

TAUNTON'S

Fine Woodworking

August 2017 No. 262

Stronger, lighter frame-and-panels • Hudson Valley chest of drawers
How to build and use a shaving horse • Build a perfect drawer pocket



Fresh take on the trestle table, p. 30

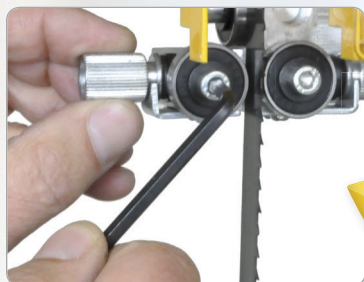
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Visit FineWoodworking.com/262 for online extras, available May 31. And don't miss the collection of free content on our website, including tool reviews, an extensive project gallery, and must-read blogs.



VIDEO

Chinese Joinery

Andrew Hunter learned his ultrastrong, rigid frame-and-panel construction (p. 52) from studying the work of Chinese cabinetmakers, who've been using it for centuries. In this video, watch Hunter demonstrate some other amazing interlocking joinery.



VIDEO

Behind the Design

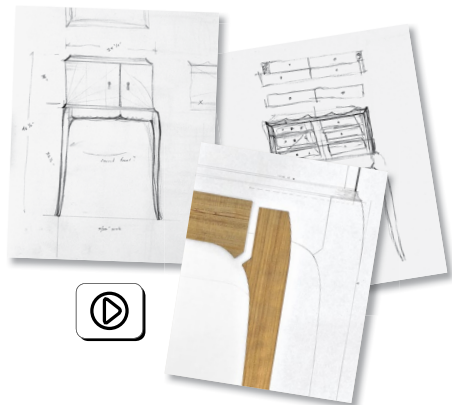
Take a closer look into Designer's Notebook author Mike Korsak's sketchbooks, plans, and overall design and construction process (p. 20).



VIDEO

Workshop Tip

Learn a clever way to make crosscutting on the tablesaw safer and more accurate (p. 18).



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VIDEO WORKSHOP

Federal Side Table

Steve Latta shows you how to build this beautiful side table with lots of Federal-style embellishments. In more than two hours of video, Latta takes you through every step of the process, including how to:

- Cut workpieces and joinery faster and more efficiently
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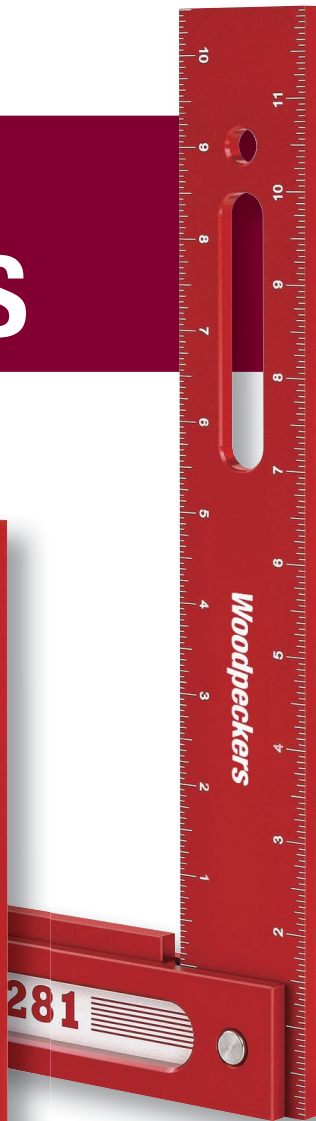
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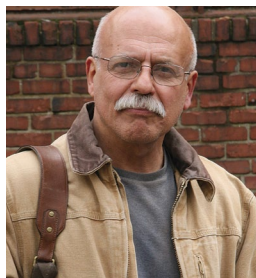
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contributors

Spend a few hours with **Tim Manney** (“Build a Thoroughbred Shaving Horse”) and your head will be brimming with things you need to check out—great furniture makers, woodworkers, and tool makers, but also musicians, writers, and filmmakers. His taste in music runs from Mississippi John Hurt to Peggy Lee, from Tom Waits to Chance the Rapper. Having seen the impeccable quality of the furniture and spoons and tools he makes, you’ll be in a great rush to follow up on his recommendations. Manney, who began carving spoons while in college in North Carolina, apprenticed with chairmaker Curtis Buchanan in Tennessee, and collaborates with Peter Galbert of Massachusetts on Windsor-related tools. Manney’s current shop is in a large old mill building in Brunswick, Maine.



Marcus Soto (“A Fresh Take on the Trestle Table”) has spent his working life in woodworking shops, eventually finding his way to his current positions as design and production partner at New York Heartwoods, a Kingston, N.Y.-based company that creates furniture and retail displays from fallen and urban trees, and as the owner of Sojen Design, a custom furniture company. Asked to describe why woodworking holds such an attraction for him, Soto says “I am not certain; the one thing I know for sure is that I could not imagine doing anything else.”



Mario Rodriguez (“Hudson Valley Chest of Drawers”) has written more than three dozen meaty articles for *FWW* since his first in 1991. A talented carpenter and cabinetmaker, he converted an industrial building in Brooklyn into living space in the 1980s and then completely restored an 18th-century house in upstate New York in the 1990s. He is now sprucing up a row house in the Mt. Airy neighborhood of Philadelphia. One thing we hadn’t expected to find in the new house: a painting studio. Turns out he’s eager to devote more time to brushes and acrylic paint.

Mike Korsak (Designer’s Notebook) makes custom furniture in an outbuilding he renovated beside the house in Pittsburgh, Pa., where he lives with his wife, Jen, an assistant professor of microbiology. Largely self-taught as a furniture maker, he traces his interest in woodworking to his grandfather, an avid hobbyist. Korsak studied wood products at Penn State and later worked as a timber framer and carpenter and as a designer of timber-frame structures. After taking informal classes with Garrett Hack, he shifted his focus to building fine furniture.



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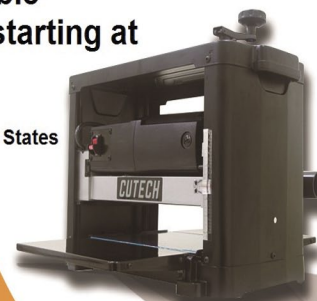
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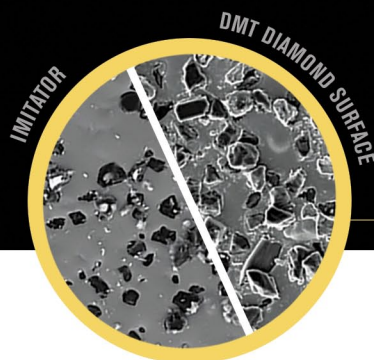


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Spotlight

ISSUE NO. 241
July/August 2014
p. 50



Successful project, thanks to Michael Fortune

Please allow me to toot the horn for Michael Fortune. When I saw his bentwood garden chair in the magazine I immediately wanted to build it. It looked like an ambitious project for my skill level; but what the heck, nothing ventured, nothing gained. At first I was thinking about trying to build it from the magazine article alone, but I'm very glad I got smart and bought the plan set.

If one chair is good, two must be better. For Michael's chairs, I decided to use mahogany. I followed his plans closely, trying to avoid mistakes and wasted materials. Today—yes today—I completed assembling the two chairs. I simply must share how much pleasure and how much fun I had making them. I still have a little work left to complete them, but this has been an outstanding project for me. Everyone who sees the chairs loves them. I could not be happier with the outcome. Please, pass along my thanks to Michael and share my absolute pleasure at his design. Awesome.

—GERARD WELCH, East Bridgewater, Mass.

Caution about “multipurpose” tools

Most woodworkers I've met appreciate a multi-function gadget or tool, so I see the attraction of the IBC convertible bench chisels (Tools & Materials, *FWW* #261, p. 27).

However, I see two limitations of this innovative solution. First, one of the major benefits of a paring chisel is the lower bevel angle that works better with hand power. Simply installing a longer handle doesn't account for this feature of most dedicated paring chisels. Of course, the chisel's bevel angle can be reground and honed to a lower angle and restored to the greater bench chisel angle afterward, but this is not always feasible for a quick paring job. Second, one of the great advantages of a paring chisel is that the socket on the comparatively shorter blade of a bench chisel can get in the way when trying to reach in from the edge of a board to level long dados

or grooves. My most useful paring chisels allow me to reach in from the edge 9 in. to 12 in. While I appreciate Chris Gochnour's review of the IBC bench chisels, the more years I spend at the bench, the more convinced I become that the best tools are well made to a specific purpose, and there is a trade-off in performance or convenience when buying multi-function tools.

—DAMIEN KING, Hudson Valley, N.Y.

More musings on metric

In reference to the letter, “When metric makes no sense” (*FWW* #261), I have worked in both measurement systems and find that the metric system is a sheer pleasure to use. Calculations are easy to make, as one has no fractions to deal with. Use should be made of the millimeter (mm) rather than the centimeter (cm) for woodworking. The 50½-in. example, or 128.27 cm, is thus

1,282.7 mm or rounded off to 1,283 mm. One rarely needs to use a decimal of a mm and if so then only one decimal place is required. Think in terms of units of mm and the metric system makes sense!

—PAUL ROBERTS, Pretoria, South Africa

As a fellow Canadian, I truly hope that the author of the “When metric makes sense” letter (*FWW* #260) wasn't actually serious about the hard metric conversion thing. Metric may work well if you're a machinist or a tool-and-die worker, but I have never found it to be as user-friendly as imperial when it came to woodworking. The thing I like about imperial tapes is that the ½-in. graduation is shorter than the 1 in., the ¼ in. is shorter than the ½ in., etc., making it much easier to read the scale at a glance.

Please keep your plan dimensions just as they are; us 73-plus, old-fart Canadians will be more than thankful!

—KEN SOUTAR, North Bay, Ont., Canada

Include more affordable tools

As a hobbyist woodworker, I have to balance woodworking against my family's budget. All of your tutorials and videos feature craftsmen working with *very* expensive equipment. Most of us do not have access to or cannot afford thousand-dollar jointers, mortisers, or planers. Please, tailor your media to a more complete audience. For example, show how to build a basic workbench without \$10,000 worth of equipment. Show me how to make mortises with a drill press and a chisel. Many people are interested in woodworking but cannot afford to buy the equipment you feature.

—JONATHAN V., Alexandria, Va.

Correction

We incorrectly identified the photographer of Alex Magnin's desk (Gallery, *FWW* #261, p. 74). The photo was taken by Chris Lavergne.

Fine Woodworking

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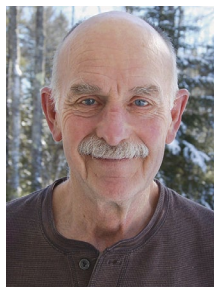
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workshop tips

Best Tip



After 25 years as a professor of psychology, Lary Shaffer moved from New York to Maine to turn his woodworking hobby into a second career. His specialty is an American version of the Morris chair, with cabriole legs and round spindles. He also does a good trade in replacement hardware for old, broken Morris chairs. For more information, go to Scarboroughmarshfurniture.com.

A smarter planer sled for flattening wide stock

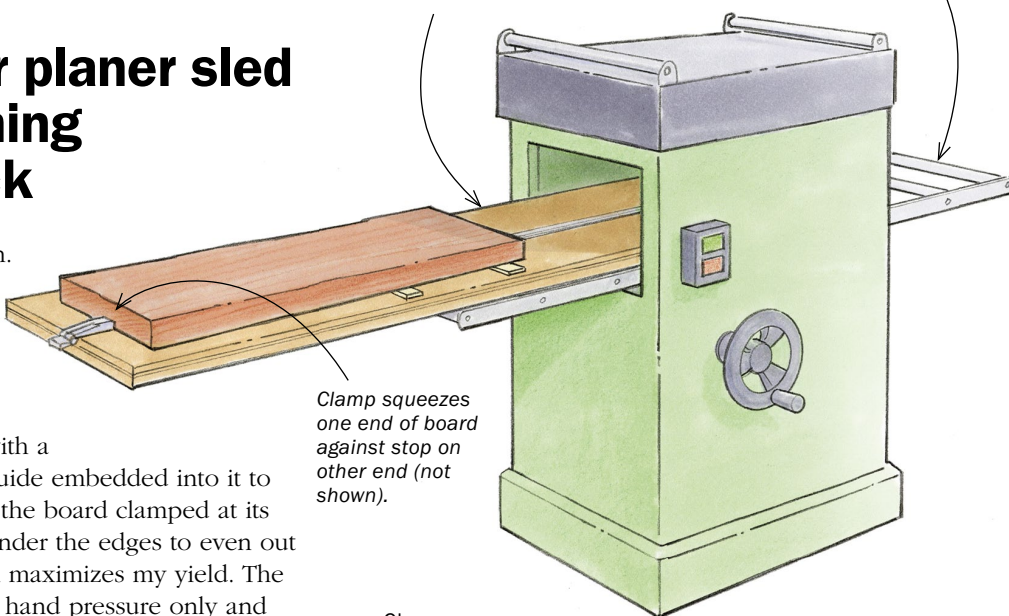
My jointer is only 6 in. wide, and I often have to joint wider boards than that. To flatten those boards with my big planer, I use a sled with a long clamp-on saw guide embedded into it to hold the board. With the board clamped at its ends, I slip wedges under the edges to even out the high spots, which maximizes my yield. The wedges stay put with hand pressure only and keep the board rock-steady on the sled. The system works wonderfully.

The clamp is one of those clamp-on straightedges used to guide a circular saw or router. I chose the 50-in. length (available online for \$35), which works for most boards I mill.

To make the top of the sled just flush with the clamp bar or slightly higher, so the low-profile clamps grab as much of the board as possible, I screwed it to a $\frac{3}{4}$ -in. MDF base and then added more MDF on the sides, shimming them up with thin plywood to just the right height. The resulting sandwich is stiff and stable. I also had to trim the handle of the clamp so that it wouldn't interfere with the planing operation, but it is still easy to operate that way.

For the infrequent occasion when a board is too twisted to allow good clamp purchase, I just handplane the high spots a bit to let the board sit lower in the clamp.

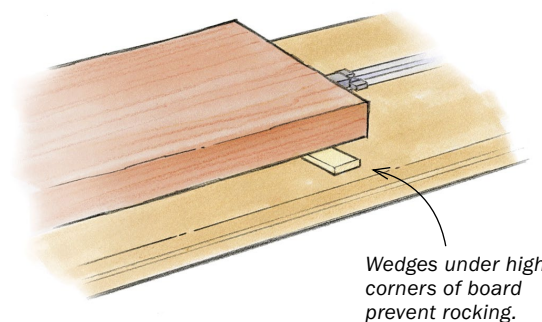
—LARY SHAFFER, Scarborough, Maine



Clamp-on straightedge, screwed to base layer of $\frac{3}{4}$ -in. MDF

$\frac{1}{8}$ -in.-thick plywood raises top layers of $\frac{1}{2}$ -in. MDF just above top of clamp bar and screw heads.

Clamp handle is trimmed so that it doesn't interfere with planing.



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 Calavera veg-tanned leather work apron.



Quick Tip Drill clean holes by hand

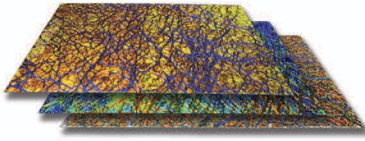
When drilling holes in pine with a cordless drill and $\frac{1}{4}$ -in. brad-point bit, I was having trouble with the bit digging in and tearing out the rim of the hole. Then I discovered that running the brad-point bit in reverse scores the rim of the hole and compresses the fibers, letting me then switch the direction and drill a clean hole.

—JEREMY BURRILL, Fredericton, N.B., Canada

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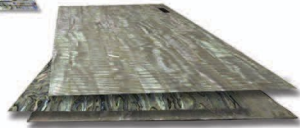
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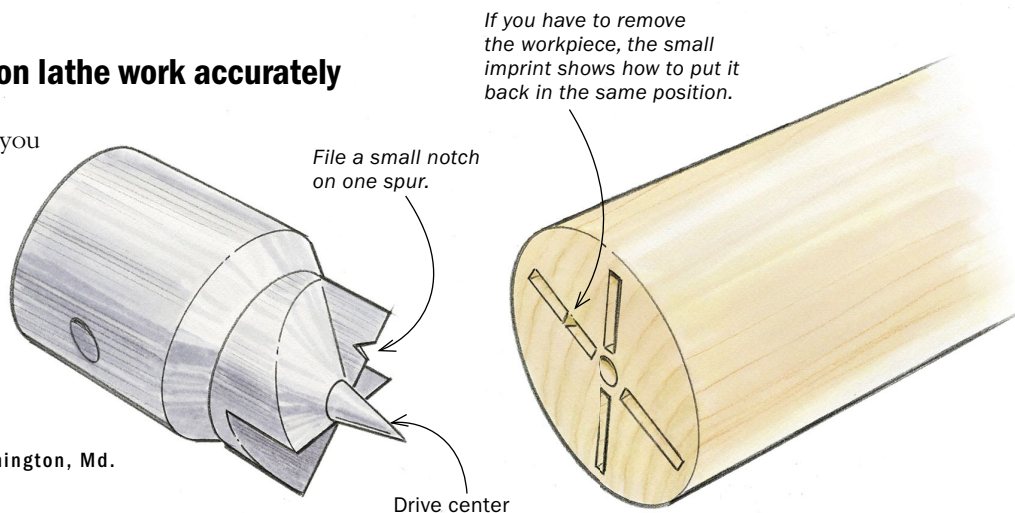
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Notch the drive center to reposition lathe work accurately

When turning wood spindles and vessels, you often have to remove the work and then put it back on the lathe, hoping to return it to the exact same position on the drive center so that the balance is the same as when you removed it. To be sure all future parts are repositioned accurately, just file a small V-notch on one of the spurs of the drive center. You'll see that imprint on the wood every time.

—TOM ZMUDZINSKI, Fort Washington, Md.

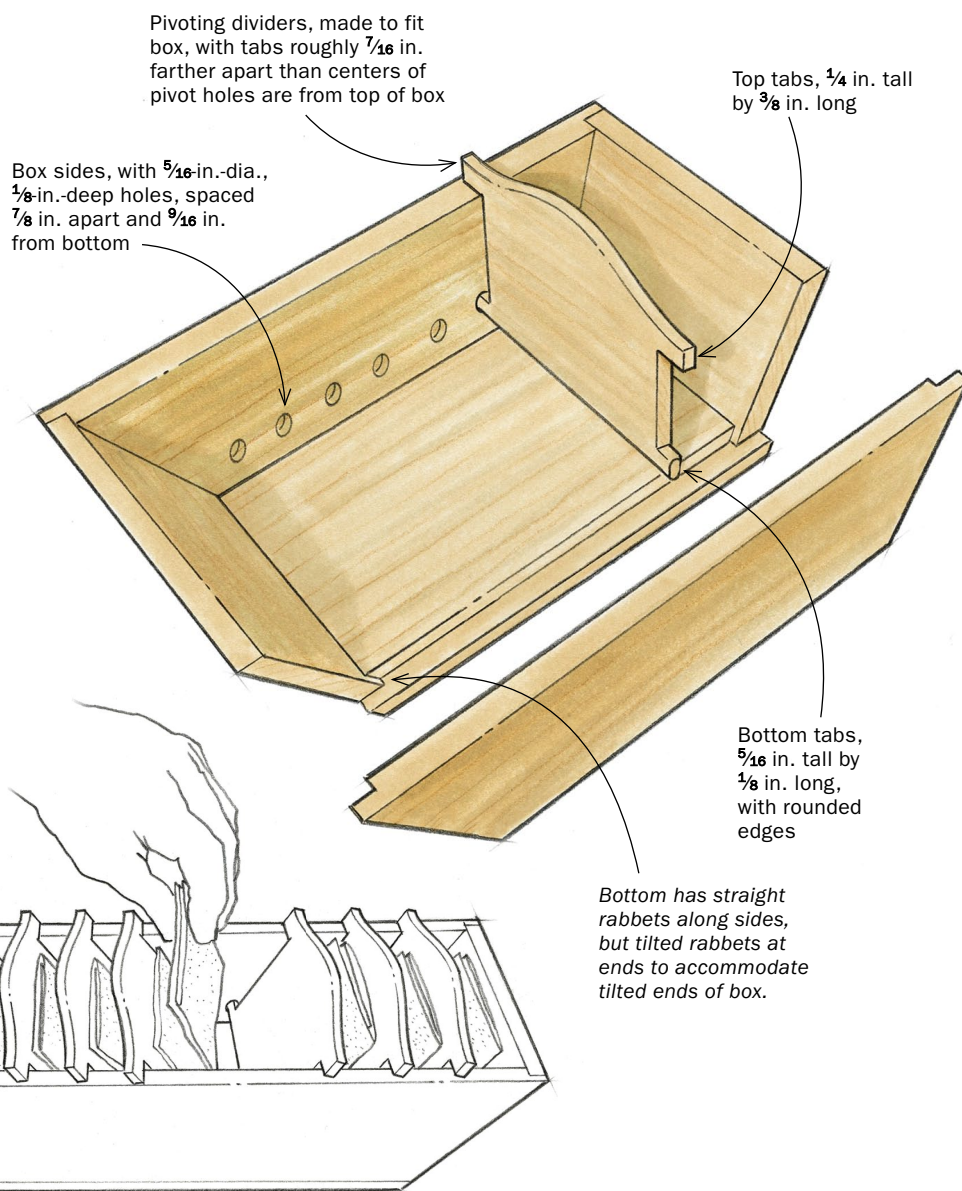


Box keeps sandpaper organized and at your fingertips

How often do you hunt through a drawer or box of sandpaper looking for a specific grit? This small tray will keep up to nine grits of folded sandpaper organized and accessible. I sized the tray and dividers for quarter-sheets of sandpaper (torn width-wise and folded in three) but you can size the box for sanding disks or other paper sizes.

The important part is the pivoting dividers, which are spaced $\frac{7}{8}$ in. apart but open up to $3\frac{1}{2}$ in. for easy access. The sloped ends of the box are the other key. The only critical dimension for good pivoting action is that the tabs are roughly $\frac{7}{16}$ in. farther apart than the centers of the pivot holes are from the top of the box. Also, note that the tabs at the bottom of the dividers have to be inserted in their pivot holes when you are gluing up the box.

—LARRY POORE, Issaquah, Wash.



Box ends angled at roughly 26°

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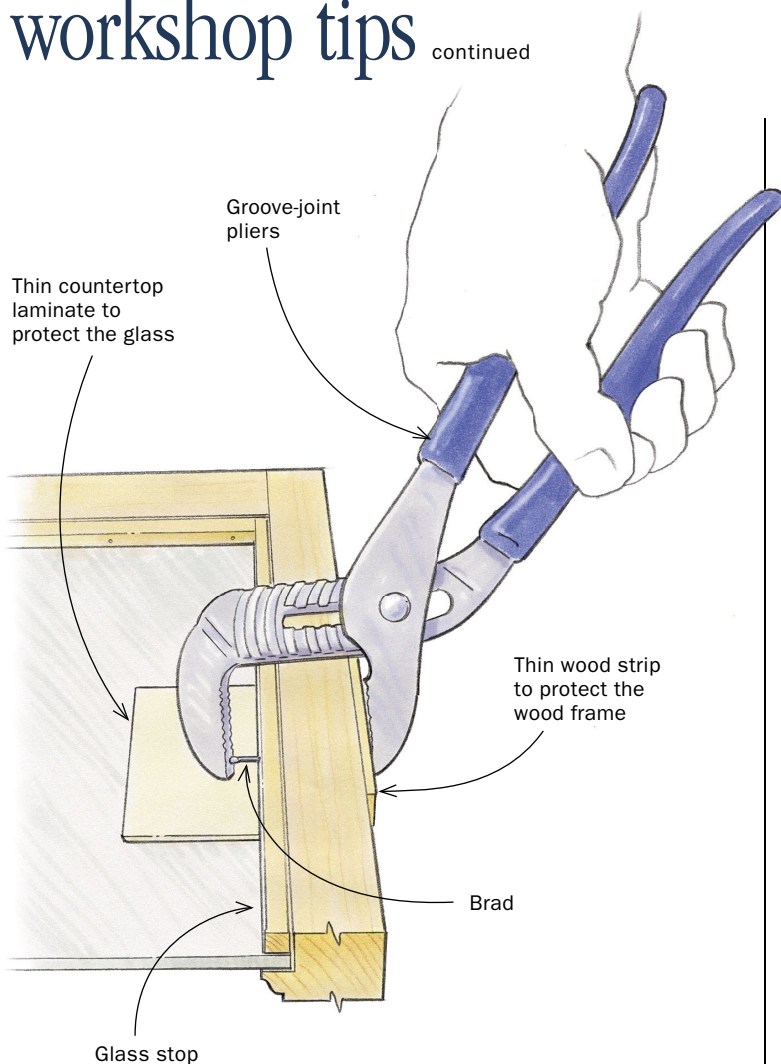


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Groove-joint pliers set brads safely in glass stop

The usual way to set glass in a door panel is to cut a rabbet in the back of the frame parts, drop in the glass, and then fix it in the rabbet by nailing thin wood strips, called stops, behind it. This creates a nice finished look, and the strips and glass are easily removed for repair. But it is tricky to drive in the tiny brads without hitting the glass with your hammer. On a huge display case with 20 glass doors that I was building recently, I came up with the idea of using groove-joint pliers to set the brads for the glass stop. I use a thin piece of laminate material to protect the glass from the pliers and a thin strip of wood to protect the outside of the frame. The pliers do the job quickly and easily, with a lot of control.

