

TAUNTON'S

Fine Woodworking

Essential planes for
hand-cut joinery, p. 68



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at the tablesaw

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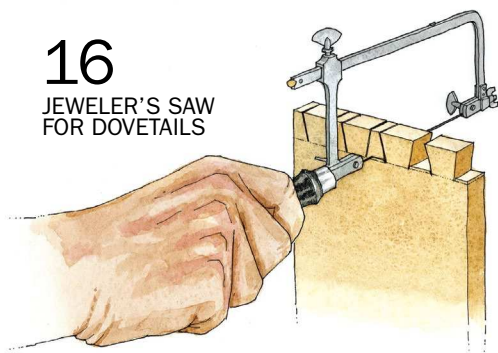
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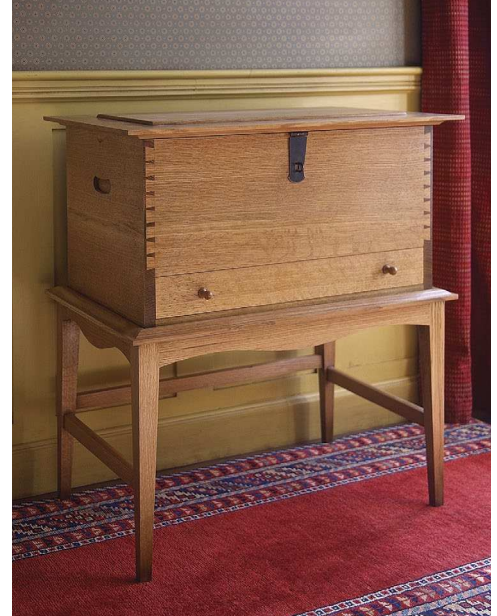
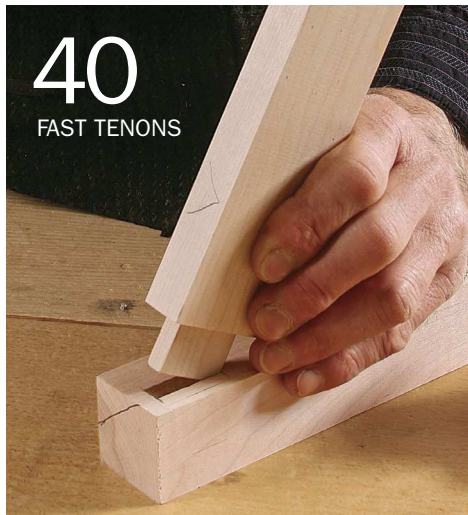
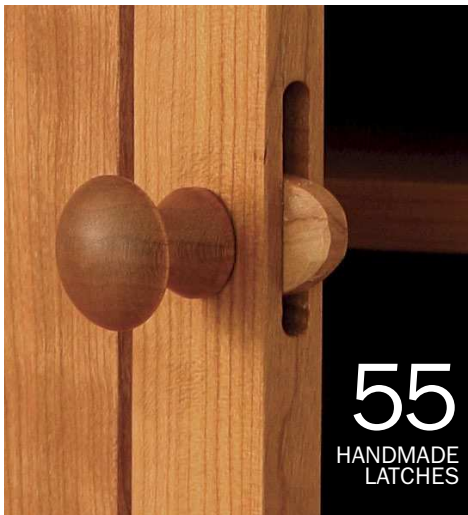
Four Planes for Joinery

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in no time

BY VIC TESOLIN



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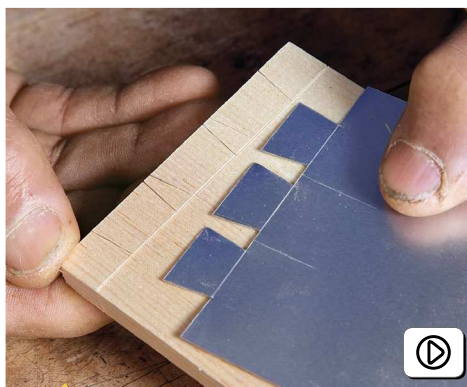
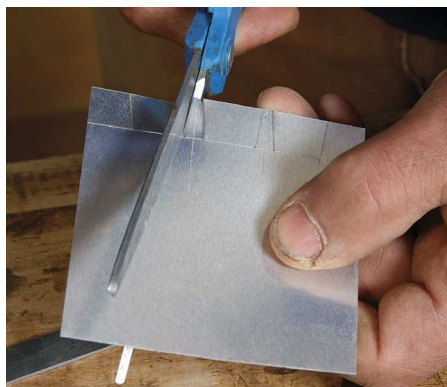
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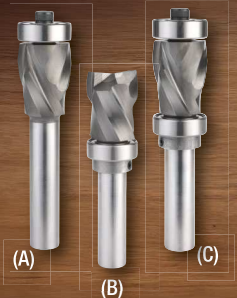
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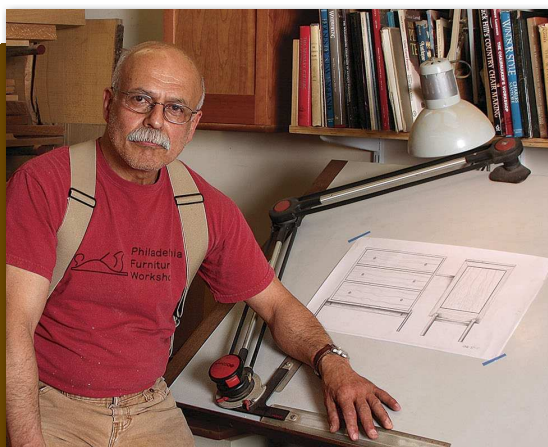
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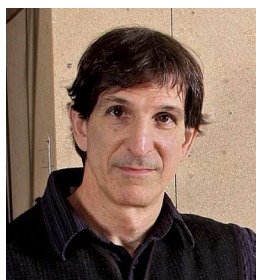
154275 (A) Flush Trim
154276 (B) Pattern/Plunge
154274 (C) Combination

contributors

In the 24 years that **Mario Rodriguez** (“Oak Chest on Stand”) has been a contributor to *FWW*, he has written articles on such wide-ranging topics as making a rocking chair for two toddlers, building custom fireplace mantels, and numerous project articles on tables, stools, cabinets, and more. He’s also written extensively for us on design, using hand tools, and specific woodworking techniques. Suffice it to say he’s passionate about furniture making, and he shares that passion in his full-time gig as a teacher at the Philadelphia Furniture Workshop (philadelphiafurnitureworkshop.com). Oh, and he wants you all to know he makes a mean Bolognese sauce.



Reed Hansuld (“Lather Up”) shares shop space with a collection of other woodworkers in a 19th-century building a few steps from the waterfront in the Red Hook section of Brooklyn, N.Y. A native of Canada, Hansuld apprenticed with Michael Fortune in Ontario, and spent time as a student and as a fellow at the Center for Furniture Craftsmanship in Maine, where he’ll be teaching this summer. Although he’s built everything from boats to kitchens, Hansuld now focuses primarily on furniture, with a little exploratory work in sculpture.



Tim Coleman (“Precise Tenons by Machine”) makes custom furniture in the shop he built a few paces from his house in Shelburne, Mass. He’s run a one-man shop for 25 years now, since apprenticing in Seattle with Curt Minier and studying at the College of the Redwoods under James Krenov in the 1980s. Coleman’s manuscripts are as well-crafted as his cabinets, betraying his college major in creative writing at St. Lawrence University.

Vic Tesolin (“4 Planes for Hand-Cut Joinery”) is a graduate of the furniture design and making course at Rosewood Studio in Ontario. After graduating, he ran his own studio furniture business while working at Rosewood as a part-time instructor and craftsman in residence. His current shop is a small space where he uses mostly hand tools. By day, Tesolin is the Woodworking Technical Advisor at Lee Valley & Veritas Tools and by night he teaches privately and for Lee Valley’s seminar program. He maintains a blog at minimalistwoodworker.com.



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Spotlight

ISSUE NO. 243

November/December 2014
p. 66

INSPIRING PHOTOGRAPHY

A key part of a *Fine Woodworking* editor's job is going on the road to photograph the action in the author's shop. There's no one better suited to the task because, aside from the author, there's no one more familiar with the material. That leads to strong, well-composed photos that illustrate woodworking techniques with clarity.

Rich photography is a signature element of *Fine Woodworking*, and the fact that we take our own photos is a real source of pride for the staff. So it's especially satisfying when one photo in an issue is so inspiring that it entices readers to pen a letter of praise. Jon Binzen's photo of Curtis Buchanan assembling a Windsor chair in issue #243 did just that. I received a few letters about it, but I thought two captured the essence of what all the vocal readers thought. Check them out below.

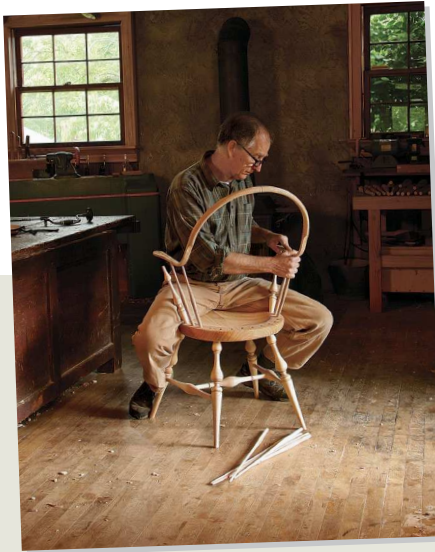
—TOM McKENNA, editor

Thanks for the outstanding lead photo on the Curtis Buchanan/Windsor chair story. The beautiful light picks out wonderful details from the tools on the benches to the refraction of Buchanan's glasses. It feels absolutely authentic. Thanks to the designer who recognized the worth of the photo and to everyone who resisted the temptation to reverse type into the dark areas. Great photo. Great page design.

—CHARLIE BUCHANAN, (no relation to Curtis),
WINSTON-SALEM, N.C.

Flipped through the latest issue and got into the particulars of the Windsor article. I started looking at pictures of wood being pared, carved, and bored, backed up to the start of the article, and started reading. Then something happened as I looked at Buchanan's face, his glasses, the attention he was paying to what his hands were doing, the warm palette of the benches, lathe, tools, windows, and light. It slammed into me that this wasn't just a document of process, it was a portrait. A really good portrait. Thanks for seeing that and giving it a full page. I think we can safely say you guys have honorably met the challenge of representing the Windsor chair on its own level.

—WILLIAM RICHTER, Berkeley, Calif.



Delight in Designer's Notebook

I just received my latest issue (#245) and can only applaud the inclusion of more design discussion. This is the most difficult part for me. And along with this feature, please—and I mean PLEASE—include more project photos and an expanded Readers Gallery. Pictures speak so much about how other folks are tackling shape, proportion, size, and scale.

—CHRIS DETRICK, Olympia, Wash.

Fashion faux pas

Regarding Marc Adams's article in this year's *Tools & Shops* issue ("Working Class Router Table," *FWW* #244): This article is very interesting, but as the owner of one of the largest woodworking schools in the country, it would be better if he followed the repeated advice of John L. Feirer in his book *Cabinetmaking and Millwork*: Short sleeves are safer.

—CLAY SAMMIS, Amherst, N.H.

Missing Minwax

Your recent article, "Wiping Varnishes," in the February 2015 issue (*FWW* #245) caught my interest when I noted that my favorite wiping oil finish, Minwax Antique Oil, was among those tested. Even though the focus of the article was to find a single product suitable for both wiping and brushing, the article was well worth reading to compare my standard wipe-on oil finish that I use for both furniture and smaller articles.

Unfortunately, I cannot find a source for Minwax Antique Oil and have been limiting use of my stashed supply for only the very finest projects. Do you know of a source for this excellent wiping oil?

—LEE WALKER, Sideview, Ky.

Editor replies: Minwax Antique Oil Finish is available online at rockler.com and amazon.com.

Sharpening scrapers

I held onto the August 2012 issue for a couple of years and finally got around to trying Michael Pekovich's technique for sharpening scrapers. Why did I wait so long?! My scrapers have never produced such great results. I did, however, make one slight change to the technique. I filed the edges with the scraper held in

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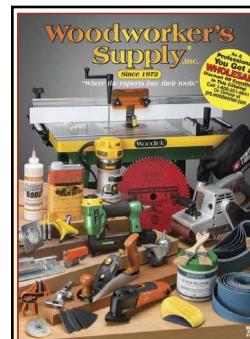
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the block and clamped up in my vise as shown in the article. But rather than remove the block and scraper and run it across the diamond plate, I left it in the vise and used the diamond plate like I would a file. The results were incredible. The sharpening technique I'd used in the past was OK but Mr. Pekovich's technique works much better. Thanks for the article.

—JACK DOBRIAN, Sandia Park, N.M.

Shooting down plane purchase

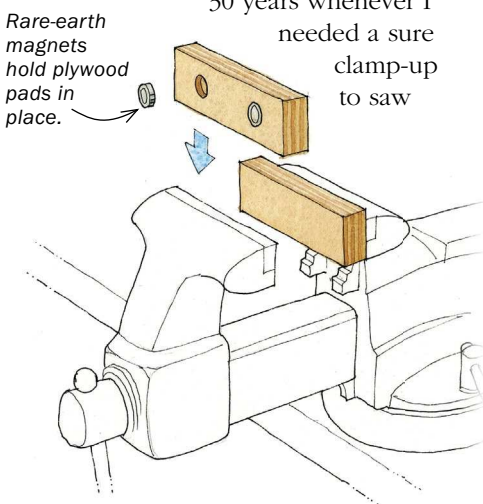
I enjoy your magazine and have learned a lot from reading it. However, after reading Matt Kenney's review of the Lie-Nielsen shooting plane in the *Tools & Shops* edition, I wonder whether y'all have lost your minds. I believe in using the right tool for the job, but \$500 for a single-purpose handplane? That's crazy.

—ALLAN WOODS, Cantley, Que., Canada

Best tip of the year

Bill Wells from Olympia, Wash., has my vote for best tip of the year (Methods of Work, *FWW* #243). I read his tip with laughter in my heart thinking of all the times I struggled to hold one piece of scrap against the front vise jaw, and another against the back jaw, all the while using my middle fingers to position whatever I was clamping in-between them. Hours spent over the past

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or file, plane or chisel, sand or carve. I developed my own technique of keeping pressure on one side of either cushion piece as I opened the vise to prevent the piece I was working on from falling. I built slip-over wooden jaws, but they take up too much space on the workbench. And then bam! Bill Wells of Olympia, Wash., changes my life. \$3.46 for rare-earth (Super Strong) magnets and some scrap plywood and I will never struggle or waste time again.

Thank you, Bill.

—DAVID PIAZZO, Norwood, Mass.

No support for circular-saw technique

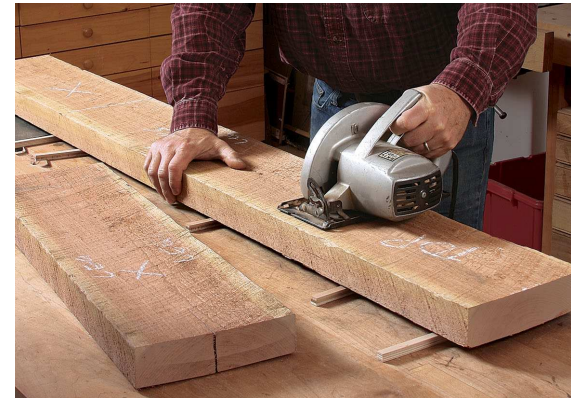
I have been a longtime subscriber to both *Fine Woodworking* and *Fine Homebuilding* and although I have been tempted in the past, I have never written a letter. That is until I read Michael Pekovich's article "Make a Table from a Board" (*FWW* #243).

While I enjoyed the piece, I was shocked at the dangerous circular-saw technique used. The photo at the top of p. 60 and advice about kickback—"This isn't a problem using the circular saw or bandsaw, but at the tablesaw the kerf can close up and pinch the back of the blade, causing a dangerous kickback"—misleads your readers into a potentially hazardous situation.

I've been a carpenter for 45 years and have run my own contracting business for the past 32 years and I can assure you that while bandsaws will not kick back, circular saws most definitely will, and with a surprising amount of force. It is important that the free or waste end of the board be allowed to drop during the cut to allow the kerf to open at the top to prevent pinching the blade. The stickers as shown in the photo should be only under the board on the right side of the blade. The setup as shown will cause the kerf to close up near the completion of the cut due to the weight of the saw and board. While you can have a

support directly under your cut, never cut between two supports.

—ROBERT MAHRER, Santa Cruz, Calif.



Michael Pekovich replies: You're correct that the saw can bind if the stock is bowed or not adequately supported when stickering each side of the cut. Letting the offcut drop is a safe solution, but runs the risk of splintering the end of the board. In construction this usually isn't a problem, but when I'm cutting furniture-grade lumber, every little bit counts.

West Coast left out

Your article on wiping/brushing varnish ("Wiping Varnishes," *FWW* #245) looked interesting to me but was then frustrating when I realized that none of the products tested were available to me as a resident of Southern California. That a national magazine could publish a major article that completely ignores the more than 18 million people in the Los Angeles region because of our air-quality issues frankly baffles me. The least you could have done was to have a disclaimer at the beginning of the article that says it is of no use to those who live in smog-impacted regions. What would be really helpful is that you acknowledge the issue and produce an article on achieving quality finishes when wiping varnishes are not available.

—LAWRENCE TRIESCH, Long Beach, Calif.

About your safety

Working wood is inherently dangerous. Using hand or power tools improperly or ignoring standard safety practices can lead to permanent injury or even death. Don't perform operations you learn about here

(or elsewhere) until you're certain they are safe for you. If something about an operation doesn't feel right, find another way. We want you to enjoy the craft, so please keep safety foremost in your mind.



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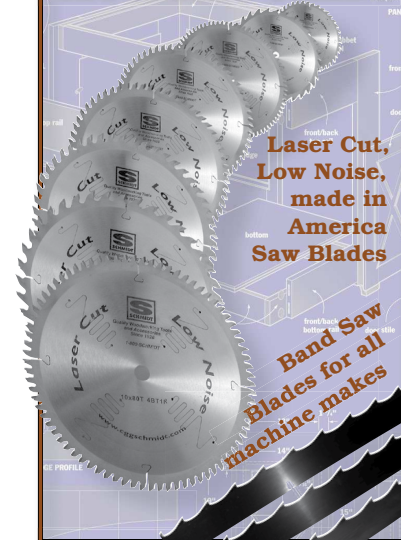
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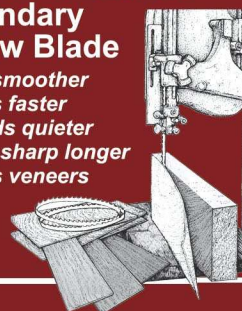


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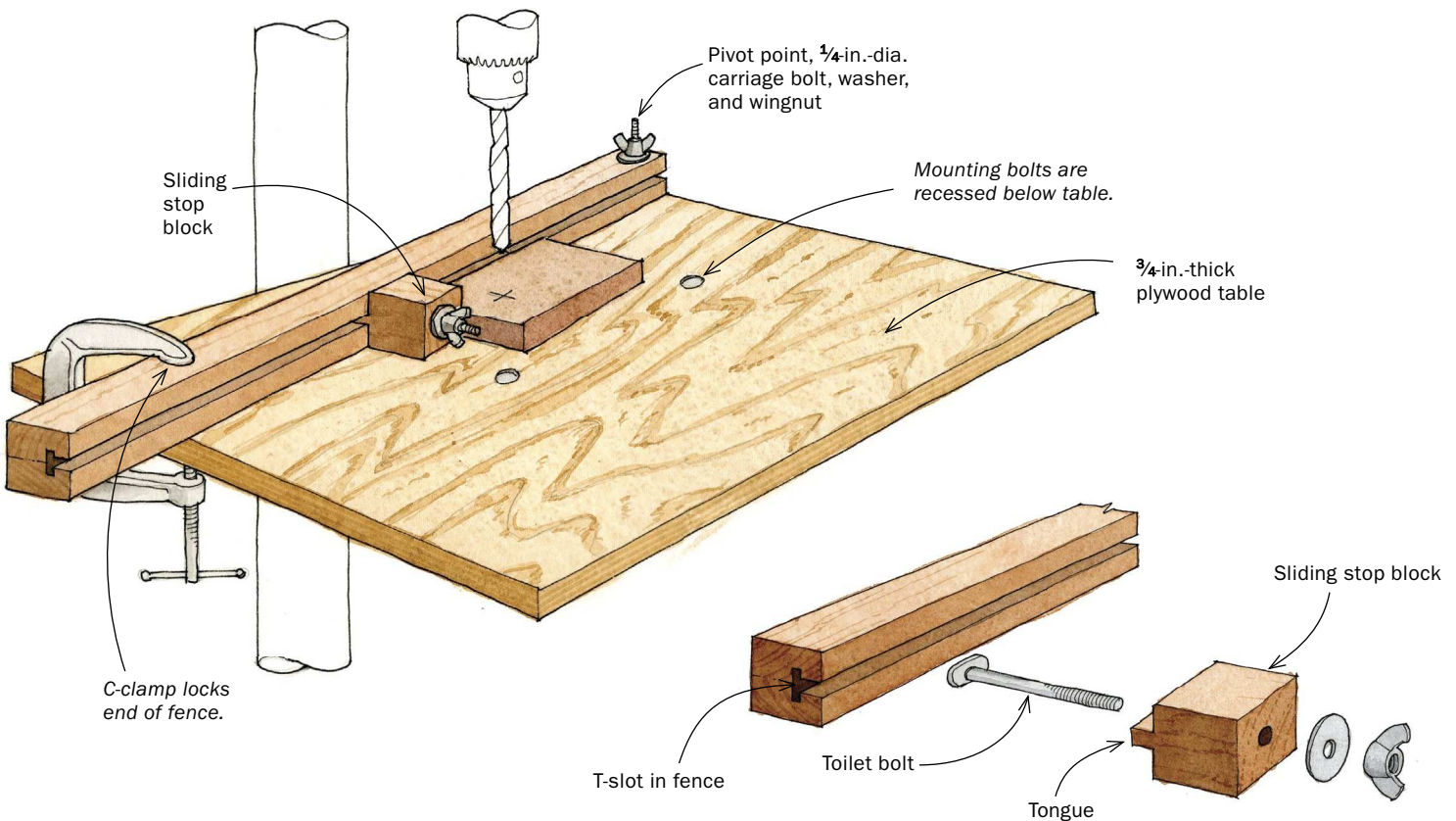


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Best Tip Super-simple drill-press fence adjusts without tools



John Cusimano is a retired engineer, and woodworking has been his creative outlet and favorite hobby since junior high. His shop has come a long way since he started out in the 1950s, when all of his machines were powered by old washing-machine motors.

A fence and stop block come in handy when drilling identically placed holes in multiple pieces and securing your work safely. This simple drill-press fence works great. It's made from cheap supplies—scrap stock, a few basic nuts and bolts, and a clamp. The best part is it can be adjusted without tools.

To start, make an oversize table from 3/4-in.-thick plywood and mount it to the steel drill-press table with carriage bolts and wingnuts, recessing the bolt heads in the table. Make the T-slot fence from two halves. Cut a rabbet and slot in each half on the tablesaw, then glue the halves together. Drill a pivot hole through one end of the fence and fasten it to one side of the table with a 1/4-in.-dia. carriage bolt and a wingnut.

The sliding stop-block's tongue is sized to fit in the fence's T-slot, and tightens against the fence with a toilet bolt (available in the plumbing department of home centers) and a wingnut. It is also quick and

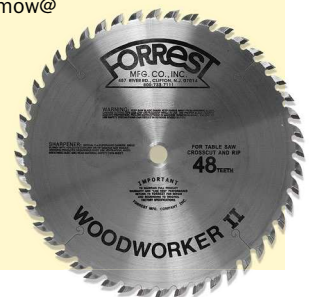
easy to remove when you need to use the fence's full length.

To use the fence, pivot it to the desired distance from the drill bit and secure it with a C-clamp. Then, if needed, slide the stop block into position and tighten the wingnut.

—JOHN CUSIMANO, Lansdale, Pa.

A Reward for the Best Tip

Send your original tips to fwmow@taunton.com or to Methods of Work, *Fine Woodworking*, PO Box 5506, Newtown, CT 06470. We pay \$100 for a published tip with illustration; \$50 for one without. The prize for this issue's best tip was a Forrest Woodworker II sawblade.



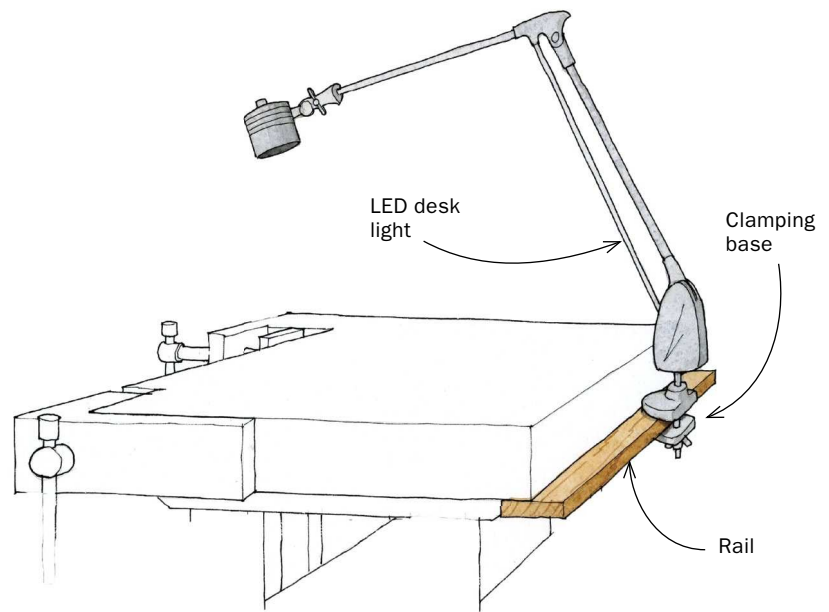
Flexible task lighting for the workbench

For close work at my bench, an easily adjustable, bright light source has always been a necessity—even more so as my eyes age. Here's a solution that works perfectly.

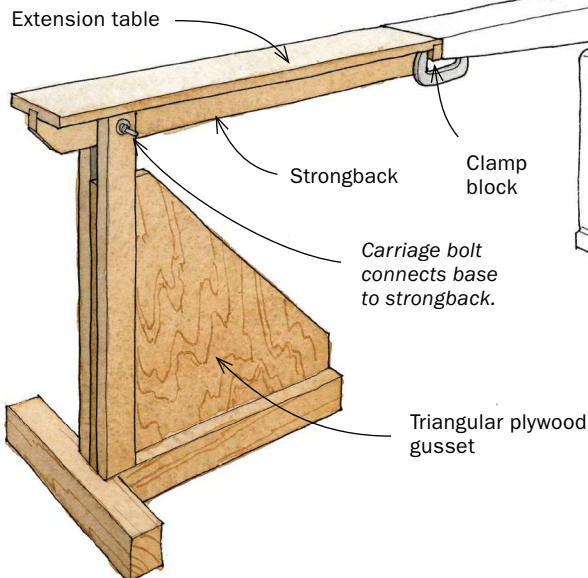
I started by choosing a lamp that had bright white light and low-energy LED bulbs, an adjustable arm, and a clamping base. Since my benchtop is too thick for the light's clamp, I screwed a hardwood rail to the rear apron of my workbench to create a $2\frac{1}{2}$ -in.-wide ledge. Using the rail, I can now position the light right where I need it by clamping it anywhere along the length of the bench.

When I don't need the lamp, it's easy to remove and hang out of the way, and it takes only seconds.

—RICHARD BOWEN, Plantsville, Conn.



Jointer table extensions for long planks



I occasionally need to joint a board that's 12 ft. or longer in my one-man shop—a difficult if not impossible task on my 8-in. jointer. These two jointer table extensions solve the problem.

Make the tops from cabinet-grade birch plywood and glue plastic laminate to the bottom face of each piece.

Rabbit one end to attach a clamp block and rout a groove down the center for a plywood strongback.

Then glue them in and add screws through the top, and add plastic laminate to the top. The plywood gussets are glued into a groove in the foot and sandwiched between the two uprights, then glued and screwed in place. Connect the top with a carriage bolt through the uprights and the strongback. Three adjustable feet on each base make it easy to fine-tune the tables' height and align them with the jointer bed.

—PHILLIP T. KEHOE, St. Tammany Parish, La.

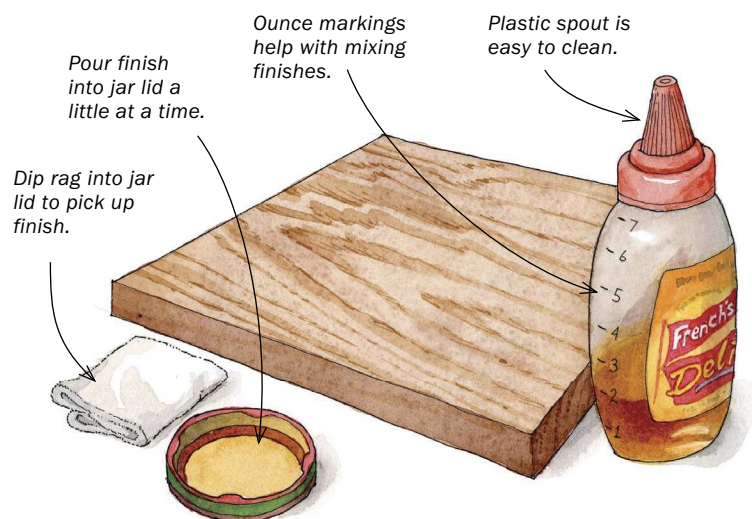
Easy wipe-on finish kit

My wipe-on finish kit consists of a jar lid, a rag, and a used squeezable mustard bottle. I usually mix my own wiping varnish, so I marked the sides of the bottle in 1-oz. increments to make it easy to mix the finish right in the container. Then I shake it up and I'm ready to go.

Twist open the container, squirt a little finish into the jar lid, dip the rag, and go. Each squirt introduces only a very small amount of fresh air into the container, so the varnish lasts forever without jelling. Periodically, varnish builds up on the tip, but the hardened finish chips right off.

