-ft. space with a great sound system. Sound matters to Sweeny, who is the principle bassist in a regional orchestra. When he's not playing music or going to work as a mechanical engineer, he makes wood parts for basses and furniture for friends.

Bandsaw jig cuts perfect dovetails

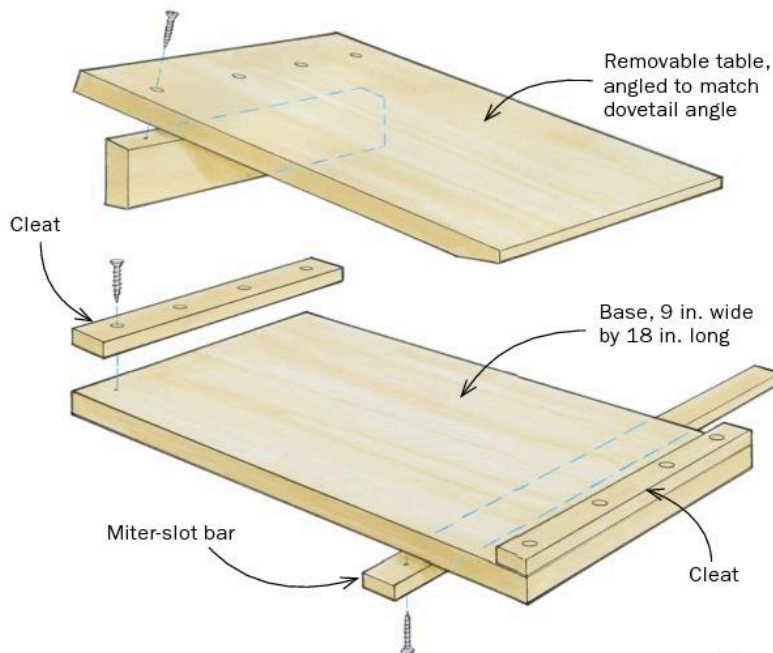
I recently invented a jig that makes great through-dovetails on the bandsaw—both pins and tails. It cuts the cheeks and also lets you remove some of the waste, leaving just a bit of chisel work. You need only a moderate skill level to use the jig but the results are super: pins as narrow as you like and a level of precision that is difficult for some of us to produce with hand tools alone.

The base of the jig is a sliding table with a wood bar that fits in the miter slot on your bandsaw table. The tails are cut on that table with a small tapered fence holding the workpiece at the correct angle. For the pins, a sloped table fits between two cleats on the flat one, and a T-square holds the workpiece in position. Whether you want to cut pins or tails first, you'll need to lay those out clearly, and transfer the layout precisely from pins to tails or vice-versa. With just a little practice, you can cut the second half of the joint for a very precise fit with the first half, with no additional fitting needed.

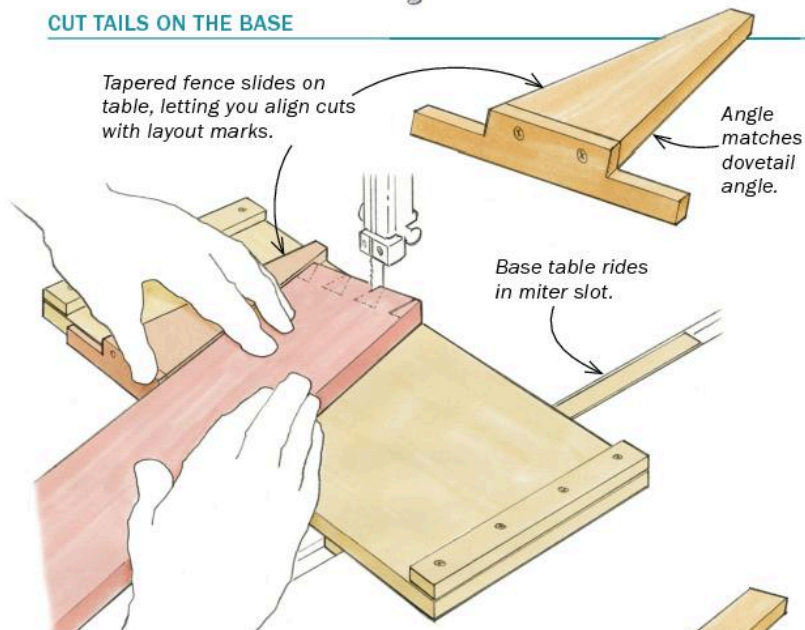
—DAN SWEENY, Westlake, Ohio

A Reward for the Best Tip

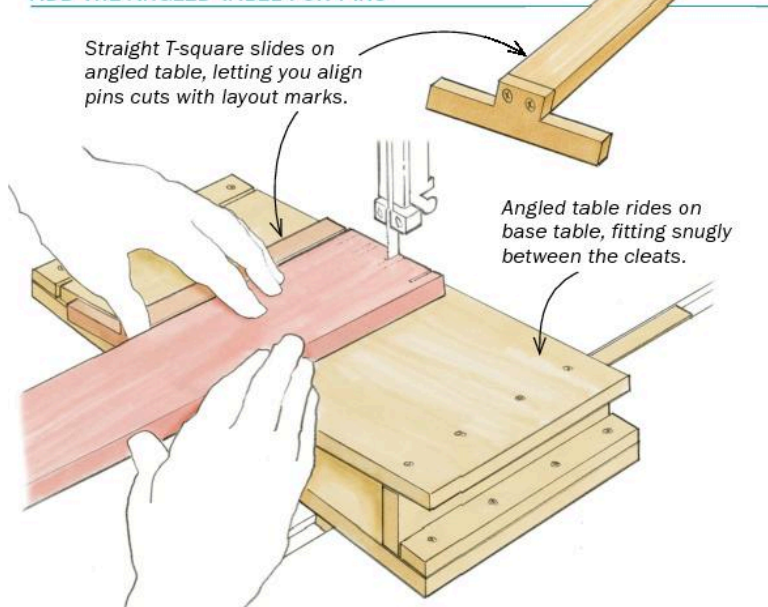
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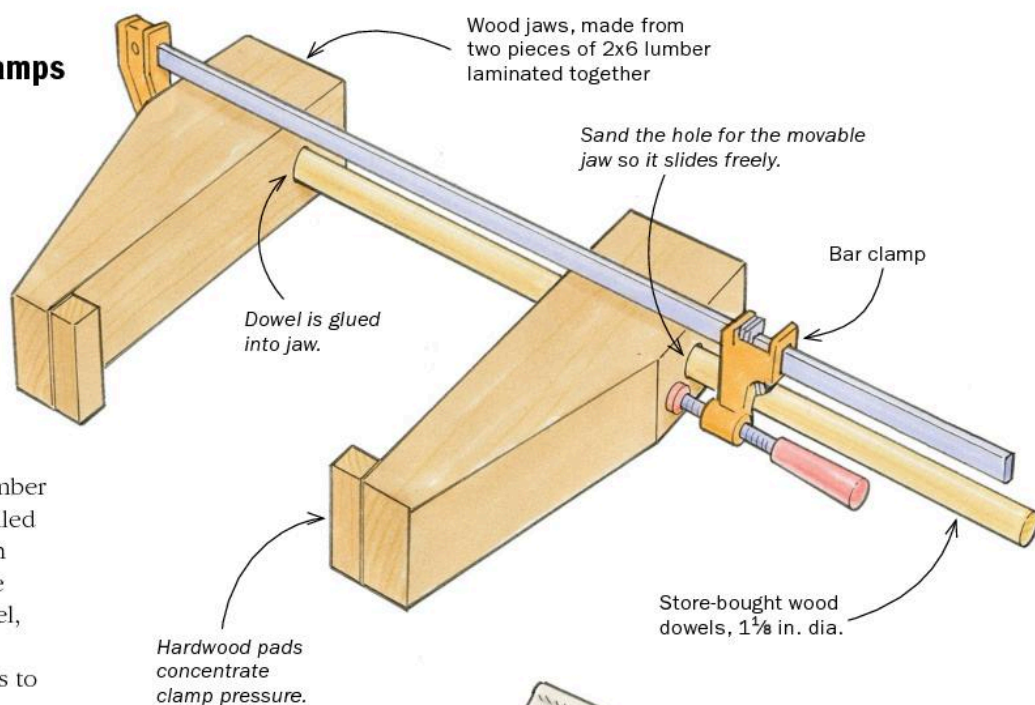
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Wood jaws extend the reach of clamps

When working on a staircase, I needed a way to reach past a banister and apply clamp pressure. So I devised these jaw extenders for my F-style bar clamps. I later realized they would work for almost any job where I wanted to extend the clamp's reach. A hole could be drilled through both jaws if you wanted to use a pipe clamp.

I made the wood jaws a bit beefy for the job at hand, but they could be sized in all sorts of ways. I used construction lumber and bought a dowel. Both jaws are drilled for the dowel, and the fixed jaw is glued in place on one end. Another option is to use a length of 2x2 lumber instead of the dowel, dadoing each half of each jaw to create a square hole. I added small pads to the jaws to concentrate the clamp pressure.

—ROGER KALDAHL, Eugene, Ore.

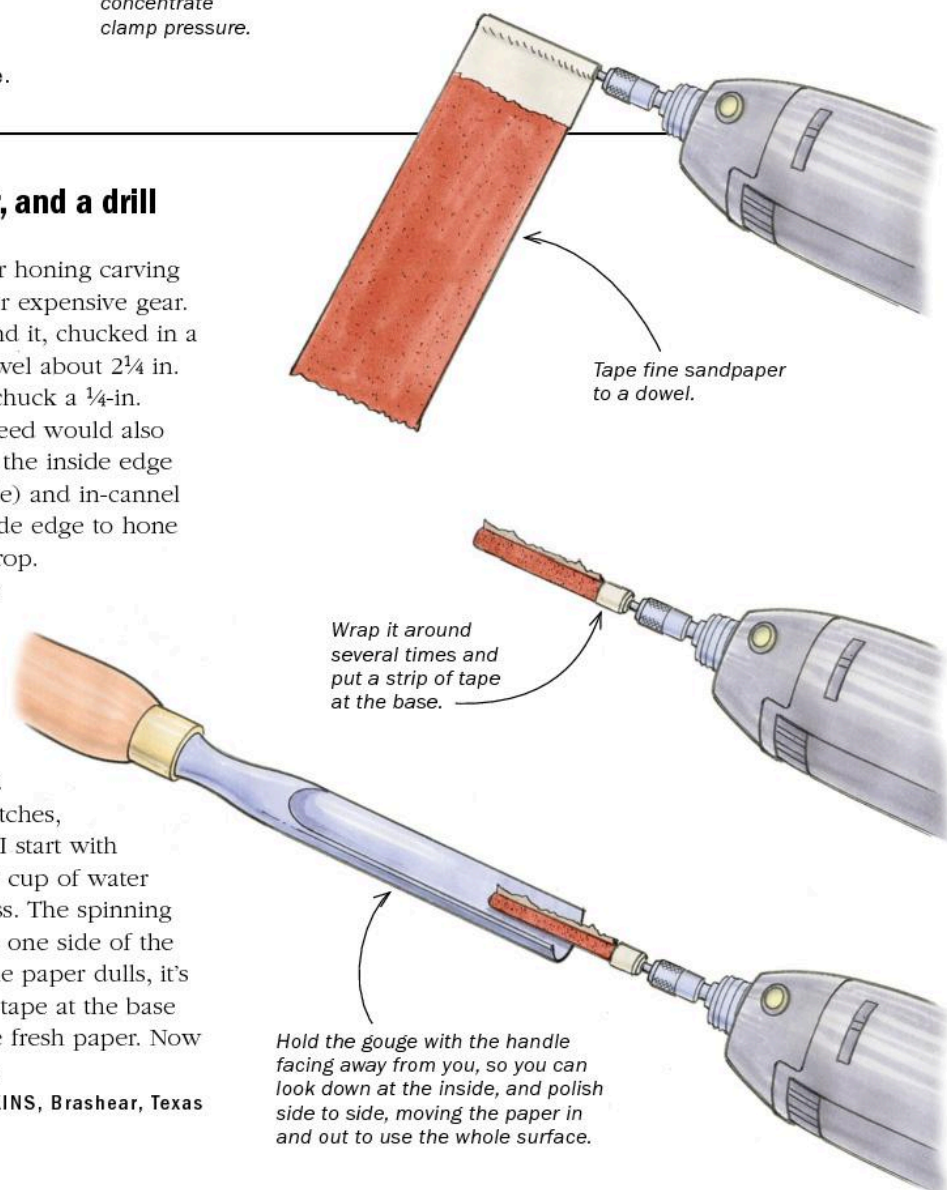


Hone gouges with a dowel, sandpaper, and a drill

Here is a simple but effective shopmade tool for honing carving gouges, taking the place of slip stones and other expensive gear. It's a dowel with fine sandpaper wrapped around it, chucked in a rotary tool. For smaller gouges I use a 1/8-in. dowel about 2 1/4 in. long in a Dremel tool, and for larger gouges, I chuck a 1/4-in. rod in a die grinder. A drill set on its highest speed would also work. The spinning roll does a beautiful job on the inside edge of gouges, both out-cannel (bevel on the outside) and in-cannel (bevel on the inside). This leaves only the outside edge to hone on normal stones, finishing up with a leather strop.

The trick lies in how you wrap the sandpaper around the dowel. Cut a strip of wet-or-dry paper wide enough to fit the exposed rod and long enough to make several wraps around it. Tape the sandpaper to the rod as shown and wind it on tightly. Then use a thin piece of tape to bind the paper at the base. That's it. If the gouge has particularly nasty scratches, I start with 400-grit paper, but more commonly I start with 800 grit and work my way up to 2,500. I keep a cup of water handy and dip the paper to lubricate the process. The spinning sandpaper roll will have a tendency to catch on one side of the gouge. So I stop just short of that side. When the paper dulls, it's easy to renew: Just make a short tear along the tape at the base and then tear off the used section to expose the fresh paper. Now I no longer avoid tuning up new or old gouges.

—KIRK HOPKINS, Brashear, Texas



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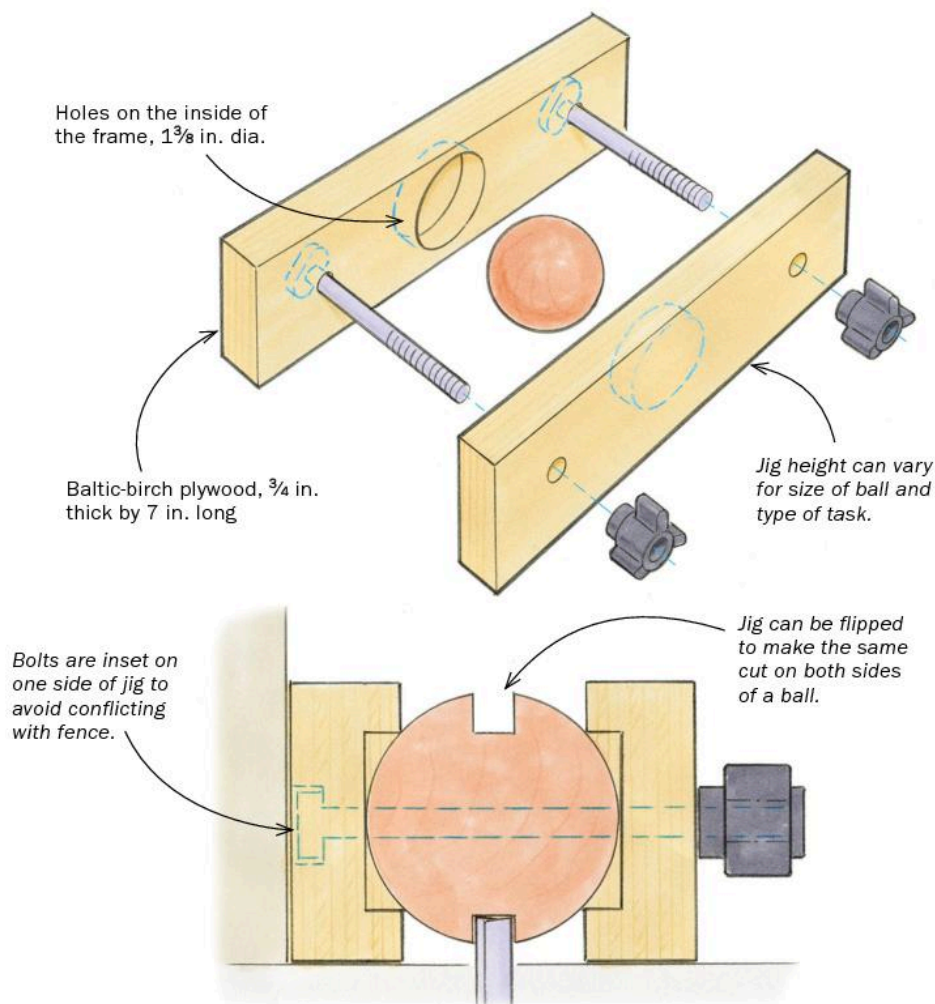
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Ball-holder jig lets you machine a sphere in multiple ways

My friend Louis DeHan was making a decorative box with a top ornament composed of a turned ball held between two small posts. The problem was figuring out how to safely and securely hold the ball while cutting $\frac{1}{4}$ -in.-wide slots in it for the arms. We came up with a simple jig that stabilizes the ball and creates reference surfaces that could ride on a number of machines, such as a tablesaw, router table, or drill press, for safe machining or drilling. It's made of $\frac{3}{4}$ -in.-thick Baltic-birch plywood. To grip the ball, cut stopped holes on both inside faces of the jig with a Forstner bit. The bolts that hold the jig together are inset on one side so the jig can run against a fence. We used the jig on the router table. We ran it over the bit, flipped the jig 180° , and ran it through again. Worked like a charm.

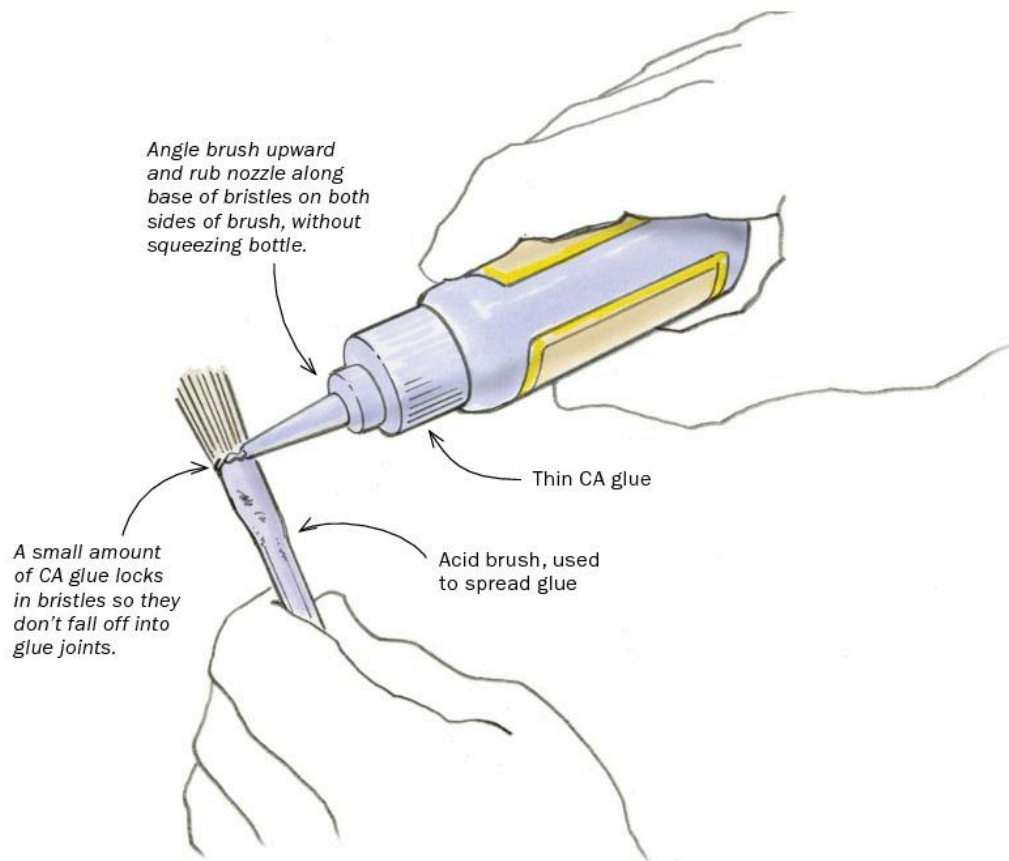
—LAWRENCE KILLINGSWORTH, Spokane, Wash.



Keep glue brushes from losing their bristles

I buy cheap acid brushes in packs of 36 and use them for spreading glue. They work great but always seem to drop some bristles in the glue joint. I've tried hammering the base of the brush but bristles still drop out. I recently found a better solution. Put just a drop of thin cyanoacrylate (CA) glue on both sides of the brush at the base of the bristles, and you won't lose a single one. To apply the glue, hold up the brush at an angle so the glue doesn't run down to the tip and harden all the bristles. The thin CA glue is like water, so don't squeeze the bottle; just rub it along the bristles on both sides and let a little glue soak into the ferrule area. I have also used this on 1- and 2-in. chip brushes, and it works great every time.

—MIKE CYR, Westport, Mass.



