

TAUNTON'S **Fine
WoodWorking**
Teach • Inspire • Connect

- Handheld routing
- Benchtop vise
- Folding tabletop
- Off-center turning
- Readers gallery



Shaker chest, p. 26



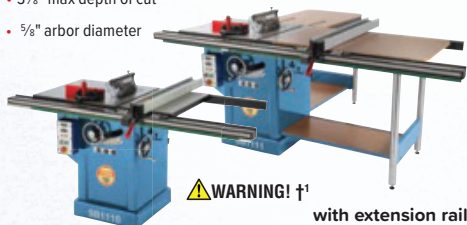
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- ¾" arbor diameter



SB1110
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WARNING! †

with extension rails

SB1111
\$3140⁰⁰ FREIGHT **\$275**

8" Parallelogram Jointer with helical cutterhead

- 3 HP, 230V, single-phase motor
- Heavy-duty center-mounted fence with rack & pinion lateral adjustment
- 4-row helical cutterhead with 36 inserts
- 83" table length
- Parallelogram tables with hand-wheel adjustment
- Digital readout for infeed table height
- Rabbeting table
- Pedestal-mounted switch controls
- Easy-to-reach knee stop for emergency hands free shut-off



SB1091
\$3195⁰⁰ FREIGHT **\$350**

WARNING! †

12" x 87" Jointer with helical cutterhead

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- Precision-ground cast-iron table
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- Anodized handwheels and fence handle
- Rabbeting table
- Pedestal-mounted switch controls
- Easy-to-reach knee stop button located below cutterhead
- Rack-and-pinion lateral fence adjustment



SB1113
\$5970⁰⁰ FREIGHT **\$425**

WARNING! †

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- Two 4" dust ports
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- Foot-operated brake system
- Quick-change blade release/tensioner

WARNING! †

SB1123
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WARNING! †

SB1118
\$14,935⁰⁰ FREIGHT **\$575**

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- Segmented chip breaker
- Drive gears run in oil bath
- Triple belt drive inside housing

16" Heavy-Duty Bandsaw with 14" resaw capacity



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- Quick-change blade release/tensioner
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SB1080
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WARNING! †

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SB1101
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- 3 HP, 220V, single-phase motor
- Two 4" dust ports
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- Two large sanding tables
- Miter work stop
- End guards swing away for edge sanding long boards
- Quick-release belt lever
- Table height handwheel for easy and precise adjustment and maximum use of sanding surface area
- Conveniently located belt tracking and tension adjustment



WARNING! †

SB1117
\$5775⁰⁰ FREIGHT **\$350**

6" x 48" Belt / 12" Disc Combination Sander



WARNING! †

- 1½ HP, 115V/230V (prewired 115V), single-phase motor
- 2690 FPM belt speed, 2630 RPM disc speed
- Two precision-ground cast-iron tables
- Heavy-duty cabinet stand
- Heavy-duty miter gauge
- Belt sander table tilts 0-45°
- Disc sander table tilts down 45° and up 15°
- US based customer service and technical support

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*To maintain machine warranty, 440V operation requires additional conversion time and a \$325 fee. Please contact technical service for complete information before ordering.

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SHOPMADE VISE **44**



34 HANDHELD ROUTING TIPS



FOLDING TABLETOP **58**

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COVER STORY

Shaker Chest with a Side Drawer

Manageable size and smart technique make this a fun and rewarding project

BY CHRISTIAN BECKSVOORT

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Folding Tabletop

An uncommon way to maximize your table area

BY STEVE LATTA



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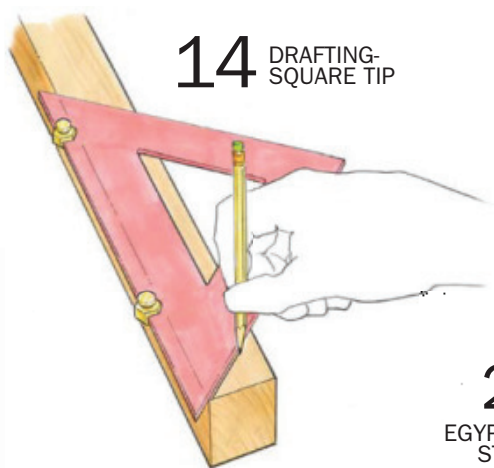
My mentor, Mr. Scriven

Back Cover

A sideboard
cloaked in
Osgood oak



GALLERY: **72**
DRESSING TABLE



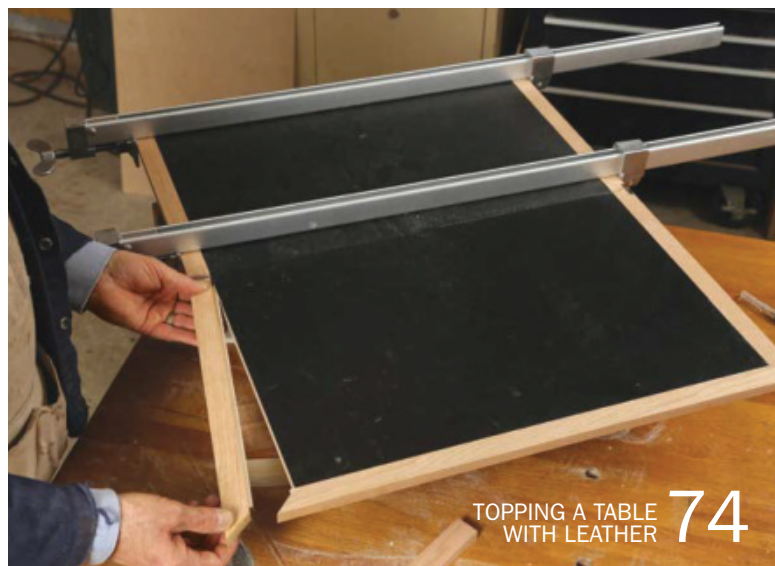
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TOPPING A TABLE **74**
WITH LEATHER



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Making it in the market

Looking to start selling your wares at a local market? You might want to listen to the sage advice of Adam Godet, who sells thousands of small goods every year.



VIDEO Hand-routed letters

Larissa Huff doesn't let the lack of a CNC machine get in her way. All it takes is a good router, the right bit, and lots of practice.



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VIDEO WORKSHOP

Shaker candle stand

He's built dozens of round Shaker stands over four decades, so there is no one more qualified than Christian Becksvoort to demonstrate making this classic. In this seven-part video series, you'll learn how to:

- Turn the wine-bottle post
- Shape the legs, softening the edges with a lathe-mounted sanding drum
- Hand-cut dovetails to attach the legs to the post
- Add a beautiful hand-rubbed finish with oil and varnish



Online extras

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VIDEO Hammer it home

Steve Latta veneers his folding-top table (p. 58) using a vacuum pump. In the pre-industrial age, the task was likely done by hammer veneering, and in this video Steve will show you how.



VIDEO Offset turning

Beth Ireland (p. 52) shows how to make turned parts like legs or boxes with an elliptical cross-section, or even a triangular one.

VIDEO What exactly is a climb cut?

Climb cutting when routing can be confusing. In this video we try to clear up the confusion and show some tips for identifying a climb cut and avoiding it.

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contributors

It's pretty much established fact that among *Fine Woodworking's* staff, **John Tetreault** (deputy art director and illustrator) is, hands down, the nicest. And that's saying a lot, really, because we think we are all pretty nice. An artist and woodworker who grew up in Granby, Mass., John spends a lot of time working with unconventional and reclaimed woods, and upgrading the farmhouse he shares with his wife, Meyesa, and children Eloise (8), Jude (5), Petros (2), and Phoebe (1). When asked what he's working on right now, he said, "Patience. Oh, and an addition to our little farmhouse."



Beth Ireland ("Learn Offset Turning") turns wood, builds furniture and stringed instruments, and makes sculpture in St. Petersburg, Fla. After graduating with a degree in illustration, she took a job in Boston as a carpenter and soon became a cabinetmaker, furniture maker, and architectural turner. She still turns professionally and teaches turning widely. Working with her hands, she says, "saved my life. It's like my meditation; it's allowed me to maneuver in the world."



KT Kaminski, assistant digital editor for *Finewoodworking.com*, lives in New Haven, Conn., and helps facilitate blog posts, online extras, and video content. As a lifelong artist and writer, branching out into new mediums comes as second nature to KT, and their venture into the world of woodworking is no different. Coupled with a penchant for art history, KT finds a particular fascination in sculpture, marquetry, hand carving, inlay techniques and patterns, and the philosophy behind green woodworking.

Paul Bouchard (Designer's Notebook: "Extracting the past") grew up in Southern Ontario with a love for drawing that eventually led to a career in animation. Several years ago, the examination of a friend's antique dresser sparked an interest in hand-tool work and the construction/design choices that follow from it. Like a lot of hobbyists, he enjoys making furniture in Shaker and other period styles. Finding comparatively little detailed documentation of Egyptian furniture construction, he's having a great time exploring its techniques.



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Shaper Studio simplifies CNC design

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While most woodworkers can appreciate the power and potential of Shaper Origin, the world's first handheld CNC router, some may doubt their ability to create the precise shapes and cutting paths they need on a separate computer. While basic shapes can be drawn directly on Origin, more complex designs have required separate CAD or drawing programs in the past, fueling anxiety for some potential customers.

While these third-party programs can be very powerful and effective, most are not designed for woodworking specifically, nor Origin for that matter.

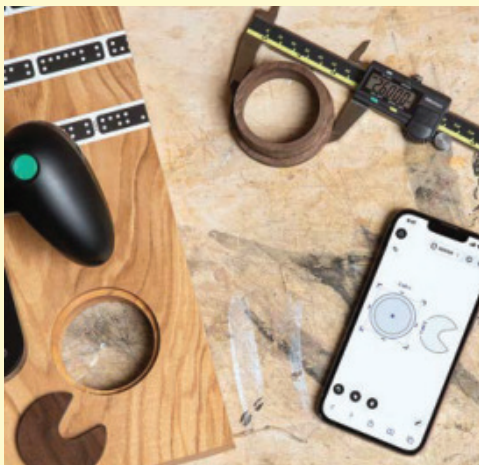
Shaper Studio is a simple, intuitive 2D design tool that focuses on the features woodworkers need most. Basic shapes and cutting offsets can be created in minutes, and a powerful new tool called ShapeShifter makes it easy to combine those shapes into more complex cutting paths. Studio also includes a massive library of fonts and icons.

Once a design is created in Studio, it's transmitted instantly to Origin via Wi-Fi. By the way, that ability to sync instantly with



Powerful team. Combined with the Shaper Origin router and Shaper Workstation, Studio brings boundless digital capability to woodworkers of all backgrounds.

Digital design made easy. Studio is a simple design tool that works on any device, and syncs instantly with the Origin router. With Studio, a woodworker can quickly design the joinery, profiles, and parts they need, upload them directly to the Origin, and get to work.



Origin is the same for the thousands of projects and hundreds of Shaper-vetted hardware templates in Shaper's online resource library, called ShaperHub.

Because Studio is a web-based tool, woodworkers can use it on any device, from a smart phone to a desktop computer.

While there will always be a place for more complex designs, Studio can quickly produce the vast majority of cuts a woodworker will need. "A lot of us work on computers all day," says Adi Rao, Shaper's product manager. "The point of Shaper Studio is to spend less time fussing with a computer and more time making things."

Access to the full version of Studio is \$99 a year. A 14-day free trial lets users take it for a spin, and a "Lite" version of the product is available for free. To learn more, visit shapertools.com/studio.



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From the Editor

Remembering Nancy R. Hiller: woodworker, designer, writer, friend

As I sit here striking these keys, it's been a mere 24 hours since I learned my dear friend Nancy Hiller died. It is hard, right now, to find the words to pay tribute to her, though given weeks or even months, it wouldn't be easier. As word of Nancy's passing spreads, social media has been full of posts about her. The outpouring of remembrances, anecdotes, love, and words of admiration is not a surprise. The sheer volume of it, though, overwhelms me. I hope it gives Nancy's family and friends much comfort to know how many people she has impacted in such profound ways. I'm also grateful and struck by the kindness of our woodworking community, the genuine love and support being offered from so many directions.

Some of what I say now I will borrow from what I wrote in a Lost Art Press blog, published in May 2022. If you are reading this, you likely already know of Nancy. For decades she plugged away in a calling where it is difficult to succeed professionally. She wrote countless articles showing how to make gorgeous pieces of furniture, wrote books about designing and woodworking and life, and was a woodworking social media icon. She taught, lectured around the country, and blogged about the realities, joys, trials, and every other aspect of the woodworking life you can imagine.

Through her blogs on FineWoodworking.com and on Lost Art Press, Nancy introduced us all to each other. Naturally curious, interested, and sincere, she had a remarkable knack for seeking out the fascinating aspects of people's lives and writing eloquently about them, bringing us together.

Nancy paved the way for aspiring woodworkers, authors, women in woodworking, and designers. But these last three years, in addition to doing all that, she illuminated a dark path for anybody who struggles—so, all of us. In the same strong, determined, and steady way that she moved through her career, Nancy confronted her pancreatic cancer diagnosis, thinking

creatively, managing one obstacle at a time, learning, teaching and advocating, exuding grace through it all.

I was intimidated by Nancy when I started out as an editor in 2006. I was assigned to work with her on the article "Arts & Crafts Wall Shelf." It would be my first (mostly) solo assignment, and I would be traveling to Nancy's shop. On the phone with her it was clear I was out of my intellectual league and every other league I cared about. She was talented, educated, and articulate, and she could woodwork circles around most other pros. She could write quite well, had ridiculous design skills, and was clearly going to be on top of her deadlines. I was a nervous newbie editor/photographer. When I arrived for the

shoot, Nancy was all I expected and more. She was kind, thoughtful, very well prepared, humble, professional, accommodating, hilarious, and had an ease about her that started things off on the right foot. We began a long path of friendship that has grown steadily deeper since. We made our way through that shoot and article and today, almost 16 years later, we've done about a dozen more. I often wonder if I had been paired with a different author on that first shoot whether I would have made it

past the first year in a job with quite a steep learning curve.

Nancy was known for her smile and that fantastic laugh of hers, and it was my pleasure to capture both every time we worked together! She was never stingy with either, even in the midst of doing the hard work of staying alive. My heart is heavy with the loss, but I am honored to have had Nancy Hiller in my life. I will always love and be in awe of her.

I'm going to go out on a limb that muddles the lines between science, the mystical, and religion. I don't claim to know what happens next. I do know that energy can be neither created nor destroyed—only transformed. Wherever Nancy's limitless energy is, I hope she is feeling all the love pouring toward her.

—Anissa Kapsales, senior editor



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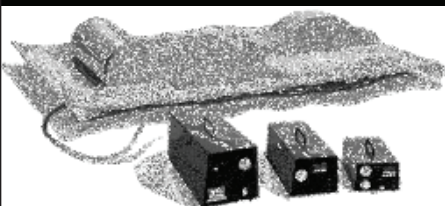
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workshop tips

Refresh the zero-clearance surfaces on your crosscut sled

When you make the first cut with a new crosscut sled, you create zero-clearance support around the blade, preventing chipping on the bottom and back edge of the workpiece. As time goes on, those slots tend to get expanded by wider blades, bevel cuts, and so on. You can refresh the zero-clearance support on the base and front fence by attaching sacrificial layers of plywood or MDF using double-sided tape, but that reduces the effective cutting height of the blade.

I built this crosscut sled a couple years back, and it addresses this problem. The sled construction is standard; where it differs is that both the base and the front fence have replaceable inserts. You can add these features to an existing sled.

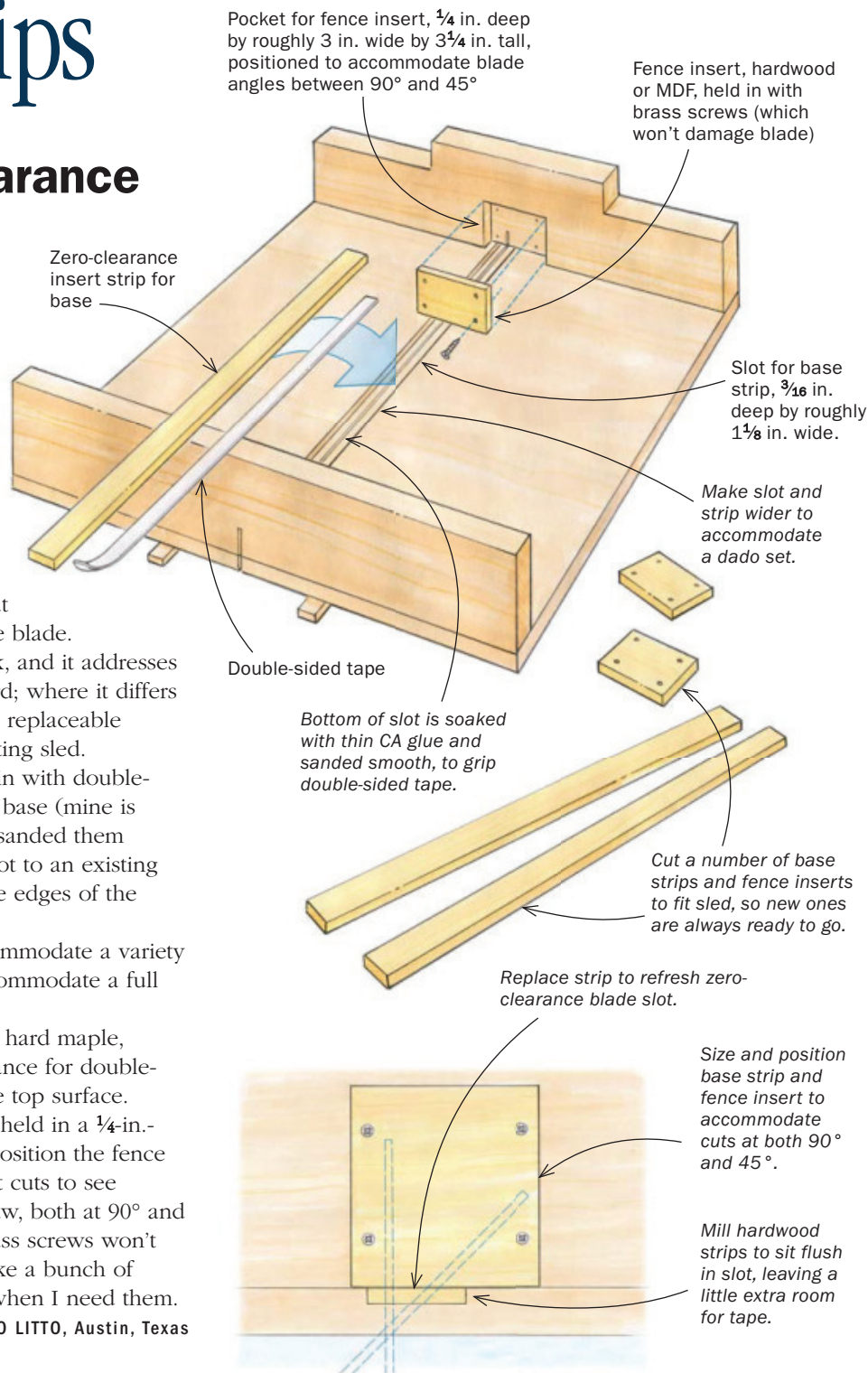
The sacrificial strip in the baseplate is held in with double-sided tape. I saturated the rabbets in the sled base (mine is MDF) with thin cyanoacrylate (CA) glue and sanded them smooth so they'd grip the tape. To add this slot to an existing sled, take it apart, cut rabbets along the inside edges of the base, and reassemble the sled carefully.