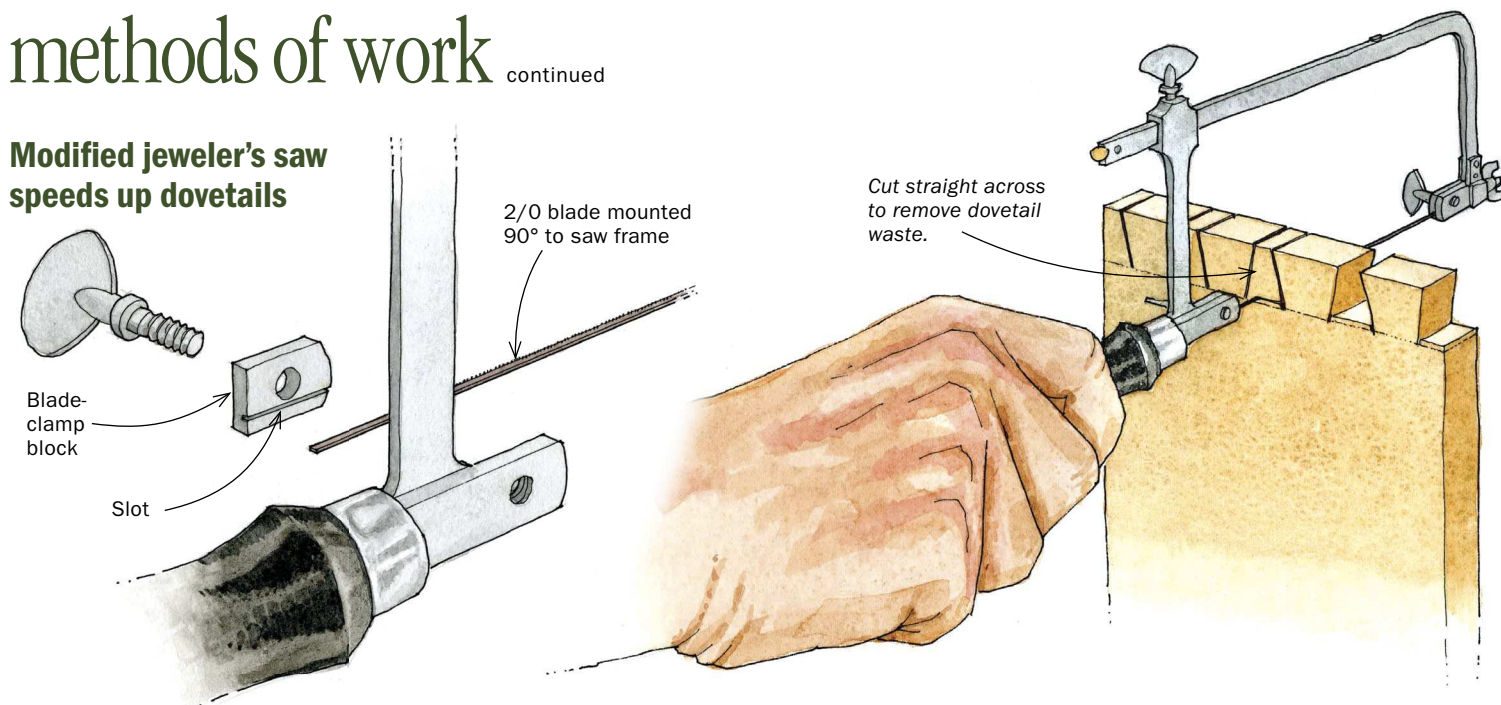
My current finish container is five years old, so I am due for a new kit—as soon as I empty my next bottle of mustard.

—MIKE RYAN, New Hope, Pa.



methods of work continued

Modified jeweler's saw speeds up dovetails



The blade on a jeweler's saw is tiny enough to drop right into a dovetail saw's kerf, and with the blade mounted sideways in the saw, I can cut straight across, leaving minimal cleanup work for the chisel. The blade angle isn't usually adjustable on this type of saw, but an easy modification will allow you to mount the blade to cut sideways.

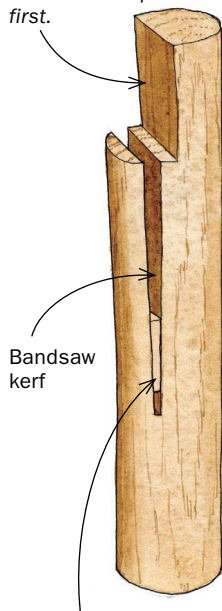
Take apart the blade clamp on each end of the frame. Cut a slot for the blade in each clamp block. To get the slot the proper size, use the same size blade you'll be using later—I

use a 2/0 blade from toolsforworkingwood.com. If the steel clamp blocks prove too hard to cut, soften the steel by heating them to a glowing red in a gas or propane flame, then let them cool off slowly. Mount a 2/0 blade in a scrollsaw to cut the slot into each clamp block, making them a little shallower than the blade's width. There's no need to harden the steel again once you cut the groove.

—PETE MICHELINIE, Woodstock, Vt.

Benchdog with wooden spring

Clamping face cut at slight angle so top contacts workpiece first.



Wooden shim is glued in place.

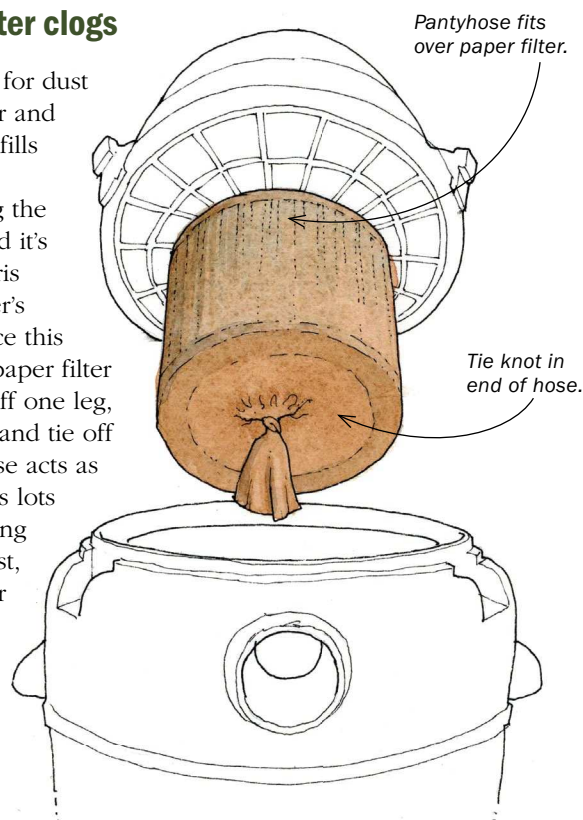
When it was time to replace my old benchdogs, I made new ones that use a wooden spring cut from the dog body. It works great, and it's wood, so it won't wear out your dog holes. Grab a hardwood dowel that matches the dog-hole diameter and cut it 5 in. long. Then make the $\frac{3}{16}$ -in.-thick leaf spring by cutting a kerf halfway down the dowel's length on the bandsaw. Cut a wood shim slightly wider than the kerf, put a little glue on it, and push it to the bottom of the kerf. Finally, create a flat clamping face by notching the top $\frac{7}{8}$ in. of the dog. Cut the face at a slight angle to keep it from lifting the workpiece when pressure is applied.

—MIKE BILLECI, Tivoli, N.Y.

Fix for vacuum filter clogs

I use a shop vacuum for dust control with my router and sanders. But the filter fills up quickly with chips and sawdust, reducing the vac's performance, and it's hard to clean the debris from between the filter's paper pleats. To reduce this problem, I cover the paper filter with pantyhose. Cut off one leg, slide it over the filter, and tie off the end. The pantyhose acts as a pre-filter and catches lots of dust without clogging up. To remove the dust, just blow it with an air hose or clean it with a brush.

—MIKE BAKER, Hamilton, Mo.



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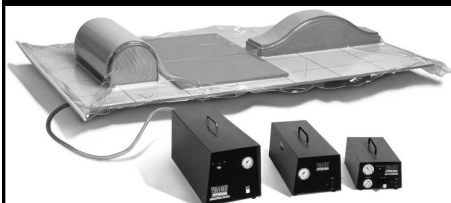
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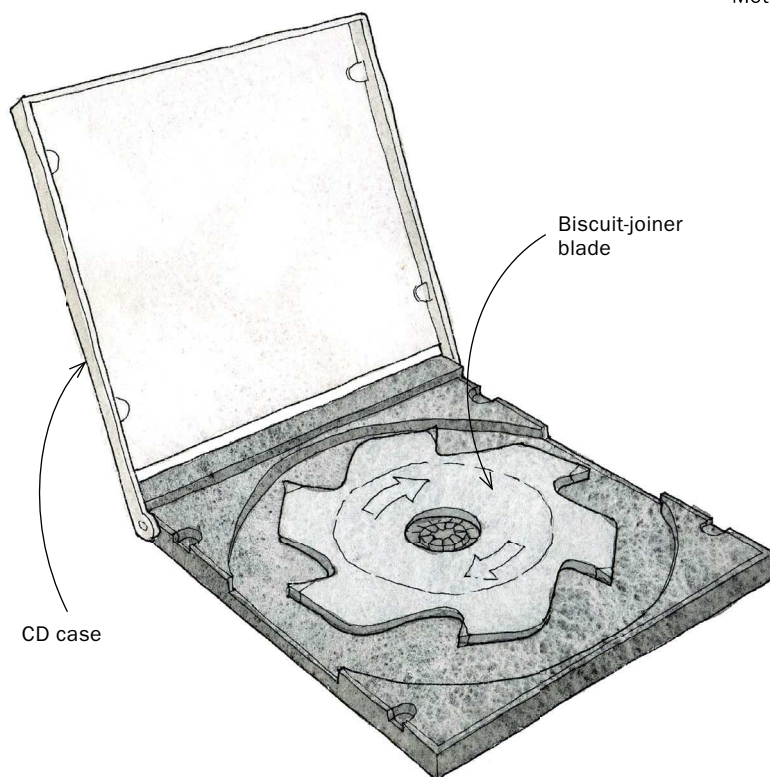
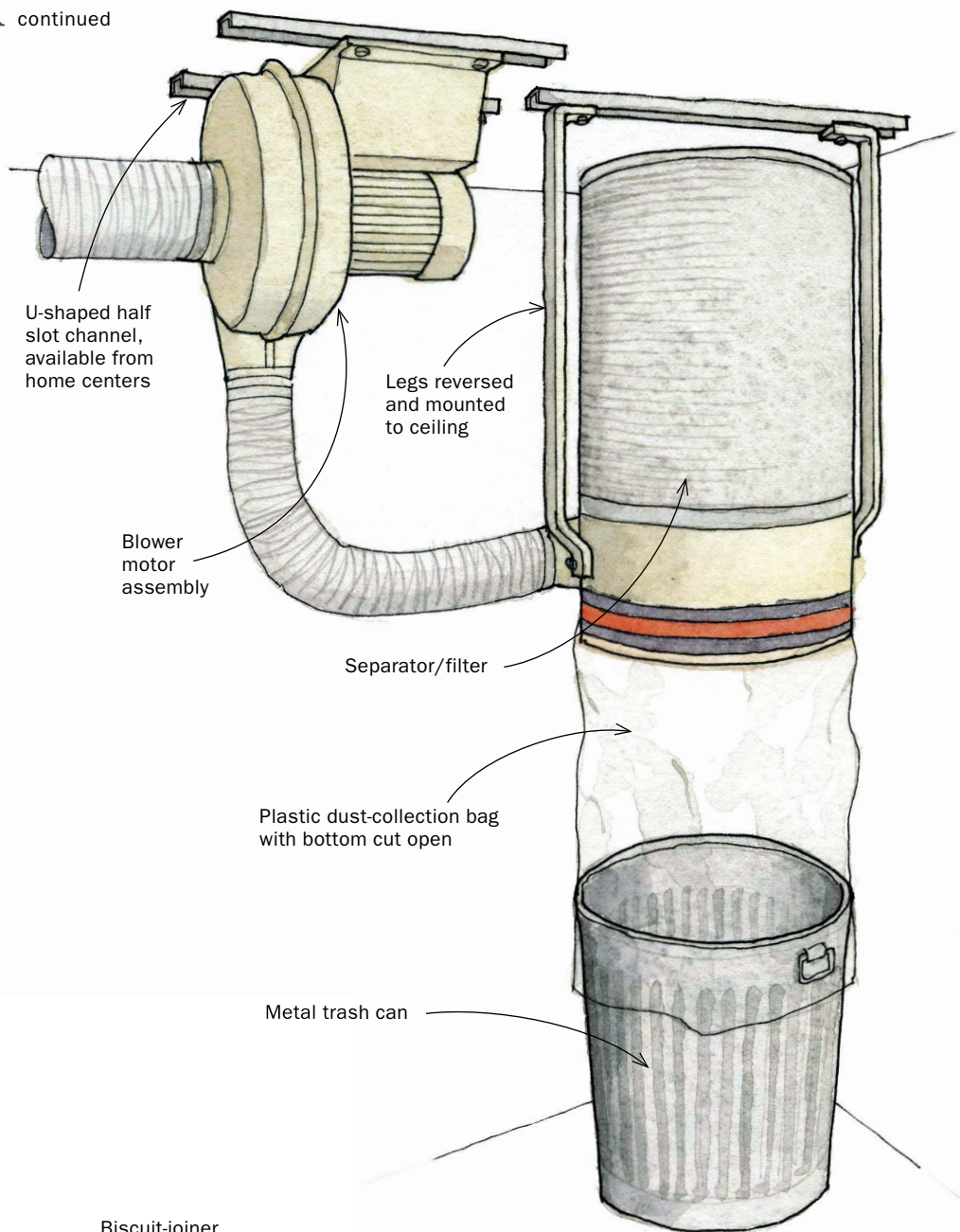
Ceiling-mounted dust collector saves space

My Jet dust extractor was mounted on a castered cart that occupied a lot of floor space, and was a pain to empty. Having the machine near the floor also required two extra vacuum-robbing elbows to route the ductwork up to the ceiling.

To reclaim that floor space, I mounted the blower/motor assembly to the ceiling of my shop, and suspended the separator/filter assembly from the ceiling, too. To collect the shavings, I cut the bottom out of a stock bag and placed a 30-gallon metal trash can under it. The plastic bag stretches over the lip of the can, and no further sealing is necessary.

Inverting the legs of the separator/filter assembly disables the manual flapper system that cleans the pleated filter, so I removed the flapper handle. I now dislodge the dust from the filter before emptying the shavings from the can by banging on the sides of the filter.

—DEAN HEDSTROM, St. Paul, Minn.



Protect a biscuit-joiner blade

To use a biscuit joiner for building face frames, you need to change the regular 4-in.-dia. blade to a 2-in.-dia. face-frame blade.

When I switch out one blade for the other, I put the loose blade in a CD case. The case fits both blade sizes and I can drop the encased blade into my biscuit joiner case, where it is protected from dings and damage.

—GARY McCANN, Sioux Falls, S.D.

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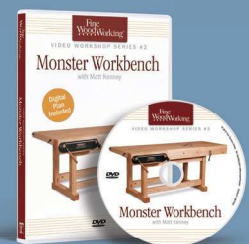


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■ HAND TOOLS

Veritas unveils customizable bench planes



Front knob available in three different shapes.

Custom bench planes by Veritas

No. 4, No. 4½, No. 5,
No. 5½, No. 7

\$279-\$379



Two tote designs available in three sizes each.

THERE ARE FIVE BENCH PLANES in the new line of customizable bench planes from Veritas, and over the past few months I've been using three of them (No. 4½ smoother, No. 5 jack, and No. 7 jointer) daily in my shop. They perform extremely well.

With these planes, you can choose from among three knob options and six for the tote (two designs in three sizes each). Also, in addition to three standard frog angles, you can have a frog made at any angle between 40° and 65°.

Because the frogs are affordable (\$55

to \$65) and easy to switch out, you could equip a single body with different frogs to dial it in for the work at hand: Use a standard angle (45°) for most work. Add a low-angle frog (40°) to smooth softwoods and trim end grain. Switch to a high angle (50°) for figured woods.

But these planes are much more than tricked-out versions of a traditional design. Some great innovations make them easier to use, too. Gone are the days of moving the frog to adjust the mouth for finer and rougher shavings. Instead, the planes have an adjustable mouth (similar to those found on block

Three standard frog angles (40°, 45°, and 55°). Custom angles between 40° and 65° (in ½° increments) available for an additional \$10.

planes), and the frog is stationary. This is a much quicker and easier way to dial in the mouth opening.

And the cap-iron screw has been replaced by a "blade carrier." The chipbreaker, which is secured to the blade carrier with an Allen-head screw, is taken off for sharpening. The blade carrier, secured to the blade with a second Allen-head screw, stays attached to the blade during sharpening. It acts as an indexing pin so that when you put the chipbreaker back on, its distance from the cutting edge is already set.

Out of the box, the planes needed very little work. After a few minutes honing on my finest polishing stone, I was planing beautiful, light shavings.

In nearly 30 years of woodworking, I've used some excellent planes, and these are some of the finest. They are now my go-to planes for everyday use.

—Chris Gochnour is a professional furniture maker in Salt Lake City, Utah.



Adjustable mouth. Changing from a narrow opening for light shavings to a wide one for heavy work is quick and simple because you don't have to move the frog, as you would on traditional bench planes.



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■ ACCESSORIES

Jig takes the hassle out of dowel joints



Automatic alignment. The jig straddles a dowel put into the first drilled hole (above), which ensures that the hole in the mating workpiece will be in perfect alignment when drilled using the center bushing (right).



JESSEM'S NEWEST DOWEL JIG has two features that set it apart from every other dowel jig I've used. First, you can adjust the plate that holds the drill guides in $\frac{1}{8}$ -in. increments without removing the jig from the workpiece. This allows you to drill parallel rows of dowel holes quickly. Second, a slot on one end of the plate is aligned with the center dowel hole drill guide, which makes it very easy to drill mating holes for an edge glue-up.

After drilling holes in the first edge and putting dowels in them, clamp the mating board to the first board face to face. Then place the slot in the jig over the dowel and drill a hole in the center bushing. This guarantees that the hole in the second board is in perfect alignment with the one in the first board (and saves you a ton of meticulous and tedious layout). The jig also comes with alignment pins for drilling a series of holes in a straight line.

I tested the master kit version of the jig, which includes everything you need to drill holes for $\frac{1}{4}$ -in., $\frac{3}{8}$ -in., and $\frac{1}{2}$ -in. dowels. This is a versatile jig that's easy to use. Each dowel size requires different-size drill guide bushings, but switching between the guide plates is easy, because you need only remove four small screws with a provided Allen wrench. The drill bits were sharp and the depth collars stayed put. The jig has helpful hash marks for locating the dowel hole centers.

—Mark Edmundson is a professional furniture maker in Sandpoint, Idaho.



Dowel jig by Jessem

Model 08350 Master Kit

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■ FINISHES

A more durable shellac

SHELLAC IS OFTEN DESCRIBED AS THE FINISH that can do it all, from sealing to coloring to French polishing. However, its one drawback has been poor durability when compared with solvent- or water-based varnishes, lacquers, and polyurethanes. I was therefore anxious to try Shellac Finishes' Royal-Lac, which claims to combine the beauty of shellac with the toughness of artificial resins.

I tested it against two other shellac finishes and one oil-based finish to determine its durability. Royal-Lac couldn't match the oil-based finish for durability, but it was way better than the other shellac finishes in this regard. And it did seem to maintain traditional shellac's greater clarity and depth. So while I wouldn't use Royal-Lac on a kitchen table, I'd certainly use it on a formal dining table.

—Mark Schofield, a finishing expert, is FWW's former managing editor.



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Plywood is a popular material for bookshelves and other case projects, and it's hard to beat dado joints for ease and strength when you want to include fixed shelves. But here's the rub: Plywood typically isn't as thick as advertised, meaning that a standard-size router bit could leave you with a loose dado that wrecks the appearance and compromises the structural integrity of your project. Fortunately, Rockler has the solution. The Perfect Fit Dado Jig allows you to cut perfect dados from 1/2" to 1" wide with a 1/2" bit, one setup and two passes. And the jig locks in the channel of the popular All-in-One Clamp Guides for easy, straight cuts every time!



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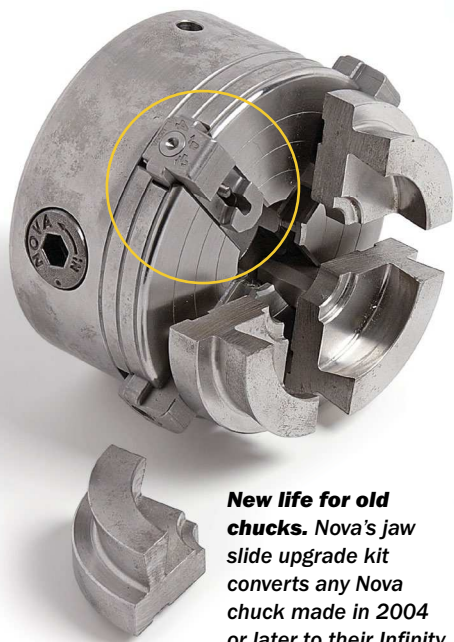
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■ TURNING

Change chuck jaws faster



New life for old chucks. Nova's jaw slide upgrade kit converts any Nova chuck made in 2004 or later to their Infinity quick-change system.

TURNERS HAVE ALWAYS LONGED FOR a chuck with a simpler way to change the jaws. That's because changing jaws is a time-consuming process that often results in a screw falling into the pile of shavings beneath your lathe. So, many turners would rather buy a second chuck with a different set of jaws than have one chuck and change the jaws.

However, if you have a Nova four-jaw chuck, Teknatool's new Infinity quick-change four-jaw retrofit kit makes jaw changes fast and

pain-free. Here's how it works. Replace your current jaw slides with the Infinity Quick Change Jaw Slides. Now you can use Nova's quick-change jaws on your chuck. Older jaws that aren't quick-change can be upgraded with a retrofit kit (\$45). Changing between jaws is incredibly simple. A small picture of a closed padlock and an open padlock on the scroll jaws shows you which way the jaws slide in and out while you depress a button on the back of the scroll.

—Mike Mahoney is a professional turner.



Quick-change jaw slides by Nova
\$135



■ ACCESSORIES

Safety glasses work better with earmuffs

I ALWAYS WEAR SAFETY GLASSES and over-the-ear hearing protection when using machinery in my shop. But there are two problems with this safety combination. The arms that hook over your ears break the seal between your skin and the hearing protection, and that means that they don't protect your hearing as well as they could. Second, the earmuffs are constantly pressing against the arms of the glasses, pushing them against your head. That starts to hurt after a while. Both of these problems are solved by SoundVision safety glasses from FullPro. These glasses don't have rigid arms that hook over your ears. Instead, there is a hook-and-loop strap on each side that latches onto a mating pad that you stick to the outside of your ear muffs. The result is improved comfort and better hearing protection.

—Timothy Rousseau is a professional furniture maker in Appleton, Maine.



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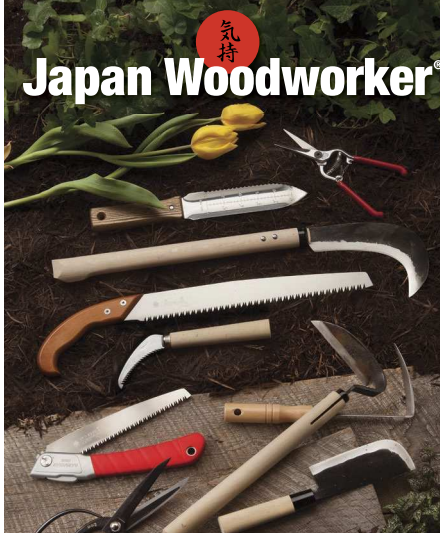
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Every woodworker needs a cutting gauge

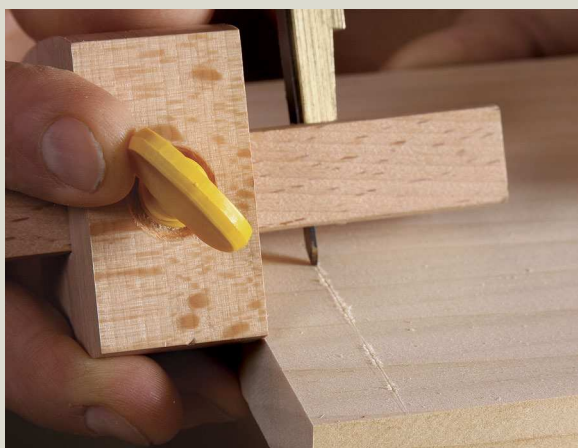
THIS MUST-HAVE LAYOUT TOOL WILL
HELP YOU GET TIGHT JOINTS EVERY TIME

BY TIMOTHY ROUSSEAU



QUICK TUNE-UP FOR SHARPER LAYOUT

Out of the box, the blade on most cutting gauges is dull and pointed, so it tears out fibers when cutting across the grain (right). However, after refining and sharpening the tip (see p. 28), the same gauge cuts a clean, accurate line.



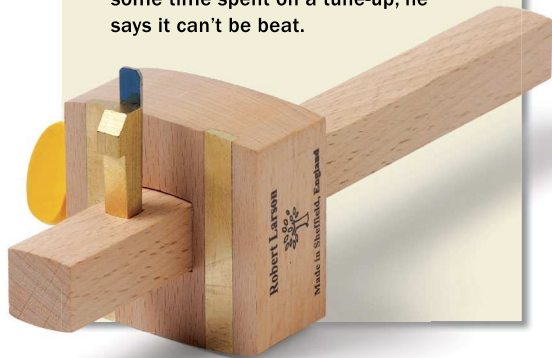
Tight joinery begins with crisp, accurate layout. This is why a scribed or cut line is better than a pencil line for most layout work. A knife and square can be used for most (if not all) layout jobs, but I find that a gauge is often more efficient and accurate. The three most commonly used in woodworking are the marking gauge, the mortise gauge, and the cutting gauge. Marking and mortise gauges use a pointed pin to scribe lines with the grain, while a cutting gauge has a knifelike blade that slices fibers across the grain.

All three are necessary if you cut joinery by hand, particularly the mortise-and-tenon. However, if you use a powered apprentice to cut mortises and tenons, then the marking and mortise gauges won't get much use. The cutting gauge, however, is an indispensable tool for furniture making regardless of which tools you use to cut joinery. It's perfect for marking dovetail and tenon shoulders, and can be used to sever fibers and minimize tearout before making a crossgrain cut with a tablesaw or router.

There are two types of cutting gauges. Wheel gauges have a steel beam with a round cutter at the end. The fence is usually round, too. These work fine, but I prefer the traditional-style cutting gauge with a wooden beam and fence. The cutter is often a spear-point knife that is held in the beam by a wedge. Because

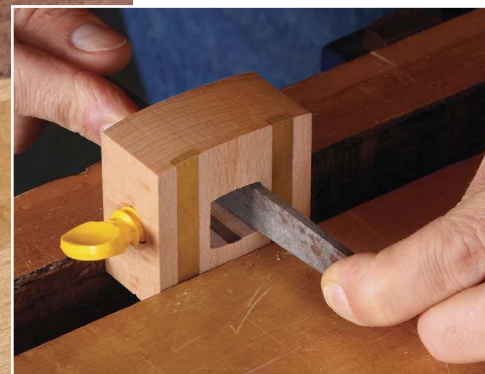
INEXPENSIVE GAUGE GETS THE JOB DONE

There are many traditional-style cutting gauges on the market. Of these, Rousseau prefers the Robert Larson cutting gauge (model #605-1100, circlesaw.com). For \$22 and some time spent on a tune-up, he says it can't be beat.

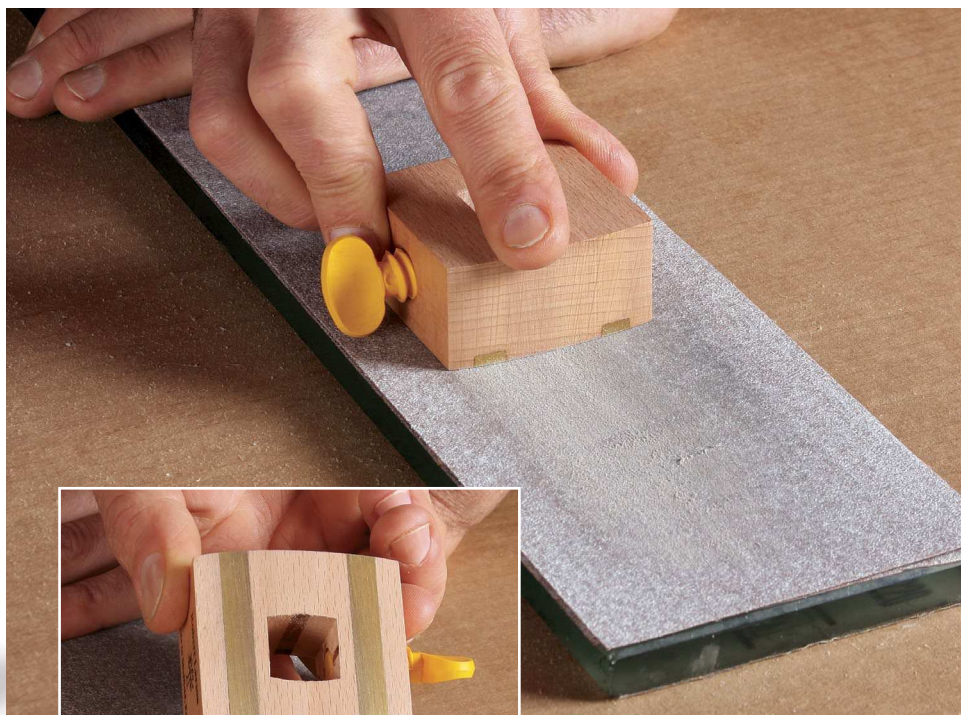


TUNE UP THE FENCE

A cutting gauge works best when the fence glides smoothly along the edge of the workpiece and the blade cuts parallel to the fence.