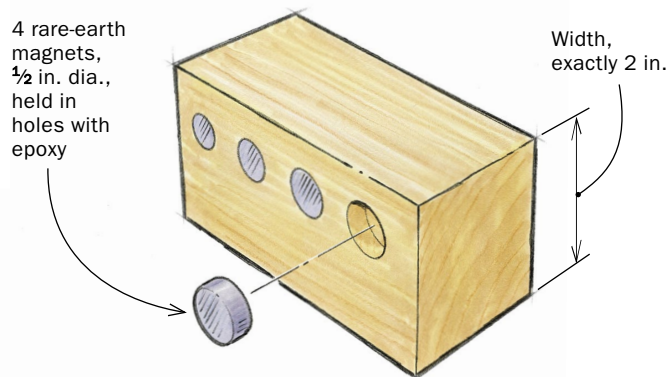
—ANDY OLERUD, Driggs, Idaho

Self-clamping stop block for crosscutting

If you try to use the rip fence as a stop block when crosscutting on the tablesaw, the trapped, unsupported cutoff can turn into a missile. The safe method is to clamp a block to the rip fence well in front of the blade, so the freed piece is not trapped. However, this can be awkward, particularly on my shallow Biesemeyer-style fence where the clamp can interfere with the work. To avoid clamping of any kind, I created a stop block with four rare-earth magnets embedded in the base. The block is placed against the fence and sticks securely to the cast-iron table. When it's not in use, it I just stick it to the side of the saw cabinet.

I use this quick, handy stop on my bandsaw too, where I don't feel good about applying clamping pressure to the extruded aluminum rip fence. By making the block a known width (and perfectly square), I can still use the ruler on my rip fence without measuring, remembering to do the simple math. Note also that the magnets are located close to one edge of the block; this allows me to flip the block if the magnets end up over the miter slot.

—ROBERT GUNN, Mississauga, Ont., Canada

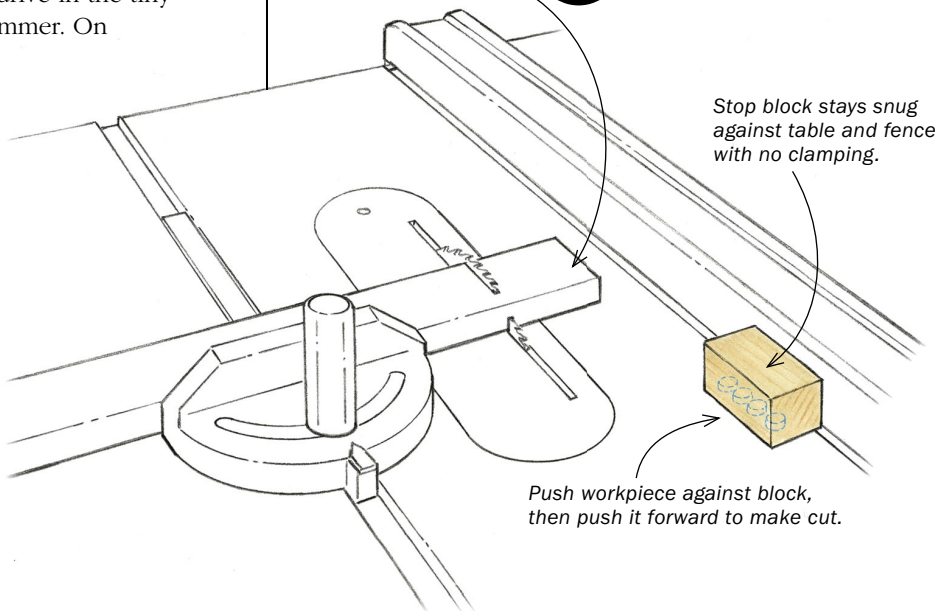


Cutoff is not trapped.



Article Extra

Watch a video of this tip in action.



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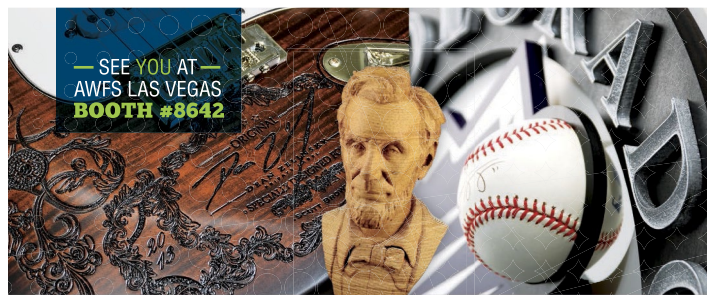
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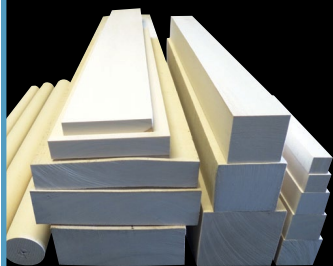
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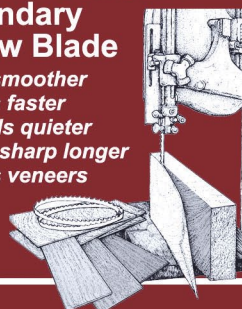


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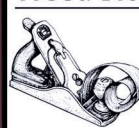
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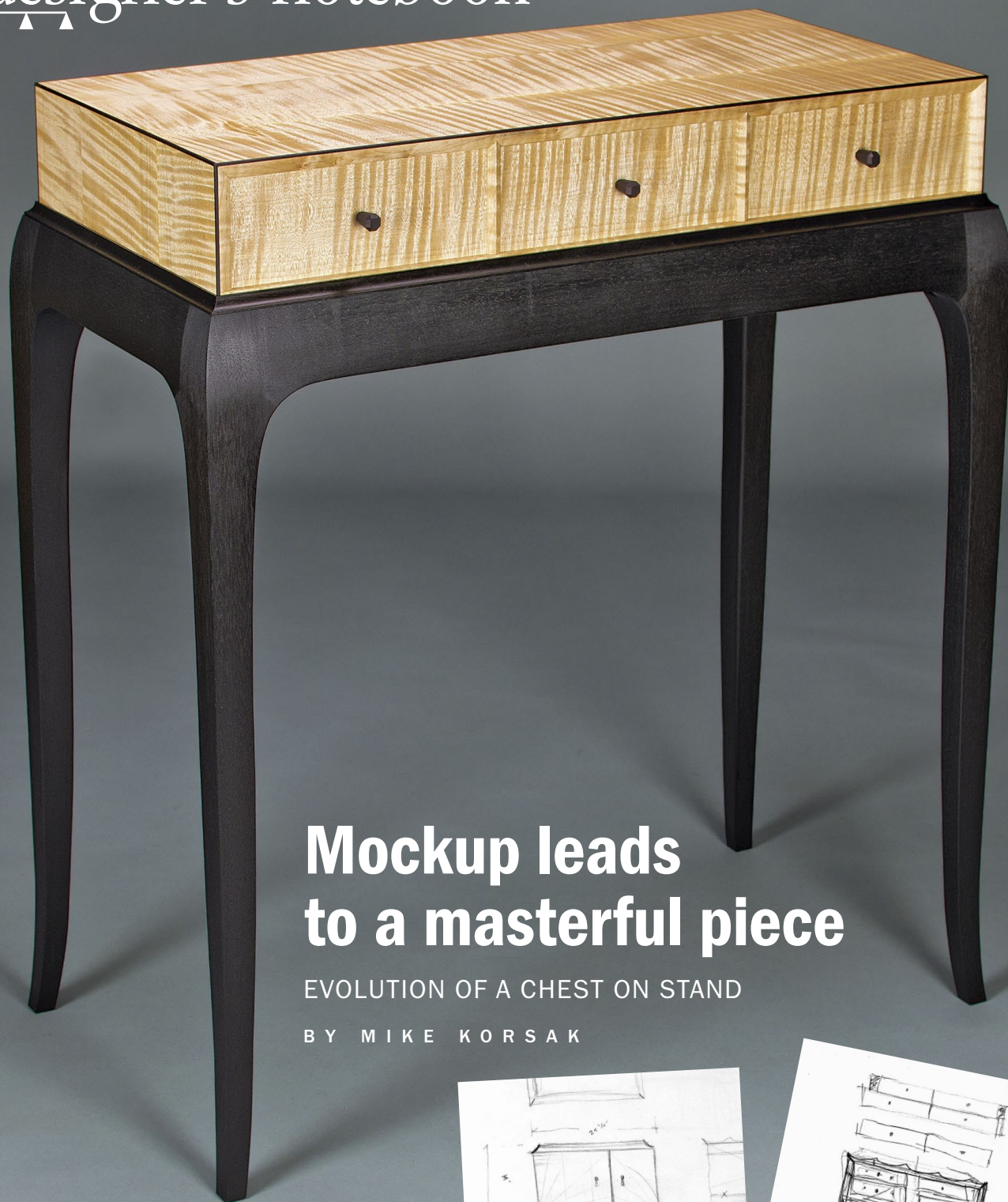


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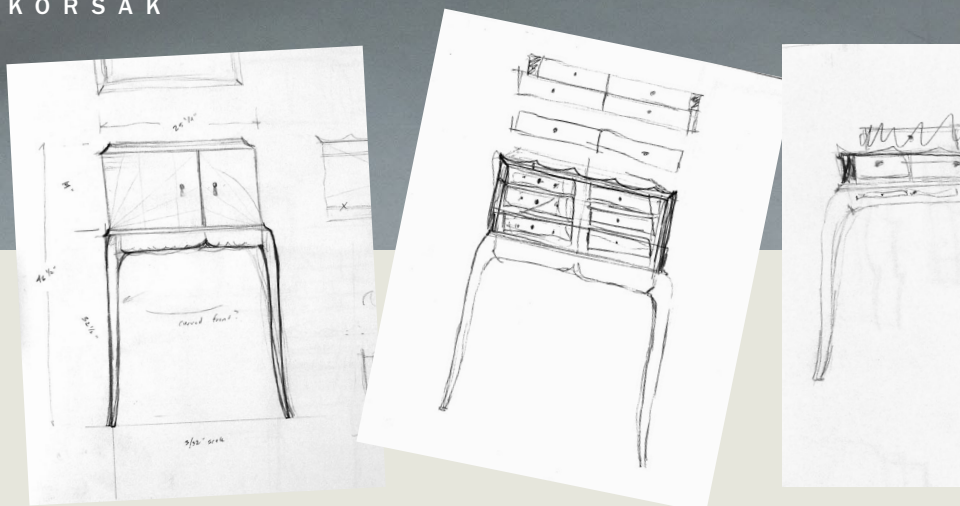
Mockup leads to a masterful piece

EVOLUTION OF A CHEST ON STAND

BY MIKE KORSAK

TOOLS OF FINE DESIGN

Korsak's chest on stand began as a taller, two-door cabinet. Dissatisfied with that, he sketched a six-drawer chest with a scalloped case, then stretched the piece out to its current three-drawer format. He made templates from his full-scale drawings to guide shaping. The proving ground for his drawn concepts was a mockup made of MDF.



This chest began as a response to seeing a lot of cabinets-on-stand, all very similar and clearly inspired by the work of James Krenov. I admire Krenov's cabinets, and I was interested in building a cabinet-on-stand, but I wanted to deviate from this familiar form. I was also intent on designing a stand whose legs and base were "just right." In some of my past pieces, the legs had not quite met that elusive standard. Building them, I learned that a design can look fine on paper but totally different in three dimensions. So this time, to guide the design process, I invested the time in building a leg prototype and a full-size mockup.

My initial idea was for an upright piece with two asymmetrical doors that would open to reveal shelves or drawers inside. At some point it hit me that the overall design of the piece closely resembled the work of other makers—the very opposite of what I had intended. I scrapped it.

Going back to the sketchbook, I roughed out an idea for a wider base, borrowing some of the shapes from the original concept. My new case design began as something more complex with fluted, or undulating, sides and top, and multiple rows of drawers. Through more concept sketching and some rough full-scale drawings, I arrived at a simpler case that seemed to harmonize better with the relatively quiet base. I liked the contrast between the two—a rectilinear case atop a curvaceous base.

Once I had a full-scale front elevation that looked right, I made a template of the leg profile out of thin quartersawn cherry. I then used the template to lay

out a prototype leg in solid wood. My aim was to shape the prototype to the same extent as an actual leg, minus any joinery. In areas that needed refinement, I modified both the prototype and template, because later I would use the template to shape the actual legs.

Next came the full-scale mockup. I built it using the prototype leg and three legs made of $\frac{3}{4}$ -in. MDF. I cut out the MDF legs quickly on the bandsaw, with no cleanup of the cuts. For the aprons, I attached $\frac{3}{4}$ -in. MDF to the legs with pocket screws. I built the case with $\frac{1}{4}$ -in. MDF over a skeleton of scrap solid stock.

When I had the mockup built, the piece seemed a bit tall and narrow. So I

Study in contrast. Korsak paired a curvy base with a straight-lined case, and used the wood to heighten the contrast: ebonyed walnut for the base and pulls, and curly maple for the case. The edging is rosewood.

stretched the width, increasing the apron length by about 3 in. and tacking more $\frac{1}{4}$ -in. MDF to one end of the case. Now the piece looked too wide. I trimmed 1 in. off the width, then 2 in., where I thought it looked good. Satisfied with the width, I cut the height of the case down by about 1 in. Now I was happy. To make the mockup more realistic, I dyed the base black and drew lines on the front of the case to represent the drawer fronts. I used a Sharpie along the corners of the case to represent the rosewood edging.

I probably spent about four hours building the mockup and another four making the sample leg. It was time well spent, allowing me to dial in the shapes, dimensions, and proportions, and providing visual affirmation that I was on the path to a successful finished piece. □

Mike Korsak builds custom furniture in Pittsburgh, Pa.



Article Extra

Get a closer look into Mike Korsak's sketchbooks, plans, and design process.



tools & materials

■ ACCESSORIES

Jig unlocks dovetail keys

ALTHOUGH LOVELY AND INTERESTING, dovetail keys in the corners of a box can be fussy to execute. However, Infinity's dovetail spline system, once dialed in, is fuss free. It cuts slightly tapered notches in the box and cuts the mating keys, which slide together perfectly for a gap-free fit. Glue-up is easy but requires a bit of attention because the keys fit from one direction only.

The system has two jigs. One is used to cut the notches in the box. It can be used with a handheld router, but the box must be clamped into the jig, which can be awkward. I prefer using it at the router table—the box stands neatly in the jig and gravity helps keep it in place.

The second jig rides in the miter slot of the tablesaw to cut the keys. It has an insert that can be changed so that the jig is always zero-clearance, regardless of the angle needed for the keys. To create the key's taper, the miter bar on the underside of the sled is slightly off square.

The system is well-made and works great. I think it's the right choice for boxes with dovetail keys. There is a version of the system that also includes a longer router jig (for bigger boxes) and six dovetail bits. It sells for \$300.

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



Notch the box. Nestled in the 45° cradle, the box is run through a dovetail bit to create the tapered notches in its corners.

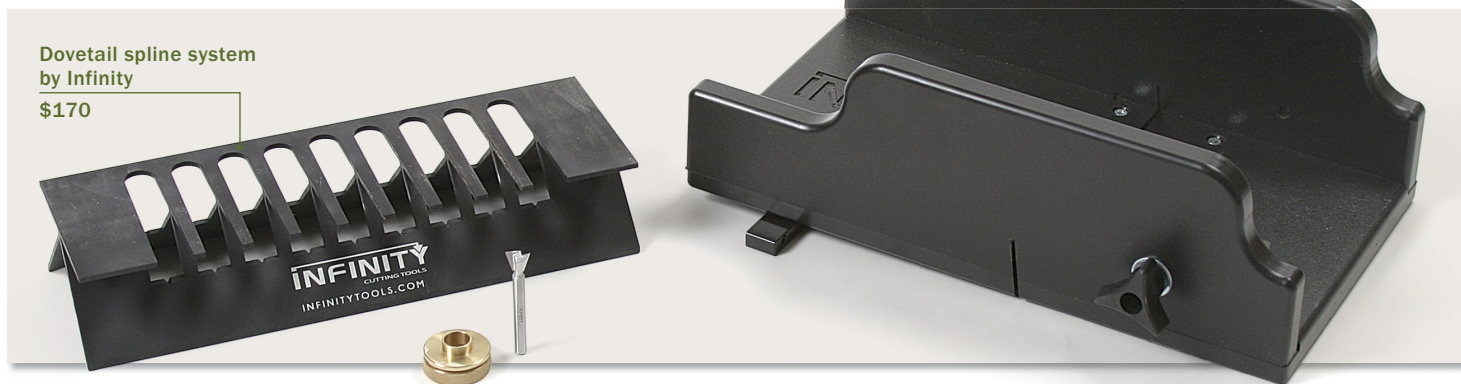


Cut the key. The jig's tablesaw sled is angled slightly to create tapered keys that fit the tapered notches seamlessly. A replaceable throat insert ensures accuracy, safety, and a clean cut.



Tap in the key. The key slides in from one side only, but the taper guarantees that it fits tightly into the notch with no gap.

Dovetail spline system
by Infinity
\$170



■ SAFETY

Rock out and protect your hearing at the same time

I ALWAYS LISTEN TO MUSIC IN MY SHOP. When I'm working at the bench with hand tools, the quiet hum of music in the background, played through a Bluetooth speaker, helps me concentrate. The same is true when I'm milling lumber, routing, and using my tablesaw and bandsaw. But those machines are so loud that they drown out the speaker, so I started to use earbuds under my hearing protection. This combination was less than perfect—it was uncomfortable, and the cord running from the earbuds to my phone compromised the earmuffs' protection. Fortunately, I found ISOtunes Pro earbud hearing protectors. These in-ear protectors have an ANSI-certified



ISOtunes Pro
\$90

27-db. noise reduction rating, and connect to your smart phone via Bluetooth technology. They did a great job of muffling machinery noise, and I was able to keep the music volume at a comfortable level (to comply with OSHA standards, the earbuds top out at 85 db.). As for sound quality, it was good. Ben Strano, *FWW's* web producer and a former sound engineer in Nashville, gave them a thumbs-up, too.

The earbuds are very comfortable and the controls are easy to use. The Bluetooth signal is strong and battery life is great. A USB charging cord is provided. There is a less expensive version, called ISOtunes, with cords that drop down from the earbuds. Their noise reduction rating is slightly less (26 db.), and the battery doesn't last as long per charge.

—Matt Kenney is the special projects editor.



ISOtunes
\$60

■ ACCESSORIES

Clever gauge reads bandsaw blade tension

TENSIONING BANDSAW BLADES has always been a bit of a crapshoot. The gauges most bandsaws have for indicating blade tension are notoriously unreliable, and accurately using finger pressure against the side of the blade takes more experience than many bandsaw users have. Thankfully, Monarch Industrial's TG1000 makes tensioning blades as easy as using a clothespin.

The stainless-steel gauge consists of a pair of overlapping plates with three pins and a scale. Simply squeeze the plates like salad tongs, place the pins on the blade—the two outer pins on one side of the blade and the middle pin on the other—release the plates, read the indicated number, and adjust the tension as needed. A chart tells you what the number should be for any blade from 1/8 in. to 1 in. wide.

—Roland Johnson wrote the book on bandsaws (Taunton's Complete Illustrated Guide to Bandsaws, *The Taunton Press*, 2010).



TG1000 Tension Gauge
by Monarch Industrial
\$80



Clip to the blade, then read. The blade is pinched between the three pins, and its tension moves the indicator on the opposite end. An included chart provides tension ranges for various blade widths.

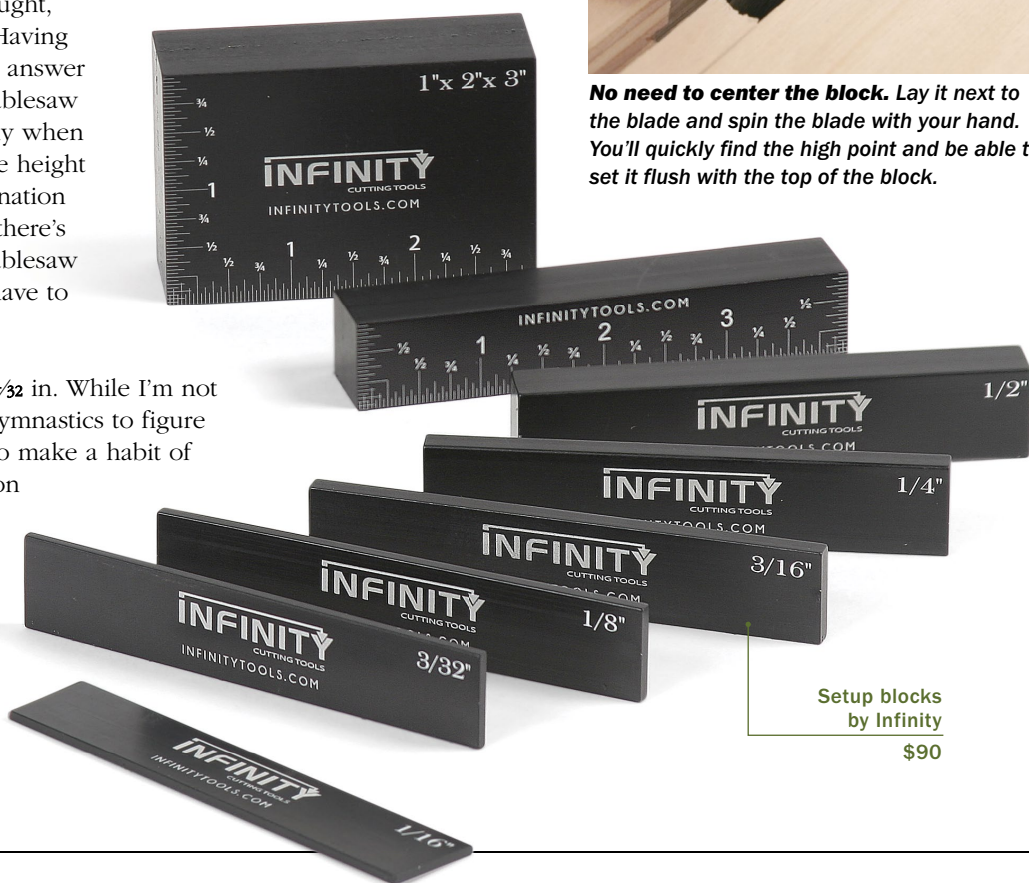
■ ACCESSORIES

Blocks enable accurate setup

I MAKE A HABIT OF USING a combination square to set blade and bit heights, and a dial caliper to check stock thickness. So when I was asked to take a look at Infinity's setup blocks, I thought, "Sure, but when would I use them?" Having had them in my shop for a while, the answer is quite a bit. I like them for setting tablesaw blade and router bit heights, especially when cutting dados and grooves where the height is critical. The benefit over the combination square is the blocks' length. At 4 in., there's no need to locate dead center on a tablesaw blade for an accurate reading, like I have to do with a combo square.

The six blocks can combine for measurements between $\frac{1}{16}$ in. and $1\frac{31}{32}$ in. While I'm not sure I'd ever go through the mental gymnastics to figure out some of those measurements, I do make a habit of combining blocks for odd but common measurements, like $\frac{5}{32}$ in. or $\frac{5}{16}$ in. The blocks have their thicknesses printed on one side and an inch scale on the other. I don't find any use for the scale and would rather have the thickness printed on both sides, but that's a small gripe.

—Michael Pekovich is the executive art director.



No need to center the block. Lay it next to the blade and spin the blade with your hand. You'll quickly find the high point and be able to set it flush with the top of the block.

■ SHARPENING

Diamond stone complements waterstones

A DIAMOND STONE PLAYS A KEY ROLE in my sharpening technique. Not only do I use it to keep my waterstones flat, but also to dress card scrapers, and occasionally to regrind the bevel on a chisel or plane blade. Lately, I've been using the M-Power double-sided diamond stone, called the Diamond Cross.

The stone is $2\frac{3}{4}$ in. wide and 8 in. long. One side is 300 grit and the other is 1,000 grit. The coarser side cuts very fast, enabling me to repair small nicks in a cutting edge in just a few minutes. The finer side removes the scratches from the 300-grit side efficiently, which allows me to jump quickly from the diamond stone to my waterstones when sharpening chisel and plane blades. The diamond stone was adept at dressing card scrapers. The 1,000-grit side left a polish that resulted in a keen hook and fluffy shavings.

The stone comes with two rubber feet that latch onto it with magnets and keep the stone still during use. Overall, this is a very good stone.

—M.K.





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handwork

How to ride a shaving horse

BY CURTIS BUCHANAN

Over the past 34 years, I calculate that I've spent over 21,000 hours at work on my shaving horse. Why do I still look forward each week to my time on it? I'm sure simple-mindedness plays a role, but I like to think it goes beyond that. Partly it's that it does its job so beautifully, and partly that it just feels great to use it.