I made my insert strip wide enough to accommodate a variety of single-blade cuts. If you want yours to accommodate a full dado set, you'll need to widen it accordingly.

I make a stack of strips ahead of time, from hard maple, planing them to fit the slot with a little allowance for double-sided tape, so the strip ends up flush with the top surface.

The hardwood or MDF fence insert plate is held in a 1/4-in.-deep pocket with brass screws. To size and position the fence insert properly, you'll need to make some test cuts to see where the blade cuts at full height on your saw, both at 90° and 45°. (If you do get the positioning wrong, brass screws won't damage the blade.) Like the base strips, I make a bunch of fence plates ahead of time so they're handy when I need them.

—LEO LITTO, Austin, Texas



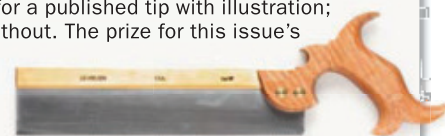
Best Tip



After studying industrial design and working in that field for a few years, Leo Litto bought a small hardwood lumberyard in southwest Florida and turned it into a highly successful architectural millwork company. When he got tired of watching beautiful woods roll in and beautiful wood products roll out, he moved to Texas to set up a 2,000-sq.-ft. industrial woodshop of his own, where he builds furniture on commission.

A Reward for the Best Tip

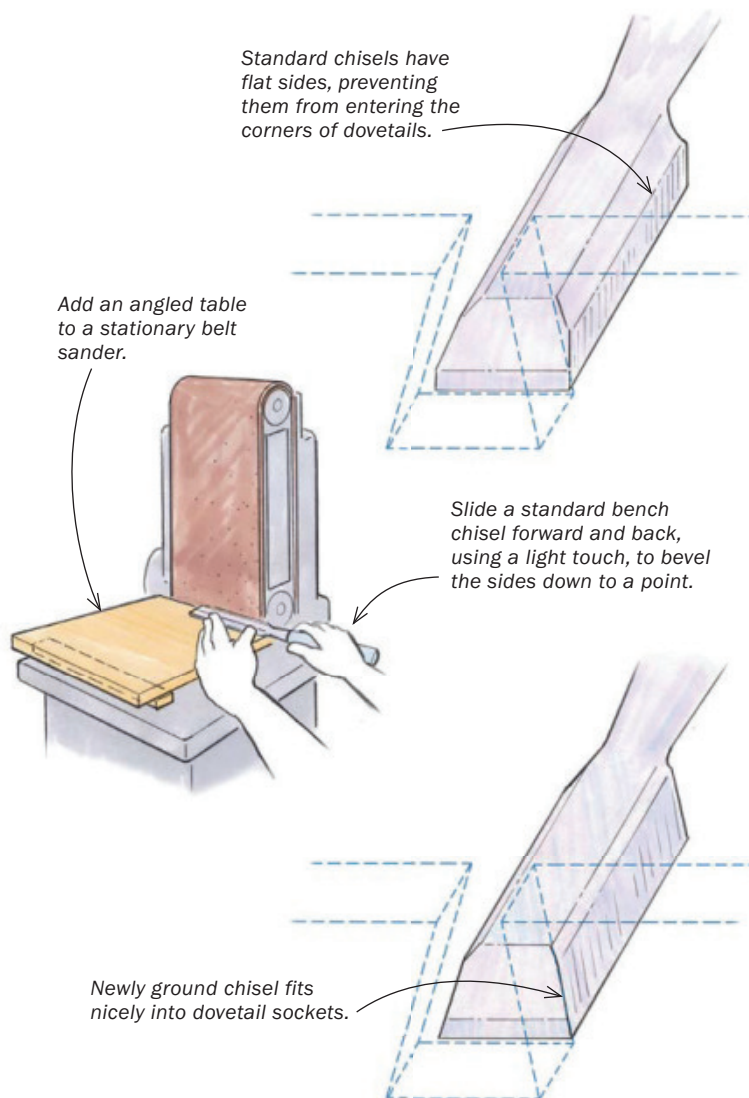
Send your original tips to fwtips@taunton.com. We pay \$100 for a published tip with illustration; \$50 for one without. The prize for this issue's best tip was a Lie-Nielsen Tapered Dovetail Saw.



Turn any chisel into a dovetail chisel

A dovetail chisel has angled sides, letting it nestle nicely into the corner of a dovetail socket. Standard bench chisels have flat areas at the sides, called “lands,” which prevent them from working all the way into the corners, and can make obvious dents there. To turn a bench chisel into a dovetail chisel, many folks use a bench grinder, which requires a steady hand to produce a smooth, even result. A stationary belt sander makes the job a lot easier. Start by creating an angled bed as shown, using a piece of plywood. The angle of the bed should match or exceed your favored dovetail angle. Slide the chisel forward and back against the belt, with a light touch, and stop just as the angled side reaches the bottom of the chisel. You’ll love the results. For Japanese chisels, you can use a black-oxide coating or other patina solution to turn the freshly ground metal black.

—DEREK COHEN, Rossmoyne, Western Australia



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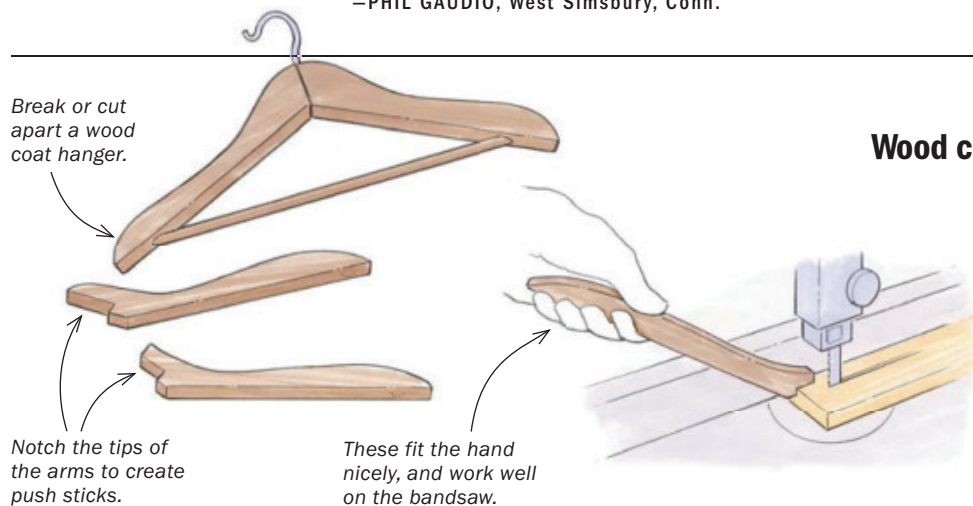
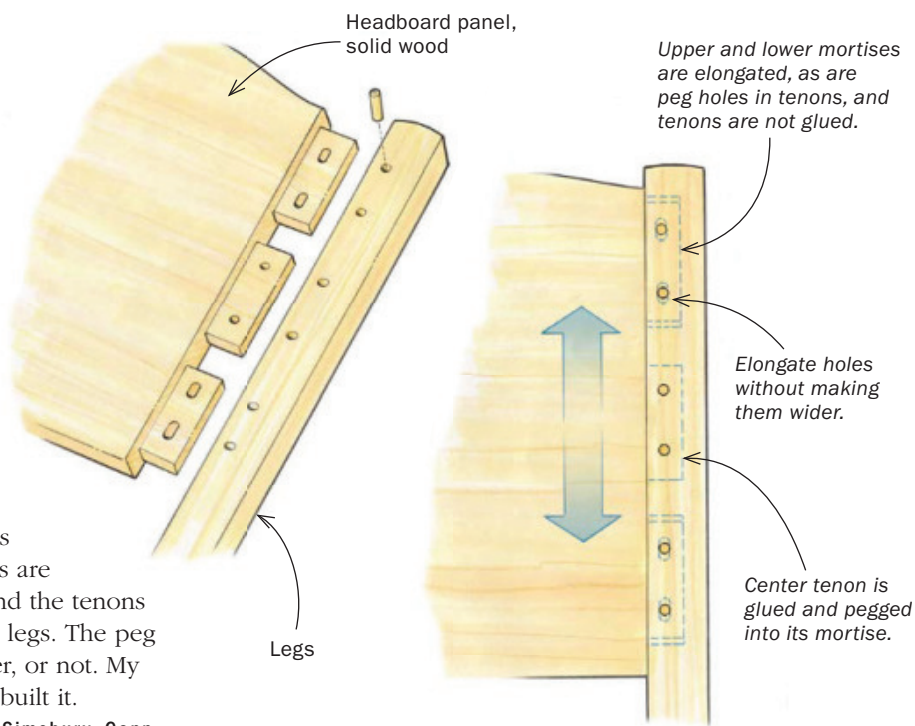
SINCE 1993



The breadboard headboard

I decided to build a Shaker-style bed with a traditional headboard. This presents a cross-grain joinery challenge where the panel attaches to the posts, and opinions differ on how to solve it. It occurred to me that I could attach the posts the same way breadboard ends are attached: using multiple mortise-and-tenon joints, with pegs passing through elongated holes, drawing the parts tightly together but allowing the panel to expand and contract with changes in humidity. In this case, the center tenon is glued and pegged through standard holes to lock it in place. The upper and lower peg holes are elongated, as are the mortises for those tenons, and the tenons are not glued, letting them shift slightly inside the legs. The peg holes can be offset to help draw the parts together, or not. My breadboard headboard is as solid now as when I built it.

—PHIL GAUDIO, West Simsbury, Conn.



Wood coat hangers make great push sticks

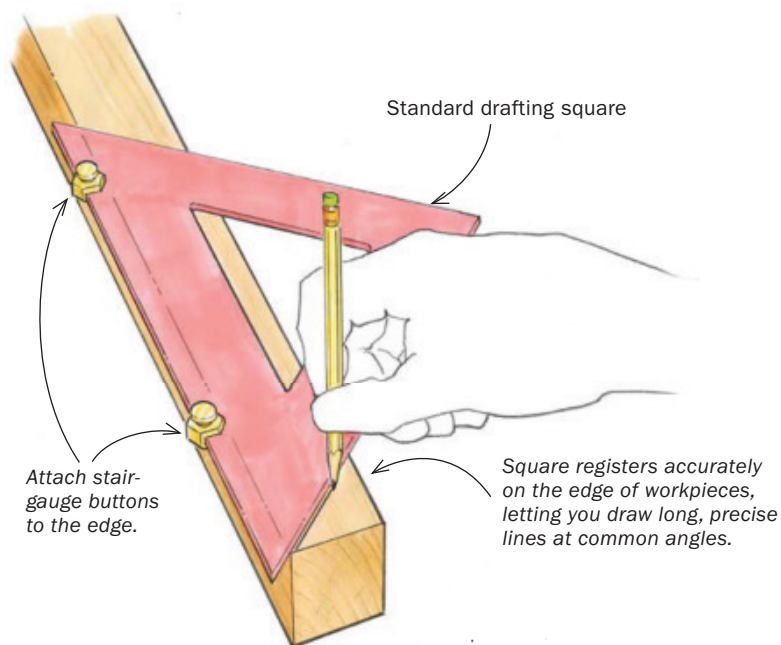
To make long, comfortable push sticks in minutes, break apart a wood coat hanger and cut notches in the parts. The curved end fits the hand beautifully. This type of push stick works well on several machines, but the shark-fin type with a long lower edge is better for the tablesaw.

—GERARD GILBOE, Royal Oak, Mich.

Framing buttons make drafting square more versatile

A drafting square is designed to slide along the parallel bar on a drafting table, and it does that job well. Try to use it for layout on real workpieces, however, and you might find it hard to line up the square with the edge of the board. The simple solution is a pair of stair-gauge buttons, designed for framing squares. They attach nicely to your plastic drafting squares, turning them into excellent layout tools for woodworking.

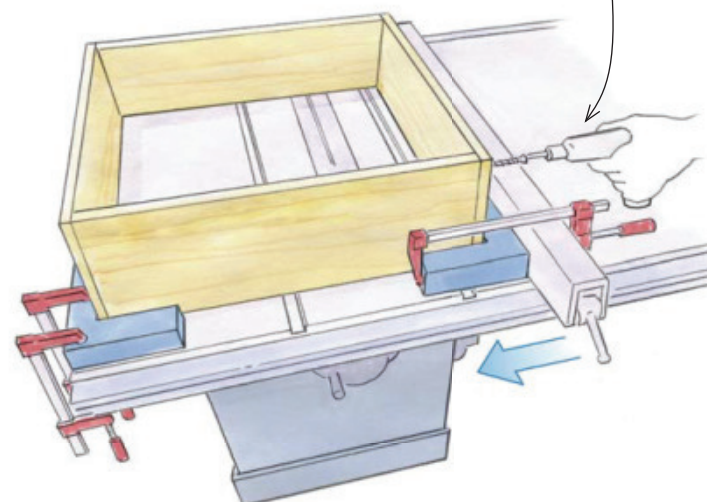
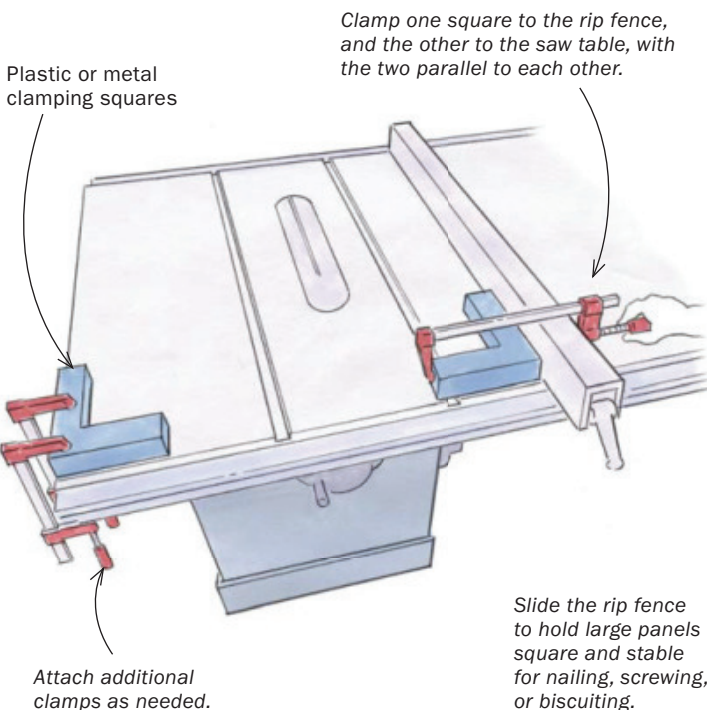
—ROB HARE, Ulster Park, N.Y.



Use your rip fence to assemble boxes

It's hard to manage large cabinet parts while joining them with glues, screws, nails, or biscuits. To control the parts of any box and hold them square, try using your tablesaw and two clamping squares as shown. Clamp one square to the rip fence and the other to the saw table, using a straightedge to align them with each other. Slide the rip fence to draw the parts together, and then add nails, screws, or biscuits to complete the assembly. There's plenty of room to attach additional clamps. To keep glue off the table, I don't apply any to the bottom ½ in. of the joints. I plan to make taller clamping squares from plywood, but my current setup works great.

—LIN DRAKE, Clovis, N.M.



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■ ACCESSORIES

Miter gauge and fence team up

I HAD THE OPPORTUNITY recently to try out Rockler's new Precision Miter Gauge and Miter Gauge Fence. The setup is simple and effective, and the gauge in particular works well. I used the miter gauge and fence in the shop for several weeks, and they both performed dependably, whether making square cuts, 45° cuts, or miters for an octagonal frame. All in all, the Rockler miter gauge makes a beneficial addition to a tablesaw. The fence is nice too, but with some caveats.

The guide bar was easy to tune for a precise fit in the miter slots via four nylon set screws. Once set, the bar tracked smoothly and precisely. The front face of the gauge was accurately plumb.

The protractor head has detents for accuracy. In addition to one at 90°, there are detents at five common angles on each side of the head. There's also a detent that positions the guide bar parallel to the fence for ease of storing. The bar even has a large hole for hanging, making storage a snap. The detents are not microadjustable to the bar, but my gauge came square out of the box anyway.

The gauge has a high-contrast protractor scale that is easy to read and align with the gauge's hairline indicator. A tall handle locks the head in various positions. Additionally, there are knobs for securing a sacrificial fence, meaning all adjustments on the gauge can be made without additional tools. An added plus is that all the knobs and adjusters are easy to grip.

The fence is made of lightweight anodized aluminum. At the end of the main fence is a short section that telescopes out. A flip stop for setting repeat cuts slides along the top of the fence, though there is no measurement scale. Included with the fence is a removeable melamine face for zero-clearance cuts.

The fence is a nice, simple idea, but I should note that the telescoping arm, when tightened, extends forward of the main fence by 0.010 in. This pushes the workpiece slightly out of square.

—Contributing editor Chris Gochnour
stands behind a tablesaw
in Salt Lake City.

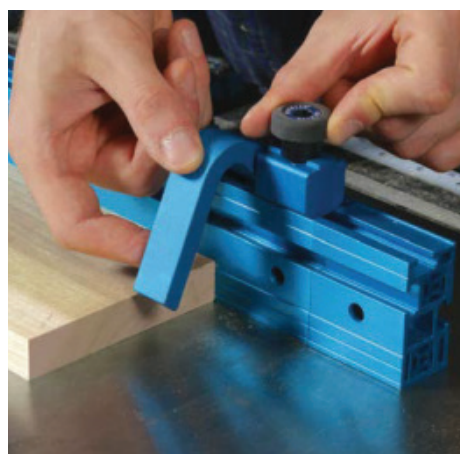


Easily adjustable. A spring-loaded pin engages detents to lock the head at common angles. For in-between angles, the pin can be withdrawn so the knob can lock the head anywhere within 70° left and right. The handles and knobs are easy to grip.

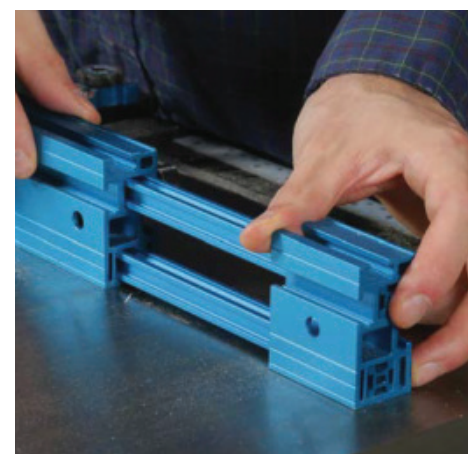


Miter gauge
by Rockler
\$120

Miter gauge fence
by Rockler
\$70



Flip stop is a convenient timesaver. With a flip stop, you can alternate between squaring the ends of boards and cutting them to equal length without the stop getting in the way or you losing your setting.



Telescoping arm is a stretch. The fence worked well, but not with the arm. When the arm was extended, it was slightly forward of the main fence, interfering with square cuts.

■ SHARPENING

Trio of stones and strops

M.POWER'S SIDE BY SIDE (SBS)

diamond stones and leather strops are a reliable sharpening setup. The SBS's aluminum base solidly holds six sharpening surfaces, three diamond stones and three strops, and allows for efficient movement from coarse to fine. Everything, including the strop compounds and stone lubricant, fits into a heavy-duty storage case.

The stones and strops measure 3 in. wide by 8 in. long. The diamond stones' grits are 300, 600, and 1200. The polishing compounds' are 1800, 2500, and 5000. The strops are leather attached to plastic covers that slip over the diamond stones and use magnets to stay in place.