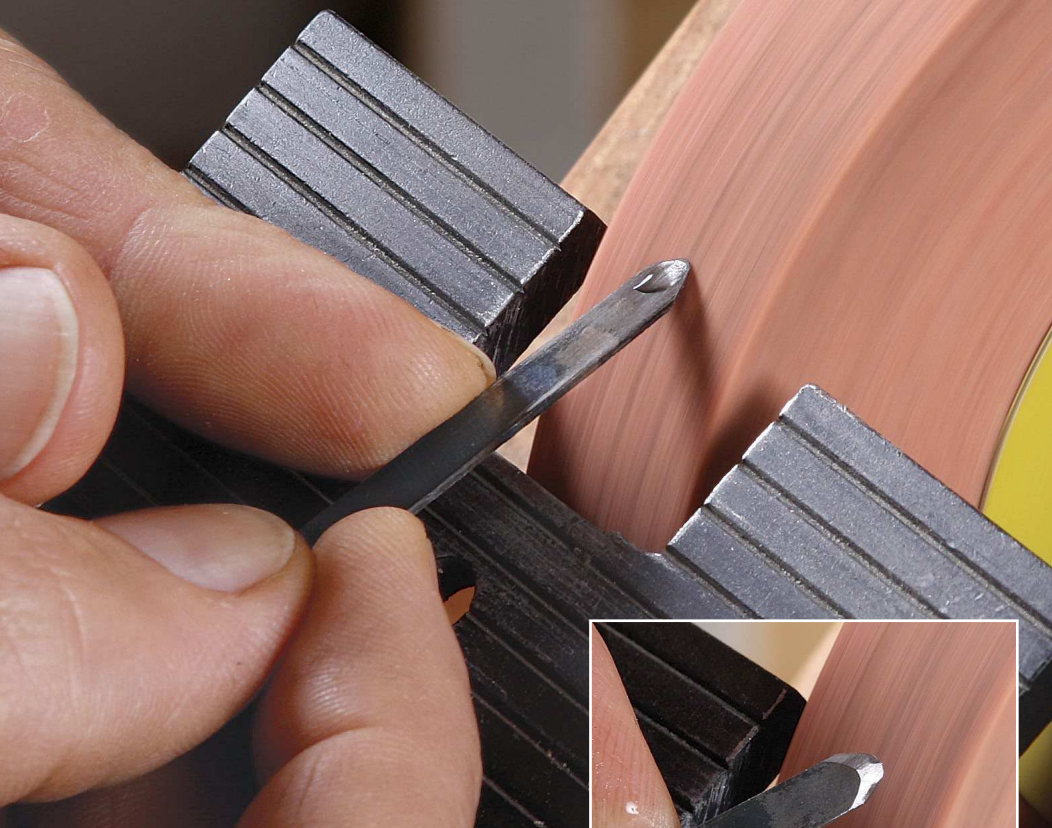
The beam and fence should be square. If the beam does not move smoothly through the mortise in the fence, file the mortise.



Smooth the fence face. For accuracy, the brass wear strips should be flush with the fence. If they're not, sand the fence on a flat surface (above), working from 80- to 220-grit, until the strips are level (left).

SHARPEN THE BLADE

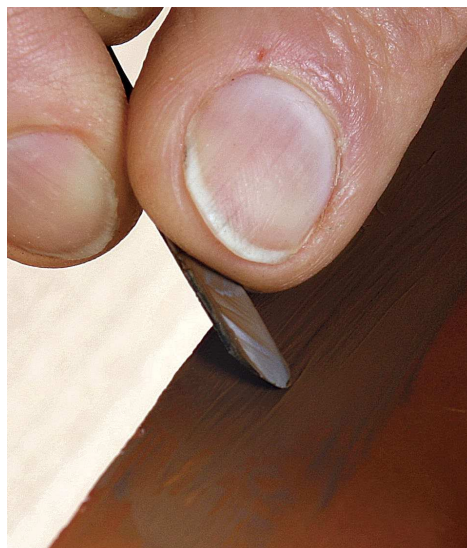
A cutter with a curved, rather than pointed, tip can be pulled and pushed through the wood.



Round the point on a grinder. Anchor the blade with both hands and then rotate to create the thumbnail profile (above). The cutting edge should have a slightly rounded tip (right).



Hone the back and bevel. Start with the back, using the edge of a polishing stone (left). Then polish the bevel (right). Don't worry if the bevel has facets. Only the cutting edge matters.



they have a wider fence, I find these gauges track the edge of the board more easily than wheel gauges. However, before you put one to use, it's a good idea to give it a quick tune-up. It's not hard, and I'll show you what to do.

Tweak the fence and cutter

Start with the fence, which must be flat (check it with a 12-in. rule) so that it glides smoothly along the workpiece. Any hiccup caused by the fence is transferred to the cutter, leaving a hiccup in your layout line, too. The result? Joints that aren't as tight as they could be.

Check that the beam is square to the fence. If it's not, use a chisel to pare the wall of the mortise square, then glue a thin shim to the pared wall so that the beam slides smoothly in the mortise. If the beam is square, slide it back and forth in the mortise. If it is difficult to move, file the mortise until the beam slides smoothly. If the beam moves so easily that it's hard to set and lock it in place, glue in a thin shim. Next, sand the business side of the fence on a flat surface (especially important if there are brass wear strips embedded in the face).

Now move on to the cutter. Like any cutting tool, it must be sharp to perform at its best. I prefer the bevel to have a rounded tip, rather than a pointy one, because it can be pushed and pulled. I round the tip with a slow-speed grinder. I then hone the back and bevel on the edge of a polishing stone. Admittedly, it takes some practice to hone a curved bevel, but it doesn't have to be pretty, just sharp.

When the cutter is sharp, put it back in the beam with the bevel facing the fence. This pulls the fence against the workpiece during use, and also puts the bevel on the waste side of the cut for 99% of joinery layout. The cutter should stick out $\frac{3}{16}$ in. below the beam. Slide the beam back into the fence, and the cutting gauge is ready to use. Hold it between two fingers and apply sideward pressure against the fence to keep the gauge snug on the workpiece. Take a light cut, and you'll have precise layout lines, the first step toward tight joints. □

Timothy Rousseau of Appleton, Maine, is a professional furniture maker.

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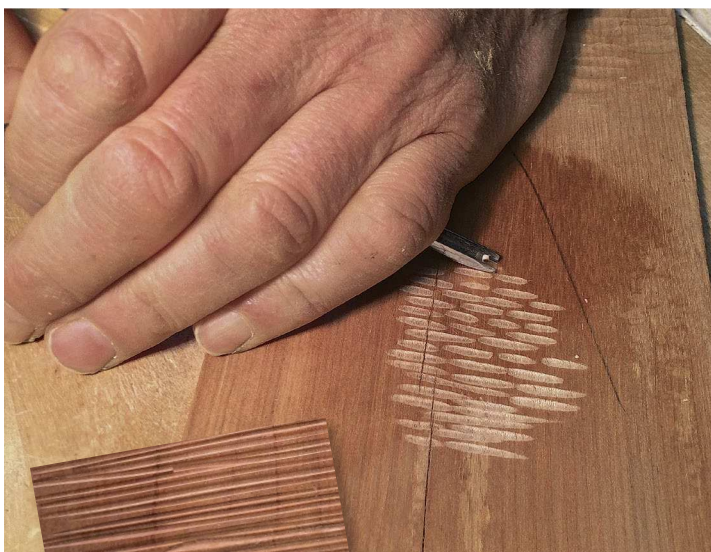
BY SAM NORRIS

One flash of inspiration and—bam!—the design flows into the sketchbook with all of the details, proportions, and material choices worked out. Well, perhaps design doesn't always work quite that way. Maybe it's a grueling process of searching for an idea and then redrafting and reconsidering every detail. My own design process often has elements of both extremes.

When I designed this liquor cabinet in light and dark madrone, I was a student at the College of the Redwoods. I wanted my piece to stand out from the dozen or so being built around me, but I had no idea where to start. I did have a few advantages that often lead to creative discovery—I was constantly on the lookout for inspiration from a range of sources, I had trusted colleagues and teachers to tap for advice, I had a consistent work schedule with time to explore my ideas, and I had the constraint of a set deadline.

The bam! for my liquor cabinet came in a San Francisco gallery when I saw a sculpture by Hiromichi Iwashita. The piece was a wall-hung triptych of large basswood panels, and Iwashita had covered the entire surface with broad gouge marks, then colored it with red gouache and graphite pencil.





Great gouging. Inspired by the gouged surface of a wall-hung wooden sculpture, Norris experimented with various gouging patterns (left) before settling on the subtle, all-over flecking he used on his liquor cabinet.



The effect was stunningly vibrant, and I was captivated by the idea of adding depth and life to otherwise fairly mundane wood. I drew gouged textures that were simpler and more regimented, intentionally different from Iwashita's work, and I planned the cabinet to frame these textured panels.

The proportions for my cabinet I lifted, more or less intact, from a successful piece by a classmate. I was open to the time-honored approach of outright pilfering as long as I could put stolen details in an arrangement I had not seen before. By changing the materials, adding distinctive pulls, and gouging the surface, I'd make my cabinet clearly different from the one whose dimensions it shared.

The design of the door pulls started with images of round windows in Japanese architecture. I struggled to

adapt the idea to a pull design, but critiques from instructors and fellow students helped me work out the details.

The construction of the cabinet moved along smoothly. But no amount of searching produced a pleasing design for the feet. I tried a plinth base, a Chinese-inspired base, a tapered, angular Shaker foot, a square foot, and got no closer to a design that fit the cabinet. This was grueling. That is, until I learned a lesson that has served me well since: Take cues from the piece itself. I realized that the door pulls—as the one curved element in an otherwise rectilinear piece—called for a curve somewhere else, just as the dark wood in the latch plate called for dark wood in the top and base. With this insight, the base, with its subtly curved feet, took shape naturally.

Late in the process I returned to my original inspiration—the textured surfaces. The nearly complete cabinet looked great with no texture. As I sharpened my gouges, some of my classmates seriously questioned my judgment. I hesitated, suddenly unsure of what had so clearly

been the impetus behind the whole design. But an impending deadline forced me to take a reluctant first swipe. After that it was easy. □

Sam Norris, a member of the New Hampshire Furniture Masters, teaches at the Vermont Woodworking School.





Secrets to a Perfect Mitered Box

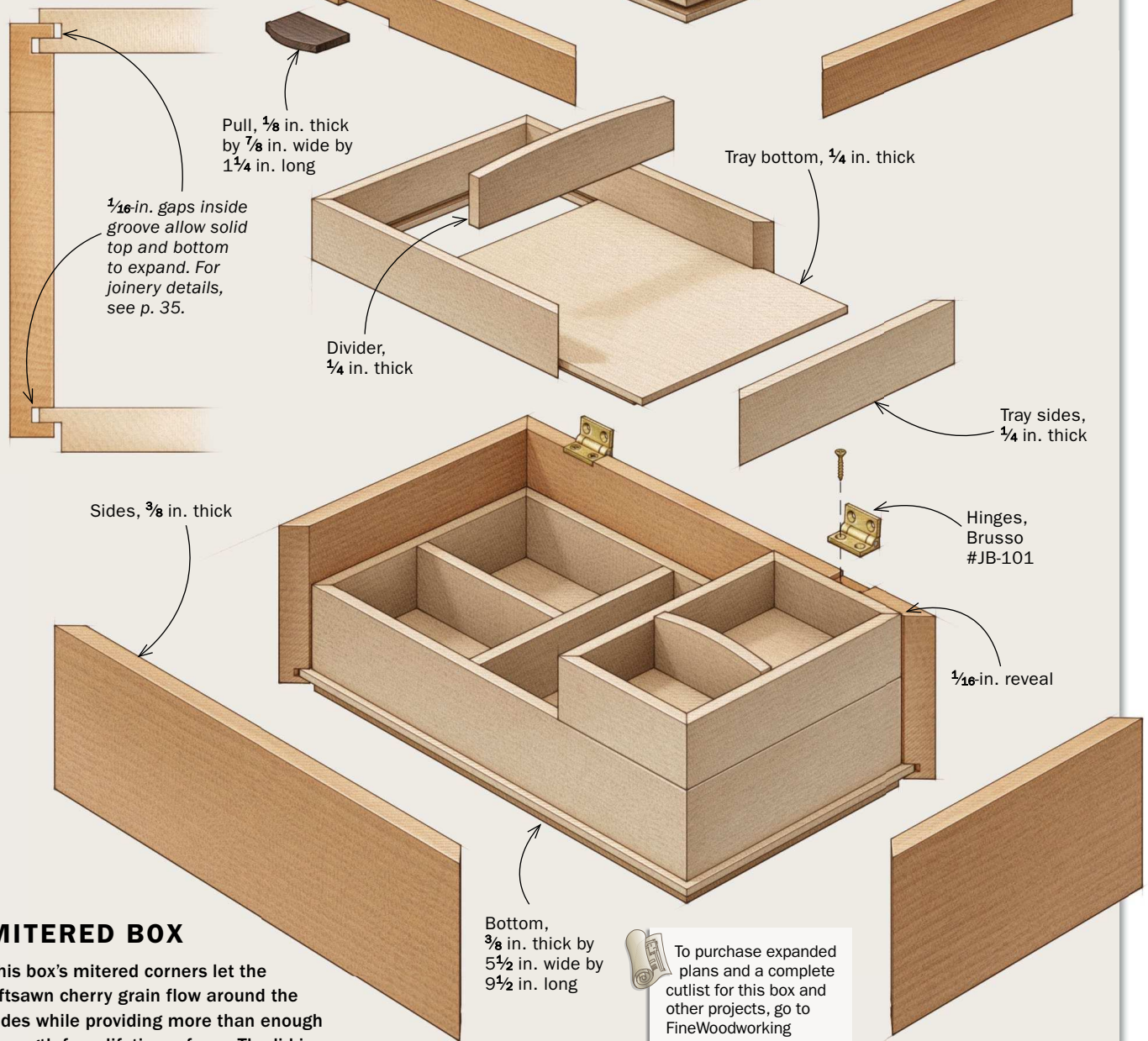
It's not hard to make a box, but it is difficult to make a beautiful one. Mistakes are hard to hide on such a small piece, and even the tiniest ones stand out more than on a larger piece of furniture. For a box to truly sing, every detail—from the proportions to the quality of the joinery, from the wood's color to the pattern and size of its grain—must be flawless.

This box is a good example. It's well proportioned, with clean lines, tight joints, and grain lines that meet perfectly at all four corners. I also picked complementary rather than contrasting woods. For the outside,

How to create a seamless grain match and gap-free joints

BY MATT KENNEY

ROOM TO MOVE

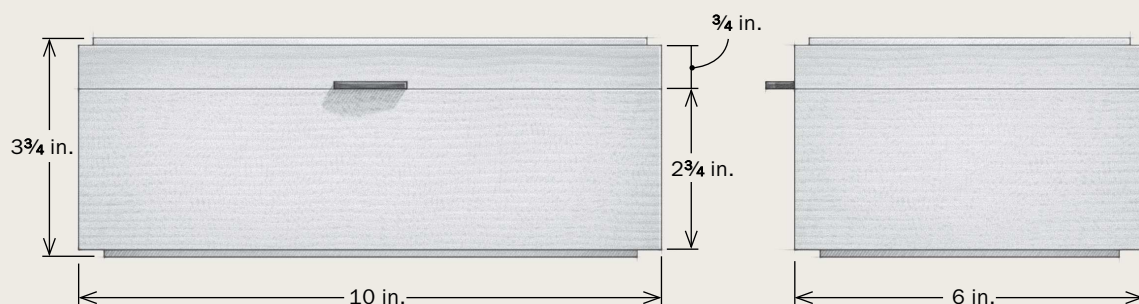


MITERED BOX

This box's mitered corners let the riftsawn cherry grain flow around the sides while providing more than enough strength for a lifetime of use. The lid is sawn from the box after glue-up.



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



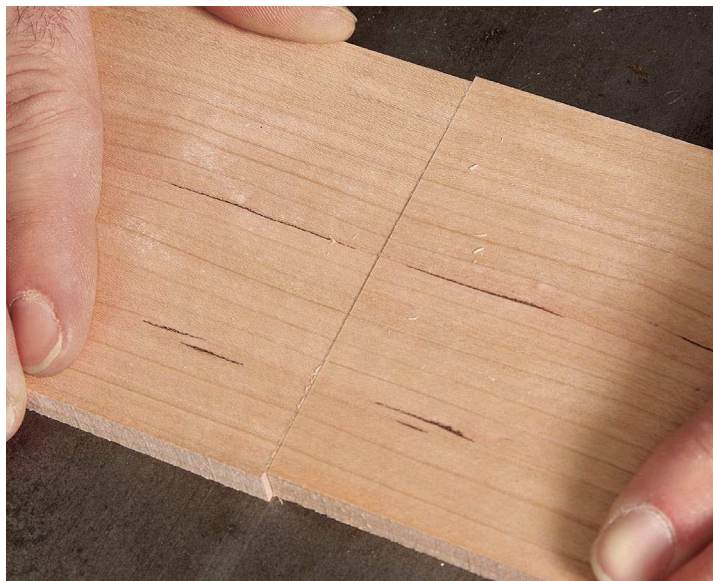


RESAW FOR A PERFECT MATCH

The match begins. Joint one face of the 5/4 board. Put the jointed face against the fence and resaw it into two 1/2-in.-thick pieces. Keep track of the inside and outside faces.



Slide to align the grain. After jointing the inside, resawn faces, butt the two boards together with the jointed faces up (above). Slide them up and down until the grain aligns across the pieces (below).



I chose riftsawn cherry to take advantage of its warm, earthy color and straight, tight grain. I used quartersawn spruce, which also has an arrow-straight grain pattern, for the top and bottom. The straight, tight grain lines work well on a piece of this size. For the pull, I decided on cocobolo with a rich brown color and visible grain that make it pop from the rest of the box.

The top itself is grooved around its edges, with its bottom lip fitting a groove in the sides. This configuration gives the top a tight fit and also reduces its visual thickness. After final assembly, the lid is cut away from the box using the bandsaw.

The box bottom is rabbeted to fit a groove in the sides and is left proud at the bottom to create a nice shadow line.



Remove the overhang. With the grain aligned, the boards will overhang each other (left). Set up the tablesaw to remove the overhang from the bottom of one board. Then cut both boards to uniform width, referencing their bottoms against the fence.

The interior features two levels of stacked, mitered trays. These were built using the same technique as the rest of the box.

Plan the grain carefully

To get the four-corner match, start by resawing a 5/4 cherry board into two 1/2-in.-thick pieces. The board should be a few inches longer than the box's final dimensions and about 1/4 in. wider. The outside faces of the thick board become the inside of the box, and the freshly sawn faces become the outside. One end and the front come from one board, and the other end and the back come from the second board.

Joint the resawn faces and plane them to 1/32 in. over final thickness, removing material only from the inside faces of the box.

At this point, the grain match at the corners where the two different boards meet will be close, but not perfect. Here's how I dial it in. Lay the boards down, outside faces up, so that they butt against one another end to end. Shift one board up and down until its grain lines up with the other (see bottom left photo, opposite). One board will end up lower than the other. Trim the bottom of that board so that the bottom edges on both pieces align. Next, rip both pieces to final width, placing the bottom edges against the rip fence. Once the pieces are mitered, the grain should wrap around the box perfectly.

Cut grooves for the top and bottom

Both the top and bottom are housed in grooves. I cut them at the tablesaw, using a 24-tpi, flat-top-grind rip blade, which has a 1/8-in. kerf. Each groove is 3/16 in. deep and 1/8 in. from the edge.

Once the box sides are grooved, the only task left at the tablesaw is to run a groove along the edges of the dimensioned top, and to rabbet the bottom. The top comes first, as the fence and blade are already set to the right position. With the inside face of the top against the fence, cut the groove around the top's perimeter.

Finally, rabbet the box bottom using a dado set in the tablesaw.

The secret to seamless miters

As simple a joint as a single miter is, it can be infuriating to get right. After cutting them by hand and machine a dozen different ways, I've settled on a method that gives perfect results. I cut them in two

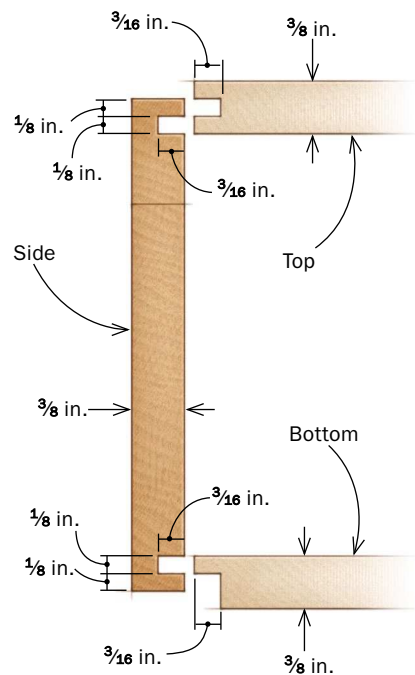


FIT THE TOP AND BOTTOM

Cut grooves for the top and bottom. Each groove is 3/16 in. deep by 1/8 in. wide, 1/8 in. from the edge. Use a featherboard and a push stick to ensure consistency.

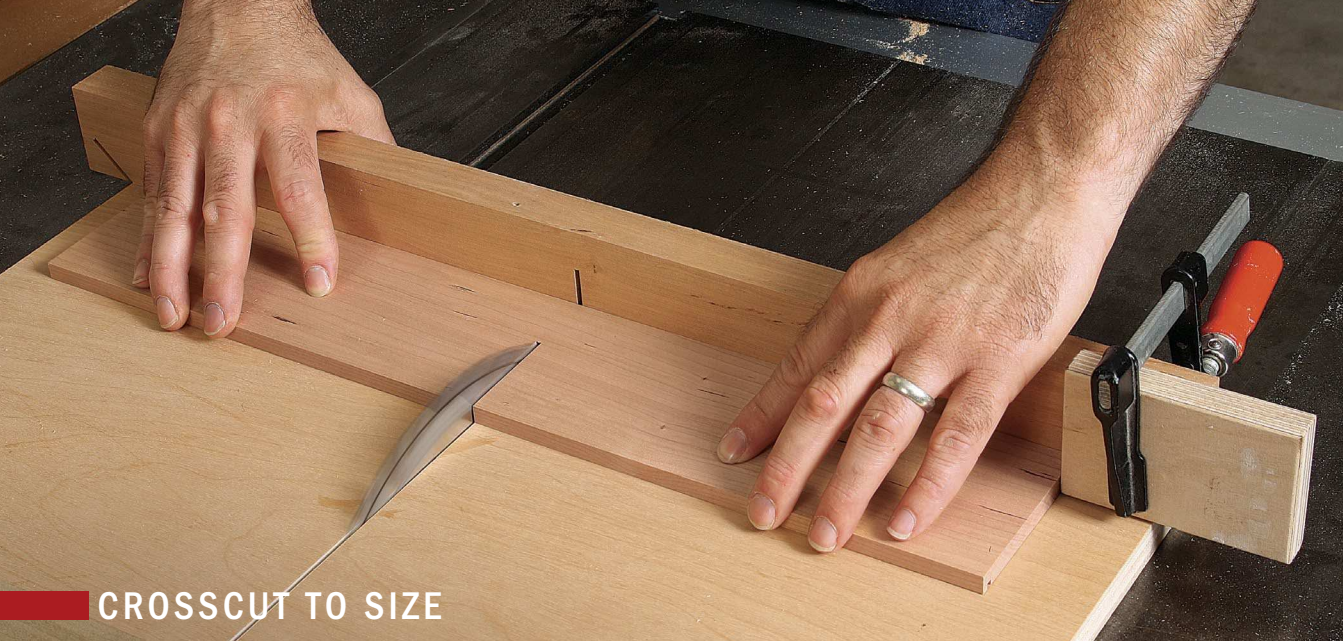


GROOVES AND TONGUES



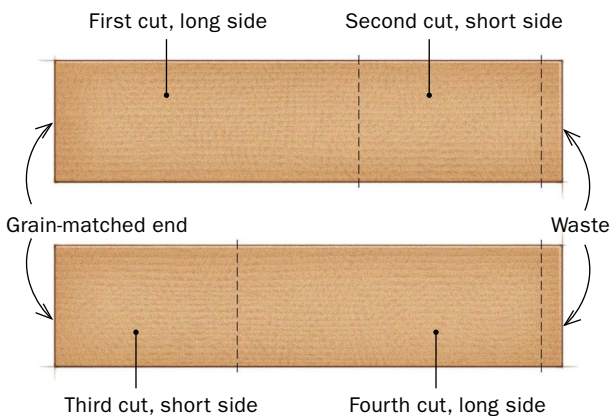
Groove the top. With the same settings used to cut the grooves in the box sides, cut a groove around the edge of the box top. It's critical to keep the inside face of the top against the fence to ensure the two grooves mesh perfectly.

Cut the tongue. The bottom is rabbeted at the tablesaw to fit the grooves in the sides. Kenney uses a dado set and an auxiliary fence clamped just above the blade.



Start with a long side. With a stop block clamped to the sled's fence, cut the first long side to length, keeping the matched grain against the stop. Leave this stop in place to cut the second long side later.

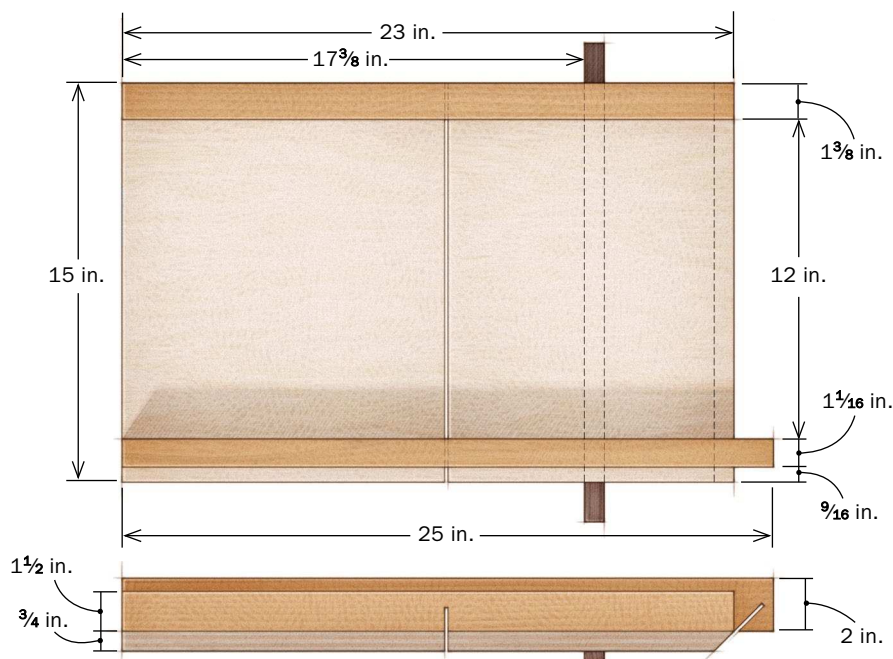
CROSSCUT TO SIZE



Follow with the short. With a second stop block in place, crosscut the short piece, keeping the previously cut end against the stop. Cut the second board in the opposite order—short piece first—starting with the matched end against the stop.

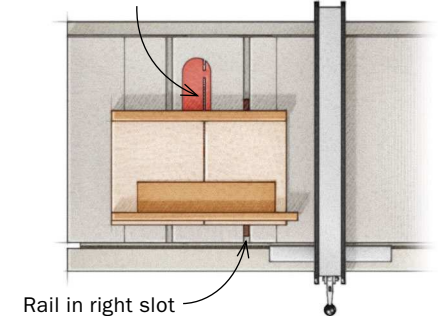
A SLED FOR CROSSCUTS AND MITERS

Kenney uses a single sled for both square and mitered crosscuts. The key is a single rail that can be used in either miter-gauge slot. He has a right-tilt saw; those with left-tilt saws should reverse the sides of the sled.



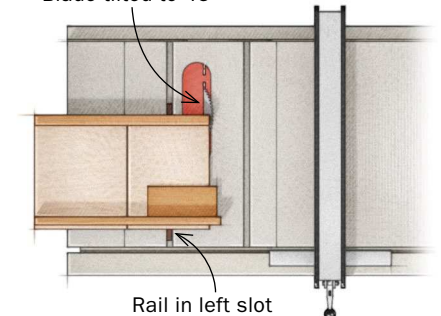
RIGHT SLOT FOR SQUARE CUTS

Blade at 90° for crosscuts



LEFT SLOT FOR MITERS

Blade tilted to 45°



steps at the tablesaw with a sled that cross-cuts and miters (see p. 36).

Begin by crosscutting the sides to final length using a stop block to ensure that parallel parts are the same length. The two boards will each yield one long and one short side. It's important to cut each board starting from the matched end to make sure the grain stays matched around the box.

Set up a stop block for the long side and put the matched end of one board against the stop. Cut the first long piece and then set up another stop to cut the short side of that board (keep the first stop in place). Use the same stop to cut the short side of the next board, placing the matched grain end against the stop. Finally, remove the stop for the short sides and cut the last long piece.

To cut the miters, tilt the blade to 45°, put the sled in the opposite miter slot, and cut a kerf in the sled fence. Set a short side on the sled and move it up until the top corner of the end is right next to the kerf. Clamp a stop block against the other end. When you make the cut, the blade will cut the miter, but won't shorten the side, which will preserve the grain match. After making the first cut, turn the side end for end and cut the second miter. Repeat for the second short side and then miter the long sides in the same way, moving the stop block as needed.

The box sides are now mitered at 45° and the components are all set for glue-up. Any inside surface should be sanded or planed and finished before moving on.

Streamlined glue-up

Gluing up end-grain miters on a box like this can pose some interesting issues, such as how to keep the end grain from soaking up the glue and starving the joint, or how to accurately keep pressure on all four miters while keeping the joints square.

To help avoid glue starvation, coat all of the joints with glue size using a small brush and let it dry before assembly. Glue size is a mixture of equal parts yellow glue and water that saturates and clogs the end grain. Let it dry for two hours before gluing up the box. Now, a full-strength glue spread won't wick into the end-grain fibers, and the resulting joint will be solid.

The best way to clamp a mitered box while keeping it square is with painter's tape. Lay out all four sides, miters faceup and touching, with the top and the bottom pieces within reach. Put tape on one



DEAD-ACCURATE MITERS

Bring it to the kerf. A zero-clearance sled lets you line up the already sized box side with the kerf, no measuring required. Just be sure that the inside of the box is facedown and the upper edge is lined up just right, then clamp down a stop block to keep things in place.



Let the waste fall. The shopmade sled makes it easy to get a perfect miter, and the waste falls clear of the blade.



No gap, guaranteed. Kenney's method of cutting for length and then cutting the miter yields perfectly aligned grain across a tight miter.



CLAMP IT UP WITH TAPE

Sized end grain. To help seal the end grain and ensure a good bond at final glue-up, apply glue size, a 50/50 water and Titebond II mix, to the mitered ends. This will fill the end grain and help avoid a glue-starved joint.

side of the joint with enough overhang for the mating piece. With the mating piece vertical, press the mitered points together, then lay the piece flat. Now when the joint closes, the tape will stretch, keeping the joint tight and in line while the glue dries.

After the glue has dried, head to the bandsaw to cut the lid from the body. Smooth the cut surfaces by rubbing them on a piece of sandpaper that's flat on your tablesaw's table. This keeps all of the cut edges in the same plane for a seamless fit.

