

TAUNTON'S

June 2018 No. 268

Fine Woodworking

Elegant serving trays • 3 techniques for creating curves
Clever magnetic door catches • Strengthen miters with splines



A simple jig for tapering legs, p. 54



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- Cutting capacity/throat: 18 1/4"
- Max. cutting height: 12"
- Blade size: 143" L (1/8"-1 1/4" wide)
- Blade speeds: 1700 & 3500 FPM
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- Floor-to-table height: 34"
- Arbor: 3/4"
- Arbor speed: 4300 RPM
- Max. dado width: 1 1/8"
- Capacity @ 90°: 3 1/8", @ 45°: 2 1/8"
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- Approx. shipping weight: 557 lbs.

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20" PLANER WITH SPIRAL CUTTERHEAD

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- Max. cutting width: 20"
- Min. stock length: 7"
- Max. cutting depth: 1/8"
- Feed rate: 16 & 20 FPM
- Cutterhead dia.: 3 1/4"
- Cutterhead speed: 5000 RPM
- Table size: 56" x 20" w/ extensions
- Overall size: 39" W x 56" D x 41" H
- Approx. shipping weight: 909 lbs.

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- Cast-iron table size: 12 1/4" x 84"
- Fence size: 5 1/8" x 47"
- Floor-to-table height: 32 1/2"
- Max. depth of cut: 1/8"
- Cutterhead diameter: 3 1/4"
- Cutterhead speed: 4950 RPM
- Number of carbide inserts: 96
- Carbide insert size: 15 x 15 x 2.5mm
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- Overall size: 84" W x 39" D x 47" H
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- Belt speed: 4120 FPM
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- End table size: 18" x 13"
- End table travel: 8"
- Approx. shipping weight: 873 lbs.



G9984 ~~\$3295⁰⁰~~ **SALE \$3150⁰⁰**

3 HP SHAPER

- Motor: 3 HP, 240V, single-phase, with reversing switch, 12A
- Table with extension wing attached: 30 1/2" x 28 1/4"
- Floor to table height: 34"
- Spindle travel: 3"
- Spindle size: 1/2", 3/4", 1"
- Table spindle openings: 1 1/2", 3", 4", 7"
- Maximum cutter height: 2 1/2"
- Spindle speeds: 7,000 and 10,000 RPM
- Overall size: 30 1/2" L x 30" W x 39 1/2" H
- Footprint: 20" L x 21" W
- Approx. shipping weight: 392 lbs.



G1026 ~~\$1295⁰⁰~~ **SALE \$1225⁰⁰**



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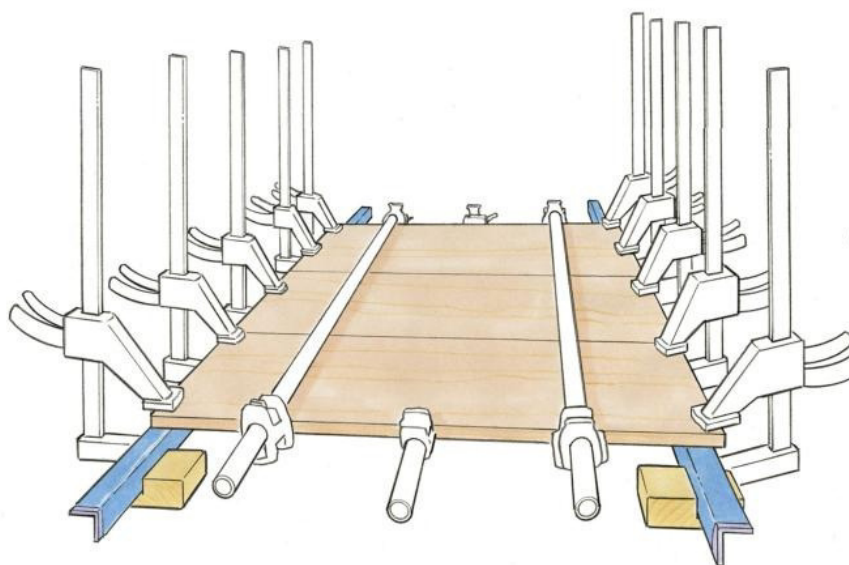
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A Cabinet of One's Own



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Visit FineWoodworking.com/268 for online extras, available March 28. And don't miss the collection of free content on our website, including tool reviews, an extensive project gallery, and must-read blogs.



VIDEO

The perfect taper

After cutting his tapers with a tablesaw, Tom McLaughlin (p. 54) uses a handplane to clean off the machine marks and refine the taper. Watch as Tom shares his tips for getting perfect results every time.



VIDEO

A different take on tenons

Doug Stowe's hidden splines (p. 65) shine when used in smaller boxes, but for larger pieces, they might prove challenging. Duncan Gowdy uses box-jointed L-tenons in his case pieces to keep his miters clean and strong. In this video, he'll take you through the process.



VIDEO

Baffling bed hardware

Mortised bed locks provide a secure way of attaching bed rails to a headboard or footboard. They're easy to install if you have a horizontal mortising machine like Michael Cullen (p. 34), but how do mere mortals mortise the end of an 80-in. board? In this video, web producer Ben Strano demonstrates the simple method we came up with.

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VIDEO

From the box to the board

A new, high-quality handplane is a great addition to your shop, but no matter how much it costs, it won't be ready to work right out of the box. In his *Fine Woodworking Live 2017* class, our own Mike Pekovich demonstrated his method for getting a new plane up and running. This members-only video will be free for a limited time. In it, Mike will show you:

- How a plane works
- A sharpening routine that you can use on any plane
- Jigs that will help you get the most out of your planes



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contributors

For the past 28 years, **Tom McLaughlin** ("Leg-Tapering Jig") has been designing and making custom furniture. Starting in April, though, you can catch him hosting *Rough Cut with Fine Woodworking* on PBS, where he and guests explore a range of woodworking topics and projects. He's no stranger to teaching. For years, he's taught classes in person and online at Epic Woodworking (epicwoodworking.com). To find him on *Rough Cut*, check your local listings and finewoodworking.tv.



Heide Martin ("Stylish Serving Trays" and Back Cover) left Seattle and a career in landscape architecture several years ago to study woodworking at the Center for Furniture Craftsmanship in Maine. Her husband, Patrick Coughlin, a carpenter and craftsman, made the trip to Maine with her, and accompanied her on a yearlong detour while they worked on farms in Ireland and France. The pair recently bought a house nearby with a freestanding shop where they plan to work together designing and building home furnishings.

Joe Morgan ("A Hidden Door Catch") is a self-taught woodworker who ran a one-man cabinet shop from 2005 to 2009 after building furniture for years. He burned out on the business, though, and put down his tools for five years. He picked them back up after discovering the work of marquetry master Silas Kopf and seeing all the possibilities of incorporating marquetry into his own furniture. He's since won numerous awards for his work. You can see more of his furniture at jmorganwoodworking.com.



Brian Boggs ("Creating Curves") has been building chairs since 1982, when he was a student of French and philosophy at Berea College in Kentucky. Before that, he aspired to be a fine art painter; he even took a trip to Paris to pursue it. Back in the States, though, after exposure to James Krenov's books, to *Fine Woodworking*, and to Jennie Alexander's book *Make a Chair from a Tree*, Boggs poured his passion into chair making. After working in Berea for two decades, he moved to Asheville, N.C., where he and his team build a broad variety of furniture. Catch our interview with him at FineWoodworking.com/268.

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

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From the Editor

Fine Woodworking on television

It was about a year ago when WGBH Boston, Public Television's largest producer, approached *Fine Woodworking* about partnering to develop a new version of their show *Rough Cut*, with a new host. We thought it was a great opportunity, and *Rough Cut with Fine Woodworking* was soon launched.

The new host, Tom McLaughlin, sealed the deal for me. I had come across Tom's work a few years ago when I was a new editor searching for article ideas on the website of the New Hampshire Furniture Masters. With his teaching history and wide breadth of skills, Tom seemed like a great source of information for our readers. Unfortunately, he was too busy at that point to take on the extra work.



Here we are now, and not only is Tom in the magazine, but he's also on the cover, showing his process for tapering a leg. It turns out Tom is a natural in front of the camera, with a humble, happy demeanor and an exuberance for woodworking. Tom is the star of the show, but this season he's sharing the spotlight with four phenomenal woodworkers: Terry Moore and David Lamb, both members of the New Hampshire Furniture Masters (furnituremasters.org), and

our own Mike Pekovich and Chris Becksvoort. Each guest is appearing in an episode, helping Tom build a project. This season features 13 projects in 13 episodes. It's no small feat to build that many pieces over the course of just a few months. There are patterns and jigs to generate, and new techniques to try. And Tom has to make multiples of each project so that the production crew can film the process in a timely manner. Tom is fast and highly skilled, but even for him this job was a tall order. He is fortunate to have a talented helper in Calvin Todd, who spent long hours with Tom in his New Hampshire shop, prepping for each episode.

All of the hard work has paid off. *Rough Cut with Fine Woodworking* looks great and is chock-full of techniques and inspiration (check your local PBS listings for times). Viewers can watch the projects come together via Tom's skilled hands, and then visit finewoodworking.tv for more information on techniques helpful to each episode. Folks will also be able to download or purchase plans for some of the projects, and see behind-the-scenes photos and videos, too.

Welcome to the show, Tom. It's time to smile for your close-up!

—Tom McKenna, editorial director

Expert tips on epoxy inlay

I just finished reading Christopher Moore's article on epoxy inlays (*FWW* #267). I worked for a company that used epoxy extensively, everything from filling small voids to inlaying large rocks and fossils. From my experience I can offer a few more tricks and tips to add to Mr. Moore's article.

- Bubbles can be removed with a heat gun. Just keep it moving or the epoxy can foam up.

- For very thick pours, keep the layers at $\frac{3}{8}$ in. thick and let them cure for a couple of hours between pours.

- Make sure the epoxy is non-blushing to ensure there will be no adhesion problems.

- Last, overexposure to sanding epoxy can lead to contact dermatitis, especially on the hands. I suffered through this. Be sure to wear the appropriate safety clothes and wash your skin regularly.

On a side note, I wouldn't want epoxy in a cutting board since slicing into it could cause small pieces to end up in my food.

—JOSHUA KANTER, Great Barrington, Mass.

Truth hurts

The true measure of a person or an organization in my book is not their title, mission statement, or stock price; rather it's what they do when they screw up. You published a sampling of the letters about dichromate, you acknowledged that your research fell short of your standards, and you apologized. You could just as easily have not published the letters, and perhaps buried a little correction sidebar someplace. You have admitted that you are not perfect, but most importantly you have demonstrated that your readers can be sure that when errors do crop up they will be clearly revealed, not swept under the rug. Welcome to the small world of absolutely trustworthy publications—a vanishing breed. Thank you.

—GEORGE INGRAHAM, Eureka, Calif.

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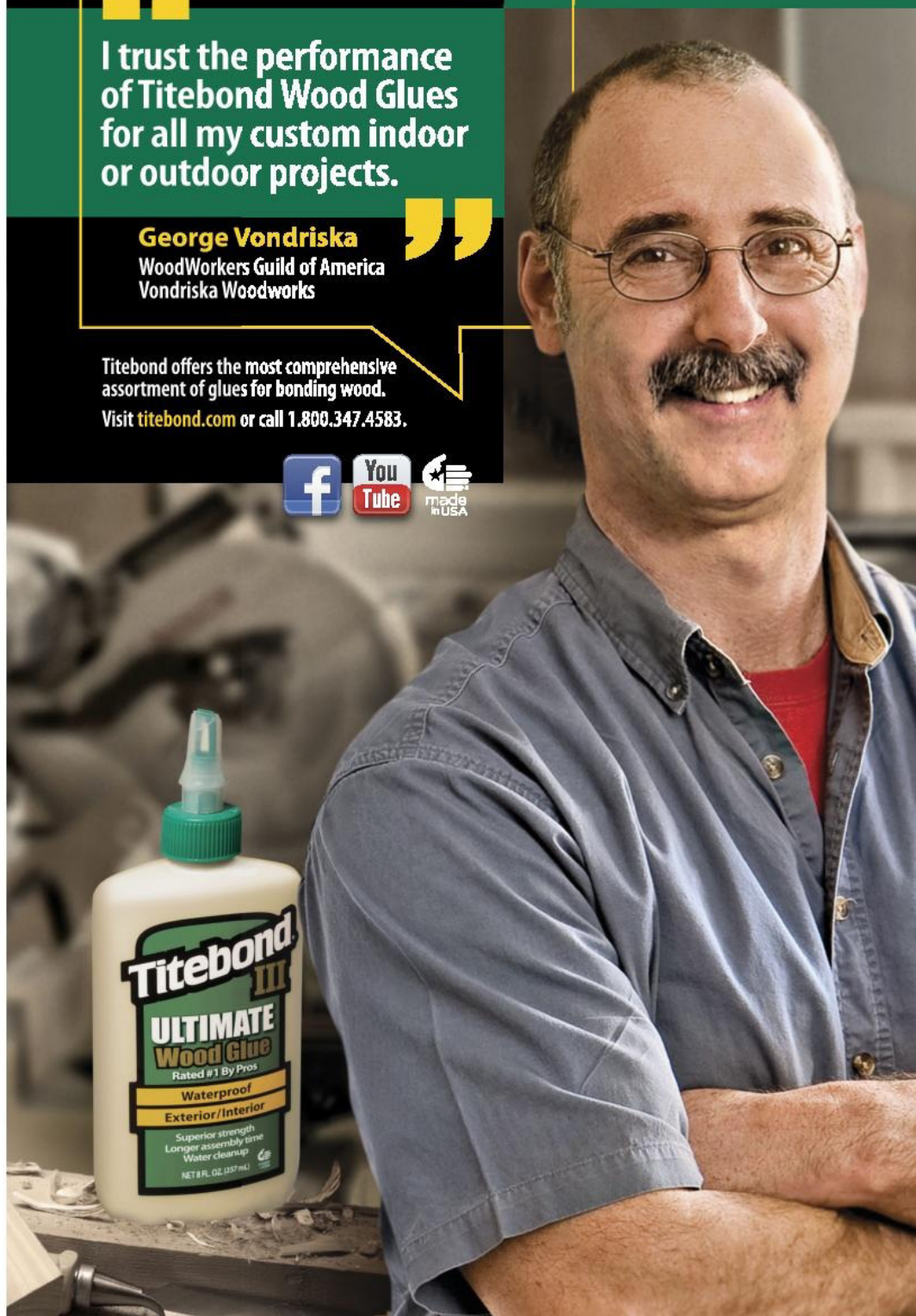
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workshop tips

Best Tip



Bill Jones has built all sorts of things in his 30 years of woodworking, from furniture and turnings to a 7-ft.-tall cabinet in the shape of a Pez dispenser. Lately, his daughter has joined him in the shop, working side-by-side and start-to-finish on pieces for her room.

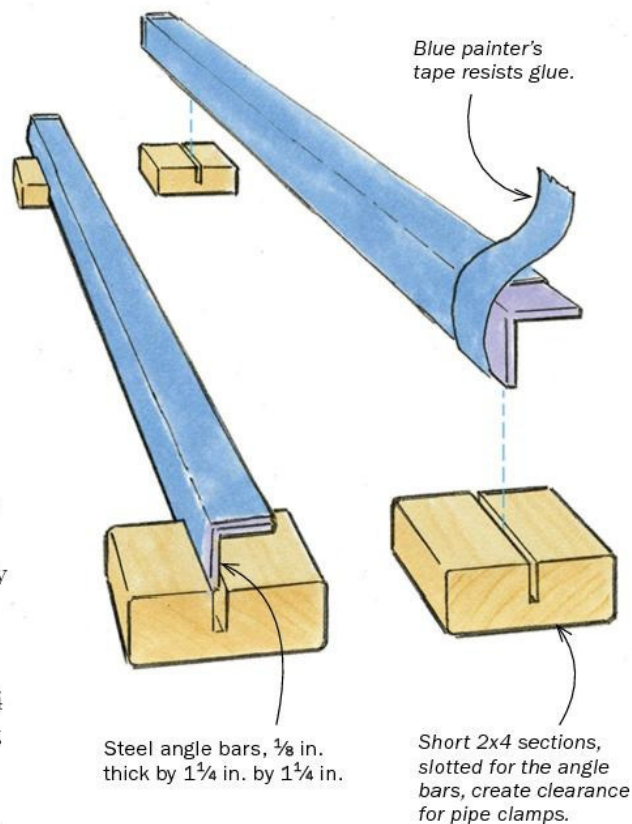
Angle bars tame big panel glue-ups

When gluing multiple boards edge to edge, a common woodworking practice, the clamping pressure often bows the assembly. Here is the simplest, most effective solution I've found. All it takes is two plain steel angle bars, available at any home center or hardware store, plus a few chunks of 2x4, slotted to hold the bars in the right position.

The great thing about this setup is that it not only lets me clamp the panel flat, but the 2x4 blocks also lift the whole assembly, making it easy to get bar clamps on both sides for even pressure.

It only takes a few minutes to cut slots in the 2x4 pieces (do that on a long piece before crosscutting it) and then put painter's tape on the steel angles to protect the wood and prevent staining when the wet glue hits them. The other nice thing about this system is that you can cut the angle bars to different lengths to match your projects.

The angle bars go at the ends of the boards, so when I place clamps right at the seams, the ends of the boards are aligned. As soon as the assembly

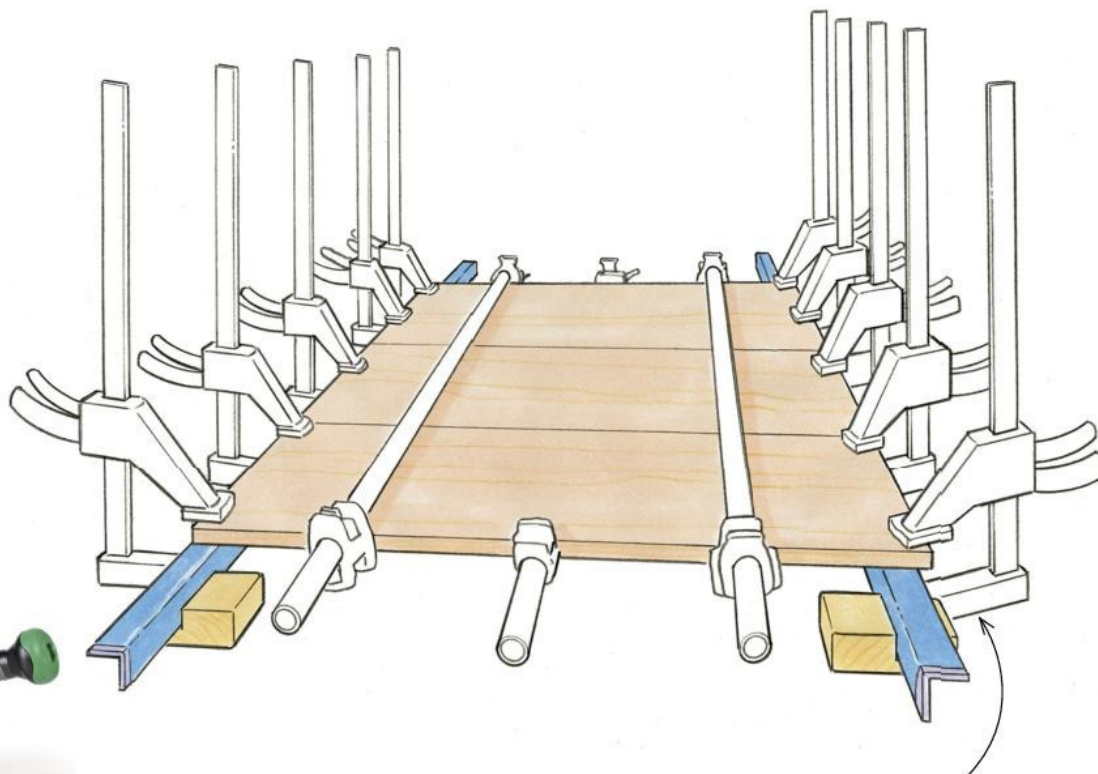


is clamped, you can flip it to clean glue squeeze-out off the back side, and lean it against a wall to dry while you move on to the next task.

—BILL JONES, Farmingdale, N.Y.

A Reward for the Best Tip

Send your original tips to fwtips@taunton.com. We pay \$100 for a published tip with illustration; \$50 for one without. The prize for this issue's best tip was a Hitachi fixed base/plunge router combo kit.