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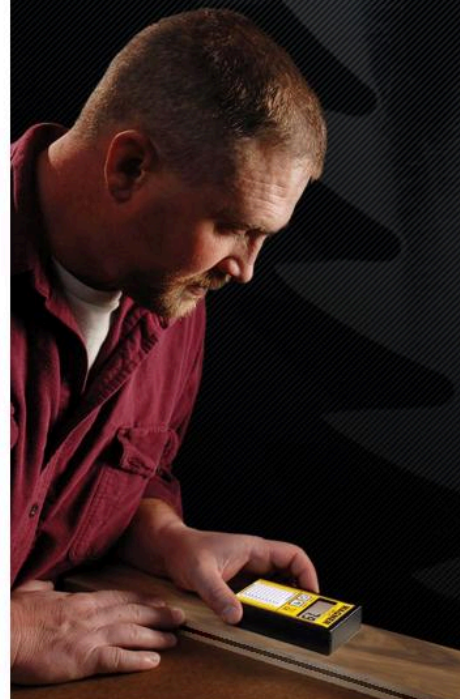
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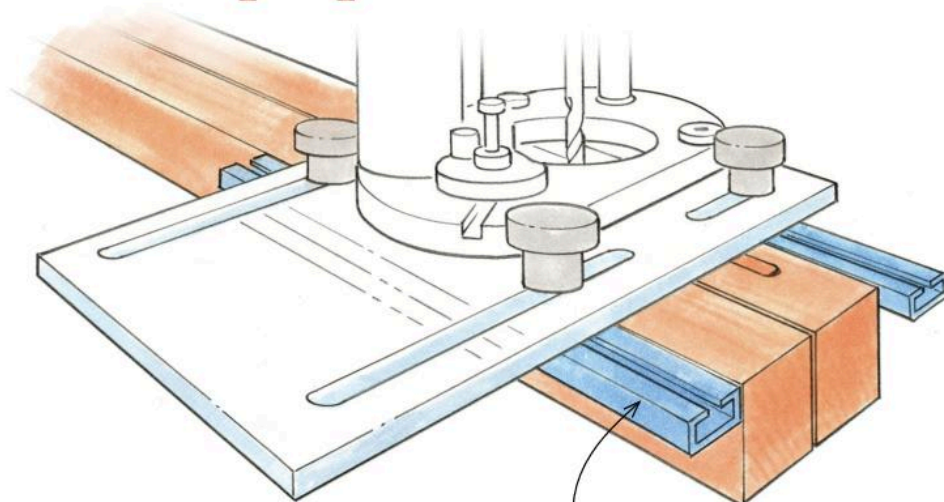


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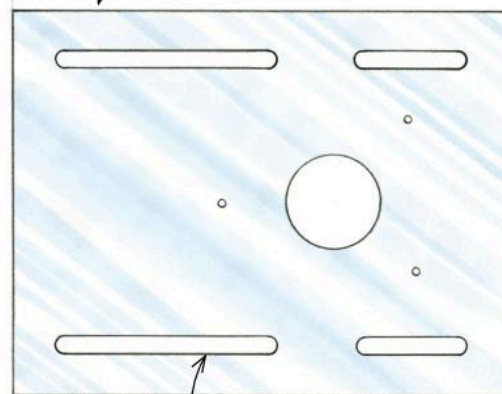
Mortising base works on any plunge router

This auxiliary base for my plunge router makes mortises in all sorts of furniture parts. I made it from ½-in.-thick acrylic, slotting it to attach two pieces of T-track, which hug the workpiece to guide the router. You can saw, sand, and rout the acrylic like wood. The acrylic lets you see your end marks when routing, and the fences slide smoothly. I often clamp legs together in pairs to create a more stable surface, reversing the jig to cut matching mortises in both legs. For narrower stock, I attach the T-tracks to wood fences as shown to add stability.

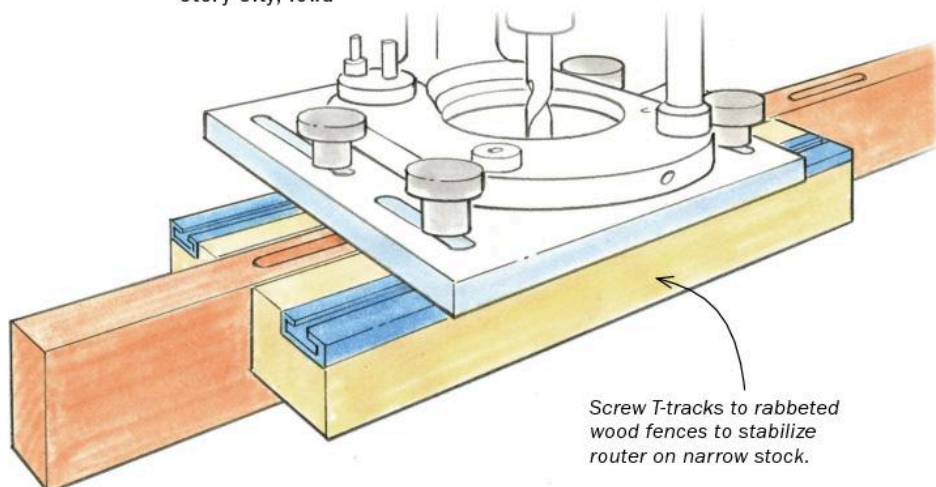
—DEAN M. VANDE GRIEND,
Story City, Iowa

T-tracks, attached to the base with clamp knobs (with 1-in.-long bolts), act as fences for most workpieces.

Base, ½-in.-thick acrylic, 7 in. wide by 9 in. long



Slots, 2 in. long and 4 in. long, spaced 1½ in. apart



Screw T-tracks to rabbeted wood fences to stabilize router on narrow stock.

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■ MACHINES

Trusted bandsaw gets a big brother

LAGUNA TOOLS' 14BX BANDSAW has gained a following as a great midsize bandsaw, and now there's a big brother tracking in its footsteps: the 18BX. With 3 hp, an 18-in. throat, 16 in. of resaw capacity, a 20-in. by 26-in. table, and more than 400 lb. of mass, the 18BX brings serious capabilities to the woodshop.

The new saw includes one of my favorite features of the BX line: a very effective disc brake, which can help prevent injuries from silent, coasting blades. Dust collection is also very effective, with a 4-in. port directly below the lower blade guides and a second port at the bottom of the lower wheelhouse. To facilitate blade changes, a magnetic strip on the hinged blade guard makes it easy to open and close. The blade guides offer great blade support, though the lower guides are a bit awkward to access.

The 22¾-in.-long extruded aluminum fence has a 5¾-in.-tall face for great resawing support and can quickly be reconfigured to present a ½-in. edge to allow the guides to be set close to thin stock. The fence also has a T-track at the top for a flip stop to glide in, and the stop moves easily and locks securely. Unfortunately, I had to tweak the fence to make it square to the tabletop, and it wasn't flat across the vertical face. However, I've been assured by Laguna this hiccup will have been taken care of by the time this review is published, and a company representative told me Laguna will replace any problematic fences that were shipped before the problem was found.

Overall, the 18BX is a lot of saw for the price. And if you add the \$175 mobile base, it can be easily tucked away until some serious sawing summons the big boy.

—Contributing editor Roland Johnson wrote the book on bandsaws (Taunton's Complete Illustrated Guide to Bandsaws, The Taunton Press, 2014).

Bandsaw by Laguna
Model 18BX
\$2,000



Rigid resaw. The upper guide post is extremely rigid, keeping the guides in place and creating an ideal setup for resawing.



No tools needed. You can adjust the ceramic blade guides with your fingers, so no worrying about finding the right Allen wrench.



Flip stop included. The Laguna comes with a sliding flip stop that will make cutting accurate tenon cheeks a breeze.



Pump the brake. Light pressure is all that's needed for this disc brake, which cuts power and stops the blade quickly and effectively.

■ JIGS AND GUIDES

Add some magic to dowel joints

DOWELS ARE ONE OF THE QUICKEST WAYS to put furniture together. It's good to use more than one dowel at each joint to keep adjoining surfaces parallel and prevent racking, but lining up mating holes can be tricky. The Dowel Wizard makes the process easy. Two hardened steel drill guides are spaced 1 in. apart with a registration line in the middle. The drill guides are threaded for easy and accurate interchange, and three sizes ($\frac{3}{16}$ in., $\frac{1}{4}$ in., and $\frac{3}{8}$ in.) come with the tool.

The overall design is stellar. Two pivot arms connect the guide block to the side plates, creating a parallelogram that automatically and quickly centers the guides to accommodate workpieces of different thicknesses. The Dowel Wizard will accept stock up to 2 in. thick. A clearly marked centerline makes alignment a snap. The manufacturer recommends using a clamp to hold the guide in place, but I found I could hold it securely enough by hand to drill the holes. When you're finished using the jig, it folds flat to fit easily in an apron pocket.

One drawback to the tool is that when you're drilling only one hole, your registration mark will have to be offset $\frac{1}{2}$ in. to match the offset of the centerline. Also, while the jig can handle face to edge joints—all you do is remove one of the side plates—I found it inconvenient.

—R.J.



Right down the middle. A pair of pivoting arms ensures that dowels are centered on stock up to 2 in. wide.



■ HAND TOOLS

Smart design makes mortise chisels stand out

CHISELS ARE AMONG THE SIMPLEST of woodworking tools, so every little detail is noticeable. The Veritas mortise chisels' superior design combines many little elements in a way that sets them apart from others on the market.

The blades' sides taper slightly to reduce resistance when levering out waste. The taper also lets you redirect an errant cut. Another nice feature is the radius at the heel of the bevel. This transition provides a fulcrum that also aids in levering.

The handles are impressive, too. They're spacious and comfortable, with flats on the sides that help orient your grip. They're attached to the blades with a barbed tang, but there's also a tapered

ferrule that mimics a socket, giving the tool the qualities of both tang- and socket-style chisels.

I tested the mortise chisels in PM-V11, a proprietary tool steel developed by Veritas. Their details make the arduous task of mortising by hand much easier. I recommend them for their quality and performance.

—Contributing editor Chris Gochnour shows how to chop a mortise by hand on pp. 24–28.



■ ACCESSORIES

Mobilize your machines

GRIZZLY'S NEW BEAR CRAWL MOBILE BASE boasts features you normally find on bases costing two or three times as much: a tubular steel frame with a whopping 1,200 lb. of capacity. It can be adjusted from 19 in. square to 29½ in. square, and if you are willing to trim its rails, it can be made smaller. So it should accommodate all of the machines in most shops. Inside each corner bracket is a landing pad that will support either a closed base or the legs of an open one.

With the base resting on its rubber-toed feet and non-swiveling casters, the machine was rock-solid in use. I also flipped the foot levers to take the machine for a spin. With its beefy frame, big ball-bearing casters, and urethane tires, the Bear Crawl handled its heavy cargo like a dream, gliding over my concrete floor and riding easily over chips and debris. I also appreciated the big foot levers, which are easy to operate even when you have to reach your foot into a corner to access them.

I haven't tried every mobile base on the market, but I can't imagine one working much better than this one. If you are motivated to mobilize, this new Grizzly base offers amazing value.

—Asa Christiana is the author of *Build Stuff with Wood* (The Taunton Press, 2017).



Grizzly Bear Crawl Heavy-Duty Mobile Base

Model T28000

\$70



Assemble in place. You can build the base around the machine. You'll just need a way to support the machine while you put the base together. Blocking works fine.



Rock steady. Pressing down the foot levers raises the base off its swivel casters and onto strong steel feet with rubber toes, making the machine very stable in use.

Universal Dust-Free Router Hood by Oneida

\$35

Snaps in. The base is made of two plastic disks that sandwich together, providing a groove for the dust-catching hood to rotate freely. Because it can rotate, the open side of the hood can ride against the stock to contain the shavings and direct them toward a dust port.



■ ACCESSORIES

Router hood has you covered

THERE ARE FEW TOOLS MESSIER than a handheld router, especially when pattern-routing thick material with spiral bits. Oneida's new router base cleans up the mess, and it won a Visionary New Product Award from AWFS.

The base, which fits most common routers, comes with two interchangeable, open-sided hoods. One is 2¼ in. tall, accommodating 2 in. of bit extension, and the other is ⅝ in. tall, which allows bench clearance when routing the edge of a ¾-in. board. The pieces simply snap into place with a squeeze of the hood sides. The hose connection is another two-piece affair that swivels around the top of the base as far as the router support rods allow. These pieces also snap together, making it easy to clear big chips if they get caught. While putting the tool through its paces, I had a few shavings escape through the top of the base, but nothing escaped below the hood. Impressive.

The maximum bit diameter you can use is 2½ in., or 1¼ in. when you are plunge routing. Also, the hose adapter won't fit Bosch or Festool hoses without a proprietary accessory hose from Oneida.

—R.J.

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The hand-cut mortise and tenon

MORTISE GAUGE AND MORTISE CHISEL
ARE KEYS TO HELPING MAKE
THIS TIME-TESTED JOINT

BY CHRIS GOCHNOUR

This article builds on the skills from my previous Handwork joinery lessons (the half-lap, the bridge joint, and the mitered bridge joint) and adds a mortise gauge and a mortise chisel. I focus on through-mortise and tenons here for two reasons. First, they're stronger because they offer more long-grain glue surface, and the long grain of the tenon going through the stile helps the stile resist splitting. Second, your frames will more likely be flat and without twist because you mortise halfway through from both edges. Plus, through-mortise and tenons take about the same time as stopped ones.

In this example, the through-mortise is $\frac{1}{4}$ in. wide by $1\frac{3}{4}$ in. long by $2\frac{1}{2}$ in. deep—a typical size for a frame-and-panel door. The rail gets the tenon and the stile is mortised.

Chris Gochmour, a furniture maker based in Salt Lake City, teaches hand-tool skills around the United States. See him at Fine Woodworking Live 2018 (finewoodworkinglive.com).

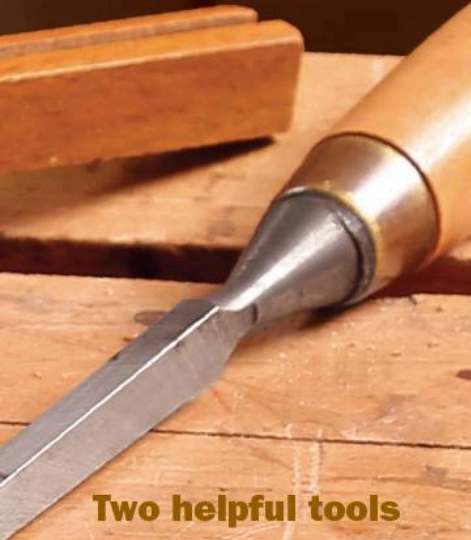




Mark the mortise length. Start by marking the rail width on the stile, then measure in $\frac{3}{8}$ in. to locate the mortise ends.



Set the mortise gauge using the chisel. Adjust the pins so the $\frac{1}{4}$ -in. chisel drops just inside them. Keep this setting for the whole process. Set the fence to center the mortise on the stock.



Two helpful tools

A mortise gauge resembles a marking gauge, but instead of one pin, it has two—one fixed and one adjustable. The gauge also has a moveable fence that, once set to the desired position, can be locked in place with a thumbscrew.

Mortise chisels excel at chopping mortises because of their stout construction. They can withstand heavy mallet blows and some levering to remove waste. Plus, the long bevel shears the wood fibers as you drive it downward—a key to mortising.



Scribe the mortise walls. Run the gauge between the end lines of the mortise on each edge of the stock. Make sure to reference off the show face.

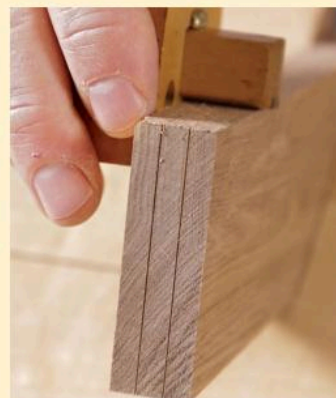


Knife the mortise ends. With the mortise walls scribed, knife the mortise ends along the pencil lines, starting and stopping at each scribe line. The knifed line will register your chisel when you chop.

USE THE SAME GAUGE SETTING FOR THE TENON



Lay out the tenon shoulders. The length of the tenon should equal the width of the stile. Use a knife and square to wrap the shoulder line around the piece.



Mark the cheeks. With the mortise gauge at the same setting, and again referencing off the show face, scribe the edges and end of the rail.



Scribe the tenon's width. Mark $\frac{3}{8}$ in. from both edges. Scribe the ends only. After you cut the cheeks, bring these marks down the tenon.

Mortise

Make a space for your chisel. Starting on the inside edge, make stop cuts with a chisel at the ends of the mortise. With the chisel bevel down, lift out a shaving between the cuts. This groove helps precisely register your chisel.



Drill a starter hole. Bore a 1/4-in.-dia. hole halfway through the stile near the mortise end closer to you. This hole enables the chisel to plunge deeply right off the bat.



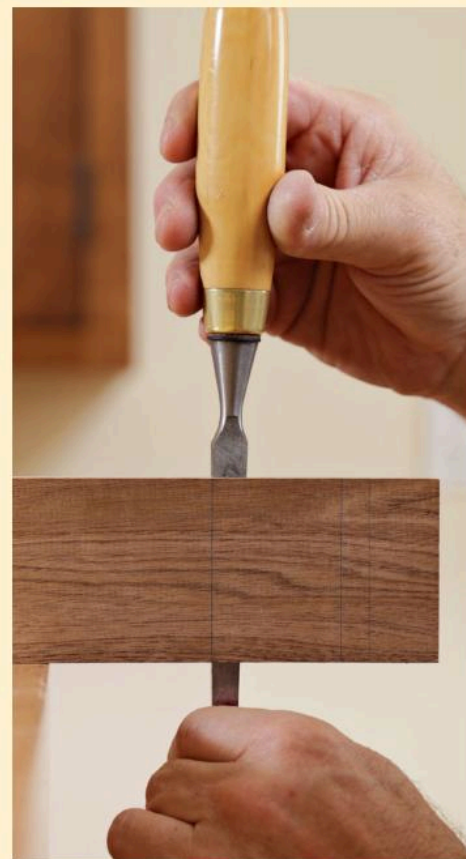
Draw your depth gauge. To monitor the depth of cut, draw a mark around the chisel representing slightly more than half the width of the stile.



Chop. The key to effective mortising is to let the long bevel of the chisel make shearing cuts. Start 1/8 in. in front of the hole, with the chisel bevel facing away from you. Angle the handle toward you when chopping so the bevel is plumb. Drive the chisel 1/2 in. or so deep.



Lever and repeat. Lever the waste, and move the chisel 1/8 in. farther. Chop and lever again. When you lever, make sure the fibers are free to move. At the ends of the mortise, rotate the chisel so the bevel is facing inward.



Mortise the other edge and check the ends. Repeat the mortising steps on the other edge. Once you're through on both sides, scrape away any remaining debris until the chisel can extend to the interior pencil lines.

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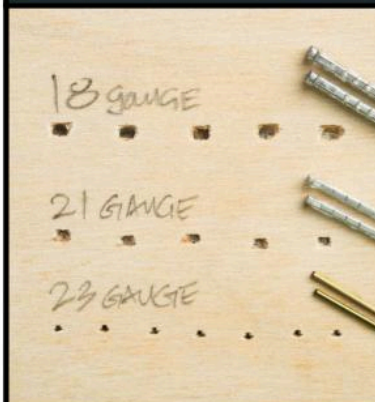
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Tenon

Cut the cheeks. On the waste side of the layout lines, cut as close as possible but never take the lines. With the handle lowered, follow the mark down the edge facing you. Flip the board 180° and cut from this edge as before. Finish by raising the handle and sawing the middle all the way to the shoulder. The two angled kerfs will guide the saw.



Define the shoulder. Use a 1-in. paring chisel to cut a bevel on the waste side of the knifed shoulder lines.



Cut the shoulder. Place a saw into the bevel and butt the saw teeth against the tenon shoulder. Next, with a steady hand, cut the shoulder down to the cheek. Repeat on the other side.

Bring the tenon to width. Use the marking gauge set at $\frac{3}{8}$ in. to extend the mark down the tenon's face from its end. Next, make a sawcut at the shoulder from the outside edge of the tenon to the scribe mark. Do this on both sides of the tenon. Then remove the waste with a ripcut down to the shoulder.



Fit the joint. Spread pencil lead on the mortise walls and then assemble the joint as far as you can. Remove the tenon; graphite will be on the tight spots. High spots inside the mortise may also be burnished. Remove these with a chisel or plane until the fit is right. If the pieces are out of square, relieve the areas pushing the joint out of alignment.



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If you love turning but don't have the time or equipment it takes to effectively sharpen your tools, you have to check out Woodpeckers new *Ultra-Shear* line. Just like other carbide insert tools, *Ultra-Shear* tools have a short learning curve, simply keep the tool flat and level on the centerline of the workpiece and cut the shape you want.

But *Ultra-Shear* goes even further, delivering a spectacular surface finish with a technique called **shear scraping**. Roll the tool right or left on your tool rest and you will feel it land solidly on a secondary bearing surface. This sets your cutting edge at 45° to the stock. Coming into the work at this angle, the wood fibers slice cleanly, virtually eliminating sanding. The exclusive shape of the *Ultra-Shear* shaft allows you to switch from aggressive stock removal to super-fine finishing in the blink of an eye.

The Sharpest, Longest Lasting Inserts

On the "business end", Woodpeckers development team worked hand in hand with the best carbide manufacturer in the country to give you the best inserts on the market. It starts with a **nano-grain** carbide material.

This extremely fine-grained carbide can be polished to a mirror finish, yielding a cleaner, sharper edge. Yet it is tough enough to hold that edge longer than virtually every other insert on the market.



Solid Support for the Insert Means Chatter-Free Cuts

The alloy steel shaft undergoes a two-step hardening process giving you a tool that floats smoothly across your tool rest and resists vibration, even when extended well over the tool rest. The tool pocket machined into the shaft supports the insert with three-point contact, not just the clamping force of the screw. You get a tool that feels and responds even better than most conventional tools.



Keep the tool flat on the tool rest and level to the ground for fast stock removal and basic shaping cuts.



For ultra-fine finishing cuts, roll the tool right or left until it lands on the 45° bearing surface. Now, take a light pass with the tool still level. You'll be amazed at the clean cut and smooth finish.



Detail tool has two styles of tips, full sharp (supplied as standard) for creating precise vee lines and radius point for making small beads and coves (optional).

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Classically inspired

BY ROSS DAY

For this chair, Wishbone 2, my client wanted eight chairs to match a minimalist dining table. My design was sparked by a chair she had in the house—a chrome and caned-seat version of Italian architect Gio Ponti's classic Superleggera chair. I set out to make my own attempt at a very light, strong chair.

The hardest part about design inspiration is to avoid falling into the trap of largely copying the existing design. Instead you want to create something you can call your own. In the end, your design should whisper an homage to the original rather than scream back at it.

The minimalism of the original chair is its most important feature. To carry this concept into the new chair, the individual pieces needed to be narrow and thin, yet the nature of the materials had to be considered and respected. I had to solve the inherent construction challenges with just the right joinery techniques to make the chair attractive and still able to stand the test of time.