Hinge mortises are easily done

I rout the hinge mortises with a small plunge router, a bearing-guided pattern bit, and a shopmade jig. The jig has two parts: an MDF template with a notch the size of a hinge leaf and a fence that registers against

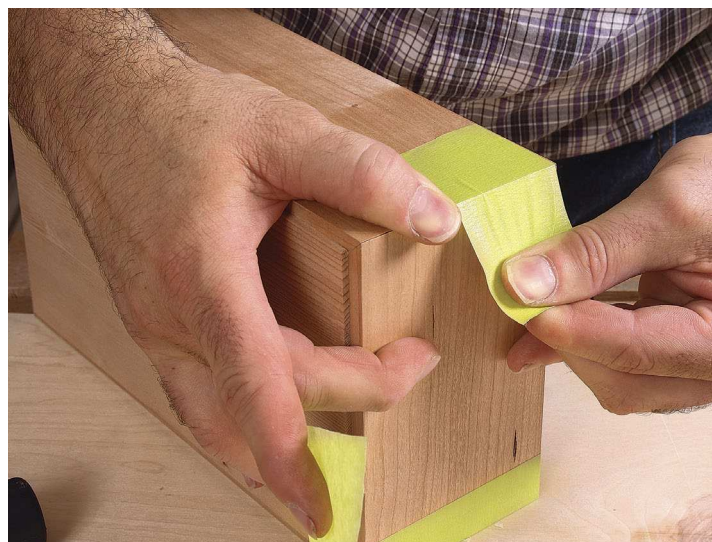


Clamping without the clamps. Once the glue size has properly cured, painter's tape clamps the box together. With tape on a piece laid flat on the bench, place the point of the other piece's mitered edge directly onto the tape. Keeping the two miter tips tight together, lay the piece flat. This ensures the tape will be stretched over the joint, applying even pressure.



Get to the glue. With all the box sides taped and placed inside-face-up on the bench, carefully spread glue over all the miters except the open ends.

Ready to be sealed. Place the top and bottom in the grooves in the sides and fold the sides around them. Before closing the final corner, apply glue to the miter faces there.



Stretch it tight. To get some clamping pressure on the last corner, Kenney stretches tape over the miter.

the side of the box. The fence fits into a groove on either face of the template, so it can be used for all four mortises.

To set the router bit's cut depth, put the template on a flat surface such as your tablesaw. With the router on top, plunge the bit through the notch in the jig until it touches the table. Then put a hinge leaf on the depth stop and lower the depth stop rod onto the hinge leaf. Once locked in, this will give you the perfect depth.

To cut each mortise, simply clamp the jig to the box and rout. While the jig is still in place, use a chisel to square up the mortise corners. Repeat for the other three mortises, moving the fence when switching sides. All that's left is to install the hinges.

The finish is in sight

I don't like my boxes to have a thick film finish, so I use a simple finish that's half Zinsser SealCoat, half denatured alcohol. This gives the box a low-luster finish that retains the true color and feel of the wood. It dries in 5 to 10 minutes. Wipe on a coat with a clean piece of old T-shirt and let it dry. Then wet-sand it with P600-grit wet-or-dry sandpaper and mineral spirits to even out the surface. After the mineral spirits have dried, wipe on a second coat of the shellac. When dry, rub it out with Liberon ultrafine steel wool, blow off the steel-wool dust with compressed air, and apply a coat of wax for an even sheen. □

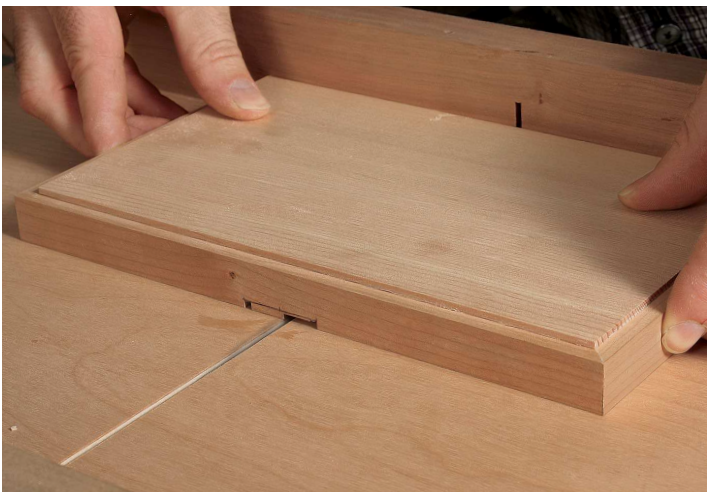
Matt Kenney is a senior editor at FWW.



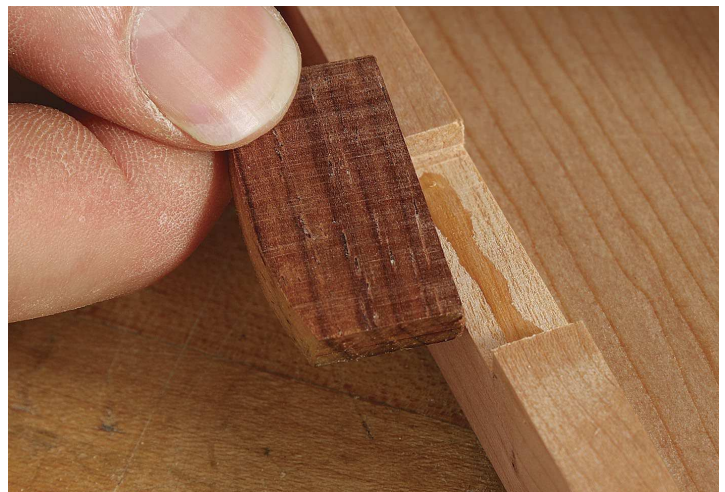
Off with the top. Saw apart the box at the bandsaw. Its thin blade minimizes loss of material and gives a tighter match from the lid to the body. Kenney uses the Wood Slicer from Highland Hardware, which is designed for resawing. A piece of thin plywood under the box helps prevent tearout.



Smooth out the cut. To clean up the machine marks, rub the freshly cut surfaces on a sheet of 180-grit sandpaper on the tablesaw table. To preserve the grain match, apply even pressure and take off only as much as needed.



Notching the lid. Notch the lid for the pull at the tablesaw using a standard crosscut sled. Cut the stopped sides first, then knock out the waste by slowly moving the lid side-to-side over the blade, advancing until the notch is clean and even.



Perfectly fit pull. Kenney cuts the cocobolo pull and trims it with a handplane to get a slight friction fit. He leaves it slightly thick, glues it in using cyanoacrylate glue, and planes it flush using a block plane.

Precise Tenons by Machine

Fit tenons fast using the tablesaw and bandsaw

BY TIM COLEMAN

3 SIMPLE STEPS



1. DEFINE THE SHOULDERS



2. CUT THE CHEEKS



3. TRIM TO WIDTH

When I cut mortise-and-tenons, I look at the job as a production process. Seldom is there just one tenon in a piece of furniture, so it is imperative that I have a way to ensure consistent, repeatable results.

Toward that end, I developed a system for cutting tenons on the tablesaw that allows me to move through the process quickly and efficiently. All the setup and fitting is done with test pieces. Once I get the setup dialed in, I can crank out the tenons in bunches, and all of them will fit right off the saw, with very little fine-tuning by hand.

Make extra stock for test pieces

The process begins with a full-size layout on paper. I draw several views showing the joinery in plan and elevation. With the drawing in hand, I mill all stock to dimension, including plenty of extra for test pieces to set up all the cuts. Accurate tenons begin with accurate milling. Consistent thickness is especially critical, and I wait to do any hand-surfacing until all the joinery is done. I cut all the mortised parts to length, but I treat the tenoned parts differently.

If the tenon length varies, I cut the parts so that all the tenons can be machined to the same length at first, with the shorter ones cut to final length later. This takes a little planning to make sure the shoulders end up in the right place, but it saves me from having to adjust the blade height for different tenon lengths. Make sure the ends are square across in thickness and width. If needed, adjust the blade tilt and crosscut device to correct them.

Cut the mortises first

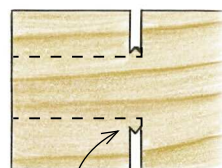
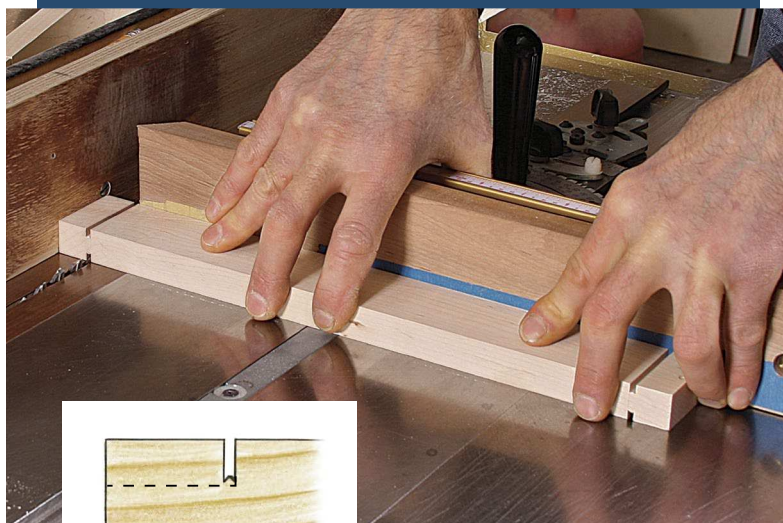
I cut mortises first, typically with a hollow-chisel mortiser. While I'm cutting the mortises in the real stock, I also cut two extra mortises in test stock. I cut two because repeated test fittings in the same sample mortise will begin to enlarge it and give an inaccurate fit. Once all the mortises are done, you can start on the tenons. By the way, I cut the joinery before I do any shaping of the parts.

Tenons next, starting with the shoulders

Because I cut the tenons all to the same length, I have to do the layout only on a couple of test pieces. That said, I do scribe the shoulders on all the parts, which reduces tearout from the tablesaw cuts.

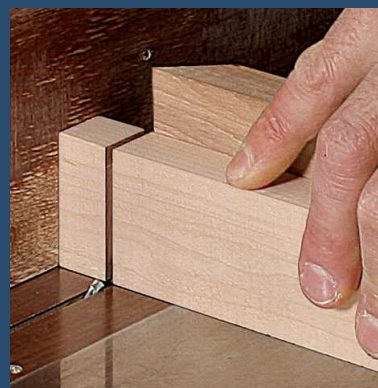
Cut the shoulders first. I use a combination blade and a miter gauge. Because this is a non-through cut, I can use the tablesaw's fence as a stop so that the shoulders are all cut in the same spot. I use a test piece to set the fence and the blade height. I cut the shoulders at the base of the cheeks first, setting the blade height so that it's just shy of the cheek, about $\frac{1}{32}$ in. This little bit of material gets chiseled away later. I typically center the tenon on the rail or apron for efficiency. This way I can make both shoulder cuts simply by flipping the workpiece. The exception is when the rail or apron is curved in front. In those cases, the tenon must be offset, so you'll need to dial in two setups at the tablesaw.

Next I cut the top and bottom shoulders, again keeping the blade about $\frac{1}{32}$ in. from the tenon. The top shoulder may be



Set the blade height just below the final tenon thickness.

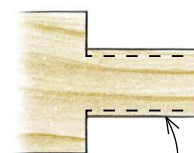
Shoulders first. With the workpiece facedown, raise the blade to within about $\frac{1}{32}$ in. of the tenon cheek. Use the tablesaw fence as a stop, holding the workpiece against the miter-gauge fence and squarely against the tablesaw fence.



Top and bottom, too. To cut the top and bottom shoulders, keep the fence in the same position. Adjust the blade so it's about $\frac{1}{32}$ in. from the base of the tenon.



Close shave. Zip off most of the waste using the bandsaw. Be sure to use a fence, and aim to leave the tenon about $\frac{1}{16}$ in. over final thickness.

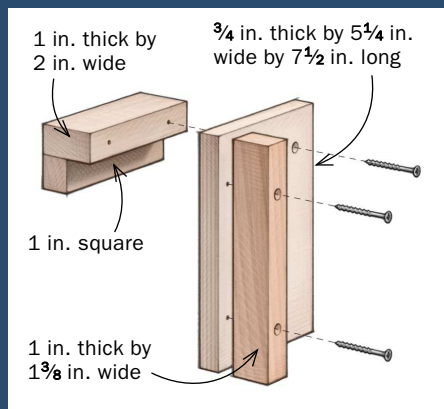


Trim slightly wider than final tenon thickness.

SIMPLE JIG TRIMS THE CHEEKS



The key to perfect cuts. Coleman uses a shopmade tenoning jig (above) to cut the cheeks. The jig rides a tall auxiliary fence that he screws to his tablesaw fence. He sets up the cuts using a test piece. His goal is to trim each tenon with just two cuts, one on each cheek.



deeper than the bottom and require a change in the depth of cut. For efficiency and consistency, make all the cuts with one setup before moving on to the next: That means cut the top shoulders in all the parts, then the bottom shoulders, or vice versa.

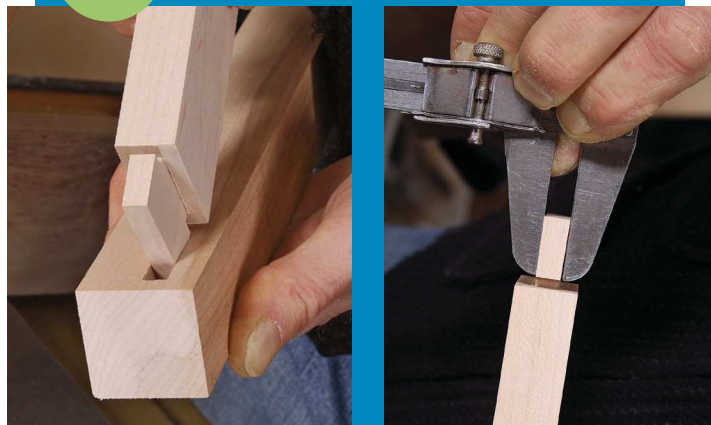
Cut the cheeks in two steps

After the shoulders are done, it's on to the cheeks. I rough-cut the cheeks on the bandsaw, leaving the tenons about $\frac{1}{16}$ in. too thick, and then I finish them at the tablesaw using a shopmade tenoning jig with a tall auxiliary fence. The bandsaw step is tempting to avoid, but I have found that I achieve more accurate and consistent tenons at the tablesaw when the blade is just skimming the cheek face. There is less heat buildup and less blade deflection.

For the tablesaw cuts, I use a flat-top rip blade (Amana heavy-duty ripping blade, 20 tpi), which allows me to get very close to the shoulder with minimal cleanup at the base of the tenon.

For a tenon centered in the thickness of the workpiece, there is only one fence setup, with the piece being flipped around to cut both cheeks. I position the fence so the blade will cut on the

TIP CHECK THE FIT



No tapers allowed. Even if you've squared the blade to the saw table, the tall tenon cuts could be off and could taper from one end to the other. The probable cause is the auxiliary fence being a pinch off 90°. Check the test tenon with calipers, and look for any change in thickness.

THE FINAL TOUCHES



Back to the bandsaw. Cut the tenons to final width on the bandsaw. Set up the bandsaw fence using the test piece, then bang out all of the tenons at the same time.

outside of the cheek. To set up the cuts, I use a test piece, with the blade raised just above the table ($\frac{3}{32}$ in.). Make cuts for both cheeks and test the fit in the sample mortise. When you're satisfied with the fit, raise the blade to within $\frac{1}{64}$ in. of the tenon shoulder, and cut along the full length of the test tenon.

There's one more check before you cut the real tenons. You want to make sure that the tenon's thickness is even from top to bottom so there's a solid glue bond with the mortise walls. Even though the blade may be perfectly square to the table, the resulting cut is what is most important. Use a caliper to check, and adjust blade tilt to compensate.

Now you can cut all the tenon cheeks on the actual pieces. Periodically check the fit during the process to make sure that nothing has changed. Once the tenon cheeks are cut, I trim the tenons to the correct width. I usually do this on the bandsaw. Then I cut them to length on the tablesaw.

Only light cleanup required

With my method, there's very little work at the bench. I use the corner of a chisel to clear away the waste at the base of the tenon. While I'm there I give a slight undercut around the base, a small extra step that ensures that the tenon shoulders are tight against the mortise face. I also soften the leading edges of the tenon with a file. This allows easier entry into the mortise.

Finally, I label all tenoned pieces as I fit them to their corresponding mortises. With my tenoning method I don't have to do much test-fitting, a bonus since too much of it can burnish the surfaces of the tenons and mortises. Burnished surfaces are not good glue surfaces.

Done. Have some lunch. □

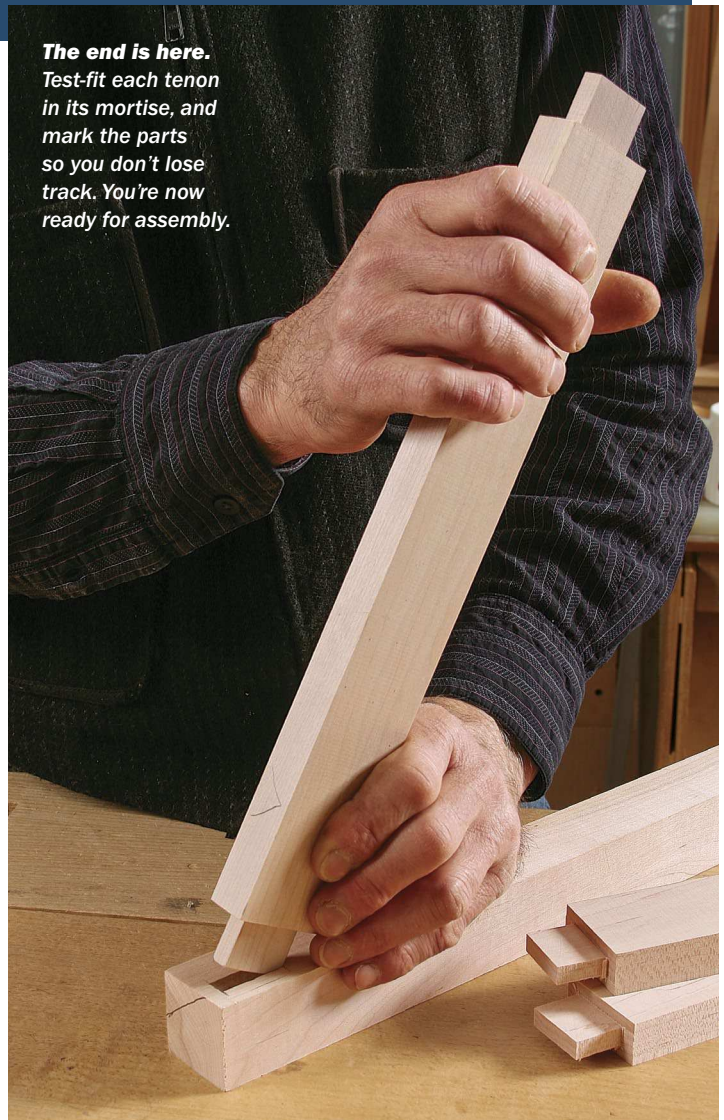
Tim Coleman is a renowned furniture maker and designer in Shelburne, Mass.



A little off the bottom and top. Use a chisel to trim the small amount of waste at the base of the tenon left by the combination blade (top). Coleman likes to go a bit deeper, undercutting that area to ensure a snug fit. He also relieves the corners on the end of each tenon with a file (bottom).



The end is here. Test-fit each tenon in its mortise, and mark the parts so you don't lose track. You're now ready for assembly.



Oak Chest on Stand



Design details evoke vintage
English Arts and Crafts

BY MARIO RODRIGUEZ

I've always been attracted to English Arts and Crafts furniture, in particular to the pieces designed by C.F.A. Voysey. Regarded as a major influence in early 20th-century design, Voysey designed pieces that embraced the ideas of the Arts and Crafts movement in England. His spare and timeless furniture is characterized by a wonderful sense of proportion, clean lines, and strong vertical elements that were often relieved by gentle horizontal curves.

To channel Voysey's spirit, I built an English-inspired piece of furniture: a chest on stand in white oak. The chest itself has half-blind dovetails, a single drawer, and a frame-and-panel lid where the panel sits proud of the frame. The base has tapered legs and a shop-made ogee molding that cradles the chest.

Start with the chest

The case is joined with half-blind dovetails and has two compartments—the box up top and a drawer pocket below—separated by a horizontal divider. There's also a rail below the drawer front. I cut the dovetails first, then I cut the grooves for the divider and chest bottom. Finally, I routed the mortises for the rail.

Dovetails first—I chose half-blinds instead of through-dovetails. Besides being aesthetically pleasing and strong, they allowed me to thicken the sides of the case to allow for the routed handholds.

I hand-cut the tail boards first, at 10°, and then laid them over the pin boards to transfer the dovetail outline. When the pins were marked out, I used a router to carefully remove the bulk of the waste. Once the pins were roughed out with the router, I then pared them back to the line with a chisel and tested the fit.

Grooves next—With the dovetails done and the case sides fitted, it's time to take care of the chest's internal parts. The grooves for the horizontal divider fall in the center of a tail, so they can be cut right

ROUTER-ASSISTED JOINERY



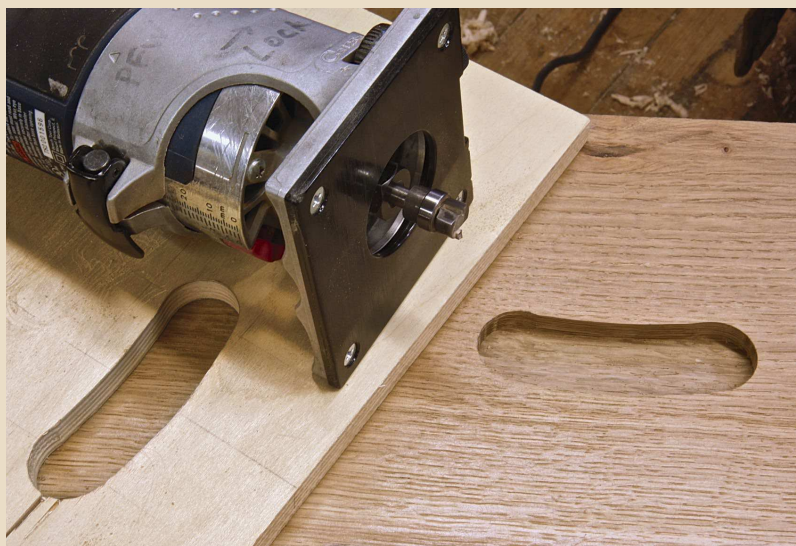
Transfer the tails. Rodríguez cuts the case tails by hand first, then transfers the layout to the sides with a marking knife.



Router work. Rodríguez removes most of the waste between pins using a plunge router.



Pare to perfection. Once the router is unplugged, he trims each pin, ensuring that all the corners of the joint are clean and free of debris.



Simple grip. Using a pattern cut out of ½-in. plywood and a router fitted with a bearing-guided ½-in. pattern bit, Rodríguez routes the handholds in the sides of the chest.

through using a dado set on the tablesaw. The grooves for the case bottom are stopped before reaching the front edge. I cut those with a router and clamped-on fence.

Mortises for the rail—The front rail has integral tenons on the ends. The mortises for them intersect at their top end with the groove for the case bottom. At the bottom end, the mortises carry through the bottom of the case side. The rail's top edge is rabbeted to receive the front edge of the case bottom. With this joinery cut, you can rout the handholds in the case sides.

Glue up the chest

Once the joinery has been cut and fitted, glue up the dove-tailed sides and the front rail with both bottom panels in place. Glue the front edge of the case bottom to the front rail, but leave the rest of the panel unglued to move freely within the chest. The divider simply sits in the grooves without glue.

To start the glue-up, place the back and one side together and then tap the divider and bottom into their grooves, followed by the front rail. Then add the other side and the case front. Once the chest comes together, be sure to clamp the front edge of the case bottom to the rabbet on the front rail. After the clamps come off, you can build and fit the drawer.

Build the lid

With the case finished, it's time to tackle the lid. It's a frame-and-panel assembly, but slightly unusual in that the panel fits over a portion of the frame. The look is plush, appearing almost like a pillow set on top of the frame.

The frame is mitered in front and reinforced with splines.

SIMPLE JOINERY, AND LOTS OF IT

This chest features bold, half-blind dovetails throughout the case and a frame-and-panel lid with soft lines that complement the curved aprons of the base.

Cross-grain spline, $\frac{1}{8}$ in. thick by $\frac{7}{16}$ in. wide by $2\frac{3}{8}$ in. long

Lid frame front, $\frac{3}{4}$ in. thick by $3\frac{1}{2}$ in. wide by 28 in. long

Lid frame back, $\frac{3}{4}$ in. thick by $3\frac{1}{2}$ in. wide by $23\frac{1}{2}$ in. long

Groove for divider, $\frac{5}{16}$ in. deep by $\frac{1}{4}$ in. wide, $5\frac{1}{4}$ in. from bottom edge

Horizontal divider, $\frac{1}{4}$ in. thick

Groove for bottom, $\frac{5}{16}$ in. deep by $\frac{1}{4}$ in. wide, $1\frac{3}{8}$ in. from bottom edge

Case bottom, $\frac{1}{4}$ in. thick

Case front, $\frac{1}{2}$ in. thick by $9\frac{1}{2}$ in. wide by 24 in. long

Drawer kicker, $\frac{1}{2}$ in. thick by $11\frac{1}{16}$ in. wide

Drawer stop, $\frac{3}{8}$ in. thick by $1\frac{1}{4}$ in. wide by $2\frac{1}{2}$ in. long

Front rail, $\frac{3}{4}$ in. thick by $1\frac{3}{8}$ in. wide by $23\frac{1}{4}$ in. long

Drawer back, $\frac{1}{2}$ in. thick

Drawer side, $\frac{3}{8}$ in. thick

Drawer front, $\frac{3}{4}$ in. thick by 3 in. wide

Drawer bottom, $\frac{5}{16}$ in. thick, rabbeted to fit $\frac{1}{4}$ -in. groove

Lid frame side, $\frac{3}{4}$ in. thick by $3\frac{1}{2}$ in. wide by $17\frac{1}{4}$ in. long

Lid panel, $\frac{3}{4}$ in. thick by $10\frac{3}{4}$ in. wide by $23\frac{5}{8}$ in. long

Tenon, $\frac{1}{4}$ in. thick by 3 in. wide by $1\frac{1}{4}$ in. long

Groove, $\frac{1}{4}$ in. wide by $\frac{1}{2}$ in. deep

Haunched tenon fills groove in frame sides.

Case back, $\frac{1}{2}$ in. thick by 14 in. wide by 24 in. long

Rabbet, $\frac{1}{4}$ in. deep by $\frac{1}{4}$ in. wide

Tenon, $\frac{1}{4}$ in. long

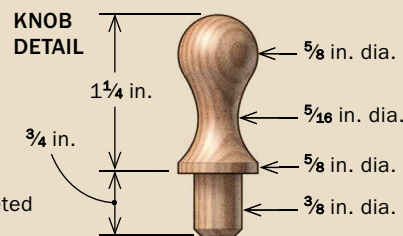
Case side, $\frac{7}{8}$ in. thick by 14 in. wide by $15\frac{1}{2}$ in. long

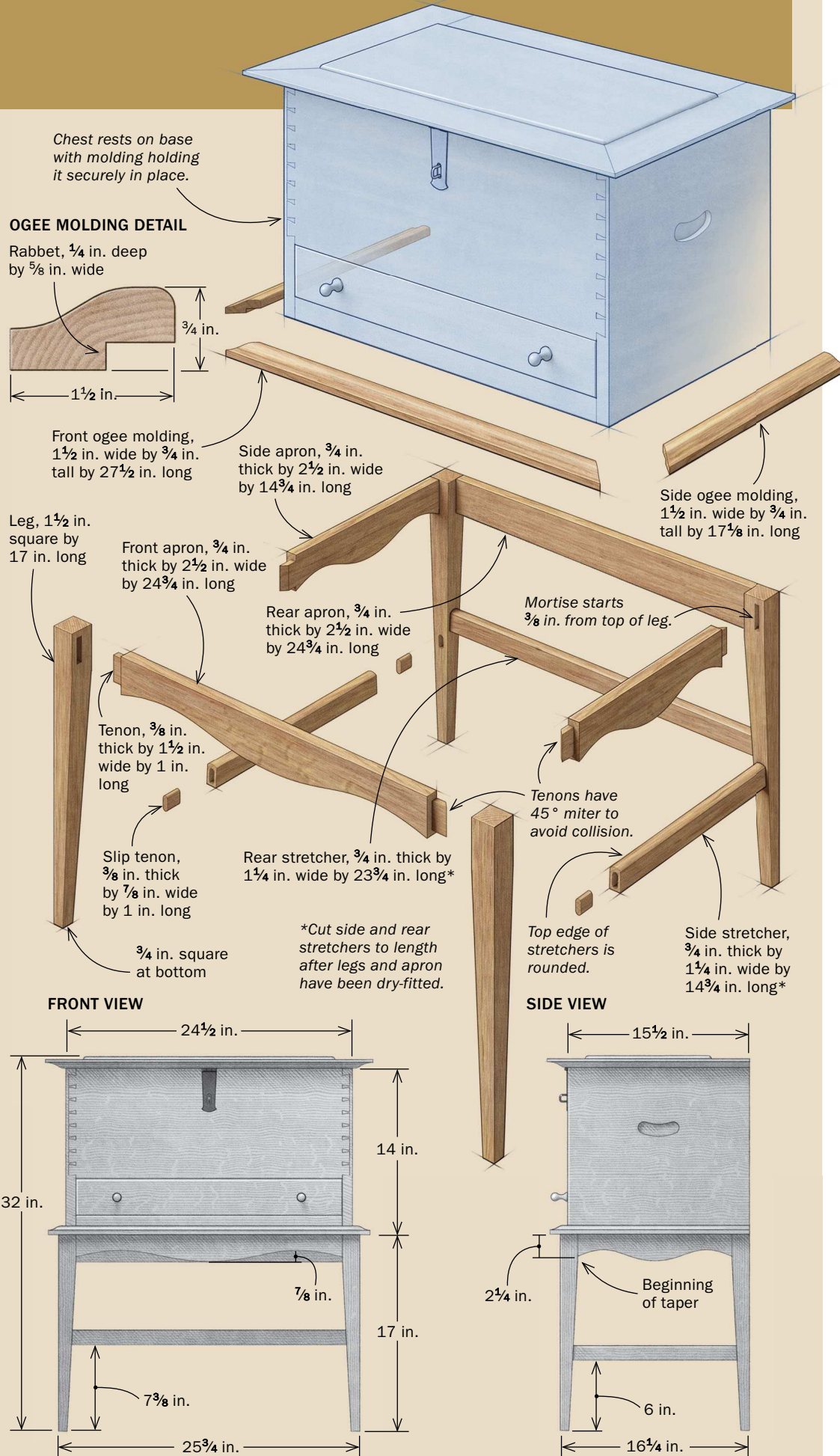
Handhold, $\frac{3}{8}$ in. deep by 1 in. wide by $3\frac{1}{2}$ in. long

SOURCE OF SUPPLY

Hinges, hasp, and lid stay
nathansforge.com

KNOB DETAIL





The rear joint is a haunched mortise-and-tenon. Each frame piece gets a $\frac{1}{4}$ -in.-wide groove to house the panel.