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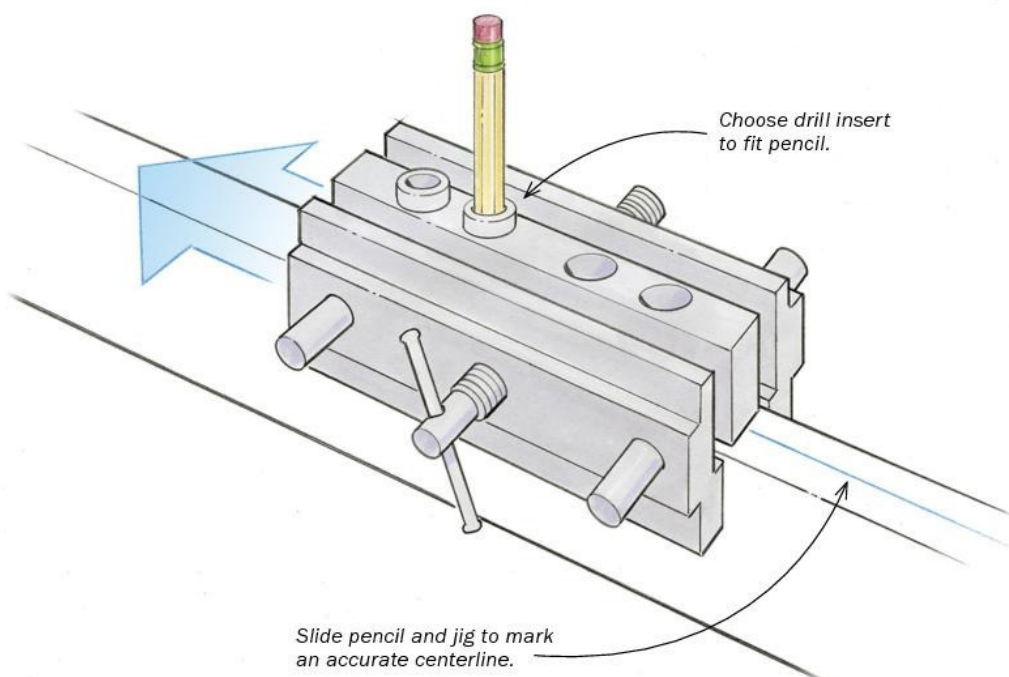
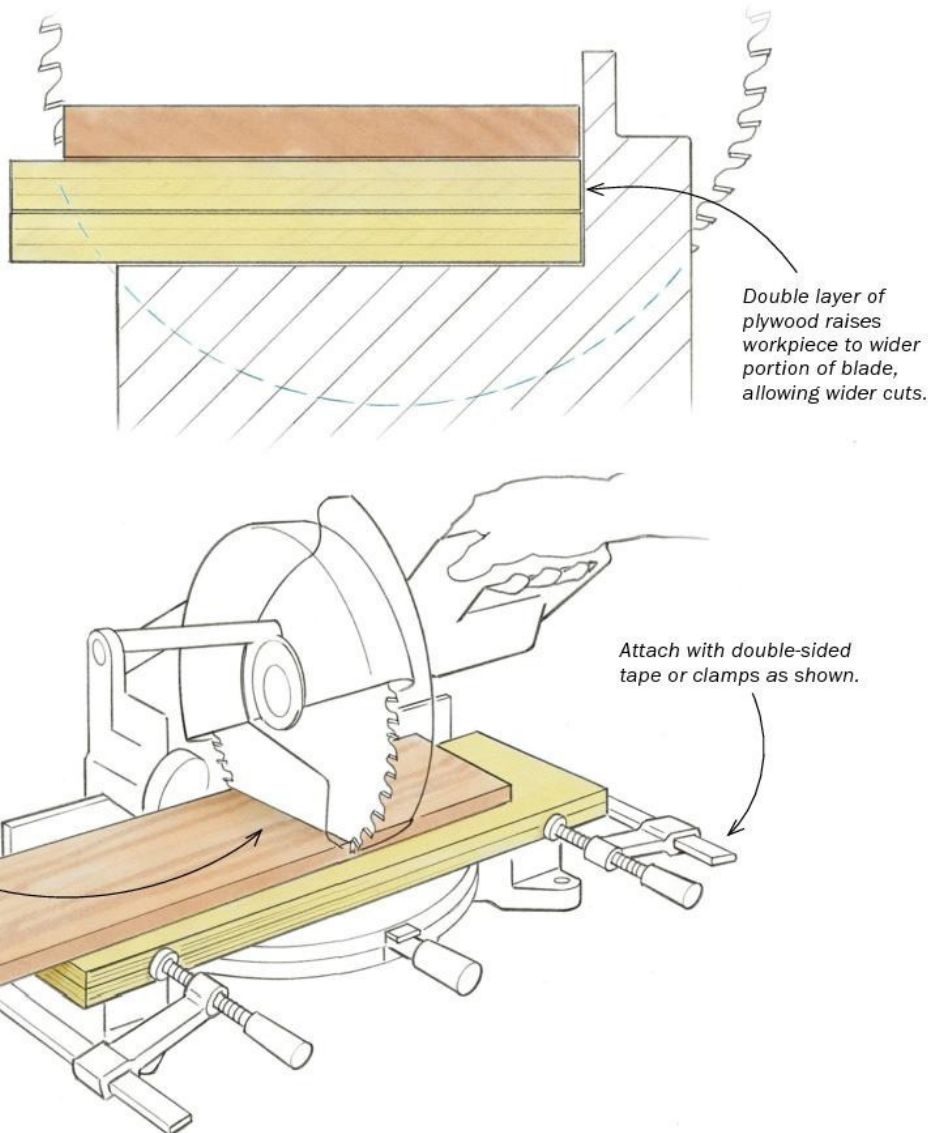
My chopsaw has a limited crosscut capacity compared to sliding models, so I often use an old carpenter's trick to add 1½ in. of crosscut width. By adding two layers of ¾-in.-thick plywood or MDF to the base of the saw, I raise the workpieces up to a wider part of the blade. The plywood also creates a zero-clearance surface that prevents tearout. Screw the layers together, and then attach them to the saw with double-sided tape, or by clamping them to the fence wings as shown.

—TONY O'MALLEY, Emmaus, Pa.

Blade cuts zero-clearance slot in base, preventing tearout.

Attach with double-sided tape or clamps as shown.

Double layer of plywood raises workpiece to wider portion of blade, allowing wider cuts.



Choose drill insert to fit pencil.

Slide pencil and jig to mark an accurate centerline.

Use dowel jig to mark true center on any board

Most boards end up at nonstandard thicknesses, making it a challenge to find and mark their true center for various tasks. I found the perfect solution in my dowel jig, which comes with a variety of inserts for various drill bits, including one that fits my mechanical pencil snugly. I adjust the jig to hug the board with no slop, but not so tight that it won't slide. Then I put the pencil in the hole, press down, and move the jig along the edge.

—JERRY DARSIE, Leominster, Mass.

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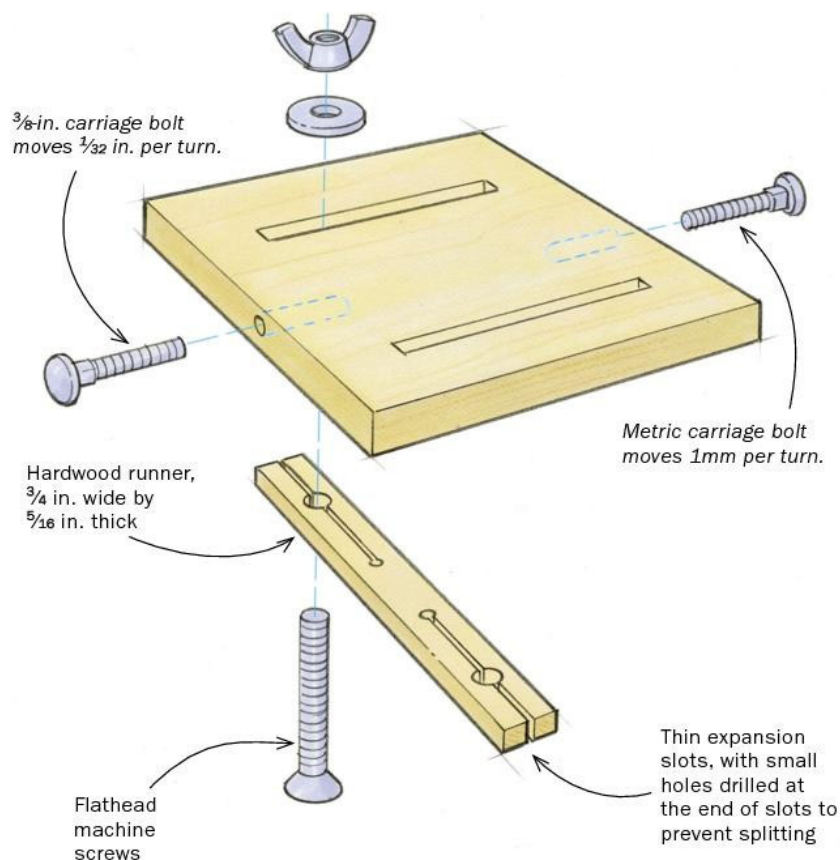
Thin-strip ripping jig has a bonus feature

I'm not the first to place a stop on the other side of the blade, opposite the fence, when ripping thin strips, so they can fall away freely. But my thin-strip jig has some unique advantages, as well as a bonus feature that will work on other tablesaw jigs.

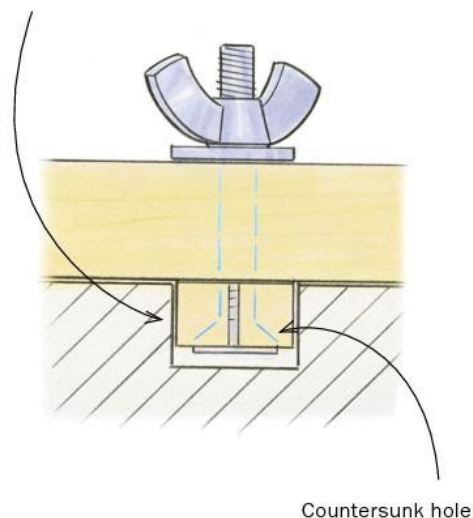
Made of $\frac{3}{4}$ -in. plywood, the jig is a reversible block with bolts on each side that act as adjustable stops, and big slots that allow a larger range of side-to-side adjustment. Because I work with both metric and standard measurements, I use a $\frac{3}{8}$ -16 carriage bolt on one side (which moves $\frac{1}{32}$ in. per turn), and a 6mm or 7mm carriage bolt on the other (moves 1mm per turn). I use a tap to cut threads for the bolts, but simple pilot holes would also work.

To attach the jig to the table, I cut a hardwood strip to fit the miter slot, and then used two thin slots and two countersunk holes to turn it into an expanding runner that locks the jig anywhere along the miter slot. Flat-head machine screws go through the countersunk holes and up through the jig, where wing nuts pull them upward and expand the runner. The locking pressure is excellent. The bonus: That same expanding runner works beautifully on router and drill-press tables, for featherboards and other shopmade jigs.

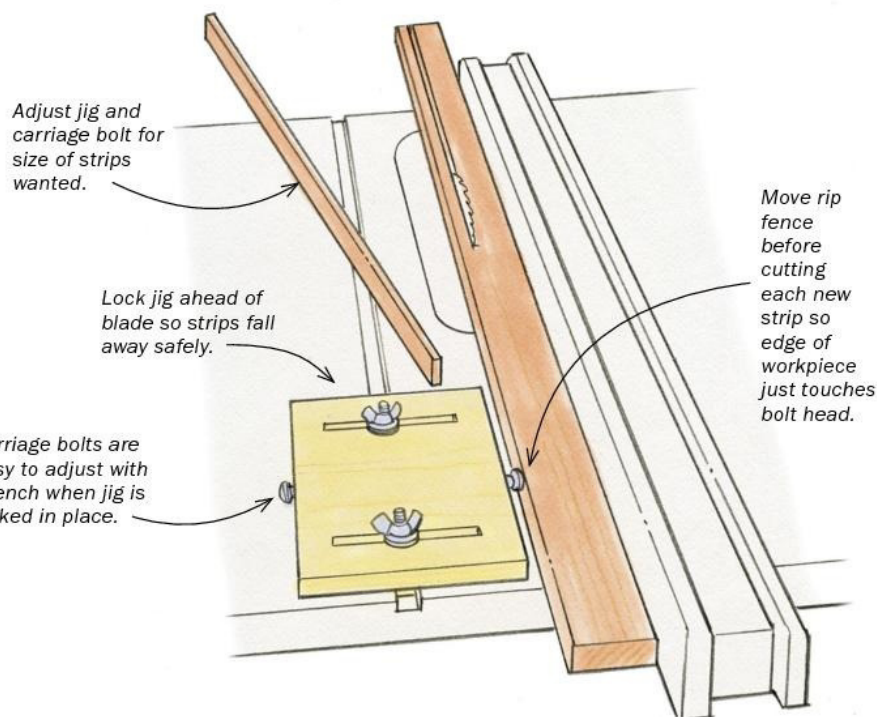
—CHARLES LOPEZ, Cherryville, B.C., Canada



Screws expand runner when pulled upward by wing nuts, locking runner in slot.



Countersunk hole



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Variable Speed	Yes
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Dust Extraction	Yes
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Product Weight	29.5lb
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Dust Extractor Dimensions	Inner: 1-7/8" and Outer: 2"

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Technical Specification

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Angle Adjustment Range	0° - 45°, left and right
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■ MACHINES

Powerful and sturdy benchtop lathe

LET'S TALK ABOUT WHAT MAKES A GOOD WOOD LATHE: a cast-iron bed, strong cam locks for fastening the banjo and tailstock, good torque, common spindle thread dimensions, easy belt changes, easy spindle lock, forward and reverse capability, and responsive speed adjustments. The Harvey Turbo T40 has all of these. And it fits on your benchtop.

A cast-iron machine dampens vibrations better than those made with other materials, and the T40's cast-iron bed is finely crafted. The banjo and tailstock glide smoothly across the bed, and both have a cam-style lock combined with a square plate underneath, which helps secure them firmly to the bed. It has 24 in. between centers and a 14-in. swing over the bed.

The 178-lb. T40 is powered by an Industrial Servo 1-hp motor with a three-sided belt that fits snugly into an aluminum pulley system. On its low setting, which has the highest torque, the lathe can spin from 50 to 2,800 rpm. The high setting's range is 75 to 4,300 rpm (good to know, although I cannot imagine spinning even the smallest diameters over 3,000 rpm). I found the belt very easy to maneuver.

The T40 has a common 1¼-in. spindle and #2 Morse taper. It also has an excellent 2-millisecond response time when speeding up your lathe—a welcome feature. The lathe's spindle-locking device is the easiest system I have ever seen: a little lever that makes it simple to lock the spindle with two fingers.

A forward and reversing switch also comes standard on the T40. This will make for better sanded surfaces and accommodate those who do their hollowing in the opposite direction (when working in reverse, you'll need to have the grub screw tightened so the work won't unscrew itself).



Outboard turning without the vibration. While the swivel headstocks on some lathes are loosely machined to glide better over dirty surfaces, the Harvey is machined a bit tighter, allowing the headstock to lock down more securely.



Pulley system is no joke. Mahoney chuckled when he saw the pulleys inside the motor compartment, doubting they'd be up to snuff. But he soon found out they produce plenty of torque for good turning.

If you are looking for a compact lathe with the power and sturdiness of a larger model, as well as all the other components that make a great lathe, the Harvey T40 could be a great fit for your workshop. And with its baked-on black paint and gold emblems, it will add some class as well.

—Mike Mahoney is a professional turner outside Sacramento.



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■ HAND TOOLS

Premier dovetail saw is worth the wait

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THE BEARKAT DOVETAIL SAW, which is handcrafted by Brian Noel at BearKat Wood, was unavailable when I reviewed a broad range of dovetail saws in the November/December 2017 issue (*FWW* #264). Now that I've had the chance to use the saw in my shop and put it through a series of tests, I find that the BearKat deserves a spot on my list of premier tools. It possesses all the qualities of a fine saw.

I used the BearKat for several hours in cherry and white oak. In both woods, the saw was easy to start, cut fast, and tracked and steered with ease. The thin plate sliced through the wood with little effort and without drifting or curving. The handle fit my medium-to-large hand comfortably with no pressure points. I also liked the moderate hang angle (the angle of the handle

in relationship to the tooth line). The saw's blade, which is filed at 16 ppi, is 11 in. long and 1¾ in. deep below the spine. The plate is 0.018 in. thick and, with the set, leaves behind a relatively thin kerf of 0.025 in. A nicely detailed slotted brass back keeps the saw plate rigid.

The BearKat is a beautiful, high-quality saw at a fair price. Because it comes from a one-man saw-making shop, you can order the handle in your choice of wood and have it fitted right to your hand. But that also means you may have to wait months for your order. At the time of this review, customers had to wait three to four months. Trust me, though: The wait is worth it.

—Chris Gochnour is a woodworker and teacher in Salt Lake City.

■ ACCESSORIES

Hearing protection with Bluetooth

ARE YOU ONE OF THOSE PEOPLE who works better with background noise? I am. Especially in the shop, music helps me stay focused. But when I'm machining wood, I have my hearing protection on—so my music might as well be off. This is where the new 3M WorkTunes Connect Wireless Hearing Protector with Bluetooth has been a boon.

The headphones have a Noise Reduction Rating of 24 decibels, which kept shop sounds at bay without completely muting them. And the audio quality was fine with anything I played, whether aggressive metal or plaintive R&B. The headphones are really comfortable, too.

The one-button control is a bit of a drawback since you can't adjust the volume using the headphones (you have to use your device). The button's controls, though, are straightforward: One click pauses and plays the music, two clicks advance the track, and three clicks goes to the previous track. The Bluetooth's range is about 35 ft. and you can receive calls using the headphones as well.

—Barry NM Dima is an associate editor.



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Meant for each other. Curtis Buchanan, a chairmaker for 30 years, says the drawknife and shaving horse “go together like peanut butter and jelly.” Still, he says, the drawknife also works beautifully when used with a bench vise.

Master the drawknife

A BRILLIANTLY SIMPLE SHAPING TOOL THAT’S VERSATILE, FAST, AND A PLEASURE TO USE

BY CURTIS BUCHANAN

Drawknives are astonishingly versatile tools, capable of removing a huge amount of wood in a hurry, or finessing fine surfaces. They’re equally good at creating flat planes and complex curves. Used with the bevel up, a drawknife works well for creating long, flat surfaces. Used with the bevel down, it will make all sorts of concave cuts—from slight to severe. While cutting face grain, a drawknife allows you to cut between the growth rings to create stock that’s beautifully suited to bending and has the ultimate structural integrity. Used with a skewed stroke on end grain, a sharp

drawknife will leave a finish that looks like it’s been waxed.

Depending on the angle of the handles relative to the blade, a given drawknife will be better suited to working bevel up or bevel down. If the handles are in line with the back of the blade, the knife is more comfortable to use with the bevel down. If the handles are closer to being in line with the angle of the bevel, the drawknife will be most comfortable used bevel up. You can get by with one drawknife and use it both ways, but having one of each type is a plus.

Grinding and honing

Sharpening a drawknife might seem daunting, but if you

The drawknife family

Drawknives come in various sizes and shapes—the blade may be long or short, wide or narrow, straight or curved. Most importantly, though, drawknives are divided between those designed to work best bevel-up or bevel-down. In bevel-down drawknives, the handles are roughly parallel with the plane of the blade. In bevel-up knives, the handles are canted slightly toward the plane of the bevel. You can get by using a bevel-up drawknife for bevel-down cuts, but it’s best for bevel-up cuts. The same goes for a bevel-down knife—it’s usable for bevel-up cutting, but not nearly as comfortable as it is for bevel-down cutting.



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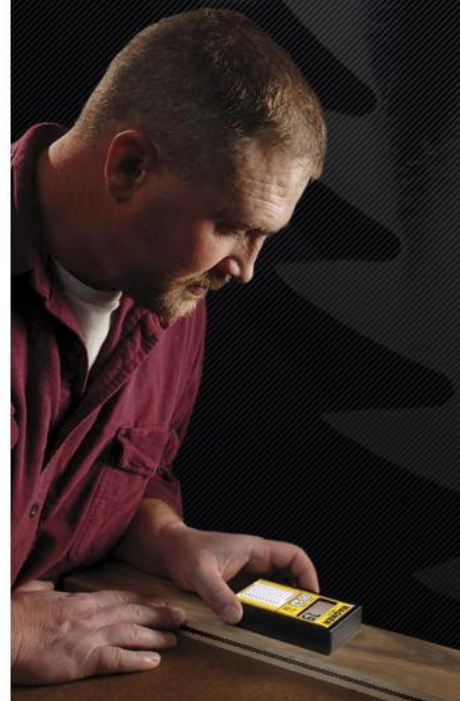


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Sharpening a drawknife

File the back. To simplify sharpening your drawknife, you'll need the back edge of the blade to be smooth and free of dings, so give it a going over with a file.



RESCUE AN OLD DRAWKNIFE



Tighten the handles. If the handles of the drawknife are loose, you can tighten them with a few hammer blows to the end of the tangs.



GET GRINDING

Joint the blade. Create a fair edge by drawing the knife across the corner of the grinding wheel. To prepare for grinding the bevel, you need the cutting edge parallel to the back edge.



A block makes the bevel. A scrap of wood clamped to the grinder table sets the angle of the bevel. Buchanan moves the blade left and right with moderate pressure against the stone.



Now grind behind. Buchanan hollow-grinds the back of the knife—leaving a narrow band at the tip—to simplify honing it flat.



HONE THE EDGE

Flat in the back. Starting with a coarse stone and progressing to 8,000 grit, Buchanan flattens the back of the blade.



Hone the bevel. Progressing again from coarse to fine, hone the bevel by taking up-and-back strokes while gradually moving from left to right along the blade.



Strop session. On his bevel-up drawknife, Buchanan works the back of the blade with a leather-covered block to create a slight back bevel that makes the blade easier to control.

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know how to sharpen a bench chisel you have the necessary skills. To get started, look closely at your knife. Has some numbskull used a hammer on the back edge? If so, file the dings out so it's smooth again. Now check to see if the back edge and the cutting edge are parallel. If not, joint the cutting edge on the grinder until they are. This is important, since when you grind the bevel you'll reference off the back edge.

To grind the bevel, adjust the grinder's tool rest to a flat position and clamp a stop to it. The motor will likely prevent you from grinding across the front face of the stone; instead you will grind on the edge of the stone. Adjust the stop until the grinding wheel is hitting the bevel at a 28° angle. (This angle works for bevel-down drawknives; for bevel-up knives, grind the bevel at 25°; the back bevel will add the other 3°.) Wax the stop block so the drawknife slides smoothly across the wood.

I hollow-grind the back of the blade to speed up the honing process—this way there's less metal to remove to achieve a flat surface. Reset the stop block and grind to within about $\frac{3}{16}$ in. of the cutting edge.

With the grinding finished, rub the back of the blade on a coarse stone. After you reach the cutting edge, switch to progressively finer stones to get a mirror finish. If the handles

Bevel up or bevel down?

BEVEL UP



Flat and true. For cuts that produce a long, flat, smooth plane, work with the bevel up (left). Skewing the blade while pulling straight creates the smoothest cut and most control (right).



Split the rings. One of the drawknife's great attributes is its ability to ride right down the wood's growth rings, creating a workpiece with grain that's perfectly continuous from one end to the other.

BEVEL DOWN



Cutting in. Working with the bevel down enables you to make scoop cuts into the workpiece without losing control.



Down for delicacy. Buchanan prefers working bevel-down for fine tasks like faceting a spindle.



Make end grain glisten. With the bevel down and the knife sharp, cut end grain so cleanly it shines. This also works bevel-up.

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get in the way of the honing process, mount your stone on a block so the handles will clear.

To hone the bevel, flip the knife over, place your fingertips on the back just opposite the bevel, and work your way up through the grits. When you reach the finest stone, alternate honing the back and the bevel until the burr falls off.

For a bevel-up drawknife there is one more step—the back bevel, or dubbing, on the back side. Without the back bevel, the knife will tend to dive into the workpiece. The trick is to create the minimum back bevel necessary to make the knife work. If the back bevel's too big, resharpening will be a problem. I use a piece of leather glued to a wooden block and charged with slurry from an 8,000-grit stone. During stropping, keep the block flat on the back of the blade, but place extra pressure on the cutting edge. Because the leather is soft, this should roll the edge just enough so the knife works well yet permits resharpening time and again.