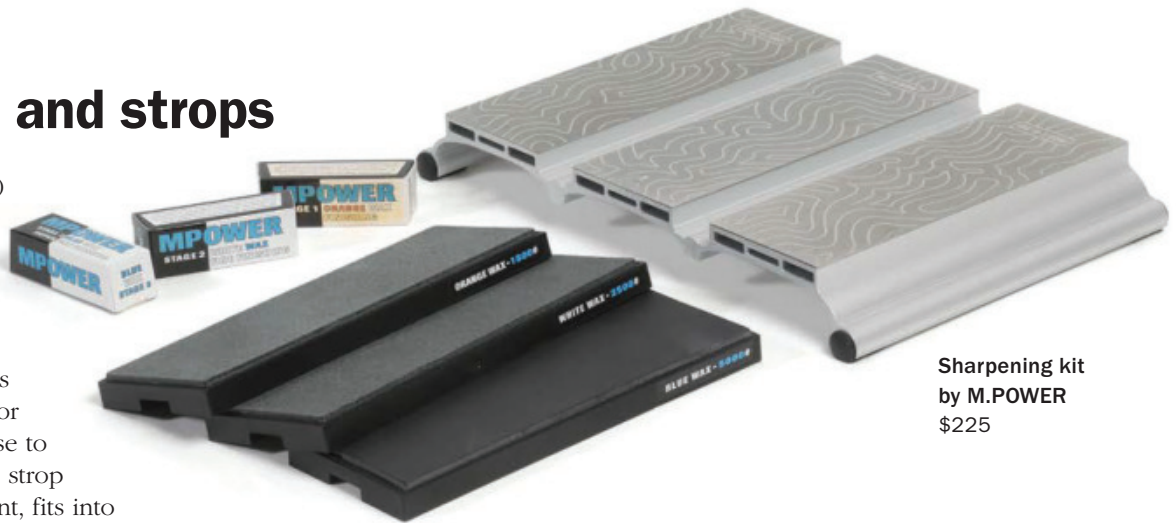
I was able to quickly reshape a bevel on the coarsest stone, then proceed through the finer stages to get very good results with plane irons and chisels. The system also worked well for carving

gouges with the addition of a slipstone for the inner flute. The strops and compounds worked surprisingly well. The first two strops are particularly firm to minimize rounding of the cutting edge. As the finest diamond stone breaks in and becomes finer, even less follow up on the strops should be required. The final strop left a mirror polished surface.

For sharpening sloyd knives, the SBS does not allow good access to the middle stone. Also, since the stones are attached to the base, it was not possible

for me to take the stones to the tool as I do when I sharpen adzes, axes, and drawknives.

—Hand-tool woodworker Dave Fisher gets a mirror polish in Greenville, Pa.



Sharpening kit
by M.POWER
\$225

■ DUST COLLECTION

Improved Dust Deputy

FOR MORE THAN A DECADE, I have used Oneida's first-generation Dust Deputy mounted to the top of a 5-gal. plastic bucket. It did exactly what you would expect—separated the dust, leaving it in the bucket instead of in my expensive dust-extractor bag. The system worked great, but the unit was top heavy and therefore prone to tipping over. Even though I devised workarounds, I still sometimes avoided using it to spare myself the hassle.

In contrast, Oneida's new Dust Deputy 2.5 Deluxe 10 Gal. Cyclone Separator Kit is a pleasure to use and works well. The cyclone still separates dust nicely, but the tippiness is gone thanks to the added weight from the metal barrel and the unit's wide stance. The 10-gal. bucket holds ample dust but isn't so large it's

unwieldy to empty. The kit's six 1½-in. casters let the unit roll easily over mats and cords.

The kit comes with a high-quality, 5½-ft.-long, crush-resistant hose to run from the separator to your dust extractor, as well as a strip of foil tape to mount to the separator if you're worried about static buildup in the separator.

One downside to the metal barrel is that there is no visual indicator that the barrel is full.

Oneida also sells the Dust Deputy 2.5 in packages with just the cyclone itself or with a 5-gal. plastic bucket. But, if you can swing it, the Dust Deputy 2.5 Deluxe 10 Gal. kit, with its heavy metal drum, is fantastic.

—Web editor Ben Strano keeps the dust down in Southbury, Conn.



Oneida Dust
Deputy 2.5
\$199.95

■ NEW TO MARKET

Tools to look out for

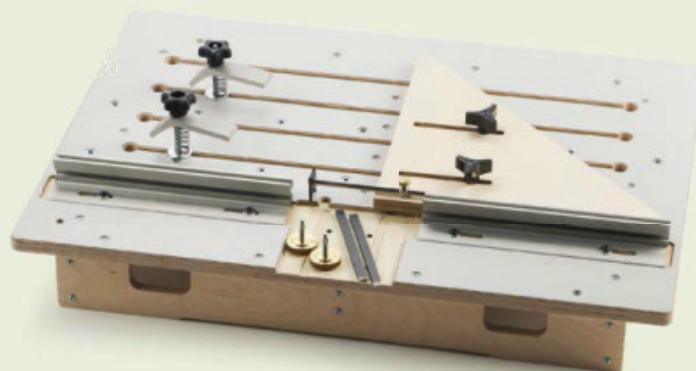
Chip carving book

FWW author Daniel Clay has released the book *Chip Carving: Techniques For Carving Beautiful Patterns By Hand* with Blue Hills Press. Clay aims the book at all skill levels of chip carving, offering step-by-step photos and text instruction over its 208 pages. The book includes both traditional geometric motifs and modern, flowing designs.



Small SawStop

SawStop's flesh-sensing technology is now available in a new, small package. The SawStop CTS accepts 10-in. blades, which can be raised to 3¼ in. It has a rack-and-pinion fence and weighs 68 lb. The table measures 23 in. by 22½ in. An optional folding stand for the saw is also available.



Domino accessory

Compatible with Festool's Domino DF 500, the Veritas Domino Joinery Table is designed for accurate, repeatable mortises on parts that may be tricky to work with freehand. The top is Baltic-birch plywood with slots and overhangs for included stops, fences, and hold-downs. A DF 500 mounts directly to the table and aligns with a fixed fence.

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Extracting the past

BY PAUL BOUCHARD



My deepest admiration goes out to the Egyptian craftspeople who developed and executed this beautiful design so incredibly long ago.

I found this ancient Egyptian stool on the British Museum's website in early 2020 and fell in love with it. A couple of things pushed me to make a copy: its graceful beauty, curiosity about the execution of its joinery, and a desire to own it, sit on it, and see how it holds up over time.

I'd planned to visit and photograph the museum display, but COVID canceled my London vacation. Thankfully, the museum page has excellent pictures and measurements, and the image viewer allows you to zoom in quite close.

This isn't a full build article, but it does shed light on some of the history and what I think are the two focal points of the piece, the seat and the lattice, and how the design and construction play off each other.

Stools in ancient Egypt

Turns out the most common pieces of furniture in ancient Egypt were stools, three- or four-legged with curved wooden seats or woven seats. Stools were made from materials such as reeds, rush, and wood. They are depicted being used by laborers and nobles alike, though stools in wealthier homes were more elaborate and made of more expensive materials. One of the reasons these pieces survive is because of the dry and stable conditions in the tombs where they were discovered.

A big takeaway from my study has been how "human" a lot of the workmanship is. X-rays show the internal joinery can be primitive (hogged-out mortises, packed with gesso to fill the gaps). I was curious about what types of tools were used in building back then, so I did some research. In his book *Egyptian Woodworking and Furniture* (2008, Shire), Geoffrey Killen covers Egyptian tools extensively. The 18th-dynasty woodworker's handsaw is functionally the same as a modern one, so I used a panel saw and a backsaw. As far as I know they didn't have bow saws or coping saws, so I made all my inside curves by sawing multiple straight kerfs, splitting off the segments, and paring with a gouge close to the final surface.

I was more concerned with staying close to the procedures than exactly replicating techniques or textures. Adzes would have been used to straighten all the flat surfaces, but I stuck



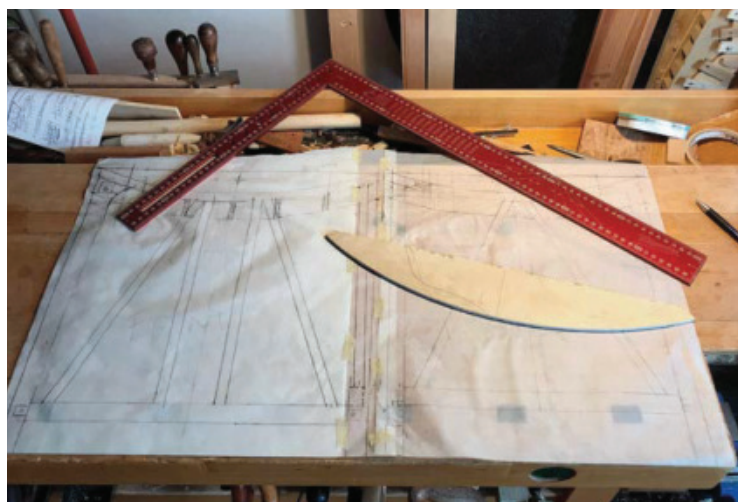
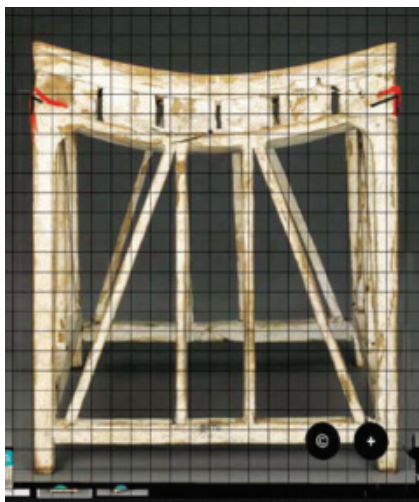
Theban lattice stool. This stool (catalog #EA2476 at the British Museum), dates from the 18th dynasty (1550–1292 BCE). Its double-coved seat and lattice bracing were often seen in stools of the time. While lightly built, this design stood up to daily use well enough that it endured, with only minor variations, for hundreds of years.

with handplanes because I didn't want to lose any fingers. The Egyptians also would have sanded with flat or curved stones. I work in my apartment and for health reasons try to minimize my use of sandpaper, so I used coarse rasps for rough work on the seat underside and cabinet scrapers for the final shaping.

Making the seat slats and side rails

I used cherry scraps for the seat's roughly 3-in. by 2-in.-thick side rails. Their top and inside faces were most critical to keep flat and square, but I made the outside a reference face as well because I'd be marking the leg sockets on it. I cut the side rails to overall length, then made myself a radius template from $\frac{1}{8}$ -in. plywood and used it to draw a curve on the outside face connecting the

From tomb to museum to computer to paper. Bouchard took the side view from the museum site, overlaying a scale grid on his computer. He then made full-size drawings on paper. He was able to lift and transfer many measurements and angles directly from the full-size drawings with dividers and bevel squares. Just as importantly, the process helped flesh out his understanding of the construction.



THE SEAT CONTOUR

At first glance, the seat shape looks like part of a sphere, but it is actually a double cove spanning the side rails and seat slats. It's unclear how the Egyptians made the seat, whether by steam-bending or sculpting, but Bouchard believes it was by sculpting.

Side-rail mortises. After shaping the bottom face of the side rails and marking out the slat mortises, Bouchard drilled them using a guide block to help set the correct angle and as a depth stop (a bit over 1 in. deep). He then used a chisel to remove the waste and clean up the mortises.



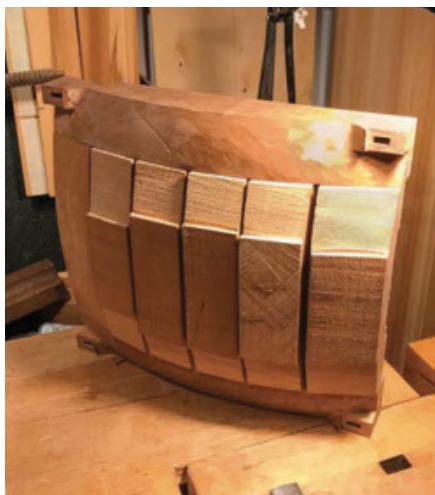
top corners of the rough block. Then I set dividers for the seat thickness, pricked a few marks to line up the template, and repeated the curved line about $\frac{1}{2}$ in. lower. For the slats, I started with blanks wide enough to encompass the shoulder contact outline and thick enough to allow for the belly of the curve. Three different widths were needed for the six slats. I marked the tenon shoulders from a reference piece to make sure all the slats were exactly the same length.

Adding lattice and paint

The mortises for the stretchers are offset vertically to preserve strength in the leg.



Testing the layout. During the shaping process, Bouchard dry-fit the parts to double check the accuracy of the joinery markings and to see that the forms were working together. Here, you can see the slats dry-fitted and at various stages of completion.



Shape the bottom. After glue-up, the bottom side of the seat is ready to be shaped with a rasp, scraper, and block plane. All the curved lines that were scribed around the seat and slats are still visible and guide the final shaping.



Kerf cuts are key. To make all the inside curves, Bouchard cut multiple straight kerfs, knocked off the segments between them, and then pared with a gouge close to the final surface. He left four sections of the top surface intact so that during the glue-up it would lie flat on the table and he could easily check for twist. The top side was smoothed with a tiny plane with a convex sole and a curved cabinet scraper.



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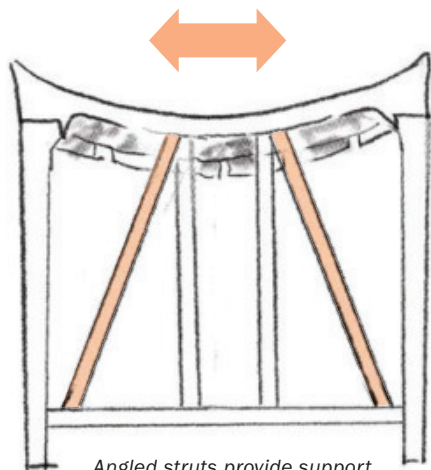
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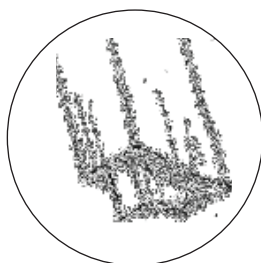


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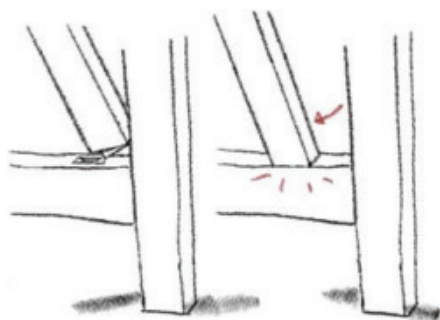
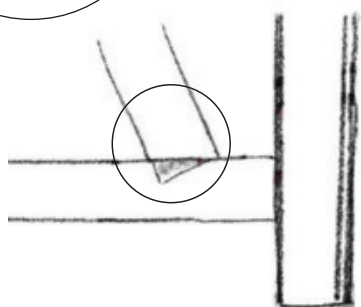
Struts add support



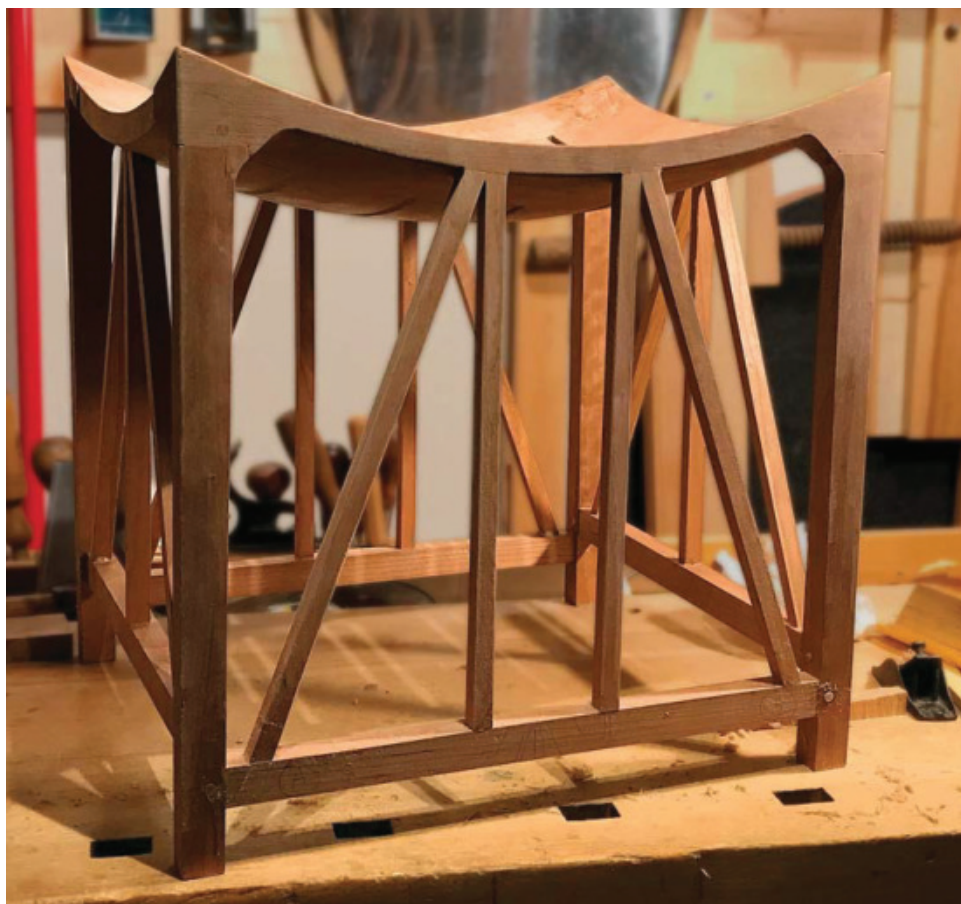
Angled struts provide support against racking.



The angled struts are attached after the rest of the stool is glued up. An angled stub tenon holds them in place.



The space between the angled strut and the leg allows the strut to pivot into place.



Glued, pinned, and braced. Once everything else is glued up, you can take some time to measure and cut the diagonal struts for a good press fit. The fit is important because the diagonals work in compression, and in opposition to each other. Bouchard set them in with gesso. With a subsequent layer of gesso and paint overall, they are secure.

Additionally, the side stretcher is flush to the outside of the leg; the end stretcher is flush to the inside.

The vertical struts can be measured and cut while the stool is dry-fit. If their length is a tiny bit off, it's only cosmetic. The diagonal struts are another story. They're trickier to fit, and if their length is off by the tiniest amount, it will throw the stool slightly out of square. With eight diagonal struts, there's a danger that tiny errors could compound, only becoming apparent during glue-up as the pins are being driven home.

Realizing this, I was feeling stumped, so I turned again to Killen, who made a very useful observation in his book: "Some of these [lattice braces] are tenoned into mortises in the horizontal elements while others are simply wedged into position." I'm not sure exactly what

he meant by "wedged" in this instance, but it got me thinking.

I've seen photos of cabinets on legs with doweled latticework, and it appears the bottoms of the diagonal struts are just pressed into notches. Many of the ancient lattice stools have their diagonal struts connecting to the stretcher at a peculiarly uniform distance from the leg. I think the gap might be there so a stub tenon can be slid into an angled mortise. I adopted this technique, and fit the angled struts after the rest of the stool was glued up. In use, there's a tendency to bump your heels against the stool's sides, and I think this tiny tenon will do a lot to keep the diagonals in place. □

Paul Bouchard is a woodworker and story artist in Toronto, Canada.