After building the frame, cut the panel to size and use a $\frac{1}{4}$ -in. dado set to run a groove along all four edges. It's important to check the panel for fit in the frame and make sure there's room at the bottom of the groove for expansion. Once it fits, use a quarter-round bit to pillow the top edge of the panel.

Cove makes a handy lid lift—The lid's refined look comes in part from the cove cut into its underside. I cut this wide, shallow cove on the tablesaw after gluing up the lid. I clamped a fence across the table at an angle and took light cuts, gradually raising the blade until I got a cove of perfect depth. Then I rounded over and softened the hard edge with a block plane followed by a sanding block.

Make the stand

The chest gets a sturdy and attractive stand, with tapered legs, shapely aprons on the front and sides with integral tenons, and lower stretchers that reinforce the structure. The ogee molding around the frame is a final attachment that creates an attractive border between the chest and the stand and also adds a richness typical of Voysey's work.

Mortises and tapers—Cut the leg mortises while the material is still square, including the mortises for the lower stretchers. For this job, I used a router and jig. Next, taper the two inside edges of each leg using a standard toggle-clamp jig on the bandsaw.

Aprons—Cut the aprons to length, and then cut and fit the tenons. I cut the tenon shoulders on the tablesaw and the cheeks on the bandsaw,

STRAIGHTFORWARD CASE ASSEMBLY

Make way for the divider. The grooves for the divider are hidden by the dovetail joinery, so you can cut them straight through. Rodríguez uses a $\frac{1}{4}$ -in. dado blade for the job.



Rout for the case bottom. The case bottom groove goes through the back and stops $\frac{1}{4}$ in. from the front. Rodríguez cuts it using a $\frac{1}{4}$ -in. straight bit and straightedge guide.



Fit the bottom. Both the interior divider and case bottom must be fit before glue-up to avoid any hang-ups. When a light mallet tap seats them, they're ready to go.



Case under pressure. Getting clamp pressure in the right places is the only way to get a tight final product. Rodríguez uses cauls and rotated clamps to avoid putting pressure on the case side pins.

rounding the edges of the tenons with a rasp and sandpaper to match the routed mortises.

Once the tenons are cut, trace the wave outline onto the front and side aprons. Cut just outside the line on the bandsaw, then clean it up using a spokeshave and scraper. The rear apron is left straight, as the back is meant to be against a wall.

Stretchers—The side and rear stretchers add stability and pleasing lines to the overall piece. Putting lower stretchers on a table with tapered legs can be tricky, but with slip tenons and careful measuring, you'll get great results.

Begin by dry-assembling the stand and marking the legs for the position of the stretchers. Crosscut one end of the stretcher at an angle to match the angle of the leg taper. Place the angled end along the inside face of the leg aligned with the pencil line and mark the opposite end. Cut just outside the pencil line and sneak up on the fit until the stretcher sits snugly between the legs at the stretcher location.

I used a simple jig to rout the mortises in the ends of the stretchers. The stretcher is clamped vertically to the fence of the jig. A top plate, slotted for a guide bushing, supports the router (for information on making the jig, see "Build a Vanity Cabinet," *FWW* #235, p. 40). Install a $\frac{3}{8}$ -in. straight bit and a $\frac{3}{4}$ -in. guide bushing in a plunge router and rout the mortise in multiple passes until you reach full depth.

Ogee frame

The final touch to the stand is the ogee frame that surrounds the chest on three sides. This molding is made in three steps, starting with the profile. I cut the ogee on the router table with an Eagle America #186-4015 router bit, then rounded over the back edge with a quarter-round bit. The last step is to rabbet the underside with a dado set at the tablesaw and a sacrificial fence. The rabbet fits over the edge of the base and holds the chest in place.

Since the chest sits against the wall, there's no need to frame the

■ FRAME-AND-PANEL LID



Spline the miters. A cross-grain spline will reinforce the joint and simplify glue-up. Mark the miter to avoid cutting into the panel groove.



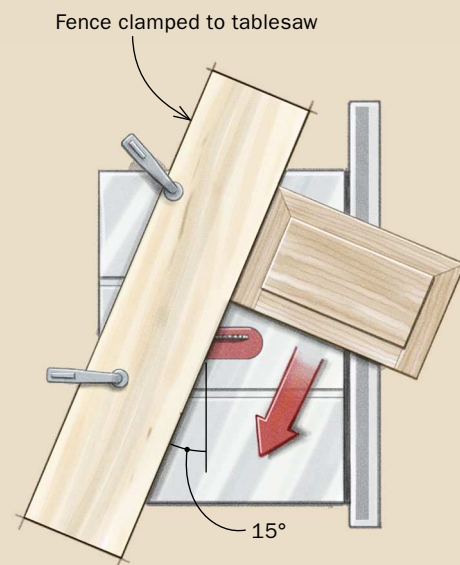
Unbreakable. The oak splines are cut crossgrain, so they won't break along the grain.



Gluing the lid. Before applying any glue, make sure all the grooves and miters fit properly. Once the glue is on, Rodriguez uses clamps to carefully align and square the mitered corners.



Tablesaw mill. To get a wide, shallow cove on the lid, clamp an angled fence across the blade. Keep the lid flat and pressed against the fence while making each pass (left). Raise the blade $\frac{1}{16}$ in. after each pass until you reach the right depth (inset), leaving a sweeping cove undercut. Don't cut too deep or the miter splines will be exposed.



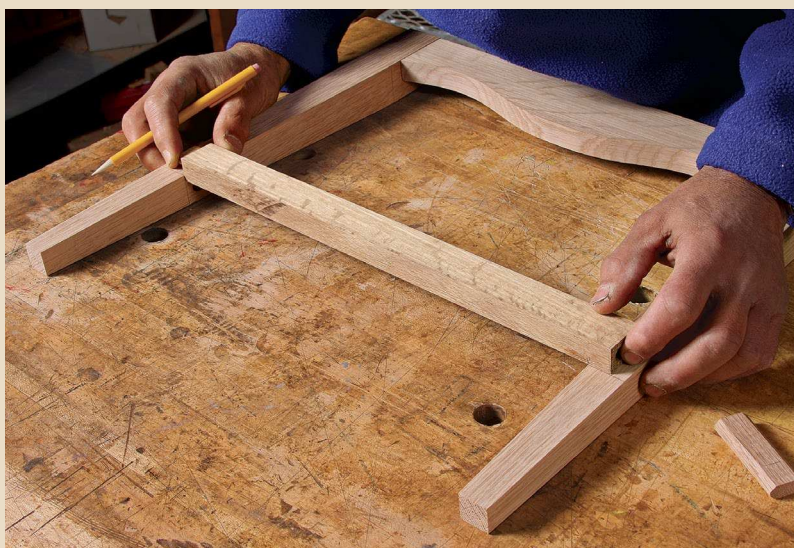
STAND WITH TAPERED LEGS AND CURVED APRONS



Taper the legs. Once the mortises for the aprons and lower stretchers are cut, Rodríguez uses a simple jig with a single toggle to cut the tapers on the two inner sides of the legs.



Cut the stretchers to length. Dry-fit the apron and mark the stretcher location on the faces of the legs. At the chopsaw, angle one end of the stretcher to 87° and set it in place to mark the opposite end. Start outside the line and take multiple cuts until the stretcher fits precisely between the legs.



Mortises on the narrow. To mortise the ends of the stretchers, Rodríguez uses a jig and a plunge router with a rub collar. Clamp the stretcher in place (above), and rout the mortise, taking multiple passes to reach full depth (right).



Stretchers assembled. Now that the ends are angled and the mortises are cut, make and fit the slip tenons.

stand all the way around; the front and sides are sufficient. That means there are only two miters to cut. I cut them on the miter saw and refined the fit with a block plane.

Installing the hardware

Hardware can add character and authenticity to a piece like this, so I chose hand-forged pieces from Nathan's Forge (nathansforge.com). The hinges fit in a shallow mortise in the top edge of the back panel that allows the lid to lie flush with the edge of the chest. They are attached with screws that resemble antique rose-head fasteners.

The lid stay is carefully positioned so that the lid closes completely and tilts back to 85° when open. The hasp is attached to the underside of the lid and placed so that its screws don't interfere with the flush fit. A horseshoe nail passes through the hasp for a secure closure. Predrill for the nail and then gently drive it in with a hammer.

A true finish

Since original Voysey pieces have a low-luster finish, I kept it simple. I ragged on several coats of 1½-lb.-cut shellac, rubbing out each coat and applying another until I achieved a light film and a soft sheen. Then I applied a little wax, rubbed it out, and burnished

it to bring out the highlights. I finished the inside of the chest and drawer with a single coat of shellac, rubbed out when dry, and waxed.

After a few days, I applied an antiquing glaze tinted with raw umber, brushing it into the corners and recessed areas. Before it dries, wipe off the excess glaze, leaving just enough to mimic the accumulation of dust and dirt over time. Some of the glaze will migrate onto the flat surfaces, muting the oak slightly and giving it a nice patina. Once you're satisfied with the chest's faux antique appearance, buff it out from top to bottom with a soft, clean cloth. □

Mario Rodriguez, a 24-year contributor to FWW, teaches at the Philadelphia Furniture Workshop (philadelphiafurnitureworkshop.com).



Mitered molding finishes the base. After using an ogee profile bit and a quarter-round bit in the router table to shape the molding, Rodriguez uses a dado set at the tablesaw to cut the rabbet in back (above). Miter the front corners, then glue the molding to the base. Leave the back of the frame without molding; the piece is meant to be stored against the wall.

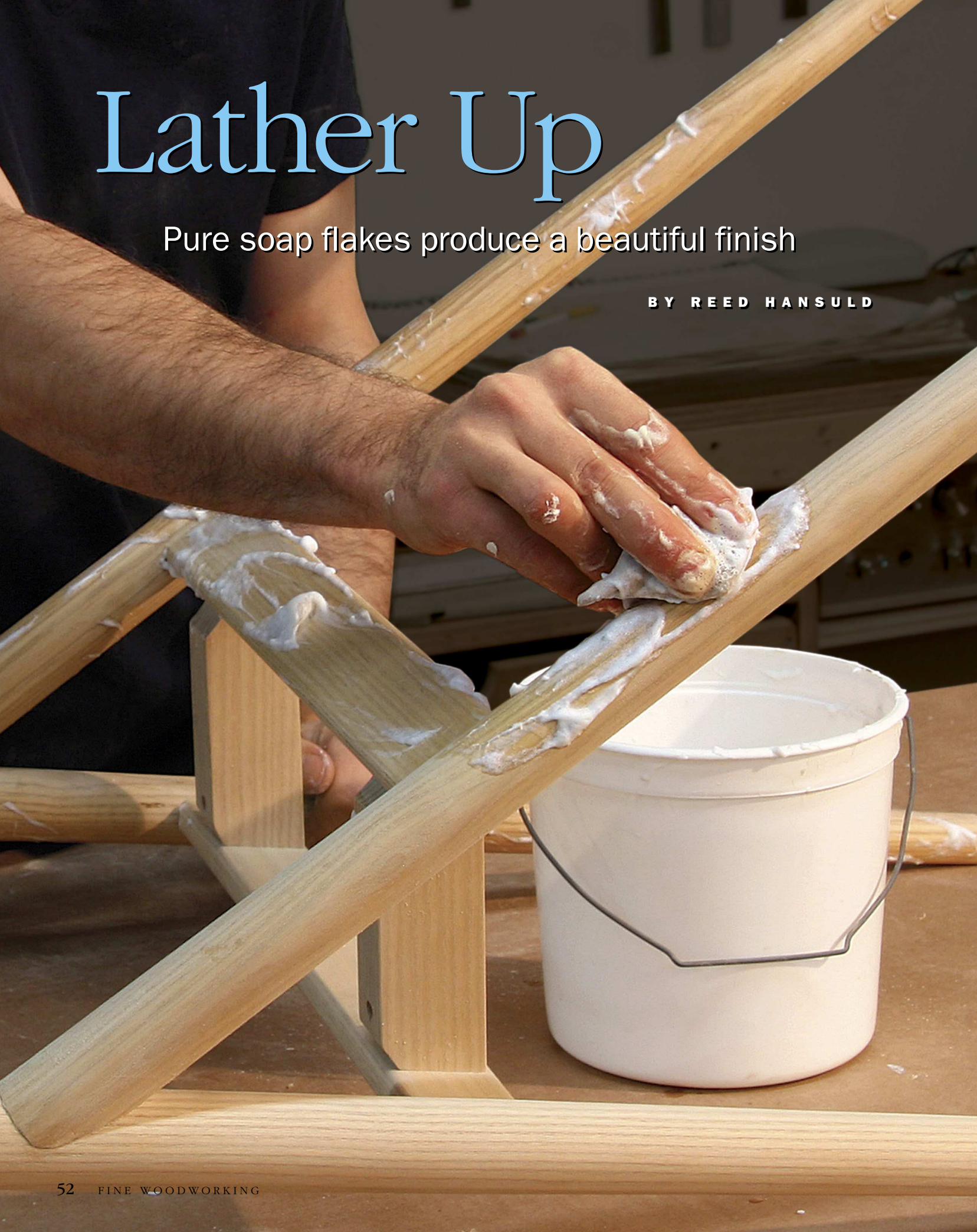


Low-luster finish. In keeping with Voysey's typical natural, low-luster finish, Rodriguez applied a few coats of 1½-lb. cut shellac with a rag. He then added wax and antiquing glaze to mimic the passing of years.

Lather Up

Pure soap flakes produce a beautiful finish

BY REED HANSULD



I first learned of using soap flakes as a wood finish from a Danish furniture maker who said it was traditionally used in Denmark on everything from chairs and tables to case goods and floors. I was skeptical, but when I saw it on a cabinet he'd made I had to try it. Four years later, it's my finish of choice. With its low sheen, this in-the-grain finish has a muted beauty that enhances the look of wood being wood. And it's smoother to the touch than any finish I've encountered.

A soap finish won't take abuse like varnish or epoxy, but it's simple to renew and a pleasure to apply. It is nothing more than soap flakes and water, so it's as environmentally friendly a wood finish as you'll find—zero VOCs (volatile organic compounds). You won't need a respirator, glasses, or gloves; there's nothing toxic to avoid and nothing dangerous to dispose of. And it's quicker to apply than most wipe-on finishes.

A soap finish is well suited for lighter-toned woods like white oak, ash, maple, and beech. Unlike oils and some waxes, soap won't produce an amber tone, so light woods look bright. It doesn't provide UV protection, so the wood will naturally darken over time. Soap isn't a good match for darker woods; it won't draw out the depth of grain and color in woods like walnut, cherry, or rosewood. Also, because of all the water involved, I'd hesitate to use it on a veneered piece.

Mix it up and slather it on

The process of mixing is incredibly simple: A handful of flakes to half a cup of hot water, and whirr. Be sure the flakes are pure and unscented. I use Dri-Pak flakes (msodistributing.com). Whisk for a few minutes with a fork or spoon in a hand drill—or with an immersion blender—until you get a thick, dense froth. Like whipped cream, it should hold peaks and never be runny. And there should be no undissolved flakes.

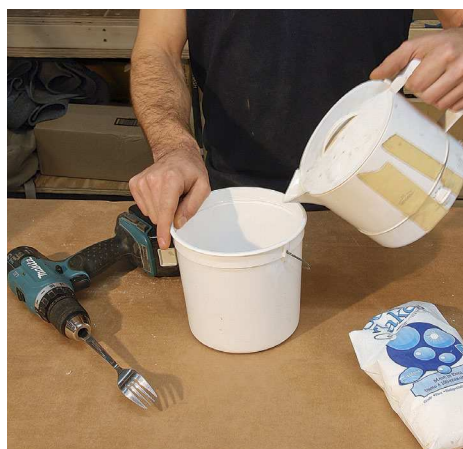
Apply the froth with a clean cotton rag, going over the workpiece thoroughly and soaping the parts more

CLEAN FINISH FOR LIGHT WOODS

Traditional in Scandinavia, the simple-to-apply soap flake finish brings a bony whiteness to light-colored woods, producing a low-level sheen and a satiny smooth surface.



MIX IT UP



A palmful per coat. A small handful of pure soap flakes and $\frac{1}{2}$ cup of very hot water make enough froth for one coat of finish on a small project like the chair above. Soap for multiple coats can be mixed at once and used over the course of a day.

Whip it. With a fork or spoon chucked in a drill, whisk the mixture until it is the consistency of whipped cream, stiff enough to hold peaks. An immersion blender also works.

LATHER, RINSE, REPEAT

Start with water.
Before applying the soap froth, raise the grain by rubbing the workpiece with water, then sand with 220-grit paper.

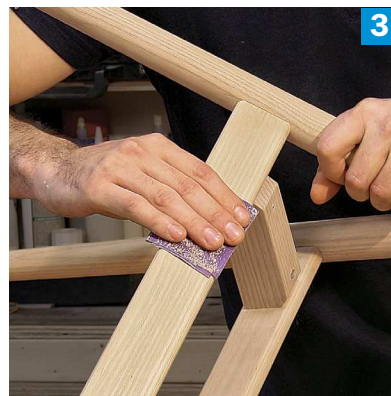


than once per coat. Then go over the piece with a fresh rag, removing excess suds and really buffing the finish into the wood. At this point I rinse out the buffing rag and hang it to dry with the rinsed application rag. Both can be reused for the next coat.

In an hour or so, when the work is dry, do a light sanding. After the first coat or two I use 220-grit, and after subsequent coats I work upward to 600-grit or higher. I have found a minimum of three coats are required, and I've done as many as 10—all of which can be done in a single day as long as you leave adequate drying time between coats. The following day I buff it with a white fine abrasive pad (Norton Bear-tex hand pads) and the finish is complete.

The finish should be renewed every year or so. Stains can be spot-treated by rubbing the stained area with very hot water and recoating with soap froth. If the stain persists, scrape or sand through to clean wood before applying the froth. □

Reed Hansuld makes custom furniture in Brooklyn, N.Y.



Spread the froth.

Use a clean cotton cloth to spread the soap over the piece. Apply it over the whole surface

several times per coat (1). Use a clean and dry rag to remove the froth and rub down the whole coat vigorously (2). When the coat is dry—in an hour or so—sand all surfaces (3). For early coats, use 220-grit paper; for later ones progress up to 600-grit. Three to 10 coats make a good finish. The day after you've applied the finish, buff the workpiece with a very fine abrasive pad (4).

Keep Your Doors Closed

Handmade latches add function and flair to your furniture

BY CHRISTIAN BECKSVOORT

Wooden spinner latches for doors are fun and straightforward to make, yet they exemplify the finer details of handmade furniture. In their most rudimentary form, spinners are mounted on the outside of case pieces; for a cleaner look, they can be placed inside the door and operated by twisting the door knob. I've always preferred the interior, back-mounted variety, but over the years the spinners on my cabinets have evolved from very basic to more sophisticated.

Many of my ideas were borrowed from Shaker pieces I've had the pleasure of restoring. One of my first cabinets had the simplest form of interior spinner, a pointed oval. It worked, but since you could turn it 360° as you twisted the knob, you had to "feel" when the spinner actually engaged behind the cabinet frame.

To solve that problem, I added two small dowels on the inside of the door stile to act as stops for the open and closed positions. Then it dawned on me that if I left one square corner on the spinner, a single dowel could serve as stop for both open and closed. I used this method of keeping doors closed for many years. Then I chanced upon a small Shaker cabinet with a spinner mortised into the edge of the door stile. Quite a bit more work, but so elegant, so understated, so clean and clever. Soon I was putting that type of spinner on many of my cabinets.

Whichever type I'm making, I first create the knob, giving it a 1/2-in.-dia. or 3/8-in.-dia. tenon, depending on the size of the case. I start by cutting the tenon with a tenon-cutter on the drill press. (For tips on making knobs, see "Authentic Shaker Knobs," *FWW* #196, or "How to Turn Pulls Without a Lathe," *FWW* #240.)

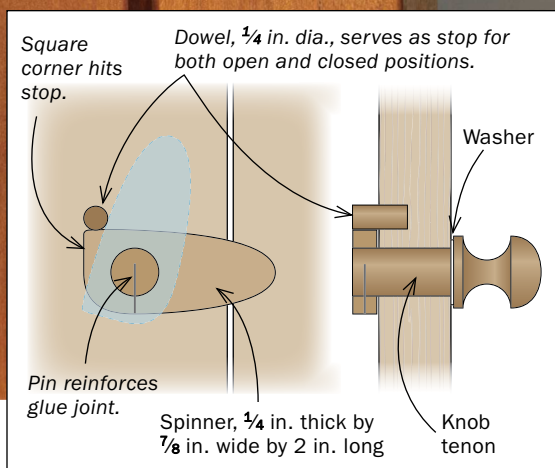
TWO OPTIONS

Both mortised and interior spinner latches operate with a twist of the knob, and disappear when the door is closed. The interior spinner (right), which engages the inside of the face frame or a slot in the cabinet side, is simpler to make. The mortised spinner (above), which requires a deep mortise into the edge of the door, rewards the extra effort with elegance.



Christian Becksvoort makes spinners and the furniture for them in New Gloucester, Maine.

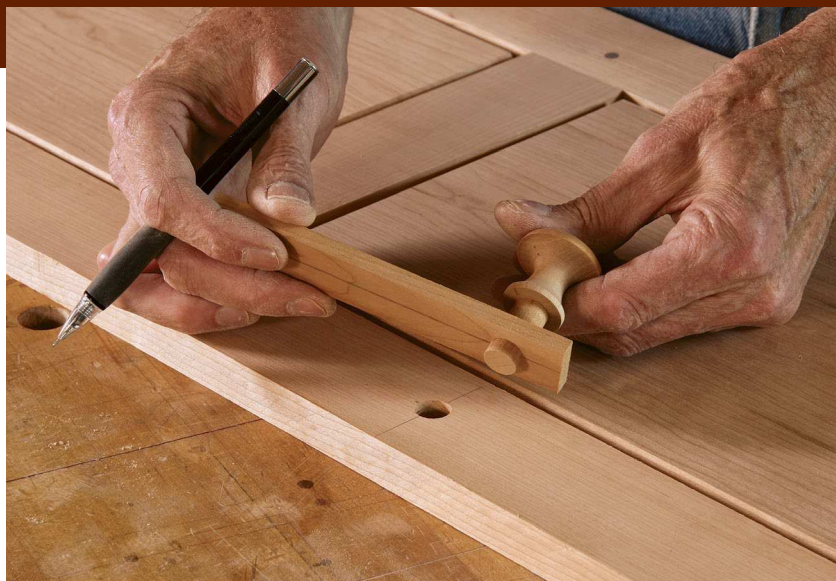
Interior spinner



An interior spinner is easy to make and install. Make the knob, then drill a knob hole for it through the door stile with a bit $\frac{1}{64}$ in. larger than the diameter of the tenon. Then, using $\frac{1}{4}$ -in.-thick stock, make a rectangular blank about $1\frac{1}{4}$ in. wide and 4 in. long. The extra length makes the blank easier to handle on the drill press and bandsaw. Drill a hole in the blank that's a snug fit for the knob tenon, centered in the width of the blank and about $\frac{3}{4}$ in. from one end. Draw the spinner by eye, bandsaw it out, and fair the edges on the disk sander.

To find the location for the stop dowel, dry-fit the spinner and turn it to the open position (up), and then make a pencil mark on the door stile along the back edge of the spinner. Turn the spinner to the closed position (out), and mark along the top edge. Drill a $\frac{1}{4}$ -in. hole centered on the vertical line and just above the horizontal one. After gluing in the dowel stop, reinsert the knob tenon in its hole through the stile, apply some glue to the inside of the hole through the spinner, and push it onto the knob tenon.

In closed position, the spinner fits behind the face frame. If the cabinet has no face frame, cut a slot into the case side to receive the tip of the spinner.



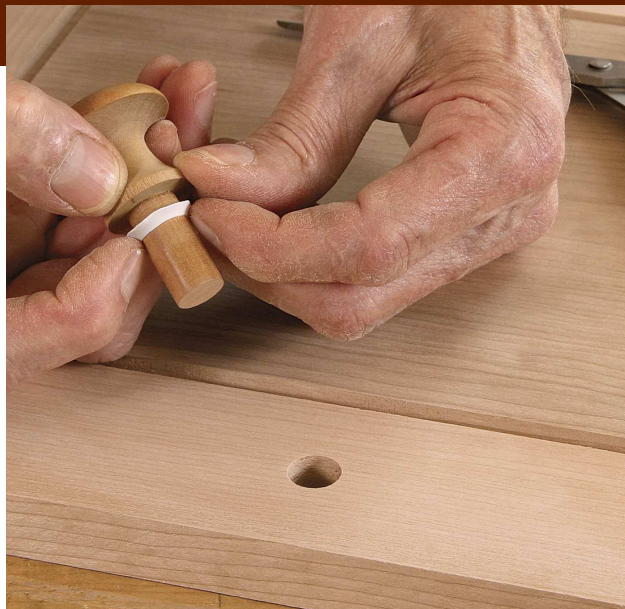
Dry-fit the knob. The hole through the spinner blank should be a snug fit. But the hole in the door stile should be $\frac{1}{64}$ in. oversize to ensure smooth action.



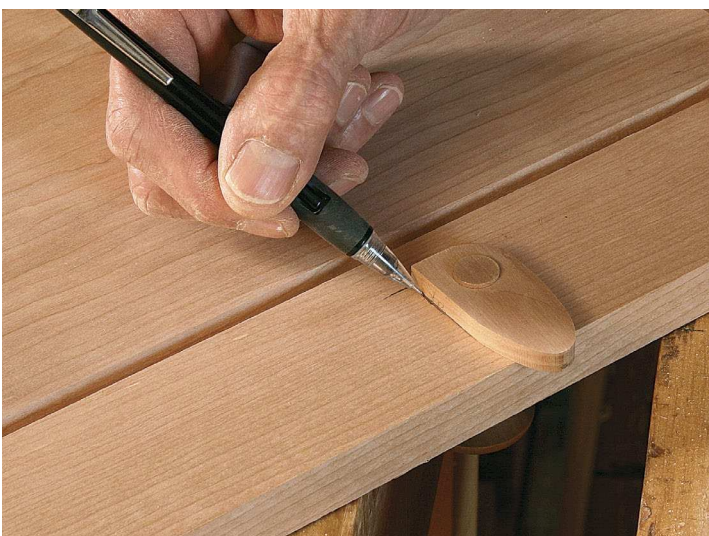
Mark out the spinner. With the knob tenon inserted in the hole in the stile, Becksvoort draws the shape of the spinner by eye. He uses an overlong blank so it is easy to control on the drill press and the bandsaw.



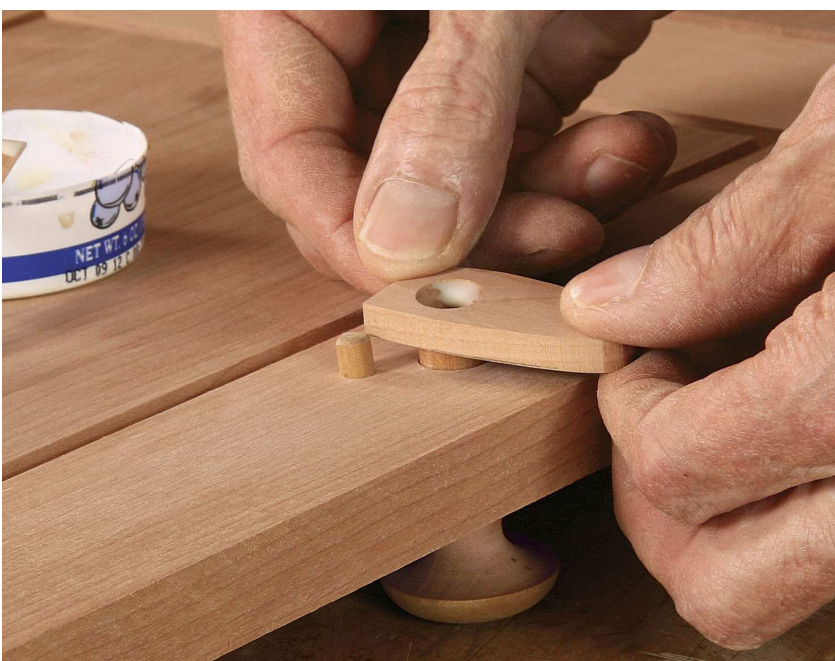
Don't cut that corner. As you bandsaw out the spinner, leave one of the inside corners square. This provides the surface that contacts the dowel stop in the closed position.



Shopmade washer. To reduce friction between the knob and the door stile, Becksvoort uses a slippery washer. He makes his own from very thin nylon weatherstripping—or, in a pinch, the lid of a yogurt container—using a hole punch and a pair of scissors.

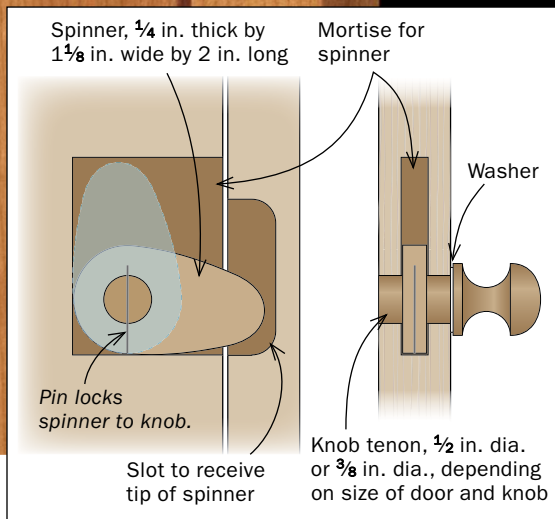


Add the stop dowel. To establish the location for the stop dowel, dry-fit the spinner on the knob and trace its flat side in both closed (far left) and open positions. Drill a hole centered on the vertical line and just above the horizontal line.



Glue and pin. After gluing the stop dowel in place, glue the spinner to the knob tenon, carefully applying just a small amount of glue inside the hole in the spinner. Then clinch the joint by drilling a hole through the edge of the spinner and into the tenon to receive a metal pin made from a brad.