How to hold a drawknife

For some drawknife work, I use a shaving horse to hold the stock. For other work, I use a vise. Use whichever best suits you and your situation. However the stock is held, you will usually be holding the knife at a skewed angle while slicing the cut. Use as much blade as possible. This skewed action takes less power and gives more control. You can also gain control by locking your joints—wrists, elbows, shoulders—as you work. Loosen these joints and you'll have less control but more power.

When I'm roughing out spindles, for example, my joints are loose as I cut fast and take long strokes. To make the careful cuts defining the edge of a seat, though, I'll shorten my stroke and tighten my joints, obtaining fine control with slight wrist movements. □

Curtis Buchanan builds chairs and carves spoons and bowls in Jonesborough, Tenn.

One versatile tool



A natural at complex shaping. Used bevel down, the drawknife can create complex shapes with speed and precision. Here Buchanan carves a guitar neck.



Smoothing tool too. Working bevel-up, Buchanan uses the drawknife to smooth the bandsawn curves of a cabriole leg.



Stopped facets. Working on the leg of a table, Buchanan creates tapered facets that are stopped at the top end.



Give me an arm. With the workpiece in his bench vise, Buchanan shapes the end grain on the arm of a Windsor chair.



Deep scoop. The bevel-down knife allows Buchanan to make a deep incut on the side of a chair seat.

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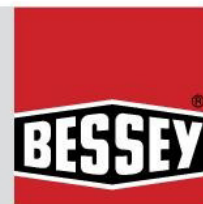
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The dynamics of designing

BY AARON LEVINE

As a teacher of three-dimensional design, I've learned there is a wide spectrum of pathways for creating something from nothing. Every craftsperson or artist embodies a unique blend of attributes that contribute to their design method. Some designers operate on an intellectual plane while others leverage their emotions. And designing is a dynamic process, not a static one. At times, it can feel overwhelming because it involves a multi-dimensional array of elements including form, function, expression of ideas, engineering, aesthetics, and technical proficiency. These are all connected. If the form of a piece is changed, the engineering might be affected, which might alter the function. To orchestrate this chorus of considerations, it's essential to have a clear understanding of what one wants to express. When you achieve that, it can become the guiding principle that informs every design decision. This approach to design requires awareness, discipline, and mindfulness, but it allows you to create a body of work that is uniquely yours.

Aaron Levine is a woodworker and teacher in Bainbridge Island, Wash.

Inspired by the human form

When I decided to make a jewelry box for the Northwest Gallery of Fine Woodworking's Annual Box and Container Show, I asked myself, "What do I want to express with this object?" I considered jewelry itself and the many ways it is used and perceived: as a decoration of the body, as a marker of commitment or status or friendship, as a talisman, or simply as a form of wealth. What resonated

most with me was jewelry's ability to augment the human form, so I chose to make a box that would reference the sensuality of the body. With this intention clearly in mind, I had the simple mechanism I needed to make each design decision: "Does this element enhance the box's expression of the sensuality of the human form?"

Looking at the front of the jewelry box, one might see the swollen curves of the hips in its hand-planed and block-sanded



sides. Other sensual curves can be found at the base of the box and where the insides of the box are coved. And in the upward-angled ends of the top, perhaps the form of a waist. If I had decided to make the box about the preciousness of jewelry, I might have used a rare or highly figured wood. Instead, I chose Alaskan yellow cedar, because I knew its fine grain would not compete with the shape of the box—and because it is very soft to the touch.

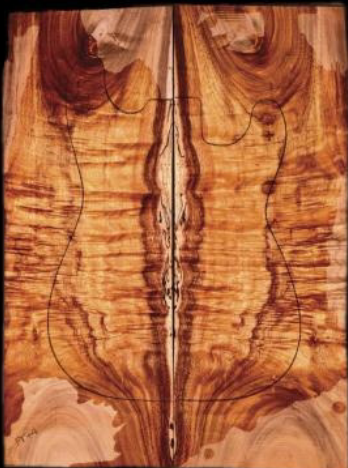
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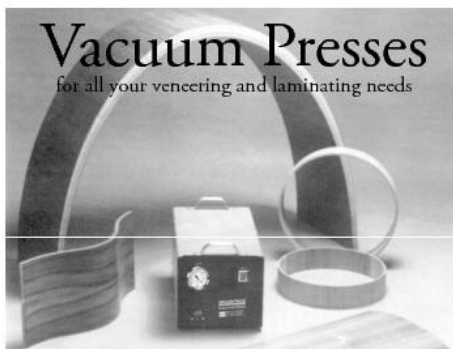
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A harmony of opposites

For me, writing is both easy and difficult at the same time. It requires an inward voyage to achieve an outward destination. When I made this writing table, I chose to reflect that duality in the design, juxtaposing opposites in an attempt to create visual balance and beauty. Writing itself is a distillation of ideas, so I kept the elements to a minimum.

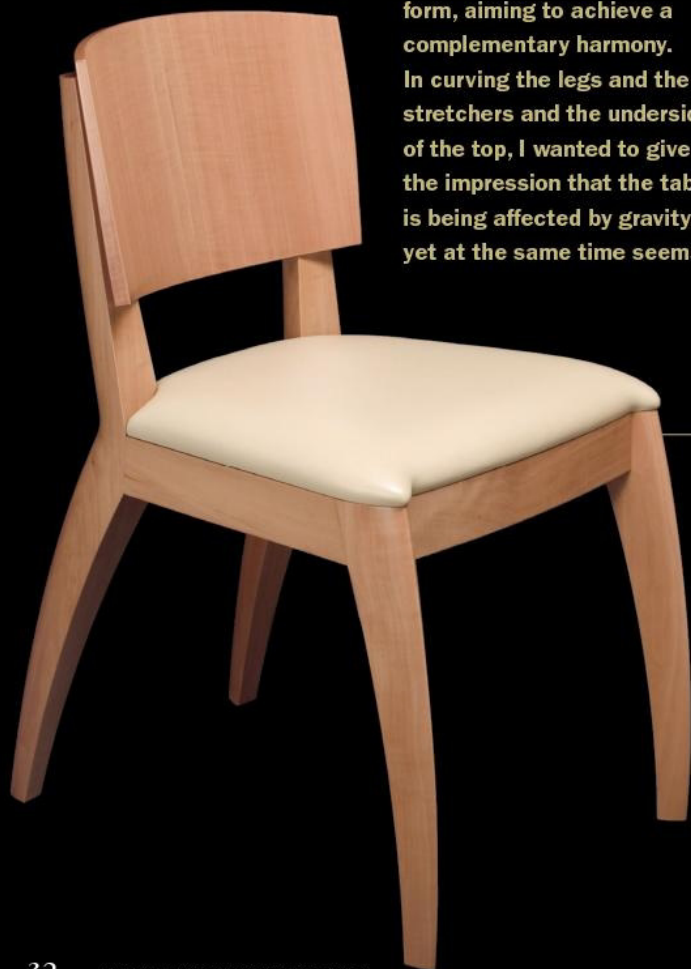
By wrapping luminescent curly Oregon myrtle veneer over the simple slab of the top, I contrasted a rich surface with a basic sculptural



form, aiming to achieve a complementary harmony. In curving the legs and the stretchers and the underside of the top, I wanted to give the impression that the table is being affected by gravity, yet at the same time seems

light and sprightly. I designed the legs and stretchers as an homage to the Japanese Torii gate, which marks the division between the sacred and the profane, a portal between two seemingly opposite worlds. I joined each pair of legs to its stretcher as one structural

unit and fitted them into the top so that they appear to grasp the slab of the tabletop; with the book-matched veneer seeming to spill in a waterfall over the ends of the table, this created the confluence of two more opposing forces: strong connection and flow.



Animal Instincts

I designed this chair to pair with a table that has talon-like legs. I decided the chair, too, should have an animal-like bearing. In keeping with that, I gave it a slightly crouching stance, so it appears poised for movement, with its two back (hind) legs appearing much stronger. The legs are all complex curves, rasped out by hand, that seem to flow into each other. I selected European pear for the chair because it's an outstanding carving wood, and because its homogeneous color and grain would not distract from the curvilinear forms. I intended the interplay of sensual curves and sharp edges in the chair legs to convey a sense of skin covering bone—something like the way it's seen on a person's shin. Similarly, at the front of the seat the calf leather is stretched over two protrusions, creating the sense of skin over structure.



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Contemporary Arts and

Updated design combines solid walnut
with veneered panels

BY MICHAEL CULLEN



A few years back I made a pair of solid walnut nightstands (*FWW* #247), and recently I decided to design a bed to complement them. The design echoes the same elements: simple lines, tapering posts, and a touch of through-joinery to evoke the Arts and Crafts period. But here's the twist—the bed also includes veneer, something you don't often see in pieces from that time period. Using veneer on the broad panels of the headboard and footboard meant I could eliminate wood movement and all the considerations that accompany it. The bed still appears to be made of solid wood, but its classic lines carry a more contemporary sensibility. And because I sawed my own veneer from the same stock I used for the solid-wood parts of the bed, the grain and color matching are perfect.

Crafts Bed



Claro walnut

Claro is specific to California, where I live, and it's a standout species. It has wonderful color—chocolate brown with purple highlights and black streaks—and extraordinary grain that can shift in one board from a tranquil quartersawn pattern to what I call quasar grain, which spins and crinkles like nothing else I've seen. It also comes in huge planks, making for beautiful one-board tabletops. Claro is so scarce that it can usually be had only from a sawyer. One back-country sawyer I know, who carts his chainsaws around in an old white Cadillac, tracks down claro in the Sacramento Valley.

According to Matt Ritter, a botanist (and woodworker) with expertise in California plants, claro is also known as Northern California black walnut, and its Latin name is *Juglans hindsii*. But he says *J. hindsii* was used as rootstock for English walnut orchards and often hybridizes with other species of walnut. As a result, there's confusion in the marketplace, and several different species and hybrids are sold as claro.



CLARO WALNUT BED

Using shopsawn veneer on the bed's headboard and footboard panels, Cullen made economical use of his supply of claro walnut and obtained a perfect match with the solid-wood parts of the bed. The Baltic-birch plywood substrate eliminates wood movement across the panels.



TIP FOR CUTTING DOUBLE TENONS



Check outer cheeks first. After cutting the outer cheeks of the tenons, check their alignment with the outer walls of the mortises.

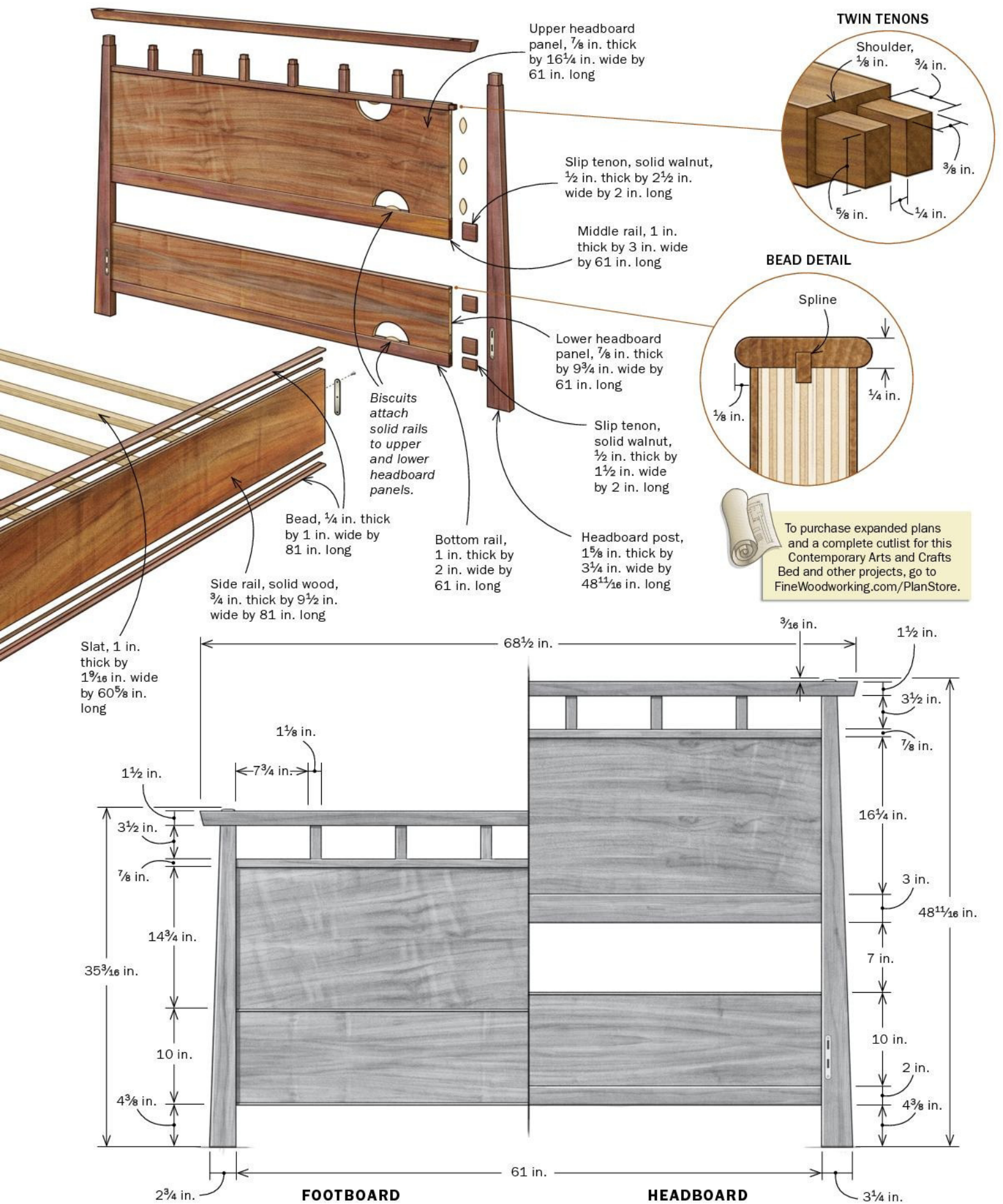


Inside afterward. Next cut the inside cheeks with a tenoning jig and bandsaw the waste between them. Sneak up on the fit.



Chisel cleanup. Having laid out the joint so the gap between the tenons equals the width of your mortise chisel, clean up by hand.

POST



Post and rail joinery

MORTISE FIRST



Multi-Router mortises. Cullen likes the Multi-Router for mortising because of its speed, accuracy, and easy setup.



Multiple mortises. For extra strength, the lower gallery rail connects to the posts with double tenons.

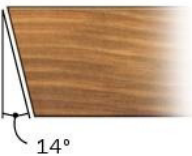


Chisel carefully. The through-tenon in the top rail is the bed's signature detail, and Cullen chisels to layout lines on both faces of the rail to make an impeccable mortise.

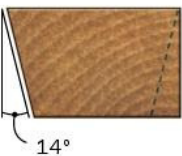
BEVEL THE RAIL

Important angles.

Cullen uses a crosscut sled on the tablesaw to cut the ends of the top rail to a 14° angle. Then he saws the side bevels, ripping with the tablesaw's blade set to the same angle.



END BEVEL



SIDE BEVELS



This bed frame is designed for a queen-size mattress and box spring, but you can adjust the dimensions to suit any mattress. Whatever mattress I use, I want the top surface to be 26 in. above the floor, which is ideal for sitting with your feet touching the floor. If you are using a box spring, the trick is to hide it behind the bed rails. I like to have its top surface 1 in. or more below the top of the side rails so that the area where sheets and blankets get tucked in is hidden. I also leave a ½-in. gap for bedding between the mattress and the bed rails on all four sides.

Choosing the lumber

I had a few choice large planks of claro walnut for this project. Because claro is precious and difficult to procure, I took considerable care in choosing and sawing out the parts. When choosing post stock, I looked for pieces whose grain and color would be balanced between the right and left posts. For the solid horizontals I wanted long, pleasing quartersawn grain if possible, so that the eye would not be distracted by a sudden change of color or line. There were many choices for veneer stock in this particular slab, from highly figured to subtle. I'm always attracted to the highly figured areas because of their dazzling beauty, but for this bed, in keeping with the understated feel of the nightstands, I eventually opted for quiet grain that rose in a subtle arc and had almost no color changes.

Handsaw works well for roughing it out

When cutting parts from unmilled planks, I usually use a sabersaw or a circular saw, but with boards like this claro, with a lot of cupping, twisting, and figure change, I use a handsaw. That way I can keep the kerf straight and vertical despite the twisting terrain, and

THROUGH-TENON ON THE POST



Tenons on top. Cullen cuts the cheeks of the through-tenon first, using a shopmade tenoning jig.

I can make perfect stop cuts so unused parts of the board can be saved at their largest possible size and put aside for future projects.

Post and gallery joints

I start the joinery with the through-tenon where the post meets the top rail. This is the most important joint in the bed for two reasons. First, because it's a through-joint that is so visually prominent with its beveled top, the fit needs to be flawless. Also, the location of these mortises will determine the placement of all the other joinery in the headboard and footboard. Remember that the distance between the posts will also be the distance between the side rails—so double-check that this span is just right for your mattress.

I cut the through-mortises using a Multi-Router. A plunge router used with a good jig will also work well, but I prefer the Multi-Router for several reasons. Because the router is bolted in place and the workpiece is clamped to the table, the cuts are clean, fast, and repeatably accurate; there's no chance of the bit wandering off course. The stops are easy to set, with no fussy alignment. Another attractive quality of the machine is visibility: Both the workpiece and the cutter are in view, and the depth of the cut is easily monitored. It wasn't inexpensive, but it easily earns its keep.

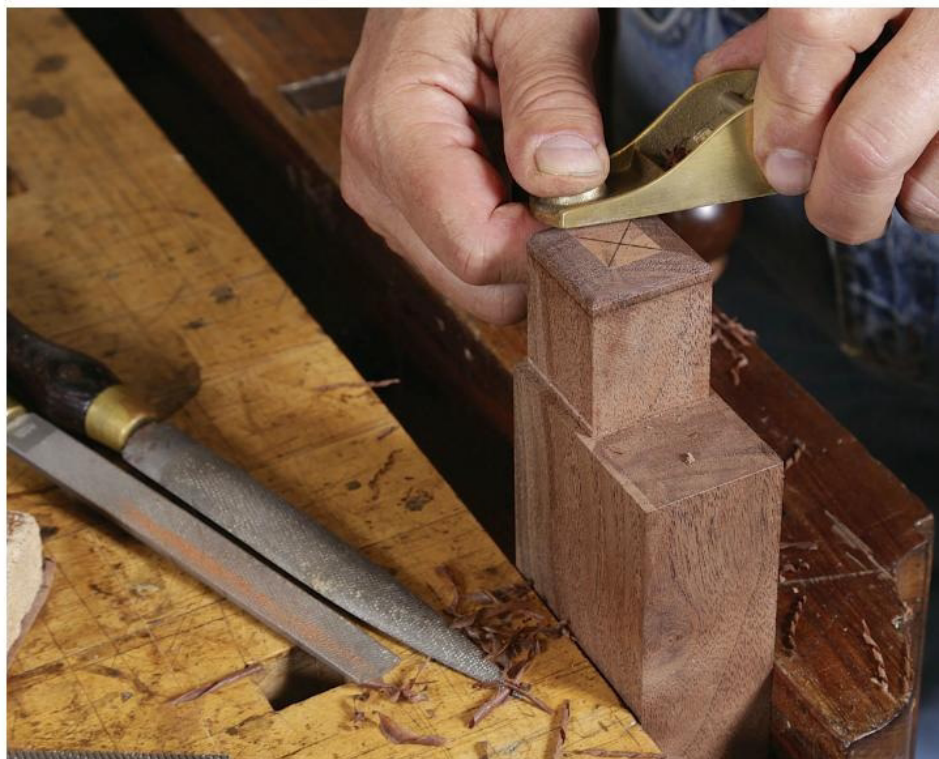
After the through-mortises are cut, I cut the double mortises for the gallery rail, also at the Multi-Router. Then I cut the through-tenons on the tablesaw. I use a tenoning jig for the cheeks and a crosscut sled for the shoulders. I really take my time checking and adjusting the fit until the tenon slides up through the mortise smoothly and its shoulders seat cleanly against



Shape the shoulders. With a crosscut jig on the tablesaw, Cullen cuts the tenon's shoulders: small ones first, wide one last.



Build the pyramids. After marking around the tenon where it emerges from the upper gallery rail, Cullen uses a block plane, rasp, file, and sandpaper to shape the top to a softened pyramid.



Veneer work



Shopsawn sheets. Sawing his own veneer enabled Cullen to match the solid wood in the bed exactly. He used a bandsaw to cut the claro walnut veneers $\frac{1}{16}$ in. thick, then had them thickness sanded to $\frac{3}{64}$ in. thick.

Benchtop jointer. Two lengths of plywood edged with solid wood and fitted with dowels at the ends for alignment comprise Cullen's rig for routing dead-straight edges on a stack of veneers.



Glue and press. Making a tent of adjacent sheets of veneer, Cullen applies glue to the edge joint. After laying the sheets flat and stretching blue tape across the show face of the joint, he applies glue to the other face and the substrate and slides the panels into his vacuum press.



the bottom of the rail. With both joints fitted, the exact distance between the posts has been established, and now the gallery rail can be cut to length and its double tenons can be marked and cut.

I cut the double tenons with a tenoning jig on the tablesaw. I first cut the outer faces of the two tenons and check to see that they match up with the outer wall of the mortises. From there, I move on to the inner faces. I use the bandsaw to remove the waste between the tablesaw kerfs, and do final fitting with a chisel.

With the post joinery for the rails complete, I lay out the short posts for the gallery. I cut all the mortises for them on the Multi-Router and square up the corners with a chisel. The tenons are cut at the tablesaw.

Make the veneered panels

I used shopsawn veneer over a plywood substrate for the headboard and footboard panels. It is much easier and quicker to buy commercial veneer than to saw your own, but in taking the harder route you gain the great advantage of being able to perfectly match the grain and color of the veneer to the solid wood. And there's peace of mind in using bandsawn veneers, which are double the thickness of their commercial counterparts, so there's minimal chance of sanding or scraping through to the substrate.

I cut the veneers at the bandsaw, setting the fence at just over $\frac{1}{16}$ in. After slicing the veneers I sent them

Prepare the panels

Space for a spline. After trimming the veneered panels to width, groove the edges to accept the spline that will align the bead.