It doesn't hurt that mine's on the porch of my shop for most of the year, so I can work outdoors. And it's always appealing that I get to sit when I use it. I typically make one chair at a time and it takes me a week or two. During this time I'm splitting logs, turning, boring holes, assembling, and finishing—all



READY THE RIDE

The seat should slide. A friction fit between the seat fin and the rails lets you shift to an optimal position without getting up, simply by pushing with your feet. The riser block tilts the seat forward, straightening your posture as you work and relieving pressure on your back.



Minimize the clearance, maximize the bite. The horse's swing arm adjusts easily for workpieces of different thicknesses. A steel pin locks in the setting. For maximal gripping power you want minimal clearance between the head and the workpiece.



Power with little pressure. When the head is adjusted properly close to the workpiece, this horse provides great grip with just light pressure on the treadle. Buchanan keeps his heel on the floor as if pressing a car's accelerator.



SHAVING SPINDLES

Rapid removal. When roughing out a spindle with the drawknife, Buchanan takes fast strokes largely with arm power. The goal here is to create a square spindle. For finishing cuts, as shown below, he keeps his elbows fairly stiff and pulls the shaving by leaning back with his upper body, exercising fine control with his wrists.



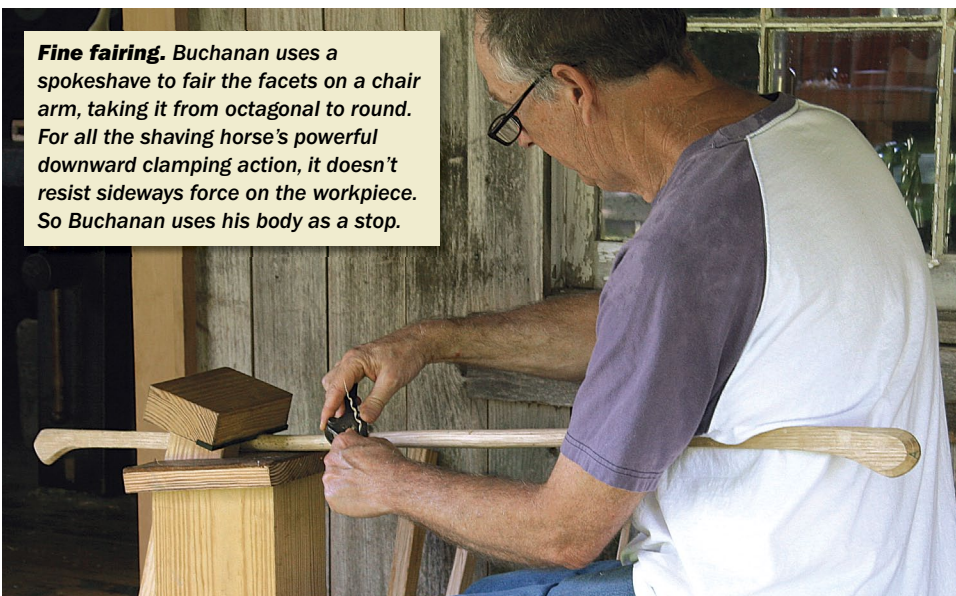
From rectangle to octagon. After shaving the spindle square, Buchanan clamps it on its points to chamfer the corners and make it into an octagon. The cushioning glued to the platform and head let him grip the angled piece firmly without denting it.



processes performed standing up. So it is a pleasure to turn to the shaving horse and work sitting down. But even though there's a meditative feeling to shaving spindles on the horse, it's not a form of rest—using the shaving horse is totally engaging.

The shaving horse is basically a giant vise, and it works seamlessly. The harder you pull on a drawknife, the harder you automatically push on the treadle with your foot. This tightens the grip on the stock and prevents it from slipping out of the jaws. To maximize gripping power,

Fine fairing. Buchanan uses a spokeshave to fair the facets on a chair arm, taking it from octagonal to round. For all the shaving horse's powerful downward clamping action, it doesn't resist sideways force on the workpiece. So Buchanan uses his body as a stop.



Most versatile vise. In some situations it's best to work on the front side of the clamping head. The small size of the platform on this horse makes the operation more convenient.

always adjust the head when you switch to a thicker or thinner workpiece. There should be just a little clearance between the head and the workpiece. The smaller the distance the head has to travel to contact the workpiece, the tighter its grip will be. When you need to rotate the stock, simply let your foot off the treadle; a properly balanced head will swing back. Rotate the stock and you're back in business, with the stock clamped securely and ready for the next cut. This motion becomes automatic and you'll develop a distinctive rhythm.

There are about as many species of shaving horses as there are users, many

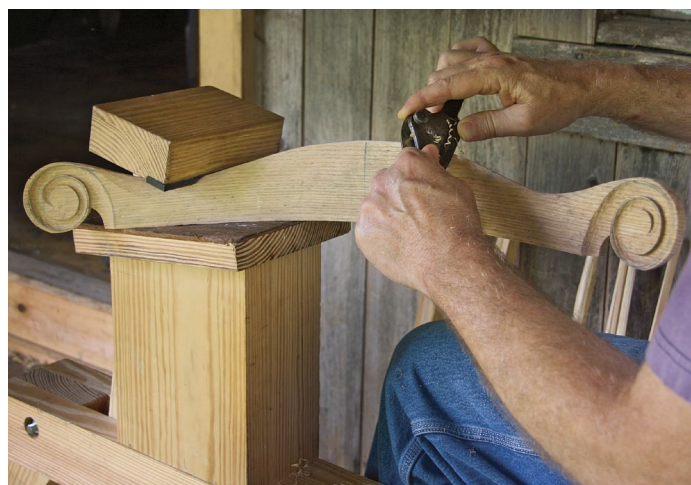


CLAMPING CURVES

Curved wood won't spook this horse. The head and pedestal can easily pinion curved parts in their one-point grip. Here Buchanan uses his shoulder to help stabilize the workpiece.



Delicate and doubly curved. With a little ingenuity, you can get the horse to grip just about any workpiece. The shaving horse makes it a simple matter to clamp compound curved parts for shaping, keeping them locked tight yet safe from damage. Here Buchanan makes finishing cuts on a crest rail.



of them customized to fit an individual's size and work style. But the broad range of horses can be divided into two basic styles. The Swiss, or dumbhead, style horse has a single arm that penetrates the work platform. A thick block of wood—the dumbhead—at the top of the arm serves as the upper jaw of the clamp. The English-style horse has a pair of arms that straddle the work platform, and the upper jaw is a crossbar between the arms. I use the Swiss type, which I think is more versatile. The one I'm using now was designed and made by Tim Manney, and it's the best I've ever used (to learn how to build your own, see his article, pp. 43–51). □

Curtis Buchanan builds Windsor chairs in Jonesborough, Tenn.



Firm grip, fast reset. While Buchanan beads this chair arm with a scratch stock, the horse's lightning-fast release-and-reclamp action enables him to work close to the clamping head for maximum stability without sacrificing efficiency.

A Fresh Take



on the Trestle Table



A live edge and
nontraditional joinery
revamp a familiar form

BY MARCUS SOTO

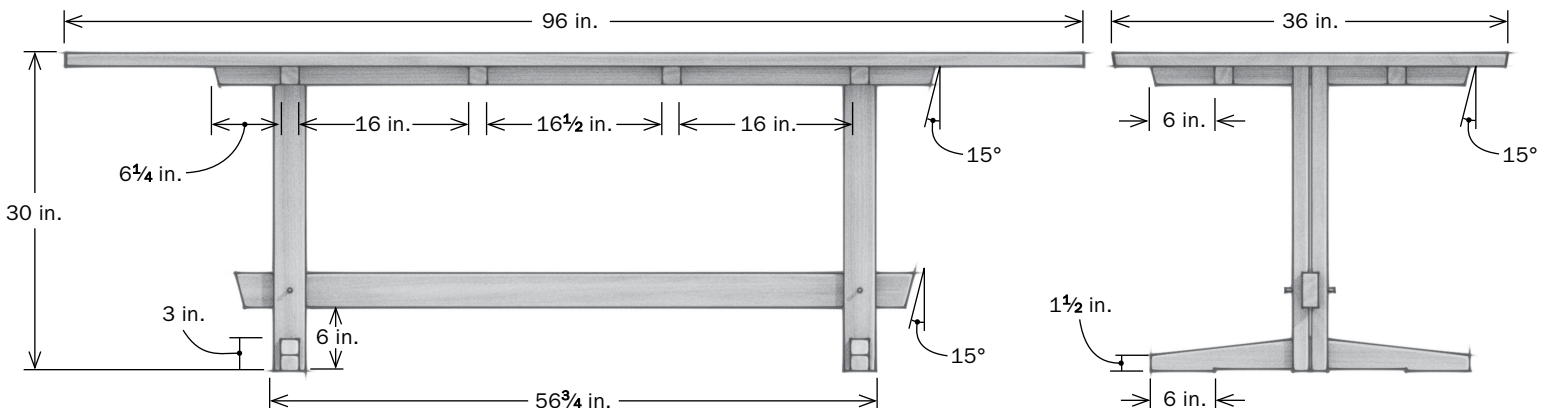
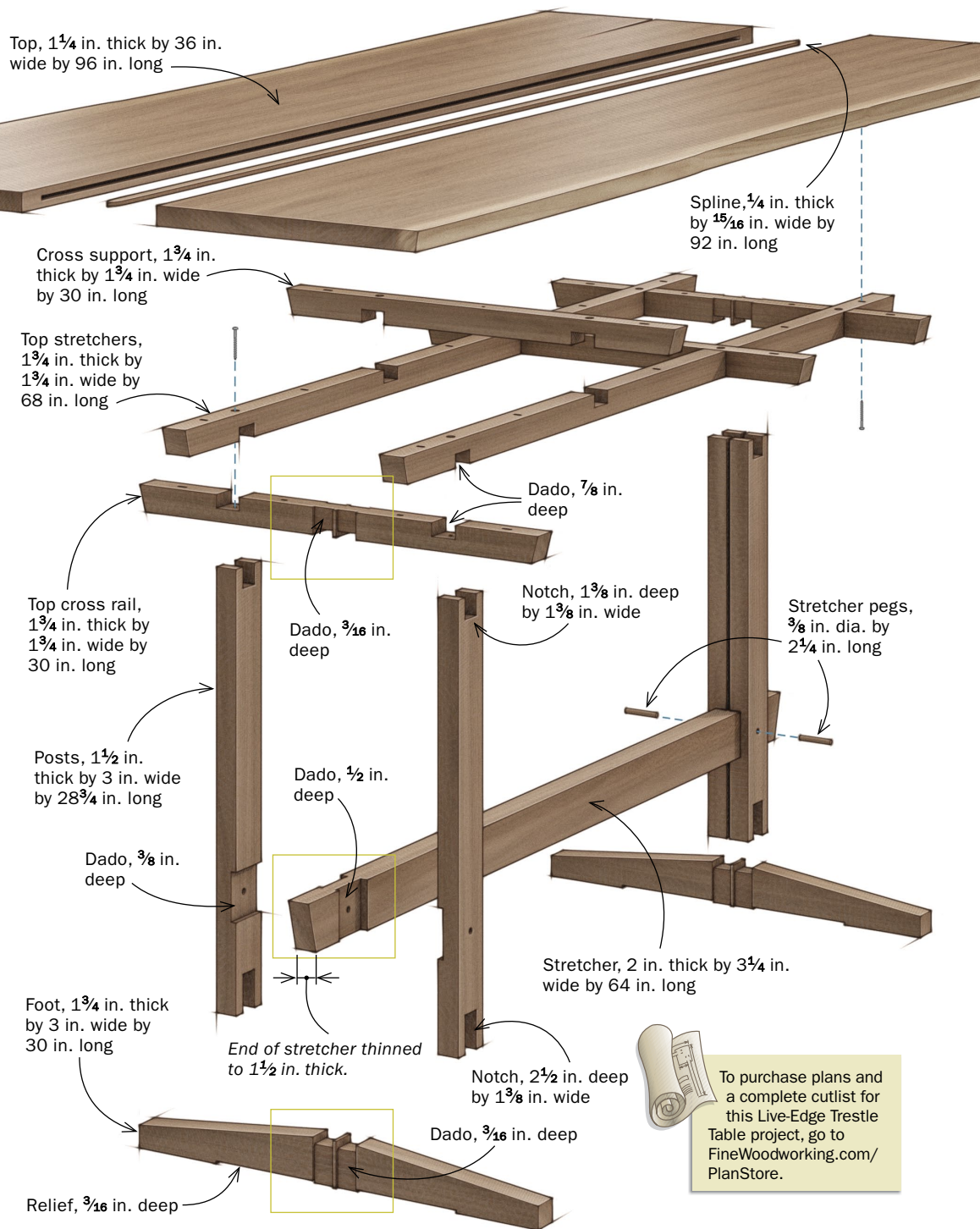
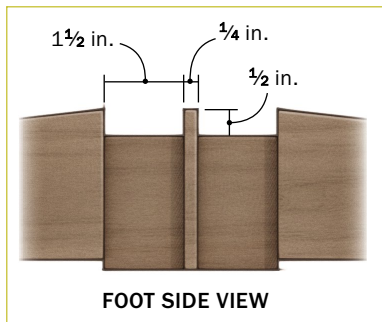
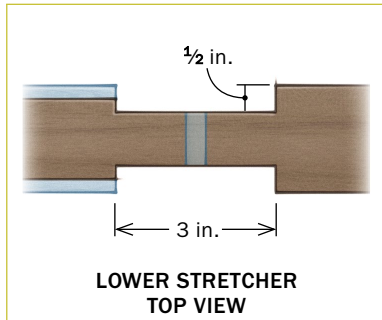
As the design and production partner at New York Heartwoods, I set out to create furniture that looked elegant and handcrafted yet for business purposes had to be quick to build and simple to repeat. This trestle-style table is the perfect example. The top is a gorgeous slab of $6/4$ book-matched eastern black walnut. I didn't want to distract from the beauty of that wood, so I designed a restrained, rectilinear base that complements the natural beauty of the top. The base joinery consists of half laps and bridle joints, with slight angles and tapers, and optional pegs to add interest.

Feet and rails come first

Although the top is the focal point of the piece, construction starts with the base. To begin, lay out the joinery for the feet and the top cross rails. These pieces are the same length, which simplifies layout and reduces setup time. The cross rails and the feet each have two bridle joints separated by a $1/4$ -in. strip in the middle.

Soto pairs the natural beauty of a book-matched, live-edge top with a subtle base, adding new twists with the joinery and angle details.

**TOP CROSS RAIL
SIDE VIEW**



This creates an interesting visual break between the posts without sacrificing strength and rigidity.

I cut the dados in the top cross rails and feet at the same time using a tablesaw and a series of stops. First cut the dados on both sides of the cross rails and around the feet. Next, raise the dado blade and cut the deeper dados on the top of the feet and the bottom of the cross rails. These deeper dados lock in the bridle joint and create more purchase.

The spacer strips on the cross rails and feet are vulnerable short-grain pieces, and are not strictly necessary. Personally, I leave the strips, but I make certain to use caution during dry-fits and glue-ups to avoid snapping them off.

Tackle the posts and stretcher

To finish the bridle joints, the two-piece posts need to be notched on

FAST DADOES WITH CLEVER STOPS



Cut a bridle joint on the feet and top cross rails.

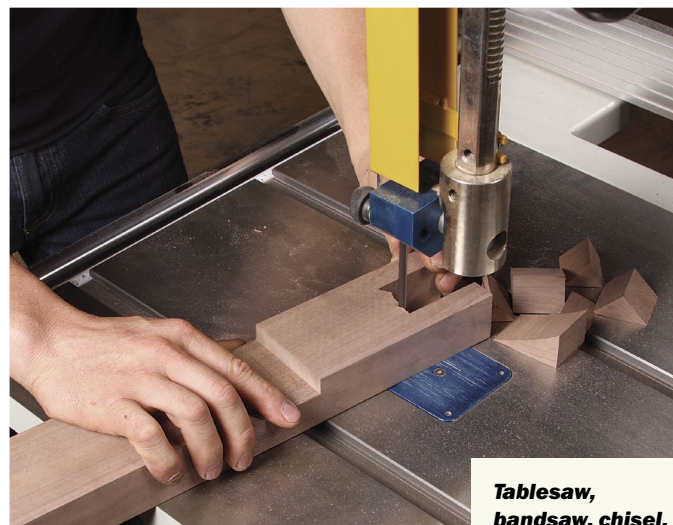
Using a dado set, establish one shoulder of the joint by registering on the fence (top). Then slide the piece to register on the stop, cut the other shoulder, and waste out the middle. Flip the piece end for end to cut the dado on the other side of the spacer. Repeat the process on the other face of the workpiece. Finally, raise the dado blade and cut the deeper dados into the top of the feet and the bottom of the cross rails (bottom).



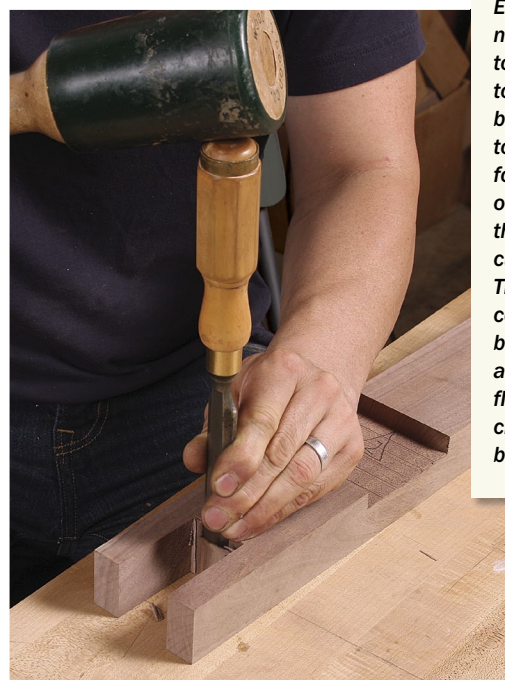
Cut half laps on the stretcher. This piece is long and heavy, so Soto sets up a stop on a miter gauge and cuts the closest edge of the notch on one side, flips to the other face and cuts the opposite side, flips to the other end, and repeats. Then he resets the stop to cut the farthest edge of the notch and repeats. Finally, he wastes away the middle.



HALF LAPS AND BRIDLE JOINTS ON THE POSTS

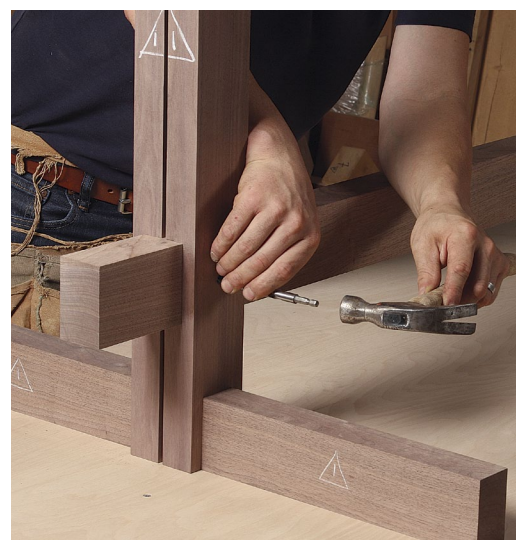


Tablesaw, bandsaw, chisel. Each post gets notched on the top and bottom to complete the bridle joint on the top cross rail and foot. With the post on end in a jig on the tablesaw (left), cut the two cheeks. Then cut out the center waste on the bandsaw (above) and finish up the flat between the cheeks at the bench (left).



the top and bottom to accept the top cross rail and foot. I cut the notch with the post upright on the tablesaw in a jig that slides on the tablesaw fence. I cut the two cheeks, cut out the waste on the bandsaw, and then finish up the flat between the cheeks at the bench. I undercut the middle slightly to ensure a tight fit.

Next I cut the half-laps connecting the posts to the lower stretcher. First I cut the stretcher to length. It's long, so I use a jig to keep the stock from tipping down. When laying out the joint, make sure you compensate for the $\frac{1}{4}$ -in. spacer that will separate the two halves



Pegs are a design detail. Locate and drill holes in the posts (left). Dry-fit the feet, stretcher, and posts, and use a brad-point bit to mark the peg location in the stretcher (right). Disassemble and drill the stretcher.



HALF-LAP GRID SUPPORTS THE TOP



Lay out the joinery for the grid. Dry-assemble the base, mark the locations for all the half laps on the intersecting pieces, and cut them on the tablesaw.

of the posts. I use a dado set to cut the joint.

Now use a $\frac{3}{8}$ -in.-dia. brad-point bit to drill holes for the pegs that go through the posts.

Time for dry-fitting and fine-tuning

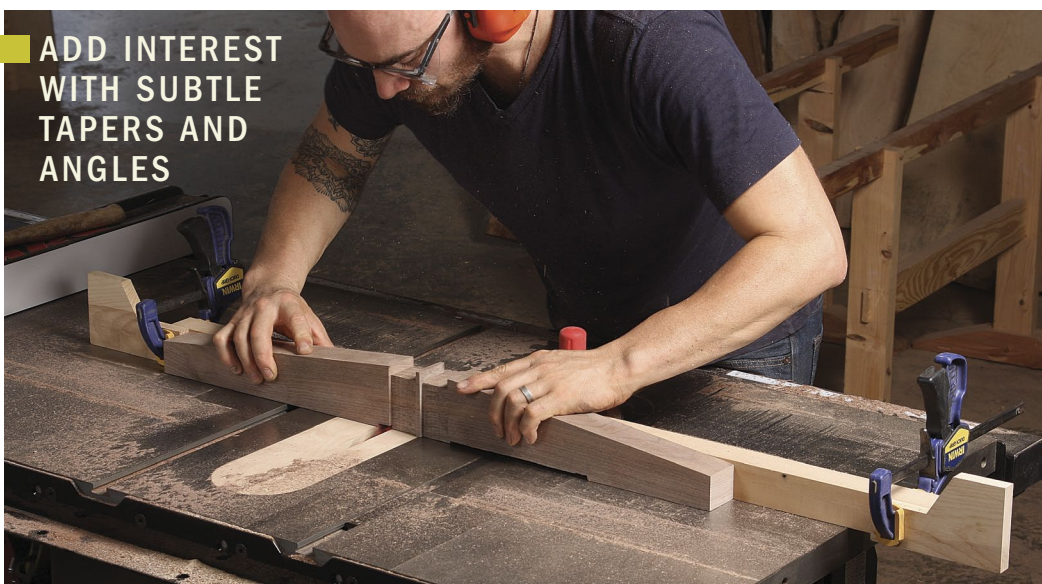
Clean up and fit all the joints at the bench. After the joints are satisfactory, dry-fit all the parts. Then mark for the peg holes in the stretcher with the bit you used to drill the holes in the posts.

Next, lay out the half laps joining the top stretchers to the cross rails and cross supports. Cut 15° bevels on the ends of the cross rails, the cross supports, and top stretchers. I use a chopsaw and then clean up the ends with a sanding block.

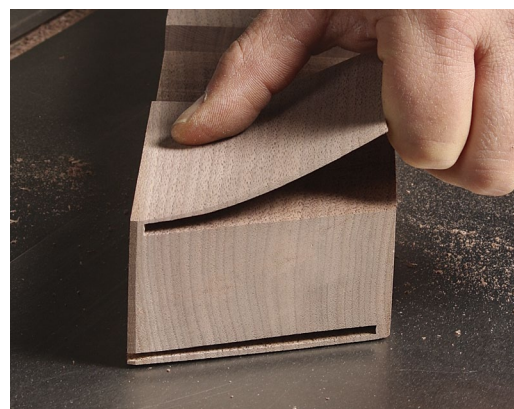
Now back to the feet. Use a template to mark the tapers on the top of each foot. I cut the angles on the bandsaw and clean up the band-saw marks with a block plane and sanding block.

You'll want to relieve the bottoms of the feet so that there are fewer points of contact on the floor. I come in about 6 in. from each side and then stop in the middle where the post touches the floor. I relieve $\frac{3}{16}$ in. from the bottom, making sure to score both sides of the foot to reduce tearout. I use

ADD INTEREST WITH SUBTLE TAPERS AND ANGLES



Feet get tapered and relieved. Cut the taper with a bandsaw and clean up the surfaces with a plane and sanding block. Then relieve the bottoms with a dado blade and two stops on the tablesaw.



Angle and thin the end of the stretchers. After cutting the angle on each end of the stretcher on the miter saw, use the tablesaw to trim the block beyond the half lap. With the blade fully raised, rip in and back out (left). Snap off the thin waste (right) and clean up with a block plane.

PREFINISH AND PUT IT ALL TOGETHER



Prefinish the inside of the posts. Because the space between the posts is so narrow, you must finish the inside of the posts and the spacers between them before assembly.



Stretcher, posts, and feet. The first step of the glue-up is to sandwich the stretcher in between the posts and add the two feet.