Mortised spinner



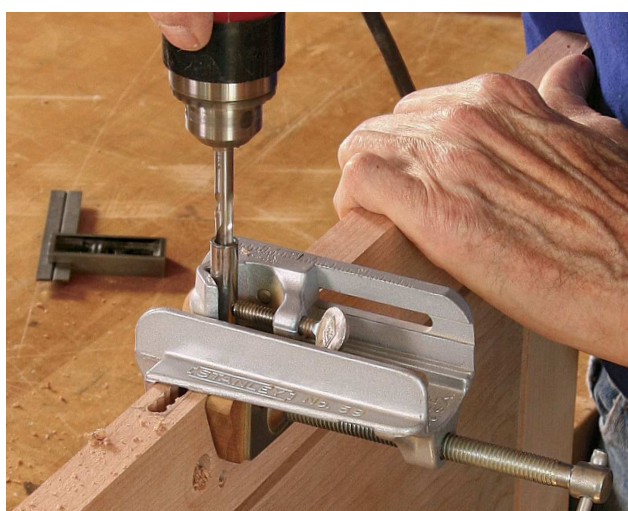
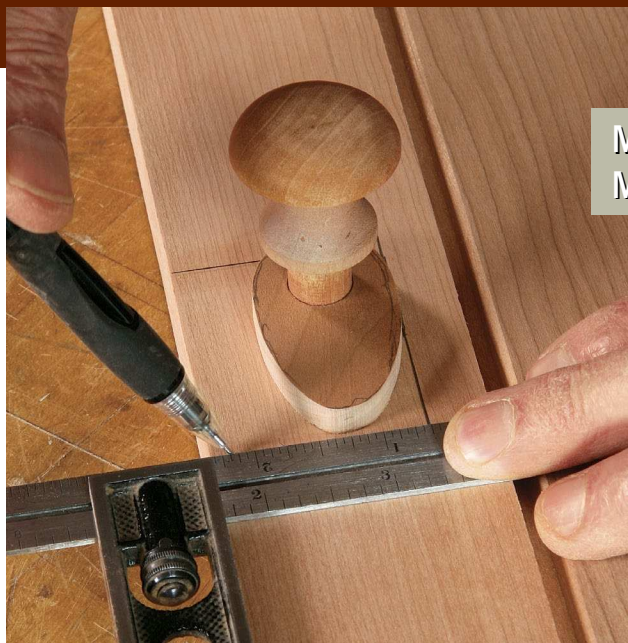
The mortised spinner may be a lot more work, but it's a marvel to behold and a pleasure to use. To make it, begin by making the knob and then drill a hole in the door stile. Make the hole $\frac{1}{4}$ in. larger than the diameter of the knob tenon. Then drill a snug hole through the spinner blank to receive the knob tenon.

After bandsawing the spinner to shape, insert the knob tenon through it and into the hole in the door. This enables you to lay out the mortise in the door that will house the spinner. I use a drill to rough out the mortise and clean up with a chisel.

Other spinners can be glued to the knob, but with this one that's not possible. In place of glue, I use a pin. With the spinner in the vertical position, I drill a $\frac{1}{16}$ -in. hole through the edge of the spinner, through the tenon, and about $\frac{1}{8}$ in. into the other side of the spinner. Using nippers, I cut a 16-gauge brad to the right length, and then use needle-nose pliers to force the brad into the hole. That locks the spinner onto the shaft. I leave the head of the brad proud so I can remove the pin in the future if need be.

MAKE THE MORTISE

Rotating layout. With the knob dry-fitted to the spinner and resting in the hole in the door stile, turn the spinner to the open and closed positions to establish the top, bottom, and back edges of the mortise that will house the spinner.



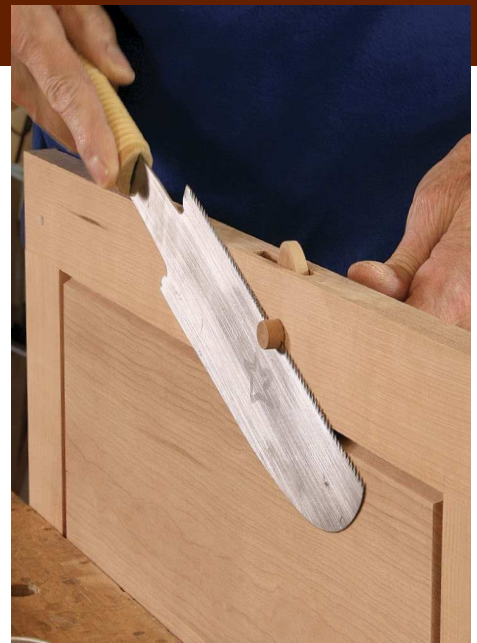
Create the spinner mortise. Becksvoort uses a doweling jig (left) to guide his drill as he hogs out most of the waste in the spinner mortise. He follows up with chisels to chop and pare the sides clean (below).



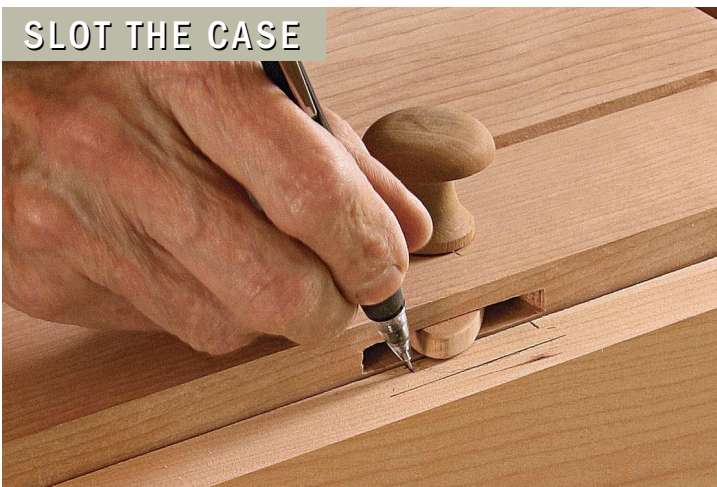


PIN THE SPINNER

Pinned, not glued. It's not possible to glue the mortised spinner to the knob tenon, so Becksvoort uses a pin. He drills through the spinner and into the knob (left), then cuts a brad to length and pushes it home with needle-nose pliers (right). To make it removable, he leaves the head proud.



Trim the tenon. After the spinner is pinned in place, saw the tenon flush to the inside face of the door stile.



SLOT THE CASE



Mark and cut out the spinner slot. To lay out the slot in the cabinet side (or face frame) for the tip of the spinner, close the door and mark the farthest points the spinner reaches (top). Use a slotting cutter to make the mortise (bottom), following the layout lines on the edge of the cabinet.



Soften that sharp tongue. Sandpaper eases the edges of the spinner, allowing it to engage the mating slot more easily.

Tapers, veneer,
and inlay give this
table style to spare

BY STEVE LATTA

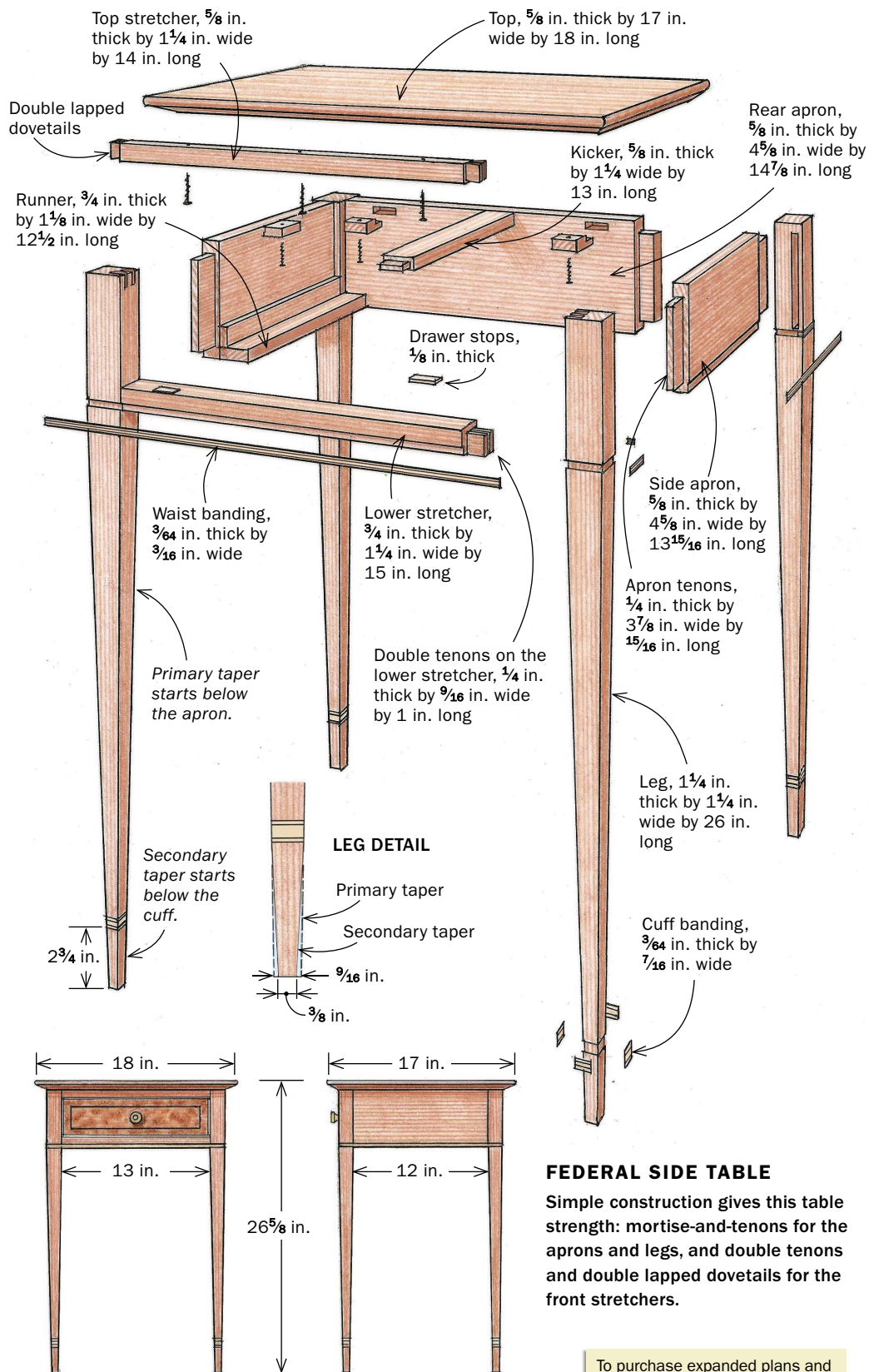
Federal Details Transform a Simple Table

Since I began building period furniture more than 30 years ago, I've developed an affinity for the Federal style. The neoclassical lines and detailing in the furniture really speak to me.

A Federal piece doesn't have to be big or complicated to stand out. Combining details in a smart way can enliven even the simplest form. Take this table, for instance. Stripped of the banding on the legs and waist, and the stringing and cock beading on the drawer, the piece is plain and unassuming. But add those details into the mix and the table goes from simple to formal, drawing attention from every angle.

The anatomy of the table is straightforward, so this article is going to focus more on adding the Federal details than on the construction of the piece. I'll tell you how to make the double-tapered legs, and on p. 67, I'll demystify the process of making and inlaying banding and stringing. Then, in the Master Class on p. 82, I'll demonstrate how to use the traditional technique of hammer veneering to add walnut burl





FEDERAL SIDE TABLE

Simple construction gives this table strength: mortise-and-tenons for the aprons and legs, and double tenons and double lapped dovetails for the front stretchers.



Article Extra

Watch Latta build this table from start to finish in a members-only Video Workshop series.



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

Cuff banding

CLEAR A PATH FOR THE CUFF



Set the bevel gauge. Pick up the leg's taper angle by pressing the bevel gauge against the bottom and side of the leg, then use it to lay out the cuff banding.



Mark the first line. Measure $2\frac{3}{4}$ in. from the bottom of the leg, then use the bevel gauge and knife to mark a line around all four sides.



The banding sets the width. Use a piece of banding to space the bevel gauge from the first line, then knife the second line.

veneer to the drawer front, and cock beading to the edges of the drawer. Let's start with the leg tapers.

Tapers and banding make boring legs more exciting

The legs have a double taper on all four sides. The primary taper starts below the apron, and the secondary taper starts below the cuff banding. After mortising the legs, you'll taper them in two steps. Cut the primary taper using a tapering jig on the tablesaw before installing the cuff banding. You'll cut the secondary taper later, after the cuff banding is glued in (for more on the tapering

jig and my method for using it, see "Perfect Tapers on the Tablesaw," *FWW* #229).

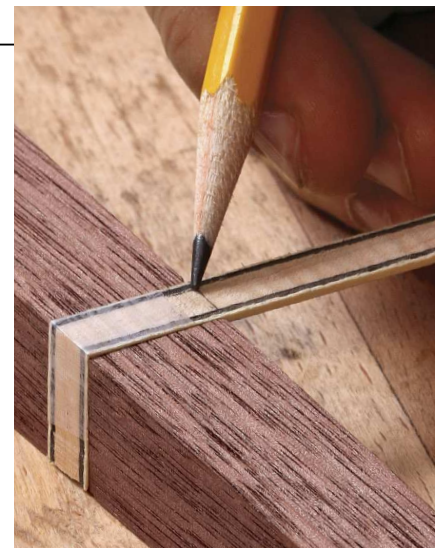
The cuff banding is mitered at the corners and recessed into dados on all four sides of each leg. First lay out and cut the dados. The primary taper puts the leg sides a few degrees off parallel, so use a sliding bevel gauge for the layout. Set the gauge by registering it against the bottom and side of the leg and locking in that angle. Mark the lower edge of the cuff first. Measure $2\frac{3}{4}$ in. from the bottom with a combination square, and then use the bevel gauge to knife a line all the way around the leg at that height.

MITER AND INSTALL THE PIECES

Miter the banding. Latta uses a plane blade and a 45° block to miter the banding at the corners. He chops the piece to rough length with the banding lying flat, then stands it on edge to slice the miter.



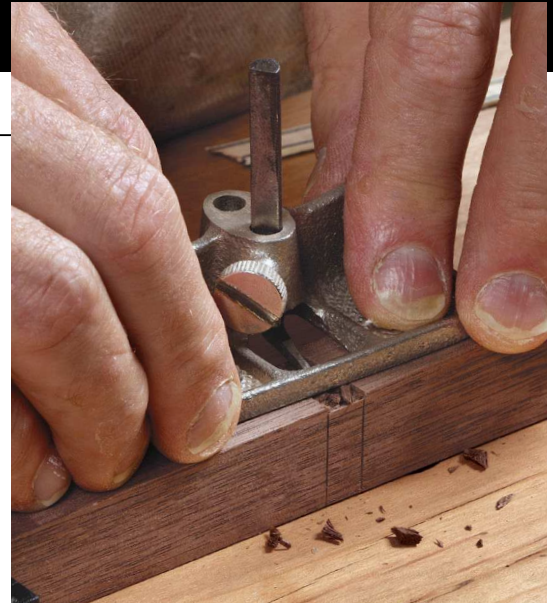
Tape the corners together. Cut the first side to length, then line it up against a straightedge with the next piece, and tape the miters together.



Work your way around the leg. Dry-fit the taped banding in the dado and mark the next joint's location, then miter the next corner.



Start the dado with a chisel. Establish shoulders next to the scribe lines by removing a chip from each side (left), then chop up the waste in between and remove most of it to create a dado (right).



Finish it with a router plane. After setting the blade depth by placing cuff banding under the base, clean up the bottom of the dado.

Next, mark the upper edge of the dado. Set the tip of the marking knife in the lower scribe line and use a piece of banding as a spacer to position the bevel gauge for the second cut. Remove the banding and knife the second line next to the bevel gauge. Chisel out the waste and use a small router plane to get the bottom of the dado flat, making it slightly shallower than the banding's thickness.

Miter the cuff bandings with a sharp plane blade and an angle block, using a slicing motion to get clean cuts. Cut the miters at 45° and tape the outside faces together end to end. Fit the front side first, and work toward the back, where any gaps in the last

corner won't show. After fitting all four sides, put glue in the dado and on the banding and tape the banding in place. Once the glue is dry, remove the tape and sand the banding flush using a sanding block and P180-grit paper.

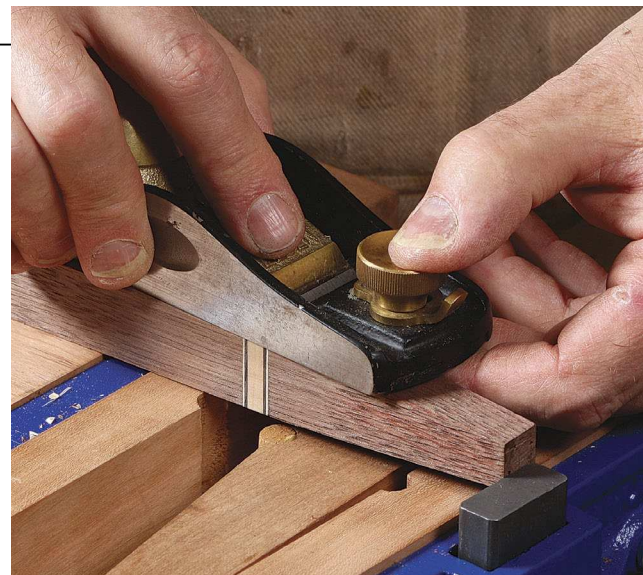
Mark lines for the secondary taper on the bottom of the leg instead of the face. Cut it by working from just below the cuff toward the line with a block plane, and finish smoothing it with the sanding block. To keep the bottom corners of the feet from chipping during use, give them a small chamfer with the sanding block.



Glue it in. Put yellow glue in the groove and on the banding, making sure to get some in each miter. Then stick it in the dado.



Tape holds it tight. Latta holds the joints together and uses clear tape instead of clamps to keep the banding in place until it's dry.



Finish off the foot. After the glue dries, sand the banding flush, then shape the secondary taper with a block plane.

Waist banding

MAKE WAY FOR THE BANDING

Waist banding adds detail in the middle

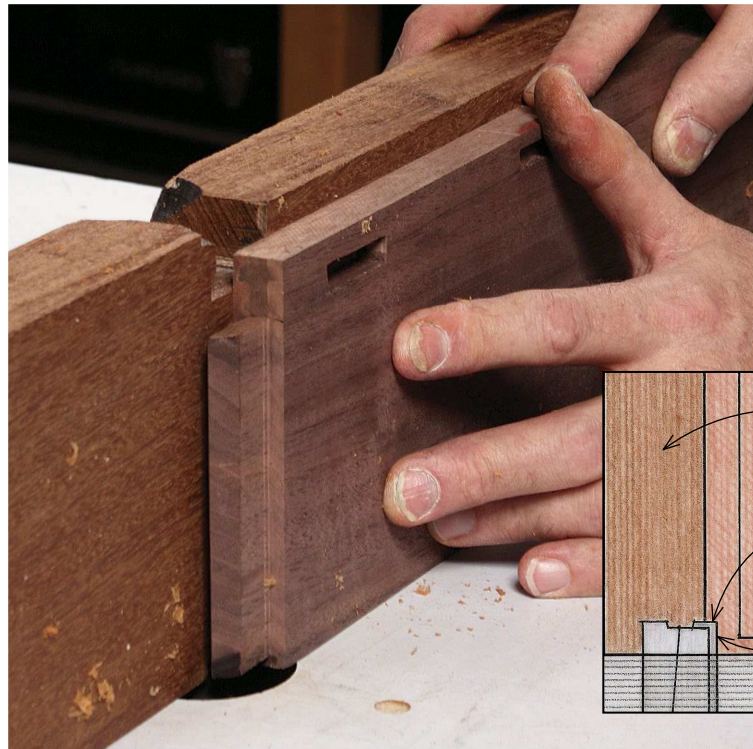
The narrow waist banding at the bottom of the apron runs around all four sides of the table, including the legs. The banding is added to each part individually, so it's critical to install it carefully so that each part lines up when you glue up the base.

Start by rabbeting the lower front edge of each apron and the lower drawer stretcher. Mark the width of the rabbet and protect against tearout by scoring a line with a marking gauge set to the banding's width. Cut the rabbet with a straight bit at the router table, making it a little shallower than the banding thickness.

Rough-cut the apron bandings to length and use clear tape to secure them in their rabbets. Leave the bottom edge of the banding unconnected; this allows you to fold the banding back like a hinge and apply glue to the rabbet. Then fold the banding back into place and put on the clamps.

Make a specialized glue caul for the banding by cutting a groove down the edge of a piece of wood that's $\frac{3}{4}$ in. thick by 1 in. wide. Clamp the caul in place with the groove facing the workpiece, so that one half presses down on the banding (see drawing, opposite). When the banding dries, trim the ends flush with a chisel and use a card scraper and sanding block to flush up the front.

The two rear legs are next. Dry-fit the base with the tops of the legs and aprons flush. Use a sharp pencil to mark the rabbet location on the legs, then take them apart and use a combination square and a marking knife to transfer the lines to the faces of the legs. Using a piece of banding as a



Rout the rabbet first. To eliminate tearout, score a line on the face of the apron with a marking gauge.



Mark the waist banding on the legs. The waist banding wraps around the aprons and legs at the same height. To ensure that each part meets perfectly, dry-fit the aprons to the legs before transferring the rabbet location to the legs. Then cut the dadoes for the waist banding using the same technique as for the cuff banding.

spacer, mark the second line above the first. Remove the waste from the dadoes and miter the banding as you did the cuff banding, but stopping the banding at each mortise. Then add glue and tape it in place.

The waist banding on the front is slightly different from the rest of the table. Because the legs are flush with the stretchers, one long piece of banding runs all the way across, and the front gets glued up before the banding is added. First dry-fit the stretchers and front legs together and mark the lower



Article Extra

Learn how to cut and fit the side table's joinery in a free episode from our members-only series.

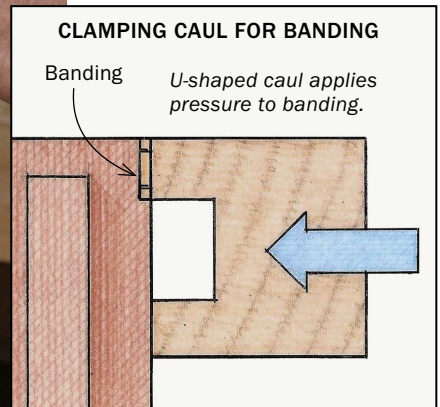
APRON



Get the waist in place. Cut the waist banding slightly long, then tape it across the front to keep it tightly in the rabbet.



Fold back the banding to put on the glue. The tape acts like a hinge, allowing the banding to fold open for the glue (left), then fold right back into place for a perfect fit. After adding the glue, Latta puts on the clamps with a special U-shaped caul that directs the pressure to the banding (below).



LEG



Install the waist banding on the back legs. The banding is mitered around three corners of the back legs. It won't be visible inside the frame, so it stops at the mortises.



FRONT

Glue-up comes first. Since the stretchers are flush with the front of the legs, cut the banding dados in the legs and glue the front together before you install the banding.



Banding goes all the way across the front. With the dados and rabbet aligned and the front glued together, inlay one long piece of banding across the front, mitering the corners like before.

Drawer stringing



stretcher's rabbet on the legs. Cut the dadoes, then glue together the legs and stretchers, making sure the dadoes and rabbet line up exactly. When the glue is dry, fit the banding and glue it in.

Holly stringing makes the drawer front pop

String inlay is great for visually breaking up the big, flat surfaces on furniture. Here, the stringing brings extra attention to the burl veneer of the drawer front. The stringing is inlaid after the front is veneered, cut to size, and dovetailed, but before the cock beading is added. To lay it out, measure $1\frac{1}{16}$ in. from the edges with a combination square and mark for the stringing using a white pencil. Cut the grooves with a cutting gauge-style inlay tool, being careful not to cut beyond the corners. Use a chisel to trim the sides of the groove in each corner. You can make a tiny tool for cleaning the bottom of the grooves by customizing a hobby knife. Grind away the sharp edge, and create a standard chisel edge at the very tip.

Cut strips of holly veneer using a slicing board and a cutting-gauge style inlay tool. Thickness the strips, checking the fit as you go. I use an inlay tool and thickening tool from Lie-Nielsen. Cut the stringing to length, miter the ends with a chisel, and fit the pieces to the grooves. Use yellow glue—a plastic syringe helps get it in the grooves—and glue in the long sides first. Then scrape off the squeeze-out. Plane the stringing nearly flush, then glue in the short pieces. Once the glue has set, flush the corners of the stringing with a chisel and plane and sand the rest flush. Pre-finish the drawer front with shellac to keep it clean and protect against glue contamination in the final steps.

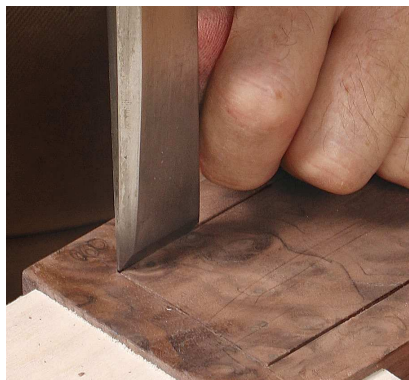
To add the veneer and cock beading to the drawer and wrap up this beautiful project, check out the Master Class on p. 82. □

Contributing editor Steve Latta teaches woodworking at Thaddeus Stevens College of Technology in Lancaster, Pa.

SLICE A RECESS



Cut the grooves. Latta uses a straight line cutter to cut the stringing grooves, making sure not to cut beyond the corners.



It's OK to cut these corners. Latta uses a 1-in.-wide chisel to establish clean edges near the corners.



Turn a hobby knife into a tiny chisel. Regrind and sharpen an X-Acto knife with square edges and a chisel tip—it's the perfect tool for cleaning out the grooves.



ADD THE INLAY

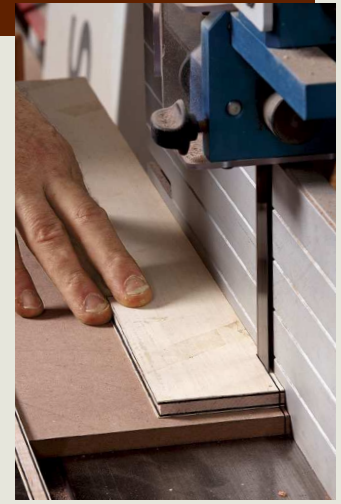
Trim the stringing to size, then glue it in. After cutting the stringing to length and mitering the ends, put yellow glue in the long grooves and press the stringing into place (above left). After planing the long pieces nearly flush, glue in the short ones (below left), then carefully plane them down and flush them all with a sanding block.



Make your own banding

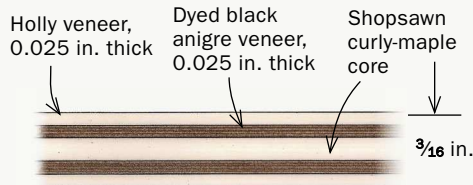


Bandings start as a sandwich. Stack layers of veneer and thin-milled solid wood for gluing. Use tape to keep them aligned (above), wrapping diagonally to prevent tearing the grain during removal. Then clamp the stack in the press (right).

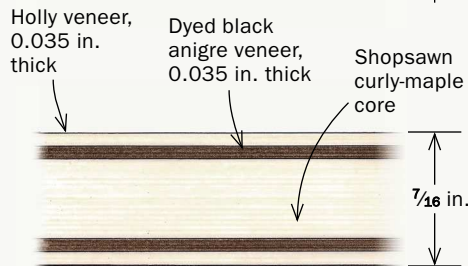


Ready to rip. After the banding dries, joint an edge and rip it into $\frac{3}{64}$ -in.-wide strips using the fence on the bandsaw. You can reduce tearout by using a zero-clearance deck—make one by cutting a few inches into a piece of $\frac{1}{2}$ -in.-thick MDF, and clamping it to the bandsaw table.

FEDERAL INLAY DETAILS



WAIST BANDING



CUFF BANDING

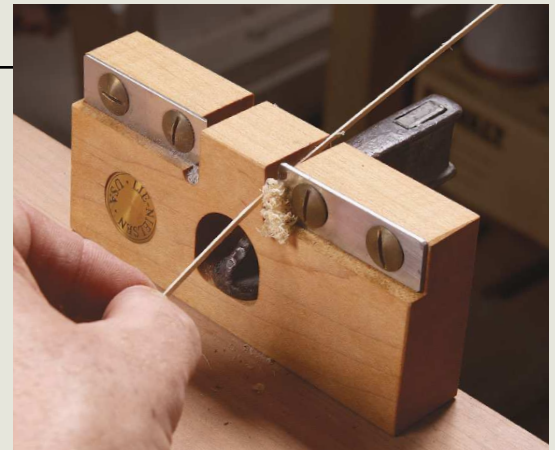
Bandings can have a major impact on the visual sophistication of a piece. Making them might seem challenging, but the process is actually straightforward. Essentially, you glue up a sandwich of veneers and thin-milled solid wood in contrasting colors, and then cut the sandwich into narrow strips.

The sandwich for this table's waist banding has a central layer of $\frac{3}{32}$ -in.-thick curly maple between thin outer layers of holly and ebonized anigre veneer. The cuff banding, which is wider, has a central layer of $\frac{5}{16}$ -in.-thick curly maple between holly and ebonized anigre veneers. I did the glue-up with a simple U-shaped banding press made from $\frac{3}{4}$ -in. MDF. Cover the inside faces of the MDF with clear plastic packing tape to prevent glue from sticking to them before screwing the pieces together.

To create the sandwiches, cut all the veneers and core stock into strips 2 in. wide. Apply glue to each layer with a small paint roller, quickly stack them together, wrap them with tape, and then clamp them in the press. Once the glue dries, joint one edge, then rip the sandwich into $\frac{3}{64}$ -in.-wide strips on the bandsaw. If the saw leaves a surface that's too rough, rejoin the edge of the sandwich before each rip.

STRINGING

Cut the stringing into strips. Latta uses a slicing board—a piece of MDF with a shallow fence on one edge—and a cutting gauge to cut the stringing from a 0.035-in.-thick sheet of holly veneer. To make sure the stringing fits perfectly in the grooves, Latta pulls it through a thicknessing gauge (far right) that he designed with Lie-Nielsen.