Slip tenons in the ends. After carefully cutting the panel to length at the tablesaw, Cullen routs mortises for a pair of slip tenons in each end.

through a friend's wide-belt sander, so they finished out between $\frac{1}{32}$ in. and $\frac{3}{64}$ in. thick. Using veneer much thicker than that should be avoided, because it will tend to act like solid wood and move significantly with seasonal changes. Once I had the veneers sanded to thickness, I jointed their long edges with a router and a shopmade jig.

After this I taped the sheets together—having applied a thin bead of glue to the edges. I use Baltic-birch plywood as my substrate and urea-formaldehyde for gluing down the veneers in my vacuum press. To be certain the panel will remain stable and flat, it's important to choose high-quality, dead-flat substrate



Becoming a bead. Cullen rounds the edges of the bead stock at the router table. The wide fingerboard dampens vibration on the thin workpiece for a smooth cut.



Beads and biscuits. When gluing on the beads, use cauls the same thickness as the panel to ensure the clamp pressure is properly directed. Afterward, to cut the biscuit joints through the upper bead, a piece of $\frac{1}{4}$ -in. sheet stock serves as a spacer.

First glue-up

Long joints first.
Glue the panels together, dry-fitting the posts to them to ensure proper alignment.



Now the posts get tapered. After the panel glue-up, remove the posts and bandsaw the taper on their outside face. A few passes with a jointer plane make the sawn surface smooth.

material and run the grain of the veneer 90° to the face plies of the plywood.

If I'm using commercial veneers I use a platen that goes on top of the panel in the vacuum bag to ensure that the pressure is distributed equally across the surface. Bandsawn veneers are thick enough that the platen is unnecessary.

Now that the panel's out of the bag ...

When the vacuum bag has done its bit, I clean one long edge of each panel, then rip them to width on a tablesaw. That's easily done, but when crosscutting them extra care should be taken to avoid chipout. The most vulnerable point tends to be at the end of the cut on the top face. The best insurance is to put a strip of blue tape along the line of cut and burnish it down, then saw through it. With the panels cut to size, I rout mortises for the pair of slip tenons in each end. I transfer the layout marks onto the posts and cut those mortises as well.

Next I glue 1/4-in.-thick solid-wood beads to the top and bottom edges of the footboard's lower veneered panel (I do the same with the solid-wood side rails). The headboard's lower panel only has a bead on top. The bead stock gets a roundover along its edges and a groove in the underside for a spline. Cut the groove down the middle of the bead at the tablesaw. Then use a 1/8-in. roundover bit to create the beading profile at the router table. Once the beads are on and cleaned up, I cut the biscuit joints that join the upper panel to the lower panel, the posts, and the gallery rail.

Three-stage assembly

I begin assembly by gluing the veneered panels to each other and to the gallery rail. It's vital to keep them aligned perfectly end-to-end during this glue-up, so I

dry-fit and clamp the posts in place during assembly. I have yet to taper the posts, so they are still square, making for good cauls. When the glue has cured, I remove the posts and taper them, cutting to the line at the bandsaw and then cleaning up with a handplane.

Step two in the assembly is gluing the posts to the veneered panel subassembly. I save the tapered cutoffs and use those to give the clamps a square surface to grip, and one that I don't mind marring. I test-fit the top rail during this glue-up to be sure all is in proper alignment. Then, when the clamps come off, I finish up by gluing on the short gallery posts and the top rail.

With the headboard and footboard complete, I install the bed-rail hardware. I used the double-hook fasteners that allow you to drop the side rail into place. Simple to install and rock-solid in use, and let me avoid putting bed bolts through the post, a look I can't abide. □

Michael Cullen builds furniture, bandsawn boxes, and sculpture in a converted egg-sorting shed in Petaluma, Calif.

Final assembly



On with the posts. Using the tapered cutoffs as cauls, glue the posts to the rails and panels.



Online Extra

For a closer look at the bed-rail hardware Cullen used in this bed, go to FineWoodworking.com/268.

Capping it off. Finally, glue on the gallery posts and knock the top rail into place. Cullen finished the bed with Minwax Wipe-on Poly Satin. He followed that with wax.



A Hidden Door Catch

This subtle, magnetic method remains unseen

BY JOE MORGAN

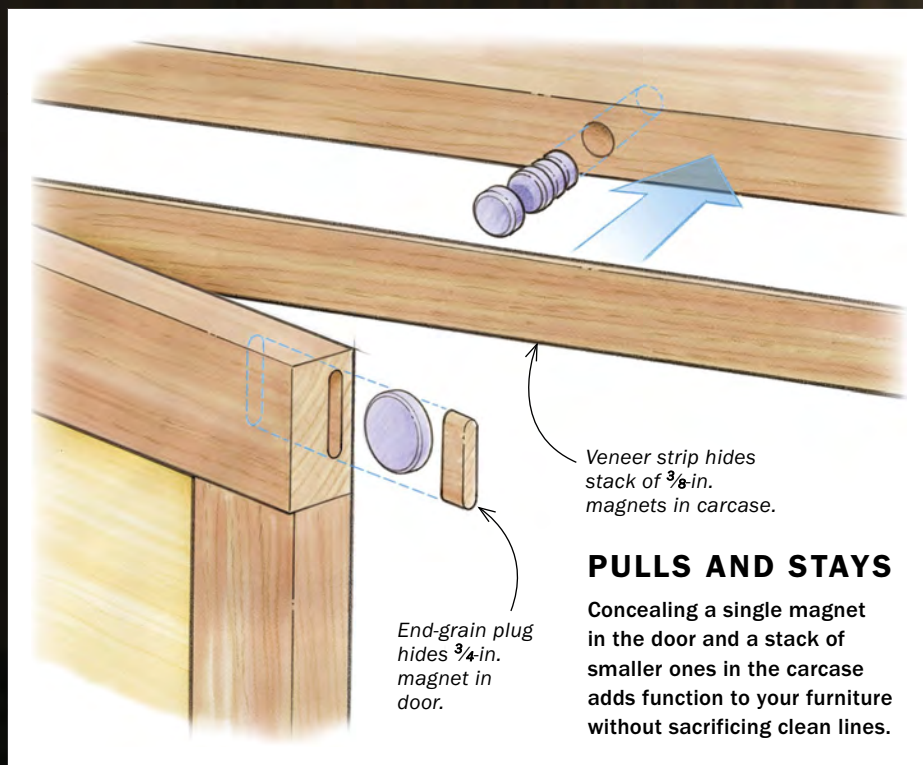
While there are many types of latches to hold cabinet doors in place, most don't pull me in. I find protruding mechanisms visually unappealing, and I don't like the sound of latches hitting each other. So I turn to another method: hidden magnets. Concealed rare-earth magnets provide a pristine look and quiet operation. When done right, the magnets have a subtle grab that makes opening and closing a door a pleasure.

For each door, you need one $\frac{3}{4}$ -in.-dia. and four to six $\frac{3}{8}$ -in.-dia. neodymium disk magnets. Each should be $\frac{1}{8}$ in. thick. You will also need a plunge router. I use mine with a mortising jig adapted from Michael Fortune's article

"Try this Versatile Mortising Jig" (*FWW* #198). You could also simply clamp a wide base to the door and attach a fence to your router. Just make sure the router is stable.

Mortising the doors

After the door is built and trimmed to fit, you're ready to rout the mortise for the magnet. The mortise should be $\frac{1}{8}$ in. deeper than the magnet's diameter so you can glue in a plug to conceal the hole. On the edge of the door, lay out the mortise. Inset the mortise at least $\frac{1}{8}$ in. from the inside face of the door, and mark the length to ensure wiggle room for the $\frac{3}{4}$ -in.-dia. magnet. With the workpiece secured and the router stable,

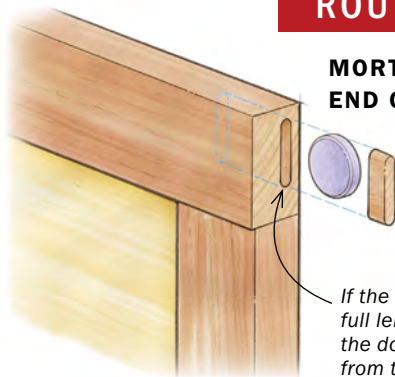


PULLS AND STAYS

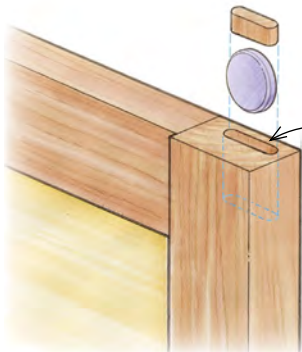
Concealing a single magnet in the door and a stack of smaller ones in the carcase adds function to your furniture without sacrificing clean lines.

ROUT THE SLOT

MORTISE INTO END GRAIN



If the rail goes full length across the door, mortise from the side.

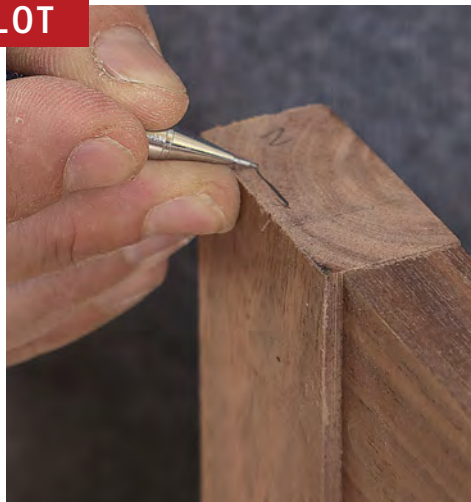


When the stile runs full length, mortise from the top.

route the mortise. Place a magnet inside and glue a plug in place.

Magnet testing

It is important to have the correct amount of magnetic force. Too much, and the door will be hard to open. Too little, and the door might not stay closed. Rare-earth magnets are remarkably strong, but their attraction falls off quickly as they move apart. To test how many magnets the carcass needs, first build the doors, install their magnets, and add their hinges.



Mark the mortise wall. For strength, leave $\frac{1}{8}$ in. of material between the mortise and the inside face of the door (left). Center the $\frac{3}{4}$ -in. magnet on your first line to find the ends of the mortise (right). Add $\frac{1}{32}$ in. on each end ($\frac{1}{16}$ in. overall) to give the magnet some wiggle room.



Clamp the door in place. Morgan first clamps the door tight to the bottom of his jig's platform with a wooden hand screw, then tightens the main clamp.

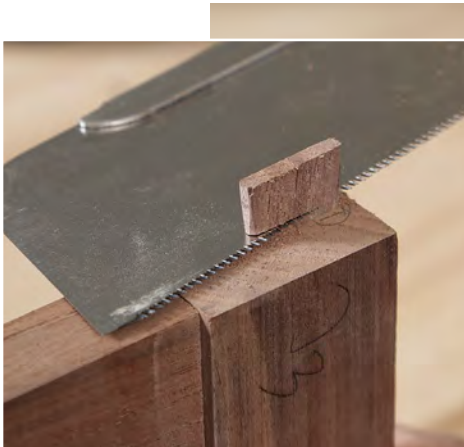
TIP To cut the $\frac{7}{8}$ -in.-deep mortise, Morgan chucks a $\frac{1}{8}$ -in. spiral bit in a $\frac{1}{8}$ -in. collet adapter, allowing him to use a standard plunge router.



Set the stops. Morgan's jig allows him to limit front-to-back and side-to-side travel, keeping his router on track. Because his magnets are $\frac{1}{8}$ in. thick, Morgan uses a $\frac{1}{8}$ -in. solid carbide spiral bit. The magnets are $\frac{3}{4}$ in. dia. and he cuts the mortise $\frac{7}{8}$ in. deep to leave a little room for a plug.

INSTALL THE DOOR MAGNET

Drop it in and plug it up. The magnet should sit about $\frac{1}{8}$ in. below the surface (right). Morgan makes plug blanks at the tablesaw, then rounds the corners with sandpaper and tapers the leading end with a knife (below). Keep it a little overlong to make it easier to handle (below right).



Make it flush. A fine-tooth pull saw and slicing cuts with a sharp chisel make quick work of the extra length, leaving you with a clean, flush surface on the frame.



For the test, I attach the door to the actual carcass or, if the case isn't finished, a tall scrap clamped vertically in the vise. Make sure the door is perfectly level and plumb. You will need a short length of $\frac{1}{16}$ -in. veneer and, to start, four or five $\frac{3}{8}$ -in.-dia. magnets. Hold the stack of magnets flush against the veneer and approach the back of the door. Start 2 in. from the hidden magnet and move slowly toward it to test the magnetic attraction. Your goal is to have the magnets engage when they are $\frac{3}{4}$ in. to 1 in. apart. Add or remove magnets until you land in this range. Whatever number works is how many magnets you should put in the carcass.

Install the magnets in the carcass

Now that you know how many magnets the carcass needs, double check the width of the carcass member they're going into. In this cabinet, I'm using a subtop rail that has been trimmed to length and will be pocket-screwed in place. The part must be narrower than its final width by the thickness of the veneer you'll use to cover the magnets. Since my veneer is $\frac{1}{16}$ in. thick, I ripped my rail $\frac{1}{16}$ in. underwidth. The veneer strip will bring the part to the correct final dimension. A quick note: Because the magnets are so strong, I opt for shop-sawn veneer instead of typically thinner commercial veneer.

Mark where the magnets will go in the carcass and drill a $\frac{3}{8}$ -in. hole there as deep as the stack of $\frac{3}{8}$ -in. magnets is tall. After drilling, insert the stack. Now prepare the strip that will be glued onto the carcass rail to hide the magnets.

The next step is very important. Check and double-check to make sure the carcass magnets are in the correct orientation to attract the door magnet. (If they are flipped the wrong way, you will have a trick door that never shuts, since the magnets will repel each other.) Now glue the edging to the carcass. □

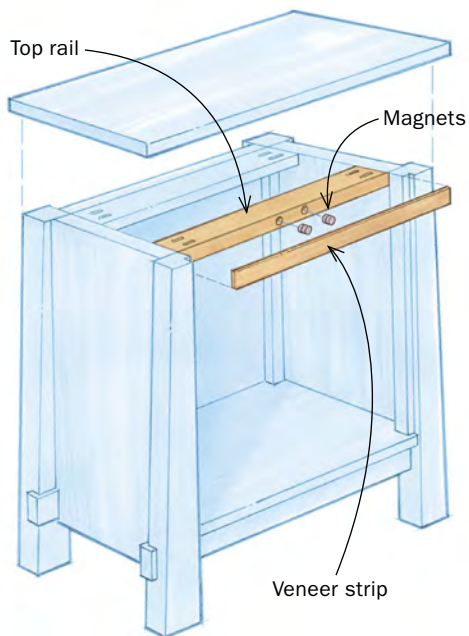
Joe Morgan is a furniture maker and marquetry specialist in Park Rapids, Minn.

Online Extra

To learn more about this self-taught cabinetmaker turned fine furniture maker, go to FineWoodworking.com/268.

ADD MAGNETS TO THE RAIL

HIDE MAGNETS BEHIND VENEER



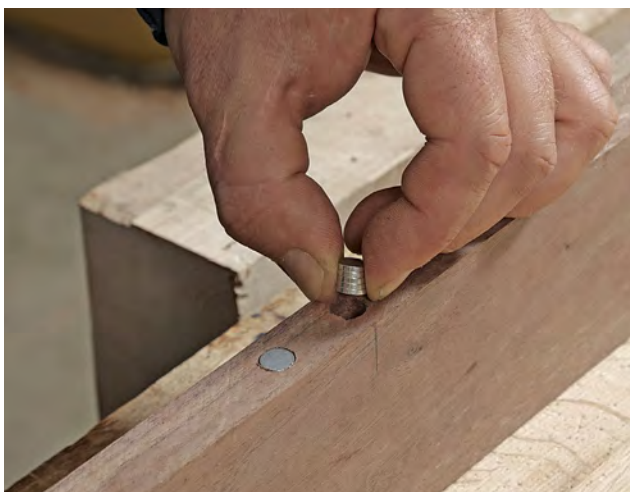
Magnet test. To determine the number of magnets you'll need in the carcass, hang the door, hold a stack of magnets behind a veneer strip, and approach the magnet hidden in the door. You want their attraction to engage when they're about $\frac{3}{4}$ in. to 1 in. apart.



Determine where to install the magnets. Sticking the smaller magnets to the one in the door lets you easily mark their centerline on the top of the door. All you have to do after that is line up the door with its final position on the case rail and transfer the mark across. Measuring works, too.



Drill the rail. Morgan relies on a doweling jig to help him drill square to the board. Tape on the bit acts as a depth gauge. You want the top magnet to sit flush with the surface.



Drop and cover. After placing the magnets inside, glue on the shopsawn veneer strip. Morgan uses a clamping caul with clear packing tape on one edge.



INSTALL THE DOOR MAGNET

Drop it in and plug it up. The magnet should sit about $\frac{3}{8}$ in. below the surface (right). Morgan makes plug blanks at the tablesaw, then rounds the corners with sandpaper and tapers the leading end with a knife (below). Keep it a little overlong to make it easier to handle (below right).



Make it flush. A fine-tooth pull saw and slicing cuts with a sharp chisel make quick work of the extra length, leaving you with a clean, flush surface on the frame.



For the test, I attach the door to the actual carcass or, if the case isn't finished, a tall scrap clamped vertically in the vise. Make sure the door is perfectly level and plumb. You will need a short length of $\frac{1}{16}$ -in. veneer and, to start, four or five $\frac{3}{8}$ -in.-dia. magnets. Hold the stack of magnets flush against the veneer and approach the back of the door. Start 2 in. from the hidden magnet and move slowly toward it to test the magnetic attraction. Your goal is to have the magnets engage when they are $\frac{3}{4}$ in. to 1 in. apart. Add or remove magnets until you land in this range. Whatever number works is how many magnets you should put in the carcass.

Install the magnets in the carcass

Now that you know how many magnets the carcass needs, double check the width of the carcass member they're going into. In this cabinet, I'm using a subtop rail that has been trimmed to length and will be pocket-screwed in place. The part must be narrower than its final width by the thickness of the veneer you'll use to cover the magnets. Since my veneer is $\frac{1}{16}$ in. thick, I ripped my rail $\frac{1}{16}$ in. underwidth. The veneer strip will bring the part to the correct final dimension. A quick note: Because the magnets are so strong, I opt for shop-sawn veneer instead of typically thinner commercial veneer.

Mark where the magnets will go in the carcass and drill a $\frac{3}{8}$ -in. hole there as deep as the stack of $\frac{3}{8}$ -in. magnets is tall. After drilling, insert the stack. Now prepare the strip that will be glued onto the carcass rail to hide the magnets.

The next step is very important. Check and double-check to make sure the carcass magnets are in the correct orientation to attract the door magnet. (If they are flipped the wrong way, you will have a trick door that never shuts, since the magnets will repel each other.) Now glue the edging to the carcass. □

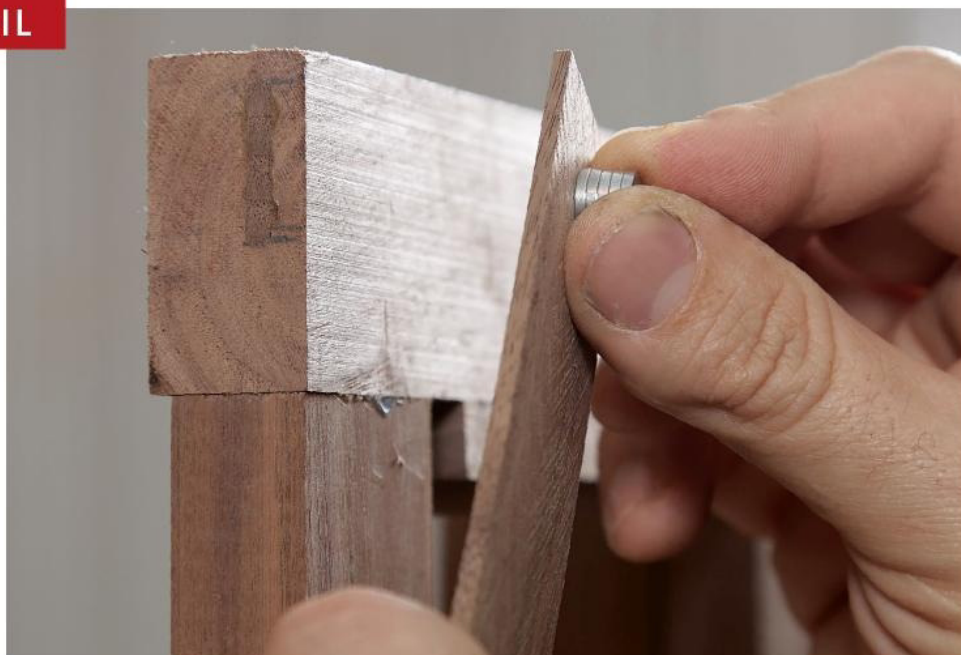
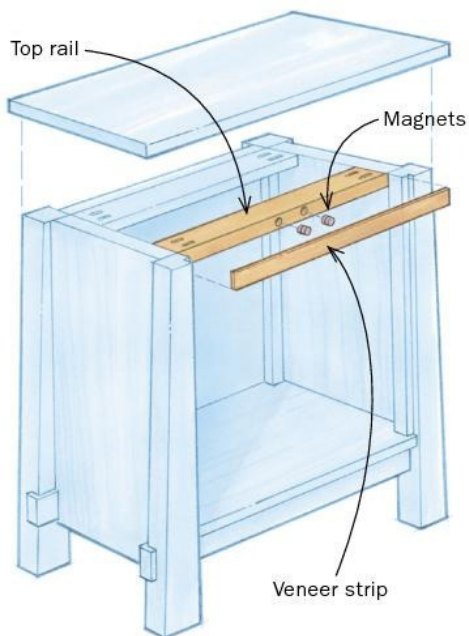
Joe Morgan is a furniture maker and marquetry specialist in Park Rapids, Minn.

Online Extra

To learn more about this self-taught cabinetmaker turned fine furniture maker, go to FineWoodworking.com/268.

ADD MAGNETS TO THE RAIL

HIDE MAGNETS BEHIND VENEER



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Rethinking the Workbench

8 ideas to make your bench work harder

Although the tablesaw is often cited as the center of the workshop, the workbench is where most of the action happens. For sharpening, handwork, sanding, assembling, and finishing, everyone needs a flat, solid surface to work on. But workbenches vary widely, as do the myriad ways our readers accessorize them. This special collection of reader ideas centers on the workbench, from the surface itself to everything that happens there.