Add the top cross rails. Glue and tap the cross rails into place (right). Dry-fit the top stretchers (below) and the cross supports. These pieces help keep things aligned during the glue-up, but leave them dry so the table can be disassembled for transportation and maneuvering through tricky doorways or tight corners.



stops on either end of the miter-gauge fence and hog out the waste with a dado set, making sure the blade comes up to the score line. I use a backer piece to reduce tearout even further.

Drill holes through the stretcher with the $\frac{3}{8}$ -in. brad point bit that was used to mark the location of the pegs. Then, drill and elongate the holes for the screws to attach the top.

Sand and glue it up

Before assembly, I finish-sand and apply finish to the inside surfaces between the posts and to the spacers themselves, being careful to avoid getting finish on any of the joinery. For the glue-up, I like to use a slower-setting glue to allow myself a little more time and a lot less stress. Titebond III is good for this.

It can be a little tricky getting all the parts together at once, so a dry run is a good idea. I do not glue in the top stretchers and the cross supports. I like to leave these dry for transportation and any tricky doorways or tight corners that may have to be worked around during a delivery. I do dry-fit them during glue-up to help keep things aligned.

Last, add the four pegs that come in halfway through the leg on each



PAIR A SUBTLE NATURAL EDGE
WITH THE ANGULAR BASE

side, protruding slightly. I make my own and pre-finish them. I ebonize the ends that will protrude and mask off the ends that will be glued in.

Top it off

For this tabletop, I used book-matched planks of black walnut that are about 18 in. wide. I made a router jig to flatten the top and edge-glued the two pieces together. Generally, with tabletops I like to add a spline between the two pieces for alignment and reinforcement. Alternatively, you can use Dominoes or biscuits. I also used a spring joint for the edges.

Finally, I used Osmo Polyx-Oil for the finish (see *Finish Line*, pp. 76–77). I used four coats on the top and two on the base. When working with walnut, I wet-sand the first coat to fill in the grain. I find this helps with spills and overall durability. □

Marcus Soto is design and production partner at New York Heartwoods in Kingston, N.Y. He also is the owner of Sojen Design, a custom furniture company located in the Hudson Valley.



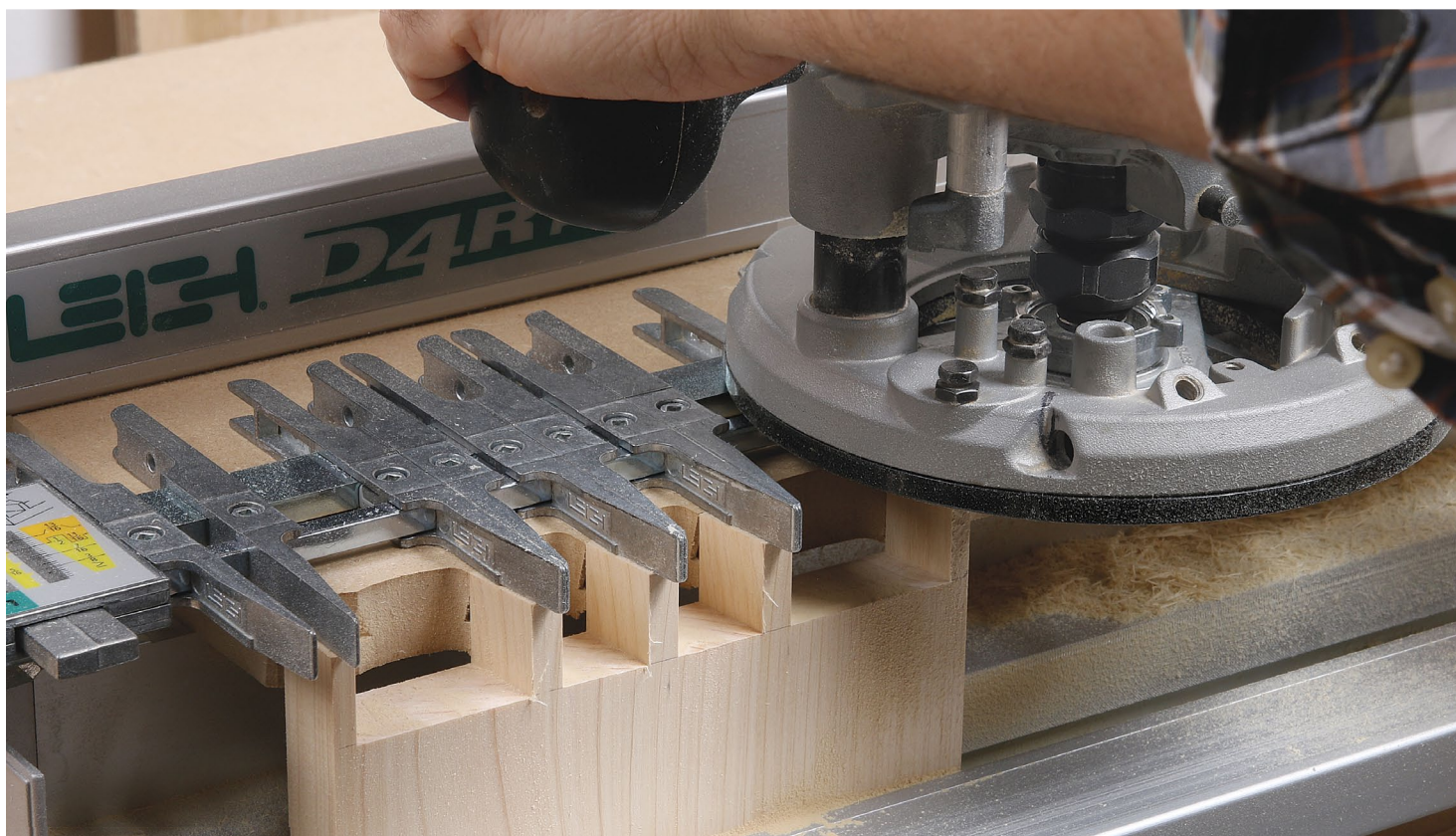
Full spline between boards. Soto prefers a full spline (above) over Dominoes or biscuits because it's easier to align the pieces in the glue-up with a full spline. Because Soto chose boards without too much wave, he doesn't have to use shaped cauls when clamping (left). He does put shims into any cracks that will get butterfly keys so the clamping pressure doesn't affect them. Screw the top to the base through elongated holes in the cross supports underneath (bottom left).



Dovetail Jigs

The best turn out beautiful, flawless joints in a jiffy

BY ASA CHRISTIANA



Everyone loves the look of hand-cut dovetails, but not everyone loves to cut them. That's why many woodworkers turn to a router dovetail jig. These jigs promise to make flawless dovetails quickly and easily. To help you pick the best one, *Fine Woodworking* asked me to test the field. There's a pile of dovetail jigs on the market, so we tested only the ones that can do both half-blinds and through-dovetails, as both are essential for furniture making.

Most of the jigs are used with a handheld router, but a couple are used with a router table. That means your table must have an insert plate that can accommodate a standard $1\frac{3}{8}$ -in.-dia. bushing. By the way, for most of these jigs you'll need a router with a $\frac{1}{2}$ -in. collet and a minimum of $1\frac{1}{2}$ hp. All of the jigs include the bushings and router bits you need for basic through- and half-blind dovetails, with some offering optional bits for different-size joints or thicknesses. All can rout both parts of a half-blind dovetail in a single pass (with even spacing), and some also can handle the workpieces separately to allow variable spacing and deeper tails, so I gave that a try, too. Whenever possible, I cut my test joints in $\frac{7}{8}$ -in.-thick stock to get an idea of the depth and spacing possible with each jig. Read on for the results.

Asa Christiana is a former editor of Fine Woodworking, now freelancing in Portland, Ore.



LEIGH D4R PRO

\$595

Spacing: Variable

Stock width (max.): 24 in.

Stock thickness: $\frac{1}{8}$ in. to 1 in. for through-dovetails (pins board can be $1\frac{1}{4}$ in.); $\frac{1}{8}$ in. to 1 in. for half-blinds

Half-blind depth: $\frac{3}{16}$ in. to $\frac{3}{4}$ in.



The D4R Pro is Leigh's flagship jig. Like the other Leigh jigs in this test, it represents a different world of quality, from its clear, comprehensive instructions to its ingenious engineering, impeccable manufacturing, and unmatched capabilities.

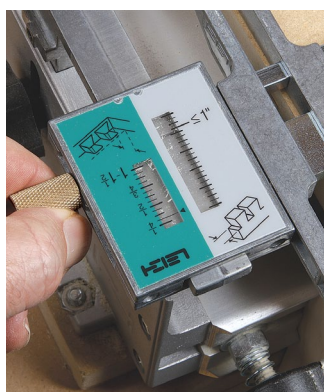
Because the sliding fingers are offset on each side of the template, you simply clamp the workpiece in place, align the sliding fingers by eye, and the pins and tails will mesh perfectly when you flip the template to machine the other half of the joint. Aligning the fingers lets you play with the array and settle on the best layout in minutes. Precise indicators ensure that you are aligning the template correctly in every position, with icons to remind you which way it flips for each task. One thing to note is that the bushing is eccentric, which lets you pivot it to adjust the joint fit 0.002 in. at a time. But you must keep the router in the same orientation to get perfect joints.

Cutting the two parts of a half-blind dovetail joint separately lets you vary the spacing and go up to $\frac{3}{4}$ in. deep, much deeper than other manufacturers' jigs. You need larger accessory bits for this—and for routing through-dovetails on the thickest stock—but the added capabilities are well worth the cost.

For both through-dovetails and half-blinds, the D4R produced better results and more consistent joints than any jig in the test other than the Leigh RTJ400 router-table jig, which has fixed template fingers.



Magic fingers. All you need is a center mark to design the array of pins (left). You can trust your eyes from there, and even if the symmetry is off, the design of the template ensures a perfect match between pins and tails when you flip it (below).



Short learning curve. Icons tell you which way the template goes on the jig, and precise guide lines dial in its position for any stock thickness.



Clever engineering. For half-blinds in one pass, a rod slides through the template fingers to stop the bushing's rearward travel in the right spot.



LEIGH SUPER 18 JIG

\$399

Spacing: Variable

Stock width (max.): 18 in.

Stock thickness: $\frac{1}{4}$ in. to $\frac{13}{16}$ in. for through-dovetails (pins board can be 1 in.); $\frac{1}{4}$ in. to $\frac{13}{16}$ in. for half-blinds

Half-blind depth: $\frac{7}{32}$ in. to $\frac{3}{4}$ in.

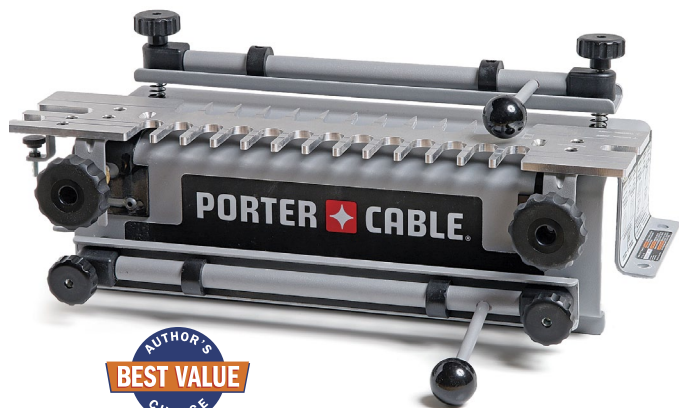


This jig is a value-oriented alternative to the Leigh D4R, but its template system is just as excellent. (I tested the 18-in. model, but there are 12- and 24-in. versions, too.) The template fingers don't split in half for extrawide pins, but I can't think of any situations where I would want those. Also, the jig's reference surfaces are not milled but are covered with coarse sandpaper, which holds workpieces powerfully.

The Super Jig actually has a few advantages over the D4R Pro. Its template fingers are a little closer together ($\frac{7}{8}$ in. vs. 1 in.), meaning you can cluster pins and tails closer, such as at the center of a joint. And I found its guide lines easier to see and line up precisely. The only true drawback for me is the Super Jig's more limited stock-thickness capacity (as with the other Leigh jigs, you need accessory bits to reach the full range of thicknesses and half-blind depth). Like the D4R, the bushing on the Super Jig is eccentric, so you must keep the router in the same orientation to get perfect joints.



Simpler fingers. These don't split for extrawide pins, but they are just as accurate as those on the D4R.



PORTER-CABLE 4212 DELUXE DOVETAIL JIG

\$160

Spacing: Fixed

Stock width (max.): 12 in.

Stock thickness: $\frac{1}{4}$ in. to $\frac{3}{4}$ in. for through-dovetails (tails board can be 1 in. thick); $\frac{1}{2}$ in. to $1\frac{1}{8}$ in. for half-blinds

Half-blind depth: $\frac{3}{8}$ in.



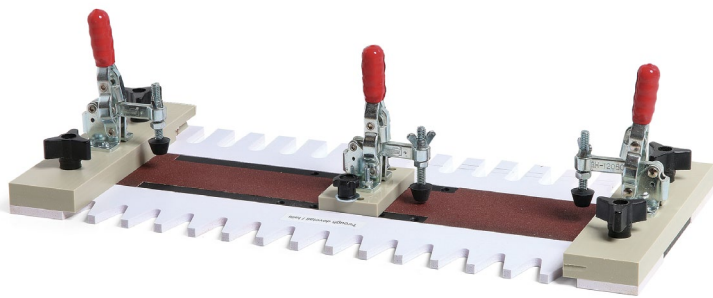
If you are OK with fixed spacing and evenly sized pins and tails, plus a $\frac{3}{4}$ -in. ceiling for workpiece thickness on through-dovetails, this jig is an exceptional value. Everything you need for precise setup is built in, making the learning curve short and success almost guaranteed.

As is the case with all fixed-spacing jigs, if you want traditional half-pins at the ends of the joint, only certain board widths will work. In this case, the optimal widths start at $1\frac{1}{4}$ in. and go up in 1-in. steps from there, with an acceptable plus-or-minus range at each increment. Also, on the Porter-Cable half-blind dovetails go only halfway through a typical drawer front, but the dovetail angle is steep enough to ensure a strong joint.

The cam-action clamp bars adjust quickly and hold fast, and the router rides steadily atop the thick, broad aluminum templates. The smooth-cutting bits have $\frac{1}{2}$ -in.-dia. shanks for vibration-free routing. The 4216 version adds a template for narrower dovetails and box joints on even thinner stock.



Set it once. Once you have the template set for one side of the joint, you can flip it into the perfect position for the other half, with no further adjustment to the router or jig.



FAST-JOINT PRECISION JOINERY SYSTEM

\$170

Spacing: Fixed

Stock width (max.): 14 in.

Stock thickness: $\frac{1}{4}$ in. to $\frac{3}{8}$ in. for through-dovetails; $\frac{1}{4}$ in. to $\frac{3}{4}$ in. for half-blinds

Half-blind depth: $\frac{3}{8}$ in.

This fixed-spacing jig is used on a router table and includes a number of decorative-joint templates, with many more available as options. It is capable of good joints, and there is some clever design to this jig, notably the little setup block that locates workpieces on various templates.

However, the jig has the same deal-breaker as the MLCS (p. 42): It can't make half-pins on the ends of through-dovetails, at least not without some sort of DIY spacer block. Because the fixed clamping blocks also serve as end stops, you'll need a spacer to center any type of joint, unless the boards are precisely sized. Worse, the jig can only machine through-dovetails on stock up to $\frac{3}{8}$ in. thick.

The Fast-Joint also requires significantly more assembly and setup time than others in the test.



Disposable stops. You rout into the plastic end blocks for many joints, making them increasingly difficult to use for later tasks.



LEIGH RTJ400 ROUTER TABLE JIG

\$330

Spacing: Fixed

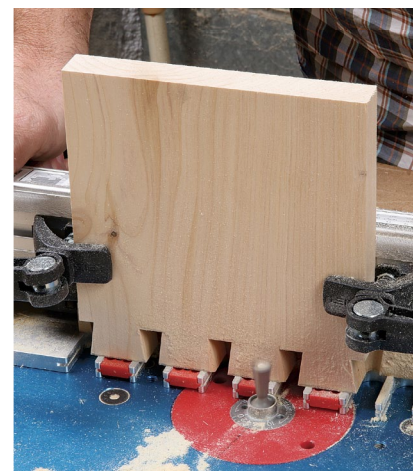
Stock width (max.): 16 in.

Stock thickness: $\frac{1}{8}$ in. to $\frac{13}{16}$ in. for through-dovetails (pins board can be $1\frac{1}{4}$ in.); $\frac{1}{8}$ in. to $\frac{13}{16}$ in. for half-blinds

Half-blind depth: $\frac{3}{8}$ in. to $\frac{19}{32}$ in.



Easy setup. The workpiece holder drops down onto the template in precise positions for different joint operations. You can't vary the spacing, but for through-dovetails, you pop in little spacers to create wide tails.



This is another Leigh jig of impeccable quality, with a CNC-cut template and machined reference surfaces for accuracy. It produced even more consistently accurate through-dovetails than the other Leigh jigs, especially on the first try, probably due to its fixed template fingers and the fact that it is used on the router table, where it rides steadier than a handheld router can. However, in price and capabilities it falls between the Porter-Cable and Leigh Super Jig, more expensive than the former and lacking the variable spacing of both.

The template is clever, from the pins and holes that locate it to the tension levers that hold it tightly to the workholder above. The workpiece clamps slide easily and hold strong, even pulling cupped boards flat, and large handles on the back of the jig make it easy to control. Like other Leigh models, the RTJ400 requires accessory bits to reach the maximum range of thicknesses and half-blind depth.

Although this jig lacks variable spacing, it creates double-wide tails for a more handmade look than most fixed templates produce. If you don't mind being limited in the range of possible board widths and thicknesses, the RTJ400 jig is a great option.



MLCS MASTER JOINERY SET

\$200

Spacing: Fixed

Stock width (max.): 12 in.

Stock thickness: $\frac{1}{2}$ in. to $\frac{3}{4}$ in. for through-dovetails;
 $\frac{1}{4}$ in. to 1 in. for half-blinds

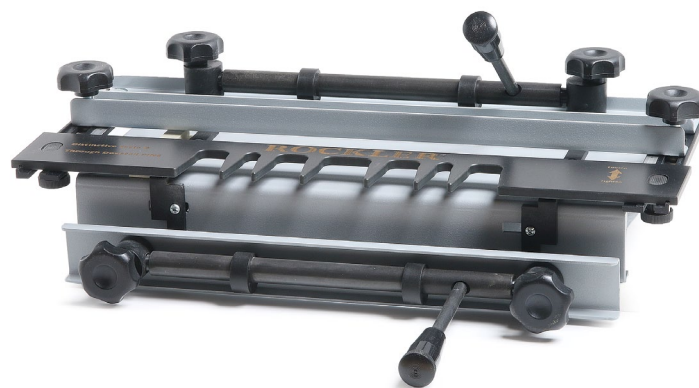
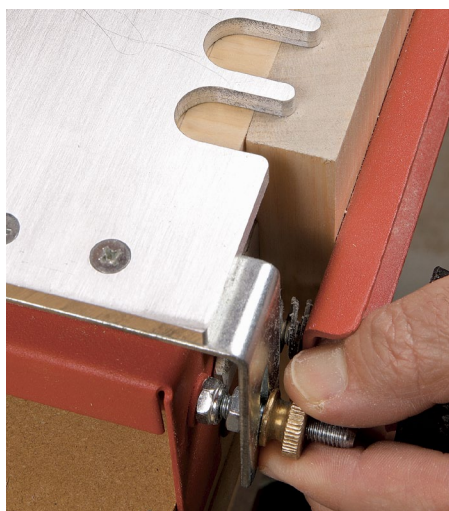
Half-blind depth: $\frac{3}{8}$ in.



This jig comes with a wide range of templates for more than one size of through-dovetails, half-blinds, and box joints, and it can machine good joints. But there are too many problems. Using the supplied edge guides, you can't position the stock for half-pins at the ends of the through-dovetails, only half-tails. Switching between joints is time-consuming and tedious: Side stops have to be changed out, as do spacers on the upper clamp bar, and you have to make a significant front-to-back adjustment to the template position, with small lock nuts that must be turned many times with a wrench.

The jig also lacks some of the user-friendly stops and guide lines of other jigs, requiring that you do a fair amount of measuring and marking for every joint you cut. Add a range of manufacturing and other design issues, including bits that don't cut very well, and I can't recommend this jig.

Tricky setups. To position the template for single-pass half-blinds, you align the bottoms of the template fingers with a pencil line on a reference board, which disappears as you get close. Also, the lock nuts that position the template must be turned a dozen or so times with a wrench to transition between joint types.



ROCKLER COMPLETE DOVETAIL JIG

\$165, optional templates \$40 each

Spacing: Fixed

Stock width (max.): 11 in.

Stock thickness: $\frac{1}{2}$ in. to $\frac{3}{4}$ in. for through-dovetails (pins board can be up to $1\frac{1}{8}$ in. thick); $\frac{1}{2}$ in. to $\frac{3}{4}$ in. for half-blinds

Half-blind depth: $\frac{5}{16}$ in.



Extra steps for half-blinds. You have to do some math and measuring to set the stop bar that limits the router's rearward travel (left). Also, the side stops don't stay square when moved, so you have to recheck them.

With its standard setup, this jig competes with the Porter-Cable Deluxe on price and machines good joints. It's also more versatile: For \$40 each, you can add templates for a few non-uniform, nice-looking arrays of through-dovetails. But those templates are still fixed, with an even more limited range of acceptable board widths. And the additional template cost bumps the Rockler up to \$275, pitting it against the 12-in. Leigh Super Jig, which offers infinitely adjustable spacing.

Where it loses to the Best Value Porter-Cable is in ease of use. Setting up for both half-blind and through-dovetails is a fussy process. There is an optional dust-collection attachment (\$48) that does its main job well, but it has to be detached for every new setup.