Merging the streamlined design of my chair with the appropriate construction was not easy. The client wanted the cherry frame members to be as thin as the metal version of Superleggera. Corner joints in welded steel at $\frac{3}{4}$ in. dia. are one thing, but wood is an entirely



Let there be lightness. Gio Ponti's classic Superleggera (Italian for super light) chair weighs only 1.7 kg. When Day found this image from a 1957 ad for the chair in Phaidon Design Classics, it really hit home just how light the chair is. Sixty years later the chair is still in production. Day's wood chair weighs in at 3.6 kg.



From idea to finished piece. Once Day comes up with a basic design direction, he begins to generate ideas and develop them in a multi-step process of rough sketches, 1:8 scale hardline drawings, and full-scale drawings on $\frac{1}{4}$ -in. MDF. Finally, he creates a full-scale functional mockup, and then he moves on to the real deal.



different matter. I wanted to push the limits of wood as a material a little bit, but not beyond capacity.

Frankly, I had structural concerns about the wood version of the Superleggera, specifically around the seat. In each corner the top stretchers came into a very thin leg, leaving virtually no room for joinery. And what joinery there was posed a short-grain problem at the top of the front legs. Of course, the Superleggera's multiple lower stretchers were meant to pick up that load, but in my design I wanted fewer low stretchers. So I needed to somehow beef up the joinery around the seat to maintain structural integrity without compromising the chair's physical and visual lightness.

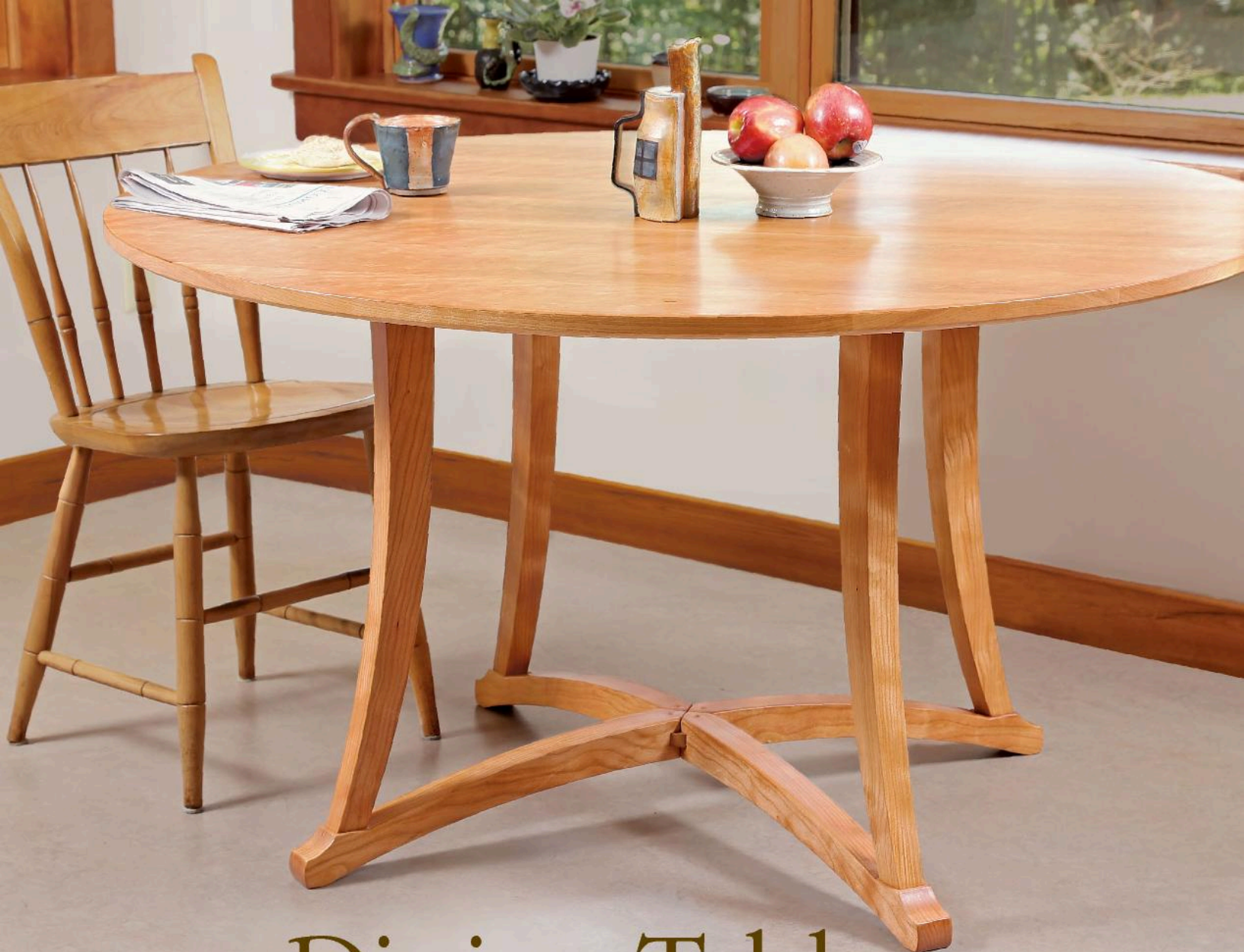
Deciding to cane the seat helped resolve these issues. Because caning is a wrapped seat covering, it allowed me to add some heftier corner joinery around the seat. It concealed thick stretchers that allowed me to offset deep tenons front to back where most of the stress occurs. I also put double tenons in each corner. This joinery combination along with some corner blocks alleviated my structural concerns. I was also pleased with the caning's texture and color, which complements the cherry. And weaving the caning in a herringbone pattern adds geometric visual interest.

For the back rest, I added another influence, a wishbone shape à la Hans Wegner. I did a three-ply bent-lamination, once again strong and light. By keeping track of the sequence of the sawn veneers, I was able to make sure the lamination gluelines were insignificant.

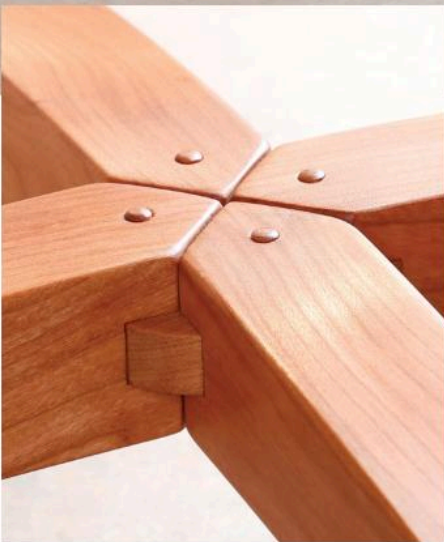
The Superleggera chair inspired me to design very light and strong chairs, with my own signature, that are used and loved every day. □

Ross Day is a furniture maker in Poulsbo, Wash.





Dining Table Shows Off Its Secrets



Exposed joinery,
echoed shapes,
and elegant curves
on display

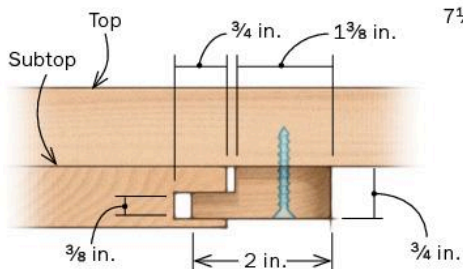
BY TIMOTHY COLEMAN

Well-executed joinery is at the heart of every piece of furniture I make, but it's often hidden. However, when designing this cherry table, with its stretchers so low to the floor—and therefore quite visible—I made the stretchers' central joinery a focal point by exposing it.

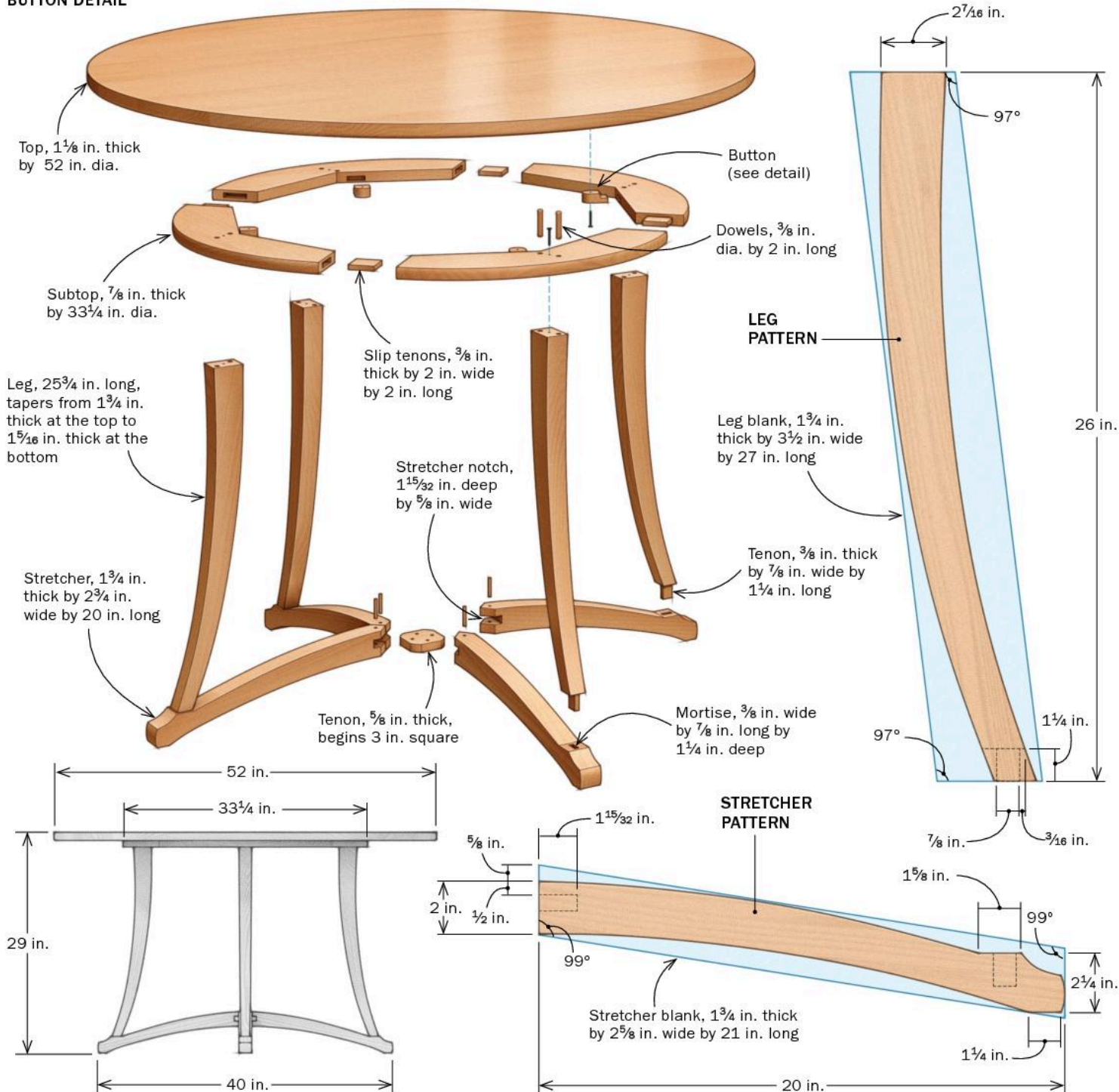
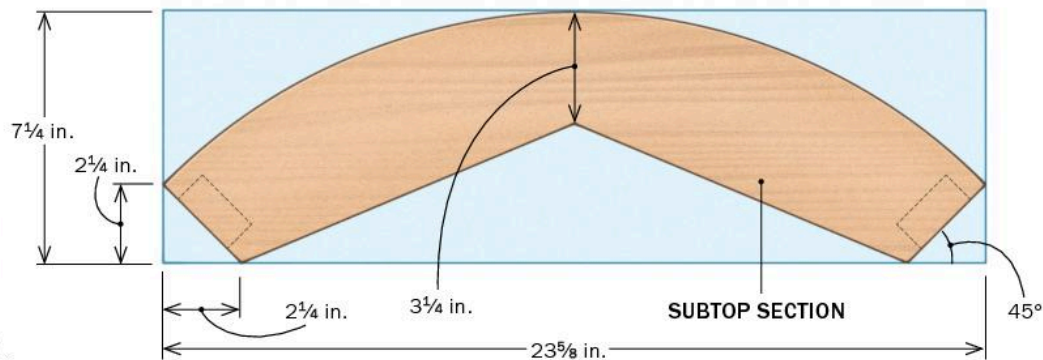
The overall lines of the table came first: the stretcher assembly rising from the floor in a gentle arc, the legs resting on the stretchers and thickening as they curve upward, fastening to a subtop that supports

AROUND THE BEND

The few straight lines in this table are mostly hidden.



BUTTON DETAIL



Lay out and cut the stretcher joinery

Templates are your road map.

Once the 99° ends are cut, Coleman uses a template to lay out the upper and lower curves of the stretchers, as well as the joinery areas.



Reference flats guide shaping and joinery. With the top curve drawn, use a square to draw a reference flat at the top of the arc, square to the inside joinery face (upper right). You'll register this flat on the chopsaw table to cut the 45° ends. You'll also run it against the bandsaw fence to cut the notches for the tenon. To true up the leg joint area, which is square to the outside end of the blank, Coleman again uses a square (lower right) in case the template's not perfect.



a round tabletop. Once I had that idea in focus, it was a matter of figuring out how to accomplish it. While the joinery is not exotic—dowels and mortise-and-tenons for the legs and a pinned bridle joint to connect the stretchers—the curved parts complicated matters. The key was to create flat reference surfaces for the joinery before cutting the curves. This simplified both the layout and cutting of the joints.

Making the stretchers

The stretcher assembly is made up of four identical pieces. Each one comes to a point so the four nest snugly together. At that joint, a single large slip tenon fits into a notch in each stretcher, and the assembly is glued and pinned. The rounded corners of the tenon are visible, making it appear to be a disk. This visible joinery is not only strong construction, but it is also an elegant design feature as the tenon echoes the circular shape of the tabletop.

To make the stretchers, I used several templates. One was to mark the angles on the ends of the blank before cutting them at the chopsaw. I used a second template to lay out the curves and the leg flats. I laid out the reference flats with a square. Later, I would use the flats to register the blank at the chopsaw and the bandsaw. To ensure the strongest stretchers—and legs—and to visually enhance the curves, the grain in the blanks should follow the curve of the templates as much as possible.

I cut both the flat for the leg joint and the reference flat at the bandsaw and cleaned

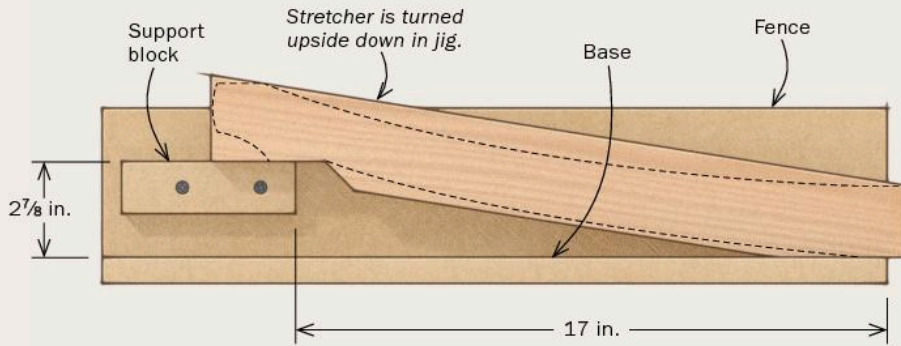


Cut, clean, and check. After Coleman cuts the leg joint area and the reference flat at the bandsaw, he cleans up the cuts with a broad chisel and a handplane, respectively (left). He regularly uses a square registered on the stretchers' ends and sides to ensure the cuts remain flat and square.



Miter jig orients the stretcher

After Coleman lays out the miters, he turns to the chopsaw and a simple jig to hold things in place. He miters the ends by turning the blank upside down so that one reference flat rests on the base of the jig and the other on the support block. He cuts one miter on each stretcher, then rotates the saw and resets the jig to cut the second.



them up with hand tools. A chopsaw and simple jig helped me tackle the stretcher miters.

One big, shared tenon

The stretcher assembly derives its strength from the shared tenon, for which the deep notches in the ends of the stretchers provide significant glue surface. When fully seated against the tenon, the stretchers don't quite touch; instead, there is a 1/16-in. reveal between the miters to emphasize the junction.

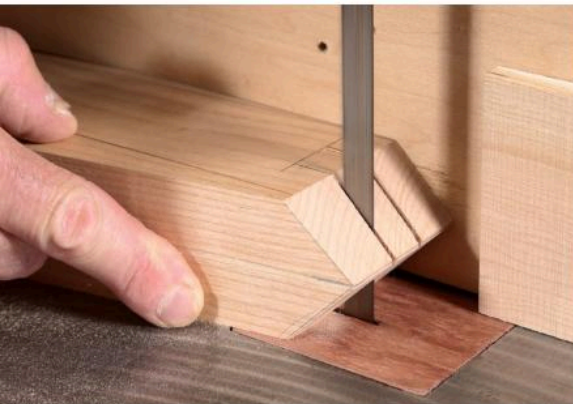
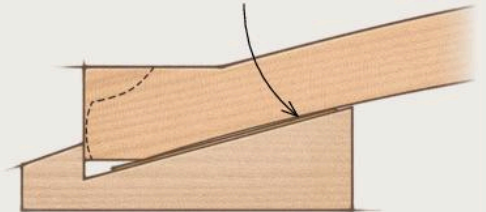
Lay out the notches, cut them at the bandsaw, and tidy up the bottoms with



Mortise jig

Coleman uses a hollow-chisel mortiser to cut the mortises. The jig holds the part so the joinery face is parallel to the table.

Apply cardboard on top face to protect stretcher.

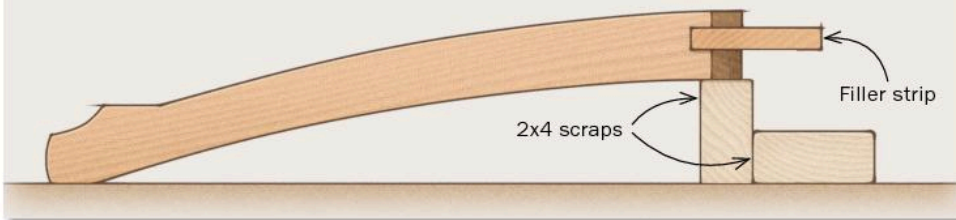


Cut the notches. The notch is cut on the bandsaw by running the square reference flat against the fence with a stop to limit the depth of the cut (top). Coleman cuts the walls before removing the waste in between by cutting a series of kerfs. He cleans up the bottom of the notch with a chisel registered in a knife line made during layout (above).

Drawbores lock it together

Drilling jig

Bore through the top of the joint and partway into the lower part of the stretcher. A filler strip in the notch helps keep the bit from wandering. A 3-in.-tall block holds the piece at the correct height.

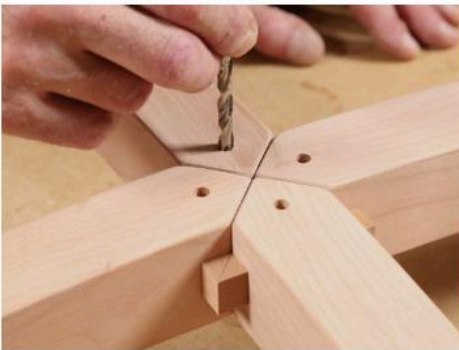


a chisel. Make the 3-in.-square slip tenon after you've cut the notches so you can mill it to fit, but don't round over its corners just yet.

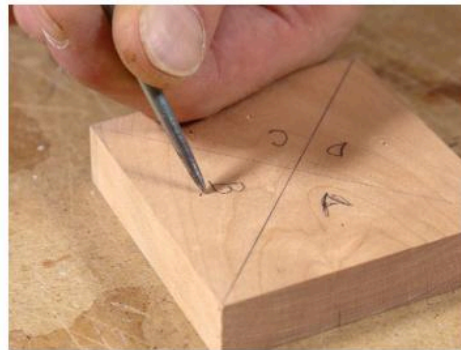
Since you don't need to lay out any more joinery on the stretchers, you can cut their curves at the bandsaw. However, I leave the outside end of each stretcher square so a clamp block can more easily hold it in place when gluing them to the legs. The final shape of the end is easy to cut and refine afterward.

Mortise with a jig and clamp block

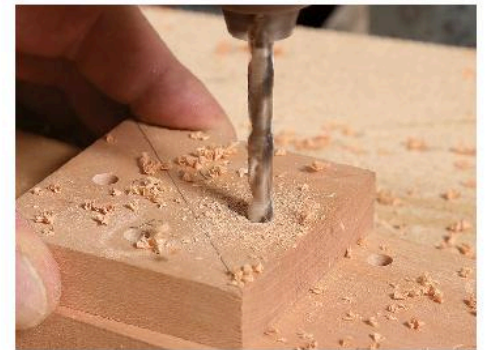
I used a hollow-chisel mortiser to cut the mortises that receive the leg tenons. To hold the curved stretchers at the proper angle, I created a ramped jig that follows the lower curve of the stretcher and is notched for the stretcher's end (see p. 35). You'll use the same ramp as a clamp block when gluing each leg to its stretcher. Once all four mortises are done, soften the



Mark the tenon. Assemble the joint and mark the tenon with a brad-point bit. Label each stretcher and its location on the tenon.



Mark the offset. Use an awl to prick an offset a heavy $\frac{1}{32}$ in. to the center of the tenon. This is where you'll drill, ensuring the stretcher is drawn tight when you drive the pins.



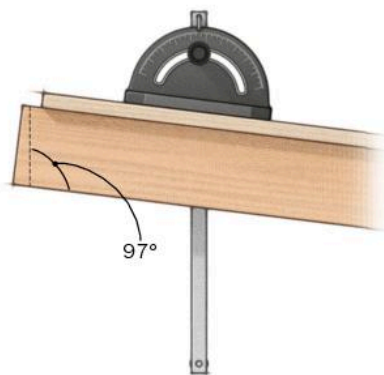
Drill at the offset. Bore through the tenon at the awl marks. Coleman then countersinks the holes and, on each pin, tapers the end that will go into the hole to help the drawbore seat.



Assemble gently and mark the tenon. Reassemble the joint and drive the pins slightly. Mark the ends of the notch on the square tenon (left). With a compass, scribe the corners of the tenon (above). Don't go past the lines from the previous step. Coleman radiuses the corners with a disk sander.