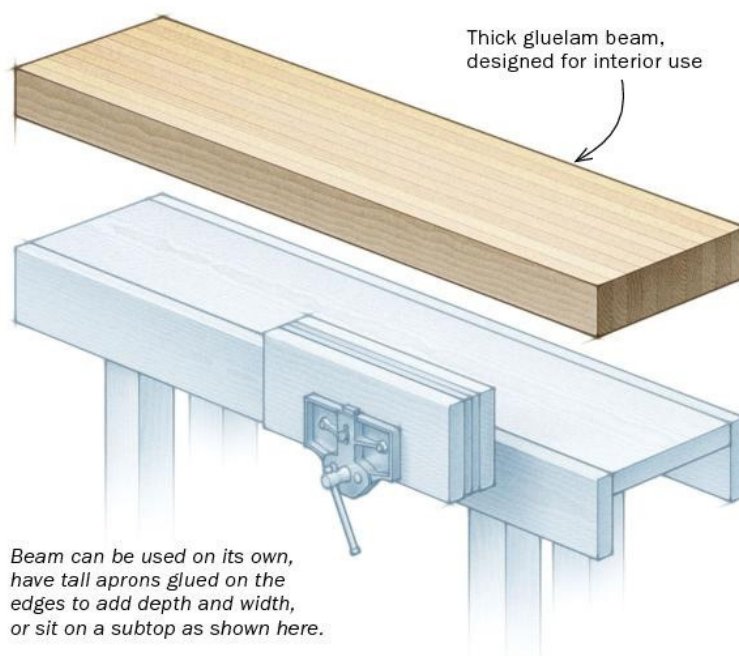
Whether you are dreaming up a new bench or looking to improve the one you have, you are likely to find some great ideas here.



Use a gluelam beam to make a flat, forgiving benchtop

While builders were constructing a combined garage and workshop at my house, I was building my first workbench. Looking closely at the laminated beams they were using, I saw my first benchtop. I went to the local lumberyard and purchased a 6-ft.-long portion of a laminated beam designed for interior use. It was much less expensive than purchasing similar lumber for laminating the top myself, not to mention the many hours of labor saved. While various dimensions are available, including widths up to 24 in., my beam/benchtop is 14 in. wide and 3½ in. thick. Adding a tool tray is an easy way to expand the width. While most gluelam beams are softwood, I don't mind the nicks and dents it collects, plus I like the forgiving nature of the surface.

—PETER MILLER, Little Rock, Ark.



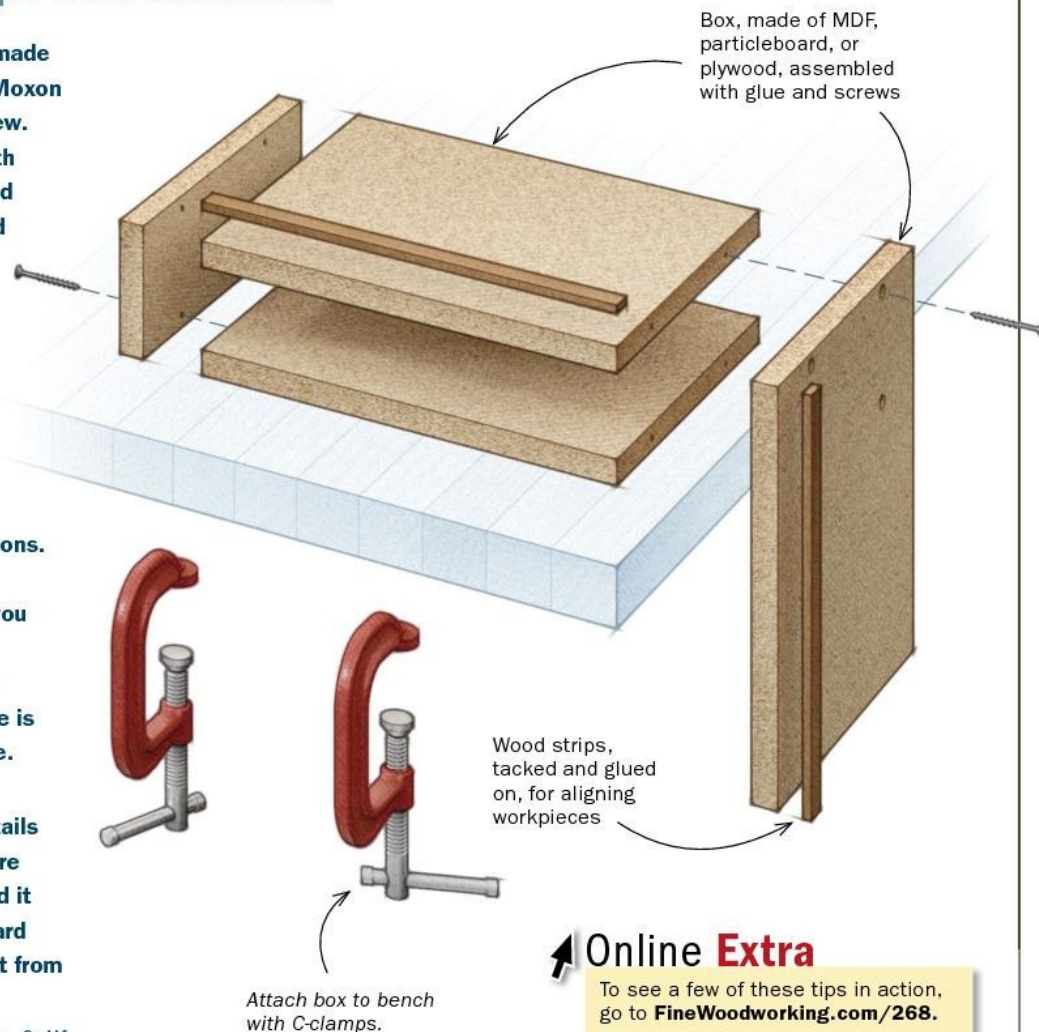
Simple, solid box helps with handwork

I'm new to dovetailing, and before I made a grand investment in a leg vise or Moxon vise, I decided to try my own home brew. I made this simple but effective jig with scraps of particleboard and some wood strips. The four pieces of particleboard form a basic box, with one side left long to hang down and register the jig against the front of the bench. I glued wood strips along the front edge of the two working faces of the box. A couple of C-clamps attach the box to the bench.

Once I had built the jig, I found it useful for all sorts of hand-tool operations. To clamp a workpiece vertically for dovetailing or tenoning, for example, you just push the workpiece against the molding strip and secure it in seconds with Quick-Grip clamps. The workpiece is perfectly vertical and extremely stable.

It works just as well for clamping pieces horizontally, for chopping dovetails or routing, bringing the action to a more comfortable height in the process. And it really shines when lining up a tails board with a pins board to transfer the layout from one to the other.

—STEVE FARNOW, San Diego, Calif.



Online Extra

To see a few of these tips in action, go to FineWoodworking.com/268.

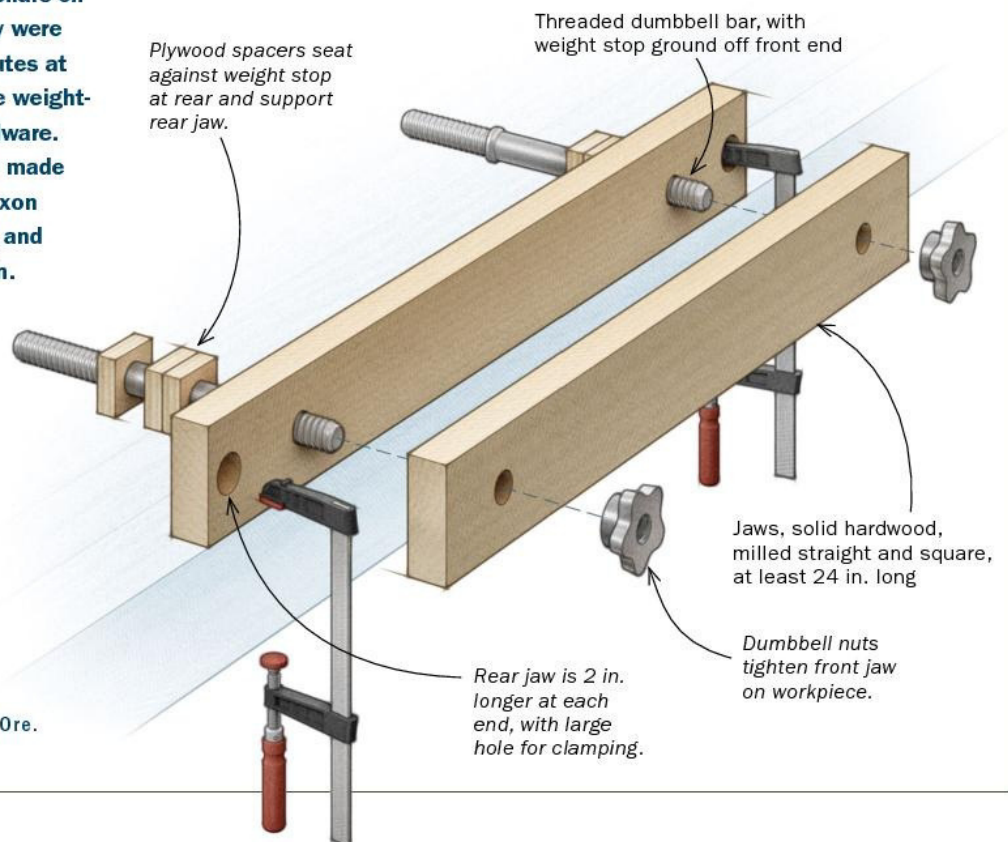




Dumbbell bars create a cheap Moxon vise

I've been wanting a Moxon vise but have hesitated to spend the money on some of the beautiful Moxon hardware out there. I'm not crazy about the makeshift alternatives I've seen either. Stumbling around in the garage one day, I saw some discarded dumbbell bars with acme threading and large lock collars on the ends and thought how similar they were to twin-screw hardware. After 15 minutes at the bench grinder, removing one of the weight-plate stops on each bar, I had my hardware. I made some simple spacers and then made the vise jaws as you would for any Moxon vise. The jaws will open to about 3 in. and hold tightly and securely, even at 24 in. long. The nuts spin freely and with a little momentum will close on the fly just like the high-priced version. The dumbbell bars sell for about \$20 on the web but are a dime a dozen at thrift stores and on Craigslist, etc. With a bit more work and creativity, I think the dumbbell bars will also work for a leg vise and other workbench fixtures.

—REX BOSTROM, Sweet Home, Ore.



Easy way to divide and organize drawers

I build a lot of drawers in my shop to store all my wonderful tools, including under my workbench. But a drawerful of tools and supplies will become a mess in no time without some kind of organizer. I keep the entropy at bay with a simple system of custom dividers, held in place with hot-melt glue. I use $\frac{3}{4}$ -in. plywood, which is cheap and easily cut to lengths and heights convenient for every application. The hot glue goes on fast and lets you start loading the drawer in seconds. Any time an adjustment is needed, a little bit of force will break the divider out. Fast, cheap, strong enough to serve, yet weak enough to remove without damage—it's perfect!

—CHASE HANSEL, Melbourne, Fla.

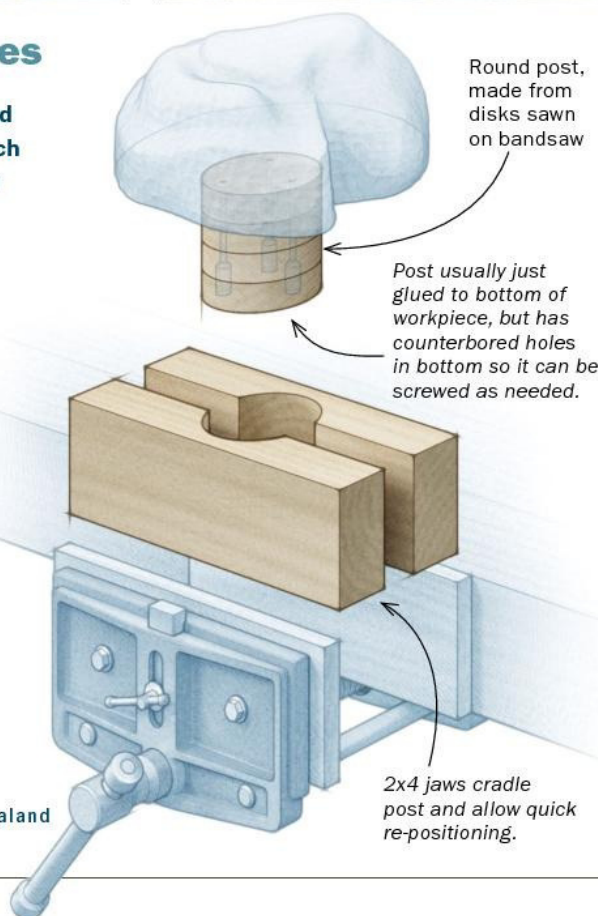


Carver's clamp allows access from all sides

I carve all sorts of objects, including some recent tuataras (a New Zealand lizard; see photo at top right) in tough black beech burl. This simple bench clamp works for most of them, letting me attack the work from almost any angle and reposition the blank within seconds. The post attaches to the carving with yellow glue, and is clamped in the two halves of a holding block, with force provided by any workbench vise. (You can add screws to strengthen the joint but I haven't found that necessary in most cases.) Release the vise and the workpiece can be turned 360°; by tilting the holding block in the vise, you can angle the workpiece up to 30° to allow undercutting. Tighten the vise handle again, and the carving is rock solid.

You'll need a lathe to turn the post, but the rest of the construction is simple. You could turn the post from one block, but for a long-grain glue joint with the carving, I cut disks on the bandsaw to about 3½ in. dia., glued them in a stack, and turned the post from that. In fact I turned a few posts, sized for various carvings. I counterbore and drill the posts for screws as needed. To make the holding block, I just traced the post on two pieces of 2x4 lumber, and bandsawed the matching half-circles. After carving, you can remove the post from the workpiece with a handsaw and clean up the cut faces with a sander.

—JOHN FRY, Richmond, New Zealand



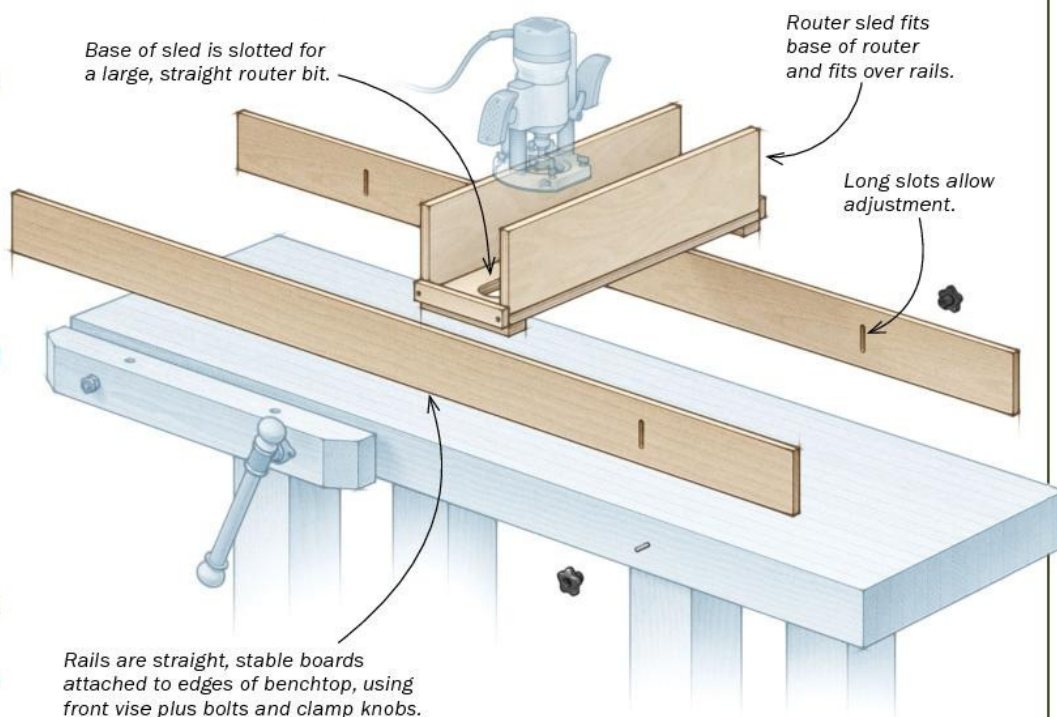


Turn your workbench into a wide jointer

I came across some rough 16-in.-wide walnut boards, far too big for my jointer. Inspired by the jig Nick Offerman uses to surface big slabs (FWW #222), I created a simplified version that sets up in minutes, with simple boards that are jointed straight and attached to the front and back edge of my workbench, and a slightly simplified version of Offerman's sled.

The rear board is attached permanently with bolts and clamp handles, and takes just a few seconds to raise. I clamp a second board to the front and measure to be sure the ends of both boards are the same height off the bench. My benchdogs make it easy to lock the lumber in place, and I wedge under the board, if necessary, to keep it level and stable. Then, just like Offerman, I load a fat straight bit in the router, zip the router back and forth on the sled, and the wide board comes out dead flat. If it will fit in my planer at that point, I surface the other side that way; if not, I just flip the board and use the jig again. On my bench I can flatten anything up to 25 in. wide and 6 ft. long.

—JOSHUA CSEHAK, Boston, Mass.



DIY benchdogs work perfectly

Square notch at top of dog for secure grip on workpiece



Standard $\frac{1}{8}$ -in. kerf cut on tablesaw, using push stick and featherboard



Rubber window-spline fits tightly in notch and sticks out slightly.

Most shopmade benchdogs employ bullet-catch hardware or spring steel to create some friction in the dog hole so that they can be adjusted up and down without dropping out of reach. I found an easier answer for my benchdogs. I used rubber spline material left over from repairing window screens, setting it in a sawkerf to create the perfect amount of friction. I started with a dowel that was $\frac{3}{4}$ in. dia. (the same as my dog holes) by 3 ft. long, using the extra length as a way to keep a safe, firm grip on the dowel. A standard-kerf (0.125 in.) blade worked perfectly for the spline material. I cut the slot to a depth between $\frac{3}{32}$ in. and $\frac{1}{8}$ in., pushing the first 7 in. of the dowel over the blade, trapped between the rip fence and a featherboard, with a zero-clearance insert below. Then I tilted the dowel up out of the cut. Last I sawed the little notch at the tip of the dog, cut it to length, and tapped the spline into place with a hammer.

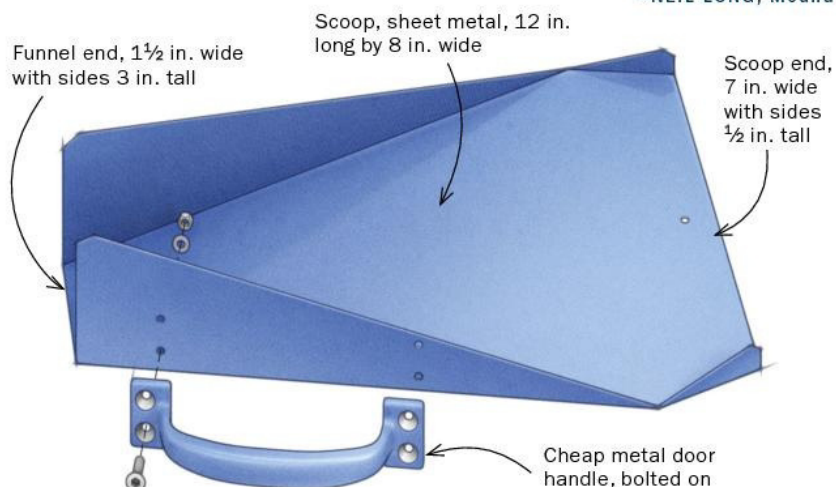
—ADAM WAGNER, Plymouth, Mich.



Metal scoop helps you sort through small parts

Here is a gadget I put together the other day that I should have made years ago. I am always sorting through nails, screws, nuts, and bolts, and I'm tired of dumping them out on the bench, losing some off the edge or down a dog hole, and then having to round them up afterward. It's a tedious, awkward process. This simple shopmade scoop is both tray and funnel, helping me fan out small parts for a closer look and then dump them smoothly back into the container they belong in. You might already have the materials you need. Any piece of stiff sheet metal will work, with a cheap door handle. The scoop is 12 in. long by 7 in. wide at the big end and $1\frac{1}{2}$ in. wide at the funnel end. The sides taper from 3 in. high at the funnel end to $\frac{1}{2}$ in. at the back. It sure speeds things up in my shop.

—NEIL LONG, Mound City, Mo.





Leg-Tapering Jig

Dedicated sled is dead-simple to build and use

BY TOM McLAUGHLIN

MAKING THE SLED

Tapered legs are a simple design choice that can dramatically affect the appearance of a piece. In most cases, when located at the corners of a table, legs are tapered only on their two inside surfaces. This produces a light and elegant look—not to mention the illusion that the legs are splayed, giving the table a sturdy and stable appearance. To get these results with greater efficiency, accuracy, and safety, I recommend a dedicated jig. The one I use is a breeze to make. It consists of a platform, some stops, and two toggle clamps.

Build the jig

Start with a leg blank squared to its largest finished dimension, cut to length, and with its joinery cut. Then, on the end grain at the foot of the leg, lay out the end points of the tapers. Make your marks slightly outside the final dimensions. You'll set up the jig to cut to these points and be left with a comfortable margin for handwork when you clean up and refine the taper.

For the sled's platform, use ½-in.- to ¾-in.-thick Baltic-birch plywood or another stable material, approximately 6 in. wide and 4 in. longer than the finished leg.

Now clamp the leg blank to the sled platform, with the material to be removed overhanging the edge. Position the top and bottom of the leg approximately 2 in. from the platform's ends, with the top of the leg leading the cut.

With the leg clamped in place, add the three pre-drilled plywood stop blocks—approximately ¾ in. thick by 1½ in. wide by 4 in. long—that will ensure



Mark the taper. On a square leg blank cut to length, mark the ends of the taper on a face and the bottom (top). Using the marks you just made, place the leg on the jig platform so the offcut overhangs the jig and the top of the leg is at the leading end (above). Then clamp the leg in position.