Build a Thoroughbred Shaving Horse

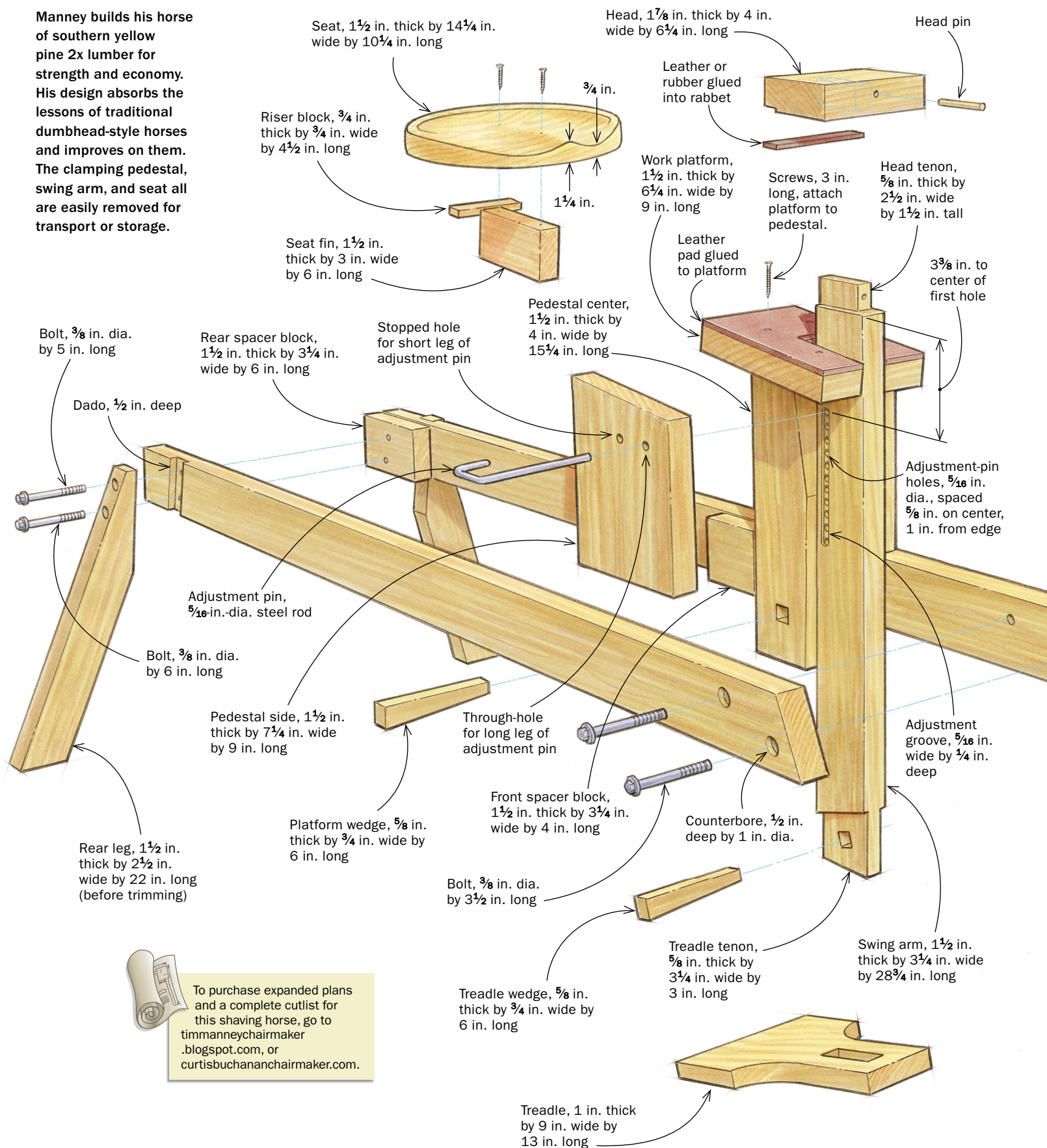
Intelligent design delivers
a strong, stable structure
and a powerful grip

BY TIM MANNEY

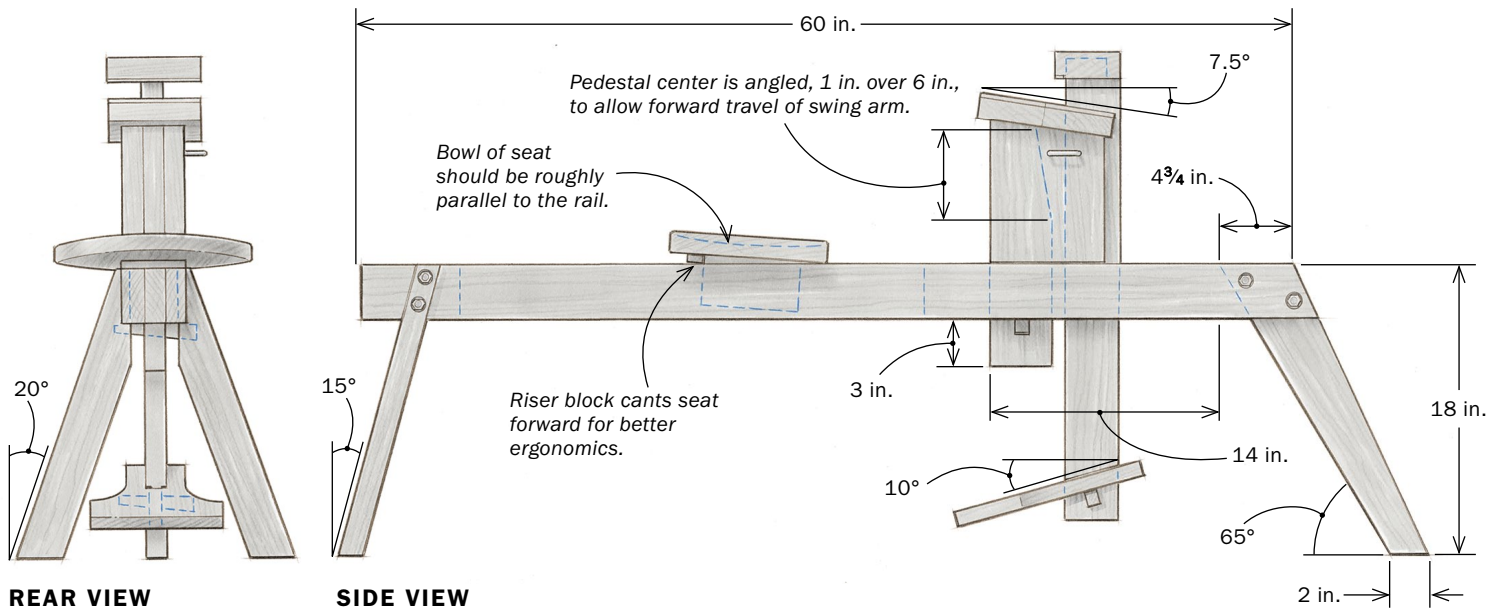
The first woodworking I ever did was on a shaving horse. I had just turned 20, and a 12-year-old sat me down at a shaving horse with a drawknife and taught me how to make a spatula from a piece of red maple firewood. I was hooked. The simple elegance and intuitive feel of the horse and drawknife completely drew me in as shavings piled up around my feet. Since then I've had the good fortune to spend countless hours on shaving horses and to work extensively with other shaving horse aficionados.

Shaving horse

Manney builds his horse of southern yellow pine 2x lumber for strength and economy. His design absorbs the lessons of traditional dumbhead-style horses and improves on them. The clamping pedestal, swing arm, and seat all are easily removed for transport or storage.



To purchase expanded plans and a complete cutlist for this shaving horse, go to timmanneychairmaker.blogspot.com, or curtisbuchananchairmaker.com.



Rail, 1 1/2 in. thick by 3 3/4 in. wide by 60 in. long

My current horse is the offspring of great horses built by two of my mentors. The base comes from Curtis Buchanan's horse, and the clamping mechanism is a simplified version of Carl Swenson's. By crossbreeding these two steeds I got a strong, simple-to-build shaving horse that adjusts easily for different-size workpieces and has a very powerful grip. It looks similar to traditional dumbhead-style horses, which grip the work with a block-shaped head rather than a clamping bar, but it offers increased holding power and better ergonomics. (For Curtis Buchanan's advice on using a shaving horse, see *Handwork*, pp. 26–29.)

For me, the horse starts with a single 16-ft. 2x10 of clear southern yellow pine. With thoughtful layout and a blemish-free plank, this is enough material for the entire horse. In New England, where I live, southern yellow pine can be hard to find. But I discovered that OSHA-approved walkboard planks for scaffolding are made of it, and a good construction-lumber supplier should have them in stock. In the absence of yellow pine, a medium-soft hardwood like tulip poplar would work, or, in the Northwest, clear Douglas fir.

Begin with the beam

The base of a shaving horse needs to be extremely solid. If the base can flex, your horse will creak, moan, and trot across the floor as you work—undesirable traits for a horse of this sort. The laminated-beam construction

I use makes for a very rigid base that won't flex under the heaviest use.

To make the beam, start by milling the spacer blocks and the front leg to the same thickness, and then glue the spacer blocks between the rails. Wait to glue the front leg in place until after the spacer blocks have cured. This lets you true up the beam by passing it through the planer after the initial glue-up. It also lets you take your time to get the front leg aligned just right at glue-up.

Fit and fix the legs

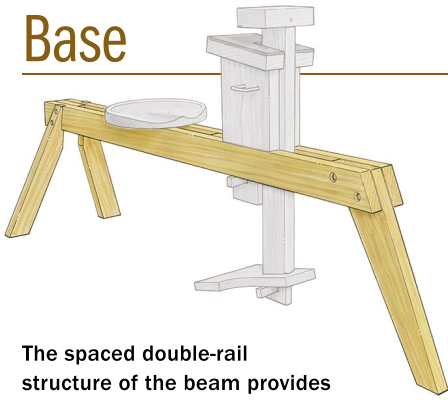
All three legs should be several inches overlength at assembly; you'll trim them to final length only after they're all glued and bolted. The front leg is tapered, being wider at the top to allow for a greater offset between the two bolts that will hold it in place. If the bolts were placed one directly above the other, they would provide much less resistance to racking forces. I glue in the front leg, and then drill counterbores and clearance holes for its bolts, nuts, and washers. With those bolts in place, it's on to the rear legs.

The rear legs fit into angled dadoes in the rails of the beam that produce the legs' 15° backward rake. To rough out the dadoes and establish their depth, I cut multiple kerfs with a circular saw. I clear the waste and chop the shoulders with chisels, and then clean up the bottom of the dadoes with a router plane. Alternately, you could cut these dadoes with a router. The fit should be tight to prevent the rear legs from racking over time.

Drilling for the bolts through the back legs takes some finessing. Start by drawing a square line across the top of the beam from the center of

Front leg, 1 1/2 in. thick by 4 1/2 in. wide by 20 in. long (before trimming)

Base



The spaced double-rail structure of the beam provides rigidity without excess weight and also creates the slot that neatly accepts the front leg, pedestal, swing arm, and seat.



The spine of a horse. Manney creates a stout beam by gluing spacers between a pair of rails. He trims the assembly afterward with a pass through the planer.



Front leg first. Cut from stock milled to the same thickness as the spacers, the front leg is glued in next. When the glue dries, Manney adds carriage bolts to the joint.

one dado to the other. Then clamp the legs in position, leaving enough room above the clamps to drill the top hole. I drill the counterbores first, then the bolt-clearance hole. Using the line across the top as a sighting aid, drill the clearance hole with a long $\frac{7}{16}$ -in. bit, drilling in from both sides. You might want to have a friend—or a mirror—on hand to help ensure that the bit stays horizontal as you drill.

If the bolt slides right through the clearance hole, take a moment to give yourself a little pat on the back. If it doesn't, wallow out the hole with your drill bit, or chase through the original hole with a larger bit to create more clearance. Insert and tighten the upper bolt, then remove the clamps and drill the lower hole. When that's finished, spread glue on the dados and bolt the rear legs in place.

With all three legs glued and bolted to the beam, find a large flat surface so you can level the legs. The goal, after trimming, is to have the top of the beam 18 in. from the floor. Use blocks and wedges under the legs to get the horse level from side to side and



Dadoes in the beam. Multiple kerfs with a circular saw (left) make quick work of roughing out the angled dadoes for the rear legs. Manney follows up with chisels (above) and a router plane.

front to back. Then use a scribe—I clamp a pencil to a scrap of wood—to mark a cut line around each leg. If the beam is 21 in. above the flat surface, for example, you'll need a 3-in.-high scribe. Cut to the scribe lines with a handsaw, chamfer the edges with a knife or a chisel, and you've completed the base.

The heart of the horse

The clamping mechanism is the heart and soul of this shaving horse. The tight tolerances of the work platform and the swing arm prevent the head from racking and make for a stronger grip. And a simple improvement to the height-adjustment mechanism makes the horse far easier to use. Like many dumb-head-style shaving horses, this one has a row of holes that allow you to adjust the swing arm up and down to accept thick or thin workpieces. But on this horse the adjustment holes all lie in a groove. As you draw the pin from the hole to adjust the height of the head, the pin remains in the groove, making it simpler to slide the pin into one of the holes above or below.

The pedestal that supports the work platform is laminated from three pieces. The center piece forms a long tenon and has a wedged mortise at the bottom that locks the assembly to the beam. The angle cut on its front edge allows the swing arm to pivot all the way forward. The center piece should be thickened so that it just slides between the rails of the beam. The two outer pieces of the pedestal form massive tenon shoulders that pull tight against the rails of the beam when the wedge is driven home.

When you glue the side pieces to the center piece, be sure to orient them pith-side in. Flatsawn yellow pine boards this wide will cup a little over time. Placing them this way should prevent them from cupping in toward the swing arm and pinching it.



Boring for a bolt. After counterboring for the top bolt, Manney carefully drills the clearance hole.



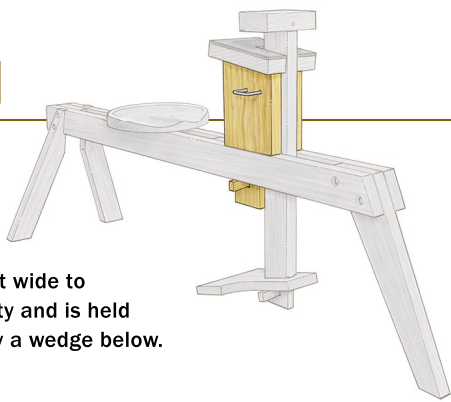
Flatten the tops. A thin shim protects the beam as Manney saws the rear legs nearly flush.



Shim and trim. After shimming the legs until the beam is parallel with the bench, scribe a line around each leg. Then cut them to length.

Pedestal

The clamping pedestal, a U-shaped unit that slots into the beam, is built wide to maximize stability and is held firmly in place by a wedge below.



The pedestal is a sandwich. Having already glued one side of the pedestal to the center board, Manney uses the beam to support and register the work as he glues on the second side.



A slice off the pedestal. After glue-up, cut the top of the pedestal at an 82.5° angle.



Mark for the mortise. Strike a line along the bottom of the beam to locate the mortise for the wedge that will lock the pedestal in place.



Drill and chop. Cut the top cheek of the mortise slightly over the line to be sure the wedge will pull the pedestal fully home.

On to the swing arm

When the work pedestal is glued up and wedged to the base, plane the swing arm to fit the channel in the pedestal. The swing arm should move easily, but it shouldn't be loose—a good fit here will prevent the swing arm from racking to the left or right when a piece of wood is held under only one side of the jaw.

With the swing arm dimensioned, drill the height-adjustment holes and rout the groove they sit in. I drill the holes 1 in. from the front edge of the arm. The groove should be on the same side of the horse as your dominant hand when you are on the horse.

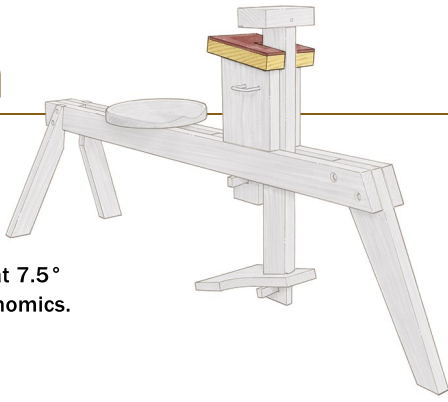
I prefer a low-profile head on the shaving horse. That makes

it easier to reach over the head to work on the front side of the swing arm and keeps you from ever having to push the drawknife. The joint that attaches the head to the swing arm is a bit odd. The mortise is oriented across the grain of the head, with end grain forming the two long side walls. This is not ideal for joint strength, but it's the trade-off that lets me keep the head profile low. I remove the bulk of the mortise on the drill press, then square it up with chisels. To compensate for the glue-surface issues, I use epoxy and make certain this joint has an exceptional fit.

I make the treadle next. I do the layout on a rectangular blank and take it to the drill press to rough out the through-mortise for

Platform

The platform serves as the lower jaw of the vise. It is canted upward at 7.5° to improve ergonomics.



Cover the platform. Glue leather to the top face of the work platform (far left), then screw the platform to the pedestal, sinking the screws below the surface of the leather.

Adjustment pin



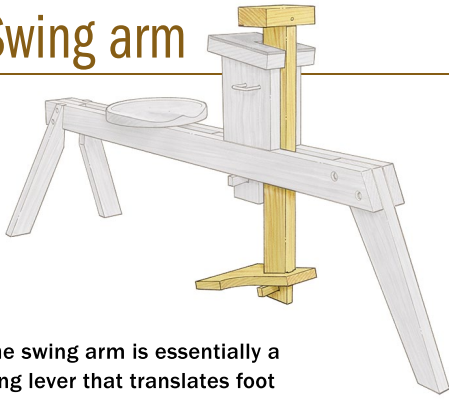
Preparing the adjustment pin. Use a propane torch to heat the steel rod and bend it in a vise (above). Once it's bent and cut to size, insert the long leg in the through-hole and mark for a stopped hole (right) for the short leg.



the swing arm. Next I cut out the overall shape at the bandsaw. You can clean up the sawn edges or leave them as is, as I would tend to do. Last, I clean up the sides and ends of the mortise with chisels.

With the head and treadle made and mortised, I cut the tenons on both ends of the swing arm. Before gluing on the head, I cut a rabbet into its gripping edge and glue in a strip of thick leather or 80A polyurethane rubber. This will make the head grippier and keep it from denting the workpiece. With the jaw lining installed, glue the head to the swing arm. Once the glue has cured and the clamps are off, drill through the tenon, insert a piece of 1/4-in. steel rod, and epoxy it in place.

Swing arm



The swing arm is essentially a long lever that translates foot pressure into gripping power.



Start the treadle tenon. Manney makes most of the cheek cut on the bandsaw, but because the shoulder is angled, he can't complete it there. He finishes the cut with a handsaw.



Piercing the treadle. After drilling out most of the waste, Manney uses chisels to clean up the mortise in the treadle.



Wedge issue. With the tenon finished, fit the treadle and strike a line to begin mortise layout for the wedge that will hold the treadle in place.

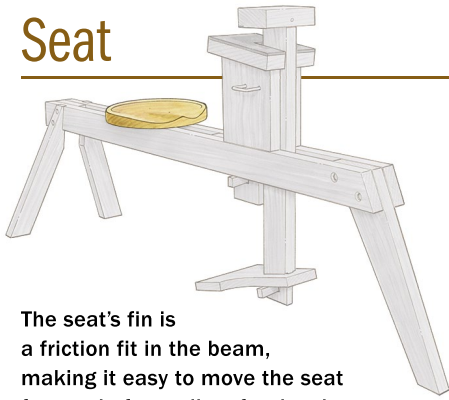


On with the head. Manney glues the head with epoxy because the mortise cheeks are mostly end grain. He uses an angled cutoff as a clamping caul.



Leather lip. A strip of leather glued into a rabbet at the front of the head gives the horse more grip and less bite.

Seat



The seat's fin is a friction fit in the beam, making it easy to move the seat fore and aft to adjust for the size of the workpiece (and the worker).



Scoop and saw. After scooping out the seat with a scorp and a spokeshave, Manney cuts it to shape at the bandsaw.

An important little pin

I bend the end of the adjustment pin to a U-shape, so it's easier to grasp. I insert the short leg in a stopped hole to keep the pin stationary as I work. A propane torch provides plenty of heat for bending the $\frac{5}{16}$ -in.-dia. rod. Locate the first bend by inserting the pin into the pedestal as far as it will go and making a mark on the pin $\frac{1}{2}$ in. from the surface of the wood. Use an awl so that the mark will not disappear when the rod is heated. Heat the pin, place the mark in line with the jaw of a metal vise, and bend the remaining portion of the rod 90°. Make a second bend $1\frac{1}{2}$ in. from the first, and cut the short leg to length. Then insert the long leg and use the short leg to locate the position of the stopped hole. Now put the swing arm in place, and install the adjustment pin to make sure everything glides smoothly. Sometimes the pin requires some light filing to keep the swing arm from binding.

All the horse lacks now is a seat. The one I like is based on a stool by Pete Galbert. It is big enough to be comfortable, and small enough that you won't bump it getting on and off. After the seat is shaped, I attach a fin to the bottom that fits between the rails of the beam. Then I add a riser block at the back to give it a slight forward tilt. Now this horse is ready to ride. □

Tim Manney builds chairs and hand tools in Brunswick, Maine.



Fin details. Attach the fin with countersunk screws through the top of the seat (left). Then add a riser block at the back (below) to tip the seat forward for better ergonomics.

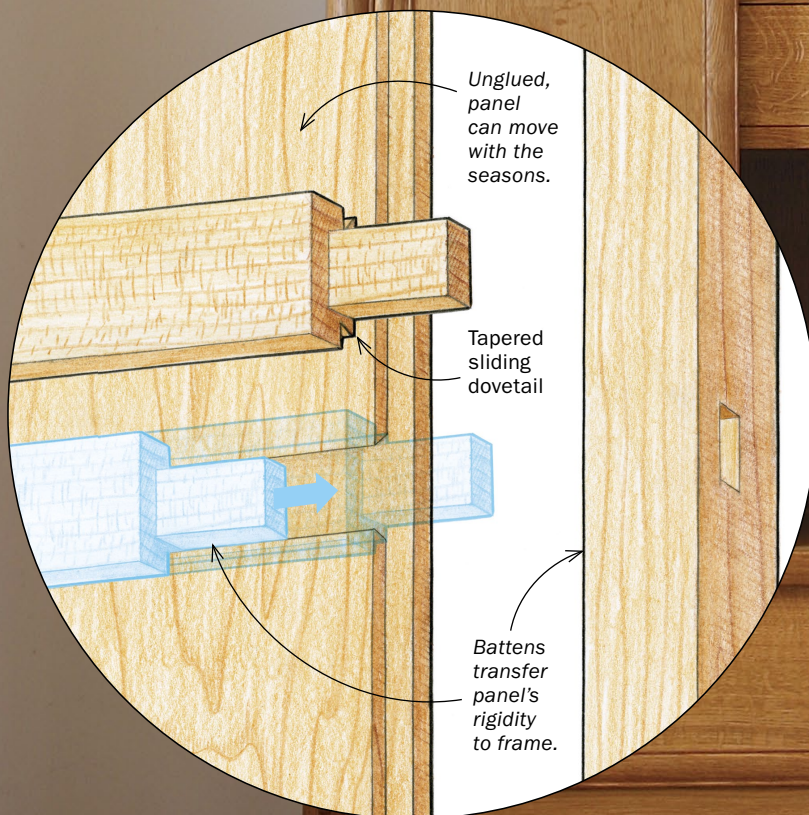


Saddle up. The seat is a friction fit in the gap between the beam's rails, so it can easily be adjusted up and back for comfort.

Lighter, Stronger Frame-and-Panels

Dovetailed battens make
even a narrow frame
impervious to racking

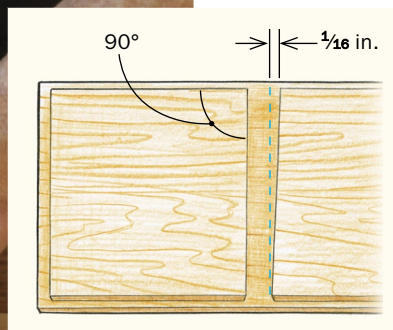
BY ANDREW HUNTER



Battens deliver brawn and beauty. Hunter's cabinet, like traditional Chinese examples, incorporates sliding dovetailed battens in its frame-and-panel doors, making them light, elegant, and amazingly strong. The frame-and-panel sides, top, and bottom of the cabinet are built in the same fashion.

CUT THE SOCKETS

Work on the battens begins after the rails, stiles, and panel are made.



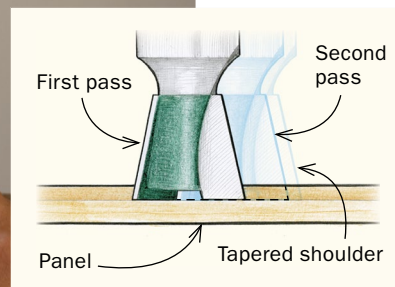
One line is angled. Lay out one shoulder of the dovetail socket parallel to the top of the panel. Draw the second shoulder at a slight angle to produce a taper of $\frac{1}{16}$ in.

The main virtue of a solid plank door is rigidity. It will never sag. Of course, solid-plank doors have serious issues with wood movement and warping, and frame-and-panel construction was invented to solve those problems, cleverly combining the simplicity of a solid panel with the dimensional stability of a rail-and-stile frame. Yet frame-and-panel construction has its own limitations. In a traditional frame-and-panel, the panel is dead weight—left unglued so it can move with the seasons, it simply fills the center of the frame, adding no strength to the structure and relying entirely on the frame joints for strength.

Chinese cabinetmakers figured out a way to harness the power of a floating panel. For many centuries, they've been using a type of frame-and-panel construction that has both the rigidity of a plank and the stability of a frame. They use it for a cabinet's doors, sides, top, and bottom, and also for tabletops and even chairs. Although their panels are typically thin and their frames elegantly slender, the resulting structures are insanely strong, even when assembled without glue. The secret is simple: battens.



Make a setup stick. After using a fence to rout a dovetail socket in a scrap, Hunter records the distance from the fence to the socket (left), then uses that measurement to locate the fence on the panel (right).



Two passes for a tapered socket. Rout one shoulder of the dovetail socket, then angle the fence to cut the tapered shoulder.

TAPER THE BATTEN



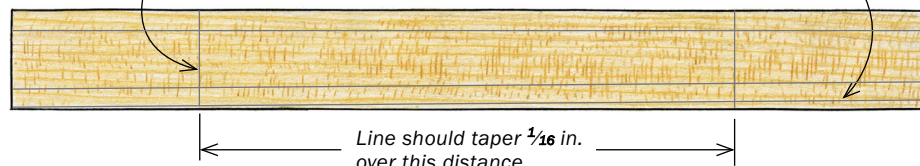
First taper the blank. Transfer the width of the panel blank (above), and draw a $\frac{1}{16}$ -in. taper over that span (right). Then plane the blank to the taper line (bottom).



BATTEN BLANK LAYOUT

Mark panel rabbet shoulders.

Taper blank along this line.



The Chinese frame-and-panel has battens that tie into the panel with sliding dovetails and into the stiles with mortise-and-tenon joints. Thus the panel, while still free to expand and contract, lends its rigidity to the frame, strengthening the whole unit. Are you sitting down? That means the frame can never rack. The stress, instead of being isolated in the corner joints, is now distributed throughout the whole. So even a large door can have a thin, delicate frame and it will not sag over time. Simple, yet genius.

Yes, there is more work to this design, but the structural and aesthetic benefits are huge, and I have a foolproof method for producing the tapered sliding dovetails quickly and precisely.

Frame and panel first

Before worrying about the battens, make the frame: Mill the rails and stiles, cut the corner joints, and run the groove for the panel. Then make the panel, and rabbet its perimeter to create the tongue that will fit into the frame groove. When sizing your frame pieces, keep in mind that they must be thick enough to accommodate both the panel groove and the batten mortises. Exact thickness will depend on whether you intend to dovetail the battens into the rabbeted face



ROUT THE KEY



Create the dovetail key. At the router table, run each side of the blank against the fence to cut the tapered dovetail key (above). To assess the fit, slide the batten into the socket and pull up on each end (right). If one end lifts up and other is tight, adjust the batten's taper (below).