Make the curved, tapered legs

Cut the angled ends. The bevel leaves the ends parallel to the floor. Coleman uses his tablesaw and a miter gauge for these cuts.



Draw the tenons after tracing the curves. With the legs' sweep established, scribe the tenons. A square registered against the end ensures the tenon shoulder is at the correct angle.

Legs start at the tablesaw... Coleman cuts the tenon shoulders at the tablesaw using a miter gauge. Next, he cuts the cheeks. Finally, he trims the narrow end cheeks at the bandsaw.



...and finish at the bandsaw. Coleman saws each leg's interior, convex curve before turning to the outside curve. Using a flexible straightedge and a pencil, he draws the taper before taking it to the bandsaw. Finally, he smooths the machine marks with a jointer and hand tools where appropriate.

stretcher's corners, including where they meet in the middle, with a slight radius, and prep the parts for the final finish.

Drawbores strengthen the joint

For durability and to aid assembly, I draw-bored the center joint. This starts with drilling holes through the stretchers for the $\frac{1}{4}$ -in. pins. I use a jig at the drill press to elevate the pointed end of the stretcher (opposite page, top left).

Then, on the square tenon, draw lines from corner to corner to help locate the stretchers. Label and mark each stretcher

and its spot on the tenon so that everything will go back to roughly the same place.

Assemble the pieces and check for square. Insert a $\frac{1}{4}$ -in. brad-point bit by hand into each pin hole to mark the tenon. Take the joint apart and, with an awl, mark a $\frac{1}{32}$ -in. offset from each dimple toward the center. Drill at these marks.

Now's the time to determine how much to round over the tenon's corner. Reassemble the joint and drive the pins in just a bit. Mark the square tenon at each notch's base to set the boundaries of each corner's curve. Use a compass to connect the lines.

Do not go past the lines, or you may undercut the rounded tenon and leave a gap. You may need to fudge the curve a bit to connect the lines. I use a disk sander to radius the tenon.

Making the tapered legs

Although the finished legs will taper in thickness, start with blanks a consistent $1\frac{3}{4}$ in. thick. Cut the end angles before tracing the legs' curves from a template. Since the length of the template includes the tenon, be sure to locate the template on the blank accurately.

Bring it all together

Glue each leg to its stretcher. A long clamp pulls the two parts together. The curved jig Coleman used to support the stretcher at the mortiser here becomes a clamping caul.



Carve channels for the epoxy. Shallow grooves, cut with a carving tool on the tenon's faces, enhance the glue bond. The walls of each notch were scored by the bandsaw.



Glue and drawbore. Once the stretchers are in place, spread epoxy in each pin hole and drive the pins. A wood scrap helps bolster the stretchers during the mallet blows.

Mark the tenon's length on the leg blank with a square registered against the end. The tenons start at the tablesaw with cuts for the shoulders and wide cheeks, and finish at the bandsaw. While there, bandsaw the curves and taper as well. After cleaning up the cuts, slightly radius the edges of the legs and prep them for final finishing.

Glue the legs to the stretchers, using the mortising jig as a clamping caul. Once the glue has dried, you can do the final shaping on the stretcher ends. Because these ends protrude beyond the legs, I soften their shape so they feel nice to rest your foot on.

Assemble and glue up the center joint

Cut the drawbore pins so they are slightly longer than the hole and will stay slightly proud of the joint's surface. Soften their top ends now; it's too fussy to do it after assembly. I apply a slow-set epoxy, which gives plenty of time for assembly, to the insides of the notches. Once the stretchers are in place, I apply epoxy in each pin hole and drive the pins.

Finally, clamp the top and bottom of the joint. Do a final check for square before letting everything sit overnight.

Make the subtop and top

The subtop is a ring of four solid-wood pieces slip-tenoned together. Three dowels per joint or Dominoes would also work. After glue-up, I cut the outside of the ring to a diameter of $3\frac{3}{4}$ in., placing it $\frac{7}{8}$ in. beyond the outside of the legs' tops. I slightly radius the subtop's outside edge



Clamp the joint. Cork-faced cauls are soft enough to conform to the tops of the pins without pressing them farther into the holes. After clamping, Coleman does a final check to ensure that all the parts are square to each other. He cleans any squeeze-out with lacquer thinner before leaving the joint clamped overnight.



Position the legs and predrill the subtop. After locating the legs (right), Coleman drills a centered clearance hole for a screw into each leg (above).

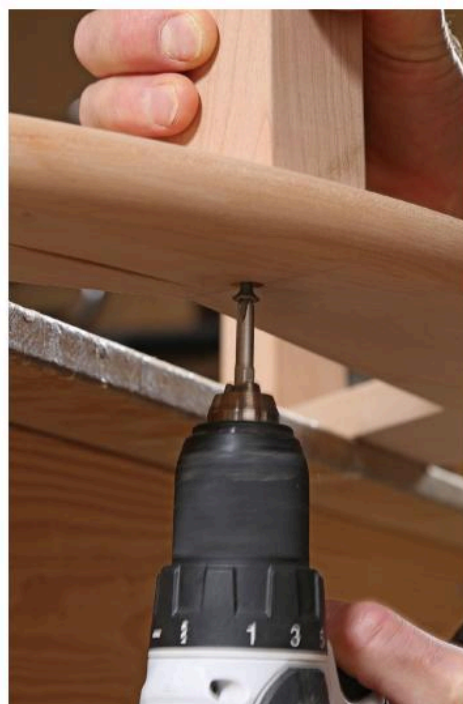


to soften it. The subtop is fastened to the top of each leg with two dowels epoxied in. But I start by screwing it to the legs to hold everything in place while I drill for the dowels. Driving the screws from underneath helps keep the legs from moving. Make sure the fit between the subtop and legs is gap-free now, because the dowels won't tighten anything later.

Flip the table base assembly upright and drill for the dowels. Apply epoxy to the holes and then drive in the pins.

Use a jigsaw to rough-cut the top's circumference before finishing with a router on a shopmade compass beam. Undercut the top with the router and a $\frac{7}{8}$ -in.-radius bit. To fasten the base assembly to the top, I use wooden buttons that are screwed to the table and fit into slots on the inside facets of the subtop. □

Timothy Coleman is a professional furniture maker in Shelburne, Mass. See him at Fine Woodworking Live 2018 (finewoodworkinglive.com).



Drive the screws. With the table upside down, Coleman drives the screws $\frac{1}{4}$ in. to $\frac{1}{2}$ in. into each leg to make sure they don't move while he drills for and drives the dowels.



Dowel the subtop to the legs. Coleman flips the table to drill the holes for the dowels. After clearing them of debris, he applies epoxy inside the holes and hammers in the dowels.



Safe Ripping on the Tablesaw

Mastering this fundamental task
requires understanding
and finesse

BY BOB VAN DYKE

BEFORE YOU BEGIN

PREP THE STOCK

It is never a good idea to cut roughsawn wood on the tablesaw. Instead, turn to the bandsaw to rough cut stock for milling. Then, to avoid kickback from warped boards, joint the face that will ride on the saw table and the edge that will be against the fence.



SET UP THE SAW



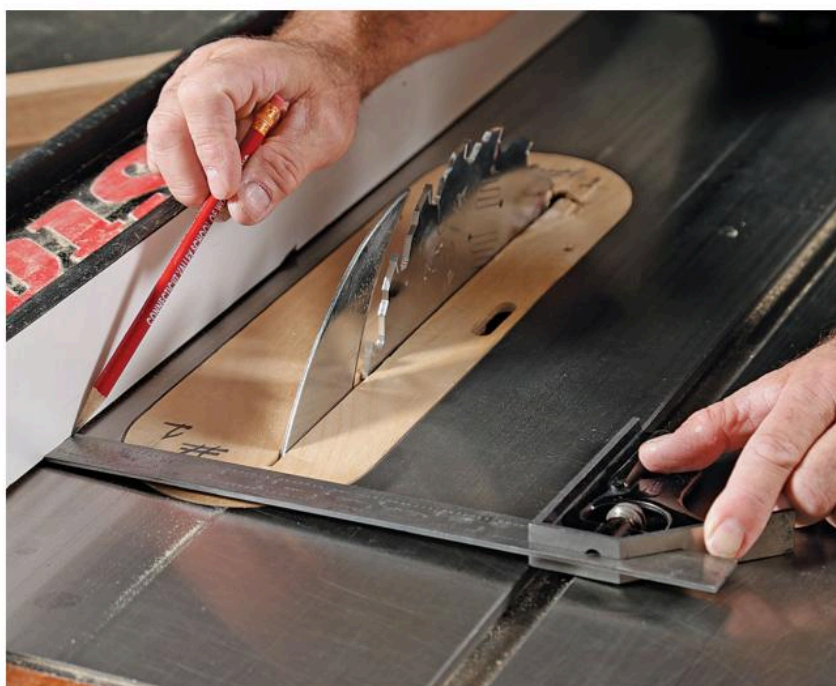
Install a splitter and rip blade. Because ripping requires more force than crosscutting, a blade with fewer teeth and larger gullets is typically used. Behind it should be a riving knife or splitter, a crucial piece of safety equipment that minimizes the chance of kickback when ripping.



Square the fence. Use a combination square to check that the rip fence is parallel to the miter slot, or heeled out slightly so the gap between the fence and the slot is no more than $\frac{1}{64}$ in. wider at the back than at the front. This assumes that the blade is parallel to the miter slot.

A tablesaw is the best tool for ripping a board's edges parallel, but safe and successful ripping on the tablesaw depends on understanding a handful of essential techniques and practices. This article will explore and explain these factors so that you can master the mechanics of ripping.

One important concept to keep in mind is the rotation of the blade. Think of the blade as having a front and a back and remember that as they cut, the teeth in the front push the wood down onto the saw table. At the back, the teeth are rotating up away from the table, and if wood contacts these rising teeth, they'll exert upward pressure, creating the possibility of kickback. Kickback happens when the back of the blade contacts the edge of the wood with enough force that it grabs the stock and propels it back straight toward



RIPPING 101

Standing in the right place and positioning your hands correctly will keep your rips true and your body out of harm's way.

The right stance is to the left. Stand close to the front of the saw and a little to the left of the blade. This makes it easier to support the board as you begin the cut and easier to hold the board against the fence the whole way through. Because you are standing slightly to the left at this point, you won't be hit by a kickback, which typically goes straight back when ripping.



Handwork. The left hand, which remains stationary, exerts pressure downward and toward the fence. Position the hand about 1 in. in front of the throat plate and keep it there until the cut is nearly complete. The right hand, palm up and fingers under the board, holds the stock until the fingers hit the fence rail.

you at great speed. I once saw a piece of molding shoot 20 feet across the shop before going completely through two pieces of $\frac{3}{4}$ -in.-thick particleboard. Fortunately, as long as certain practices are followed, kickback is easy to avoid and should never be common.

Another important concept is that ripping requires more force than crosscutting. Picture the board's grain as a bundle of straws. Cutting across the bundle does not require as much force because once cut, the fibers don't exert pressure against the blade.

When ripping, however, the blade cuts lengthwise through the straws. Because the grain is not always straight, picture a bundle of bendy straws instead of straight

ones. This irregularity, plus the fact that these fibers are usually under tension, means that as the fibers are cut, the tensions within the board change and it can push against the blade, thus requiring more force to cut through the wood. To overcome this, install a more aggressive blade for rips, one that has fewer teeth (24 is standard for a rip blade) and larger gullets.

Stock must be flat and straight

For safe, clean ripping, the face of the board that rides on the table and the edge riding the fence must be flat and straight. If they're not, the stock can easily move during the cut and kick back. Avoiding this is easy. Always use the bandsaw to break

down roughsawn stock. And then joint the face that will be against the saw table and the edge that will be against the fence.

The adjustment of the saw's fence is also crucial. Never assume that a saw coming from the manufacturer is correctly adjusted, and be aware that all saws can go out of adjustment over time. The rip fence must be parallel to the blade or heeled out slightly at the back.

Essential equipment—The splitter or the riving knife (depending on the design of your saw) is the one critical safety device that should always be on the saw when ripping. Positioned directly behind the blade, it fits into the kerf and prevents the stock from drifting off the fence, which could result in kickback. It also prevents the kerf



Hook a ride on the fence. When the fingers of the right hand hit the rail, pivot the hand around so your pinkie is hooked on the fence; your ring, middle, and index fingers are pushing the board down and slightly toward the fence (and so is your left hand). Your right thumb is on the end of the board midway between the blade and the fence.



Hand off. As the end of the stock approaches the throat plate, making the risk of kickback minimal, move your left hand to hold onto the left edge of the saw, giving you a firm stance as you push the board through the rest of the cut with your right hand. Unless the board is wider than 8 in., the right hand stays hooked on the fence. If it's wider, position your hand midway between the fence and blade. Do not release the board until it is completely past the blade and riving knife.

from closing up on the back of the blade—another common cause of kickback.

How to stand, hold, and push

There is only one correct way to stand to easily ensure the edge of the board remains against the fence at all times: close to the front of the saw and a little to the left of the blade. This makes it easier to support the board as it enters the cut and easier to hold the board against the fence the whole way through the cut. Standing a little to the left also keeps you clear of a potential kickback.

The left hand—The left hand pushes the board against the fence and down onto the saw table simultaneously. Position your left hand about 1 in. in front of the

throat plate and keep it there until the cut is nearly finished. Never move your left hand beyond the front of the throat plate. When the end of the stock nears the plate, move your left hand to hold onto the left edge of the saw. Holding here gives you a very firm stance as you lean forward and move to the right to complete the cut with your right hand.

The right hand—At the start of the cut, cup the end of the stock with your right hand and push forward. When your fingers meet the rail, pivot the hand so your pinkie is on the fence, your next three fingers are holding the board down and toward the fence, and your thumb is on the end. Do not release the board until it is past the riving knife. When ripping a board wider

than 8 in., have the whole hand on the board to keep it against the fence.

Essential accessories

While your hands alone give you the most control when ripping, there are times when some accessories are crucial.

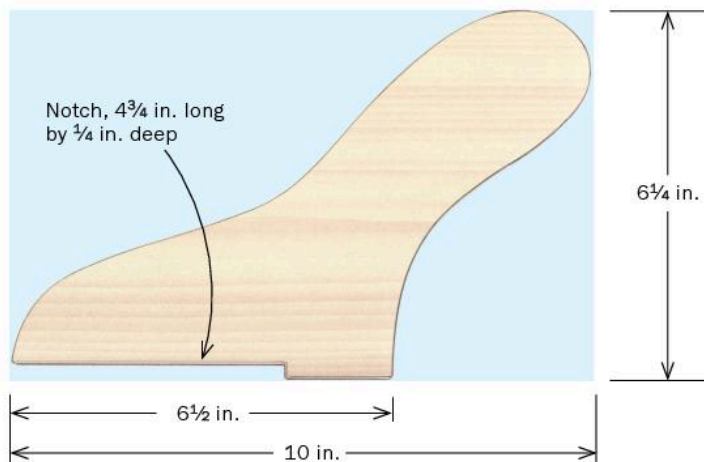
Push sticks—Push sticks keep your right hand safe when ripping narrow stock. Be mindful, though: While push sticks do a good job pushing, they can't exert as much lateral pressure toward the fence as your hand. To determine if a cut requires a push stick, simply make a fist. If your fist fits between the blade and the fence (be sure to turn off the saw before making this test!), use your hand. If not, pick up a push stick.

PUSH STICKS AND PADS

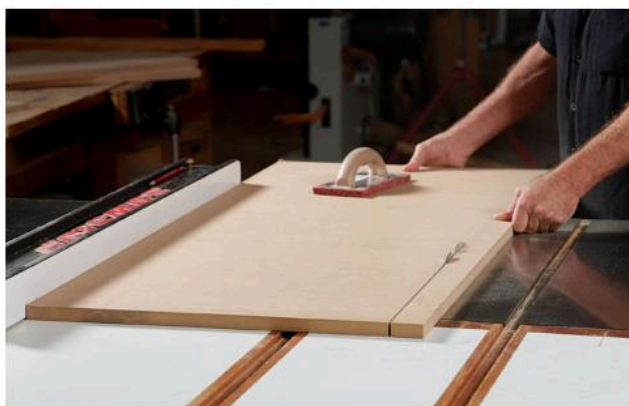
For rips narrower than your fist or wider than 15 in., pick up a push stick or push pad, respectively.



Push stick for narrow rips. Start the rip as you normally would (1). As the end of the board reaches the table, hold it in place with your left hand as you pick up the push stick (2). Remove your left hand and use the push stick to finish the cut while adding lateral pressure to keep the stock against the fence (3).



Grout float handles wide stock. When ripping wide stock, Van Dyke uses a grout float as a push pad. Unlike some push pads sold for woodworking, its spongy pad is very grippy and enables him to exert lateral and forward pressure. To make sure he can reach it when necessary, he places it on top of the stock before starting the rip.



Before the cut, make sure the push stick is next to—not on top of—the fence so it's easy to grab. Never use a push stick while the end of the board is off the table, unsupported. Wait until the end of the stock is almost at the throat plate.

I make my own push sticks out of scrap plywood (see drawing, top left). These work better than the ones that come with saws, which are typically just a plastic stick with a small V at the end. And since my push sticks are made from scrap, I don't have to worry about cutting into them during narrow rips.

Featherboards—Featherboards are designed to take the place of the left hand. Positioned in front of the blade, they hold the stock against the fence.

Featherboards are helpful when making repetitive cuts and when cutting large or awkward pieces. For more information about them, see my Fundamentals, "Work more safely with featherboards," in *FWW* #224.

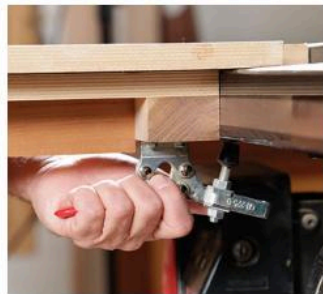
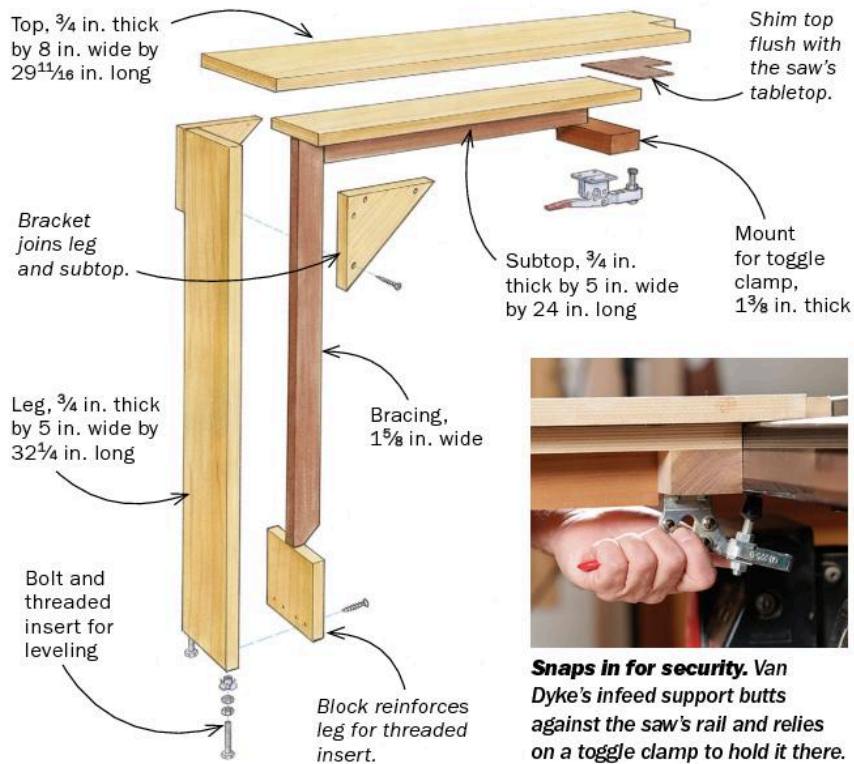
Special circumstances

Occasionally, the size or shape of the board being ripped will require you to change tactics.

If the board is too long to comfortably hold on the end, your right hand should hold its right edge until enough stock has gone through the blade that you can comfortably move your right hand to the end of the board. I also like to use a removable infeed support for ripping long stock (see drawing, opposite).

A HELPING HAND FOR LONG STOCK

This removable infeed support, made from scrap, supports long stock so you can focus on ripping. Adapt the dimensions to your saw if necessary.



Snaps in for security. Van Dyke's infeed support butts against the saw's rail and relies on a toggle clamp to hold it there.

As a rule of thumb, if you have a wide piece that is shorter than the width of the blade projecting out of the saw table, rip it using a sled or miter gauge. It is unsafe to rip these using the fence because the extra width will tend to drag the back edge of the board away from the fence and into the back of the blade.

Ripping plywood is usually a lot simpler than solid stock, as there is no grain direction to consider. Nevertheless, when ripping wide pieces of plywood, it's easy for the stock to come away from the fence—which can cause a kickback that acts differently. Rather than heading straight back, it will arc across the blade, putting your right hand in extreme danger. Luckily, the riving knife or splitter prevents this situation. Also, a very effective aid for controlling wide plywood is a grout float. The spongy surface gives you a nonslip grip, making it a lot easier to hold the stock against the fence.

Ripping is a basic and necessary function on the tablesaw that requires your total respect and undivided attention. It should never cause paralyzing fear. If you simply understand that the board must stay against the table and rip fence, you will be on your way toward success. □

Bob Van Dyke runs the Connecticut Valley School of Woodworking and teaches at other guilds and schools. See him at Fine Woodworking Live 2018 (finewoodworkinglive.com).



Stable setup. Feeding long stock into a tablesaw can be difficult without the proper support, so Van Dyke uses a specially made infeed support (left) that holds his stock at the right height, leaving him one less thing to worry about. If a board is so long you can't comfortably reach your right hand back to the end, grip the right edge of the board (center) and push until enough stock has gone through the blade that you can comfortably move your hand to the end of the board. Then the rip proceeds like any other (right).

Marking Gauges



BY JEFF MILLER

A marking gauge is a simple tool, with a fence that rides the edge of a workpiece and a blade or pin designed to scribe a line parallel to that edge. I've even heard of woodworkers who have used a sharpened screw driven into a board as an improvised gauge. That might work in a pinch, but over time you'll want to own a quality gauge, one that can be set easily and accurately and that marks cleanly and reliably. Essential for hand-tool woodworking, marking gauges are also very helpful when laying out machine work. In many cases, the incised marks made by the gauge are more than just layout lines; they become the finished edges of joints.