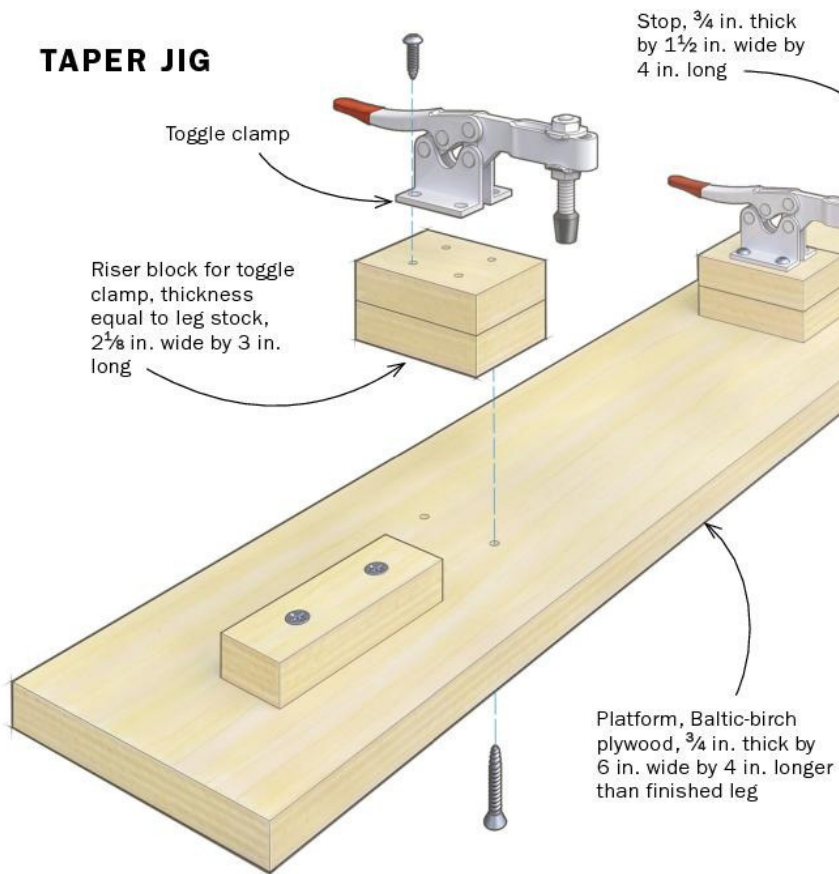
Add stop blocks and hold-downs. Three stops—one at the leg's foot and two flush with its side—are all you need for repeatable cuts. Toggle clamps screwed to riser blocks keep the leg secure as you feed it through the cut. Just make sure to get the right amount of clamping pressure. Too little, and the leg may slip during the cut, but too much may force the leg out of square.

CUTTING TAPERS



Set the fence. With the platform of the sled against the table-saw fence, slide the fence over so the sled just fits between it and the blade, as if you were ripping a board to the width of the jig (left). To check the setting, McLaughlin scrapes the leg with the blade to make sure the cut begins at his line or just past it.

TAPER JIG



accurate repeatability. All three stops should be pressed up to the leg. Screw the stops in place. Now you can remove the clamps and leg from the platform.

At this point, the leg can be quickly nested and placed against the stop blocks, but it won't be secure. For that, mount two toggle clamps to riser blocks roughly the height of the leg's thickness and secure them to the sled near the ends of the leg.

Using the jig

I prefer to use the sled on a tablesaw since it leaves the smoothest surface requiring the least clean-up, but you can also use it at a bandsaw. I recommend mortising the legs before tapering them. Not only does this spare you from cutting joinery on a non-square piece, but you also can use the mortises to confirm you're tapering the correct faces.

Slip a leg into position and clamp it in place. The mortises should be at the leading edge of the jig, with one facing down and the other toward the sawblade. Now slide the saw's fence to the edge of the jig platform so that the overhanging portion of the leg will be sawn during the rip. To confirm that the fence is where it should be, I turn the blade by hand to nick the leg to make sure the cut begins in the right spot or just past it.



Time to taper. As with any standard rip at the tablesaw, keep the sled tight to the fence. McLaughlin likes to use the nearer clamp as a handle for good control.



Rotate clockwise. This ensures you have square surfaces referencing on the jig's stops and platform for both taper cuts. Be sure to save the offcut for the second cut.

When feeding the jig through the cut, keep it tight to the fence, as if ripping a board. Using a toggle clamp as a handle during this operation offers safety and good control. It is important to have the splitter in place so the jig cannot drift into the back side of the blade, producing kickback.

After cutting the first taper, rotate the leg clockwise so the other mortise is facing the sawblade and the taper is facing up. Snap down the toggles and repeat. Note, however, after one side has been tapered, the toggle over the bottom of the leg will no longer touch when snapped into position. A spacer shim can quickly be made from the initial tapered cutoff.

When all tapers are cut, handplane them to clean off any machine marks. Be careful here, though. Don't extend the taper so far that you leave a gap at the bottom of the apron shoulder. Pencil a line where you want the taper to stop and then a series of scribbles below that to let you know when you're nearing your line. Also, take care to keep the tapered surfaces square. □

Tom McLaughlin is a furniture maker, woodworking teacher, and new host of public television's Rough Cut with Fine Woodworking.

Online Extra

For tips on how to finesse the taper by hand, go to FineWoodworking.com/268.



Offcut simplifies second rip. After one side has been tapered, the toggle over the bottom of the leg will no longer touch when snapped into position. A spacer shim made from the initial tapered cutoff and cut to length quickly solves this problem.



Stylish Serving Trays

Strong, light, and graceful, they deliver breakfast beautifully

BY HEIDE MARTIN



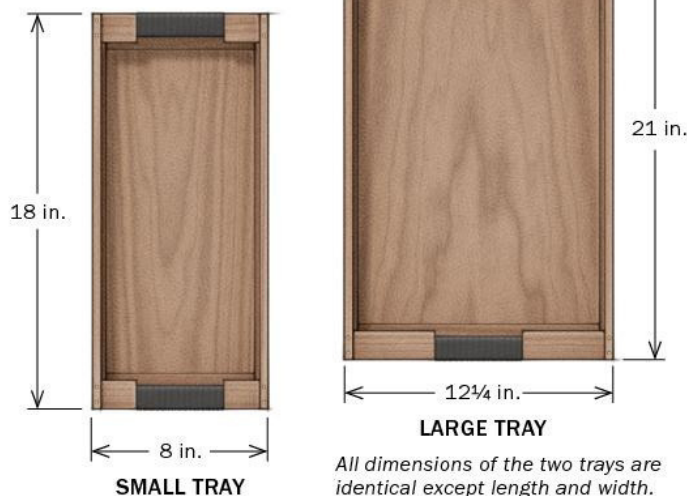
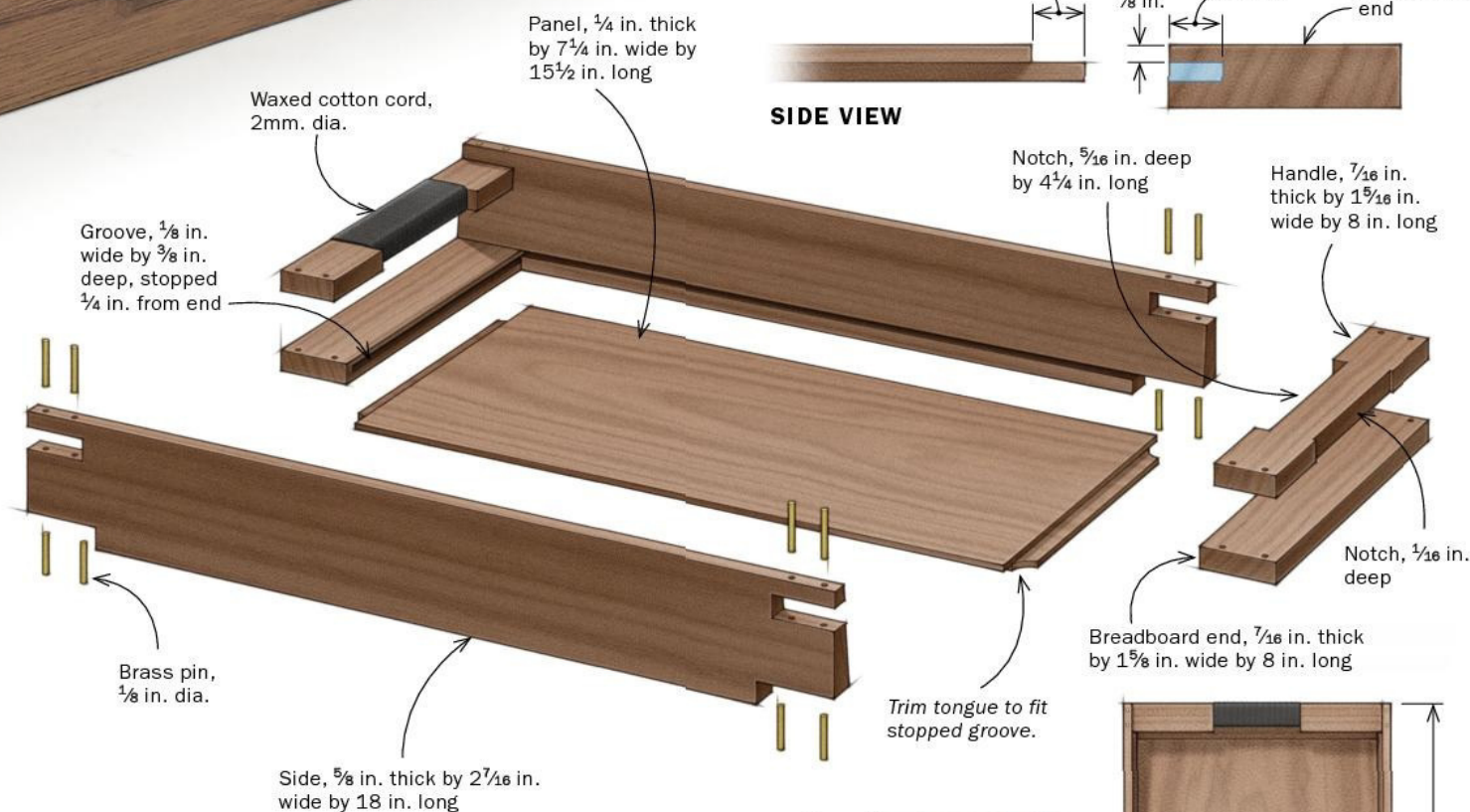
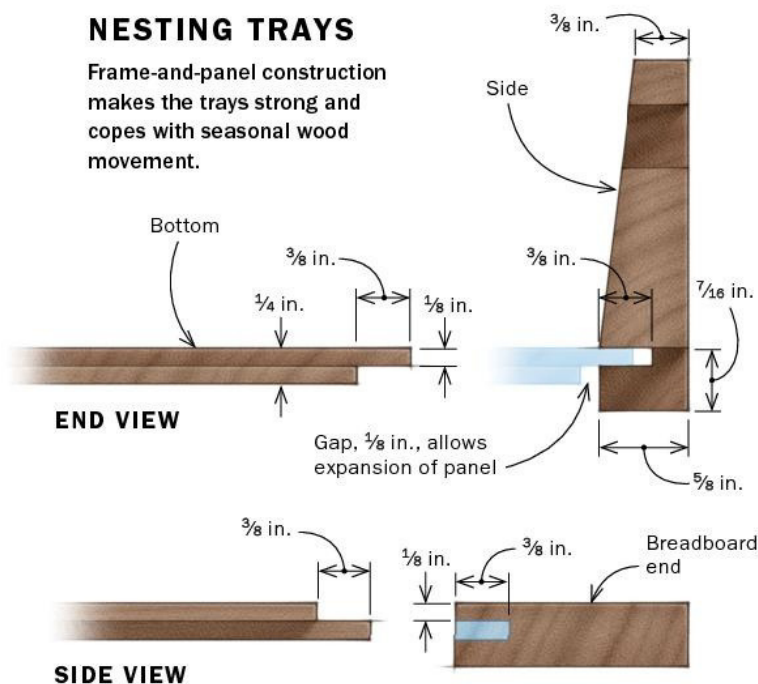
As is often the case with clean, simple designs, there is more to this set of serving trays than meets the eye. Relying on solid-wood construction, these trays pack a surprising number of techniques into a small package: breadboard construction, exposed joinery, tapered stock, pinned joints, and cord lashing. I designed the trays with batch production in mind, and arranged things so that although the two trays nest inside each other, once the components are cut to length and width, the joinery for both sizes can be cut with the same machine settings.

Trays make excellent gifts and have the potential to be used daily. In my home, the small tray gets constant use carrying condiments to the dinner table or placed on the sofa as an extension of the end table. The large tray is handy for carrying a meal to the



NESTING TRAYS

Frame-and-panel construction makes the trays strong and copes with seasonal wood movement.



dining table, or as a document organizer in the home office. Both are handsome enough that we do not stash them away: We leave them on the table during meals, and then store them vertically on the kitchen counter. In this article I'll lay out the steps needed to create a single tray, and you can use the provided dimensions to build either size, or a full set.

Prepping and cutting joinery for handles and breadboards

I begin the tray by milling the handles and breadboard ends. I leave all these parts about $\frac{1}{16}$ in. over final width and length—I'll trim them flush after glue-up. Then I cut the lap and bridle joints in the sides that receive the handles and ends. I cut them at the tablesaw with a $\frac{7}{16}$ -in.-thick dado stack and a tenoning jig with

Prepare the parts

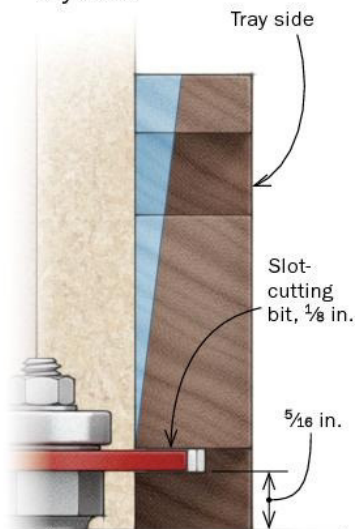
CUT THE JOINERY



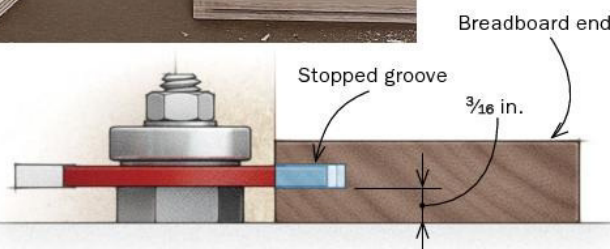
Notch the sides. Using a shopmade jig that rides the tablesaw's fence, Martin first cuts joints in the sides for the handles (left), then for the breadboard ends (right). She uses a dado set for both.



Grooves for the panel. With a slot-cutting bit in the router table, cut through-grooves in the tray sides.



Stopped grooves on the ends. Make a stopped groove for the bottom along the inside edge of the breadboard ends. The grooves in the breadboard ends are at a different height than those in the sides, so you'll need to reset the bit height.



a tall fence. I use a sacrificial backer behind the workpiece to avoid blowout.

You can use the same dado set with a crosscut sled to cut notches in the handles where the cord will be. On the outside of the handle, cut the notches just deep enough that the wrapped cord will be slightly proud of the rest of the handle.

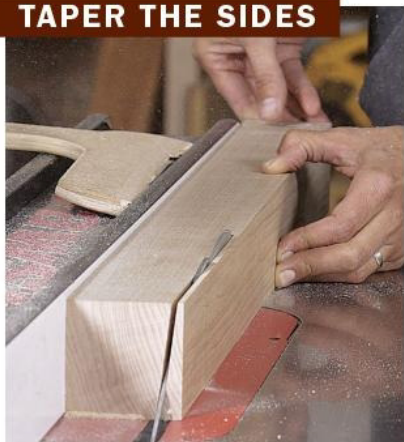
A slot-cutting bit for simple panel joinery

With the major joinery cut, shift your attention to the bottom panel. Begin by planing and sanding it to final thickness. Its thickness should be exactly double the width of the groove made by the $\frac{1}{8}$ -in. slot-cutting bit.

At the router table, cut a through-groove in the tray sides. Set the fence so it exposes just over $\frac{3}{8}$ in. of the cutter; this provides added depth to avoid having the tongue bottom out. Set the bit so the top of the groove is in the same plane as the cheek of the notch for the breadboard end.

Then cut stopped grooves in the breadboard ends. This

TAPER THE SIDES



A sled for a slant. To taper the sides, Martin makes a special nesting jig for the planer. She makes an angled ripcut in a piece of solid maple (left), then screws on fences and an end block (right).



Taper gradually. Take a number of shallow passes through the planer to achieve the taper, stopping when the taper reaches the groove for the bottom.

will require resetting the height of the router bit, since these grooves are not in line with the grooves in the sides. Clamp stop blocks to the fence to stop the groove $\frac{1}{4}$ in. or so from the ends of the workpiece.

One router setting for two joints

When setting up to cut the tongues on the panel, I make a test piece milled to the exact dimensions of the panel; it is invaluable for dialing in my settings. Using a 1-in. straight

bit exposed $\frac{3}{8}$ in. through the fence, cut the tongues on the ends of the test piece: The distance between the shoulders should exactly match the distance between the shoulders of the joints on the sides.

To cut the tongues on the sides of the panel, flip it and run the top faceup. First, however, cut the test panel to check the fit. To allow for expansion of the panel, leave a $\frac{1}{8}$ -in. gap between the end of the tongue and the bottom of the groove.

Finally, trim the corners of the

NOTCH THE HANDLES

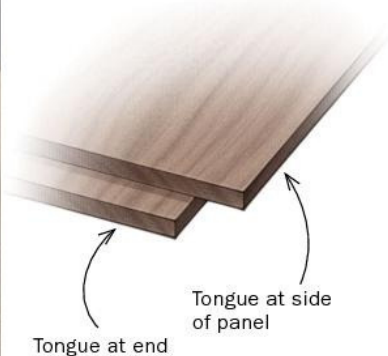


Get ready to wrap. Martin makes relief cuts on the handles where they will be wrapped with cord. The dado set leaves a slightly rough surface, which is good because it gives the cord extra purchase.

RABBET THE BOTTOM



Rabbets all around. At the router table, cut rabbets on all four sides of the panel. When cutting the end rabbets, run the panel facedown; for the sides, run it faceup.



Assemble the tray

Begin with the bottom. Martin glues up the tray in two steps, first gluing the bottom panel to the breadboard ends. She pre-finishes the panel and applies glue only to the center inch or two.



tongue to fit into the stopped groove. Raise the bit to the full thickness of the panel, and clamp a stop on the table to clip off the end of the tongue.

Planer sled tapers the sides perfectly

To angle the sides I use a sled for the thickness planer. To build it, rip a piece of hardwood to 83.8°, then plane it smooth. Attach a stop to one end and both sides. Wax the bed and sides of the sled.

Cut the taper using a series of light passes through the



Second assembly. Martin pulls the corner joints together with clamps along and across the glue-up. A brace built to fit inside the tray keeps the sides aligned correctly. The sides of the bottom panel are left unglued.



Now squeeze. With the joints pulled home, Martin removes one set of bar clamps and locks the joint with vertical pressure.

Post-cure cleanup. Having cut the ends and handles slightly overlength, Martin carefully planes them flush to the sides once the glue has cured.



planer, stopping when the side is about $\frac{3}{8}$ in. thick at the top edge and the taper reaches the top of the groove or a bit beyond. If you have any snipe in your thickness planer, take the sides to just over final thickness, then clean the snipe with a few passes of a bench plane.

A two-stage glue-up

Gluing up this tray in one fell swoop can be tricky; a two-stage glue-up gives me more control. Dry-fit the full tray before the first glue-up, taking care that the panel pulls tight to the breadboard ends and the lap joint between the ends and sides closes up.



Add pins

A strong detail.

To dress up the tray and cinch the joinery, Martin adds brass pins at the corners. She drills two stopped holes from the top and two from the bottom.



Quick chamfer. To make the pins easier to drive, Martin chamfers the leading end, chucking the pin in a drill and spinning it against a file.



Rough it up. Epoxy needs purchase, so Martin files notches in the pins.



The top should be clean. Martin smooths the top end of the pins with sandpaper before gluing them in; this avoids problems with getting brass dust in the grain of the wood.

Before the initial glue-up, I pre-finish the bottom panel, taping off 1 in. at the center of the tongue where I'll apply glue. Then I tack-glue the panel to the breadboard ends. To help with alignment, I pencil a very fine mark at the center of the panel and the breadboard. I also set my combination square to $\frac{3}{8}$ in. as a physical reference during the glue-up.

For the second glue-up, a spacer jig set into the tray helps to hold the sides at the proper distance. Remember that after assembly, the ends of the handles and bread-

boards will sit $\frac{1}{32}$ in. or so proud of the sides, depending on how overlong you cut them.

Finishing touches

I use pins to reinforce the joinery. I prefer $\frac{1}{8}$ -in. metal pins, and I set them with epoxy; alternately, you could use shop-made wooden pins. I cut rough notches into the sides of the metal pins to allow for glue purchase, and I taper the driving end to ease insertion.

I use two coats of Osmo Polyx Hard Wax Oil to finish the tray. Since I prefinished the



Drive them flush. After spreading epoxy in the holes with a toothpick, Martin inserts the pins and drives them flush with a mallet and block.



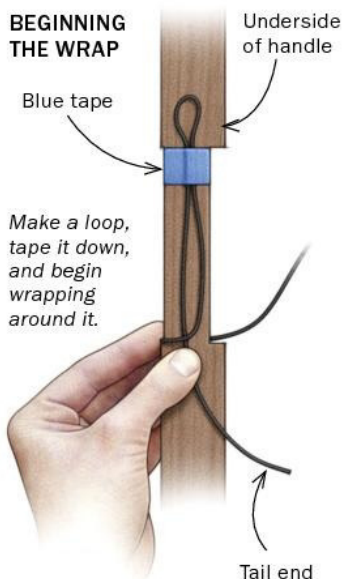
bottom panel, it will get at least three coats total. Once the oil has cured, I apply a coat of Clapham's Beeswax Salad Bowl finish for extra luster and protection.

The final step is lashing the handles. I use a 2mm-dia. waxed cotton cord, and a basic lashing technique that is often used on the handles of knives and axes. Make sure to start and end your lashing under the handle, where it will be hidden. I made a small wooden shuttle to make the lashing easier. I wrap a length of cord around the shuttle, allowing me to keep the cord tight and tidy while working. □

Heide Martin designs and builds home furnishings in Appleton, Maine.