4

Planes for Joinery

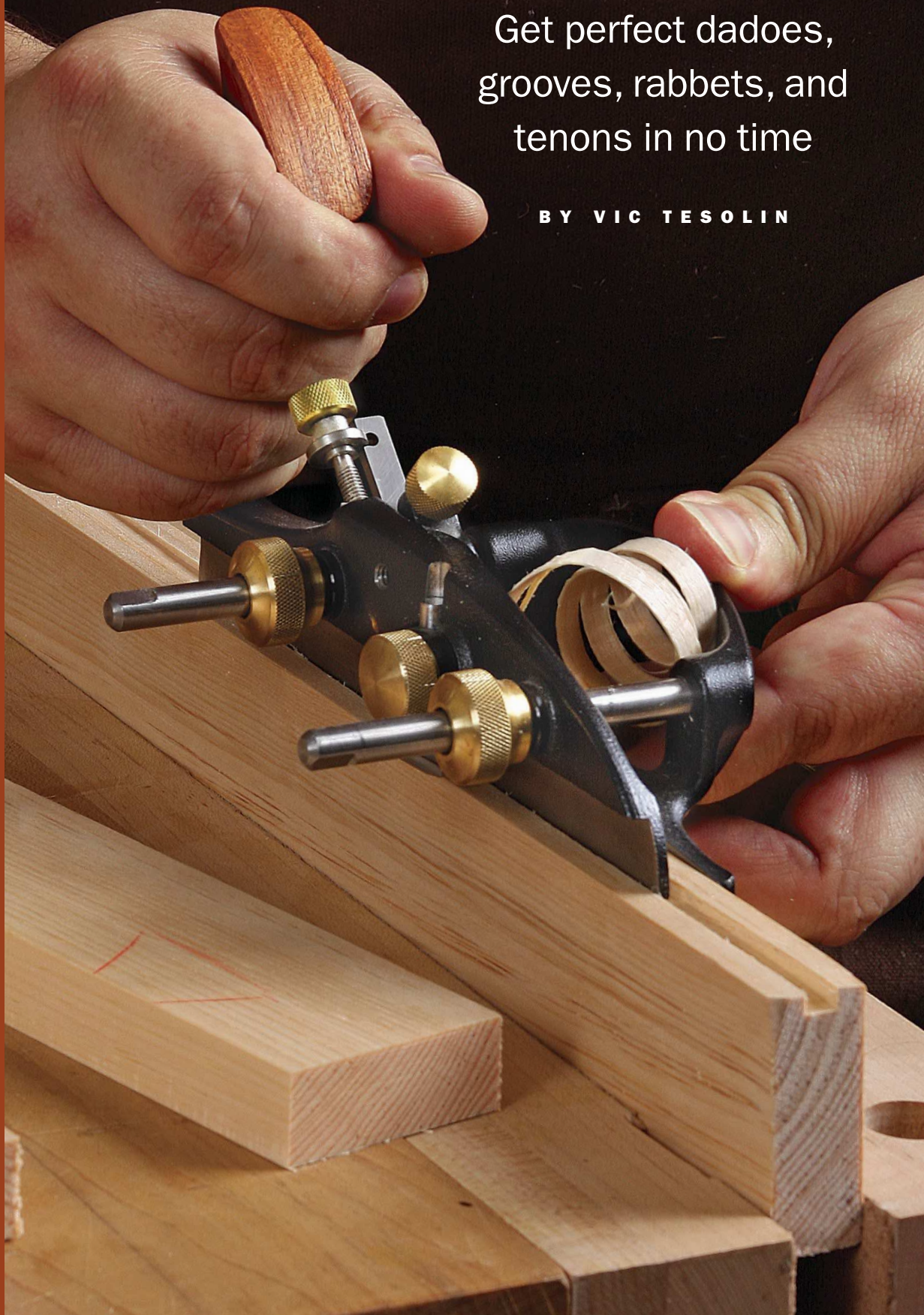
Get perfect dadoes, grooves, rabbets, and tenons in no time

BY VIC TESOLIN

At just 170 sq. ft., my shop is—without question—small. When I first moved into it, I was forced to think carefully about which machines were essential and which I could do without. In the end, only my bandsaw, drill press, and thickness planer survived the cut. As a result, most of my woodworking, including all of the joinery, is done with hand tools.

After I made that decision, it didn't take long to realize that to cut joinery by hand I'd need more than just my backsaw and a set of chisels. So over time I added some specialty planes to my collection. With these planes—shoulder, router, rabbet, and plow—I'm able to knock out just about any traditional furniture joint quickly and accurately. Here I'll demonstrate how I use each of these planes in my furniture making, and I'll give you some tips on setting them up for best results.

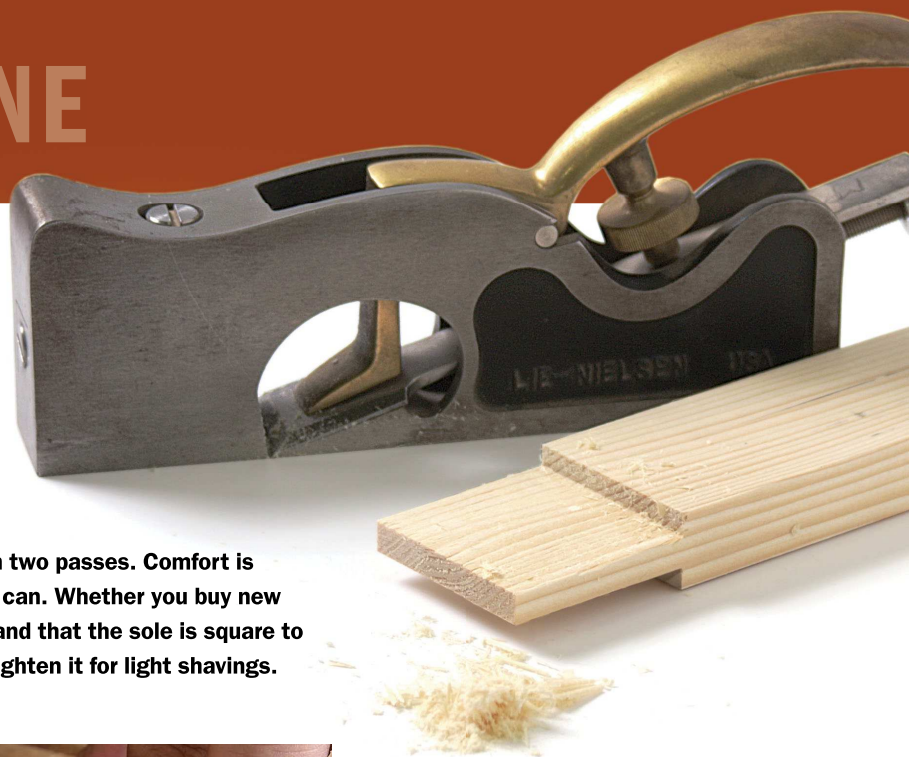
Vic Tesolin enjoys building furniture with hand tools in his well-insulated shop outside of Ottawa, Ont., Canada.



SHOULDER PLANE

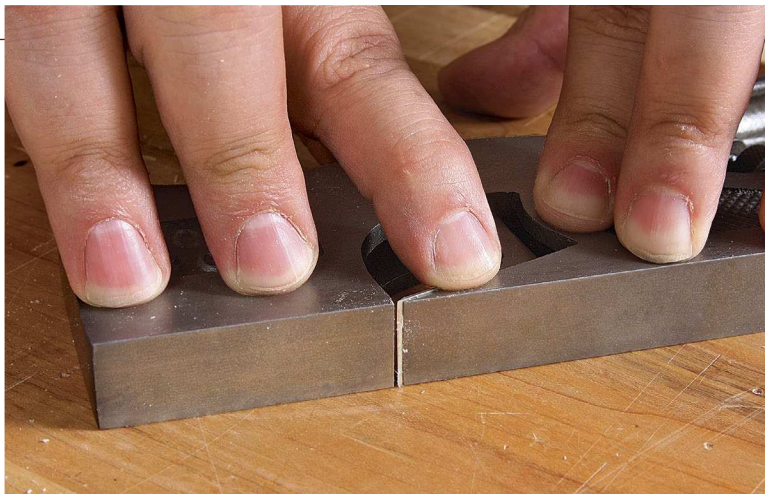
Fine-tunes tenons

Cutting the mortise-and-tenon joint by hand means sawing the shoulders and the cheeks with a backsaw. And unless your saw work is perfect, you'll need to trim both the cheeks and the shoulders to get the tenon to fit the mortise tightly with no gaps. This is where the shoulder plane comes in. As its name suggests, it excels at trimming shoulders. Set for a light cut, it can also do a good job of trimming the cheeks. Your first shoulder plane should have a $\frac{3}{4}$ -in.-wide blade. It's small enough for shoulders, but wide enough to trim most cheeks in two passes. Comfort is important, too, so give the plane a spin before buying it if you can. Whether you buy new or used, check that the blade is slightly wider than the body, and that the sole is square to both sides. Finally, look for an adjustable mouth, so you can tighten it for light shavings.

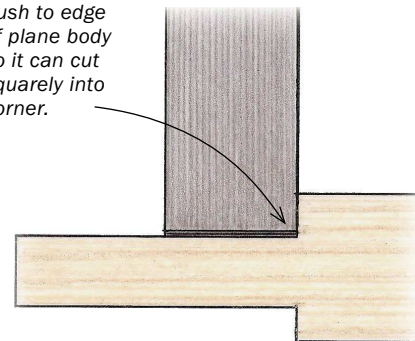


SETUP

Align the blade to the body. To avoid creating a stepped corner, the iron must be flush with the side of the plane that's in the corner. A blade that's a bit wider than the body is easy to set up. With the cap iron loose and the plane on its side, press the blade down against the bench, then retighten the cap iron.



Blade is parallel to sole and flush to edge of plane body so it can cut squarely into corner.



USE



Stand up for cheeks. You have to flatten the cheeks before trimming the shoulders. To prevent the cheeks from tapering, overlap cuts and work carefully to your layout lines.



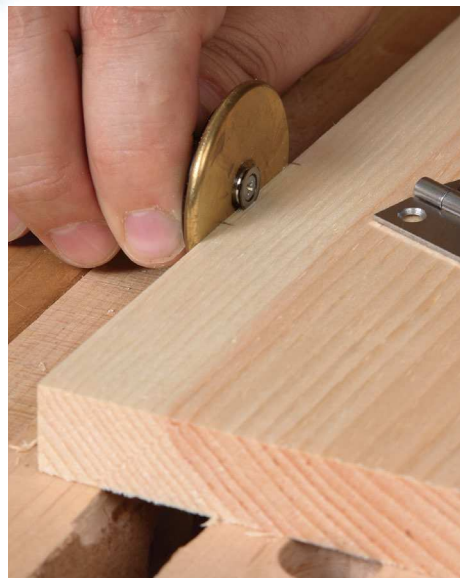
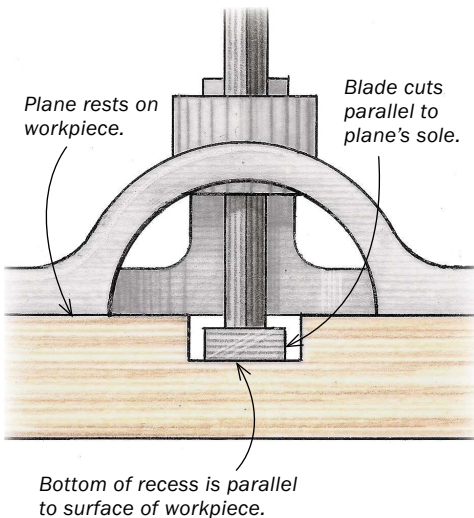
Lay down for shoulders. With the rail laid horizontally, the tenon's cheek becomes a broad support surface for the plane, making it much easier to trim the shoulder than if you held the rail vertical and tried to balance the plane on the narrow shoulder.

ROUTER PLANE

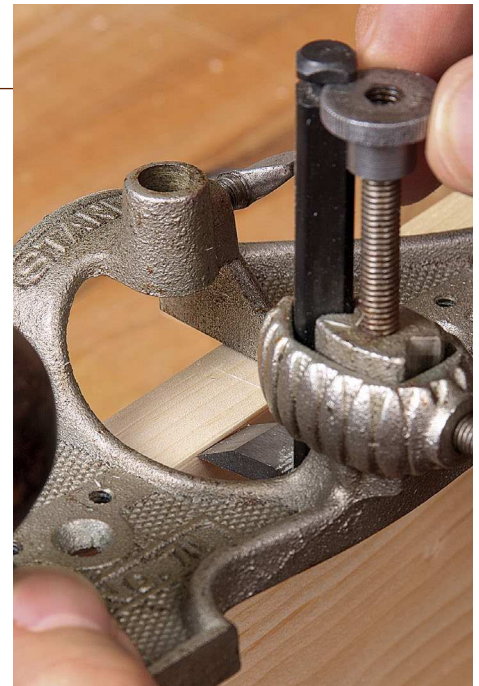
Guarantees flat-bottomed cuts

Though designed for a very specific task—to trim the bottom of a recess flat and parallel to the surface of the workpiece—the router plane is quite versatile. It can be used to clean up the bottoms of dadoes and to cut mortises for hinges and inlay. It also can be used to trim tenon cheeks. Working from both sides of the rail, you end up with a tenon that's perfectly centered and cheeks that are

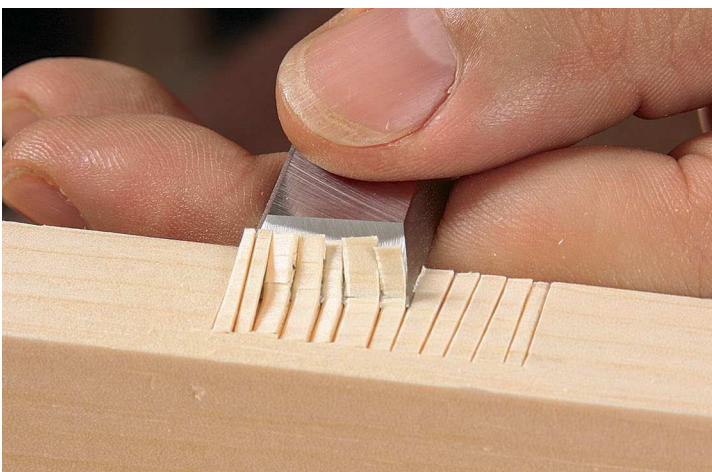
HINGE MORTISES



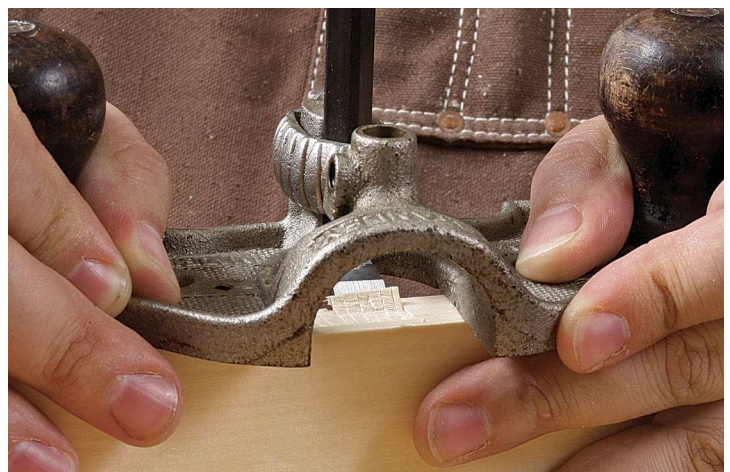
Mark the mortise depth. Use a wheel or cutting gauge set to the hinge leaf's thickness.



Set the blade depth. Put the blade's cutting edge into the knifed line, then lock it in.



Chisel the waste. After lightly chopping across the grain down the length of the mortise, clear out the waste by chiseling in from the open side. Don't attempt to pare down to the mortise's full depth.



Plane to final depth. Balance the plane on the door's edge, wrapping your fingers around the stile, then come straight in. The blade is set to the final depth, so one series of overlapping cuts does the job.

parallel to one another. Two features I recommend are a depth stop, which makes it easier to set the blade's cutting depth, and a fence, which allows you work parallel to edges. Look for a fence that allows you to work both straight and concave edges. As for size, large router planes are good for most furniture-size joinery and larger hinge mortises. Small ones are great for inlay and smaller hinge mortises.



TENONS

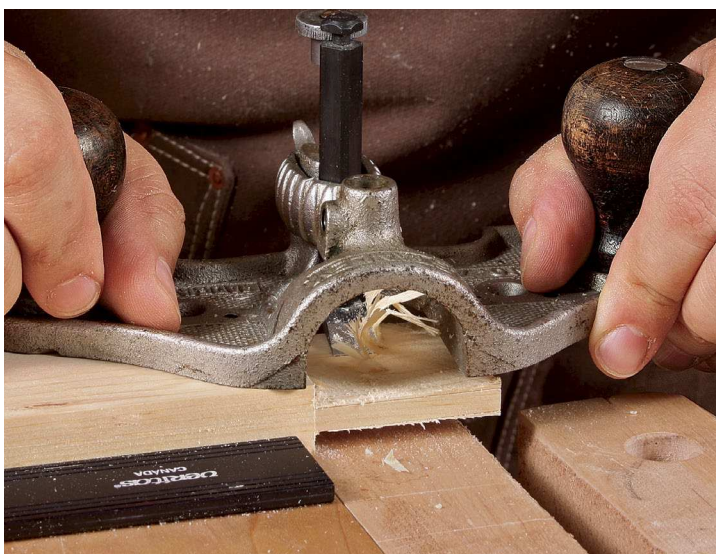
Saw and plane.

You're only roughing out the tenon at this point, so there's no need to saw to the line (right). After setting the blade's depth of cut just like you did for the hinge mortise, clean up the cut with the router plane (below). Press the plane firmly onto the rail, and then pivot the plane with the outboard hand, bringing the blade over the tenon in an arc.



STOPPED DADOES

Chisel removes the waste in two steps. After defining the dado's sides with a knife followed by a chisel, work from the center out and down to chip out the waste quickly (top). Use a chisel, bevel down, to get rid of the triangular ridge of waste that remains after the first step (left). Two to three passes should be enough. Stop when there's just a bit left, and trim down to the final depth with the router plane (below).



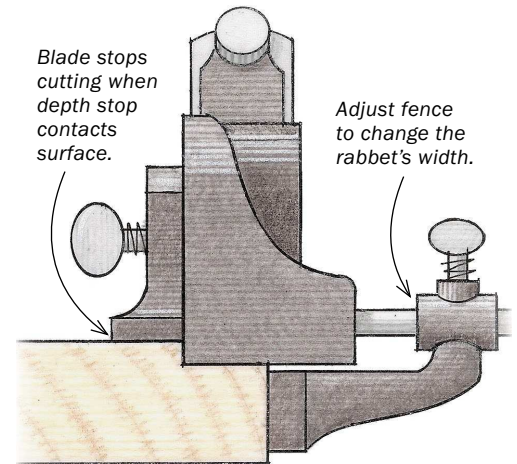
RABBIT PLANE

Ideal for case joinery



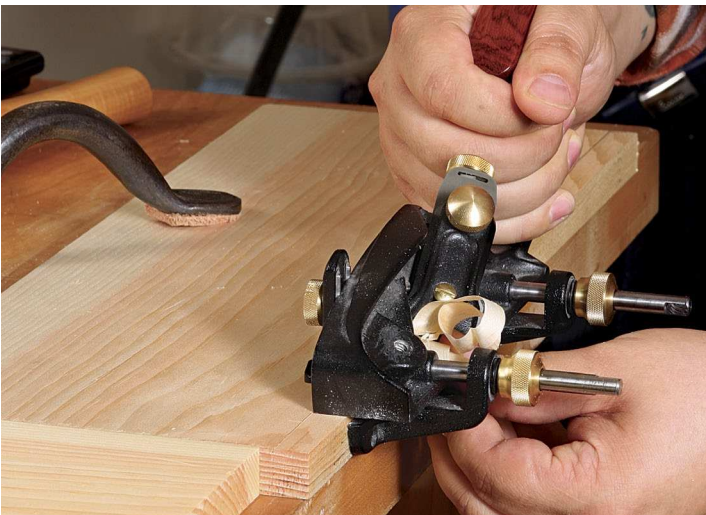
Rabbets show up in furniture making more than you might think. Case and cabinet backs typically fit into rabbets, drawer bottoms are rabbeted to fit into their grooves, and panels—whether for a door or casework—are often rabbeted to fit into the frame's grooves. To cut a rabbet, you need a plane with a blade that extends just past the edge of the body (so that it cuts cleanly into the corner), a fence to control the rabbet's width, a depth stop to determine its depth, and a nicker in front of the blade to sever wood fibers when cutting a cross-grain rabbet. This is exactly what you get with a rabbit plane. It's also nice, but not necessary, to have a skewed blade, which makes it easier to work across the grain.

SETUP



It's simple. To prevent tearout when cutting cross-grain rabbets use the nicker, making sure it's aligned with the blade's edge (left). It severs the fibers cleanly ahead of the blade. A stop on the side controls the rabbet's depth. It's easiest to set it with a rule (center). But set the fence, which determines the rabbet's width, directly from the workpiece (right).

USE



Start at the far end. As you work back toward the near end, both the fence and the blade will guide the plane. The added tracking from the blade is key while the rabbet is still shallow.



Concentrate on the fence. To cut a vertical wall, keep firm, sideways pressure on the plane's fence. Push gently on the tote with the other hand to move the plane through the cut.

PLOW PLANE

Cuts flawless grooves

Need to make a drawer or a frame-and-panel door? You'll have to cut some grooves. To cut grooves accurately and repeatedly, get a plow plane. Like a rabbet plane, the plow has a fence and depth stop, allowing you to locate the groove precisely and control its depth. You can also get blades of different widths, so you can cut different-size grooves.

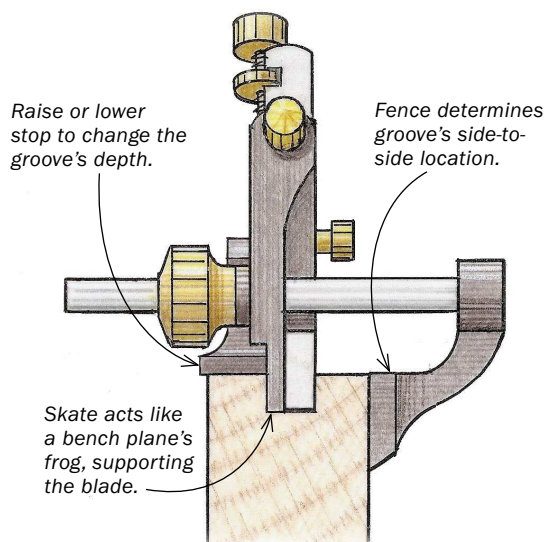


SETUP

Fence locates the cutter. Tesolin scribes a centerline for the groove, centers the cutter on the line, and then pushes the fence against the workpiece, tightening the locknuts with his other hand.

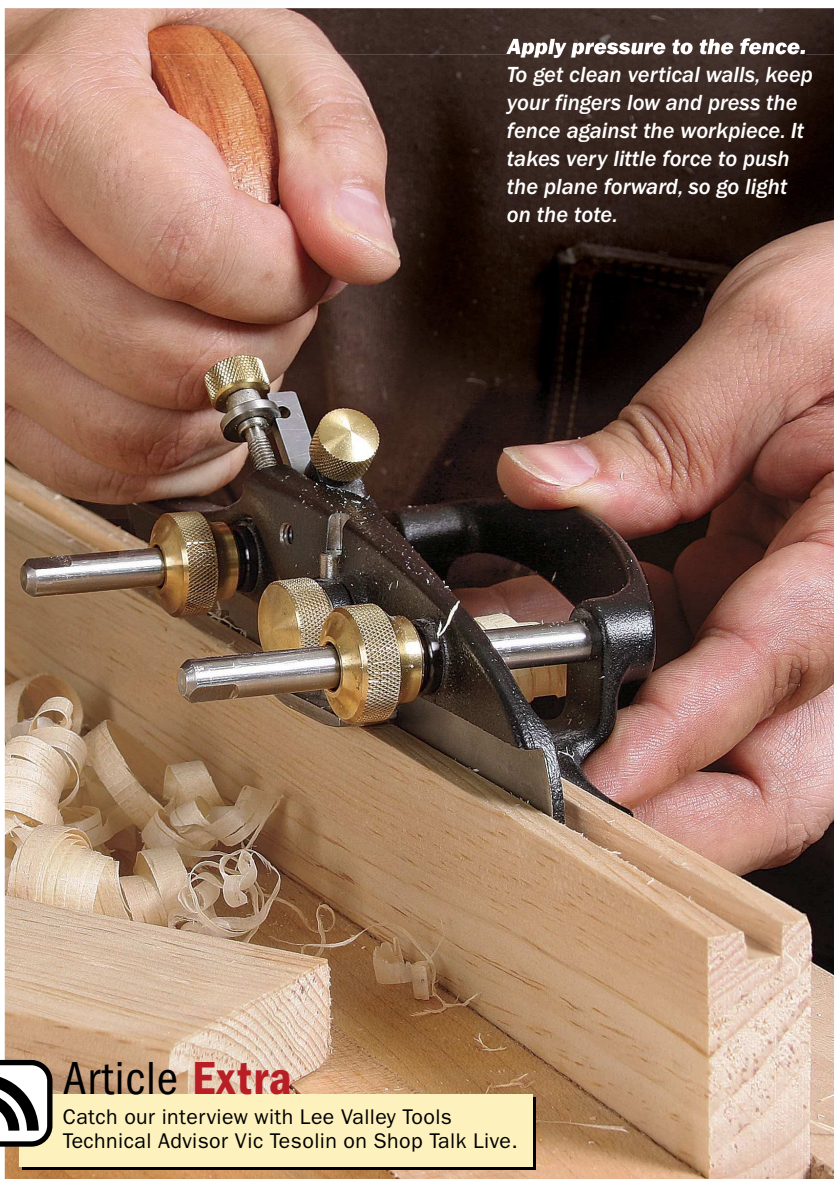


Stop determines the groove's depth. Because it's easier and more precise, set the stop with a rule rather than with a mark on the workpiece.



USE

Apply pressure to the fence. To get clean vertical walls, keep your fingers low and press the fence against the workpiece. It takes very little force to push the plane forward, so go light on the tote.



Article Extra

Catch our interview with Lee Valley Tools Technical Advisor Vic Tesolin on Shop Talk Live.

readers gallery

PETER FLAXMAN

Brooklyn, N.Y.

Flaxman built this cabinet-on-stand while studying at the Inside Passage School of Fine Woodworking. Not only was it modeled after one of James Krenov's cabinets, but the veneered case is made with the maple offcut left over from that same Krenov cabinet. Using the same materials that Krenov hand-selected for his own cabinet "made it all the more special to build."

SPALTED MAPLE, HARD MAPLE, AND KWILA,
14D X 32W X 52H

Photo: Ingeborg Suzanne



JENO PETERDI

Grant-Valkaria, Fla.

Since building his first period piece in 1973, Peterdi's love for 18th-century American furniture has led him to projects ranging in style from Queen Anne to Chippendale. The ball-and-claw feet, the spiral urn and column post, and the shell and bellflower motifs on the legs of this pie crust tea table highlight Peterdi's carving expertise.

MAHOGANY, 34 $\frac{3}{4}$ DIA. X 30 $\frac{3}{4}$ H

Photo: Southern Photo

Submissions

Readers Gallery provides design inspiration by showcasing the work of our readers. For submission instructions and an entry form, go to FineWoodworking.com/rg.

GEREMY COY

Alexandria, Va.

After an extended dialogue with his client and many sketches, Coy designed these two shelves “that seem to be talking to each other.” Every joint, including the pointed ends, has hand-cut dovetails with mitered ends to give the corners a neat finish. Both boxes are hung with mortised Brusso brass brackets for a seamless fit against the wall.

CHERRY, 12D X 27W X 12H,
12D X 12¾W X 8¾H



LARRY EVANS

Tulsa, Okla.

- Evans's buffet was inspired by the work of Charles Rohlf. The book-matched mahogany door fronts were made from shopsawn veneer, and the octagonal legs were cut with a jig on the tablesaw and cleaned up with a handplane.

MAHOGANY, 19D X 53W X 37H

WILLIE SANDRY

Camas, Wash.

The arched bridges of the Pacific Northwest, such as the Henry Thompson bridge in Concrete, Wash., inspired this Arts and Crafts occasional table. The flowing curves and strong rectilinear supports of the bridges show up in the table as arched aprons, through-joinery, and the shaped and pierced stretcher.

WHITE OAK, 24D X 44½ W X 18H



CLARK KELLOGG

Houston, Texas

Kellogg built this Art Deco-inspired card table for a competitive bridge player. Each side of the table has a drawer and tray—one for each player. The table was built from two massive pieces of flitch-cut padauk. “I had just enough wood to build it,” Kellogg says, “but not enough to fix it if anything went wrong.”

PADAUK, 40D X 40W X 31H



TIM GORMAN

Minneapolis, Minn.

Affectionately titled “The Taller Sister,” this hollow vessel is part of a series of turnings all taken from the same log of spalted maple harvested from a neighbor’s backyard. For the segmented top of the vessel, Gorman says, “I was going for the feeling of a drop of water splashing into a pond.”

SPALTED MAPLE, EBONY, AND HOLLY, 10 DIA. X 18H

Photo: Ramon Moreno



JESS DONNERBERG

Cheney, Wash.

The zigzag structure of Donnerberg’s bookshelf was designed to challenge the visual and structural standards of a typical bookcase. Finger joints keep the shelves together and the walnut modules in between offer support and a complementary negative space.

MAPLE AND WALNUT, 11D X 24W X 76H





SCOTT WYNN

San Francisco, Calif.

"I've been exploring the use of lattice patterns, or kumiko, the decorative elements on Japanese shoji screens, for several years," says Wynn. "This is my most complex design by far." To start, Wynn made a full-size pattern of the cabinet on a sheet of plywood. All the bent-laminated parts were done right on the pattern, bending the pieces around nails driven into the plywood.

HEMLOCK, CHERRY, AND WALNUT, 13D X 25W X 43H

RICHARD CIUPKA

Mount Royal, Que., Canada

Ciupka embraced the work of Émile-Jacques Ruhlmann in this bedside table. The ivory-like pulls are made from tagua nuts, and turning them proved the most nerve-wracking part of the project. "The nuts are small and irregular, and it was easy to hit the hollow center and ruin the knob," Ciupka says. "I went through a dozen before getting the two perfect ones on the table."

MACASSAR EBONY, REDWOOD BURL, AND MAPLE, 12½D X 18½W X 25½H

Photo: Ramon Moreno



WILLIAM EDWARDS

New Orleans, La.

Edwards's rolling-pin bed is built in the style that was prevalent in New Orleans's French Quarter during the Colonial era. The detachable rolling pin on the headboard was used daily to smooth out mattresses made of horse hair or Spanish moss. To turn the 8-ft. bed posts, Edwards used an industrial lathe at a local mill that makes house columns.

CYPRESS AND BRASS, 54W X 75L X 96H

Photo: David Nicolety



Use patterns to guide your work

FROM MILLING TO JOINERY TO SHAPING, THESE FULL-SIZE TEMPLATES ARE A ROADMAP TO SUCCESS

BY GARRETT HACK

Perhaps the most common technique for shaping a curved part is to rough it out with a bandsaw and then rout it flush to a full-size pattern. For many woodworkers, that might be the only time they ever use a pattern, but it shouldn't be. A thin, full-size pattern can be useful at just about every stage of furniture construction. Before milling parts from rough lumber, I use patterns to find the best grain for each part. I also use them like story sticks, marking them with joinery, banding, and inlay locations. They are great aids for difficult joinery like angled tenons. Of course, I use patterns for

shaping, too, but not only with a router. They are great guides for a spokeshave as well.