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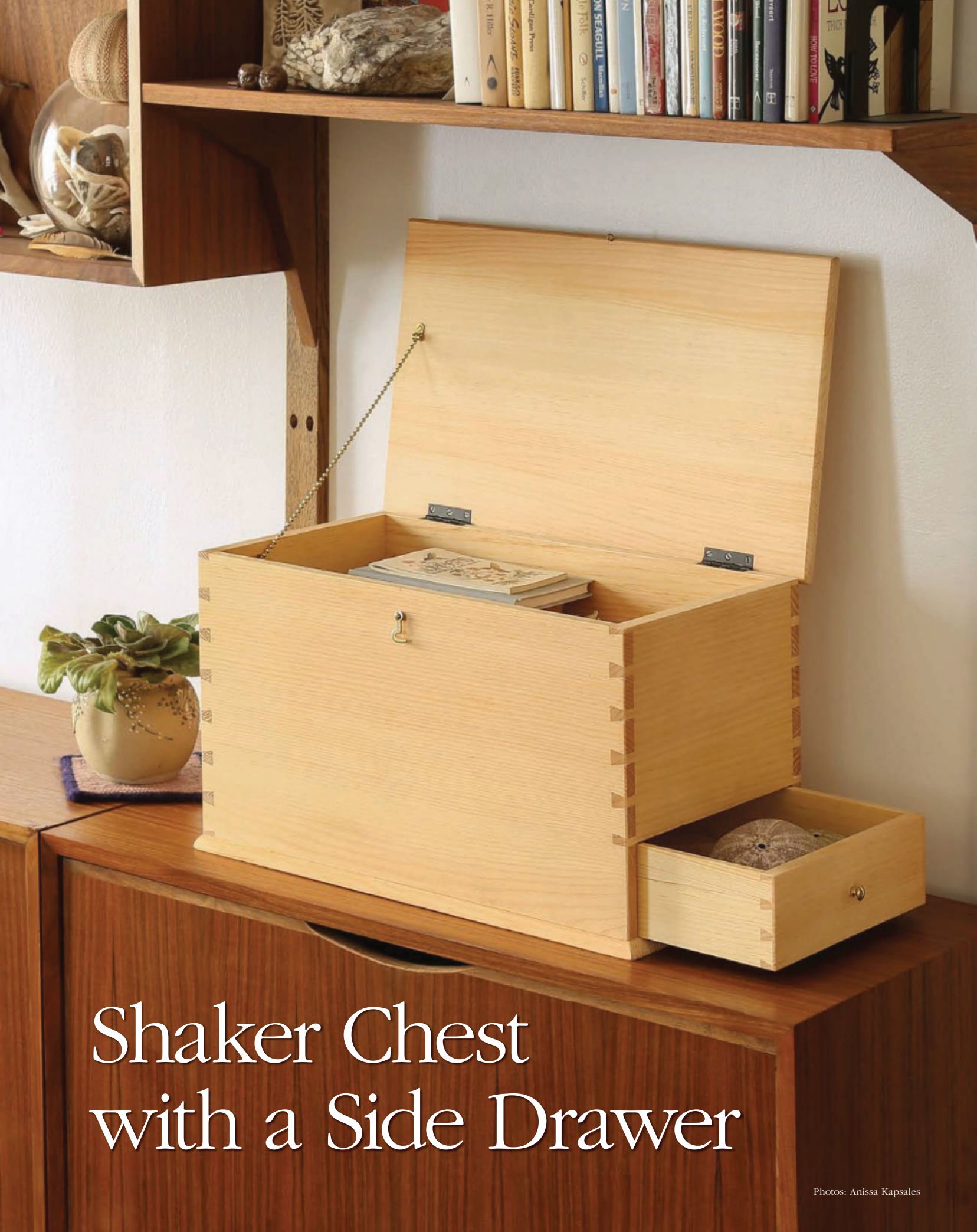


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Shaker Chest with a Side Drawer

Not your typical dovetailed case

On one end of this chest, the dovetail layout must accommodate the side drawer, stopping short to create a drawer pocket below.



Stop the tails short. Start by cutting the tails on the front and back boards. On the right end of both boards, the tails stop where the drawer opening starts. On the other end, the tails span the full width of the board. Becksvoort cuts to the line with a handsaw and chisels the tails clean.

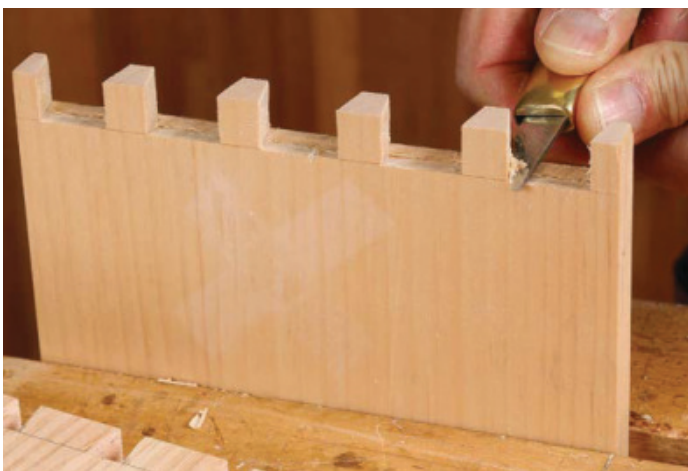
Manageable size and smart techniques make this a fun and rewarding project

BY CHRISTIAN
BECKSVOORT

This small pine chest with a drawer can be used for storing all kinds of treasures. The size and craftsmanship make this a fun project. It offers plenty of chances to practice your dovetails, and the fact that it is made of pine means it won't break the bank. The full-length drawer is useful for jewelry, photos, and other collectibles. You can follow the original faithfully for a perfect reproduction or make minor changes to suit your needs.

Dovetails first, then the false bottom

While this chest would look handsome in any species, I prefer clear white pine (like the original) with quartersawn pine for the two bottoms (there's a false bottom separating the drawer from the main part of the chest). The original piece is likely from the Mt Lebanon, N.Y., community, and made in the early 1800s.



Pin boards are different widths. The board on the left end of the chest is the same width as the front and back boards, but the right end board (above the drawer) is narrower. Transfer the truncated tails from the front and back boards to the two ends of the narrower side board. Cut the pins, clean them up, and dry-fit the case.

Top and bottom boards

While both the lid and the bottom get a subtle molding profile, the profiles are different for each.



Bottoms up. The top corner of the bottom board gets a roundover, but the bottom corner is left square. Becksvoort cuts the profile at the router table, doing both end-grain ends first, then the long-grain ends, ensuring any end-grain blowout that could occur gets cut off with the long-grain cut.



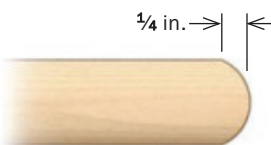
Top it off. The lid gets a bullnose profile, cut with a $\frac{3}{8}$ -in. roundover bit. While the profile can easily be shaped with a block plane, Becksvoort cuts it on the router table. Again, he makes the end-grain passes first and then follows up with the long grain.

SHAKER CHEST WITH SIDE DRAWER

SOURCES OF SUPPLY

Knob: Horton Brasses H-42 ($\frac{1}{2}$ in.)
Hinges: Rockler 29234
Hooks: Rockler 47683
Chain: Lee Valley 00G44.01
Chain ends: Lee Valley 00G45.15
Brass eyes: Lee Valley 00S56.41

LID EDGE DETAIL



Side, $\frac{9}{16}$ in. thick by $10\frac{1}{4}$ in. wide by $10\frac{7}{8}$ in. long

Front, $\frac{9}{16}$ in. thick by $10\frac{1}{4}$ in. wide by $18\frac{3}{8}$ in. long

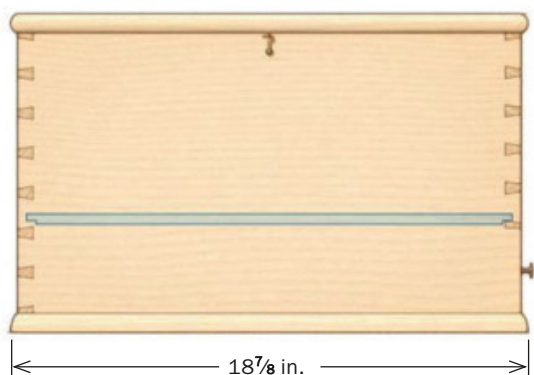
Groove, $\frac{1}{4}$ in. wide by $\frac{1}{4}$ in. deep, located $3\frac{3}{8}$ in. up from bottom edge

Hook

False bottom, $\frac{3}{8}$ in. thick

Bottom, $\frac{11}{16}$ in. thick by $11\frac{3}{8}$ in. wide by $18\frac{7}{8}$ in. long

Drawer opening, $3\frac{1}{8}$ in.



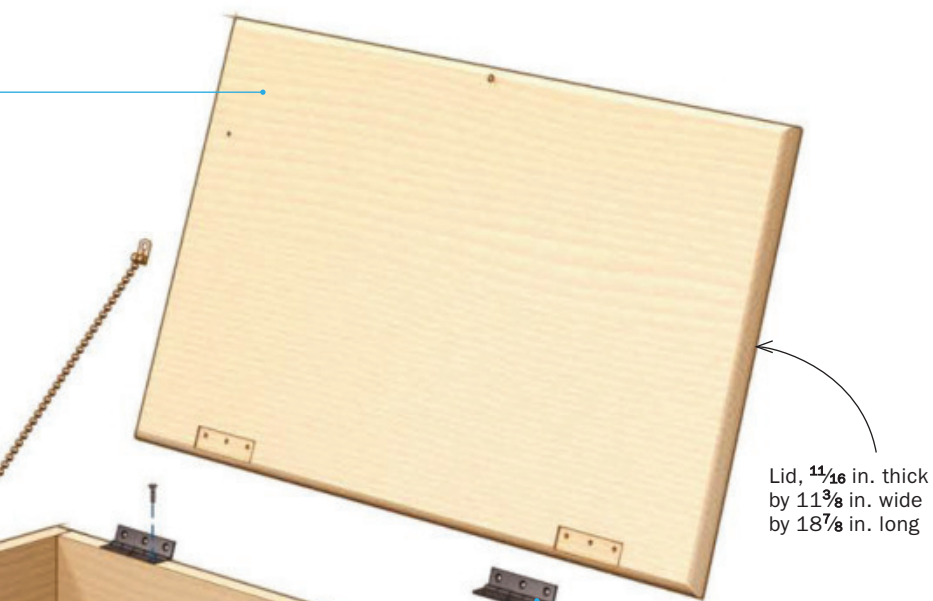
FRONT VIEW



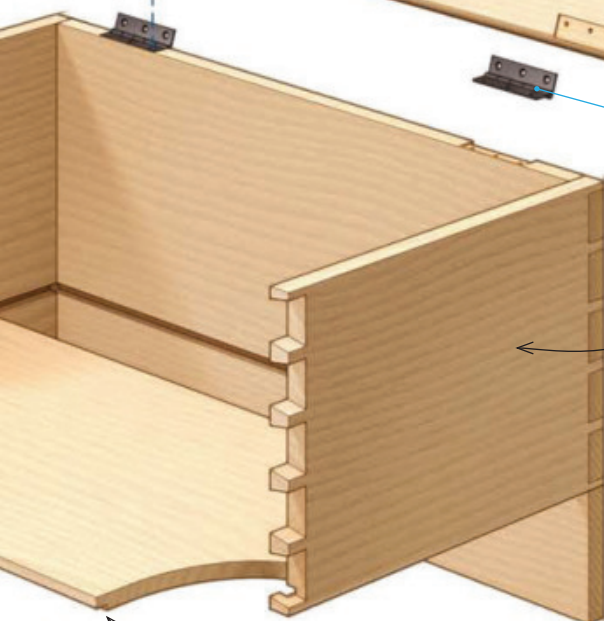
SIDE VIEW



To purchase expanded plans and a complete parts list for this chest and other projects, go to FineWoodworking.com/PlanStore.



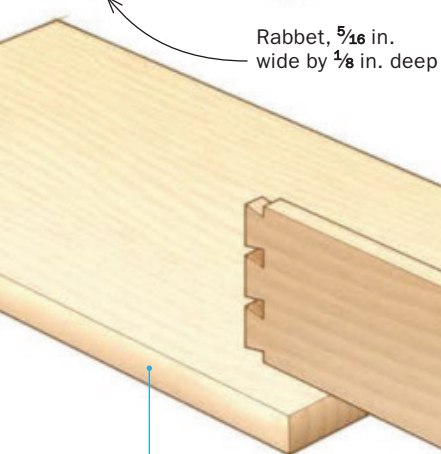
Lid, $1\frac{1}{16}$ in. thick
by $11\frac{3}{8}$ in. wide
by $18\frac{7}{8}$ in. long



Side above drawer,
 $\frac{9}{16}$ in. thick by $7\frac{1}{8}$ in.
wide by $10\frac{7}{8}$ in. long

Back, $\frac{9}{16}$ in. thick
by $10\frac{1}{4}$ in. wide by
 $18\frac{3}{8}$ in. long

Rabbet, $\frac{5}{16}$ in.
wide by $\frac{1}{8}$ in. deep



HINGE MODIFICATION



Because the profiled lid overhangs the back of the chest, hinging it is a little finicky. Becksvoort swaged the hinge in the jaws of a vise, crimping one side into the other. He recessed that crimped side into the edge of the case back and let the flat side into the lid. Without swaging, you would have to gouge out for half the barrel into the lid.

Drawer back, $\frac{1}{2}$ in.
thick by $3\frac{1}{16}$ in. wide
by $9\frac{3}{4}$ in. long

Drawer front, $\frac{3}{4}$ in.
thick by $3\frac{1}{16}$ in. wide
by $9\frac{3}{4}$ in. long

Drawer side, $\frac{1}{2}$ in.
thick by $3\frac{1}{16}$ in. wide
by $17\frac{11}{16}$ in. long

Drawer bottom,
 $\frac{5}{16}$ in. thick

Brass knob

BOTTOM EDGE DETAIL

$\frac{1}{4}$ in.



False bottom divides the chest

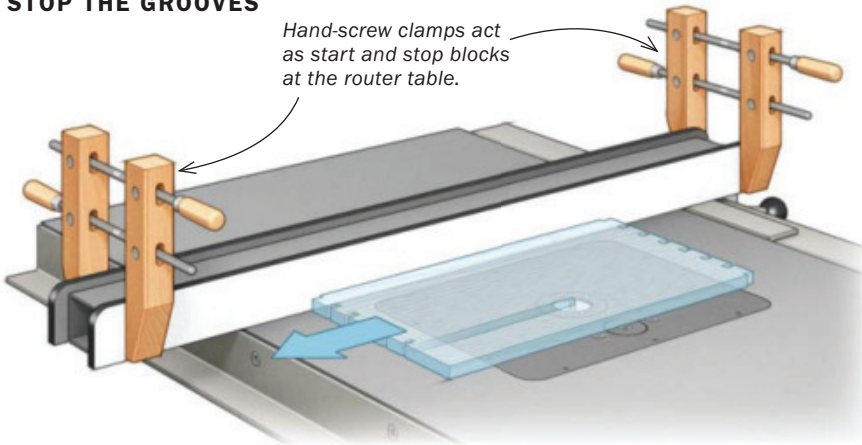
Lift the lid and you'll see that the chest interior isn't full depth. It stops at a false bottom, which serves as the top of the drawer pocket.

Groove all four sides of the chest. Set up stops on the router table and pivot onto and off the bit to create stopped grooves for the false bottom.



STOP THE GROOVES

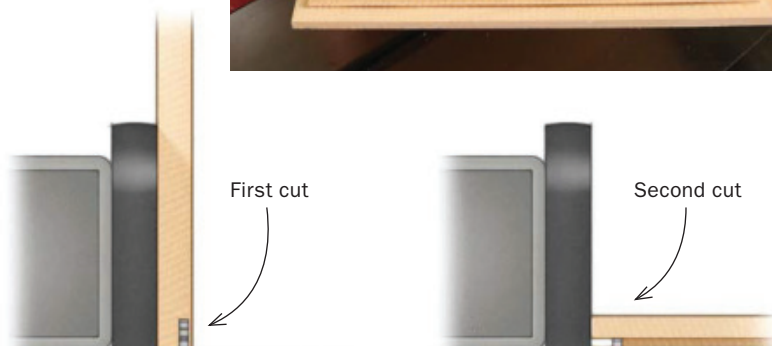
Hand-screw clamps act as start and stop blocks at the router table.



Start by milling the four sides and cutting them to length. Lay out, saw, and chop the tails on the front and back boards. Then transfer the tails onto the end pieces, and saw and chop the pins. Dry-fit the case.

The $\frac{3}{8}$ -in.-thick false bottom above the drawer sits in grooves. The original chest has through-grooves (and small filler plugs to cover the ends) which can be cut on the table-saw or by hand. Typically, I like to go with the original, but stopped cuts look so much cleaner that in this case I decided to veer from the past. You can use a $\frac{1}{4}$ -in. dado set on the

Rabbet the false bottom. On the tablesaw, create a rabbet around the false bottom with two cuts on each side (right). Check the fit in the groove (far right).



Glue up the case

Becksvoort's clever technique for gluing a dovetailed case reduces stress and the likelihood of error.



Set the stage. Prior to adding glue, Becksvoort gathers all the parts and sets one long side and the two ends together so the dovetails are just engaged. He slots the false bottom into the groove, and adds the final long side, again with the dovetails just engaged enough to keep it in place.



Glue it up. Using a small strip of wood to apply the glue, Becksvoort coats the cheeks of the dovetail pins and all the dovetail sockets. He taps the parts together and adds clamping pressure to completely seat the dovetails.

tablesaw, but I think that method requires too much chisel work at both ends of the stopped cut. I prefer to use a router with a $\frac{1}{4}$ -in. bit. Clamp a start and stop block to the router-table fence where you want the cuts to begin and end, about $\frac{1}{4}$ in. from the ends.

Since the false bottom must be supported on all four sides, I located the groove for it $\frac{1}{8}$ in. above the drawer opening. The false bottom is $\frac{3}{8}$ in. thick, and I ran a $\frac{1}{8}$ -in. by $\frac{1}{4}$ -in. rabbet all the way around the underside. So the false bottom fits into the $\frac{1}{4}$ -in. groove and its underside is flush with the drawer opening. Because it floats in the grooves, the false bottom can be made from flatsawn or riftsawn material as long as you allow a little space for potential movement.



Hinge the lid

Mark the hinge placement. After using the hinge to mark its location on the edge of the case back, follow up with a marking gauge.



Cut the hinge mortise. Use a trim router to waste away close to the lines, and then clean up to the lines with a chisel.



Transfer to the lid. Once you've screwed the hinges onto the case, set the lid upside down with the case upside down on top of it. Dial in the placement of the case on the lid, then transfer the hinge location to the lid. Cut the mortise, and screw the hinge to the lid.



Assemble the chest

Once the interior faces of all the parts have been sanded or planed, and the false bottom has been cut to size and rabbeted, the carcass can be glued. Dry-fit all the pieces together to make sure everything works as it should before adding any glue.

While the glue dries, mill the lid and the bottom board and cut them to size. The bottom must be quartersawn because it gets glued directly to the chest without allowance for wood movement. With Eastern white pine, this works fine.

The lid has a half-round molding profile, while the bottom has a slight arc. You can shape the profiles with a block plane or router.

I attached the lid to the chest with a pair of 1¾-in.-long butt hinges. They need to be inset



from the back edge of the lid to allow for the molded overhang.

The full-length drawer is made and fitted last. I cut half-blind dovetails, and once it's glued together I sneak up on the fit in the chest, using a belt sander until the fit and reveal around the drawer are both perfect. Then I add a ½-in. brass knob as the drawer pull.