There are many marking gauges on the market, and I wanted to see which were best. To narrow a very wide field, I looked only at cutting gauges—marking gauges that employ cutting knives or sharpened disks—and skipped



What really matters, and which tools make the cut



BUILT-IN RULERS NOT NECESSARILY AN ADVANTAGE

A graduated beam (far left) isn't a great advantage, because it can be hard to line up the fence with the markings precisely. A digital readout isn't a panacea either. The AccuMarking gauge (left) has a digital readout that's accurate to an incredible 0.0005 in., but it is difficult to nail a precise number on the readout.

ONE-HANDED ADJUSTMENT IS A BIG PERK

The standard Veritas gauge (right) has an O-ring inside the fence that makes it glide smoothly, and a thumbscrew nearby for accurate, one-handed adjustment. The Tite-Mark's knurled adjustment collar (far right) moves the fence smoothly and accurately, and the thumbscrews are easily accessible, too.



TWO-HANDED ADJUSTMENT IS LESS CONVENIENT

The latest Veritas gauge (far left) offers a very precise micro-adjuster, but its location at the end of the beam makes it trickier to hold a ruler or workpiece at the same time. The JessEm's $\frac{1}{2}$ -in. detents are very accurate (left), but the fence is drawn toward them. In-between measurements require spinning the micrometer dial.



TITE-MARK MARKING GAUGES

\$90

My favorite overall gauge in this test is the Tite-Mark, which has an excellent micro-adjuster. There are three Tite-Mark models, based on the length of the beam and the size of the fence, with optional cutters for scribing both sides of a mortise at once or making deeper cuts, such as for slicing strips of veneer. I'd go with the standard model, shown here. These gauges can be easily and precisely adjusted with one hand, which allows you to set the tool while holding a ruler or workpiece in the other. The quality is exceptional, and all have sharp cutters that offer great visibility. The only minor downside I could find was the longest model's potential to roll off the bench.



VERITAS WHEEL MARKING GAUGE

\$33

For roughly one-third the price of the Tite-Mark, you can own the Veritas Wheel Marking Gauge in the standard model. An O-ring inside the fence provides just the right amount of friction to hold it where you put it but still allow it to slide, making fine adjustments easier than they are on other gauges without micro-adjusters. The fence tightens effectively with a knurled brass thumbscrew, and the sharp disk cuts clean lines. You can buy a similar model equipped with a micro-adjuster, but that version is neither as intuitive nor as well-made as the newest micro-adjusting model from Veritas (see p. 51). This tool also has the potential to roll off the bench.



CROWN ROSEWOOD AND BRASS CUTTING GAUGE

\$41

The Crown Tools cutting gauge tightens securely and cuts well, but fit and finish issues make fence adjustments fussy. The thumbscrew can't apply moderate tension, which would make adjustment easier. As shipped, the knife was inserted with the bevel facing outward, though it was easy to switch around.

those with pin-type cutters. Pins work very well along the length of a board but tend to tear the wood when used cross-grain. If you are willing to use two gauges, one for along the grain and one for across it, a pin-type gauge may be just the ticket for along the grain. But if you want one tool that will do it all, go with a knife- or disk-type gauge. These cutters have an additional advantage: They create a clean, sharp line with a square edge on one side, which starts the square edge of a tenon shoulder or cheek, or the bottom

of a perfect socket between pins and tails.

I also did not test gauges with double beams or double cutters, meant to scribe two walls of a mortise at once.

Dodgy fence is a deal-breaker

Even after eliminating all the pin-type and double gauges, the field was still very large. To test out the best, I considered a number of critical factors, eliminating a few more gauges along the way.

While a marking gauge is a simple tool, it must do a few things well. Quality of cut is

important, and most gauges cut well out of the box. However, a few needed attention to be tested fairly. It's not difficult to sharpen the little knives and disks, and you'll need to do so throughout their life, but it was disappointing to have to do significant sharpening or reshaping right away.

As for the disk vs. knife question, I found that both can do an excellent job. Knives tend to cut a little deeper than disks, but that isn't a critical advantage or disadvantage for me. On the other hand, disks are mounted on the end of the beam, giving



HAMILTON MARKING GAUGES

\$60

If your taste hews closer to the traditional, give strong consideration to the marking gauges from Hamilton, available in a variety of woods and lengths. I tested the 4-in. model in African blackwood (\$90), but would probably opt for the less-expensive cherry or walnut (\$60). A 6-in. beam is available for a small upcharge. The Hamilton is a beautifully made tool with a long fence that adjusts easily and tightens effectively. Unlike other knife-type gauges, the Hamilton's cutter is mounted on the end of the beam, where it works well and is easy to see.

good visibility for starting and stopping lines. Only one knife gauge had its knife at the end of the beam; on the rest the knife emerges from the bottom of the beam, making it harder to see. This last factor isn't as critical as some others, but an end-mounted cutter can be very helpful when you need to start and stop a cut at a precise point.

Next up was testing the effectiveness of the fence. I checked whether each gauge was easy to set to the thickness of a board, such as when scribing dovetail



IGAGING WHEEL MARKING GAUGE

\$18

If price is your primary concern, this gauge offers good value. Unlike the other inexpensive disk gauges (see photo, below), this one has an O-ring inside the fence. It doesn't work as smoothly as the Veritas fences, but if you put slight pressure on the thumbscrew, you can remove the slop between fence and beam, making fine adjustments easy. The disk would benefit from some honing, but works as is.



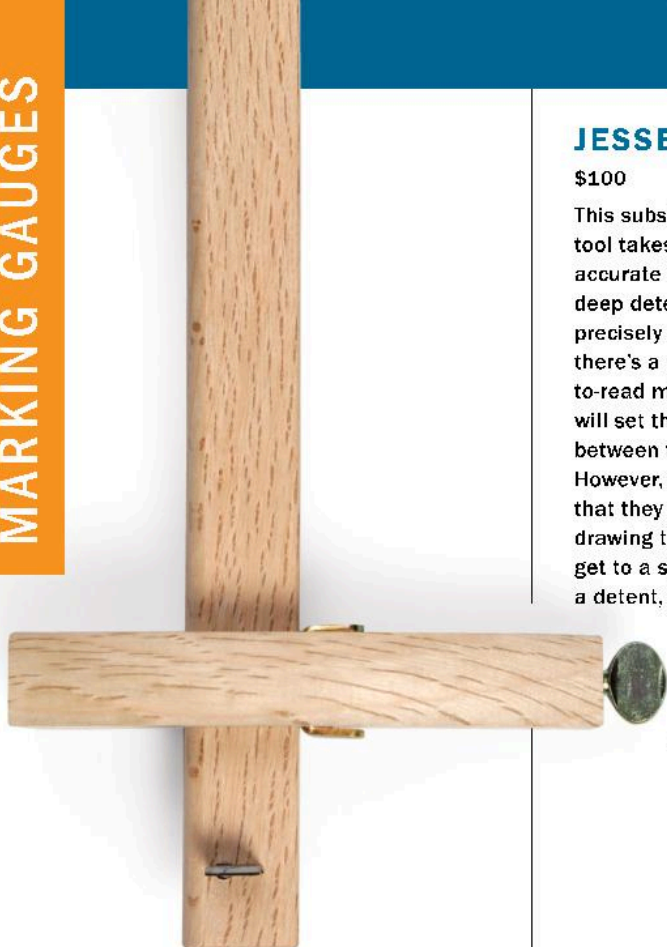
Three of a kind. Wheel gauges from Woodcraft, Rockler, and Shop Fox look similar to the IGaging gauge and have the same loose fit between fence and beam. But they lack an O-ring, making adjustments more difficult.



IGAGING ACCUMARKING DIGITAL WHEEL MARKING GAUGE

\$35

A digital readout on the AccuMarking gauge measures to the nearest 0.0005 in. It can also be set to fractions or millimeters. Lacking a micro-adjust, however, it took a steady hand to dial in exact dimensions on the sensitive readout. And in any case, I question the need for this level of precision in a woodworking hand tool. Setting this gauge to a workpiece or a ruler worked well enough, though the thumbscrew is rather small and out of the way. The cutting disk needed considerable work to correct a rounded-over edge, but once sharpened, it cut well. The tool also works well as a depth gauge.



JAPAN WOODWORKER KEBIKI

\$44

This Japanese-style marking gauge came with a sharp cutter and a thumbscrew fence lock that was very secure. However, the loose-fitting fence and the location of the thumbscrew made precise adjustments fussy. Once set, this gauge was comfortable in the hand and worked very well.

baselines. Then I set each gauge to a specific dimension by holding it up to a ruler. A few of the gauges incorporate a micro-adjuster, so I tested how easily and intuitively these worked.

I also checked to see if the fences held firm during use. A few gauges just didn't hold their settings reliably, with fences that would pivot or shift in use no matter how hard I twisted the thumbscrew to tighten them. A dull blade can be remedied, but a shifty fence can't, so I eliminated a few gauges from the group at that point.

Last, I evaluated how easy it was to hold the fence firmly against a board when scribing lines both near and far from the edge.

To address these questions and more, I

JESSEM WOOD SABRE

\$100

This substantial and very well-made tool takes a unique approach to accurate settings. The beam has deep detents that index the fence precisely at $\frac{1}{2}$ -in. increments, and there's a well-machined and easy-to-read micrometer adjustment that will set the gauge to any distance between the indexed points. However, the detents are so positive that they sometimes interfere, drawing the fence toward them. To get to a specific measurement near a detent, you sometimes have to

employ the micrometer dial and some math, which makes an otherwise simple task more complicated.



LEE VALLEY POCKET MARKING GAUGE

\$23

This is the smallest tool I reviewed, with a two-fence, double-ended design. I liked being able to set two distances on the same gauge, but the small fences made this tool the most difficult to hold comfortably and securely against the edge of the work while scribing lines, requiring more focus and effort than others did. Also, because the beam is so short, the cutter that was not in use tended to rest against my palm, which was uncomfortable.

scored scores of lines—with the grain and across it, in a variety of woods, at fence settings long and short. I worked with each tool enough to get a feel for it in use, and kept rating sheets.

In the end, having jettisoned the real clunkers, I found quite a few tools that will serve the purpose, and a select few that really stood out.

Micro-adjusters matter, rulers don't

Once I unboxed the gauges and went to work, I learned pretty quickly that I prefer those with micro-adjusters on the fence, which make it easier to fine-tune the setting. But you certainly can do a lifetime of woodworking with a basic gauge that



MARPLES HALF ROUND CUTTING GAUGE

\$16

The Marples is the least expensive gauge in this test, with a pointy, double-beveled knife that didn't cut smoothly at first. But after I rounded the point and honed the edge, this gauge worked well. If you are willing and able to do the work, the Marples offers very good value. I'm not crazy about the look of the yellow plastic thumbscrew, but it proved effective, letting me add enough tension to make precise adjustments and then tighten the fence securely.

does the important things well and you'll save some cash. So my winners came from both categories: with microadjusters, and without.

All of the gauges can be set to a ruler or an existing workpiece, which is generally how I work. But some are available with markings on the beam, intended to make things easier. Even the best markings, however, were not as accurate as lining up the knife and fence with the marking on a good ruler, so I wouldn't bother paying more for the graduated beam.

Some gauges go to even greater lengths to build in accuracy—one even includes a digital readout—but none of these built-in measurement devices could tempt me

VERITAS MICRO-ADJUST WHEEL MARKING GAUGE

\$50

My second-favorite micro-adjusting gauge is a very recent debut from Veritas. Its adjuster runs through the beam from a small knob at the back end right to the cutting wheel, which moves in and out as you turn the knob. This arrangement works well but makes adjustments a two-handed operation, requiring a little more effort. On the plus side, the fence is larger than on past models, and the shaft comes through it off-center, making the tool feel very stable in use and preventing it from rolling off the bench.



WOODRIVER WHEEL MARKING GAUGE (NO. 154340W)

\$42

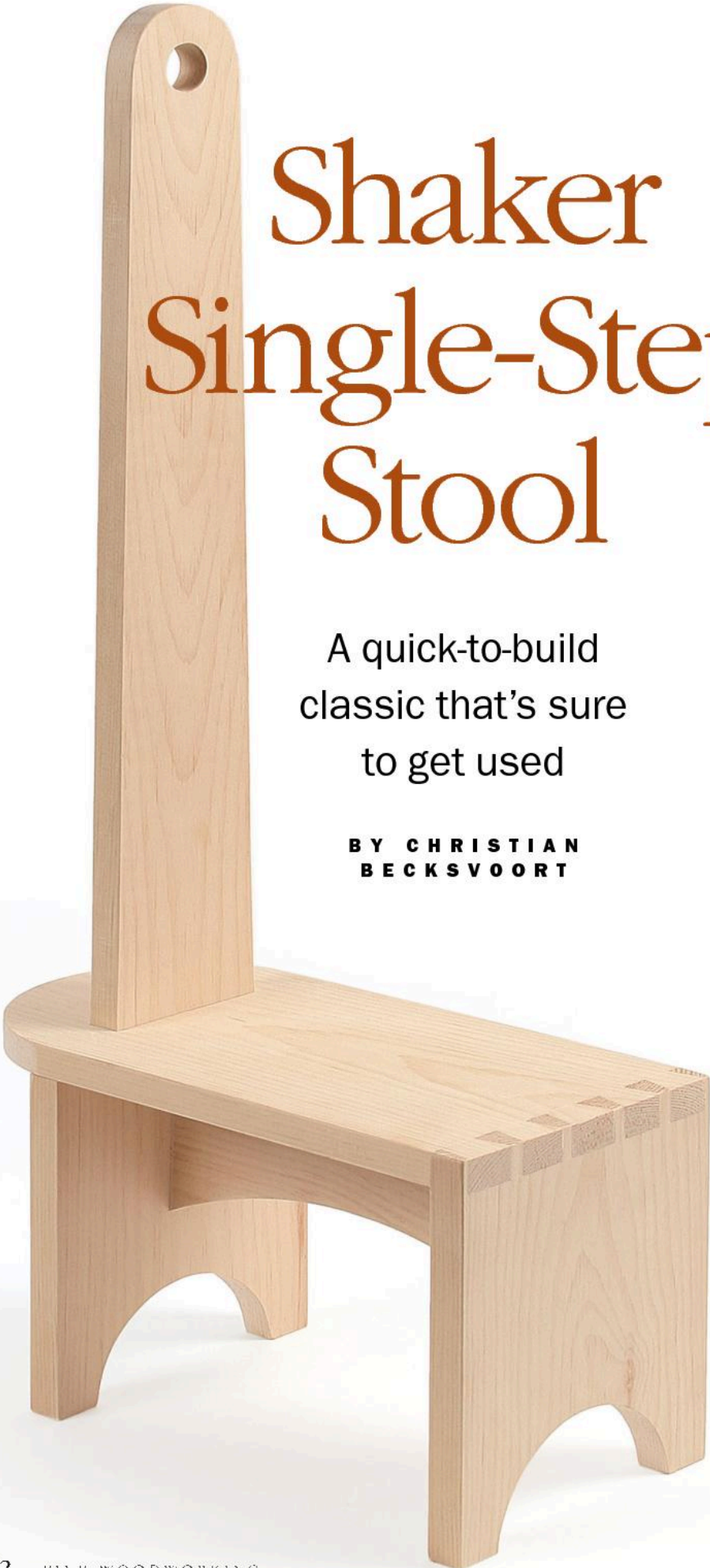
WoodRiver's deluxe marking gauge is a good-quality disk-cutting gauge, but lacking the O-ring of the Veritas models, it was a tad fussier to set precisely. Also, the etched markings on the shaft were $\frac{1}{32}$ in. off the actual distance between cutter and fence. On the plus side, the tool cuts well and won't roll off the bench.

away from my tried-and-true methods of setting the gauge. Check the individual write-ups to see why.

Mark my words

Once you get used to working with a good marking gauge, it's hard to go back. Ultimately, you may decide that having more than one of these tools will be helpful. I tend to keep a couple on my bench as I lay out joinery, each one set for a particular task. This makes precise layout a snap. □

Jeff Miller builds furniture in Chicago, and teaches classes both in his studio (furnituremaking.com) and around the country.



Shaker Single-Step Stool

A quick-to-build
classic that's sure
to get used

BY CHRISTIAN
BECKSVOORT

The Shakers made the most out of storage space, both with free-standing tall cabinets and floor-to-ceiling built-ins. To reach into the tops of those cabinets required the use of a stool, most commonly found with two or three steps. Single-step stools like this one were not often seen. The stool features a dovetailed leg and step in front, with a brace underneath, and a long handle in back that comes right through the step and serves as the other leg. A hole near the top of the handle makes it easy to carry and hang on a pegboard when not in use.

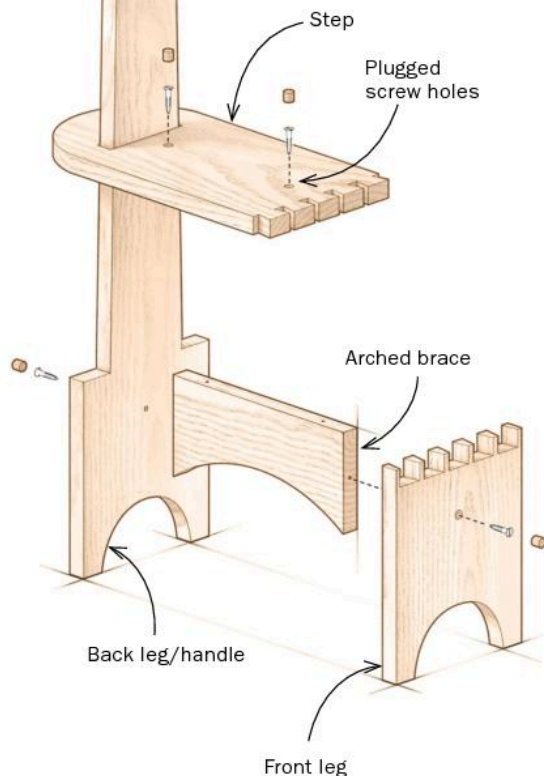
The combined back leg and handle is the most intricate part of this simple stool, so I tackle that first. I cut it to length, and then I measure up from the bottom and use a tablesaw with a miter gauge to make two stopped cuts across the grain, one from each side. At the top end, I mark $1\frac{1}{2}$ in. on either side of center. With a straightedge and pencil, I connect the ends of the two sawcuts with the marks for the 3-in. dimension at the top. At the bandsaw, I cut the long taper, then cut the top end round. I smooth the long, tapered sides with a block plane and drill a hole in the rounded end.



Versatile, portable, durable. The stool is light and easy to grab and go. The simple design holds up painted or in any wood species, and it's built to last for generations.

STEP STOOL

Hand-cut dovetails, a through-mortise, and screwed bracing yield a simple design that's functional and straightforward to make. All the parts are cut from $\frac{3}{4}$ -in. stock.

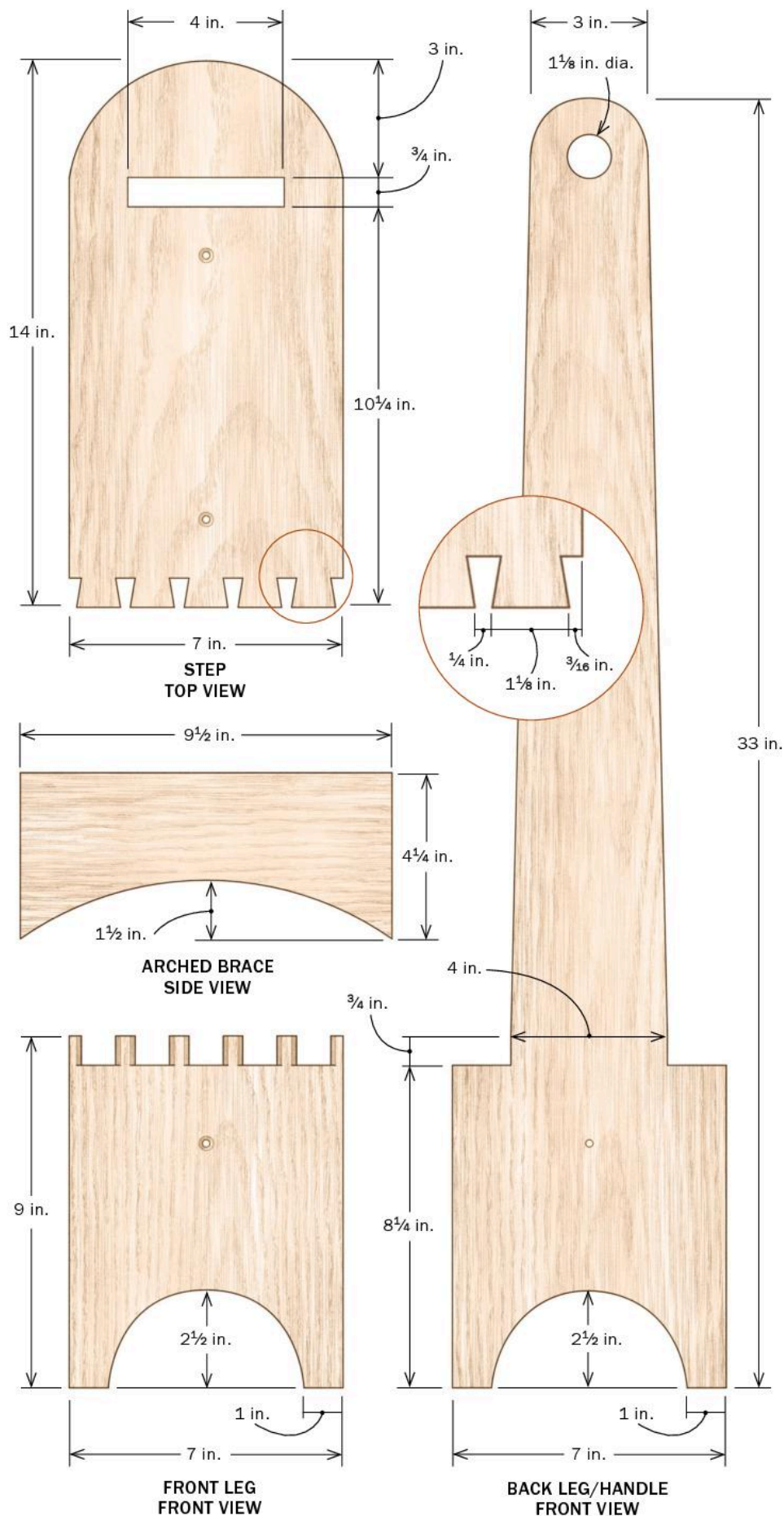


Dovetail the front leg to the step

Next I tackle the step and the front leg. I cut the tails on one end of the step board and then the pins on the front leg. Once they are fitted, I take the joint apart and mark the location of the through-mortise at the back end of the step. Using the back leg as a template, I mark its thickness and width on both sides of the step and chisel out the mortise. Because the bracket underneath locks everything into place, I won't be gluing this joint. But the mortise should be pared to fit snugly.