FINE-TUNE THE FIT



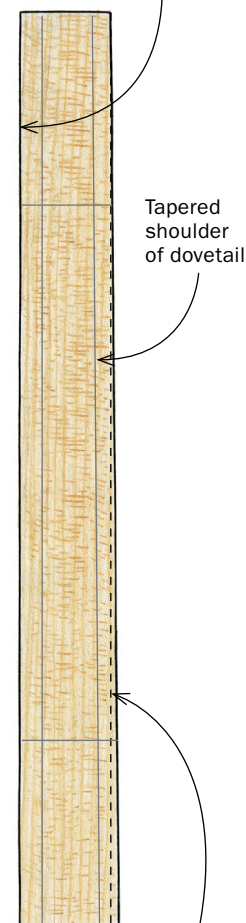
Tweak the taper. Setting your plane for a light cut, take a few shavings off the edge of the batten blank at the end where the fit was tight (left). After adjusting the taper, make another pass on the router table with the tapered edge of the batten blank against the fence.



Rip off the taper. When you're satisfied with the fit of the dovetail, trim off the tapered edge of the batten so the two sides are parallel.

RIP THE BATTEN

Straight edge rides tablesaw's rip fence.



After the dovetail is fitted, rip the tapered edge of the batten so that it is parallel to the opposite edge.

of the panel or the tongued face. Dovetailing into the rabbeted face of the panel will mean you need a slightly thicker frame.

Sockets for the battens

The next step is to lay out and cut the sliding dovetail sockets, orienting them perpendicular to the grain of the panel. For full racking resistance at least two battens are necessary, and for most panels two battens are sufficient. I often place

them so that they divide the panel into equal thirds, which looks good, but I also experiment with different spacing. In Chinese case-work the battens are typically on the inside, but depending on the piece, having the battens visible on the outside can look great too.

Begin by laying out one shoulder of the dovetail socket, drawing a line parallel to the end of the panel. Then lay out the other shoulder, but this time angle your straight-

edge so that the two shoulder lines are $\frac{1}{16}$ in. closer on one side of the panel than on the other. Tapering the socket makes for a tighter joint that's easier to fit.

With the shoulder lines laid out, establish the location of the guide fence for routing. I do a test cut on a scrap piece to determine the precise distance from the fence to the router bit and to dial in the depth of cut. With a $\frac{1}{2}$ -in. dovetail bit, the socket can be cut in two

THE BATTENS GET TENONS



Tenon layout. Start layout by waxing the dovetail keys and driving the battens fully home (above). Mark the location of the panel's rabbet on both ends of the batten (inset).

Split the difference.

Remove the batten from the panel, and use the rabbet marks to center the batten on the rail. Then transfer the shoulder positions of the rails onto the batten (right). Cut the batten tenons (below), leaving the dovetailed face unshouldered.



passes. After the first pass, clean up any fuzz along the edge of the cut with a knife to keep the router riding level. Then reset the fence to make the second cut.

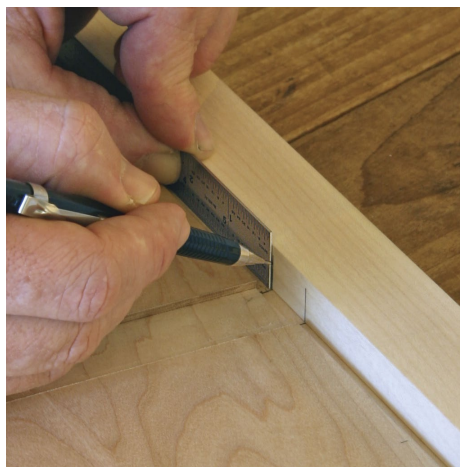
Temporarily tapered battens

To create the tapered dovetail keys, I start by making batten blanks several inches over length and $\frac{1}{2}$ in. over width. The extra length allows me to make adjustments on the way to a perfect fit for the sliding dovetail. The extra width lets me put a temporary taper on one edge of the batten. This tapered edge, when run against the router fence, creates the taper in the dovetail key.

I use a handplane to taper the batten (see drawing, p. 54). Then I cut the dovetail key by running both edges of the batten against the router fence. I sneak up on the fit and adjust the taper of the batten if necessary to achieve the perfect taper of the key. To test the fit, insert the dovetail key and try to lift the batten at either end. If one end is tight and the other is loose, adjust the taper. Take light shavings with a bench plane on the end of the batten that was tight. Run the tapered edge against the



Tenon transfer, step one. With the tenons cut, replace the batten in the panel and mark the location of the tenons on the panel's tongue.



Step two in the transfer. After removing the batten and assembling the frame around the panel, transfer the tenon marks from the panel's tongue to the stiles.



Chop away. Following your layout lines, chop mortises for the batten tenons.

router-table fence again and there will be a slight adjustment to the dovetail. Continue until the taper is right. When you're happy with the fit, rip the extra width from the batten, removing the taper.

Join the batten to the frame

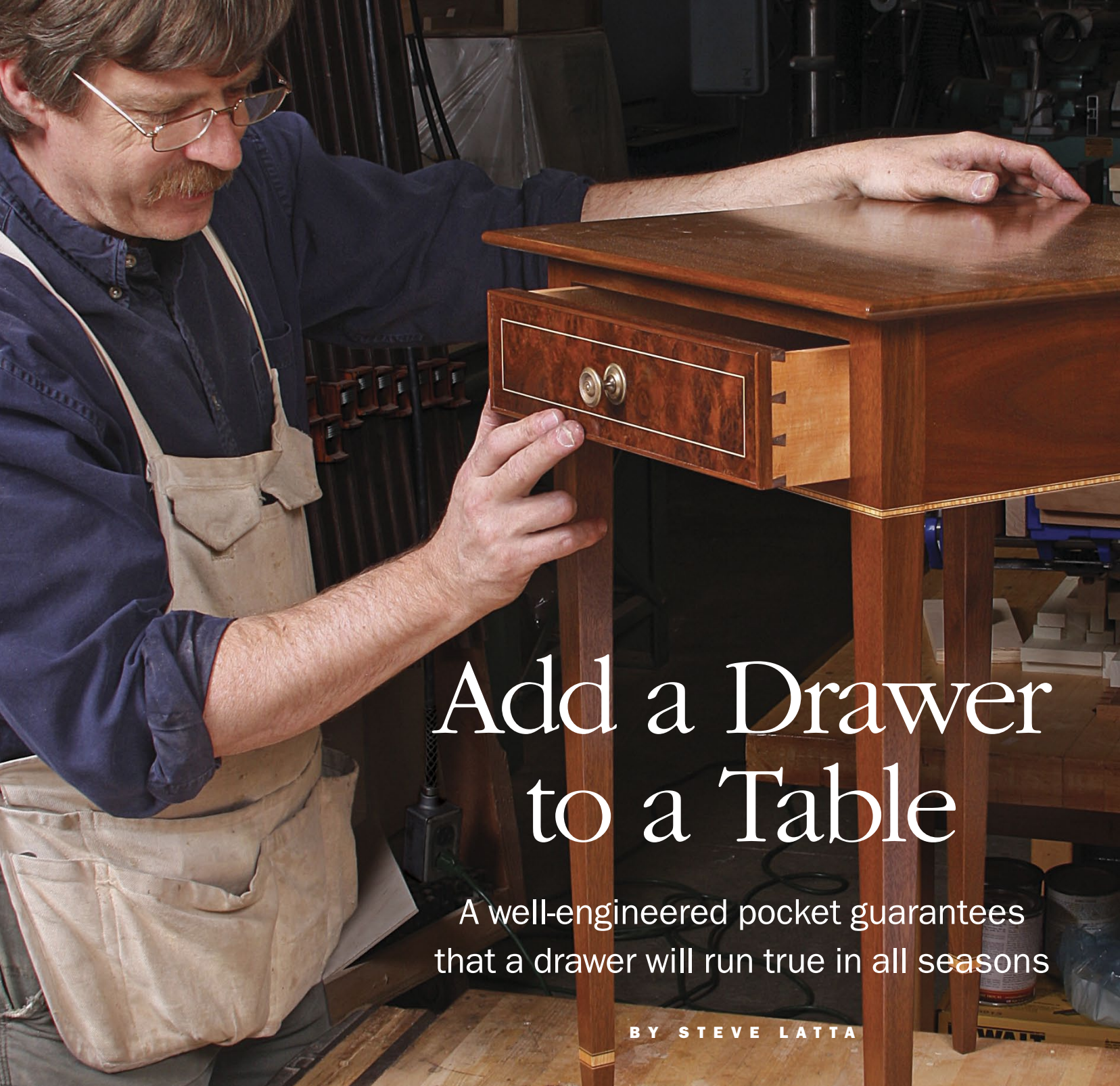
When the sliding dovetail's fit is right, it's time to lay out and cut the batten tenons, and then the mortises for them. Layout is a bit of a trick. With the batten driven home, mark each end at the shoulders of the panel rabbets. Then remove the batten and place it on one of the frame rails. Center the rail between the rabbet marks, and transfer the rail's tenon shoulders onto the batten. Then cut the batten tenons.

To locate the mortises in the stile, first drive the battens into the panel, then mark the width of the tenons on the panel. Remove the battens and assemble the frame and panel without them. Last, transfer the tenon marks from the panel onto the stile, and lay out the batten mortises. Cut the mortises, either stopped or through, and you're finished. You have a frame-and-panel strong enough to endure whatever comes its way. □

Andrew Hunter makes Chinese, Japanese, and American country furniture in Accord, N.Y.



Strong assembly. Hunter typically builds his battened frames with through-tenons and leaves the frames unglued.



Add a Drawer to a Table

A well-engineered pocket guarantees that a drawer will run true in all seasons

BY STEVE LATTA

As is often the case with furniture, the parts we don't see can be just as important as the ones we do. This nightstand has a single drawer and for that drawer to work properly, it needs an invisible infrastructure that allows it to slide in and out easily without binding, stop in the proper location, and avoid tipping too far down. That means installing drawer runners, guides, a kicker, and stops. There are lots of ways of approaching all of this, but the simple methods shown here work in the vast majority of applications.

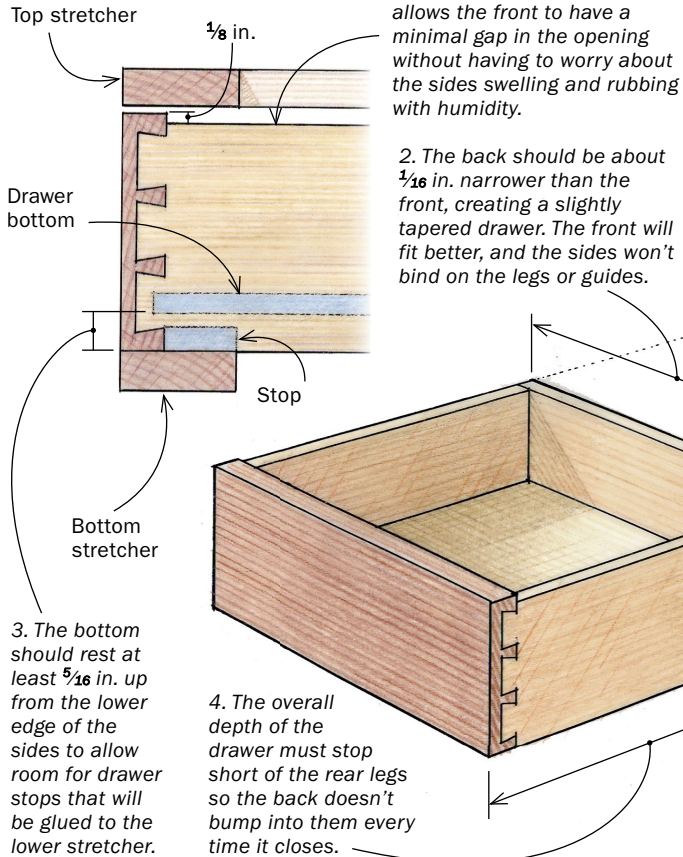
Smart milling

If you mill parts for the drawer infrastructure at the same time as the rest of the piece, you'll save time and increase accuracy. On just about every table I have made, the bottoms of the lower stretchers line up with the bottom edge of the back and side aprons. Consequently, the runners will end up the same thickness as the lower stretcher, and the kicker the same as the top stretcher. Rather than trying to match them up later, simply take all those parts to thickness at the same time. And

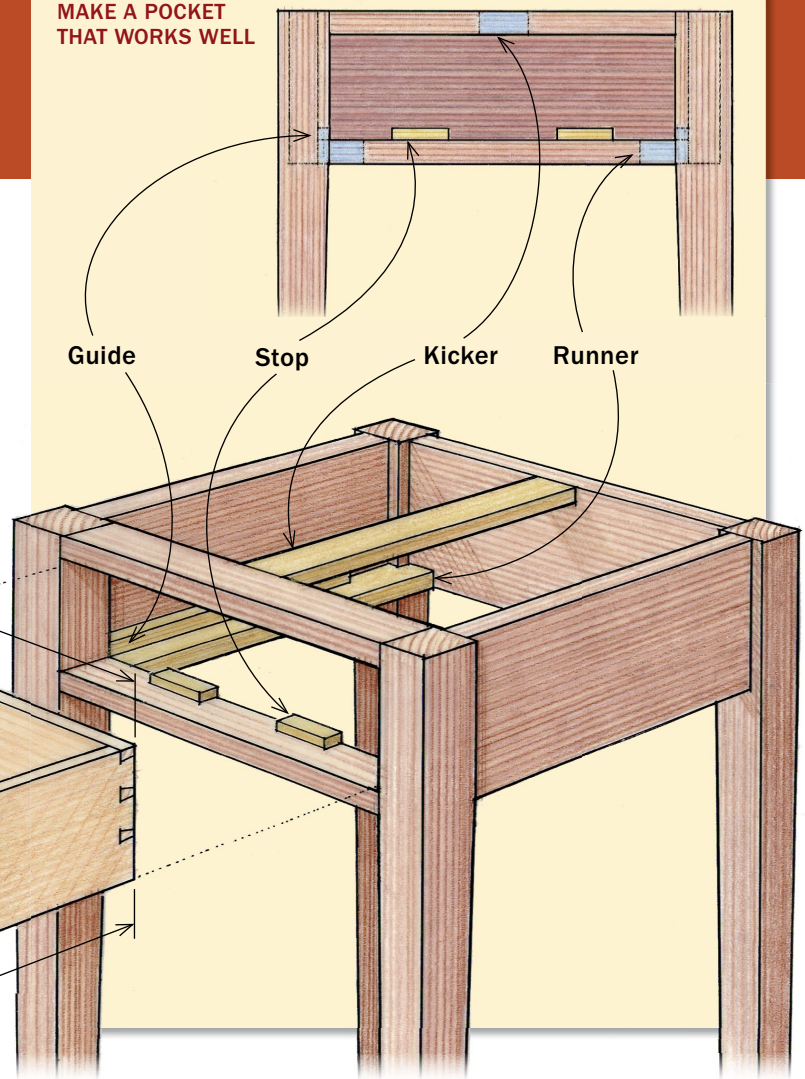
KEYS TO FLAWLESS DRAWER FUNCTION

In this article we'll focus on building a perfect drawer pocket, with guides and runners that keep the drawer running straight and true, stops that keep the drawer in place, and a well-placed kicker that prevents tipping. You also need to build the drawer correctly to ensure that all those parts can do their jobs properly.

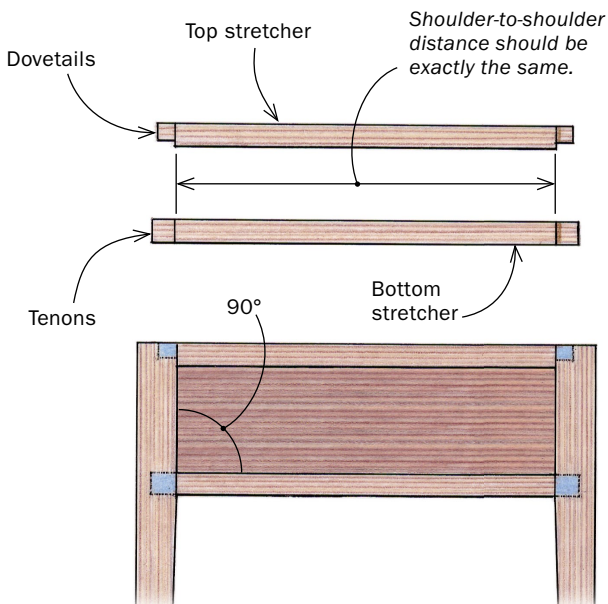
BUILD A GOOD DRAWER



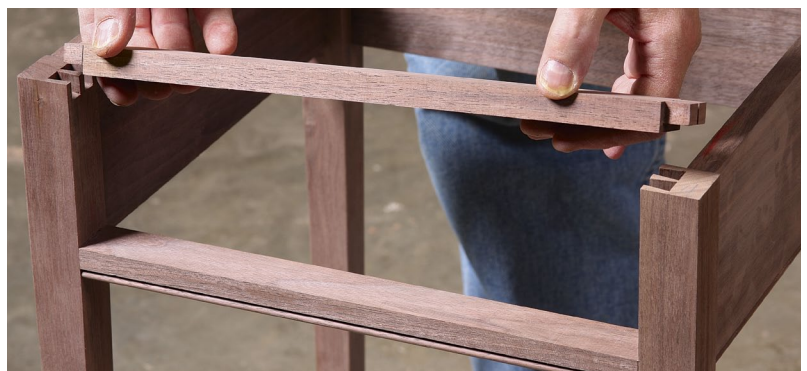
MAKE A POCKET THAT WORKS WELL



START WITH A SQUARE OPENING



Foolproof construction. If the shoulder-to-shoulder distance of the top stretcher, bottom stretcher, and back apron match, the drawer box is guaranteed to be square.



KICKER KEEPS DRAWER FROM TIPPING



No-tip construction. The kicker has a $\frac{1}{4}$ -in.-long tenon on each end that fits into mortises in the rear apron and top stretcher.

since the runner and kicker require no specific width, it makes sense to match their width to the stretchers.

No tipping

I lay out the mortises for the kicker in the rear apron and top stretcher using a marking gauge and knife, then cut them by hand using a chisel. After the mortises are cut, I dry-assemble the table, measure the distance from the rear apron to the top stretcher, and add $\frac{1}{2}$ in. for each of the $\frac{1}{4}$ -in. tenons. Then I cut the tenons on the tablesaw using a miter gauge with an auxiliary fence. I plane and give a final sanding to all the pieces and glue up the table, including the kicker. I add the runners, guides, and stops later.

A drawer that glides

The runners provide the track that the drawer runs on while it moves in and out of the table. I notch mine around the back leg.

Using a small double square, transfer the two offsets of the rear leg to the back of the runner. Although they should be the same, differences occur. To some, such an accurate fit might seem a

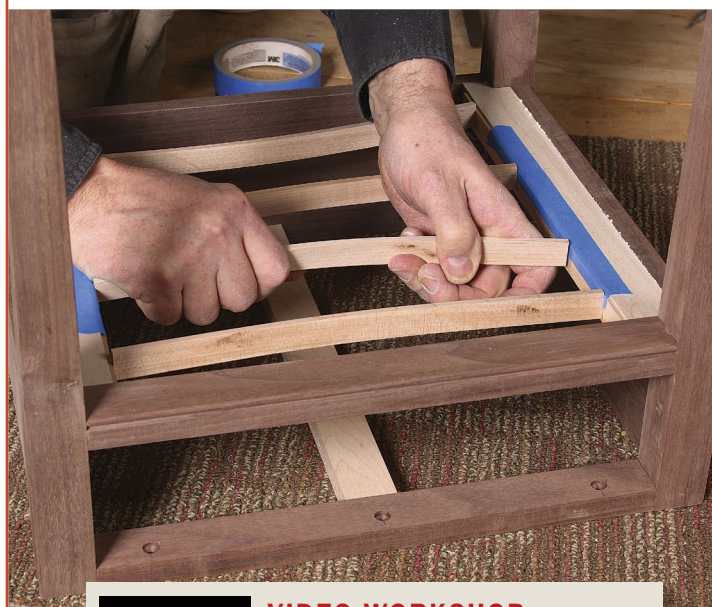
RUNNERS CREATE THE SMOOTH RIDE



Notch first, length later. The runners are notched to fit around the rear legs. Latta cuts them at the tablesaw using the fence as a stop and sneaking up on the fit. Once the fit is dialed in, cut the runners to final length.



Sprung wedges for clamps. The runners are glued and clamped in place (left) with thin strips of wood wedged to create pressure without marring (below). The process works well if the exterior has already been finished.



VIDEO WORKSHOP

Watch Latta build this table from start to finish in a members-only video at FineWoodworking.com/262.

GUIDES ADD SIDE-TO-SIDE STABILITY



Two small notches have big payoffs. Both are cut along the length. The notch against the apron straddles any squeeze-out (top left). The notch on the inner face makes trimming with a shoulder plane a breeze. Cut the guide 2 in. short. Set it tight to the front (top right). If you need to plane it, the full run will be easier than trying to chisel the last 1½ in. or so (above).

waste of time, but I simply am not in that camp. The work must be clean, readily seen or not.

Runners and guides keep the drawer aligned

The guides fit against the apron and are flush with the inside corner of the leg. Rip a small notch ($\frac{1}{16}$ in. by $\frac{1}{16}$ in.) on both bottom edges of the guide. After the runners and guides have been installed and the finish applied, I add a pair of stops that keep the drawer in the right place every time it is closed. Rub a little paraffin along the bottom edge of the drawer, and you're ready to go. □

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

STOPS MAKE IT ALL LOOK GOOD



Glue the stops in place. With the tabletop off and the drawer bottom removed, slide the drawer into its closed position in the opening. Glue and clamp the stops 1½ in. from the sides.



Flush up and fit. If the stop overhangs the lower stretcher, use a block plane to trim it flush (left). If the front of the drawer protrudes from the table, trim a bit off the front of the stop (below) and try again. The fronts of the stops are notched like the guides to simplify planing.



Hudson Valley Chest of Drawers

Tasteful moldings and turned feet add quiet style
to a sturdy dovetailed case

BY MARIO RODRIGUEZ



A couple of summers ago while visiting Hyde Park, Franklin and Eleanor Roosevelt's estate along the Hudson River north of New York City, I toured Eleanor's getaway cottage two miles from the main house. In one of the bedrooms I came across a simple, handsome, and well-proportioned chest of drawers and instantly decided I'd like to make one for myself.

Like most of the furniture in the cottage, this Dutch-colonial style chest was the product of Val-Kill Industries, a program Eleanor Roosevelt and three friends set up in 1926 to create skilled jobs for local people and to revive craftsmanship in woodworking, pewter casting, metalwork, and weaving. The cottage I was standing in, which Eleanor called home for the last decades of her life, originally served as Val-Kill's workshop. The chest I admired, made of pine, was closely based on pieces produced by Dutch craftsmen of the Hudson Valley in the 17th century. The originals would have been made of local woods of varying quality—these were country pieces. Their joinery was strong and straightforward, solid without undue elaboration. And this Colonial-period directness was also reflected in the modest molding details of the piece, which are elegant but not overly complex. I chose to copy everything about the piece except the primary wood—I made mine in walnut, with pine as the secondary wood.

The long and short of sliding dovetails

The chest's case has two sets of sliding dovetails—long ones joining the sides to the top, short ones where the drawer dividers meet the case sides. I began with the drawer divider dovetails, which are simpler. I made an MDF template with three slots and used it to cut the stopped sockets with a router and guide bushing. I roughed out the sockets with a ½-in.-dia. straight bit, then followed up with a ⅝-in.-dia. dovetail bit. To cut the tails to fit these sockets, I put a dovetail bit in the router table and ran the drawer dividers vertically against a high fence.

The long sliding dovetails that join the sides to the top take a little more finesse. Getting a long sliding dovetail to seat well along its entire length can be a challenge. Even if the dry assembly goes well, after you've applied glue and the wood has begun to swell, a long sliding dovetail will often hang up during assembly, prompting unprintable responses from the woodworker. The best way to ensure a tight fit and an easy assembly is to slightly taper the dovetail. You can taper both the socket and the key, but I find that tapering just the key works fine; this makes for a fit that is slightly loose most of the way in but tightens up nicely as you reach the last third of the joint.

I cut the long sockets in the underside of the top using the router with a guide bushing again and another slotted MDF template. I roughed out the slots with a straight bit as before and followed up with a ¾-in.-dia. dovetail bit.

To create the tapered dovetail keys, I went back to the router table with the high fence in place and cut them

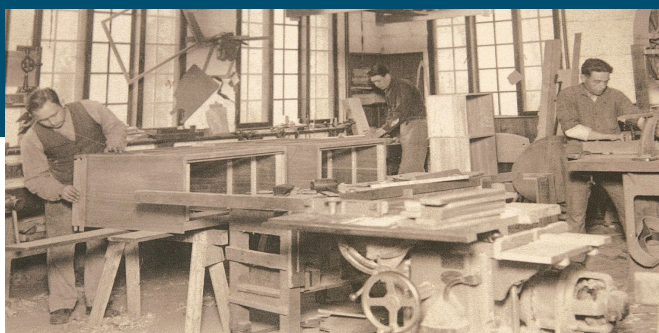


Eleanor Roosevelt's workshop

Enter the unimposing stucco structure where Eleanor Roosevelt lived toward the end of her life, and you'll find the walls paneled in knotty pine and adorned with framed photos. The furnishings, carpets, and light fixtures have a familiar feeling, and the house lacks any sign of wealth or privilege. Instead an air of casual warmth, plain comfort, and modesty pervades the place. I instantly felt at home and wished I could take off my shoes, pull up an armchair, and read a book—or take a nap.