Over the course of my career, patterns have become an essential part of how I make furniture, and I can't imagine working without them. They are easy to make, and there is nothing complicated about using them. Even if you are just



THREE SMART USES FOR PATTERNS

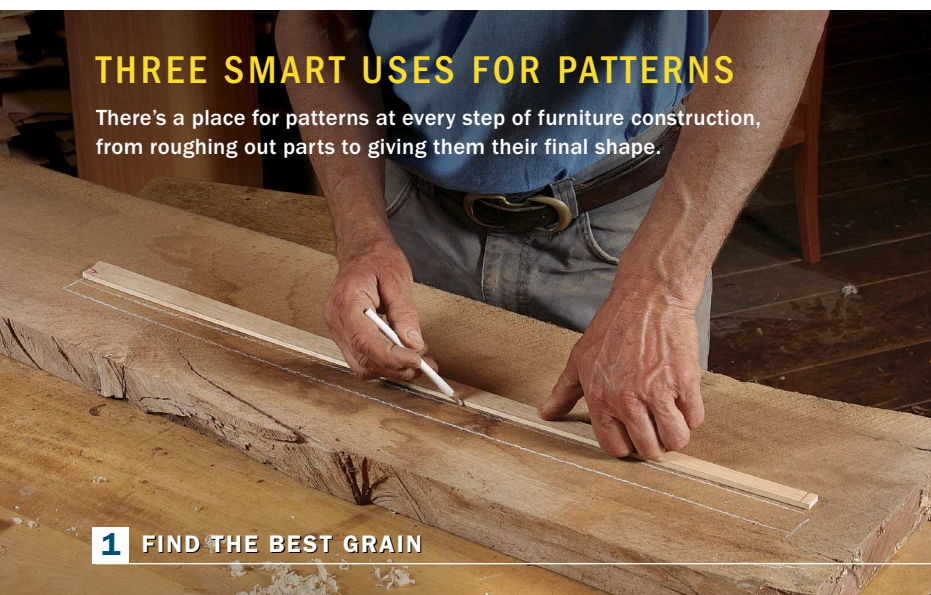
There's a place for patterns at every step of furniture construction, from roughing out parts to giving them their final shape.

1 FIND THE BEST GRAIN

Trace the pattern onto rough lumber to see whether the shape and direction of the grain complements the part's shape. You can also use the pattern to lay out several identical parts (like legs) on a single board before cutting them out.

2 LAY OUT JOINERY

Marked with joinery sizes and locations, a pattern becomes the perfect story stick for parts.



starting out, you can incorporate them into your woodworking and reap the benefits.

Start with a drawing

Your design should be complete before you begin making any patterns. It's far easier to erase an errant line on paper than to recut a pattern. I sketch a bunch of ideas, and when I've settled on the one design I like best, I create a full-size drawing of the parts that need patterns. I typically transfer the drawing to the pattern blank by gluing a tracing to it.

A pattern needs to be dead accurate. Any bump or flat in a curve will be transferred to every part made with the pattern. And if you mislocate the transition from a straight section for joinery to a taper, you'll have trouble with the joinery when you're building the piece. That's why I always use solid wood for patterns (I prefer pine, basswood, and cherry). With solid wood, I can use planes and spokeshaves to refine the pattern with precision after cutting it out. It's far easier to finesse a pattern with hand tools than with sandpaper. If you use sheet goods, like plywood and MDF, you're stuck with sanding the edges—an unpleasant and tedious job.

Patterns aren't just for routing

When making furniture, I use patterns right from the beginning. The success of a piece can hinge on how well you select grain for the individual parts, and a pattern makes it easier to orient grain on a part for the best appearance. Put the pattern on your stock, trace around it, and move it away. You can now see exactly how the grain will look. If it's not pleasing, adjust the pattern's orientation on the stock, retrace, and take another look.

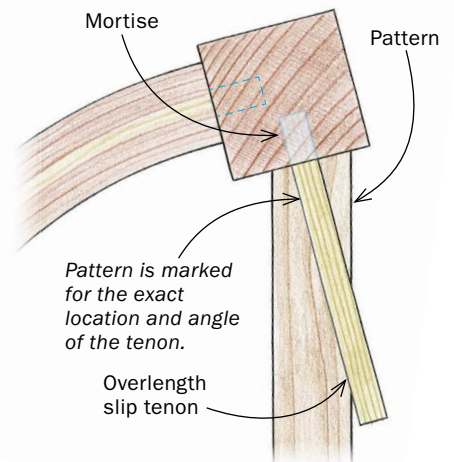
Patterns make great story sticks, too, because you can lay out joinery on them and then transfer from the pattern directly to the parts. This eliminates the chance that you might misread a rule or measure from the wrong end. It works great for mortises

SIMPLIFY COMPLEX JOINERY

Have an apron that needs angled tenons? A crest rail that needs mortises for spindles? Avoid mistakes by laying out the joint directly from the partially assembled piece using a pattern of the part.



No measurement needed. For angled tenons like those on the back apron of this demilune table, Hack places a pattern of the apron between the back legs and inserts long slip tenons into the mortises. He then traces the exposed part of the tenon onto the pattern to guide his work.



3 SHAPE PARTS PRECISELY

Patterns also work great as templates for shaping. A spokeshave works just as well as a router and flush-trimming bit.

HOW TO MAKE A PATTERN

The best material for patterns is solid wood, because you can use hand tools to make perfectly smooth edges.



Use a batten and bandsaw for curves. A narrow piece of straight-grain basswood, about $\frac{3}{8}$ in. thick, easily bends into a fair curve (left). To hold the ends in place, Hack clamps the batten to a block with a C-clamp, then clamps the block to his bench. Cut the curve as fair as you can (above), so that it's easier to clean it up afterward. A steady hand and feed rate are key.



Refine convex curves with a block plane. Keep the arc fair. You can square the edge to the face later.

on legs, but don't overlook other types of joinery. I often lay out dovetails for casework on my patterns.

I also rely on patterns for tricky joinery, like mortise-and-tenons for parts that come together at an angle. I use the pattern as a stand-in for the actual part in the dry-assembled piece. This allows me to mark the angle and location of the tenon accurately on the pattern.

Patterns are also great aids for shaping parts. Used with a router and a flush-trimming bit, a pattern is a very fast and accurate way to make several matching curved parts. But if you have just one or two parts that need to be shaped, forego the router and pick up a spokeshave. Clamp the pattern and the part in your bench vise, then shave it down to match. □

Garrett Hack is a contributing editor.

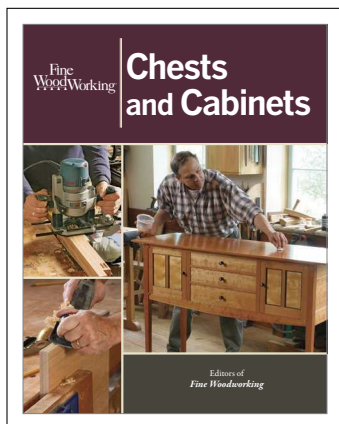
Square up the edge. A piece of milled lumber on top of the bench creates a shooting board that can handle curved parts. A block plane is better than a bench plane here, because it's easier to maneuver over the curve.



A spokeshave is the tool for concave curves. Its short sole is able to follow the inward arc. Keep the edge square as you fair it.

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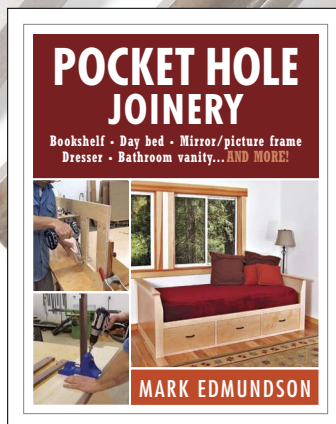


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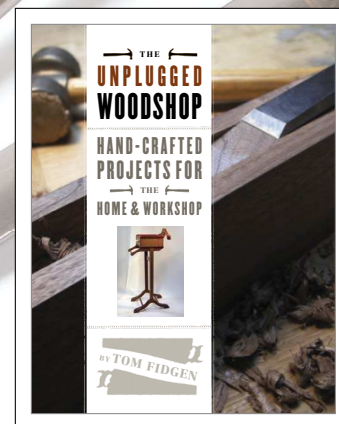


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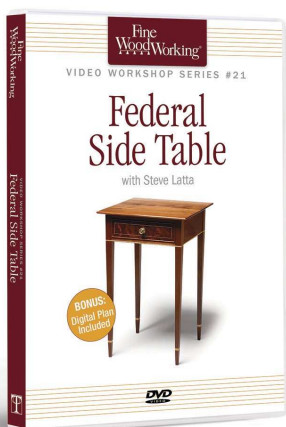


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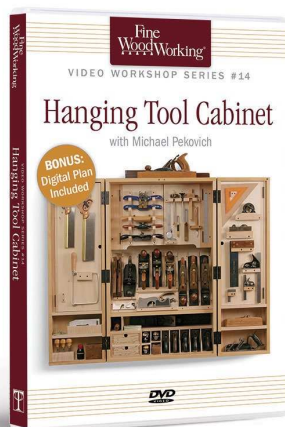
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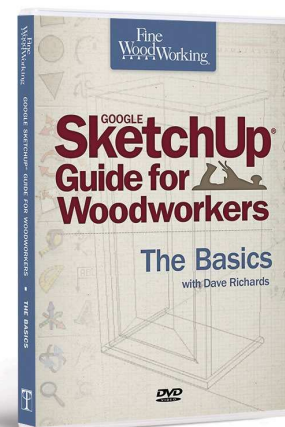


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Dress up your drawer fronts

ADD VENEER AND COCK BEADING TO MAKE YOUR FURNITURE POP

BY STEVE LATTA

Burl veneer and cock beading go hand in hand, working together as beautiful and functional details. They are classic design elements that were used a lot in early America, and I used both in the Federal table project on pp. 60-67. Veneering the drawer with beautiful burl gives the table a visual focus; the cock beading provides a frame for the burl while adding a subtle, eye-catching three-dimensional look.

In addition to looking great, cock beading helps protect the veneer by forming a raised lip around the edges, and it cleverly conceals the gap around the drawer. The cock bead also comes in handy when the drawer doesn't quite sit flush, or the sides don't line up perfectly with the opening.

Hammer veneering: low-tech but effective

Traditionally, veneer was applied using the ancient but effective technique of hammer veneering. Laying down veneer with hot hide glue and a veneer hammer is not

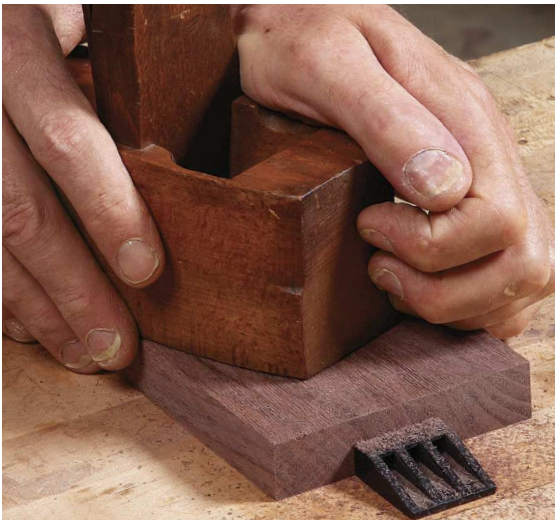
GET THE GLUE READY

For the veneering, you'll need to mix and heat hide glue in a glue pot (right). The veneer hammer's flat face is used to press down the veneer like an iron.



Cook up a batch. Combine equal parts hide-glue granules and water in the pot. Latta prefers high-clarity 192 gram-strength hide glue. When the glue is up to temperature (140°), it will stretch between your fingers in fine strings that don't break apart.

Veneer goes on first



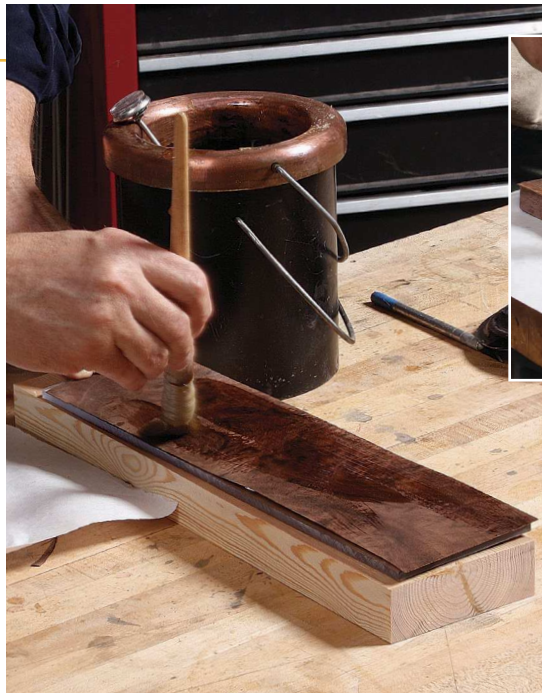
Give the drawer front bite. Latta uses a toothy plane to add texture to the drawer front substrate. It's not essential, but it will help the glue hold on better.

complicated, and doesn't require a big investment in tools—you only need hide glue, a brush, and a glue pot to heat the glue in (I get mine from oldemill.com). You can get a veneer hammer at most woodworking suppliers.

Mix the glue granules with an equal volume of room-temperature water and let it soak for 45 minutes, then plug in the pot to heat it up to 140°F. Hide glue sets when it cools, so you can gain a little more working time by warming up your veneer hammer on a hot plate.

While you're waiting for the glue to heat, prep the drawer front and the veneer. You'll apply the veneer before cutting the joinery, so cut the walnut drawer front $\frac{3}{4}$ in. longer and wider than the final size. It helps the veneer hold on better if you roughen the surface of the drawer front with a toothy plane. If you don't have one, several tool companies offer toothed blades for their handplanes. Cut the veneer slightly smaller than the oversize drawer front, using a razor knife and straightedge. Put veneer tape across any cracks on the veneer's face side.

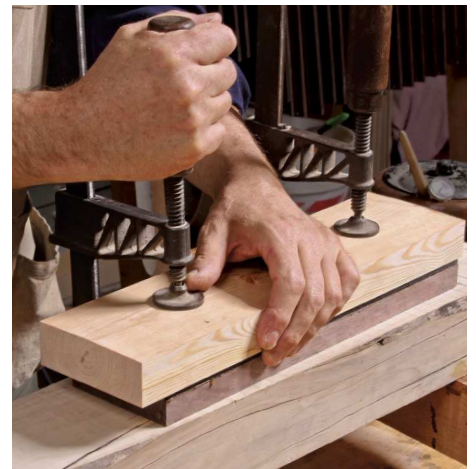
Brush glue onto the drawer front and the back of the veneer, and quickly set the veneer in place. Then brush some glue on the show face too, and begin to push the hammer over the veneer to force out excess glue and air pockets. This creates suction underneath that



Brush on the glue. Latta spreads hot hide glue on the drawer front and the veneer (left), and quickly sets it in place. Then he brushes glue on the face of the veneer (above) to fill the pores and lubricate the hammer. Placing paper on the benchtop beforehand keeps glue cleanup to a minimum.

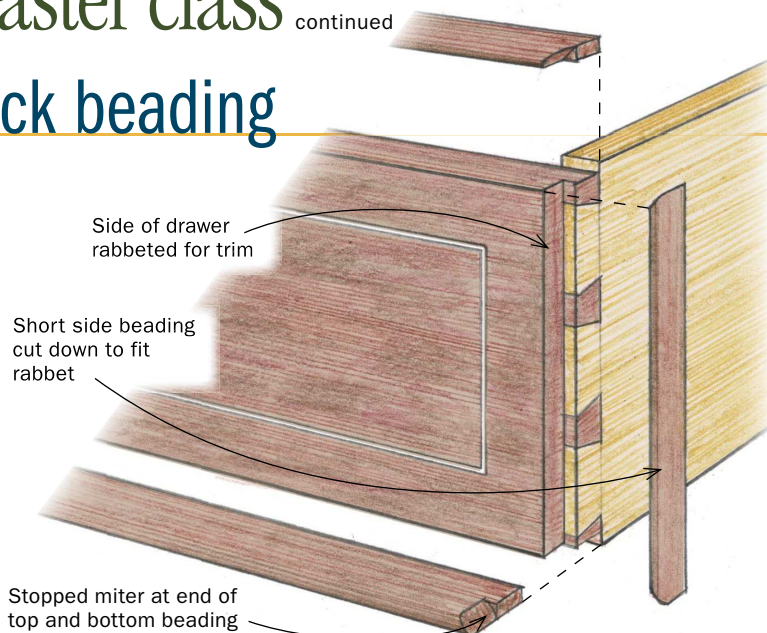


Hammer it down. Use the hammer like a squeegee, starting in the center and pushing bubbles of excess glue and air out at the edges. Keep the edge of the hammer clean with a wet rag.



Clamps ensure a good bond. Clamp the veneered drawer front between cauls. Place a sheet of acrylic or waxed paper on top of the veneer to keep the glue from sticking to the cauls. Using clamps isn't strictly required with hammer veneering, but it's quick, easy, and keeps the veneer flat as it dries.

Cock beading

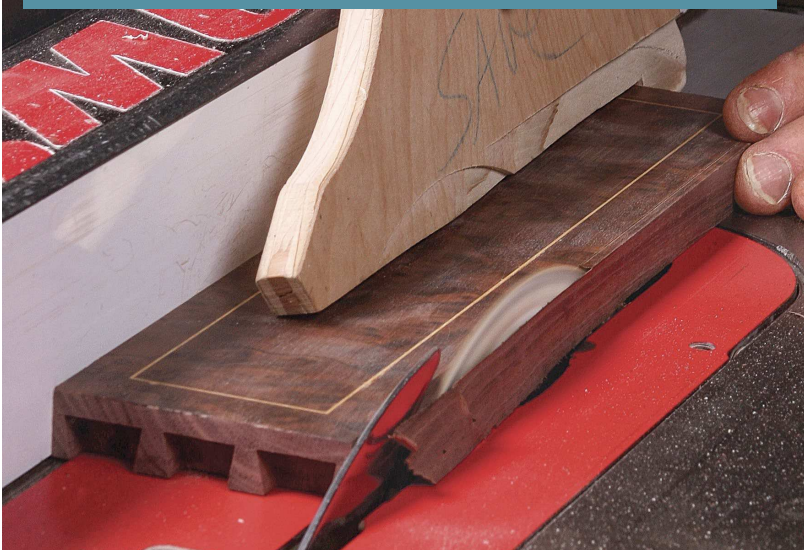


pulls the veneer tight against the drawer front. Work the veneer with the hammer until it is uniformly flat and stuck down. Next, clamp the drawer front between cauls. Let it dry overnight, and use a card scraper to remove the thin film of glue and smooth the veneer. Then cut the drawer front to size.

Cock beading protects and beautifies

The cock beading is $\frac{1}{8}$ in. thick with a $\frac{1}{8}$ -in.-dia. bead profile on the front edge. It covers the edge of the drawer front and stands proud of the drawer face. Make the beading two pieces at a time on a router table, using a wide piece of stock—it will vibrate less and be easier to hold. Rout the bead

MAKE ROOM FOR THE BEADING



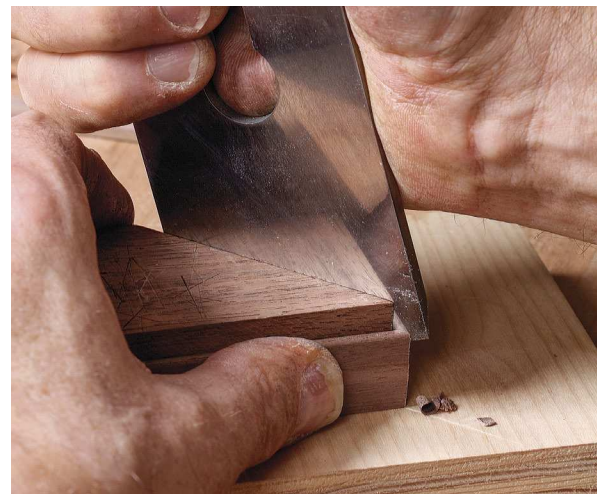
Rip the top and bottom, rabbet the sides. After you cut the joinery and dry-fit the drawer, set a cutting gauge to the beading's thickness and score through the veneer at the top and bottom. Rip to the lines on the tablesaw (above). Then with the drawer sides glued in, score lines on the front and sides to mark the rabbet, and cut to the lines using a fence-guided trim router (right).



MARK AND MITER

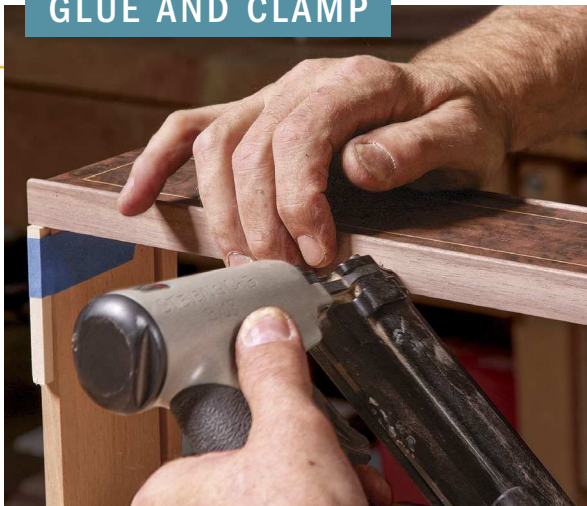


Use the rabbet to mark the stopped miter. Dry-fit a long piece of cock beading in place, and mark the rabbet's depth on it using a plane blade.



Miter to the mark. Using a 45° angle block and a plane blade, miter the ends of the beading, stopping the cut at the depth mark for the rabbet.

GLUE AND CLAMP



Add a brad. Add glue and get the cock beading into position, then pop a brad in the edge to keep it from slipping around when you put on the clamps. A small piece of wood taped to each drawer side also helps steady the banding.

profile on both sides of the stock, then rip each strip free on the tablesaw.

Before installing the beading, dovetail and dry-assemble the drawer to check the fit in the opening, then take the drawer apart. If you're going to add stringing, do it now. When laying out the dovetails, keep in mind that you'll be ripping or rabbeting $\frac{1}{8}$ in. from each edge to create space for the cock beading. With the dovetails cut, set a cutting gauge to the bead's thickness and score a line at the top and bottom of the drawer front, cutting through the veneer. Then rip to these lines on the tablesaw.

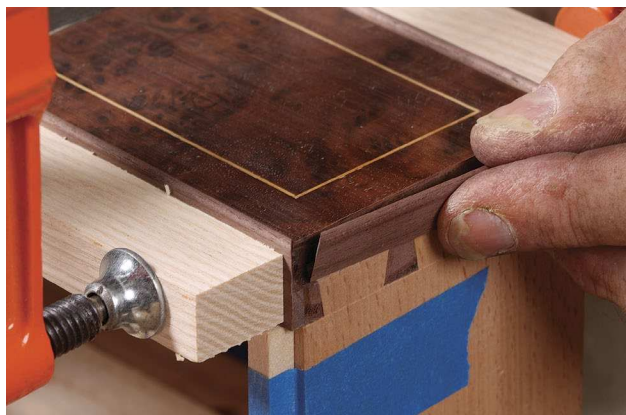
The beading on the ends of the drawer front sits in rabbets, cut after the drawer box has been glued up. With a cutting gauge set to the bead's thickness, score lines across the face at each end of the drawer front. Reset the marking gauge and score a line across the end grain, centered on the thickness of the drawer front. Then cut the rabbets. I use a trim router with a fence attached to the base—it lets me cut right to the lines with no cleanup work.

The cock beading is mitered at the corners. The end pieces are narrower, so the top and bottom pieces get stopped miters. Crosscut the top and bottom beads to length and dry-fit them in place. Use a plane blade to mark the rabbet depth—this is where the miter will stop. Cut the miters using the plane iron and 45° block, checking the fit with an extra mitered piece of beading. Glue and clamp the top and bottom beading in place. When it's dry, miter the cock beading for the short sides, and glue and clamp it in place. □

Contributing editor Steve Latta teaches woodworking at Thaddeus Stevens College of Technology in Lancaster, Pa.



Clamp it up. Latta clamps the long top and bottom pieces in place to dry. Cauls spread the pressure and keep the metal clamps from denting the wood.



Fit the short sides. With the long pieces glued in place, fix the beading for the sides. Trim it using a block plane to bring it flush with the top and bottom beading.



Clamp them in place. Once the beading fits perfectly, put on the glue and clamps.

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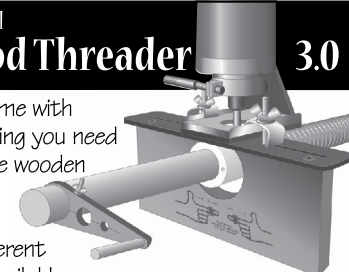
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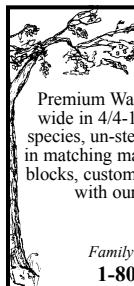
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how they did it

BY JONATHAN BINZEN

Assembling a parquetry pattern

To make the parquetry top for his coffee table (see the back cover), Jason Andrew Hernandez did initial design work at the drafting table before drawing the pattern full scale in pencil on a sheet of 1/4-in. MDF. He bandsawed veneers from a couple of solid planks, smoothing the sheets with a

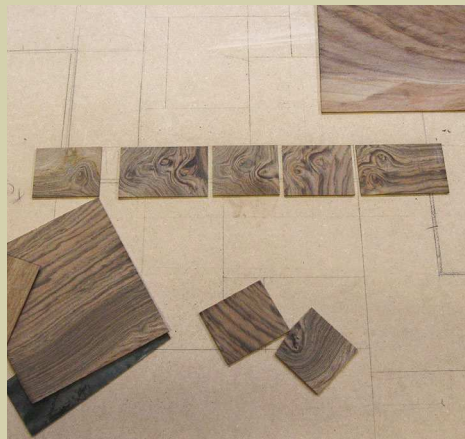
wide belt sander and finishing with slices of a heavy 1/16 in. thick. As he cut and fit the tiles, he followed his drawing carefully, but deviated in places where the grain and color of individual pieces guided him. He enjoyed choosing and placing the tiles, comparing the process to working with images. Once all the rectilinear pieces were

edge-glued into a sheet, he routed out the two circular spaces—"a nerve-wracking experience," he says—and created mating circles to fit in them (see photos, next page). He used a vacuum press to glue the finished sheet to a 1 1/2-in.-thick substrate made of ApplePly with a 2-in.-wide lip of solid claro walnut.

MAP OUT THE PATTERN



Full-scale layout guides the process. After developing a small version of the parquetry pattern on paper, Hernandez roughed it out full-scale on the plywood substrate itself (above), and then drew a fully detailed version on a sheet of 1/4-in. MDF (right), which he used throughout the fitting process.



SHOOT TO FIT

Piecing the pattern. Hernandez edge-glued a piece at a time to build the pattern. Elevating the workpiece on a shopmade shooting board, he planed the edges to create straight glue joints.



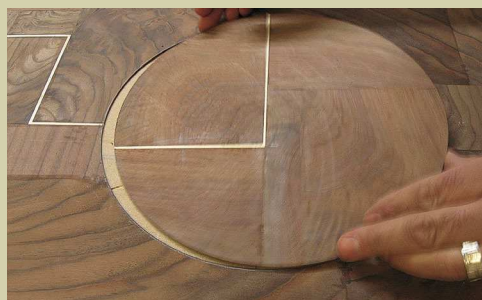
how they did it continued

CREATING THE CIRCULAR INLAY

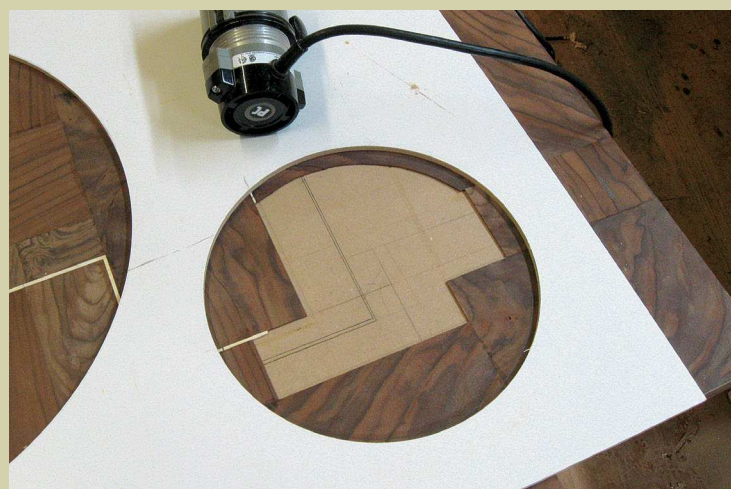
Circle in the squares. The roughsawn circular insert (right) helps locate the mating recess. To rout the recess (below) Hernandez made a template from melamine and used a Whiteside 9500 router inlay set with its wide rub collar so the cut was inset by $\frac{1}{4}$ in.



Quick, clean circle. Using the same template and bushing with the wide rub collar removed, Hernandez routed the circular insert.



Fitting the circle. After applying a bead of glue around the perimeter of the recess, Hernandez pressed the circle in place. Masking tape stretched across the seams provides the clamping pressure, as seen in the glue-up of the larger circle (left).



Ready for glue. With all the tiles edge-glued and the parquetry pattern complete, Hernandez scraped and sanded, and then glued it down to the ApplePly substrate in a vacuum press.





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- Maximum static pressure (inches of water): 16.8"
- Sound level: 87-90 dB
- Filter surface area: 398 sq. ft.
- Collection drums: Steel, 55 gallon x 2
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Parquetry Landscape

When Jason Andrew Hernandez creates a parquetry tableau, fitting together small rectangles of thick, shopsawn veneer in a geometric pattern for one of his tables or cabinets, he spends a lot of time up on a stepladder looking down at his creation-in-progress and deciding how the next piece of wood should be placed. “It’s a bit of a jigsaw puzzle,” he says, finding the right place for each piece. In the case of this coffee table, which was commissioned as a wedding gift, that



elevated perspective was especially appropriate. The wedding joined a landscape architect to a teacher of agriculture, and Hernandez decided that the parquetry pattern, executed in claro walnut and English walnut, would represent an aerial view of farmland—with a road, in holly, running through it. Hernandez designed a trestle base in the Mid-Century Modern style to support the top without competing with it. And he used a conversion varnish to bring out the rich, loamy browns of the landscape he’d created.

—Jonathan Binzen

Photos: Mark Stein



How They Did It Turn to p. 89 to see how Hernandez pieced together the parquetry tabletop.



Pro Portfolio Watch an audio slide show with details on this table and more of Hernandez’s furniture.