Rounding things out

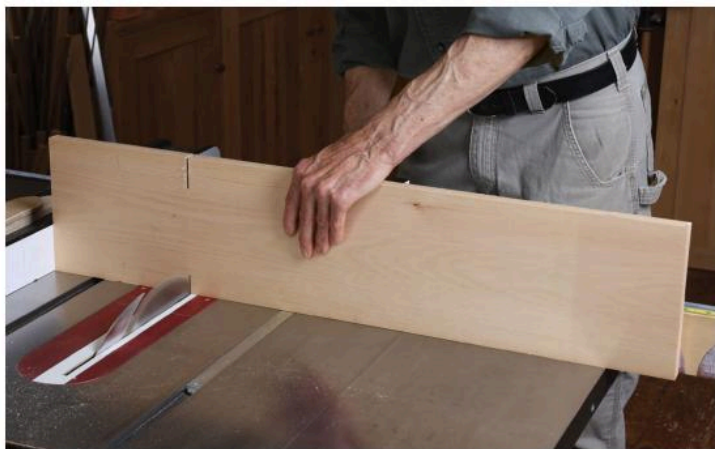
If you haven't already bandsawn and sanded smooth the arched cutouts at



Online Extra

To watch our editors and their kids build a version of this step stool, go to FineWoodworking.com/266.

SHAPE THE BACK LEG



Kerf the sides. With the workpiece on edge and the fence as a stop, establish the bottom width of the handle portion of the back leg.



Shape the handle. Use a bandsaw to cut the taper in the sides of the handle and the curve at the top.



Tackle the hanger. A Forstner bit makes fast, even work of the hole that you'll use to carry and hang the stool.

DOVETAIL THE STEP TO THE FRONT LEG

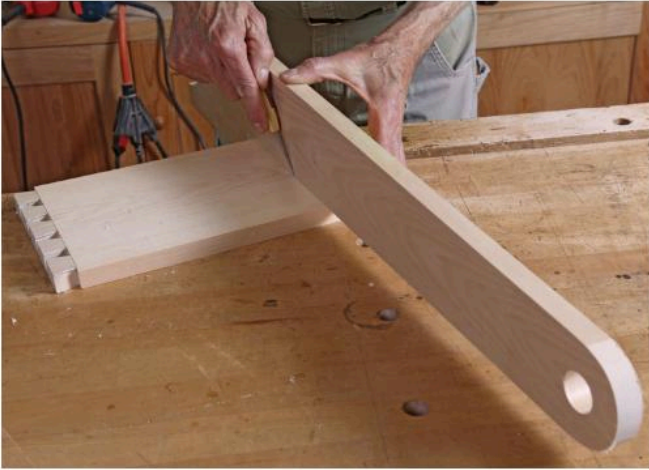


Tails first. After rounding the back of the step, cut the tails in the front.



Move to the pins. Transfer the tails onto the top of the front leg and then cut the pins.

MARK AND CUT THE MORTISE FOR THE BACK LEG



Use the leg to mark out the mortise. With the leg on edge, use a marking knife to scribe the thickness of the leg onto the step. Then set the face of the leg against the face of the step and mark the width of the mortise.



Define and chop. Use a marking knife to deepen the outline of the mortise on both faces of the step, and then chisel the mortise halfway down.



Flip and finish. After going halfway through, flip the step over and remove the waste from the other side until the mortise is completely cut.

PUT IT ALL TOGETHER

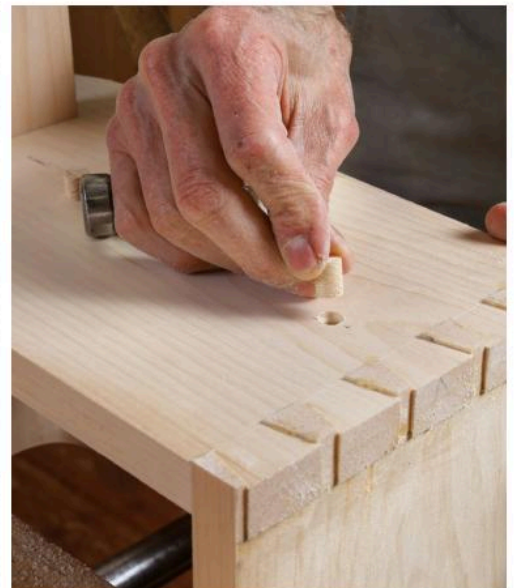


Mortise and dovetails first. Before applying glue, Becksvoort slides the back leg through the mortise in the step and just barely engages the dovetails at the front. He adds glue only to the dovetails and hammers them home.

the bottom of both legs, now is the time to do it. Then slide the back leg through the mortise, making sure it is at 90°, and glue the dovetail joint.

I calculate the length of the underside brace by measuring the distance between the front and back legs, and then cut it to length. It, too, gets an arc cut on the bandsaw. With the brace clamped in place underneath the legs, I counterbore and screw through both legs and the step board. Then I plug the holes and sand, plane, and finish the stool. □

Contributing editor Christian Becksvoort makes furniture in New Gloucester, Maine. See him at Fine Woodworking Live 2018 (finewoodworkinglive.com).



Add the arched brace. Clamp the brace in place, and then screw it in and plug the holes.



Extra Help for Holding Work

Holdfasts and
hand screws
make your bench
more versatile

BY CHRIS GOCHNOUR

Every piece of furniture I make begins at my workbench and ends there, too. It's where I lay out, cut, and fit joinery, plane surfaces, and glue it all together. At the end of the project, it's where I do things like break edges and look for small defects in the surface. Because the bench is such an important tool, it's critical that it be set up for effective and efficient work. This means it must be able to hold work reliably and securely, while still being flexible enough to get a handle on any part you throw its way.

A bench's ability to hold work securely begins with its vises, but it shouldn't be limited by them. When my front and tail vises are unable to get an adequate grip on a workpiece, I turn to other strategies. Most of them involve a holdfast or two. Holdfasts are quick to use, apply plenty of clamping pressure, and can be located just about anywhere on a bench where you can drill a hole. I'll show you how I use them to supplement my vises, as well as a few other techniques that expand my bench's workholding abilities.

FRONT VISE

TRADITIONAL DESIGN NEEDS SOME HELP

A single-screw vise can rack when you hold a part on one side of the jaw. It also has trouble holding wide or long stock. The solutions are simple.

WEDGE ELIMINATES RACKING

To prevent racking when clamping a workpiece on one side of the jaw, use an L-shaped wedge. Slide it in from the opposite side so that both sides are clamping something of the same thickness. The vise holds the part securely, and you can work more accurately.



HOLDFAST EXTENDS THE GRIP

Dog holes drilled along the front apron make the front vise more versatile, letting you use it in conjunction with a holdfast to clamp a wide panel for dovetailing. Without the holdfast, the board would chatter so much that sawing would be nearly impossible. A holdfast can also be used to secure the far end of a long board for edge-planing, another task that's far more difficult without the holdfast.



Make your vises work better

My bench has a front vise with a wooden jaw, and a traditional tail vise. Both are great, but they have limitations. Luckily, there are simple ways to improve their versatility and effectiveness.

The front vise has a single screw in the center. Almost any time a workpiece is held vertically it is placed to one side of the screw, which causes the jaw to rack and weakens the vise's grip. To prevent racking, make a wedge that slides into the other side of the vise. Once the wedge's thickness matches the workpiece's thickness, you can tighten the vise without racking.

Another problem with a single-screw vise is presented by wide boards and panels. A board more than a few inches wider than the side of the jaw can be loose enough that it chatters when you saw dovetails or plane end grain. A holdfast stops the chatter. Knocked into a hole in the front apron, the holdfast locks down the side of the workpiece that's not in the vise. This works great for long boards that need edge-planing, too. Rest the board against the bench's front edge and lock the pad down on the board's face. Now you can plane without the board wobbling.

A tail vise works in tandem with benchdogs for planing parts. But drawers are tough to hold with dogs. I've come up with two solutions. When I need to plane the

TAIL VISE

TWO UPGRADES ADD VERSATILITY

A bit of workholding ingenuity allows you to use your tail vise for more than just face planing.



L-BRACKETS SPREAD THE PRESSURE

Benchdogs have trouble clamping wide parts like drawers. Gochnour expands their reach with L-shaped MDF cauls, which stabilize drawers better than straight cauls would. Tighten the drawer between the two cauls and you can plane the drawer's edge without it skittering across the bench or chattering beneath the blade.

top or bottom edges of a drawer, I use two simple, L-shaped cauls made from MDF. Used with the tail vise and benchdogs, they spread the clamping pressure over the entire width of the drawer, stabilizing it.

The other solution gets called into action when I need to plane the outside faces of the drawer sides. I made a holding jig with two supports that stretch out in front of the bench and are clamped to the benchtop using holdfasts (see photos, p. 61). A crossbar links the two supports and prevents them from racking. The distance between the supports is adjustable, so the jig can be used for just about any drawer.

Let the holdfast take center stage

When you need to clamp something beyond the reach of your vises, the best



PLANE THIN STOCK WITHOUT A STOP

Planing a thin board against a stop is tricky, because it can bow up under the plane. Gochnour secures the board at the back instead. He clamps a hand screw in the tail vise, then clamps the board in the hand screw. Finally, he planes away from the vise and hand screw.

Online Extra

To watch a demonstration of Gochnour's method for planing thin boards, go to FineWoodworking.com/266.

How to grip when bench vises fall short

HOLDFASTS LOCK PARTS DOWN FLAT

A holdfast excels at securing a part where a vise simply can't reach. Whack it on top to lock it down, but on the side to release.

A third hand for dovetails. When chopping the waste from dovetails, the workpiece must be flat on the benchtop. A holdfast works faster than a bar clamp and can put pressure right where you need it.



HAND SCREW ADDS STABILITY

For best support, chopping a mortise should take place on the benchtop, not in a vise. A hand screw and holdfasts keep the stile vertical.



Help with molding an edge. The jaw of a front vise is often in the way of the fence on a combination or molding plane. Clear planing is possible if you pinch the workpiece between dogs and use battens secured by holdfasts to counteract the sideways pressure applied when you plane.



Power-tool assist. Gochmour often uses holdfasts to secure a straightedge when routing dados. The holdfasts also lock the workpiece to the bench, making the routing operation more stable. And the holdfasts go on and off quickly.



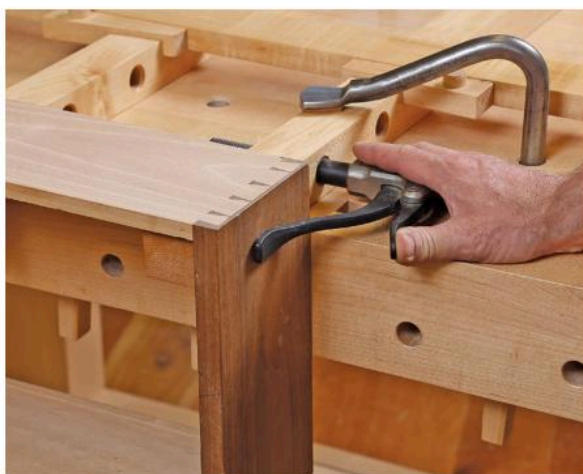
Clamp the clamp. After clamping the stile on edge in the hand screw, secure the hand screw to the benchtop with a holdfast (top). A holdfast at the stile's other end stabilizes it all the more. This way, the stile won't deflect or fall over under the force of heavy mallet blows.

LOCK DRAWER SIDES FOR PLANING

Holding big boxes is a challenge for any vise. Gochnour's clever jig, with its parallel supports, lets him plane any size drawer.



How it works. Locate the first support so there's just enough room between it and the jaw of the front vise for the drawer front or back to slide in. Add the crossbar and tighten the wedge on the first support. Fit the drawer over the supports, snug up the second support, and tighten the second wedge. The crossbar keeps the supports parallel and prevents them from moving under pressure of planing.



Lock down the second support. You should be able to barely slide the drawer onto the supports. Gochnour uses a Veritas Fast-Action Hold-down to lock the drawer to the support, which prevents the back end from lifting up as you complete a pass with the plane.

solution is again the traditional holdfast. For example, the best way to chop out the waste between dovetails is with the workpiece flat on the benchtop. A vise can't help, but a holdfast will.

When a holdfast or two doesn't suffice, turn to a hand screw. You can use one to stabilize a stile on edge to chop mortises on top of the bench. You can also use one with a tail vise to plane thin boards. Clamp the hand screw in the vise, then clamp the board in the hand screw. Plane away from the hand screw and the board won't flex. It's a great fix for an irritating problem. □

See contributing editor Chris Gochnour at Fine Woodworking Live 2018 (finewoodworkinglive.com).



Better than a vise. After the fixture is set up, you can quickly move between sides of the drawer box, and from one drawer to another as long as they are the same size.



A Simple Hinge Jig

A basic MDF template makes it easy to install cabinet hinges

BY CRAIG THIBODEAU

FIT THE TEMPLATE TO THE CABINET

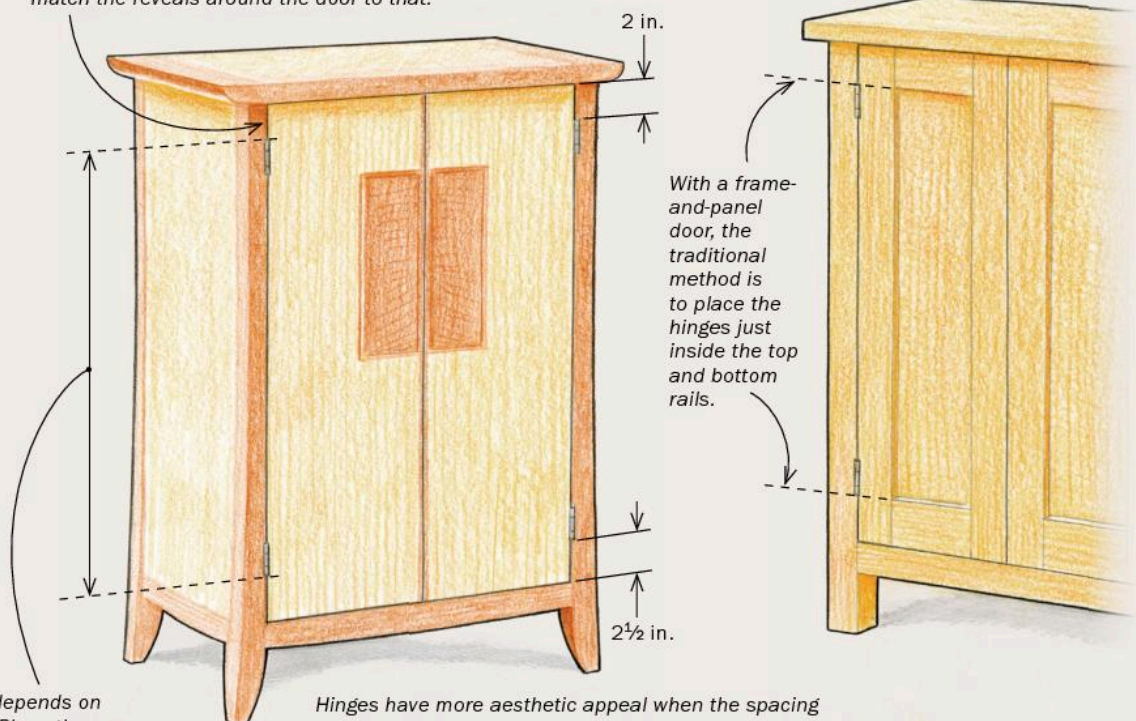
TIP



The ideal gap. Use spacers to set the reveal, or gap, around the door. When making a spacer, Thibodeau uses the hinge as a guide, setting the spacer's thickness to match the space between the leaves when the hinge is closed. With the spacer between them, the leaves should be parallel to one another. He then matches the other reveals around the door to the hinge-side reveal.

REVEALS AND HINGE LOCATIONS

Set the reveal on the hinge side first. Then match the reveals around the door to that.



The hinge location depends on the cabinet design. Place them where they look best visually, and remember that they support the door better if they are farther apart.

Hinges have more aesthetic appeal when the spacing to the door edge is greater at the bottom than at the top. For the cabinet example here, the top hinge is 2 in. from the top of the door while the bottom hinge is 2½ in. from the bottom of the door.

In the past, I routed butt-hinge mortises free-hand and chiseled them square one at a time. Though I had success with the method, it was time-consuming, and I frequently ended up with some slight misalignment between the door and the cabinet mortises. I've since come up with a better way to rout hinge mortises. I use my tablesaw to make a simple MDF template that I then use to rout the mortises in both the door and cabinet. With the template, little to no measuring is required for the hinge install, and the alignment between door and cabinet mortises is perfect every time.

Fit the template to the cabinet

Begin by dry-assembling the cabinet, having already fitted the door(s) to the opening. Set a door in the opening and place spacers at the bottom to ensure a consistent gap, or reveal. Save the spacers because you'll use them later. Now mark the hinge locations on the edge of the door. If you have two doors, mark the hinges on the second one as well.



A perfect example. Thibodeau's MDF hinge jig helps ensure that the hinge mortises in the door and case align perfectly. In a case with two doors, the jig also ensures that the hinges in each door align with one another.



Locate the hinges. With the door fitted to its opening and the spacers in place, pencil in the hinge locations on the door.



Cut and fit the template. The template is made from $\frac{1}{2}$ -in. MDF that's about 6 in. wide. Cut it for a snug fit top to bottom, and then mark its orientation in the opening. Those arrows will guide the work later.

MARK THE TEMPLATE

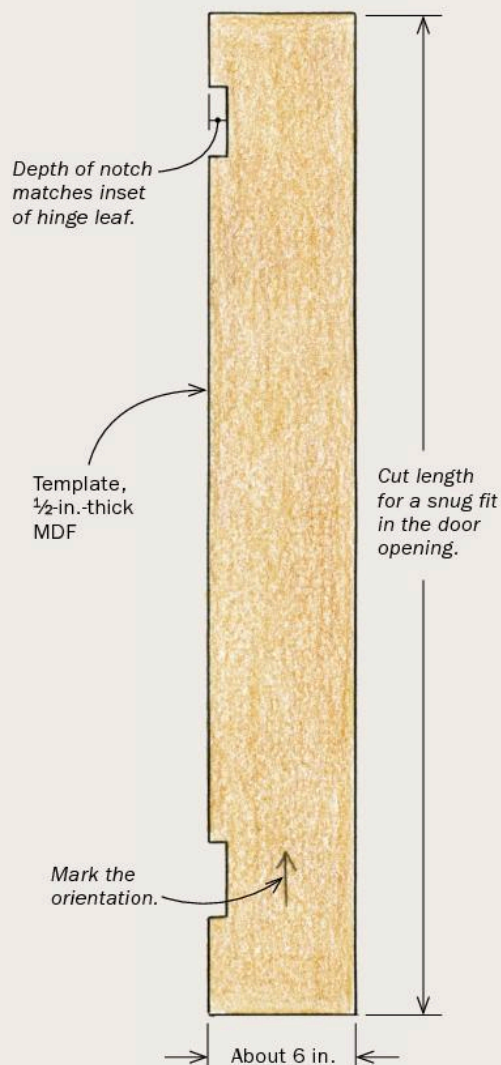
Lay out the hinges on the edge of the door. Place the door on the bench, with a spacer taped to the bottom. Transfer the hinge marks from the front of the door to its edges.



Transfer the marks to the template. With the template oriented correctly, align it flush with the spacer at the bottom. Then transfer the hinge layout from the door to the template.



TEMPLATE GUIDELINES



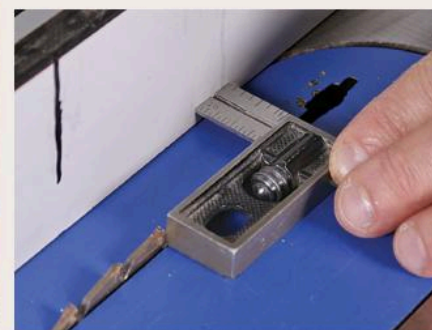
Simple way to set the inset. Use a small combination square to measure and set the inset of the hinge.



Mark the inset on the template. Use the square to scribe the inset for all of the hinges. Keep the square at that setting; you're about to use it again at the tablesaw.



MAKE THE CUTOUTS



The first cut. Use the combo square, set to the hinge leaf inset, to set the tablesaw fence (above) and mark the blade's centerpoint on the fence. Lower the blade and clamp the template in place with the hinge location centered below the blade's center mark. Slowly raise the blade through the template until it cuts the length of the hinge (left). Repeat for the other hinge mortises.

Make a template from a piece of $\frac{1}{2}$ -in. MDF about 6 in. wide and long enough that it will fit snug inside the height of the door opening. Mark the direction the template sits in the cabinet as well, so you'll know which way to orient it when routing later.

Make the hinge cutouts on the tablesaw

The next step is to cut the template openings on the tablesaw. Those cutouts will guide the router work. Start by transferring the hinge location marks from the door to the edge of the template. From there, mark the inset of the hinge leaf on the face of the template.