The original case is unfinished. If you go that route, aim for all heartwood because it will darken up nicely. You also can choose to use oil, shellac, or even milk paint. □

Contributing editor Christian Becksvoort makes furniture in New Gloucester, Maine.

The home stretch

The final touches on the chest include installing the bottom board, fitting the drawer, and adding the hardware.



Glue the bottom to the case. Center the case on the quartersawn bottom, and glue and clamp it in place.



Fit the drawer. Becksvoort uses a belt sander to fine-tune the fit of the drawer.



Finishing touches. Add a stay to keep the lid from falling too far back. In keeping with the brass knob and brass catch, Becksvoort chose a brass chain for the job.

A master of many tasks

The router's versatility is one of its biggest selling points. It can profile many different edges, duplicate patterns, cut rabbets and dados, and cut mortises.



PROFILES



JOINERY



PATTERN ROUTING



Safe, Accurate Handheld Routing

Tips for getting the most from this essential power tool

BY BOB VAN DYKE

Honestly, the router is my least favorite tool. It is loud, whiny, tiring, and messy—like some people I know. But it also is the most useful, versatile, and, when used correctly, the most accurate among any of the handheld power tools. It is capable of making accurate dadoes, grooves, rabbets, precise joinery including mortise-and-tenons, and edge details and moldings. It can also follow nearly any well-made pattern to create an almost infinite variety of shapes.

Routers can be used handheld or mounted (inverted) in a router table. This article concentrates on handheld router techniques. For information on router tables, check out my video series on router-table

fundamentals at FineWoodworking.com and Fundamentals, “Getting started with router tables,” in *FWW* #270.

Fixed based vs. plunge routers

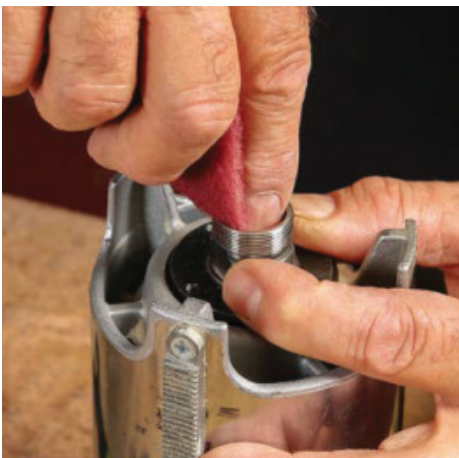
A plunge router can do everything that a fixed-base router can do, but it can also make stopped cuts. This makes it ideally suited for cutting deep and accurate mortises and stopped dadoes and grooves. So, the obvious question is why bother with a fixed-base router at all? You can get along without one. My first and only router for over 10 years was a 3-hp plunge router. It was the same router Tage Frid used in all his articles in the early days of this magazine and it was clear to me that he

knew what he was doing, so that was the router I bought and I did everything with it. However, the higher center of gravity of the plunge router does make it tippy when working along an edge. This makes the lower-profile fixed-base router a better choice for tasks like rabbets and edge details.

Basic router safety

The plunge router can be turned on with the router resting on top of the workpiece as long as the bit is retracted. You can then plunge into the work, make the cut, and fully retract the bit when finished. The plunge router should never be turned on or off with the bit extended.

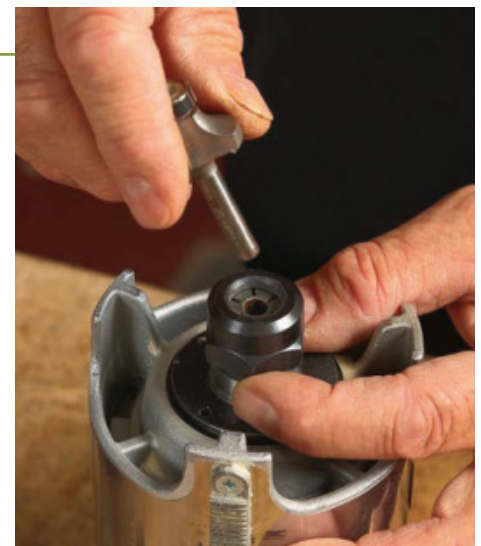
Installing the bit



Keep it clean. Any dirt, grit, or rust can interfere with the solid grip the collet has on the bit's shank. It is critical to clean the spindle and collet periodically with 4/0 steel wool or a synthetic abrasive pad.



Hold and tighten. All collets are tapered, and as the locking nut is tightened it compresses the collet “fingers,” which exert equal, consistent pressure around the shank of the bit.



Insert the bit. Place the bit so that at least $\frac{3}{4}$ of the shank is seated in the collet. If the bit bottoms out, pull it back out about $\frac{1}{8}$ in. or it could loosen while it is in the cut.

Edge work

The lower profile fixed-base router is generally better for tasks where the router is running along an edge, such as edge profiles and rabbets.

ROUTING A SIMPLE RABBET

Add stability to the base. Van Dyke retrofits all his fixed-base routers with an offset base, making holding the router while routing an edge easier. One hand is always resting on the base while the other is holding the handle, which gives a very secure grip.



Setting the depth on a fixed-base router. Simply adjust the motor until the bit extends past the baseplate the desired amount and lock it. Holding a small ruler or scale vertical on the router base is a challenge; a scale with graduations on the end makes the task easier. You can also set the depth with spacer blocks or keyway keys. Always test the cut on a scrap.



Route in the right direction. Feed the router so the wood is going into the rotation of the bit. With a handheld router this usually means feeding it left to right and you will feel the bit pulling itself into the workpiece. You should always feel the resistance of the router bit going into the wood when you begin a cut. The easiest way to keep feed direction straight when using a handheld router is to use the thumb and forefinger trick shown in the drawing at left.



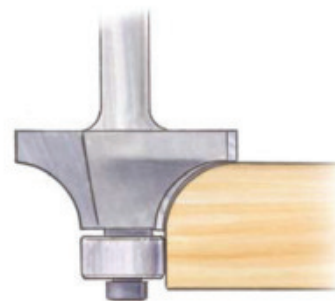
Cut the rabbet. Taking a very deep cut in one pass can be dangerous and will usually yield a rough surface. A better alternative is to take a shallow cut first and readjust to the final depth for the second pass.



FOUR PROFILES FROM ONE BIT

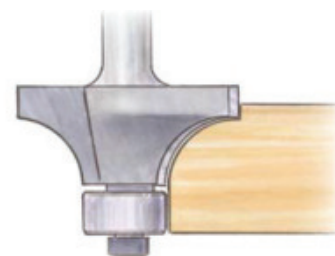


One bit, two bearings, multiple profiles. By varying the depth of the cut and changing the size of the bearing, you can create different profiles with the same bit.



ROUND OVER

With the larger bearing installed, set the bit flush to the base to get as much curve as possible without creating a fillet.

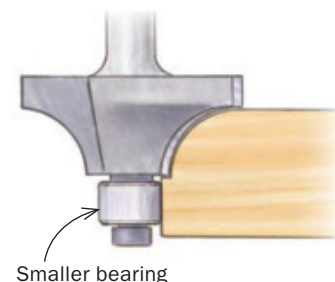
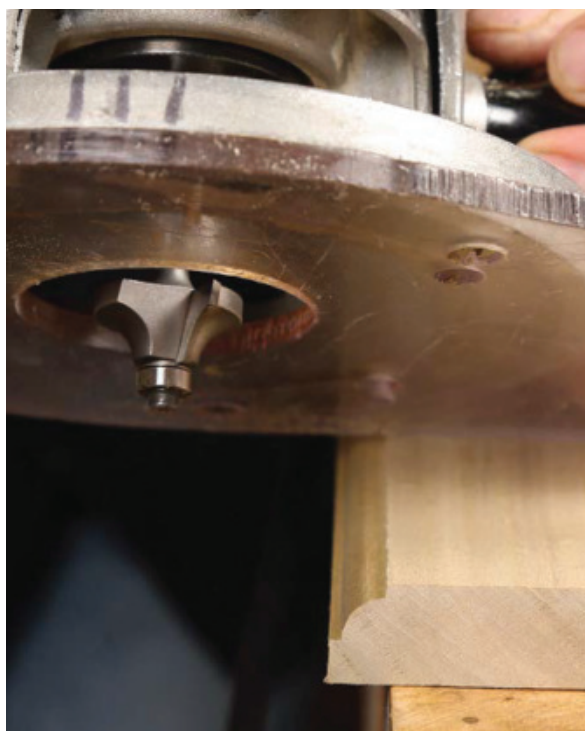


FILLET AT THE TOP

Again, with the larger bearing, set the height of the bit so its corner extends past the router's baseplate. This cut will create a roundover with a fillet on top.

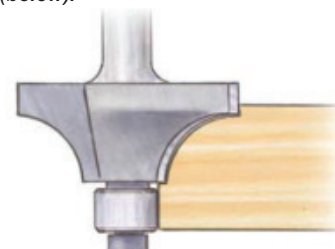


Change out the bearing. Use an Allen key to loosen the bearing, take off the $\frac{1}{2}$ -in. bearing, and put on a smaller, $\frac{3}{8}$ -in. bearing.



FILLETS BOTTOM AND TOP

Switch to the smaller bearing, and you can cut a fillet at the bottom (above). Lower the bit to create fillets top and bottom (below).



Using a fence

If you aren't using a bearing-guided bit, a handheld router should always be used with an attached guide of some sort. You can add a fence to the router or to the workpiece.

ADD A FENCE TO THE ROUTER



A fence on the router. A simple and effective method for cutting dadoes and grooves parallel and near to an edge is to attach a commercial or shopmade fence directly to the router.



TWO WAYS TO SET THE DEPTH ON A PLUNGE ROUTER



Strike a depth line. A simple way to set the depth is to make a mark on the edge of the workpiece, plunge the router to hit that mark, lock the plunge lock, and tighten the depth-control bar.



Insert a spacer. With the router turned off, plunge down so the bit just touches the surface of the wood (left), and tighten the plunge lock. Insert a spacer that matches the desired depth of cut between the turret stop and the depth-stop bar (right). Lock the depth bar and retract the router. Plunge depth will be the thickness of the spacer.



CLAMP A STRAIGHTEDGE TO THE WORKPIECE

Locating a straightedge.

When using a straightedge as a fence you need to account for the offset between the bit and the edge of the router base. To ease the task Van Dyke routed a groove in a scrap of MDF to act as an offset guide. Line up the groove in the guide with the layout line and make a mark at the edge of the guide. Then align the fence to the mark and square it before clamping it in place.



Consistent routing. Make a clear, easy-to-read registration mark on the outer edge of the base. Always keep that mark against the fence to be sure of consistent results when making your offset guide and routing.



The depth of cut on the fixed-base router is fully established before you turn it on. When turning it on, make sure you have a secure grip, and that the router is resting on the surface of the wood with the bit well out of contact with the workpiece.

Router sizes

A variety of motor sizes are available, from under 1 hp up to 3¼ hp. But because most routing tasks are not demanding enough to require the power of a 3-hp router, the bigger routers are way more power, weight, noise, and vibration than you typically need. When that much power is needed you will usually have more success using a large router in a well-fitted router table. On the

other hand, extremely small routers like laminate or “trim” routers, while incredibly valuable and useful tools, are often too small for many everyday routing tasks.

Medium-sized routers, 1½ to 1¾ hp, will handle all but the heaviest jobs and this is what I recommend as a first router. The good news is that most manufacturers offer their mid-size routers as a “kit” which includes a single motor with both a plunge and a fixed base, giving you the best of both worlds for a lot less money than buying two individual routers.

Router bit size, and consequently, router collet size, is a factor that also should be considered. Most bits are available with either a ¼-in. or ½-in. shank. Some large bits are only available with a

Zero-clearance fence

For repetitive cuts with the same bit, it's worth the extra time to make this fence. Setup is easy because the edge of the base shows you exactly where the bit will cut.

Make the fence. Use pin nails or screws to fasten a straight piece of wood parallel to the edge of a piece of $\frac{1}{4}$ -in. plywood. Keep it about $3\frac{1}{2}$ in. from the edge of the plywood. Clamp the assembly to the edge of the bench, making sure it hangs over enough that the router bit cannot cut into the bench. Run the router left to right against the fence to cut off the excess plywood. This fence is now the exact offset for that router with that bit, so label it as such and keep it for future use.



Anti-tilt spacer. To keep the router from tipping while running against the fence, Van Dyke uses double-sided tape to attach a $\frac{1}{4}$ -in. spacer to the bottom of the router base. To use the zero-clearance fence, clamp it to your workpiece with its edge on the layout line. This jig is especially useful for situations where the cut is not parallel to any edge.



T-square fence

Used to rout dadoes square across the width of cabinet sides, this jig is easily made and incredibly useful.

Criss cross and add some screws.

To make the jig, screw two pieces of approximately 6-in.-wide plywood together at exactly 90°. To create an alignment mark, make a shallow, short cut into the straightedge with the router registering against the fence. This makes locating the jig on your workpiece a simple matter of matching the routed mark to a layout line.



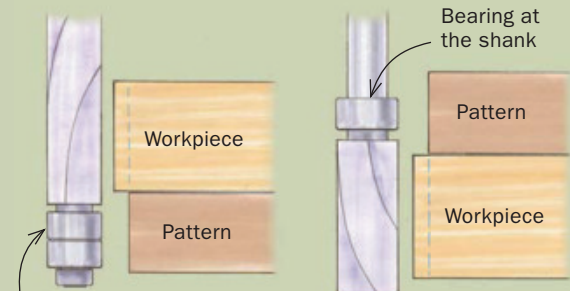
Clamp and go. Clamp the workpiece to the bench and the jig to the workpiece (above), making sure the straightedge is pressed firmly against the work. **Note:** The alignment mark you routed is specific to the router and bit you made it with, but by rotating the jig and/or turning it over, you can expose seven new edges that can be used for different routers and bits. Make sure to mark which bit and router you use where.

Pattern routing

An almost infinite variety of shapes can be made with a handheld router and a well-made pattern.

Shaping to a pattern.

Van Dyke uses patterns made of plywood, Masonite, or solid wood to replicate shapes of any kind. First, he uses a jigsaw to cut out most of the waste (right), then clamps a routing pattern beneath the workpiece (far right), and makes sure both are securely clamped to his bench.



Bearing at the end

FLUSH-TRIM BIT

PATTERN BIT

Bit options. When using a flush-trimming bit (as in the photos here), place the pattern below the workpiece; when using a pattern bit, the pattern goes above the workpiece. Both bits have a bearing the same diameter as the cutter and trim the workpiece flush to the pattern. Take extra care when using the pattern bit. If the router tips, the bit will usually tip into the workpiece, ruining your work.



Guide bushings

Another effective way to follow a fence or template is with guide bushings.

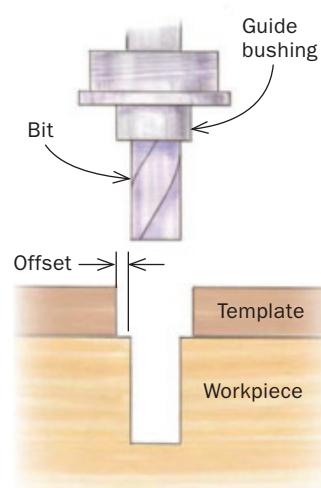
Guide bushing set.

Made to be attached to a router's sub base, guide bushings are run against a fence or template. Van Dyke cuts the bearing cylinder short so it can be used with thin templates.



The bushing and the template.

Guide bushings don't automatically cut flush, because of the offset between the outside diameter of the bushing and the diameter of the router bit. The router template must be sized to account for this offset.



1/2-in. shank, so if you want flexibility, make sure that your first (or only) router can accept both 1/4-in.- and 1/2-in.-shank bits. Smaller routers that only take 1/4-in.-shank bits are great, but I would have one only as my light-duty router.

Feed rate

How fast you move the router as you rout is dependent on a number of variables, but the goal is to get the best quality cut with little to no burning. Too fast a cut will usually result in a rougher surface, while too slow a cut may produce burning. Routing end grain is more prone to burning, so you may need to speed things up in that situation. Making a test cut is always a good way to decide on the feed rate. Using a dull router bit will always give you an inferior cut and since bits usually cost less than \$8 to sharpen, I send my bits out regularly to a good professional sharpener. □

Contributing editor Bob Van Dyke runs the Connecticut Valley School of Woodworking.



Plunge with a bushing. This is an effective way to make large mortises. The routing will be easier and more accurate if the majority of waste is first removed on the drill press.

Get a Grip with a Moxon Vise



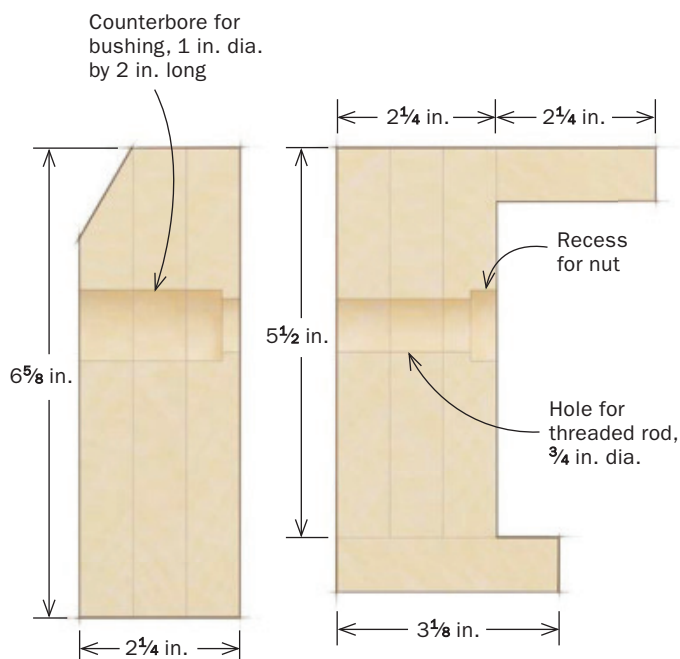
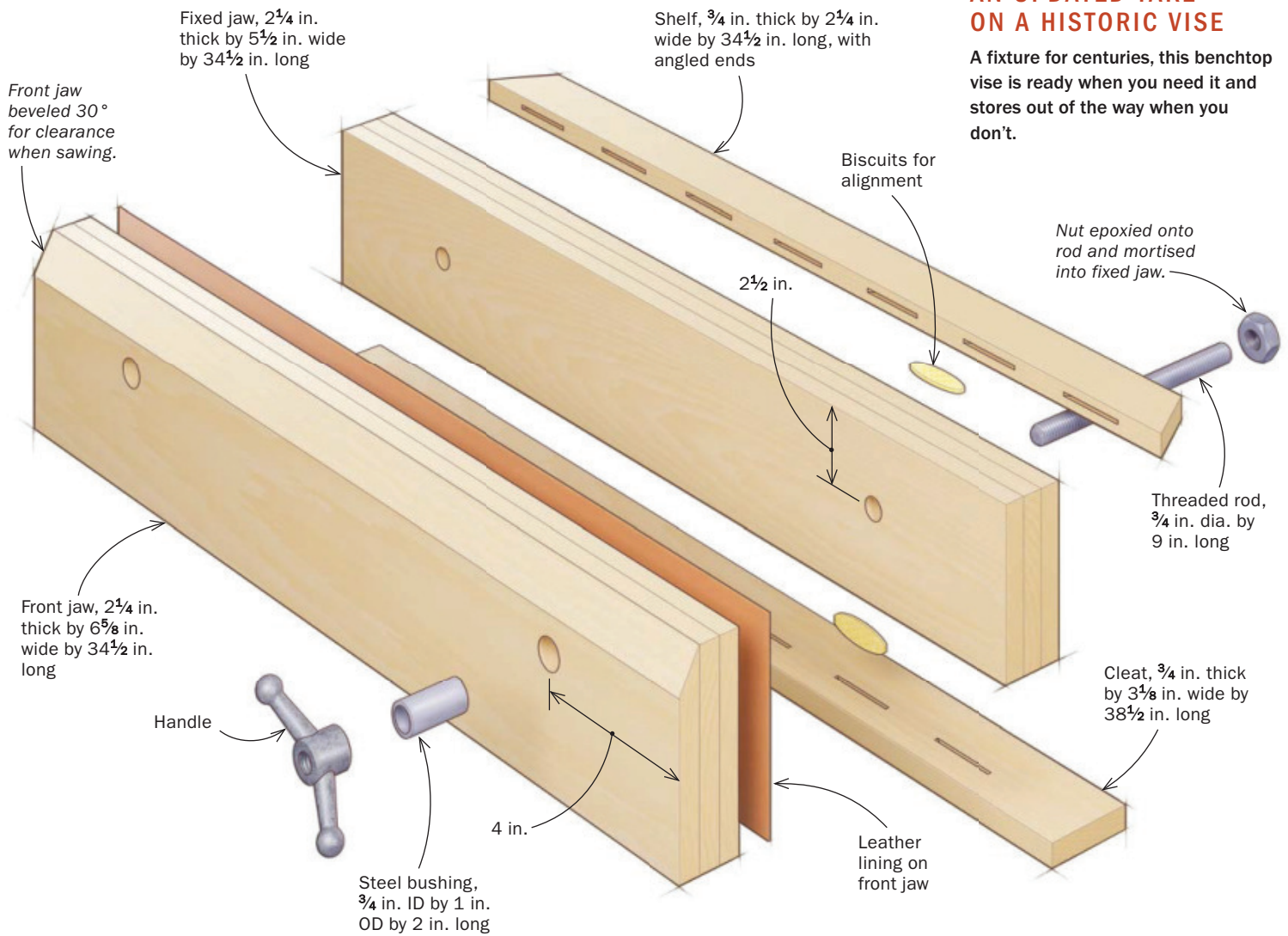
Elevate your workholding
with this traditional
twin-screw fixture

BY MIKE FARRINGTON

Moxon vises, sometimes called twin screws, are great to have around the shop. They're super for holding work, especially for joinery, gripping narrow rails for tenoning and full case sides for dovetailing equally well. The one featured in this article has an awesomely generous 24 in. between centers. And, unlike some other vises with that span, a Moxon vise doesn't require complicated or expensive hardware. For the version here, you can buy everything at a home center. Even if you change the span, the construction remains the same. Moxon vises also raise the work several inches from your bench, which can be a great help for detail work or aching backs. Lastly, since they clamp to your bench, you don't need to commit to a vise location. I move mine around depending on what I'm doing, then stow it out of the way when I'm done.