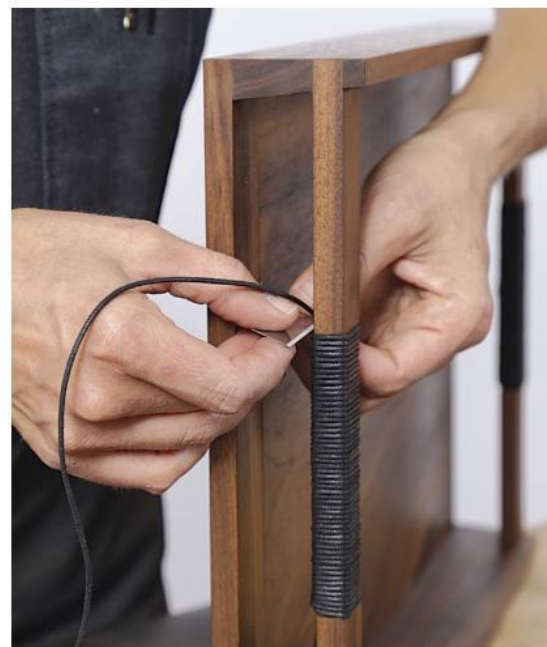
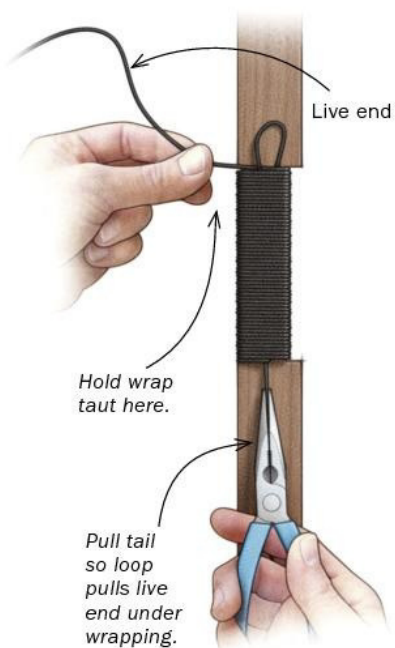
Wrap the handles

BEGINNING THE WRAP

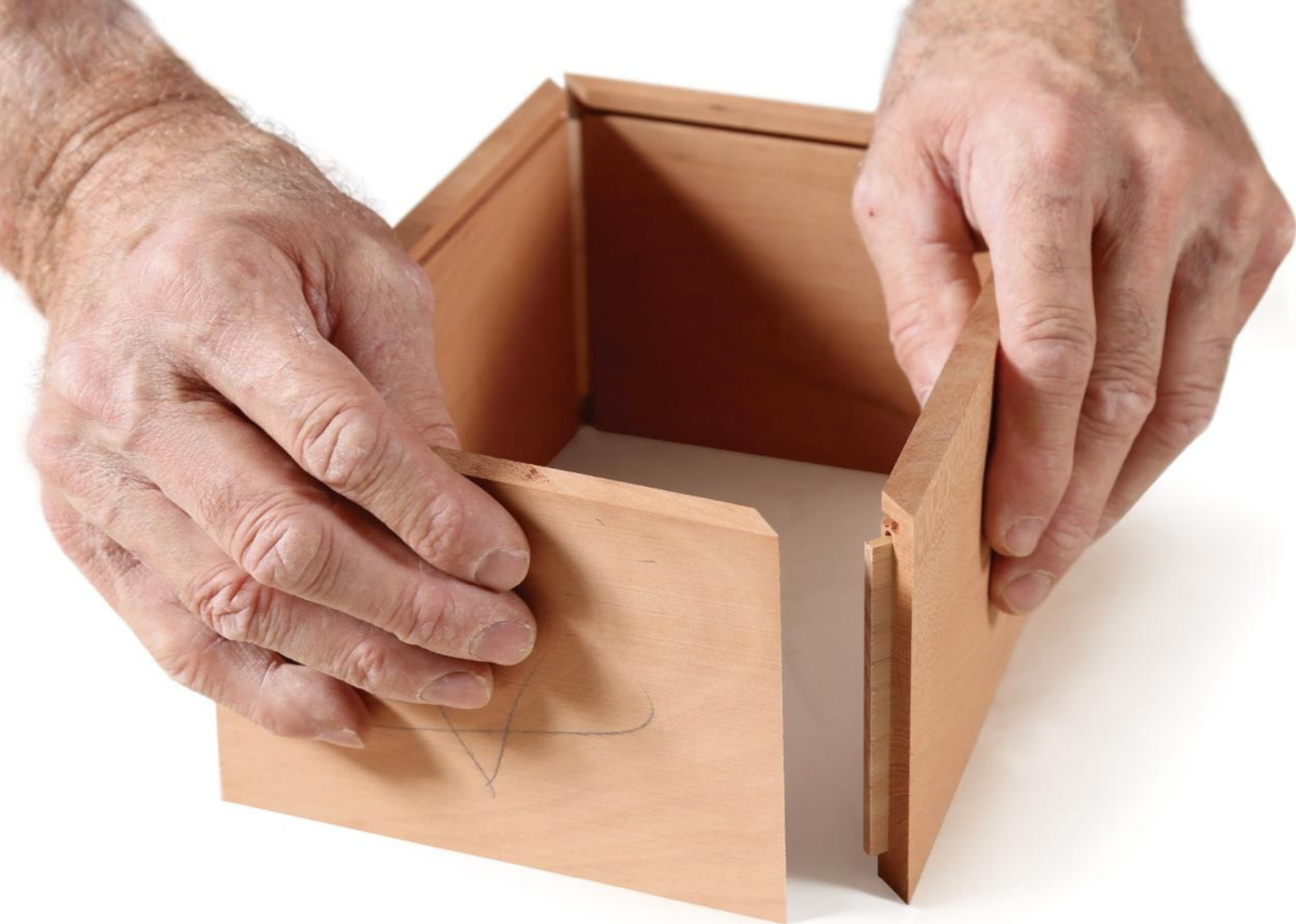


Lash the handle. Martin uses blue tape to hold a looped length of cord in place, then begins wrapping at the opposite end of the handle. She winds the excess cord around a small shuttle, which makes it easier to handle while wrapping. Exerting pressure with a metal rule helps keep the wrapped courses of cord tight.

FINISHING THE WRAP



Needle and knife. A pair of needle-nose pliers helps Martin pull the end of the cord under the wrapping to finish up. Once she has it pulled tight, she cuts the end with a utility-knife blade.



Add Splines for Stronger Miters

Quick jig produces clean joints with hidden power

BY DOUG STOWE



When making mitered boxes, I carefully select the stock for its character and grain, which I like to wrap around all four sides. Splines help me bolster the joint by adding long-grain glue surface. Cutting them into the box's outside corners after assembly can interfere with the wood I have so methodically selected. That's why I often tuck the splines into slots routed into the miters.

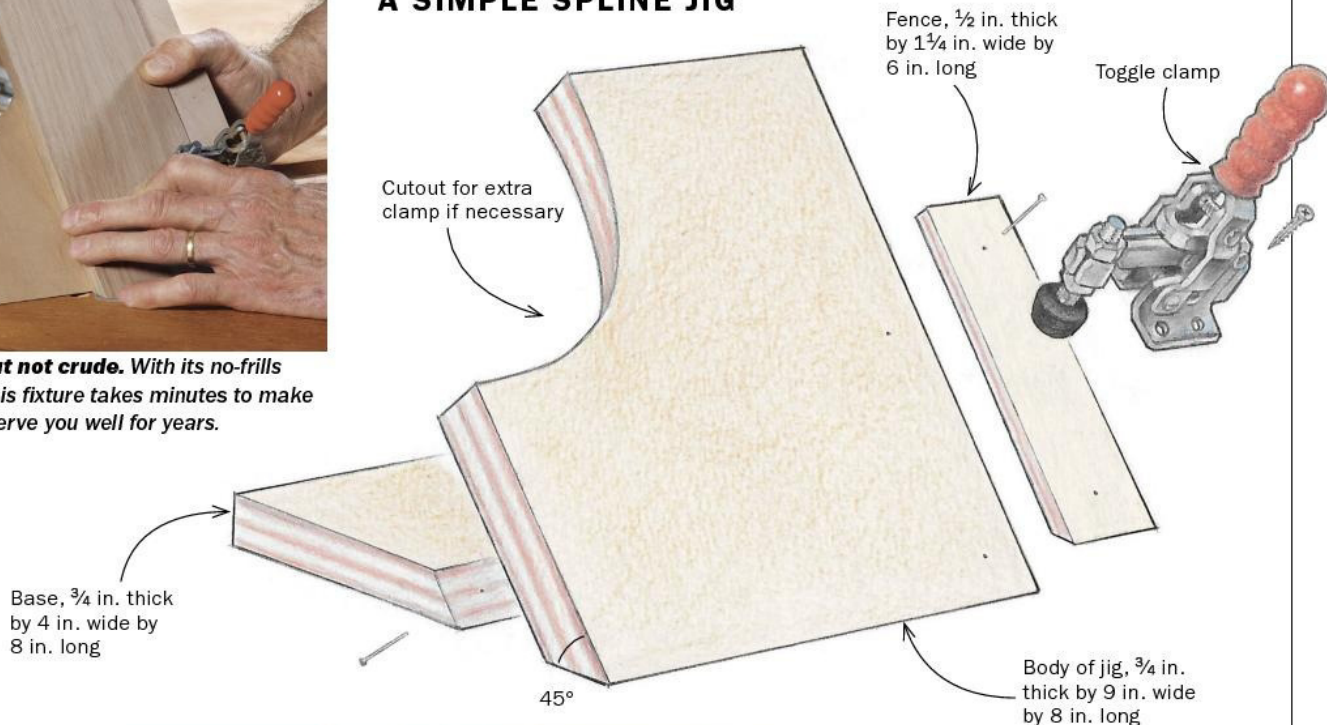
These joints are easy to cut with the right jig and they are plenty strong, and

unlike most miters they can be brought together with common clamps. Plus, unlike many other types of joinery for boxes, the splines are invisible in the finished box. Well, perhaps I should qualify that: They are invisible on the outside of the box. If you cut the lid free from the body, as I like to do, the splines will be visible when the box is open. I often make the most of this design opportunity by using a contrasting wood for the spline (see photo, left).



Basic, but not crude. With its no-frills design, this fixture takes minutes to make but can serve you well for years.

A SIMPLE SPLINE JIG



Flip and secure. With the parts inverted, apply glue and nail through the base into the body of the jig.



On the fence. Miter a strip of wood for the jig's fence. Keeping it flush with the bottom and side of the jig, nail it in place. Then attach a toggle clamp to it.



Making the jig

Building the jig requires little more than cutting a miter, nailing three pieces of wood together, and adding a toggle clamp. In about 10 minutes, you'll have a reliable fixture that gets you right to box making.

Start with a piece of 3/4-in. plywood or MDF about 8 in. to 9 in. wide by 12 in. long. Set your sawblade to 45° and crosscut the blank about 4 in. from one end. The shorter piece will be the base that rides on the router table and the longer one the body, which supports the box parts. Before attaching them, make a circular cutout on one side of the longer piece to allow for additional clamps when using the jig.

Flip over the short piece and spread glue along its mitered edge. Set it in place, flush with the mitered slope of the longer piece. Drive a brad and check that everything's still aligned. If something moved, tap it gently back in place. Drive more nails to reinforce the joint. Along the right side of the jig, add a fence with a toggle clamp to lock the workpieces in position.

Cutting the box parts

With the jig ready, I turn to making the mitered box. To make sure the miters are

Miters first

First stop. After laying out his box sides, Stowe secures a stop to a crosscut sled (right). This allows him to make repeat miters on the long sides (below).



Second stop. For boxes with ends shorter than the sides, you'll need to reset the stop. For this box, Stowe is wrapping the grain around the sides, so he aligns this miter to remove as little as possible on the outside face.



tight, I take a handful of careful steps. First, I use a tablesaw sled dedicated to 45° cuts. Second, when angling the sawblade, I use a digital gauge and double-check with a combination square. Then, to triple-check, I usually cut a test miter on stock thicker than the box sides, since the thicker stock will amplify any error in the angle. Finally, I use stop blocks on my crosscut sled to make sure the sides come out at consistent lengths. If I want the grain to wrap around the box, I mark the sides to keep track of them.

Routing the spline slots

To use the jig, you'll need a router table with a fence, two stop blocks, and a $\frac{1}{8}$ -in. or $\frac{3}{16}$ -in. straight bit. I use the $\frac{1}{8}$ -in. bit for box sides $\frac{3}{8}$ in. to $\frac{1}{2}$ in. thick but prefer the $\frac{3}{16}$ -in. router bit if the stock is $\frac{5}{8}$ in. or thicker.

I typically eyeball where to set the fence and the bit's height, aiming to place the spline so that it's roughly centered in the stock. However, make sure that the slot is located at least $\frac{1}{16}$ in. from the inside face of the stock.

Next up are the stop blocks, which get clamped to the fence to start and stop the slot. When making a box that has grooves for the top and bottom, I limit the spline slot to avoid cutting into either groove. To accurately set the fence and the stops, temporarily mount the workpiece inside face out, so you can locate the stops by referencing off the mitered face.

Slots for splines



Set the stops. To accurately set the fence and the stops, temporarily mount the workpiece with the inside face out, so you can locate the stops referencing off the mitered face. If your box has grooves for the lid and bottom, locate the stops so you don't rout into them.



Where to rout. With the stock in the jig, Stowe eyeballs where to locate the fence. He aims for the bit to be roughly centered in the stock and always leaves at least $\frac{1}{16}$ in. of clearance between the slot and the inside face of the workpiece.

To rout the slot, mount the inside face of the workpiece against the jig. Push the piece against the fence and clamp it down while holding it and the jig against a flat surface, guaranteeing the end of the stock and the base of the jig will be flat against the router table. Double-check that things are aligned, since any discrepancies will keep the joint from closing easily. For example, failing to get the miter flush with the bottom of the jig can result in a slot that's too shallow for the spline to fit at the intended depth.

Hold the jig firmly against the fence when you rout the groove, and pivot against the stops to enter and exit the cut.

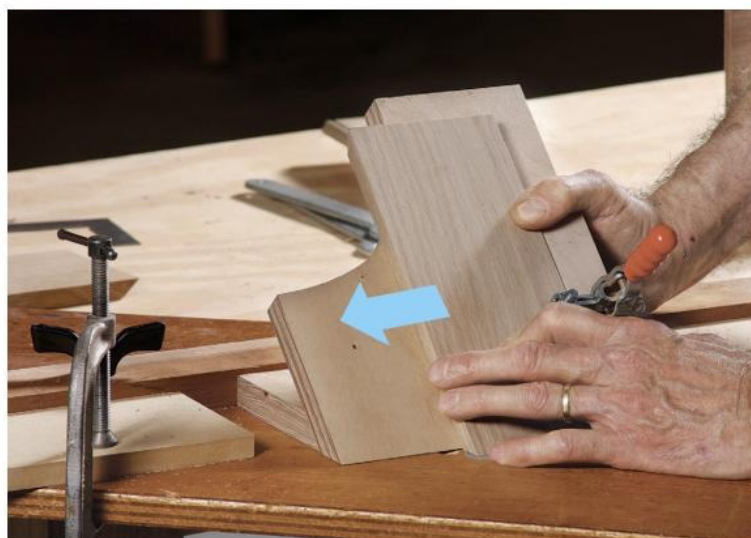
Making the splines

Make sure the grain of the splines runs in the same direction as that of the box when installed. This makes for the strongest joint, and the splines expand and contract with the box, maintaining the strength of the joint as the weather and humidity change.

To make the splines, thickness an over-long piece of stock to fit the slots. The blank should slide in and out with slight finger pressure; a fit that is too tight will cause problems during glue-up.

Online Extra

For another take on miters, watch Duncan Gowdy create rock-solid miters with L-tenons at FineWoodworking.com/268.



Plunge and push. Pivot on the right stop to plunge into the cut and then move the jig across to the other stop. When you get to the far stop, lift the trailing end to exit the cut.

Get it together

Crosscut and test the splines. Be sure the grain in the splines and the box sides runs in the same direction. After thickening the spline stock and ripping it to fit the slot's length, use a stop to crosscut the splines to width.



Dry run. Before glue-up, slip the splines into place and bring the corners together to check for gaps. Make sure the splines don't bottom out and prevent the miters from closing.

Rip the blank to width to establish the splines' length, which should be a bit shorter than the length of the slots. You can use a sanding block to round the edges to match the slots' rounded ends, but sometimes I skip this step since the corners will be buried, never to be seen again. Crosscut the spline stock to create individual spline pieces.

Before gluing up the box, dry-fit the splines and make sure the box parts come together without any gaps. If necessary, sand or trim the splines to fit.

Assembly tips

Gluing up a mitered box with hidden splines is a bit different than gluing up a mitered box without them. With typical mitered boxes, F-style clamps squeeze things out of alignment unless you use special cauls or glue blocks. But here the hidden spline directs clamping pressure in a way that allows you to use these common clamps right on the box. If you use F-clamps, be sure to tighten them from both directions to bring a particular corner together. Frame clamps work as well when you're ready to assemble (for a homemade option, see "Shopmade corner clamps for boxes," *Workshop Tips*, *FWW* #259). Put a bit of glue on each mitered surface and slot. Assemble the sides around the top and bottom panels, easing the box together from all four sides at once. □

Doug Stowe is a woodworker and teacher in Eureka Springs, Ark.



Clamping options. Frame clamps work well for assembling small boxes with hidden-spline miters; Stowe uses shopmade ones. F-clamps work, too. Although standard miter joints slip if you use F-clamps, the hidden splines keep things in place.



Creating Curves

Learn when it's best to saw, steam-bend, or laminate

BY BRIAN BOGGS



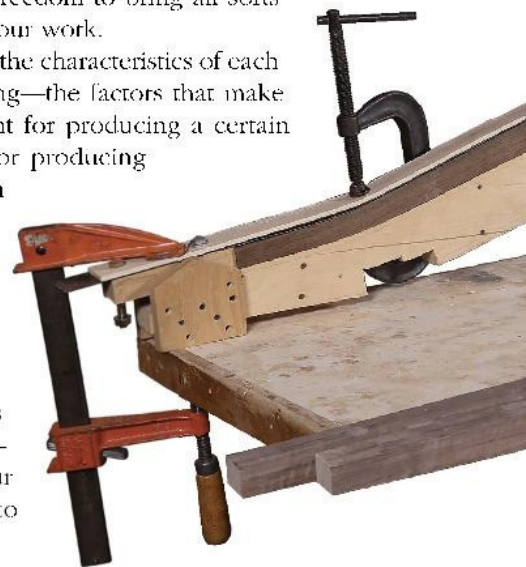
A straight line is a wasted opportunity. I love that quote from the furniture maker Jere Osgood, a wizard with curves.

It's been curves and their sculptural relationships that have kept me so enthusiastic about furniture design for more than three decades.

Curves move and flow and add life to a piece. And, yes, they add technical challenges. A mastery of curves is vital for a chairmaker, but it is also a great boon for the maker of casework and tables.

There are three chief ways to get the curve you want: sawing, laminating, and steam-bending. Each of these methods has an important place in my designs. Sometimes all three are called for in a single chair. Understanding the benefits and limitations of each method and knowing which one to use in each new situation will give you the freedom to bring all sorts of curves into your work.

Here, I'll lay out the characteristics of each approach to bending—the factors that make one method just right for producing a certain curve but all wrong for producing another one. In addition to weighing the factors I describe, you'll want to consider the variables particular to your situation: questions of space, tools, time, and the number of duplicate parts you're making. These factors will also guide your decisions about how to achieve a curve.



Sawn curves

Sawing is the starting place. Even if you've mastered steam-bending and lamination, sawing will often be the default choice for producing a curve in wood. It is the simplest and quickest method, and it requires the least setup. It allows you to make limitless shapes and, unlike steam-bending and lamination, it lets you create different curves on opposing sides of a workpiece. It also enables you to create curves in stock of virtually any thickness—you're limited only by the capacity of the saw you use.

The bandsaw is the primary tool for sawing curves. Depending on the situation and on your tool kit, of course, you might sometimes use a scrollsaw, a saber saw, or a jigsaw instead. But the bandsaw is the workhorse of sawn curves.

Sawing



ADVANTAGES

- Fastest, most straightforward method
- Works on parts of many sizes and shapes
- Can be used with virtually any wood species
- Typically requires few if any jigs and minimal setup
- Enables you to cut multiple curves on one workpiece
- Works with sheet goods

REQUIREMENTS

- A bandsaw (or, for smaller curves, a jigsaw or sabersaw)
- Tools for fairing sawn surfaces
- Solid stock or sheet goods

CHALLENGES AND LIMITATIONS

- Structural problems when curve doesn't follow the grain
- Aesthetic problems when curve doesn't follow the grain
- Can be wasteful of material
- Sawn surfaces often require cleanup with router, files and rasps, sandpaper, etc.

Steam-bending



ADVANTAGES

- Perfect grain continuity along the bend is great structurally and an aesthetic boon
- More resilient than parts sawn to a curve
- Economical use of stock
- Once the bending forms and steambox are built, it's the most efficient of time and material
- Parts can be fully shaped without glue-line issues

REQUIREMENTS

- Steambox
- Bending forms
- Air-dried, straight-grained solid stock
- Knowing each species' steamability and amount of springback
- Plenty of clamps

CHALLENGES AND LIMITATIONS

- Steepest learning curve
- Springback can vary from part to part even with stock from same source
- If improperly set or cured, workpiece can move
- Ability to bend varies greatly between species
- Expect breakage
- Difficult or impossible to bend pieces too wide, too thick, too long, or too short

Bent lamination



ADVANTAGES

- Grain continuity is a structural advantage
- Any species can be used
- Virtually no springback
- Bends are consistent from part to part
- Strongest, most stable
- For cost-efficiency, can combine show laminates with cheaper interior ones
- Can create tapered curve by tapering the laminates

REQUIREMENTS

- Laminates cut from solid wood
- Shopsawn laminates require a bandsaw and access to a thickness sander
- Bending molds, or forms
- Understanding glues and gluing suitable to the species and use
- Powerful clamps

CHALLENGES AND LIMITATIONS

- Significant waste and work required to generate shopsawn laminates
- Visible glue-lines on edges of finished workpiece
- Not possible to sculpt finished piece without cutting through outer laminate, exposing wide glue-lines

TRESTLE TABLE

This table features bandsawn curves on all its parts, from foot to top.