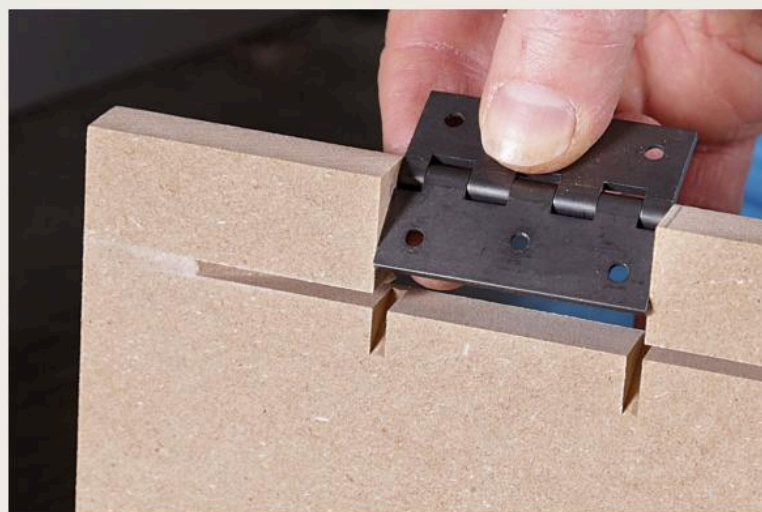
At the tablesaw, the first step is to mark the center of the blade on the face of the rip fence. The first cut you'll make will be along the line marking the back edge of the hinge leaf. Use the square to adjust the rip fence to cut just at the line—you want the blade on the hinge side of the line.

Make this cut by raising the blade up through the template (see photos, above). Clamp the template so that the hinge location is centered over the blade. Slowly raise the blade until it cuts the entire length of the line at the back of the hinge. Do the same for the other hinges.

Once you've made those inside cuts, you'll use a miter gauge to complete the cutouts. Set the tablesaw blade fairly high, and use the rip fence as a stop to ensure accuracy. Using a miter gauge, cut on the inside of the side layout lines. Finish one cutout, and check the fit of the hinge before moving on to the next cutout. You'll likely have to take a few cuts to creep up on the perfect fit.



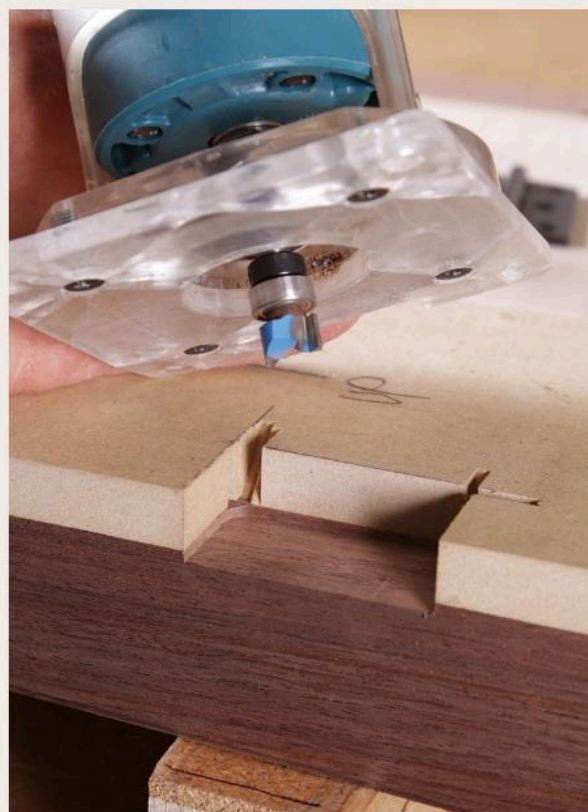
Finish up. Set the blade fairly high. Use the fence as a stop to finish the cutouts for the hinges. Remember to cut on the hinge side of the line and try to keep the blade exactly at the line. Make one cutout, check the fit, and then move on to the next one.



CUT THE CABINET MORTISES

Set the depth.

Open two hinges and place them on both sides of the template's cutout. Put the router base on the hinge leaves—not the barrels—and lower the bit until it just touches the cabinet side. Setting the depth in this manner automatically accounts for the thickness of the template and the hinge leaves. Before routing, use a chisel to score the outside corners of the mortise to prevent blowout.



Route away. Carefully route out the mortise, riding the bearing against the edges of the cutout in the template.

Cabinet mortises come first

With the hinge cutouts in the template complete, it's time to shut off the tablesaw and grab your trim router to cut the mortises in the doors and the cabinet sides.

Place one cabinet side on the workbench, and align the template (facing the correct direction) with the hinge layout marks. Bring the front edge of the template flush with the front edge of the cabinet side and clamp it in place. Set the router bit's depth (see photo above), and you're ready to start routing. I use a trim router with a flush-trimming, bearing-guided bit. Before I turn on the router, I take one extra step. I use a sharp chisel to slice the outside corners of the mortise. This step prevents blowout.

Carefully rout away all of the waste inside the template cutouts. Then use a chisel to square off the inside corners of the mortise using the template as a guide. Rout the other mortises in the same way. When you remove the template and check the fit of the hinges, they should all fit perfectly in their mortises.

Door mortises are trickier

Routing the door mortises takes a bit more setup. I find it easiest to do this with the door clamped in a vise and held securely. Set the template on the edge of the door, aligned correctly, and clamp it in place with enough force to hold it while still allowing it to be moved a bit.

Tape one of the spacers to the bottom of the door and align the template flush with it. The template also must be properly placed for the amount the hinge leaves are inset on the door. This will be determined by your cabinet design. I set a small combination square to that dimension and use it to align the template.

Once the template is aligned properly, you can rout the door mortises, following the same steps as the cabinet mortises. Chisel the ends first, rout the waste, then clean up the inside corners. Remove the template and you are ready to install the door. □

Craig Thibodeau is a professional furniture maker in San Diego, Calif. (ctfinefurniture.com).



Finish the mortise. Once the router work is complete, use the template as a guide to chisel the inside corners square.



DOOR MORTISES CLOSE THE DEAL

Same process.

With the door in a vise, clamp a strip of wood to the back of the door to help support the template. Then clamp the template lightly in place, aligning the bottom of the template flush with a spacer taped to the bottom of the door. With a combo square, align the template for the correct hinge inset, then cinch the clamps and rout the mortises. Follow the same steps you used to cut the cabinet mortises.



gallery

Inspiration for our readers, from our readers

CURTIS BUCHANAN

Jonesborough, Tenn.

"I've wanted to make this cradle since I first saw a photo of it in Charles Santore's *Windsor Style in America*," Windsor chairmaker Buchanan says. "My wife was carrying our youngest daughter back then, and extra time was hard to come by. Thirty-two years later, I was able to find the time to make it for that daughter's first child—our first grandchild." The finish is milk paint and linseed oil.

WHITE OAK AND WALNUT, 19W X 35L X 28H



STEPHANIE LUNIESKI

Edina, Minn.

The idea for this table came to Lunieski when she was scrutinizing her guitar. Later, the design took on the qualities of a suspension bridge, with every element playing off the tension in the wires. "I wanted to strike a balance that suggests the wires are pulling the legs into place while, at the same time, the legs appear to be pulling the wires taut." The table was featured in a show of student work this past spring at the Center for Furniture Craftsmanship in Maine.

WHITE OAK, 16D X 48W X 31H

Photo: Mark Juliana



REID ERIC ANDERSON

Burien, Wash.

This table is modeled after a traditional Spanish-footed tavern table, but Anderson made the top larger to fit modern dining rooms. "The base is milk-painted with a shellac topcoat that is lit on fire to give it a wonderful sheen and texture." (For more on that technique, see *Finish Line*: "An antique painted finish," *FWW* #172).

MAPLE, POPLAR, AND CURLY MAPLE,
36W X 72L X 32H





WILLIAM STRENGER

Oceanside, Calif.

This floor lamp has an inlaid brass spine that runs the length of the lamp and serves as a touch dimmer, so you can control the light from any height. The body was laid out in a bricklaid pattern with overlapping joints, and shaped using a grinder and hand tools. The lampshade has moving veneer windows reinforced with clear plastic and held in place with walnut connectors, and a turned walnut base and rim.

WALNUT, 25D X 10W X 51H



JAMES ALLEN AND DON JACOBUS

Bainbridge Island, Wash., and San Jose, Calif.



Allen, 90, and Jacobus, 80, lived next door to each other when they made this display cabinet for Allen's daughter. The two friends share a love of woodworking that goes back decades, and although each worked on every aspect of the cabinet, they say Allen contributed the woodworking expertise and Jacobus the design. The book-matched maple burl veneer used in the cabinet was acquired 40 years ago and was kept waiting for the right project.

MAPLE AND CHERRY, 13D X 23W X 43 $\frac{3}{4}$ H

BILL ANDERSON

Townsville, Queensland, Australia

Anderson credits several *FWW* contributors with teaching him to build this table and chairs. The overall design came from Gary Rogowski, the curved, beveled edge from Daniel Chaffin, and the wipe-on polyester finish from Michael Pekovich. He was worried the chairs would be "a step too far," but guidance from Philip Lowe's article on the sequence of building (*FWW* #215) helped break down the process. And the upholstery technique came from Michael Fortune.

ASH AND SHEOAK (TENONS),
39 $\frac{1}{2}$ W X 79L X 30H (TABLE),
17D X 19W X 40H (CHAIRS)

Photo: William Long



WALTER WHITELEY

York, Pa.

After his daughter fell in love with a piece in the book *Biedermeier* by Angus Wilkie (Abbeville Press, 1987), Whiteley set out to make one for her. He extrapolated the dimensions from the photo and did some research, deciding on a cherry substrate with carpathian elm veneer and solid ebony escutcheons and feet. "The carpathian elm creates this cathedral-like effect moving from the base to the top."

CHERRY, CARPATHIAN ELM VENEER, AND EBONY, 20D X 36W X 50H

Photo: David Neuburger



MARK ARNOLD

Sunbury, Ohio

When the Ohio Statehouse was searching for an antique eagle lectern to use for special occasions, it was suggested they have one made by an Ohio native instead. Arnold designed it with the late Neoclassical and Renaissance Revival styles of the House Chamber in mind. "Nothing about this job was mundane," he says. "It required almost every discipline a cabinetmaker can practice: spindle and faceplate turning, carving, joinery, veneering, and finishing."

MAHOGANY, 28D X 28W X 60H



ROB KUTNER

San Francisco, Calif.

This Federal style demilune table is Kutner's interpretation of a period reproduction by Ohio furniture maker Rob Millard. He built it over a year in his garage shop. "The table is built traditionally: bricklaid poplar apron, mortise-and-tenon rear and fly leg joints, bridle-jointed apron legs, hammer veneering, and hide glue." The top is veneered with crotch mahogany and holly.

MAHOGANY, POPLAR, HOLLY, AND DYED VENEERS, 18D X 36W X 28H



AMY COSTELLO

Provo, Utah

Costello was enrolled in an independent study course on carving and marquetry at Brigham Young University when she made this tea box. It was inspired in part by a Designer's Notebook in which several furniture makers designed their own tea boxes ("5 Takes on the Tea Box, *FWW* #257). It was also a chance for Costello to explore an interest in mandalas, traditional Hindu and Buddhist symbols.

ELM, WALNUT, AND EBONY, 9D X 9W X 3½H

Photo: Caitlin Egan



FRED ROSSI

Manchester, Mass.

Rossi's Angel Arch console table was inspired by natural arches Rossi has seen in national parks. He chose quartersawn cherry for the piece because "It allows the viewer to concentrate on the piece's form and not be distracted by the loud flame pattern in flatsawn cherry." The finish is six coats of a hand-rubbed blend of turpentine, boiled linseed oil, and satin urethane, followed by wax.

CHERRY, 18D X 48L X 29½H

Photo: Marshall Dackert



JOE MORGAN

Park Rapids, Minn.

"I have a lot of patience in general, but cutting the marquetry for this table made me seriously question how much I really had." Morgan cut the labyrinth (some 650 pieces) and central octahedron (104 pieces) by hand, employing a scalpel blade, two chisels, and a pair of tweezers as his arsenal. "I made a 48-piece radial pattern from quartersawn maple to use in the background of the top. I did not want to use veneer with a dominating wood grain because I wanted the attention to be on the marquetry."

MAPLE AND VARIOUS VENEERS, 29 DIA. X 30H

Photo: Ramon Moreno



master class



Sinuuous, tapered string inlay

BY STEVE LATTA

Over the past several years, I've tried to push the limits of traditional stringing patterns, which are basically a combination of straight lines and regular arcs, into freer, more organic forms that have a lot more life. Using patterns to guide a Dremel tool with end-mill bits gave me a new design vocabulary free of geometric constraints. To add realism and vitality to these designs, I taper the lines, routing adjacent sections with bits of different diameters, then smoothing the transitions between them by hand. The inlay on this chest that I made for my wife, Elizabeth, illustrates this effect.

Making the pattern

After working out the design full size on paper, make several copies. Spray-mount one copy to a piece of ½-in.-thick MDF and cut out the pattern using a scrollsaw with a no. 9 blade. Mark the end points of the lines in the design, but continue cutting to the edge of the pattern or merge into another part of the design. Reassemble the pattern pieces and make registration marks between them to show how they align.

I place registration pins along the bottom segment of the pattern so that I can remove and remount it accurately. Since this bottom section is the foundation for the design, properly positioning it aligns the entire form.

Rout the design

When you cut a groove, the shank of the bit rides directly against the MDF pattern. As long as you keep the tool moving, the pattern will hold up. Leave it in one place too long, however, and you'll burn a notch into the material. To avoid creating a noticeable starting point, tilt the Dremel before turning it on, and pivot the bit into the work along the same line you'll be cutting. Entering the work from the side results in a small entry slot that can easily be avoided. To finish a groove, cut the power to the Dremel but keep the tool moving, sliding back into an area previously cut as the rotation winds down.

This technique has more than a few places where things can

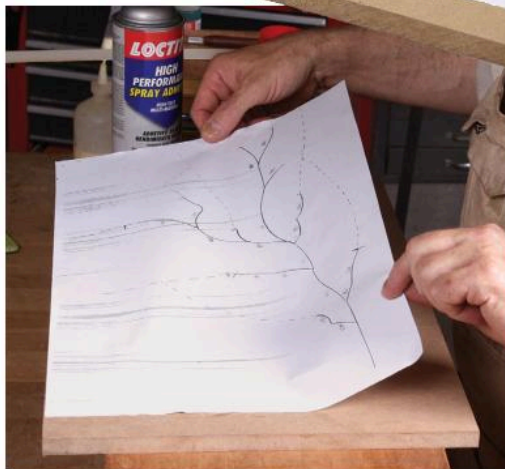
The necessary tools

The tools needed for this type of work, although somewhat esoteric, are readily available and reasonably priced. For many years, I've used a Dremel mounted in a Stewart-MacDonald router base combined with a foot-operated on-off switch to free up my hands. Spindle rotation speed is very important. I run mine at a full 35,000 rpm and have found that many of the European models, or the hanging, extended-shaft varieties, don't spin fast enough.

To cut the grooves for this type of inlay, I use precision two-fluted end mills sold by drilltechnology.com. The company's owner, Bill O'Grady, and I have come up with a solid carbide product that performs well. The bits I typically use are ¼, ⅓, ⅔, ⅕, ⅙, ⅛, 1/16, 1/32, 1/64, 1/128, 1/256, 1/512, 1/1024, 1/2048, 1/4096, 1/8192, 1/16384, 1/32768, 1/65536, 1/131072, 1/262144, 1/524288, 1/1048576, 1/2097152, 1/4194304, 1/8388608, 1/16777216, 1/33554432, 1/67108864, 1/134217728, 1/268435456, 1/536870912, 1/1073741824, 1/2147483648, 1/4294967296, 1/8589934592, 1/17179869184, 1/34359738368, 1/68719476736, 1/137438953472, 1/274877906944, 1/549755813888, 1/1099511627776, 1/2199023255552, 1/4398046511104, 1/8796093022208, 1/17592186044416, 1/35184372088832, 1/70368744177664, 1/140737488355328, 1/281474976710656, 1/562949953421312, 1/1125899906842624, 1/2251799813685248, 1/4503599627370496, 1/9007199254740992, 1/18014398509481984, 1/36028797018963968, 1/72057594037927936, 1/144115188075855872, 1/288230376151711744, 1/576460752303423488, 1/1152921504606846976, 1/2305843009213693952, 1/4611686018427387904, 1/9223372036854775808, 1/18446744073709551616, 1/36893488147419103232, 1/73786976294838206464, 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The pattern is crucial

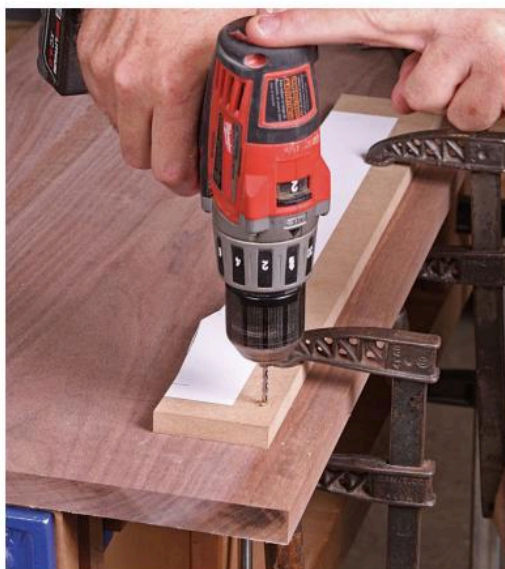
Start with the design. After working out the design on a piece of paper, spray-mount a copy to a piece of $\frac{1}{2}$ -in. MDF. On the design, mark out where the grooves will transition from one width to another.



Cut it apart using a scrollsaw. Mark the ends of the branch with a pencil but continue cutting to the edge of the pattern or merge into another cut. Reassemble the pattern and make registration marks between the pieces to show how they best align.



Proper positioning. The bottom piece of the pattern aligns the entire form. Latta installs a couple of registration pins along the bottom segment so that he can remove and remount it in the same place on the workpiece. On the blanket chest, these pins were positioned so the holes fell under its waist molding.



go south, so I always work out the line thicknesses, intersections, and cut sequences on a test piece of $\frac{1}{2}$ -in. MDF. If that goes well, I repeat the process on a slab of hardwood, making any changes indicated by my first attempt. Once I feel comfortable, I do the actual piece. If I haven't had a successful attempt on a test piece, what insanity would make me believe it will magically come together on the real piece?

Having established the line weights and transitions, start by cutting the narrowest segments of the grooves. You may have to assemble and disassemble the pattern several times to cut all of the grooves. During this part of the process, I use clear tape to hold the segments together. You can run the narrow segments into where the wider grooves will be cut, because the wider groove will cover the narrow one. To speed the work, I use a couple of Dremels set up with different-size bits. Once done with the smaller bits, I change to larger bits. It is important to cut all the grooves at the same depth (a light $\frac{1}{16}$ in.). Color-coded depth collars help keep the diameters sorted and make for an effortless bit change without the need to reset the depth. I sand or chisel the edge of the groove to smooth the transition between segments. It doesn't take much, because the shoulder between segments is only $\frac{1}{128}$ in. or so.

When cutting grooves, look for natural break points (such as offshoots) for individual pieces of stringing. Ending cuts in the path of intersecting cuts makes for really fluid transitions. Ideally, a long run on the branch should be fitted with a long single piece of stringing tapered down from the fattest point. It is not unusual to waste a few strips trying to get a good fit.

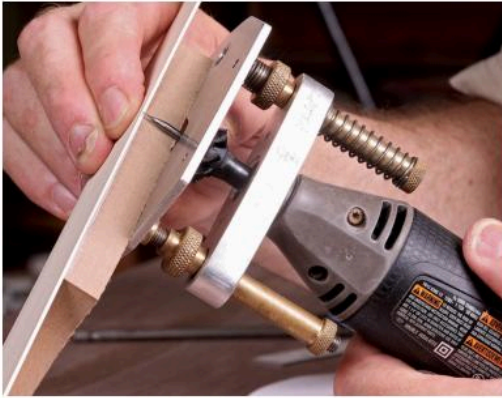
Make the stringing

The stringing is made from holly (or a wood of your choice) sliced into strips on a bandsaw or tablesaw at a heavy $\frac{1}{16}$ in. thick. Too thin will fold and flex too easily and too thick will be difficult to cut and bend. The relationship between the thickness of the stringing and the depth of the groove is crucial, because when installed, the stringing should be a hair (only a few thousandths of an inch) proud of the surface.

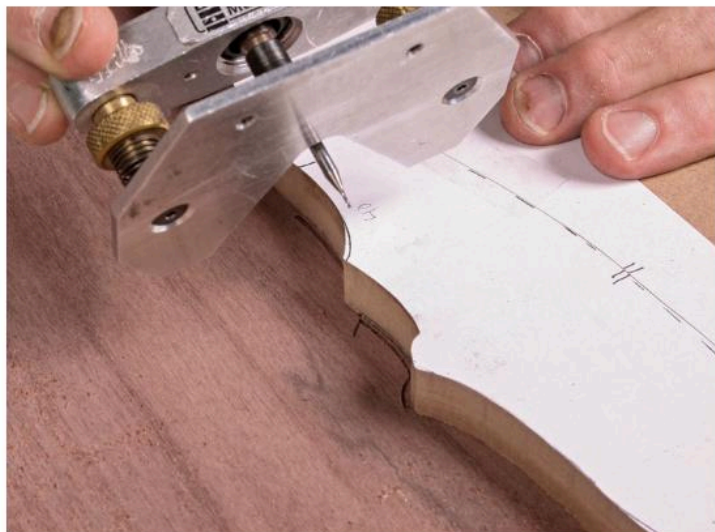
Stringing can be cut to width with a straightedge and X-Acto knife or with a slicing gauge and fixture. For my straightedge, I have a thick 2-in. by 24-in. ruler with sandpaper applied to the bottom to prevent slipping. I will often use double-sided tape

Router bit rides the template

Adjust the height of the bit. Measuring against the template and a piece of inlay stock, set the bit so that the groove will be just slightly shallower than the veneer thickness.



Hands-free start and stop. Latta uses a Dremel mounted in a Stewart-MacDonald router base and equipped with a foot switch for on and off (right). He starts by cutting the narrowest grooves (below).



Add pieces to continue the pattern

Keep track of the bit size. To make things easier, Latta uses two Dremels set up with different-size bits. You may have to assemble and disassemble the pattern several times to cut all of the grooves. Use clear tape to hold the segments together. The wide and narrow grooves will blend together, so the narrow grooves can be started within the range of the wider grooves (below).