AN UPDATED TAKE ON A HISTORIC VISE

A fixture for centuries, this benchtop vise is ready when you need it and stores out of the way when you don't.



Each jaw is a lamination. This lets you create thick, stable jaws from thin, readily available stock. Once the glue dries, cut them to final width and length.

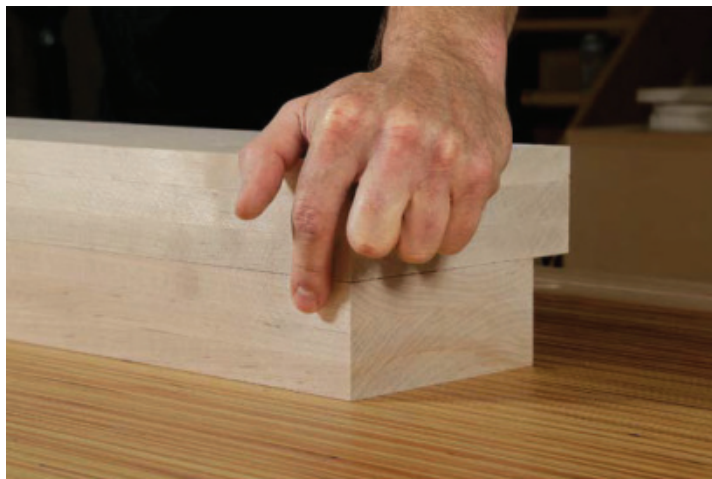


Pad the front jaw with leather. Attach with spray adhesive and trim to size. The leather reduces the chance of marring workpieces and improves the grip.

DRILL THE JAWS

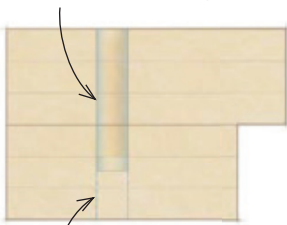


Before drilling, temporarily attach the jaws' inside faces together. Use double-sided tape, making sure the top edges are flush. The holes must be perfectly in line for the vise to work. The tape acts as an out-of-the-way clamp, letting you keep the pieces together while not interfering with drilling.



Clamp the jaws to the drill-press table. With the movable jaw on top, drill a $\frac{3}{4}$ -in. hole through it and partway into the fixed jaw. This allows you to accurately drill through the fixed jaw separately.

1. Drill through the front jaw and as far into the rear jaw as your bit will go.



2. Later, you'll use the drilled portion to align the bit for completing the hole.



I've made a number of these—in different sizes, in softwood and hardwood, with higher- and lower-end hardware. They all work well, and they all follow this design.

Thick, laminated jaws

This build starts with the jaws. I laminate three pieces of $\frac{4}{4}$ stock for each jaw. To help with stability, I mill the boards in two stages. First, I do the minimum to get the six boards parallel and glue them up while they're a little wide and long. After they sit for a few days, I lightly joint the face, then plane just enough to bring the opposite face parallel.

After that, I cut to width and length. I recommend making the movable jaw wider than the fixed one. With the vise cinched shut, the overhanging jaw registers against the workbench, leaving the fixed jaw's face coplanar with the front edge of the bench, adding bearing surface between the jaws.

Carefully drilled holes

With the jaws complete, you can drill for the bushings and screws. The bushings prevent the jaws from racking much, going a long way toward ensuring even clamping pressure across workpieces. They also let the movable jaw travel more easily and extend its life, since there's no wood running on metal.



Without unclamping the parts, drill for the bushing using a larger bit. This hole allows for a tight fit to the bushing. Farrington uses the bushing itself to set the drill's depth stop. This larger hole should go only into the fixed jaw, not the movable one. Leaving the jaws clamped while changing bits will ensure the holes are concentric.



Drilling these holes is the most important step in the project because their accuracy has a direct impact on how well your vise works. Fortunately, I have a pretty neat way to ensure that the holes line up.

To start, secure the two jaws together using double-sided tape, making sure the tops are flush. Mark the hole locations and clamp the taped jaws to your drill-press table. The movable jaw should face up. First drill the $\frac{3}{4}$ -in.-dia. hole for the screw as deep as possible. If you can drill through both jaws, great; that's the best-case scenario. If not, just be certain the bit goes through the movable jaw and imprints the inside face of the fixed jaw, allowing you to drill through it accurately later.

Now drill the movable jaw for the bushing. Without unclamping the jaws or adjusting the table, chuck a Forstner bit that



Epoxy in the bushings. After separating the two jaws, use a pea-size dab of epoxy and spread it thoroughly around the bushing. You want to avoid any squeeze-out here.

ASSEMBLE THE VISE

Epoxy a nut to the threaded rod. This nut prevents the rod from spinning freely in the jaw. Again, use only a minimal amount of epoxy.



Mortise the nut into the back of the fixed jaw.

With the rod in the hole, Farrington uses a flat-back marking knife to mark around the nut (left). He then chops and pares to his lines, aiming for a friction fit. Mortise only as deep as the nut's width.



matches the outside diameter of the bushing and drill. Make test holes to verify that your bit allows for a press fit. Depending on the length of the bushing, this can be a stepped hole, or it can go through the movable jaw. Leaving the jaws clamped while changing drill bits will ensure that the two holes are concentric.

Finish at the drill press by prying the two jaws apart and drilling the $\frac{3}{4}$ -in. hole through the fixed jaw. From there, head to the tablesaw to bevel the front of the movable jaw. Clipping off this corner lets you angle your handsaw without obstruction when you're cutting half-blind dovetails.

TIP

Lightly file and wax the rough threaded rod.

Filing knocks off burrs on the threads that can hang up the knobs in use. The paste wax makes for even smoother spinning.





Add the hardware

I used off-the-shelf hardware for this vise. It works fine, and it's inexpensive and readily available. I've used Acme-threaded stuff in the past, which is a nice upgrade if you can afford it. Either way, the steps are pretty similar.

Installing the bushing is easy. Since it should fit tightly into the hole anyway, I spread just a pea-size dab of epoxy around the bushing before hammering it into place, paying attention to squeeze-out.

I also epoxy a nut onto the end of each threaded rod after cutting them to length. To trap the screw in the jaw, I mortise the nut into the back of the fixed jaw. I mark the nut's thickness on the back of my mortise chisel for a rough depth gauge.



Add a cleat and shelf to the fixed jaw. Attach one at a time starting with the shelf to simplify the glue-ups. Biscuits help when aligning the parts. Flush the fixed jaw's inside face (left). Any protruding or uneven surfaces here will become unwanted pressure points when you clamp boards in the vise, and may affect how well it works.



Install the movable jaw and handles before jointing the top surface. Tighten the handles to cinch the movable jaw to the fixed jaw, and use a long plane to smooth the top surface of the vise. You'll use this as a reference surface for joinery, so it must be straight and true.



SETUP IS SIMPLE

Overhanging jaw and cleat add to quality of life. The overwide movable jaw ensures the inside of the fixed jaw sits flush with the bench's edge, extending the clamping surface. The cleat below the fixed jaw is a low-profile surface for clamping the vise to the bench.



If you get your hardware from the home center, lightly file the threaded rod smooth and wax it. Otherwise the handles are likely to hang up on the threads in use.

Finishing touches

Don't skip the shelf, clamping cleat, or leather lining. They're all small additions with outsize returns.

I consider the shelf in particular a necessity. I clamp workpieces to it when marking joinery so nothing shifts, like when transferring dovetails to a pin board. The shelf is also a nice spot for a task light.



Set clamping pressure. When clamping a narrow workpiece, tighten one side of the vise to a slip fit (1), then move the workpiece to the other side and repeat (2). Finally, bring the narrow workpiece to the middle and finish tightening the handles (3). This yields even clamping pressure across the workpiece. For wider stock, just do your best to get an even pressure from both screws.



GETTING TO WORK

The cleat provides an out-of-the way surface for clamping the vise to the bench. Size yours to suit your clamps.

I use biscuits to align the shelf and cleat during glue-up. Other alignment methods, like Dominoes, screws, or splines, work too. Regardless, plane these surfaces flush to the jaws after the glue dries. You don't want anything interfering with the vise's grip or reference surfaces.

Finally, the tool-grade leather offers two advantages. It helps to reduce damage to the workpiece while improving grip, allowing the piece to be held in place with



Vise holds your parts at working height. Moxon vises raise the work up several inches from your benchtop while still keeping it secure. This can be a great help when doing close-up detail work, or a dovetailed case.



The shelf is a helping hand. When transferring joinery, like tails to a pin board, Farrington clamps one board to the shelf, letting him focus on the task at hand instead of worrying about shifting one of the workpieces and ruining his layout.



very little clamping force. In fact the leather holds so strongly that with a pin board in the vise, I can tap the tail board onto the pin board, and the pin board doesn't slide down. I don't add leather to the fixed jaw because I want that face to sit firmly in plane with the bench, and the leather's too squishy for that.

Wood glue works great for adhering the leather, but it makes an extremely secure bond. I opt for spray adhesive because it lets me remove and replace the leather when needed.

When the glue sets, trim the leather flush to the jaws, clamp the vise to your bench, and cut some dovetails. □

Mike Farrington is a FWW ambassador in Aurora, Colo.

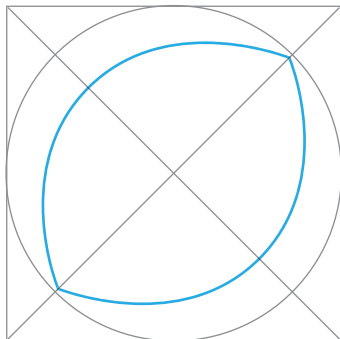


An outrigger is a longer helping hand. This movable T-shaped fixture supports long boards that need more than the shelf alone. Its total height should match that of the vise.

Learn Offset Turning



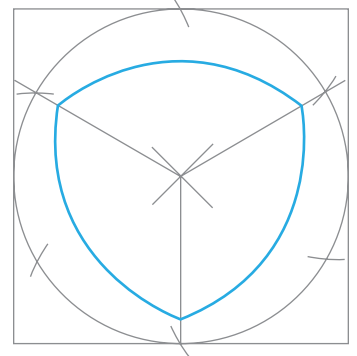
ELLIPTICAL



By mounting a workpiece off-center on the lathe you can turn a partially rounded piece; mount it off-center a second time to shape a mating arc and give it an elliptical cross-section.

TRIANGULAR

Mount the workpiece off-center three times and you can generate a triangular part.



Mount the workpiece off-center to create elliptical and triangular parts on the lathe

BY BETH IRELAND

I began exploring offset turning 25 years ago when I was asked to make some cabriole legs. As a turner, I figured there had to be a way to make them on a lathe. Sure enough, in an old woodworking manual I learned about offset turning, mounting a workpiece off-center so only a portion is cut on each rotation. Since then, I've experimented extensively with this powerful technique, which lets you shape parts in almost any geometry you can draw. The stool in the photo opposite, made by a student of mine, has off-center-turned front legs that are elliptical in cross-section, and a back leg that is triangular. This article shows how

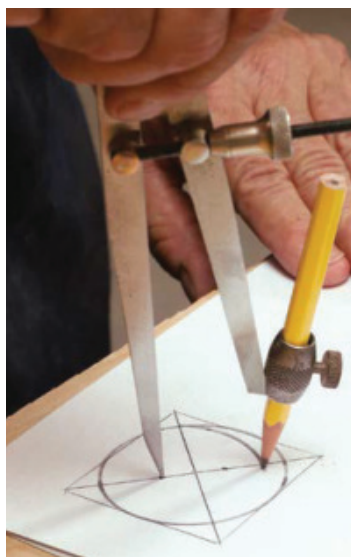
LAY OUT THE ELLIPSE



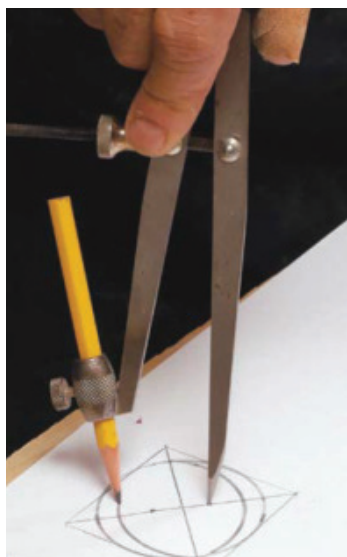
Start with the square. After carefully milling the blank square, Ireland traces it onto paper.



Circle in the square. Find the centerpoint by drawing diagonal lines from the square's corners, then draw the largest circle that will fit in the square.



A pair of arcs. Mark two offset points along the same diagonal line, placing them equidistant from the center. Then set the compass and draw a pair of mating arcs.

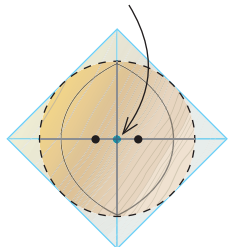


Transfer time. Transfer your layout to both ends of the workpiece: Draw the diagonals, then use dividers to transfer the offset points, and deepen those points with an awl. Draw the arcs with a compass.

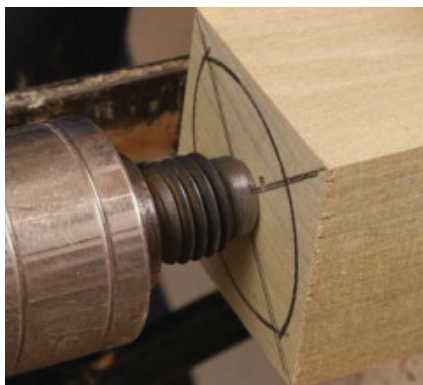
Turn the ellipse

1. START WITH A CYLINDER

Blank mounted on centerpoints to turn a cylinder.



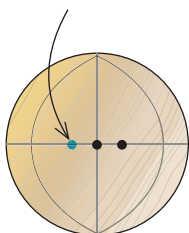
END VIEW



Turn the part round. Mount the blank on its centerpoints and turn a cylinder. You can offset-turn an ellipse directly from a square blank, but turning the part round first lets you do some helpful layout and makes the offset turning easier.

2. REMOUNT ON FIRST SET OF OFFSET POINTS AND TURN AN ARC

Cylinder mounted on first set of offset points.



END VIEW

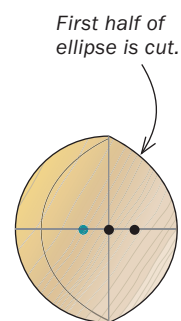


Mark and remount. Using the tool rest as a straightedge, run two lines the length of the cylinder to connect the diagonal without offset points on one end of the blank to the same diagonal on the other end. Then remount the workpiece to one set of offset points.

Helpful hashmarks. With the lathe still off, rotate the workpiece by hand and draw vertical guidelines on the half of the cylinder closest to the tool rest. Stretching from one horizontal line to the other, these lines will disappear as you turn, letting you gauge your progress.



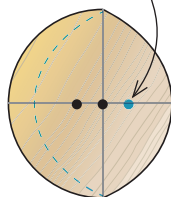
Turn an arc. Using a roughing gouge and a wide, comfortable stance, sway side to side while feeding the tool forward gradually until chips begin to fly. Keep cutting until the vertical lines are gone and just the horizontal lines remain.



END VIEW

3. REMOUNT ON SECOND SET OF OFFSET POINTS TO COMPLETE THE ELLIPSE

Cylinder mounted on second set of offset points.



END VIEW

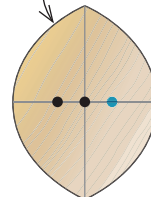


Remount and remark. Move the blank to pinch the other set of offset points between the headstock and tailstock centers. Then draw a series of vertical guidelines on the side you'll cut next.



Two arcs meet. After you have cut with the centers in the second set of offset points, the two opposing arcs will meet.

Second half of ellipse is cut.



END VIEW

to turn elliptical and triangular parts and also tapered versions of them. With this technique, there's no telling what you can make; another student of mine carved an Inuit bear using offset turning!

Layout is foundational in offset turning

Start an ellipse by laying it out on paper. You won't be making a true ellipse, rather two mating arcs. After tracing your square workpiece, draw lines from corner to corner of the square and draw a circle within the square. Place both offset points along one of the diagonal lines, equidistant from the center. The closer to the center you place the offset points, the rounder the resulting ellipse; the farther from the center, the skinnier the ellipse. With the layout finished, transfer it to both ends of the workpiece.

An ellipse on the lathe

You could mount your square blank off-center and begin cutting the ellipse right away, but it simplifies things to first mount the

blank on its centerpoints and turn it to a cylinder. Then stop the lathe and rotate the piece by hand until the diagonal layout line that doesn't have the offset points on it aligns with the top edge of the tool rest. Now use the tool rest as a straightedge and draw a line from one end of the cylinder to the other. Draw another line on the opposite side of the cylinder.