But there is a remarkable story behind this unremarkable house. Eleanor and three of her friends, Nancy Cook, Marion Dickerman, and Caroline O'Day, had it built in 1926 in a remote corner of the Roosevelt estate as a furniture workshop, home to Val-Kill Industries. For the 10 years that Val-Kill was in operation, its handful of craftsmen produced a steady stream of soundly built reproductions of American Colonial-era furniture. Eleanor's impetus for launching the enterprise was severalfold. First and foremost, she hoped to provide skilled jobs for local men at a time when farming, long the backbone of the local economy, was in rapid decline. She also wanted to provide skilled training for boys in the area. In addition, she hoped that the furniture makers at Val-Kill could help spark a revival of hand craftsmanship in an era of increasing industrialization. Finally, by choosing excellent examples of Colonial-era furniture to reproduce, she and her partners hoped to encourage a more general appreciation for finely crafted furniture.

—M.R.



DRESSER ANATOMY

Traditional construction makes for a strong, light case. Sliding dovetails secure the sides to the top, allowing for an overhang without a sub-top.

Top, $\frac{3}{4}$ in. thick by $18\frac{1}{2}$ in. wide by $37\frac{3}{8}$ in. long

Drawer stop

Elongated screw holes for seasonal movement

Side, $\frac{3}{4}$ in. thick by $17\frac{3}{4}$ in. wide by $28\frac{3}{16}$ in. tall

Drawer divider, $\frac{5}{8}$ in. thick by $2\frac{3}{8}$ in. wide

Shiplapped back boards, $\frac{3}{8}$ in. thick, have rabbets $\frac{3}{16}$ in. deep by $\frac{1}{2}$ in. wide

Back boards slide in from below after assembly and are left unglued.

Foot block, $\frac{5}{8}$ in. thick by 3 in. wide by 3 in. long

Bottom drawer runner, $\frac{5}{8}$ in. thick by $1\frac{1}{4}$ in. wide

Face molding, $\frac{5}{16}$ in. thick by $\frac{5}{8}$ in. wide

Base molding, $\frac{3}{4}$ in. thick by $1\frac{1}{4}$ in. wide

Blocking rail, pine with walnut edging, $\frac{5}{8}$ in. thick by $4\frac{1}{4}$ in. wide

Bottom, pine with walnut edging, $\frac{5}{8}$ in. thick by 17 in. wide by $34\frac{3}{8}$ in. long

Foot, $6\frac{3}{4}$ in. tall after trimming

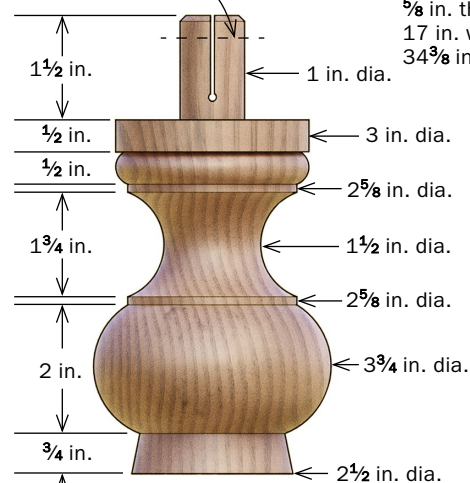
Drawer bottom, $\frac{7}{16}$ -in.-thick pine

Drawer sides and back, $\frac{3}{8}$ -in.-thick pine

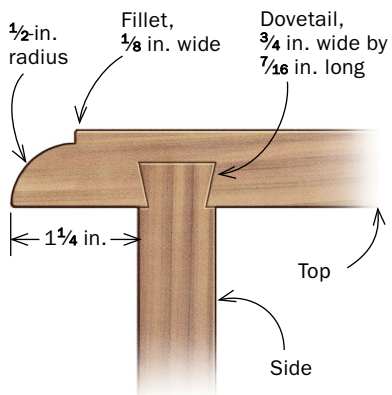
Drawer front, $\frac{3}{4}$ -in.-thick walnut

Teardrop pull, $1\frac{1}{2}$ in., Lee Valley #00A48.01

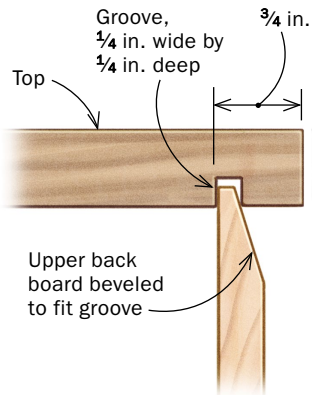
Trim to final length after installation.



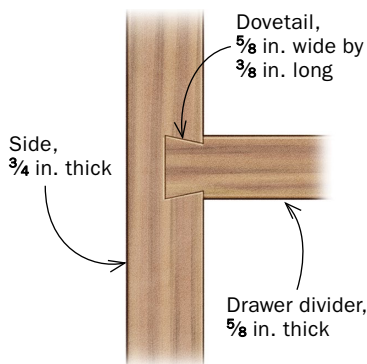
FOOT



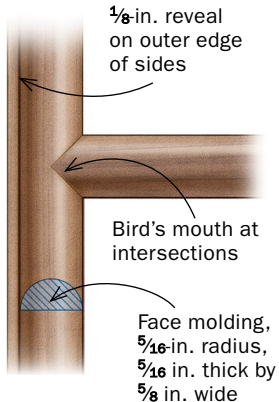
TOP DOVETAIL



BACK BOARD GROOVE



DIVIDER DOVETAIL



FACE MOLDING



1



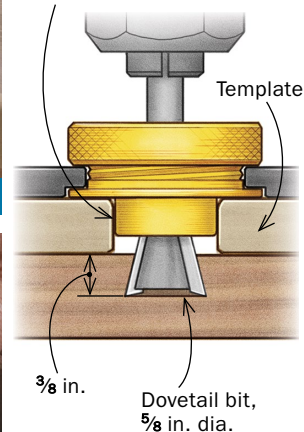
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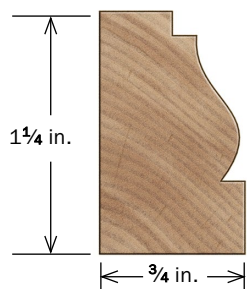
3

DOVETAILS FOR THE DRAWER DIVIDERS

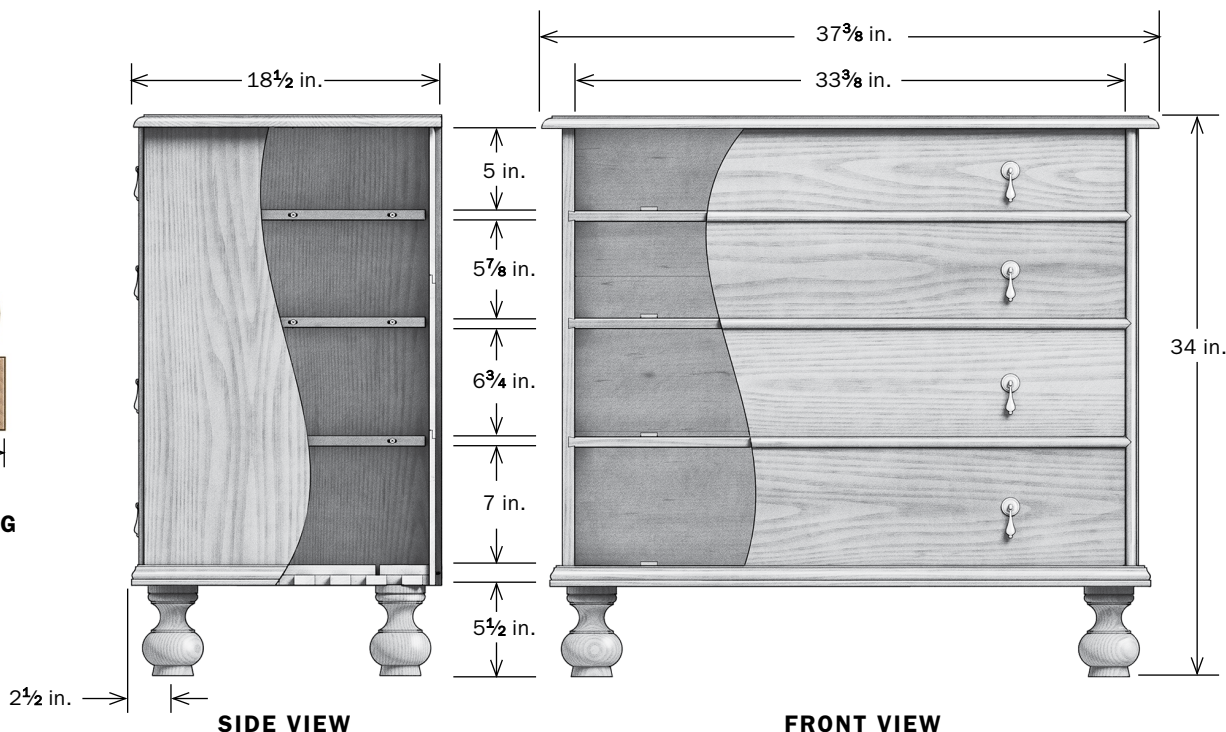
Guide bushing, 1 in. dia.



With a guide bushing in his router, Rodríguez follows slots in an MDF template to cut the dovetail sockets for the drawer dividers (1). He makes one pass with a straight bit and a second one with a dovetail bit. Two quick passes on the router table shape the dovetail key on the end of the drawer divider (2). After cutting back one end of the dovetail key and rounding it with a file, Rodríguez dry-fits the drawer divider (3).



BASE MOLDING

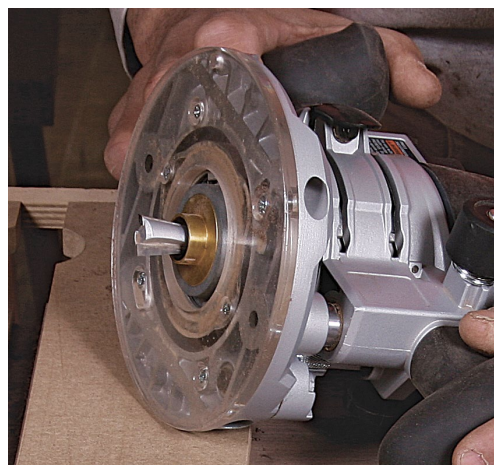
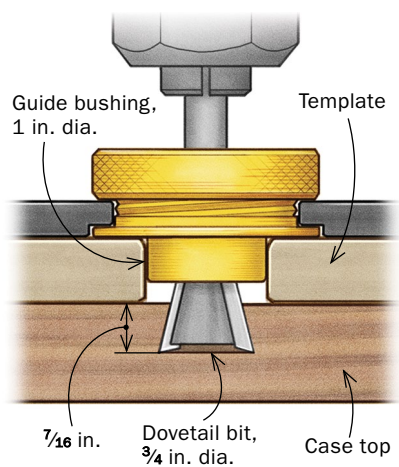


SIDE VIEW

FRONT VIEW

CASE CONSTRUCTION

Sliding dovetails at the top



The long socket. Rodríguez made another MDF template to guide the router as he cut the sliding dovetail sockets in the underside of the case top. Wooden strips keep the template in register and a temporary screw into the underside of the top keeps it from slipping side to side.



Rout a tapered key. Working with a dovetail bit and a high fence at the router table, Rodríguez cuts one side of the dovetail key as normal. When he ran the other face of the board against the fence, having the 1/16-in.-thick shim taped to the workpiece produced a slight taper.



much as I had the keys on the ends of the drawer dividers. One side of each key was cut as normal. But before I cut the other side, I taped a $\frac{1}{16}$ -in.-thick shim to one end of the workpiece. As I pushed the part along the high fence, the shim held that end of the part slightly away from the fence, producing the desired taper. When I had a fit I liked, I tested it by spraying both the key and the socket with water and doing a “wet” assembly. This approximates the swelling of the wood fibers that glue causes, so a good fit here should foretell a curse-free glue-up.

Half-blind dovetails by hand and motor

I used a combination of hand and power tools to cut the half-blind dovetails that join the case sides to the bottom. After laying out the tails on the case bottom, I made the angled cuts with a back-saw, then removed the waste between them with a coping saw. I chopped to the baseline and pared to the cheeks with chisels.

Next I clamped a case side vertically in the face vise with one



Tails then pins. Having cut the tails on the bottom board with handsaws and chisels, Rodríguez uses a knife to transfer their layout to the ends of a cabinet side (top). He then roughs out the pins with a handheld router, and chops and pares to the lines with chisels (above).



Mortises for the feet. After blocking up the case bottom with a rail across the front and squares at the back corners to allow deeper mortises for the foot tenons, Rodríguez cuts them at the drill press.

TIP

**GIVE IT A
WET TEST**

To be sure the sliding dovetail key will still fit the slot when it's been swelled by glue, Rodríguez sprays the key and slot with water and tests the fit.

ASSEMBLY

Glue up the case



Top first, then the bottom. With the dovetail key and socket lightly coated with glue, slide the case side into place. Rodríguez uses water and a rag to clean up the squeeze-out right away. He engages the half-blind dovetails by hand (right), then knocks them home with a rubber mallet.



Check for square and add the dividers. Compare the distances from corner to corner to see that the case is square (left). Shift the clamps as necessary to address any discrepancy. Dry-fit the drawer dividers to be sure the case sides aren't bowing (above), and leave them there while the glue cures.

Make and add the feet



Turning ins and outs. After establishing his major diameters with a parting tool and a pair of calipers, Rodríguez shaped the foot primarily with a gouge. He uses a medium-cut half-round file (shown) to clean up the tool marks and smooth out the surfaces.



Size and test the tenon. After sizing the foot's tenon, Rodríguez used a parting tool to slightly dish the wide shoulder. To be sure the tenon will fit the round mortise, he tests the fit in a hole drilled with the same bit.

end just above bench level. I laid the bottom in place and used a knife to transfer the tails onto the end of the side. I removed the waste between the pins with a straight bit in a router, using a clear baseplate and cutting freehand. Then I swapped the straight bit for a dovetail bit and used that freehand as well, coming within $\frac{1}{32}$ in. or so of the knife lines. Finally, I cleaned up with chisels.

Turn the bun feet

The chest has beautiful bun feet. There is something rich and indulgent about their undulating pattern, and they are a pleasure to make. The challenge is to turn a crisp foot, with the details clear and sharp and not degraded by excessive sanding.

The hardest part of the pattern was turning a precise 1-in.-dia. tenon. To achieve a tight fit, I initially sized the tenon on the lathe with a 1-in. open-end wrench. To fine-tune the fit, I used a scrap



Fit and wedge the feet. Before the dividers are glued and the back is in place, glue and wedge the feet. To be sure the foot tenon's shoulder is tight to the bottom of the case, Rodríguez will use deep-reach clamps spanning from beneath the foot to the top of the cabinet.

in which I'd drilled a 1-in.-dia. hole. Before glue-up, I sawed a kerf in the tenon for a wedge that would ensure a tight and secure fit.

Moldings give it style

Crisp, well-joined moldings go a long way toward giving the chest its elegant bearing. There are three different moldings—one integral and two applied. On the case top, the front and side edges get a roundover profile with a fillet. On the front edges of the case, a modest half-round molding is applied. And at the bottom of the case is an applied Roman ogee with a double fillet.

Half-round molding, plain but important—Choose the material for the half-round molding carefully. It should be clear, with the grain as straight as possible. I produced the molding on the router table, shaping the edge of a wide blank, then cutting the molding free from the blank at the tablesaw. I ran off extra lengths

MOLDINGS MAKE THE CASE

Half-rounds



Make the half-round. Use a $\frac{5}{8}$ -in.-dia. bullnose bit in the router table to shape both edges of a blank, then rip strips of molding free on the tablesaw.



Bird's-mouth jig. Rodríguez made a plywood jig with a V-notch and a screwed-on fence to help cut the half-round molding's bird's-mouth detail. He starts with sawcuts, then cleans up with a chisel.

Attach the case molding. With the bird's-mouth notches perfectly aligned and the inside edge of the molding flush with the inside face of the case, Rodríguez applies glue and shoots brads to fix the molding.



of the molding as insurance for the exacting joinery. Where the drawer dividers meet the case sides, the strips of half-round molding join in a bird's-mouth detail—beautiful, but fussy to fit. To ensure clean joints, I made two jigs, one for each half of the joint. I rough-cut the joints with a fine-toothed handsaw, then used the jigs to refine the fit, paring the V-notches to final size with a $1\frac{1}{2}$ -in. chisel and trimming the points of the mating male pieces with a block plane. Once the pieces were fitted, I attached them to the case with glue and pin nails.

Bolder base molding—I was unable to match the profile of the chest's base molding with anything in my collection of router bits, but it turned out I had a molding plane I'd made some years ago that enabled me to produce something very close. I milled



First fit, then fasten. Another Baltic-birch jig holds the drawer divider molding for sawing and planing to a perfect point. After gluing and nailing the molding to both case sides, Rodríguez fits the drawer divider moldings one at a time (right).



Decorative base



Find a way to match the molding. Rodríguez didn't have router bits that would reproduce the original molding exactly, but he was able to come close by using a molding plane he'd made and then cutting a fillet at the top on the tablesaw.

walnut blanks 4 in. wide and $\frac{3}{4}$ in. thick and molded one edge with the plane. Then, at the tablesaw, I cut the fillet along the top edge of the profile. Finally, I cut the molding free from the board.

I applied this molding first to one side of the cabinet, then to the front, and finally to the other side. To allow the case side to expand and contract without cracking, the side moldings are glued and pin-nailed for the front 6 in. only. I drove a screw through the very back edge of the side and into the unglued end of the molding. I made an elongated clearance hole so the screw could move with the case side while keeping the molding tight.

Finishing the chest

After thoroughly sanding the entire chest with 220-grit paper, I ragged on several thin coats of shellac, making sure each coat was dry before rubbing it out and applying the next coat. Three coats provided good protection and a pleasing soft sheen. The last step was a coat of paste wax applied with elbow grease. □

Mario Rodríguez teaches furniture making at Philadelphia Furniture Workshops and woodworking at the Waldorf School of Philadelphia.



Half glued, half screwed. When attaching the base molding to the case sides, Rodríguez glues and tacks only the front half of the molding. To accommodate the seasonal movement of the case side, he leaves the back half of the molding unglued and screws it to the side through an elongated clearance hole.



Three-step molding. After attaching the molding on one side, Rodríguez fits and fastens the front piece (above). Finally, he glues and uses pin nails to secure the last piece (left).



BOB GAUGHAN

Prescott, Ariz.

Gaughan modeled this clock after one in the lobby of the Grand Californian Hotel in Disneyland, a spot his family has visited many times. "I fell in love with it and over the years I took pictures of it and added it to my retirement bucket list. I have many pictures of my kids with it when they were of different heights, and they thought I would never be able to build such a case." The movement was made by David Lindow and the dial painted by Kathi Seiwert.

WHITE OAK, 14D X 34W X 85H

Photo: Pat Warwick



DANIEL SCHNEIDER

Champaign, Ill.

Schneider based this chair on a Sam Maloof spindle chair from the 1950s. "I love his furniture, but especially his earlier, more Mid-Century, Danish-influenced designs." Schneider said turning the long, thin back spindles was a challenge, but "I was able to do it with two steady rests."

BLACK WALNUT, 24D X 28W X 39H

NICHOLAS HAMILTON HOLMES

Hamilton, Ont., Canada

This credenza was inspired by traditional Mid-Century designs, but Holmes got creative with the base and the "horns" at the top of the case. The carcass is joined with dovetails and wedged mortise-and-tenons, and the door fronts are veneered with madrone. "I had suggested a contrasting material for the top and, with my client, decided to go with copper."

SAPELE, 20D X 72W X 36H

Photo: Jay Perry





SOPHIE GLENN

Smithville, Tenn.

This wall shelf blends traditional and modern elements, and that was the point. Glenn used hand-cut dovetails and live-edge lumber for the traditional part of the piece. The modern twist? "The cabinet and shelf are both wedged into a curved, steel form instead of being attached directly to the wall."

MAPLE AND STEEL, 8D X 32W X 30H



RICHARD CIUPKA

Mont-Royal, Que., Canada

Ciupka used two types of mahogany—Cuban and Brazilian—in this dresser, reserving the darker Cuban wood in the coopered doors to add a sense of roundness and depth to the piece. "That great Cuban mahogany board is all that was left from a batch I bought 34 years ago."

MAHOGANY AND ZEBRAWOOD, 23D X 42½W X 66H



LAURA ELIZABETH GOFFIN

Allston, Mass.

Goffin made a full-scale blanket chest as a required project at North Bennet Street School, but couldn't keep it because she doesn't have room. So she made the half-size one, which is just right for her small apartment. "I had to do some of the elements by hand (the beading and chamfers) because the parts were too small for the work to be done safely on a machine."

WHITE OAK, 9D X 22W X 13½H
(SMALL VERSION)

Photo: Lance Patterson



BOB HOUGH

Cambridge, Ohio

Hough built his own version of this cabinet, which he first saw on our back cover (*FWW* #143). The historic piece had sold at auction for \$2.4 million and we wrote about how Phil Lowe had replicated two missing pieces of molding to repair it. "I guessed at the size using Phil Lowe's hand as a gauge."

OAK, POPLAR, PINE, AND MAPLE,
11½D X 15¾W X 15¾H

Photo: Jennifer Reed

JONATHAN OTTER

Earltown, N.S., Canada

Otter shaped the frame of this chair from large planks of walnut, cutting the parts to rough shape and then sculpting them by hand, without measured drawings. "The carbon-fiber seat shell is laid up and vacuum-bagged on a form I designed and made in my own shop." The accents are casein (synthetic) ivory and the upholstery is Italian leather.

BLACK WALNUT, 32D X 30W X 41H

Photo: Johanna Matthews



JAMIE BUXTON

Belmont, Calif.

"I like curves, so there are almost no straight lines in this piece." Buxton was exploring shapes when he designed this tall dresser, which has a long curved section down the front that forms the drawer pulls. The piece is all solid wood except for the side panels, which are curved plywood that he made from sawn veneers.

SAPELE, 13D X 18W X 66H

SOUTHEAST 'WOOD WORKS' SHOW DEBUTS

The first Wood Works exhibition, showcasing wood artists, furniture makers, and turners in the Southeast, took place in January and February. The show was curated by Abraham Tesser and was hosted and administered by the Oconee Cultural Arts Foundation in Watkinsville, Ga. Here are a few of our favorites from the wide array of pieces exhibited.



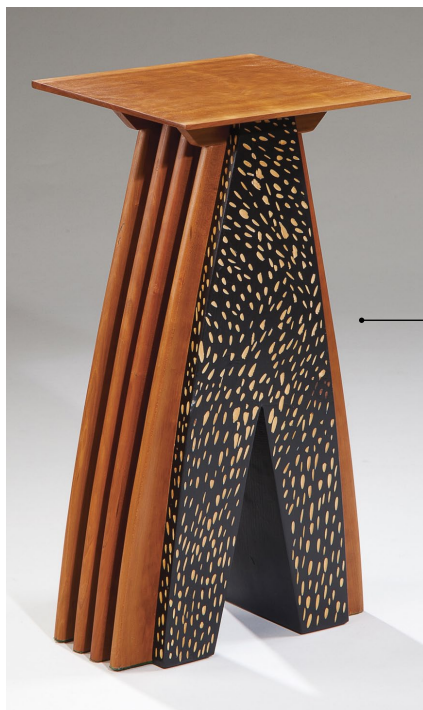
MICHAEL McDUNN

Greenville, S.C.

McDunn saw legs like this in an antique school desk and said he "was amazed at the leg design in such an old piece. I tucked this concept away for years and finally had the chance to incorporate it into a piece."

CHERRY, EUCALYPTUS BURL, AND EBONY,
30D X 54W X 30H

Photo: John Fowler



SCOTT DEWAARD

Walland, Tenn.

DeWaard calls this his personal family cabinet. "I was thinking of a furniture maker's response to my grandmother's family Bible, where significant events in the life of the family were chronicled." The front surface is cast concrete that incorporates shell pieces he collected on the beach.

WALNUT, 20D X 56W X 70H

Photo: Bruce Cole

PETER BULL

Cleveland, Ga.

The design of this table evolved from timber framing. The white pine base is wood from cutoffs from a timber-frame project Bull did 10 years ago. The pine is painted with flat black latex paint and then carved with a gouge. The finish is a mix of spar varnish, linseed oil, and raw turpentine.

CHERRY AND WHITE PINE, 12D X 13W X 26H

Photo: Light Sources

Online Extra

What's it like to start a new woodworking exhibition? For a detailed account, go to FineWoodworking.com/262.



HARVEY MEYER

Dunwoody, Ga.