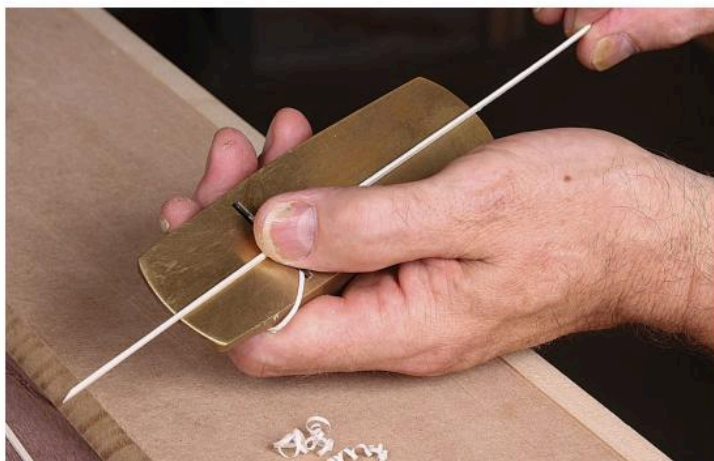


Smooth the transition. When moving from one width to the next, sand or chisel the edge of the groove to smooth the transition. Keep in mind that the shoulder between segments is only $\frac{1}{32}$ in.

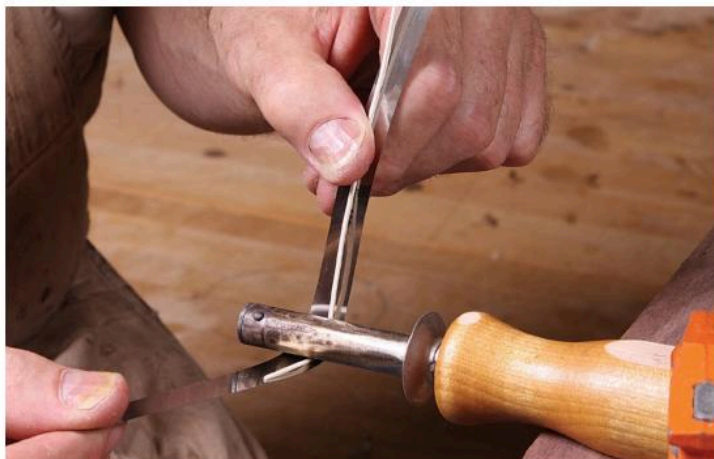
Prep the stringing



Cut the stringing. Using a slicing gauge with a shopmade fixture (MDF with a small lip attached), butt the stringing to the lip and start slicing at the bottom, working your way to the top. For a cleaner edge, cut halfway through and then flip the material and finish the cut from the other side.



Taper the strips. The strips can be tapered with a small block plane. Pull the strip across the blade. There is a lot of fitting and trial-and-error here. Be prepared to break some strips and have to redo them.



Heat helps manage tight curves. If there are any tight curves, bend the stringing on a hot pipe before you glue it in place.

Glue it in and trim it flush



Glue it in. Once the stringing fits, glue it in using yellow glue. Latta uses a Monoject 412 syringe to put glue in the channel, and presses in the stringing with a metal ruler.



Run through intersections. Glue in the stringing so it lands beyond intersections, and then use a chisel or a gouge to cut it back to perfect length.



Flush it up. As you go, smooth the stringing down to the background surface with a block plane, chisel, sanding block, or card scraper.



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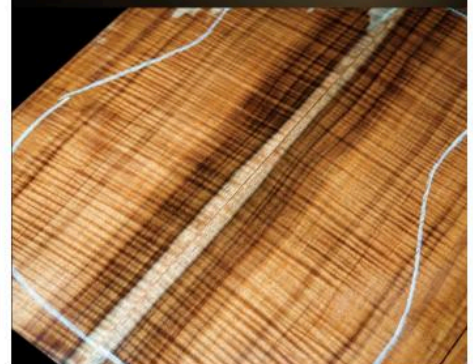
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to apply a strip of wood to the top of the rule to serve as both a handle and a guard should the knife slip. If you use a slicing gauge, you'll need a piece of MDF about 6 in. by 28 in. with a small lip on the edge. Butt the holly against the lip and start slicing at the bottom, working your way to the top—this keeps the stringing from buckling. With thicker stringing stock, I often go halfway through and then flip the material to come in from the other face. This leaves a cleaner edge that's less likely to break on a curve. I taper the strips with a small block plane. It is not difficult, but it is not unusual to ruin a strip and have to start another.

Once you know the stringing will work, glue it in place. I use yellow glue in a Monoject 412 syringe. When the glue is dry, flush the stringing to the surface using the method you prefer, whether it's a chisel, handplane, sanding block, or card scraper.

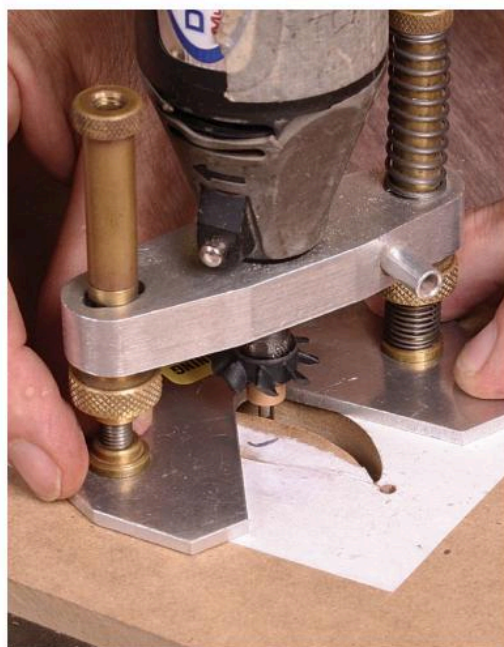
Add the leaves

In this piece, the leaves are single thicknesses. Their stems are tapered, however, and I cut the grooves for them by hand with a shallow gouge. Make a template with the cutout shape of the leaf silhouette, and an insert for the center vein. After you adjust and clamp the template where you want it, start by routing the center vein. With a shallow-sweep gouge, extend this line out to form the stem. A single piece of stringing makes both the stem and central vein. Once the outer border has been routed, inlaid, and dried, you can flush it to the background.

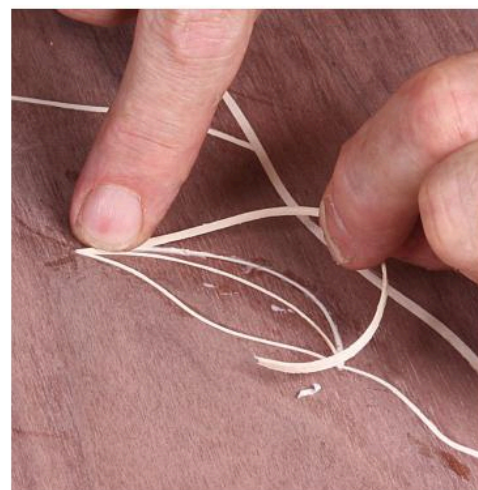
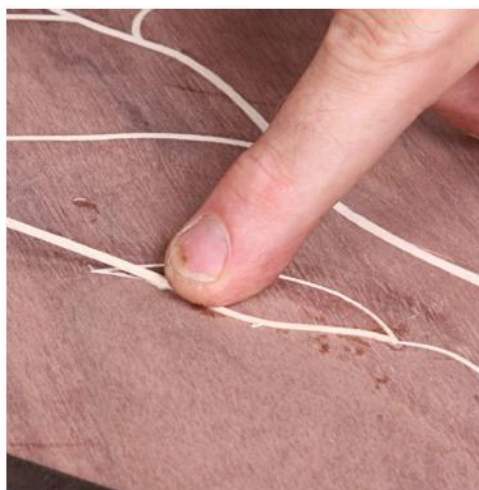
For more complicated leaves, such as the double leaf or the leaf with a flipped tip, the pattern is a little more complicated. The pattern for the double leaf has two inserts to help define the shape. Tackle them one line at a time as you would with the single leaf. □

Contributing editor Steve Latta teaches woodworking at Thaddeus Stevens College of Technology in Lancaster, Pa. See him at Fine Woodworking Live 2018 (finewoodworkinglive.com).

A pattern for leaves



Position the leaf. Clamp the template on the workpiece where you want the leaf, put in the insert (above), and tape it in place. Then rout the center vein (left), inlay the stringing, and trim it flush. Repeat the sequence for each outside edge of the leaf (below).



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Instant aging with potassium dichromate

A CHEMICAL STAIN THAT WORKS MAGIC ON TANNIN-RICH WOODS

BY DAN STROUT



How can you skip dyes and stains but still achieve the rich hues and grain clarity reminiscent of a centuries-old patina? If your project is made of tannin-rich woods such as mahogany, cherry, walnut, or oak, then potassium dichromate—or potash—is a great choice. As a bonus, potash won't darken woods without tannins, so inlaid wood such as holly stringing will stay nice and white.

What is potash?

Potash is a commercially manufactured granular powder with the same chemical makeup ($K_2Cr_2O_7$) as the naturally occurring orange crystal lopezite. Mixed with warm water, potash forms a chemical stain (the name potash can also refer to a range of other compounds containing potassium). As an oxidizing agent, potassium dichromate is used in various industrial applications such as leather tanning and black-and-white photography.

Modify the solution to control the depth of color. Strout prepared sample boards to test four solution strengths of potassium dichromate. Once the wood has fully oxidized, the color depth won't change further, nor will sapwood be affected by potash. Apply the intended topcoat finish (shellac, oil, varnish, etc.) to the test strips before settling on a final potash concentration. It's a good idea to keep finished samples and make notes on the back.

	UNTREATED	1/8 tsp. PER CUP	1/4 tsp. PER CUP	1/2 tsp. PER CUP	1 tsp. PER CUP
MAHOGANY					
CHERRY					
WALNUT					
WHITE OAK					

RAISE THE GRAIN

Apply a generous amount of water to the surface with a clean, wet rag. After the surface has dried, sand away the fuzzies with 220-grit paper. Because potash is a water-based solution, repeat this process to minimize post-solution sanding.



CHECK CHERRY FOR BLOTCHING



The mineral spirits test. Wipe blotch-prone cherry with a clean rag soaked in mineral spirits. Then examine the wood for blotchiness; this test gives a preview of the finished color's evenness.



When applied to certain woods, most notably mahogany, cherry, and walnut, potash reacts with the tannins in those woods to accelerate the natural aging process and produce an aged depth of color and shimmering grain pop that is unparalleled.

Although steeped in furniture finishing history, potash is overshadowed today by more conventional and readily available products. However, with some online digging, you can purchase 1 lb. of potassium dichromate for less than \$20. I get mine from pyrochemsource.com.

Safety first

The chemical makeup of potassium dichromate is considered toxic. This has diminished its potential as a favorable, modern-day finishing agent. However, with common sense precautions, potash is a safe finish worth including in your arsenal of finishing options.

When handling potassium dichromate—either in its pure granular or water-mixed form—wear rubber gloves, eye



Pre-treat to eliminate blotches. If you see any significant dark areas, coat the entire surface with a 1-lb. cut washcoat of dewaxed shellac. After the washcoat dries, use a rubber sanding block with progressively finer grits of paper (120 to 320) and sand down to the bare wood.

APPLY THE POTASH



Mist and apply. To help with absorption, spray a fine mist of water on the piece before applying the potash. Then generously apply the potash concentration with a clean rag. To avoid oxidized lap marks, work quickly and in manageable-sized areas of the project with defined break points. After about 4 minutes, wipe the surface completely dry with a clean rag.



protection, a dust mask, and clothing that covers your arms and legs. Mix the solution in a ventilated area and, to avoid splashing, add the powder to the water instead of the other way around. Safely store any unused solution in a clearly marked and covered plastic or glass container or use it up by spreading it on scrapwood. Either in its granular form or in solution, potash will last indefinitely. Once dry, it's no longer considered hazardous.

Surface preparation

To get ready for the potash application, scrape the surface of your workpiece until it is flat and even. On open-grain woods, raise the grain by applying a generous amount of water to the surface with a clean, wet rag. After the surface has dried, sand away the fuzz with 220-grit paper. Because potash is a water-based solution, repeat this process to minimize post-solution sanding.

If you are using an open-grain wood and want a closed-grain finish, you'll need to fill the grain first, then prep for the potash. As a side note, the scraping and surface preparation steps described above don't apply to crotch veneers because of their inherent fragility and variations in grain structure. However, these veneers should be carefully sanded to 220-grit and wiped clean in preparation for potash.

What about blotch-prone woods?

Cherry is known for its blotchiness if not properly prepared for finishing. You can minimize or prevent blotching by doing a blotch test with mineral spirits and then sealing the wood. Start by scraping the surface flat and even. Look for blotch-prone



Touch up inlay. Depending on the concentration, the holly will take on a slight off-white hue as compared to its freshly scraped, pure white color. If you prefer holly's pure-white color, wrap a piece of 220-grit paper around a credit card. With the card's edge carefully registered on the inlay, a light once-over sanding will return the holly to its freshly scraped appearance.

areas by wiping the cherry with a clean rag soaked in mineral spirits. Treat blotching with a washcoat of dewaxed shellac, followed by sanding with 220- to 300-grit paper.

Apply the potash

When applied, the potash solution will be bright yellow in color and will not immediately change the color of the wood. Over the course of the next several hours, the wood will darken to its final color. Let it set at least 10 hours to complete the chemical process before applying a topcoat of your choice. □

Dan Strout makes furniture in Milton, Mass.

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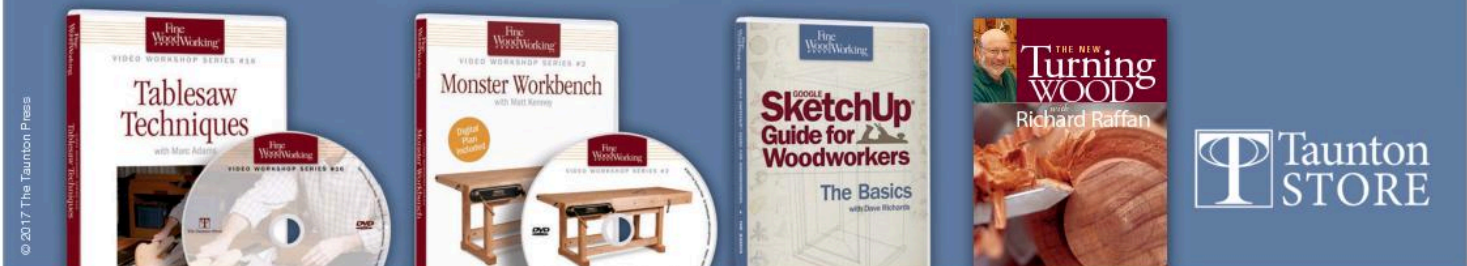


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Even when we're finished, we're not

WHEN A PIECE FINDS ITS PURPOSE, IT IS HOME

BY MICHAEL PEKOVICH

Building a piece of furniture is a long process and I typically think of that last coat of wax as the finish line. Lately, though, I've been thinking that even then, even after the piece leaves the shop, it's still not quite complete.

Whenever I bring a finished piece into the house, I go through a familiar routine. I'll stare at it for a while, pretend to ignore it, scowl at it. You'd think there would be some sense of satisfaction, a hint of admiration or self-congratulation in all of the attention. Not really. My interior monologue usually goes something like "are the lines right, are the proportions correct, is the finish perfect?"

More to the heart of the matter, "did I capture that spark of inspiration that led me to mill up all of that beautiful lumber in the first place?" None of the questions have an easy answer, nor are the ghosts of ambivalence easily put to rest. After a while I reach a sort of mental truce and leave with this thought: "Another piece thoughtfully designed and carefully made, but ultimately imperfect in some intangible way. Oh well."

But then a subtle transformation begins. A new table is soon adorned with a water glass and a TV remote. A cabinet gets filled with wine glasses or toilet paper and dental floss. A drawer is filled with socks or last summer's seashells. After a while utility begins to breathe life into the piece, and those things that bothered me about it at first somehow don't bother me as much anymore. I assumed that I just needed to get used to a piece, but finally realized that it was really about getting the piece into use.

The problem wasn't necessarily that the piece wasn't perfect (none of my pieces are, though I tend to like them well enough anyway), but that it was simply incomplete. It's a strange notion considering the time and effort that goes into making it, but I realized that we as builders can only take things so far.

I made a simple wall cabinet a while ago. It was nice, but what really brought it to life for me was a little teapot that I decided to place on the center shelf when photographing it. It dawned on me that without the teapot, the cabinet with its bare shelves was lacking something. The teapot completed the picture. There was a quiet hum to it, a feeling that neither of the two separate notes could quite conjure on their own, but together they created a harmony.

Early in my woodworking journey, I made boxes as a way to explore ideas and techniques. I still have some of those boxes. They are still empty. And in their emptiness they are somehow incomplete. A box is a container after all, and if it is conceived without a thought to what it might contain, no matter how beautiful or finely crafted, it



I assumed that I just needed to get used to a piece, but finally realized that it was really about getting the piece into use.

will lead a life that's incomplete.

So I don't make boxes anymore. Instead, I make salt boxes, or tea boxes, or kindling boxes, or jewelry boxes. I make containers with a purpose. And I make furniture to serve a purpose, for my family and for others. I still build it as soundly as I can, and I invest

every ounce of my will, intellect, life experience, and creative intuition into it. But now, I'm also beginning to invest a little patience and faith in the notion that a piece will attain its full potential only in time and with use.

Michael Pekovich is Fine Woodworking's creative director. See him at Fine Woodworking Live 2018 (finewoodworkinglive.com). Send your woodworking story to bench@taunton.com; we'll pay for any that we publish.

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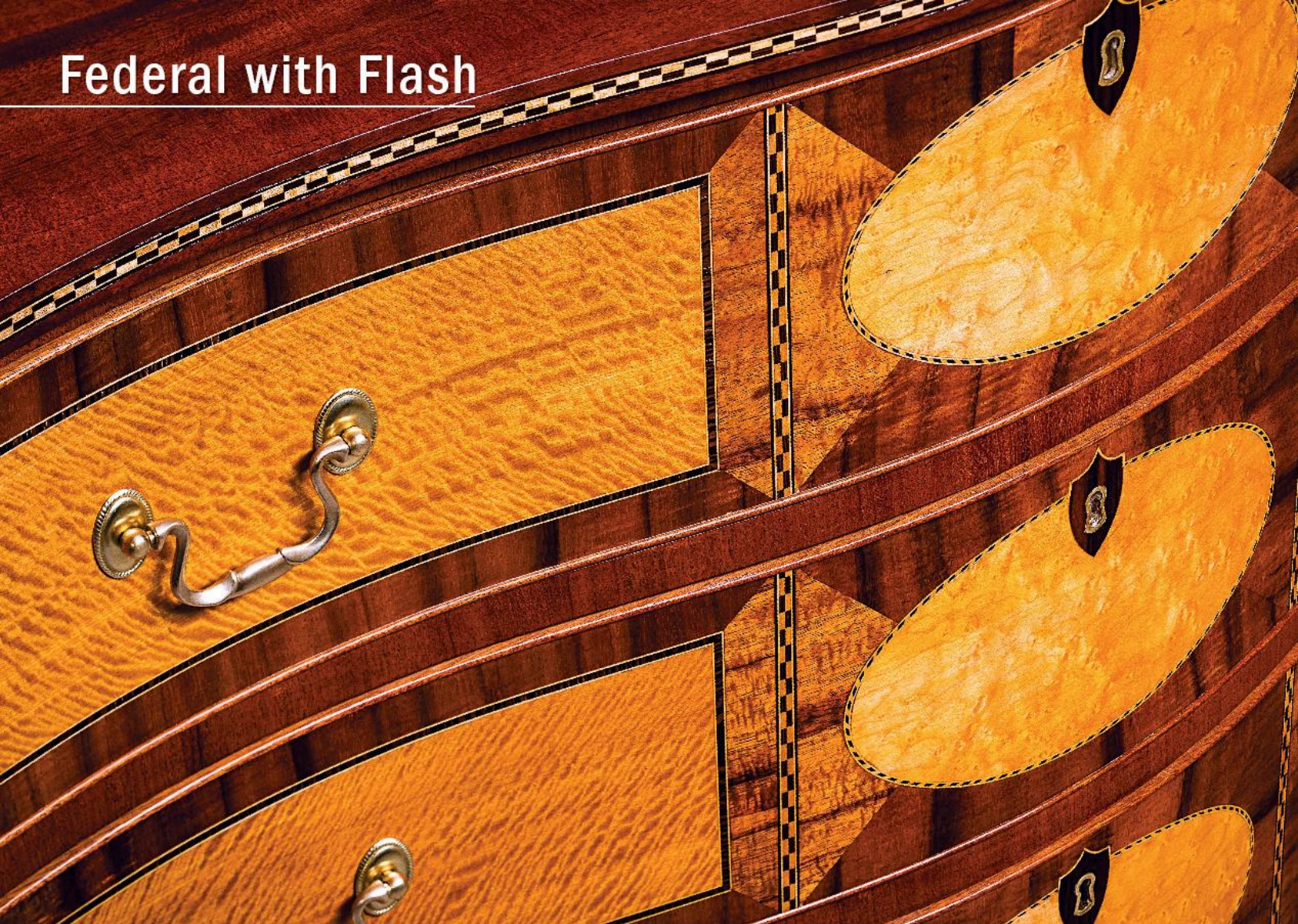
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Federal with Flash



Two hundred years ago, Portsmouth, N.H., was a thriving seaport with a vibrant community of cabinetmakers who built some of the best furniture in the country. These days, from a shop in an old mill in nearby Rollinsford, Allan Breed reignites the New Hampshire tradition in pieces like this reverse-serpentine chest of drawers, which he reproduced from an original in a private collection.

Breed, 63, who has been building period furniture since his teens, exemplifies both the technical prowess and the aesthetic daring of his Portsmouth predecessors. He built the oxbow drawer fronts for the chest by sawing out and stack-laminating S-curved



pieces of white pine, then fairing the curves with a spokeshave and radius plane. Loving the high contrast of the original veneerwork, Breed emulated it with satinwood rectangular panels surrounded with wenge-and-holly banding and a mitered koa border. For the center panels he trimmed curly maple ovals with ebony-and-maple banding, punctuating each panel with a rosewood keyhole escutcheon. To add even more

zing, he chose bright brasses and finished the piece with super blond shellac. Building the mahogany case and aligning its serpentine drawer dividers, Breed says, “was the grunt work.” Hammer-veneering the drawer fronts? “That was the fun part.” —Jonathan Binzen