Remount the workpiece using one of the pairs of offset points. Turn the cylinder by hand (it will now rotate eccentrically) and adjust the tool rest so there is never less than a $\frac{1}{8}$ -in. gap between it and the work. On the side of the cylinder that comes closest to the tool rest, draw a series of vertical pencil lines from one horizontal line to the other. These will show as the piece is spinning. When they disappear and you reach the horizontal lines, the first arc is finished. Remount the workpiece on the second pair of offset points and repeat the process.

What I've described here is the simplest type of offset arrangement. There's much more to explore. Leaving one end centered

Tapering an ellipse

To make an elliptical part that tapers from end to end, begin by laying out the large ellipse on one end of the blank and the smaller one on the other end. Mount the part on center and turn a cylinder. Then taper the cylinder. (For details on tapering a cylinder, see "Mastering the Cylinder," FWW #296.) Next, remount the workpiece to the first set of offset points and, with the tool rest still angled, cut the first arc of the ellipse. Then remount to the second set of offset points and cut the second arc.



Turn a triangle

TRIANGULAR LAYOUT

Crisscross. After doing her layout on paper, Ireland transfers it to one end of the blank. Start by making short marks where the diagonals cross, and use them as a centerpoint to draw the largest possible circle.



Radius trick. With the compass still set to the circle's radius, walk it around the perimeter making six equally spaced marks. Then connect every other mark to the centerpoint.

1. TURN A CYLINDER AND MARK THE OFFSET POINTS



A cylinder to start. Turn the workpiece to a cylinder, stopping at the circle you drew on the end. Then carry the three radial lines down the cylinder and reproduce them on the other end.

while the other end is offset, you can create a piece that transitions from round at one end to elliptical at the other. I use offset turning to create necks for guitars, legs for furniture, and a wide range of vessels and boxes. The possibilities are endless.

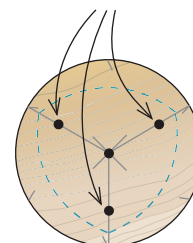
Turning a triangle

Offset turning a triangle is actually easier than turning an ellipse, though the layout is a little more complex. On paper, draw a circle that represents the biggest cylinder you can get from the blank. Divide the circle into three equal sections. You can do this by keeping the compass set to the circle's radius. Stick the point of the compass anywhere on the circle and make a short pencil mark across it; move the compass point to the crossmark and continue on around the circle. This will give you six almost perfect divisions. From every other point draw a line to the center. Use dividers to mark your offset points along those three lines. As before, swing the arcs from those offset points.



Mark the offsets. Using dividers, mark the offset points along each of the three radial lines. Do the same on the other end of the workpiece.

Offset points, equidistant from the center, marked on each of the three radial lines.



END VIEW

2,3,4. REMOUNT ON EACH SET OF OFFSET POINTS AND TURN THE ARCS

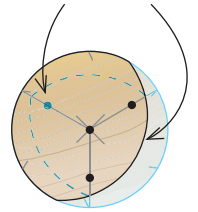
More marking.

After mounting the workpiece using one of the pairs of offset points, draw vertical guidelines on the side of the part nearest the tool rest.

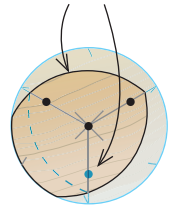


Side one. As you did with the ellipse, extend the roughing gouge gradually until chips appear. Keep your forefinger in the hollow of the tool rest to control depth of cut. Use the vertical guidelines to gauge your progress.

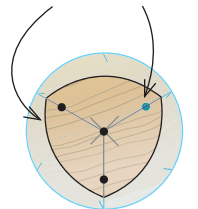
First set of offset points creates first arc.



Second set of offset points creates second arc.



Third set of offset points creates third arc.



The completed part. After remounting the part off-center twice more and cutting the second and third arcs, the triangle is complete. With the lathe off you can use sandpaper on a hard block to straighten or sharpen the arrises between the arcs.

Then transfer the layout to one end of the workpiece.

Mount the workpiece at its centerpoints and turn it to a cylinder. Then, using the tool rest as a straightedge, carry all three axis lines to the opposite end of the workpiece. Take the piece off the lathe and complete the layout on the second end, using the three axis lines to orient it.

Now mount the workpiece using one pair of the offset points, turn the piece by hand, and put a series of vertical pencil lines in the section that comes closest to the tool rest. With a roughing gouge, turn until the vertical lines disappear and you hit the horizontal lines. Repeat this on all three sides.

Here, too, the possible variations are amazing. Mount one end at the centerpoint and the other end at the offset points to create a part that goes from round to triangular. Mismatch the offset points at the two ends and you can turn a spiral. The beauty of this technique is how quickly you can achieve a sophisticated look with no setup and no jigs. Grab your scraps and have fun! □

Beth Ireland turns in St. Petersburg, Fla., and teaches around the country.

How to taper a triangle

Making a part that is both triangular in cross-section and tapers end-to-end is much like making a tapered elliptical part. Draw two layouts on paper and transfer the large one to one end of the blank. Turn the blank to a cylinder. Draw three horizontal lines along the length of the cylinder corresponding to the three radial lines of the layout. Remove the cylinder from the lathe and use the three horizontal lines to orient the small layout on the other end of the part. Remount the cylinder on its centerpoints and turn it to a taper. Then, with the tool rest still angled, remount the part to each of the three pairs of offset points in turn to create the tapered triangle.



Folding Tabletop

An uncommon way
to maximize your table area

BY STEVE LATTA

During the Federal period, some card tables and even dining tables had a unique design that allowed the top to pivot 90° and then fold open, doubling its surface area. Building a table this way eliminated the need for fly rails or other elaborate support mechanisms. The design is pure simplicity, and I thought it appropriate for a certificate table that I made for my Quaker meeting. In the Quaker faith, the wedding couple signs their names to a marriage certificate that states their commitment to each other. All members in attendance sign the certificate as well in support of the union. I made a second version of the table for my home, and it has proven to be one of the most versatile pieces I live with. Near the front door, in the smaller position, it serves as an entryway table, holding keys and mail. Opened larger, it offers drinks and hors d'oeuvres. I can easily see changing the dimensions to make coffee tables or end tables with the same technique.

The base and top are basic in design

The base for the table is nothing more than four splayed legs connected to tenoned aprons. When closed, the top measures 15 in. by 24 in., has a 1-in. overhang on all sides, and displays a veneered surface. When rotated and opened, the top doubles in size to 24 in. by 30 in., overhanging the sides by 5½ in. and the ends by 4 in., and is covered in leather, providing a great surface for signing the certificate.

The folding top is made of two plywood leaves. I veneer one side of each leaf, and then, in a separate step, I glue a single piece of leather across the other side of both leaves. Then I frame the top with solid lipping and



TOP UNFOLDS AND PIVOTS

Tabletop in closed position

Card table hinge

Once open, top rotates 90°.

Two $\frac{5}{8}$ -in.-thick flip tops

Leather interior

Pivot, $2\frac{1}{2}$ -in. disc of $\frac{5}{8}$ -in.-thick Baltic-birch plywood, screwed to underside of one leaf

1-in. solid wood border

$\frac{3}{8}$ -in. dowel, or hex-head bolt, acts as stop

Dovetailed cross-stretcher, $\frac{5}{8}$ -in. Baltic-birch plywood, 5 in. wide

$3\frac{3}{8}$ -in. disc, secured from bottom, locks assembly together but allows it to pivot.

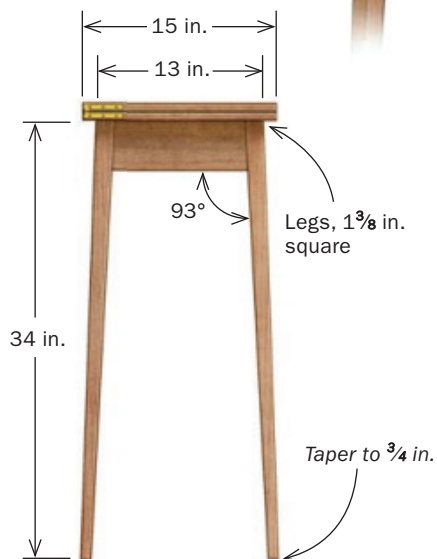
Felt

Base

STRAIGHTFORWARD BASE



CLOSED POSITION FRONT VIEW



CLOSED POSITION SIDE VIEW



Hinge the tabletop

Mounting these hinges takes a little practice, and Latta recommends doing a mock-up first to work out the nuances. The hinges' L-shaped leaves are joined with a steel link.



The space between. Latta clamps a thin ruler between the two halves of the top when he does the hinge layout, ensuring there will be a small gap between them when the hinges are installed. Without the space, the leaves of the top can pinch in back and spring open in the front.



attach it to the base of the table. For details on adding the veneer and leather to the top, see Master Class on p. 74.

Add a frame and hinges

Once the two leaves are surfaced, you can apply the edging. The three exposed sides of each leaf get covered with a 1-in. strip of cherry mitered at the outer corners. Adding biscuits along the joint helps with alignment and slippage. The edging can be flushed on the veneered side of the leaf but I do my best to avoid taking that risk with the leather, since there is no easy touch-up to a gouge in the leather surface.

So the joint

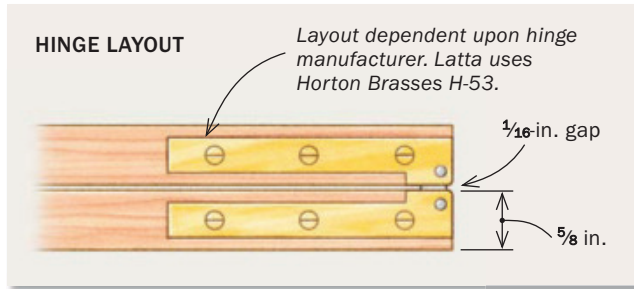


Lay out and mark. Pencil around the hinge itself to begin the layout. Then use a marking gauge to score the location. Do the layout so the end of the L with the steel link sits just a hair proud of the top's surface. The rear edge of the knuckle should extend a hair past the folding edge of the top.



STEPPED HINGE MORTISE

These hinge mortises are a three-step affair. A little practice and careful work will yield a nicely fitting mortise that doesn't bind.



between the leather and the border must be dead-on after the glue-up.

With the edging mounted and flushed, install the card-table hinges. Mounting the hinges takes a little practice and I always recommend doing a mock-up first to work out the nuances. These hinges are basically two L-shaped leaves joined with a steel link. Position the hinge so the end of the L that joins the link is just slightly proud of the table surface; this will allow for the top to fold without



the edges binding. If the hinge is mounted too far from the face, the edges will rub and, if extreme, tear the leaves from their mounting. I also set the hinges so the rear edge of the knuckle extends past the rear edge of the tabletop a hair, noticeable if you run your finger along the back edge. Once again, this allows the top to fold without binding.

With layout for the first hinge complete, use a trim router set to the hinge leaf depth to rough out the main recess. Then cut to your layout lines with a chisel. Reset the router to the knuckle depth, and rout that section. Drive just the center screws and make sure the hinge works properly. If it does, set all the screws making sure it still works. If all is good and the heavens have aligned, repeat the process with the second hinge.



The initial mortise. With the two leaves clamped together, use a trim router to remove most of the waste, then clean up to your marking gauge lines with a chisel.



Secondary mortise and a little excavation. Hold the hinge against the initial mortise to mark the location of the knuckle (far left). Then rout a deeper section to accept the knuckle. Chisel out the section where the leaves of the hinge will meet.

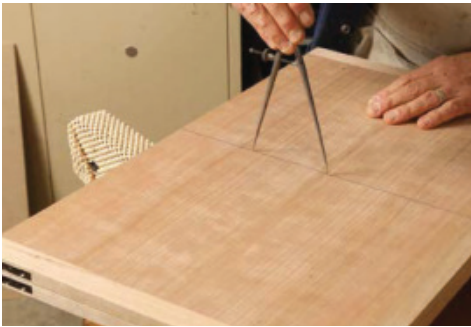


Final fit. Slide the hinge in place, make any adjustments necessary to the fit, and set just the center screws to make sure it all works as planned. Then you can set the rest of the screws.

Mount the tabletop

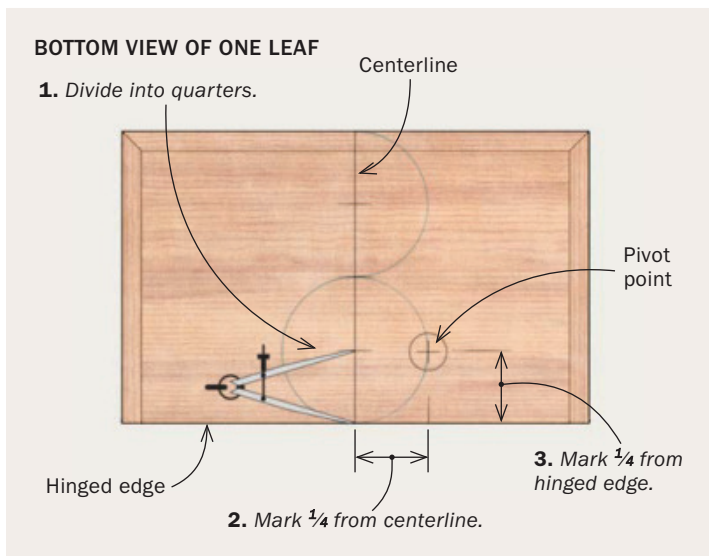
PIVOT-POINT LOCATION IS CRUCIAL

Latta uses a simple method to calculate where to create a swivel point for the top.



It's all about division. On the underside of the bottom leaf, draw a centerline across the short dimension. Divide that line into quarters with dividers and mark the point one quarter from the hinged edge. Set a compass to that same one-quarter distance, put its tip in the marked point, and swing an arc to one side of the centerline. With a combination square, make a cross mark.

A place for the pivot disc. With a compass you can use that point as the center to draw a 2½-in. circle where you'll mount the pivot disc.



Transfer the disc placement. Use the leaf itself, carefully centered in both directions, to mark the location on the cross-stretcher where you'll drill a mating hole for the pivot disc.

INSTALLING THE PIVOT



A little felt goes a long way. Before screwing the disc in place, Latta adds felt to the underside (above). It gives a soft thin gap between the leaf and the disc. Predrill with a countersink and then screw the disc to the leaf (right).

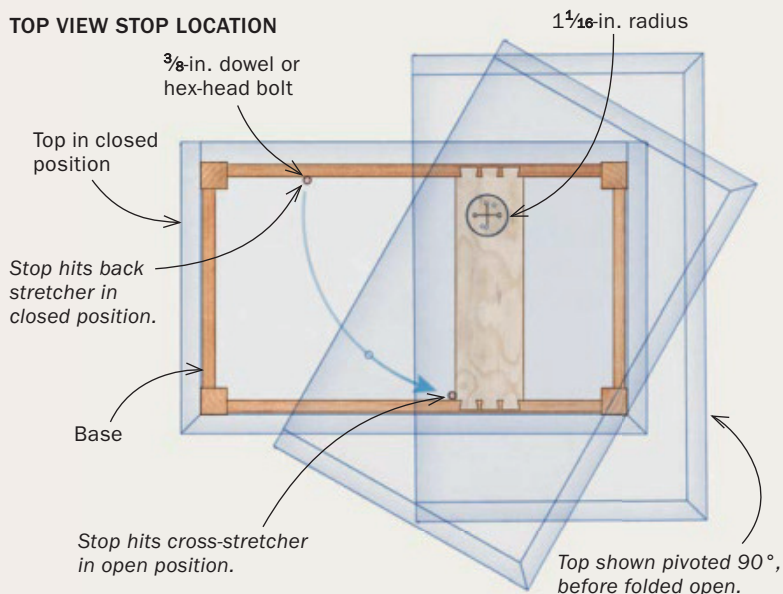


A SIMPLE STOP

A dowel or a hex-head bolt limits the pivot when it bumps against the apron or cross-stretcher.



TOP VIEW STOP LOCATION



Finding and mounting the pivot

I spent many an hour trying to find the magic formula for calculating the tabletop's pivot point. I never knew the direct method of finding it, but I always got there. Well, with writing this article as an incentive, I dug a little deeper and realized the answer was always in plain sight. I was just twisting the simple into something complicated.

On the underside of the bottom leaf, draw a centerline across the short dimension. Divide that line into quarters with a pair of dividers. The rotation point will be one quarter of the way from the leaf's folding edge to its outer edge. And that same distance—one step of the dividers—away from the centerline. Bingo! That is it. I'll leave it to the mathematicians and engineers to figure out the why, but it works every time!



Drill for the pivot disc. Once you've marked the location, use the drill press to cut the hole for the disc.

The finishing touches

Add felt to the base. Latta uses spray adhesive to glue down strips of felt to the top edge of the aprons. This makes sure the leaves are running smoothly and not getting scratched as they swivel.



Wax the disc. A layer of paste wax on the moving parts of the joint goes a long way to keep the pivot action smooth.



Next, on the bottom of the pivoting leaf, attach a 2½-in. disc of ⅝-in.-thick Baltic-birch plywood centered on the pivot point. Dovetail a 5-in.-wide cross-stretcher of the same ⅝-in. Baltic-birch between the aprons of the base, making sure the disc will fall well within its borders. Bore a 2½-in. hole in the cross stretcher to receive the disc. Once the pieces are fit together, a 3⅝-in. disc will be secured from the bottom, locking the assembly together but allowing it to pivot.

Before that magical moment, however, I adhere strips of blended wool felt to the top of the aprons and legs to make the pivot motion work easily and prevent scratching. My local fabric store offers a 35% wool, 65% rayon that is stronger and more durable than the standard craft felt at the hobby store.

Mount the top to the cross rail and make sure it pivots easily. The larger disc screws into the pivot disc and a little trial-and-error is required here to get the proper level of resistance. If the top is hard to turn, take a manila

folder and cut several 2 $\frac{3}{8}$ -in. discs to serve as shims. Veneer also works but often splits when you are trying to secure it. Add shims until the top rotates smoothly but takes some effort to move—not just sliding at the slightest touch. Then you should be good to go.

To limit the top's rotation, add a hex-head bolt, or a dowel, as a stop. Open the top and make sure the overhang is even all the way around. Mount the stop to the bottom of the pivoting leaf right up against the cross stretcher. When the top is closed and pivoted back, the stop will contact the long apron. See the drawing on p. 63 to help determine the stop's specific location. □

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



Final placement. Lining up the pivot disc with the hole in the cross-stretcher, place the top on the base (above). Then, with the table upside down, screw a slightly bigger disc over the pivot disc. This will lock the top to the base while still letting it pivot.

gallery

Inspiration for our readers,
from our readers



MEEGAN McCAFFREY

Cambridge, Mass.

Meegan was inspired by old sea chests when she set out to build this piece. She admits, “The shape is more beautiful than practical, a bit mysterious.” It took nearly as long to make the handles out of black string—her first attempt at handle making—as it did to make the box.

MAPLE, 15D X 15W X 17H

STEPHEN BODNER

Chapel Hill, N.C.

Stephen was inspired by an 18th-century John Goddard tea table with shaped aprons that sold at a 2005 Sotheby's auction. He didn't need a tea table, so he converted it to a writing desk. And he made various other changes. He designed aprons that are joined to the legs with mortise-and-tenon joints but appear to thin down as they bend in a sweeping curve to embrace the legs. He chose the aprons' grain direction carefully to emphasize the curves. To modernize the Chippendale legs, he gave them a simple curve.

WALNUT, 18D X 43W X 29H



VAL M. DZIAGWA

Arvada, Colo.

Val built this Krenov-style cabinet on stand for his wife. The ebony and koa he used had been in his family for decades. The whole building process, with its many woodworking lessons and tribulations, took several years of stopping and starting to complete.