Stretcher can be **sawn** because the curve is relatively gentle. Boggs found a board with naturally arched grain to follow the curve. Also, the part is massive enough that solid wood will provide plenty of strength; the higher strength-to-weight ratio provided by bent lamination wasn't needed.

Foot, post, and top rail must be **sawn**, since opposing sides are shaped differently.

Limitations and challenges—

The key limitation when you saw curves in solid wood is grain continuity. To put it bluntly, short grain is the curse of the sawn curve. For both structural integrity and aesthetic appeal, it's always best to have the long grain of the workpiece follow the curve as much as possible—or at least not to fight it too fiercely. The tighter the curve's radius, the more likely you are to create a structural or visual problem. You'll need to design parts and orient them on the raw stock to minimize short grain and take advantage of any natural curve in the grain.

BEREA LADDERBACK

The rocker combines steam-bent back posts and back slats with sawn arms and rockers.

Slats are **bandsawn** to perimeter shape, then **steam-bent**. Boggs steamed them because it's simple and it avoids gluelines; they could be laminated instead if he wanted a highly figured show veneer and didn't mind gluelines on the edge.

Rear posts are **steam-bent**. They couldn't be laminated because they are shaped to a flat on the front (beginning above the second slat), which would expose wide gluelines.

Rockers are **bandsawn** to shape. For these narrow, Shaker-style rockers, neither steaming nor lamination is practical.

Bent-lamination

A curve made by bent lamination will be the strongest and most stable of all the choices. It allows the thinnest, lightest option for creating a strong part. And it produces a workpiece with grain that follows the curve completely. That fact, combined with the multitude of face-grain glue joints, gives a laminated part its great strength. Unlike steam-bent parts, laminated ones experience virtually no springback when you take them out of their forms. Most bent laminations are made with laminates of a constant thickness, but you can also create curved workpieces that are tapered in thickness by gluing up tapered laminates.

Bent lamination will work with virtually any wood, and for most shops it is simpler and easier than steaming, since the steambox and steam-bending forms are more time-consuming to make than the forms needed for lamination. Lamination also makes more sense whenever

you have limited access to air-dried, straight-grained wood—required for steam-bending—or when you are working with tropical woods, which typically don't steam-bend well but do fine in bent lamination.

Limitations and challenges

—Bent-lamination depends entirely on glue bonds for its structural integrity. Successful bends require accurately machined laminates, uniform pressure throughout the bend, and a full understanding of the glue.

Although bent-lamination produces a part of maximum strength, it does so at the cost of many exposed gluelines, which can detract visually from the piece. A number of variables affect the visibility of the gluelines—the grain of the wood, the thickness of the laminates, and the color contrast between the hardened glue and the wood. Also, cutting into the face of a bent-laminated workpiece risks exposing the gluelines—sometimes creating an ugly wide stripe—so makers generally avoid shaping the outside laminations. Shaping is typically restricted to cutting into the edges, or tapering the laminates individually.

Steam-bending

Steam-bending is my favorite way to produce curved parts. The wood grain follows every curve and has a perfectly natural appearance; the steam-bent part has no glue-lines to cope with, so it can be shaped after steaming. If I'm making multiples, steaming is typically my first choice. Economy has a lot to do with this, as a steam-bent part is almost always quicker and less expensive to reproduce once the steamer is built and the forms are made.

Not all steam-bending requires complex forms. While I might invest a lot of time making a production leg-bending form, I can bend slats for fanback chairs with no form at all—just a bar clamp. I can make fine adjustments to the shape at assembly, either cold or with a heat gun.

CRESCENT TABLE

The pedestal is composed of four bent-laminated curves. The top is plywood, bandsawn to shape and veneered with curly maple.

Legs are **laminated**, and their sides are skinned with veneer after lamination. Steaming these legs would be possible on a smaller base, but impractical on a larger one because the parts are so hefty and the curve is so tight.

The four legs are joined in miters that are tricky to cut and fit; bent lamination, by producing parts with identical curves, makes the joinery less challenging. Steamed parts, with their springback, would not be as consistent. Sawing the legs would not be advisable, as it would produce very weak parts due to grain runout.



OUTDOOR ROCKER

Built of mahogany, this chair relies on lamination for its rockers and back slats, sawn curves elsewhere.

Back slats are **laminated** instead of steamed to produce consistent curves that line up precisely. Steaming would not have been a good choice anyway, because the chair is made of mahogany, which suits the outdoors, but doesn't steam well.

Seat slats are sawn. First, their sides (which taper) are **bandsawn**; then all five slats are placed on a carriage and have their front and back end curves sawn as a group.

Rockers are also a **lamination**. For an indoor chair, Boggs would usually saw these rockers. But sawing would expose a lot of end grain underneath, not a good thing in an outdoor piece, and would waste a lot of mahogany. Lamination is also a good choice because it produces identically curved rockers.



SUNNIVA SWING

Bent lamination produces the long, sweeping curves in the stand and the swing. The slats, too, are laminated.

The back slats and seat slats are **bent laminations**.

Boggs stacked them and bent four at a time. They could have been steamed, but given the variation in springback with steamed parts it would have been difficult to get the slats to line up perfectly.

The arm stumps are **bandsawn**. They could have been made with a tapered lamination, but sawing from solid wood, which is far simpler, is plenty strong since the part is so massive.

The big bowed parts are **bent laminations**. Lamination enables Boggs to bend far longer and stouter parts than he could by steam-bending. Also, the piece is mahogany, which works fine for lamination but doesn't steam-bend well.

Arms and arm stumps are sculpted on the **bandsaw**.

SCULPTED FANBACK ARMCHAIR

This recent chair utilizes all three approaches, employing bent lamination, steam-bending, and sawing.

Crest rail and lower back rail are both **steamed**, allowing maximum shaping while avoiding gluelines.

Back slats are **laminated** to achieve consistent curves. Also, because he inserts the back slats only after the back frame is glued up, Boggs needs the slats to bend without breaking, which thin bent-laminated parts will. If he steamed the slats, they'd have to be thicker for strength, and he would lose some to breakage.

Rear legs are **steamed**, creating parts that are strong and can be shaped after bending, with grain that follows the curves and is free of gluelines. Steamed parts are also more flexible than laminated parts of the same thickness. The balance of flexibility and clean shaping made steaming the best choice.

Limitations and challenges— Successful steam-bending requires an understanding of the specific wood species you want to bend. You need to heat the wood just enough to achieve maximum plasticity without weakening it too much, and the bending forms need to be made with each species' springback tendencies considered. Also, there are many species—especially tropical ones—that simply don't steam-bend well.

There's a learning curve with each new shape, jig, and species. And until you have worked out these issues, there is bound to be some breakage—consider it a small fee for mastering the process. □

Brian Boggs, who first appeared in *Fine Woodworking* in issue #48, builds furniture in Asheville, N.C.

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Inspiration for our readers, from our readers

C. STUART WELCH

La Conner, Wash.

Welch made this dressing table from quilted mahogany he bought in 1985, which he says is extremely rare wood from a tree pulled from a ravine in Belize in the 1960s, and featured in *FWW* #54. "The price in 1985 was \$30 per board foot, very expensive in those days. I purchased more than I could afford. To date I have made three pieces from the wood: a chest of drawers, a hope chest, and this dressing table and seat."

QUILTED MAHOGANY, 22D X 52W X 51H

Photo: Nick Harnen



CHAD HILL

Nokesville, Va.

Hill designed this podium to be very clean and streamlined, so as not to distract from its use as a pulpit in a church. The combination of solid walnut and walnut veneer was a practical decision. "It would have been really expensive to create the thick legs for the piece out of solid walnut, so I used poplar covered with a riftsawn walnut veneer."

WALNUT AND WALNUT VENEER, 20D X 32W X 42H



DEAN BABIN

Camden, Maine

A table made by Aled Lewis was the inspiration for this design. The aim, Babin says, was to make it simple looking and a convenient size for small spaces. "From my experience living in small spaces in New York City, I wanted to make a table that fits in most urban homes." The finish is pigmented oil and wax.

WHITE OAK, 30 DIA. X 30H

Photo: Mark Juliana





ROBERT FIEDLER

Davenport, Iowa

Fiedler took a weeklong workshop on building a Welsh Windsor stick chair with instructor Kenneth Kortemeier at the Maine Coast Craft School. After he went home, he built his own using knowledge and patterns from the course. "The seat comes from a single, knotty piece of black walnut that proved challenging to carve."

WALNUT AND OAK, 16D X 20W X 41H

MICHAEL McKEE

Boston, Mass.

For McKee, this tilt-top chess table encompassed a lot of woodworking lessons. After shaping the legs and the turned center column from sapele, he started on the top. He created a solid poplar lumber core, wrapped it with lacewood edging, and glued a layer of $\frac{1}{32}$ -in. mahogany veneer to each side. He used rosewood and bird's-eye maple veneer for the chessboard, and lacewood veneer for the surrounding field and bottom surface. Holly stringing surrounds the edges of the chessboard and the tabletop.

SAPELE, LACEWOOD, AND VENEER, 22SQ X 28H (45H WITH TABLE TILTED UP)

Photo: Lance Patterson



REID ERIC ANDERSON

Kihei, Hawaii

The design of this table was based on a Shaker hall table, but the original had turned legs and only one drawer. Anderson tapered the legs instead, and used three drawers so it would match some side tables he had built. The drawers are poplar with hard maple fronts. Like the Shakers, Anderson used milk paint on his table.

POPLAR AND MAPLE, 18W X 44L X 36H

Student work in the spotlight at Fine Woodworking Live

An exciting new addition to Fine Woodworking Live this year is a gallery of work from two premier woodworking schools—the Center for Furniture Craftsmanship in Rockport, Maine, and North Bennet Street School in Boston. Both schools are committed to providing the best education possible for people who want to learn how to build and design furniture to exacting standards. Here are just a few pieces from among the many inspiring works on view during the April 20-22 event.

CENTER FOR FURNITURE CRAFTSMANSHIP



MICHAEL DANCHAK

Durham, Conn.

Danchak made this cabinet, with three drawers behind the doors, for the casework phase of the Nine-Month Comprehensive program at the Center. The curved sides are dovetailed to the top of the case. Both bleached and natural quartersawn white oak was used.

WHITE OAK, 10D X 30W X 48H

Photo: Jim Dugan



JESSE SHAW

Watertown, Mass.

Shaw calls this the Droplet Table, because it was inspired by watching droplets of rain create expanding circles as they hit the surface of a pool of water. "The intent was to capture the geometry of the center rippling outward."

WALNUT, 40 DIA. X 16H



BRIAN McALPINE

Scituate, Mass.

Small wood turnings like this serve several purposes for McAlpine. One, they are simple and elegant on their own merits; and two, they let him experiment with color and finishing techniques he'll use in larger furniture pieces. The lid on this container is bleached ash, and the body is walnut finished with oil.

WALNUT AND ASH, 10 DIA. X 5H

Photo: Dalton Paley

Show your best work

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

BEN WAINMANN

Boston, Mass.

"This piece has certainly been my 'masterpiece' during my tenure at North Bennet Street and a reference of the knowledge and skills I developed as a student," Wainmann says of this secretary, based on a Sheraton Lady's Secretary built in Massachusetts circa 1800-1810. Among the learning opportunities it presented were constructing barred doors, turned and reeded legs, veneering, and working at a large scale—"only to name a few."

MAHOGANY (SOLID AND VENEER), CURLY MAPLE, AND SOFT MAPLE, 22D X 37W X 74H

Photo: Lance Patterson



JEFFREY TUBALLES

New York, N.Y.

Tuballes describes this chair as "a case study on reinterpreting a modern style armchair with clean lines and chamfered edges, using traditional fabrication methods." The chair features wedged through-tenons, hidden splines, and a hand-woven, custom-dyed seat stuffed with horse hair.

OAK, 17¼D X 23W X 39H Photo: Lance Patterson



EMILY FAZZINA

Cambridge, Mass.

This table is one of the required projects at NBSS. Fazzina says she approached it by taking traditional elements and playing with their proportions to create something that felt a bit more modern. "My instructors warned me that the diameter of the column got too small where the legs are dovetailed in. They, in all of their wisdom, were proven right when I put it together and the column split! Luckily, we were able to fix it."

WALNUT, 19 DIA. X 31H Photo: Lance Patterson



Woodworking wisdom

A QUARTER-CENTURY OF SHOP KNOWLEDGE, DISTILLED

BY JERRY C. FORSHEE

It was 25 years ago that I took my first hands-on woodworking class. In the years since, while developing my skills, I have discovered that woodworkers are an amazing class of people. They're almost always eager to share their knowledge, experiences, and tools with those less experienced. It's often like they have no secrets. Since so many have shared their time and wisdom with me during my woodworking journey, I've tried to do the same. In this article I will talk about the pieces of woodworking wisdom I've learned along the way.

Jerry C. Forshee is a woodworker in Bloomington, Ind.

Safety first

There is often more than one way to accomplish a given procedure, but the best method always puts safety first. No matter what you're doing in the shop, your well-being should always be the priority.

HANDS AT 3 IN.

To protect your hands and fingers, keep them at least 3 in. away from all blades, cutters, and guards.

STOCK AT 12 IN.

If your workpiece is less than 12 in. long, pause to consider if the process or machine you've chosen is safe for this operation. Every machine and tool has inherent limitations. For example, attempting to plane a board that is shorter than the distance between the infeed and outfeed rollers could cause serious kickback. In this case, either keep the stock overlong while planing or turn to hand tools to thickness it.

KNOW WHEN TO STOP

If you begin to feel tired, don't hurry or work past your peak efficiency; that's when accidents are likely. Take a break. The work will be there when you come back.

TAKE TIME FOR SAFETY

Never hesitate to spend the time and money to protect yourself. Use safety glasses for your eyes, earplugs or muffs to protect your hearing, and a dust mask and/or point-of-origin dust collection to protect your lungs. Use push sticks, push paddles, and featherboards—unlike your fingers, these are expendable. Finally, trust your gut. If an operation doesn't feel right, consider using a different tool, jig, or fixture, or ask a more experienced woodworker for assistance or advice.



42 Years

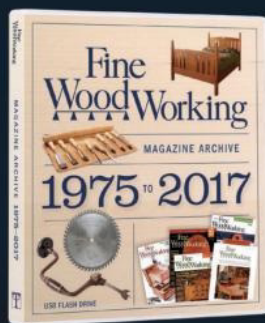
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The right mindset

One's mindset and knowledge are essential and come before the ability to execute. Staying in the right frame of mind will help you every time in the shop.

WORK WITH WHAT YOU HAVE

To do great woodworking, it is not necessary to own all the latest tools, aids, jigs, and gizmos. Instead, be creative: Find a way to accomplish your goal with what's at hand. Successful problem-solving is an essential skill in woodworking.

LEARN FROM THE EXPERIENCES OF OTHERS

We all learn through our own experiences. But most importantly, we learn from the experiences of others, whether through books, magazines, videos, woodworking classes, or other avenues. Take advantage of others' experiences to expand your woodworking knowledge and save yourself from making blunders.

YOUR TIME'S MORE PRECIOUS THAN YOUR WOOD

The most valuable resource in woodworking projects is the time you put into them. So work smart to manage your projects efficiently. Don't aim for economy by skimping on wood; you may end up paying with your time. Mill extra stock in case flaws show up as you build or you make a mistake. And always save mis-machined parts and cutoffs for testing machine setups and finishing processes.



The material

Each species and each board has its own characteristics, so it's important to know how to work your stock without it fighting back. Trust me: The wood will win every time.

WOOD ALWAYS MOVES—DEAL WITH IT

It's crucial to understand that wood forever takes on and gives up moisture, causing it to continually expand and contract. In other words, wood's always moving. Learn how the tree grows, as well as the properties of the different types of grain (flatsawn, riftsawn, quartersawn) and how they move. This will allow you to design and construct your projects to cope with wood movement.

BOARDS KNOW HOW BIG THEY ARE

You can't make a measuring error if you don't measure. Use an existing part to set up a machine rather than measuring the part and then using the measurement for setup.

FIBERS TEAR OUT WHEN NOT BACKED UP

Try to avoid tearout, which not only creates surface blemishes but also can leave gaps in joints. When routing around the edges of a panel, rout the end grain first so that you remove any tearout when routing the long-grain edges. Similarly, when trimming stock, crosscut first so subsequent ripping can remove any blowout. Also, use a zero-clearance throat plate to help limit tearout. When cutting a rabbet or dado, use a push stick or pad to back up the cut.

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Procedures

With safety at the forefront, your mindset honed, and an understanding of your material, you're ready to get the most out of your shop time. Just make sure you don't get in your own way.

USE REFERENCE FACES

To keep parts organized, keep track of which face, edge, or end is your reference surface, and use the same surface for all similar pieces. If you switch reference surfaces, parts may not fit or you may have too many pieces of one type and not enough of another. For example, if you are cutting offset tenons on table aprons, ensure that the offset is always on the same side of the apron. When milling parts, take the time at your bench to label each one, then stack them in the order and orientation they'll be processed at the next machine. This way, you'll be able to mill the parts quickly and accurately without having to find the reference surface on each one.

REHEARSE GLUE-UPS

Make your glue-ups more successful and less stressful by practicing with dry-fits. Lay out the parts, decide where you'll apply glue, map what clamps go where, plan how clamps will be supported, and organize cauls—and then make sure they're handy. If the assembly is particularly daunting, don't hesitate to rehearse the same glue-up more than once.

SNEAK UP ON IT

Woodworking is a subtractive process. Once wood is removed, it's difficult and time-consuming to restore, and sometimes the only option is throwing out the mistake and starting over. Thus, as you fit the joint or machine the part, proceed cautiously and slowly, regularly checking for fit or size to ensure that you don't remove more wood than necessary.

FINALLY, TO BE A BETTER WOODWORKER, DO MORE WOODWORKING

Don't be discouraged with your results; woodworking skill is learned and increases with experience and practice. Your success will ultimately depend on finding what safety practices, techniques, and procedures work best for you given your talent, experience, tools, stock, and project. Each project you make will be better, in some regard, than the last because of your increased experience. Learning from your own mistakes can be powerful, so reflect on and embrace them.



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Try my tools

BY CHRISTOPHER BRODERSEN



I have been an enthusiastic reader of *Fine Woodworking* almost from the very beginning. These days I'm a subscriber who awaits every new issue's arrival in the mailbox, but in my poverty-stricken youth I bought as many issues from the newsstand as I could afford.

For me, the hook of those early issues was Tage Frid. Here was a craftsman who had a similar background and training to mine: He served his apprenticeship in Denmark, while I served mine nearby in North Germany; his field was furniture making, mine was organ building. Frid wrote about using German-style hand tools such as wooden-body planes, frame saws, and bench chisels—the same ones I had learned to use. Even though my field diverged from his, I felt very much at home reading about his projects and design philosophy.

Despite Frid's prominence at the magazine and his stated preference for German-style hand tools, I noticed from the start that *Fine Woodworking* was taking a different tack, almost exclusively emphasizing English-style metal-body handplanes and backsaws made by Stanley, Record, and others. Lately, with the increased fascination with Japanese tools, the magazine has been publishing articles about Japanese handplanes and handsaws.

I admit that I've had my flirtations with Japanese tools, too. I find it unfortunate, however, that *Fine Woodworking* has given so little coverage to German hand tools, and especially to the reasons why many craftsmen find them preferable to English-style tools.

Not long ago, in the magazine's review of 14 smoothing planes, 13 were metal-bodied planes in the mold of the Stanley/Record #4. The one outlier was the ECE Primus, an "improved" version (so-called because of its adjustment wheel) of the traditional wooden-bodied smoother of the sort used throughout continental Europe. The reviewer dismissed it, saying: "Glides easily on its slick lignum vitae sole, but light weight didn't provide much

inertia." But that lightness is exactly the feature that appeals to European cabinetmakers. The plane's relatively low mass and high center of gravity mean that one can maneuver it with greater ease than a metal-body plane weighing almost twice as much.

The lighter weight is especially important when, for example, one has to work at an angle or even on the underside of a piece, as I have done on many occasions. The reduced weight is also a godsend when smoothing large surfaces—the top of a table, perhaps, or, in my case, the soundboard of a harpsichord. The

Primus smoother corners like a sportscar; it's possible to grasp the plane lightly around the base (rather than by the hand grips), almost in the manner of a block plane, while doing delicate operations.

The squared sides of its body make it simple to clamp on a right-angle fence, allowing me to accurately trim and square up the edges of a workpiece. Similarly, with a wooden-bodied jointer plane, the square body clamps easily to the workbench for accurately shooting edges. And compare the ordeal of flattening the sole of a steel-bodied jointer plane with the five minutes it takes to true the sole of a wooden-bodied jointer.

The angle of the Primus smoother's plane iron is another advantage. At 50° to the work surface, it is just 5° steeper than the angle on a standard metal-

body smoothing plane, but it makes a world of difference when working end grain or highly figured wood.

There is much more to say in praise of German-style tools, from specialty planes to hammers and from workbenches to frame saws, but perhaps if you pick up a Primus plane and give it the run of your bench for a while, you'll soon be compelled to discover what else you've been missing. □

Christopher Brodersen builds historical keyboard instruments in Northville, Mich. (cbrodersen.com). Send your woodworking story to bench@taunton.com; we'll pay for any that we publish.

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A Cabinet of One's Own

In the late fall of 2015, Heide Martin was a student at the Center for Furniture Craftsmanship in Maine, and she was stuck. She had moved to Maine from Seattle, leaving behind a career in landscape architecture, and wanted to find her way into a life making furnishings by hand. She and her 11 classmates were in the case-piece portion of the program, and while the others were already building she was still struggling to resolve her design for an entryway storage bench. Not needing such a bench, she couldn't get a grip on it. Her teacher, Aled Lewis, suggested, "Why not design something for yourself?" When he said that, Martin says, "I imagined my future studio." Having long enjoyed sewing, weaving, leatherwork, and

jewelry making, she envisioned a peg board for hanging samples, and a cabinet "for all the bits and bobs" of the various crafts. The design then came together quickly, and she was soon building. She joined the ash case with half-blind dovetails and designed the back so

the cabinet could hang on the peg board. Inspired by Shaker furniture, she created a distinctive drawer arrangement, sizing the drawers to fit spools of thread. And to express her love of weaving, she used ash splint to make a woven door panel.

—Jonathan Binzen