Meyer's basket-illusion turnings involve a mind-boggling process that includes turning, burning with a custom burning pen, and dying with India ink. The grid is made up of 19,888 little squares. "The piece was named 'Now Where Was I' because I kept losing my place as I was inking the pattern onto the wood."

BRADFORD PEAR, 9 DIA. X 11½H



finish line

Osmo oil: durable, easy to use, and non-toxic

BY MARCUS SOTO



My business partner and I run a sustainable lumber company and make custom furniture from these trees (see my trestle table on pp. 30–37). In the spirit of how we harvest and use the wood, we want our finish to be easy to use, durable, non-toxic, and easy on the environment. Osmo Polyx-Oil is all those things. Made from natural vegetable oils and waxes, it does not off-gas or smell bad. It's durable, easy to apply, and easy to repair. The secret to success with this oil is filling the pores first.

Start the surface prep by sanding up to at least 220 grit. At 180 grit, I raise the grain with a damp cloth and then continue sanding. Next, make a slurry to be used as the filler. Add a thin coat of Polyx-Oil with a cotton rag. Then take wet-or-dry sandpaper of 220 or 320 grit and sand the finish into the wood. The slurry should have a puttylike consistency. After you produce the slurry, work it into the grain. Ball up

a rag as if you were doing a French polish. Start at one end, working your way down in overlapping circles. Let the filler dry overnight, then sand it down with 150-grit paper. If there is any open grain, sand to 220 grit and repeat the entire process until there is no more open grain; twice is usually enough. Sand to the finished grit and you are ready to add the final coats of Polyx-Oil.

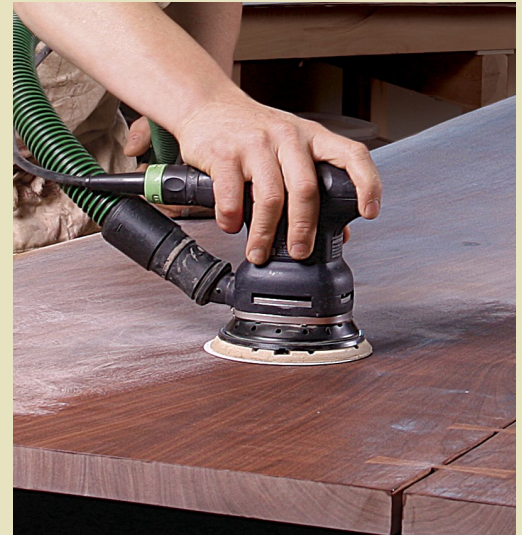
Polyx-Oil is applied like a traditional oil finish: Put it on, let it penetrate, and wipe it off. Allow at least eight hours for the finish to dry. For a tabletop I usually add three coats. On bases, I add two coats following the same process. Between coats I scuff-sand with a very fine abrasive pad. You can also use very fine sandpaper, 320 grit or above. After the finish has cured, I use a clean cloth to give it a thorough buffing out. □

Marcus Soto is design and production partner at New York Heartwoods in Kingston, N.Y., and owner of Sojen Design.



FILL THE GRAIN

Filling open grain with the slurry will provide added protection by decreasing the chances of moisture building up in any of the open capillaries of the wood. This makes the finish suitable for tabletops.



Create the slurry and rub it in. Apply Polyx-Oil with a rag and sand it into the wood using wet-or-dry paper (left) until you reach a pastelike consistency. Use a rag to work the slurry into the grain and let it dry overnight. Then sand the surface (right), repeating the process until all open grain is filled.



THEN BUILD THE FINISH

Wipe it on. Apply a generous amount of finish and work it into the wood, letting it penetrate for 10 to 15 minutes. If the finish tacks up, add more and redistribute it. After it has soaked in, wipe off the excess, making the final strokes with the grain.



Where to get it. You can find a list of distributors of Osmo Polyx-Oil in your area at osmona.com.

The inlaid fan

SAND-SHADING AND VENEERING TRICKS
DEMYSTIFY THE PROCESS

BY BOB VAN DYKE

I have always been fascinated with the inlaid shaded fans that are so common in Federal furniture. The simplicity, the symmetry, and the idea that their three-dimensional quality is achieved by singeing the parts in hot sand intrigues me.

Surprisingly, it's not that difficult to make quarter fans, half fans, and full oval fans in your shop. I'll show you how to make a five-segmented quarter fan by cutting the veneer, shading it, and piecing it together. Once you have that down, you can expand to the half fan and full oval.

Lay out on a flat surface

You will need light-colored veneer—traditionally holly or sycamore. You'll

also need dark-colored veneer of the same thickness—usually black dyed tulip poplar or anigre, but any dark veneer such as rosewood or Macassar ebony is appropriate.

I work on a piece of pine approximately 10 in. by 16 in. Whatever your choice of work surface, it must be flat, and you must be able to cut into it.

Lay out a 90° quadrant on the work surface and subdivide that into five segments. Extend the segment lines longer than the fan you'll be making. Draw the arc of the fan at the radius you desire.

Cut the holly veneer into strips about $\frac{3}{4}$ in. wide and about $\frac{1}{2}$ in. longer than the radius of the fan.

Sand shading is the special effect

To begin shading, you will need some fine sand. It's easy to find online at Amazon or in craft stores and pet stores. Beach sand is usually too coarse. It works but will not give you as fine a transition from dark to light. You'll also need a burner, a cast-iron pan, and a pair of long tweezers to hold small pieces.

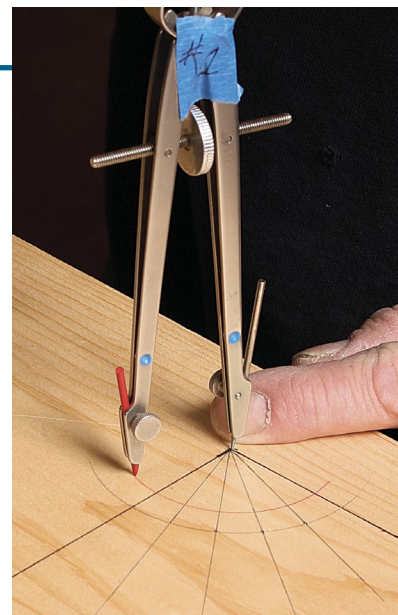
Put a layer of sand in the pan and place it on the burner set on high heat. Wait about five minutes, then test the heat by singeing the edge of a scrap piece of holly. I prefer to burn very quickly with high heat as it gives a very dramatic transition from light to dark.

When you get the effect you want, angle the holly strips in the sand, and

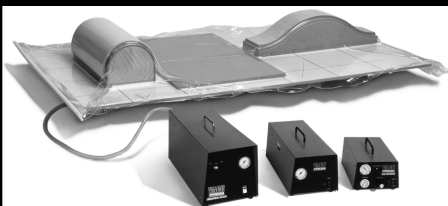
Draw the fan

Lay out the pattern.

Start by drawing out a 90° quadrant on your work surface (Van Dyke uses pine). Subdivide that into as many segments as you want the fan to have. Extend the segment lines longer than the fan you will be making. Finally, use a compass with a sharp lead to draw the actual arc of the fan.



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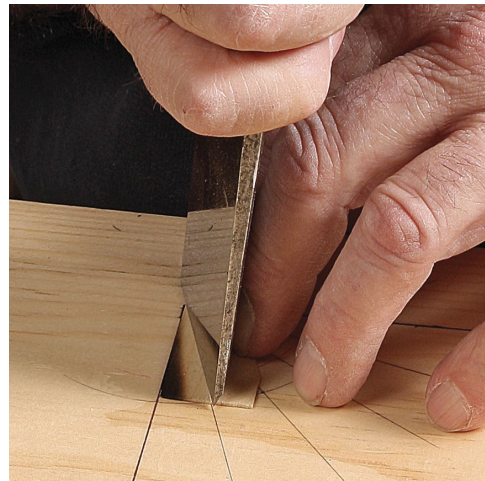
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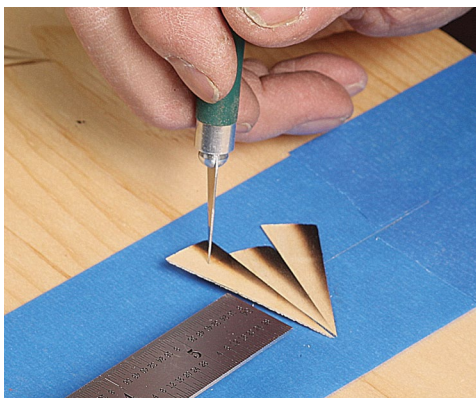
Make and assemble the segments

Shade the veneers.

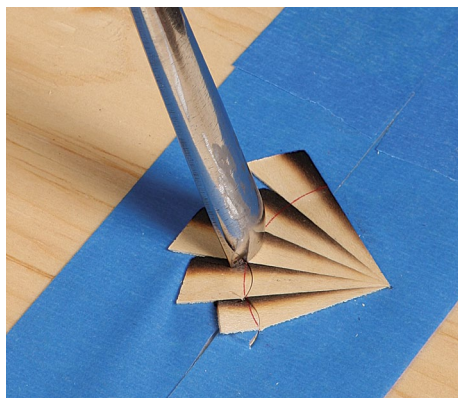
Pour a layer of fine sand about $\frac{1}{2}$ in. deep into a cast-iron pan and set the burner on high. Using a pair of long tweezers to hold the veneer, singe both long edges, angling the holly in the sand to leave some of the edge uncooked.



Cut the segments to size. Position the shaded and planed edge of a veneer segment over a layout segment. Then position a wide chisel (bevel side in the waste) just proud of the other edge of the layout segment. Slide the chisel and veneer out of your layout drawing and cut to make a finished segment.



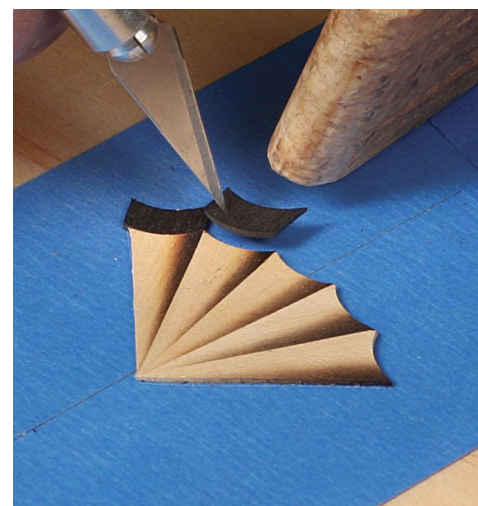
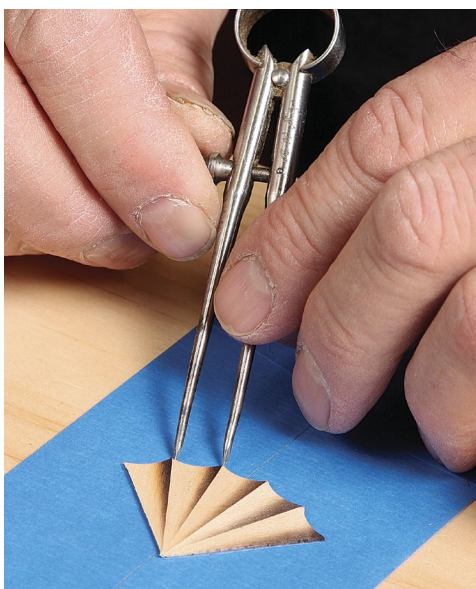
Stick it together. Lay down painter's tape sticky side up and adhere the first segment. Fit each segment to the previous one and rub firmly to burnish the tape so that they do not come loose.



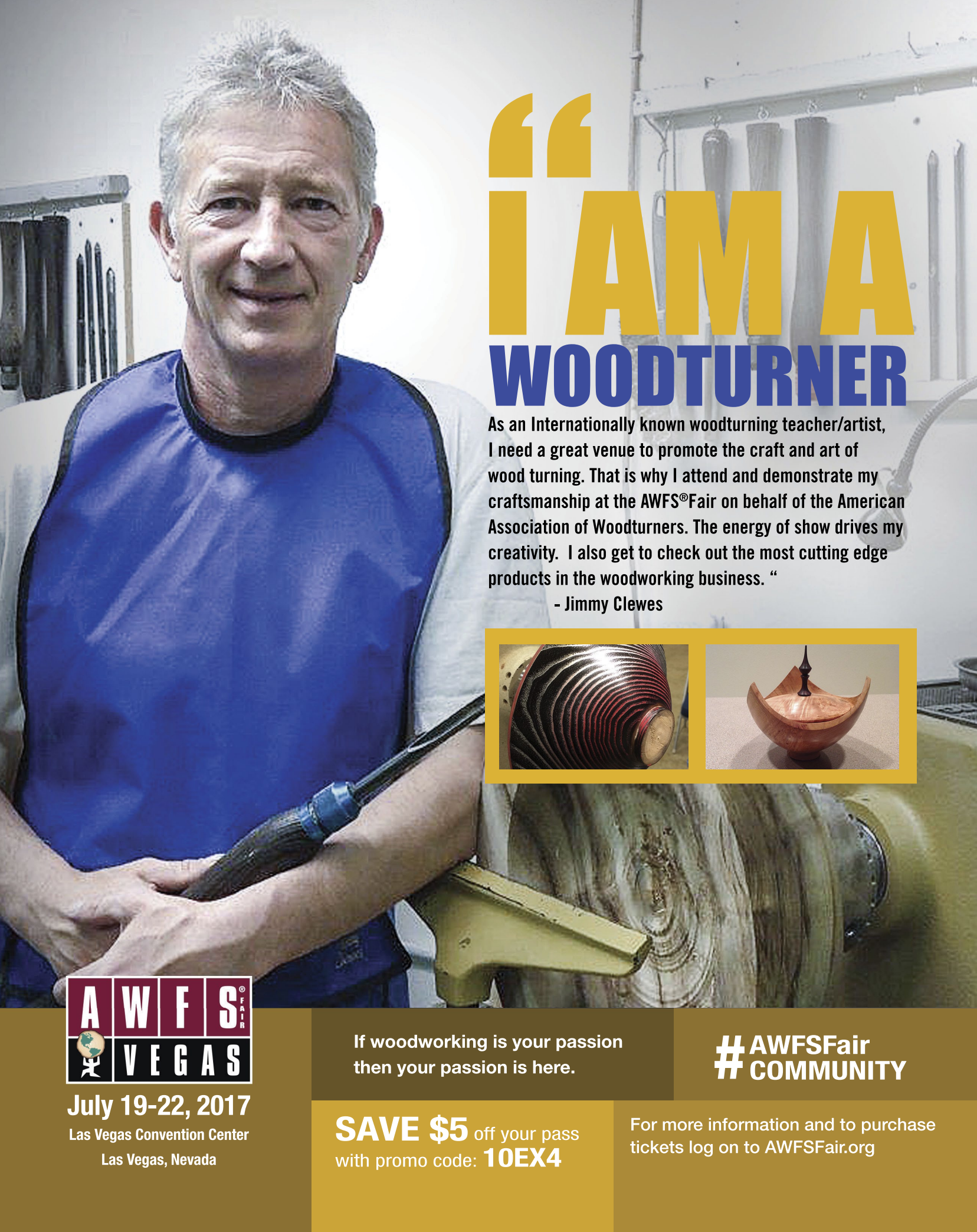
Cut the scallops. Use the same compass setting to draw a radius on the assembly. Cut a scallop at the top of each segment along the radius.



Free the fan. Slice along the long edges to release the assembly from the blue tape. Lay out fresh tape and press the assembly back down to the work surface.



Add the scallop tips. Van Dyke measures the width of the segments with dividers (left) and cuts a strip of black veneer to width, then uses a gouge to cut segments about $\frac{3}{8}$ in. long (center). Finally he presses a scallop into place at the top of each segment (right).



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Add a backer



Glue on a second layer. Cover the fan with veneer tape on the show face, and remove the blue tape. Then glue the fan to an oversize piece of $\frac{1}{8}$ -in. veneer (above). After the glue has dried, wet the veneer tape and peel it off the fan (right).



single both long edges. With a block plane and a mini shooting board, plane the burnt edge to adjust and straighten it.

Then cut the lengths of holly veneer to size. Position one over a segment of the penciled quadrant. Line up one edge with the edge of the segment and use a wide chisel or plane iron to cut the other edge just proud of the line. Make sure the bevel of the chisel is in the waste portion of the holly. Cut the rest of the segments the same way.

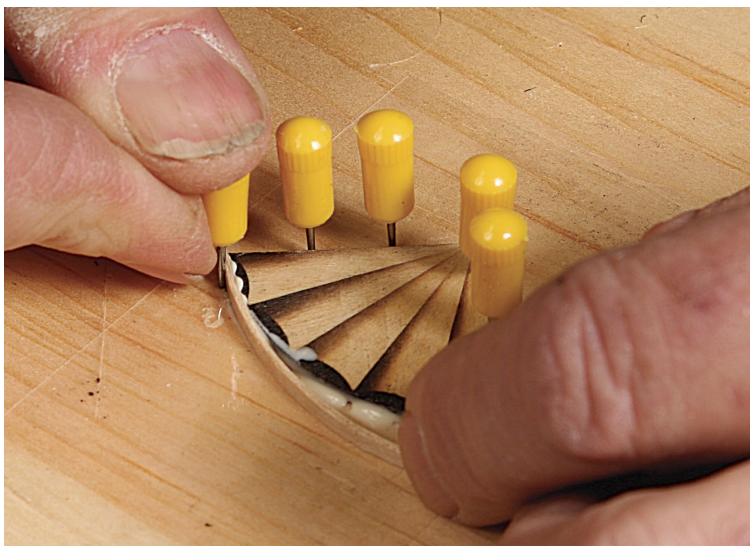
Cut the scallops

Assemble the fan carefully. You'll need a sticky surface to hold the segments. Stretch out some blue painter's tape, sticky side up, holding these strips under

Cut the fan free and size it. First, redraw the radius using the same compass setting as before. Use a wide chisel to cut the straight sides (center), and then cut along the radius line using a scrollsaw, fretsaw, or a large gouge whose sweep matches the radius of the fan (far right).



Add stringing. Use veneer pins (homecraftveneer.com) or push pins as clamps to secure the fan and put pressure on the stringing when you glue it to the fan.



tension with more blue tape, sticky side down. Lay down the first segment on the tape. Fit each succeeding segment to the previous one. Using the same compass setting as earlier, draw the radius of the fan on the assembly.

Find a gouge that has a deep enough sweep and is larger than the greatest width of the segments. I usually use a #8-13 mm gouge for fans this size. Hold the gouge at an angle so the bevel is vertical, and use it to cut a scallop at the top of each segment where the layout lines intersect. Cut the rest of the fan on the long edges to free it from the blue tape.

Now that the fan is together, add the black scallop detail. Stretch out more

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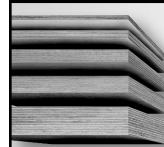


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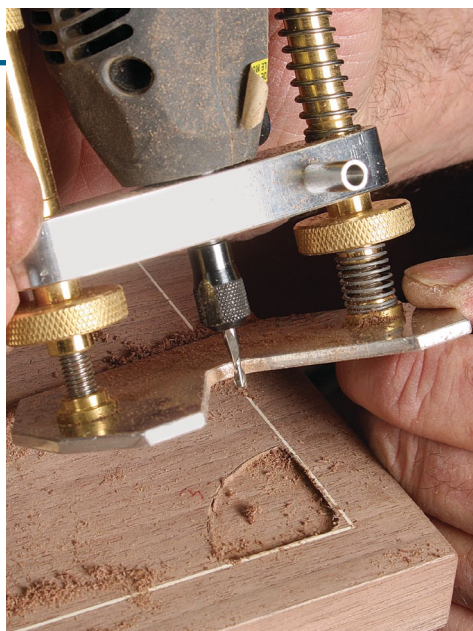


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Inlay the fan



Tack it in place. Van Dyke uses a dab of hide glue to temporarily secure the fan in place while he scores the outline.



Rout close and clean up by hand. Rout freehand and as close to the line as you're comfortable (left). Then use a gouge (above) to cut to the line.

blue tape sticky side up and adhere the fan to it. Using a straightedge and utility knife, cut a long-grain strip of the black veneer a little wider than the greatest width of the segments. Place the gouge across the grain of the black veneer. Holding the gouge vertically this time, cut enough segments to make the fan. Then fit each scallop into its segment.

Back the fan, size it, and set it in place

Now it's time to finish the fan. Cover the show face with veneer tape. Cut the fan free of the work surface and carefully remove the blue tape. Using tape-lined cauls to exert even pressure, glue the fan, veneer tape side up, to a piece of $\frac{1}{16}$ -in. veneer. After the glue has dried, remove the veneer tape and redraw the radius using the same compass setting as before. Carefully cut along the radius line with a gouge. Sand any irregularities and adjust the long edges with a block plane and shooting board so they are at 90°. If desired, add stringing to the curved edge.

The fan is now ready to set into your furniture project. Using a sharp knife, outline the edge of the fan. Rout close to the line, and then clean up to the line with a sharp gouge. I use hide glue to glue the fan into the recess. □

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



Glue them in and clean them up.

Using hide glue or yellow glue, glue and clamp the fans in place (left). When the glue is dry, use a scraper to flush them with the background (below).



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how they did it

Innovative pulls and panels

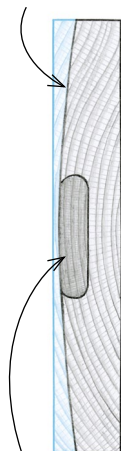
BY JONATHAN BINZEN

When Jon Billing of Big Sand Woodworking in Brooklyn, N.Y., decided his small, rectilinear wall cabinet (see the back cover) needed round, recessed finger pulls, his first thought was not to drill them out, but to turn them on the lathe. This enabled him to obtain a recess with a perfectly flat, smooth bottom and to undercut the sides for a better finger grip. He also domed the maple drawer fronts on the lathe, creating a subtle but striking effect. He dovetailed the drawer after it was shaped, creating a hollowed cork caul to stabilize the front.

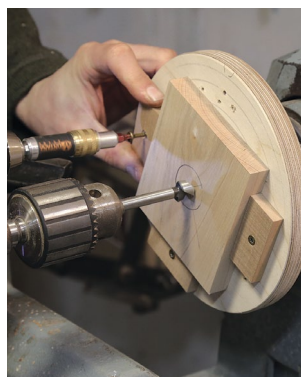


Drawer front is domed.

DRAWER PULL



Pull is hollowed out.



Using a Forstner bit to keep the drawer front centered on his lathe's faceplate, Billing screws down four retaining blocks. Billing then uses a gouge to give the drawer front a gently domed shape. After roughing out with a gouge and using a small skew to flatten the bottom of the recess, Billing uses a hook-nosed tool to undercut the rim. A flat chisel trims away the turning-tool marks on the domed surface of the drawer front, creating a pattern of overlapping facets.

DOOR PULL



After fixing the maple door stile to the faceplate with stepped screw blocks, Billing uses a Forstner bit to mark the rim of the finger-pull recess. Then he uses a gouge, skew, and hook-nosed tool to finish the job.



SLAT FACTORY



Billing made a slotted planing jig to hold the door slats still while he planed them to a pyramidal shape. A screw at one end of the jig acts as a stop.

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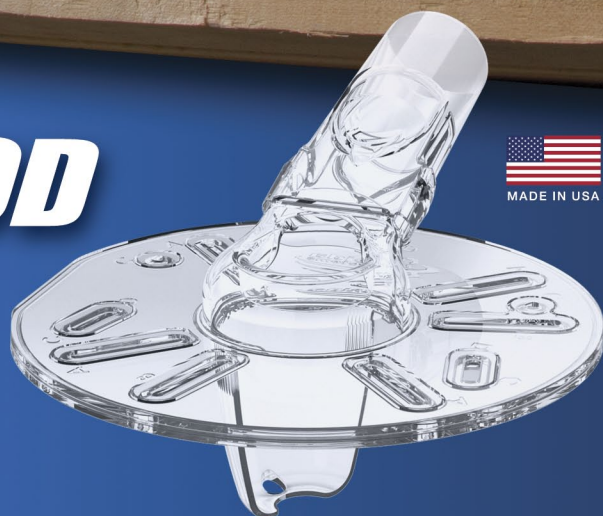
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Curriculum Cabinet

For Jon Billing, 32, a largely self-taught furniture maker in Brooklyn with a background in guitar building and sculpture, each new piece of furniture is another step in his education, another opportunity to explore new materials, new techniques, new textures and patterns. He built the case of this recent wall cabinet with sassafras, and discovered that when planed, the wood is “a real pleasure to work, with a nearly intoxicating aroma.” For the sliding doors, another first: He created pleated panels, filling the frames with rows of unglued pyramidal

slats. When it came to the drawers, to contrast the many straight lines in the piece, he decided on round, recessed finger pulls. Ever inventive, rather than



drilling the pulls he mounted the drawer fronts on the lathe and turned them; and while he had them there, why not dome the drawer fronts? After covering the convex fronts with subtle chiseled facets, he took one more shot in the dark, ebonizing the cabinet’s maple doors and

drawers with Japanese sumi ink to give them a smoky, charcoal color. Some people teach as they learn.

—Jonathan Binzen



How They Did It Turn to p. 86 to see how Billing made his cabinet’s pulls, drawer fronts, and door panels.