CURLY KOA, GABON EBONY, AND MAPLE, 12D X 24W X 56H

Photo: Steve King





SAFETY UNLEASHED



NEW

Introducing the 10" **Compact Table Saw** that stops on contact with skin.

Everything you'd expect from SawStop, in our smallest, most portable saw yet. Packed with features that bring power, precision, cut capacity, and safety to wherever your project takes you.

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ERIC DAY MORRIS

Chandler, Ariz.

This is the fifth heirloom cradle Eric has made for family members. He discovered a love of sculpting wood some years back, while building a Maloof-style rocking chair. Along the way he also came across the extraordinary work of Wharton Esherick. The work of these two artists, together with the mentoring and encouragement of Raul Ramirez, Michael Fortune, and Kelly Parker, led to the creation of his cradles.

CLARO WALNUT, 23D X 38W X 32H

Photo: Doug Forsha



PATRICK McGINLEY

Nahant, Mass.

This clock was a commission piece. Patrick's clients saw it in the movie *You've Got Mail* in 1998 and had been trying to find it ever since. When they learned Patrick was a student at North Bennet Street School, they showed him a photograph that they had taken off of the TV screen. Patrick says he was confident he could replicate the clock because "I was studying under Lance Patterson, the clock-making master."

WALNUT, 6D X 25W X 80H

Photo: Lance Patterson



SCOTT BECK

Novelty, Ohio

Scott has designed and made a few of these chairs, patterned after Mid-Century lounge chairs. While he has made versions with Danish cord seats, the seat on this one is made with leather strips, cut with a sharp knife and an aluminum straightedge. He says the strips, approximately $\frac{1}{4}$ in. thick by 2 in. wide, are perfect for weaving; they are strong and attractive and they stay flat. And he says the leather work takes about one-third the time of Danish cord.

WALNUT, 40D X 26W X 28H



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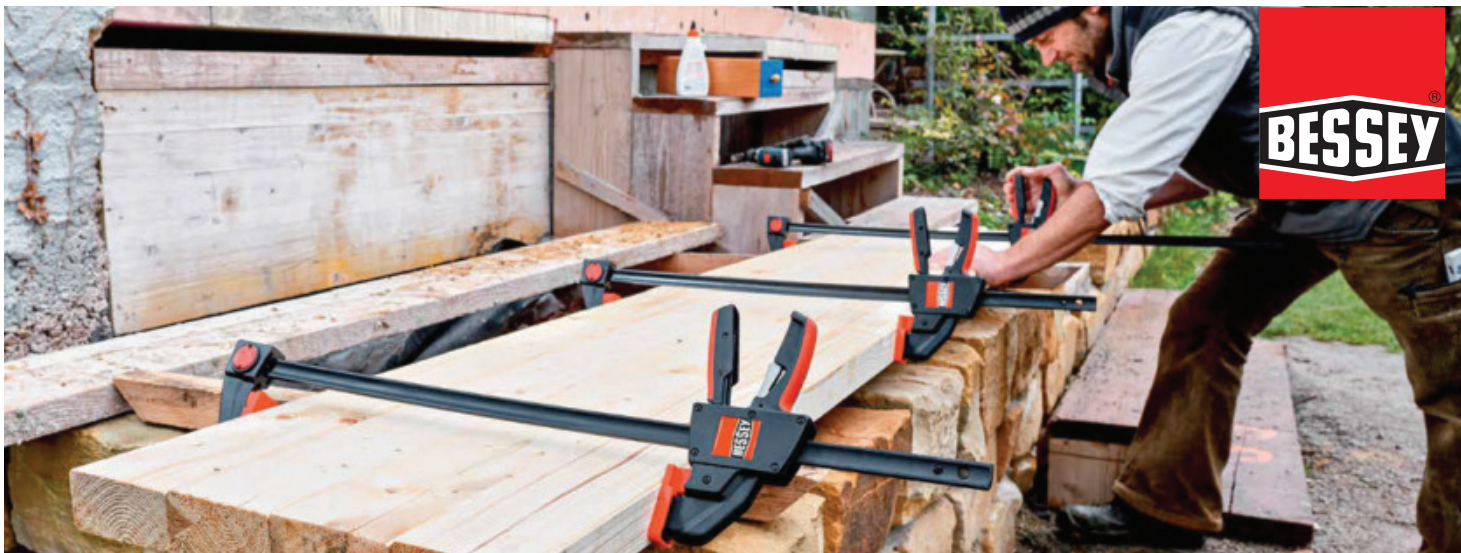
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TED SMALL

Poland, Maine

Following in his grandfather's footsteps as a maker of office furniture, Ted looked to James Krenov's work as inspiration for the legs of this desk. The rest of the piece was modeled after Boston architecture.

QUARTERSAWN ASH AND CURLY WALNUT,
30D X 60W X 30H

Photo: Rene Roy



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SPENCER RAFF

San Francisco, Calif.

This piece, a gift for his daughter, is the first box Spencer made. He was inspired by boxes he'd seen on the web, in particular those with secret compartments or locks. The bottom drawer is secret, and he made a hidden magnetic latch to lock and release it.

MAHOGANY, EBONY, SPALTED MAPLE, CURLY MAPLE
9D X 14W X 8H



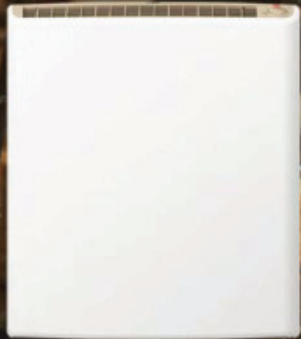
GEOFF McKONLY

Northampton, Mass.

This lamp is the result of Geoff's time taking a lighting design class at the Center for Furniture Craftsmanship in Maine. It merged his desire to build a lighting fixture with learning bent-lamination work.

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MIKE FARRINGTON

Aurora, Colo.

A client gave Mike a photo of a living room side table from a design magazine. The client wanted a similar piece, and this is the design he executed, based loosely on the image.

RED OAK, 26D X 18W X 28H



DANA SALIH

Lighthouse Point, Fla.

The inspiration for “Corset Chair” came from the pattern on the mahogany crotch slab that Dana salvaged in South Florida. He built the back of the chair so you can see through the crack. He made barbell-shaped walnut butterflies, scaled to match the flare of the back, to span the crack. The remainder of the crack was filled with clear resin before shaping.

MAHOGANY AND WALNUT, 23D X 18½ W X 34H



MATTHEW K. BROWN

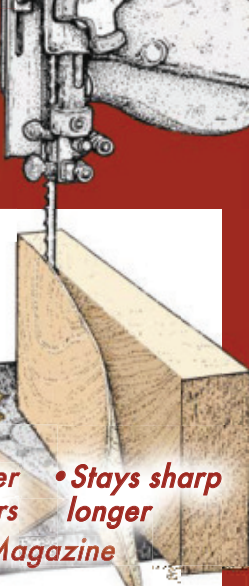
Reading, Pa.

Matthew modeled this table after Steve Latta's version of a Federal-style dressing table in the Winterthur collection.

WALNUT, SOFT MAPLE, AND HOLLY
19D X 36W X 33H

Photo: Jesi Yost

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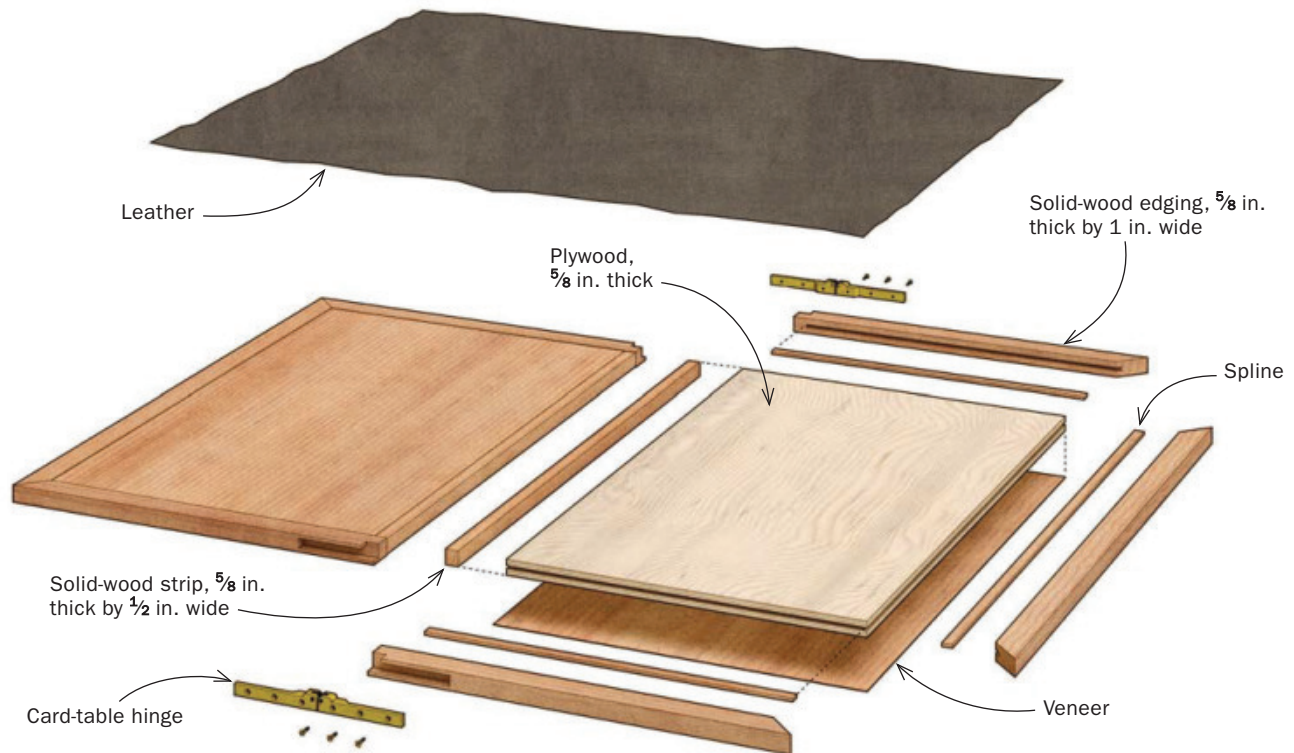
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Add a leather surface to a table

BY STEVE LATTA



A leather top adds pizzazz to a piece, a certain formality typically associated with large executive desks. When leather is touched, its slight springback projects durability, comfort, and almost a sense of kinship. That might sound odd but as humans, we have an ancient relationship with leather that existed millennia before our use of



Veneer first

Before you get to the leather, you'll apply veneer to one face of each leaf of the top.

Edge and veneer. Prior to veneering, Latta glues a ½-in.-wide strip of solid-wood edging to one long edge of each leaf. These edges will be where the top folds when the leaves are hinged. Then with yellow glue, he applies the oversize veneer.

fabric. In my mind, leather's imperfections make it perfect, with its natural defects and wrinkles breaking up the monotony of a static flat plane.

In addition to its good looks, leather is a very pragmatic choice. As a writing surface, it has no equal. Upholstery leather, which I use, requires minimal upkeep. It holds its own against life's daily assaults and I have never had to replace a damaged piece. I wish the same could be said for the countless wooden tops that have left my shop over the years.

With a little experience, leather is easy to work and requires no special tooling. Here's how I added a leather top to the expanding table on pp. 58–65.

Veneer one side of both leaves

To begin, I took two pieces of ⅝-in.-thick by 15-in.-wide by 24-in.-long Baltic-birch plywood and glued a ½-in. strip of cherry to one long edge on each of the leaves. Once the top is completed, these will be the edges at the fold.

After cutting two pieces of cherry veneer a bit oversize, I laminated a piece to one side of each leaf using yellow



Vacuum bag it. Use a vacuum bag or press or clamping pressure to set the veneer on the substrate.



Remove the excess. Once the glue is dry, use a single-bevel knife, guided by the substrate, to trim away the excess veneer.

Get ready for the leather

Prior to gluing a piece of leather to the two leaves, add a spacer between them. And secure the leaves with two tacked strips to ensure they don't shift during the glue-up.



Anti-stick tricks. Use clear tape, trimmed to fit, to cover the edging on the inside of the leaves (top). Additionally, wax the thin spacer that will sit between the leaves during the glue-up (above). This way the spacer doesn't become a permanent part of the construction.



Thin spacer. This removable strip will create a narrow gap between the leaves during the glue-up, which will allow them to fold after the glue has dried and the leaves are hinged together.

glue and a vacuum bag. When the glue had thoroughly dried, I cut each leaf to 14 in. by 22 in., leaving the cherry strips untouched.

Add leather to the tops

With the veneering complete, cut a piece of upholstery leather large enough to cover both leaves of the top with a ½-in. overhang all the way around.

Align the cherry edges with each other and place a strip of veneer between the two. To keep parts from sticking during the glue-up, cover the cherry edges with clear packing tape and wax the strip of veneer. To keep the leaves from shifting in the vacuum press, tack a temporary



Immobilization measures. It's vital that the leaves not shift during the leather glue-up. Latta clamps the two leaves to a flat surface and to each other, with the spacer in place, and tacks a temporary cleat to the edge, straddling the two leaves. He tacks another cleat to the opposite edge.

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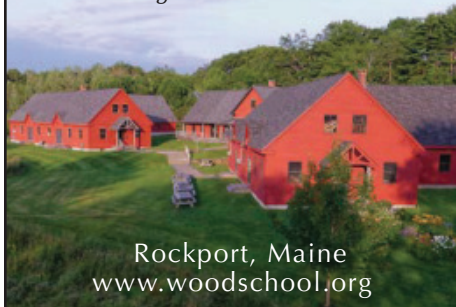
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Apply the leather

Gluing the leather in place is similar to gluing veneer.



Glue and press. Spread glue on the substrate, just as you would with veneer. But rather than putting the veneer on top of the substrate, spread the leather (good face down) on a clean, flat surface. Turn the substrate glue-side down and set it on top of the leather.

cleat to the edge, straddling the leaves. Do this on both ends. Roll a nice film of white glue onto the unveneered faces of the leaves. Lay the leather on a flat surface, and set the leaves on top. With the leather side down, put the assembly on a platen in the vacuum bag and let the glue do its thing.

Once the glue has fully cured, pull out the top and remove the cleats, and the spacer between the leaves. The leaves should easily fold onto each other at this point. Take a sharp single-bevel knife and, with the top face down, trim the leather to the edge of the leaves.

Edge the perimeter

The three exposed sides of each leaf now get edged with a 1-in.-wide strip of cherry mitered at the outer corners. Adding biscuits or splines along the joint will help with alignment and slippage. Take the time to make your biscuit or spline joints extremely accurate, because after the edging is glued it must be perfectly flush with the surface of the leather. The edging can be flushed on the veneered side of the leaf but I don't take that risk on the leather side.

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



Flip and flatten. After applying hand pressure to keep the leather and substrate together, flip the assembly and use your hands to smooth out any wrinkles, moving from the center outward. Then set the whole thing in the vacuum bag, leather side down, to dry under pressure.

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Post glue-up

Once the glue is dry on the leather, it's time to think about edging the outside.



Out of the press. When the glue has cured, remove the spacer from between the leaves and peel off the clear tape from the edges. Then use a single-bevel knife to trim the leather to the substrate.



Grooves for biscuits or a spline. It's difficult to flush the edging on the leather side without damaging the leather. So the mitered edging that goes around the perimeter of the top should get biscuits or a spline to keep it from shifting during the glue-up. Latta runs grooves for splines using a handheld router on the substrate and the router table for the edging.



One piece at a time. Working around the perimeter of the table, miter, measure, cut, and glue each piece in place.

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My mentor, Mr. Scriven

BY RICHARD MCCORMICK



A spark of creativity is an amazing thing, as is the circuitous route that sometimes unfolds when something new is ignited within us. My path into woodworking began in Fort Collins, Colo., when I was 25. With just a few tools I built some small objects and my first crude piece of furniture. Then, the unexpected gift of a new friend caused the spark to ignite into a flame, and a lifelong passion. My unlikely friend would inspire me toward unimagined creativity.

I found my way to his house after a man at the hardware store, who couldn't answer one of my woodworking questions, suggested that I look up a longtime customer, Ed Scriven. I knocked on the door and met a man in his late 70s with a calm, gentle spirit, and a smile on his wrinkled face. He invited me in, and we became instant friends. I soon learned that he had built houses, boats, furniture, and cabinets. His own house was tiny, and lacked a working bathroom; his modest, disheveled shop was out back.

Despite having little, as defined by a society bent on success and material gain (things my young mind thought important), Mr. Scriven always struck me as fulfilled. He was never in a hurry and approached each task with persistence and a desire for perfection.

Not long after meeting him, I set up my first real workshop in a one-car garage with a few more tools and some small machines. And suddenly a woodworking project far beyond my skill level came into view. I was naively inspired by a picture of a 1700s Chippendale lowboy dressing table. This piece of furniture possessed me. When I enthusiastically showed Mr. Scriven the picture, he must have thought there was no chance this task could be accomplished considering my lack of experience.

I asked him how I should begin making this huge project that so captivated me. I asked if he thought I could accomplish it with my limited experience, tools, and knowledge. I asked how long it might take, because I was in a hurry to get it done. After the avalanche of questions, Mr. Scriven asked me to sit down. As he began to answer, his smile diminished. Had my enthusiastic questioning made him serious?

He became calm and stared into my eyes. In his slow-talking manner he said, "Begin by being excited that you don't have

the experience, knowing that you are about to embark on a beautiful journey of learning and discovery. You begin by beginning." He then told me he had every confidence I could accomplish it if I adhered to one small bit of advice: "Take the time to do it right." All these years later, whenever I'm hurried or anxious, I still hear him saying, "If you can't take the time to do something right, you will never find the time to fix it."

His smile slowly returned as he stood and answered the last of my questions: "Things that matter always take just as long as they take." For him, there were no clocks or calendars when it came to doing something that mattered.

As I began the project, working evenings and weekends, I spent months at the library reading everything possible relating to Chippendale furniture. After I began building, I would often wake up in the night wondering how to do a

certain aspect of the piece. The long journey of learning and discovery continued. It was time to return to the library to study styles of carving, and techniques used by the masters from previous centuries.

A sense of trepidation crept into my mind when I realized that the fundamentals necessary to complete the project could take years of full immersion in the world of making fine furniture. Mr. Scriven had not told me how long traveling this path would take; it would take as long as it would take. But at this point there could be

no turning back. Mr. Scriven would have been too disappointed if I folded up.

It took me three years to build that Chippendale lowboy, which still sits proudly in the entryway of our home, tangible evidence of Mr. Scriven's influence on me. Every time I walk past it, I think of him and his confidence that I could accomplish my dream if only I would stay the course and invest the time, energy, and passion necessary to do it right.

Ed Scriven passed away nearly 40 years ago. His now-faded picture has hung on the wall of every shop I've had in my 50-year woodworking journey. He never knew the impact he had on me. A true mentor, he taught me as much about life as about woodworking. □

Richard McCormick works wood in Durango, Colo.



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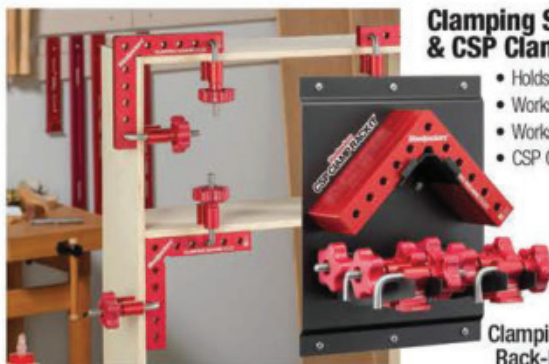
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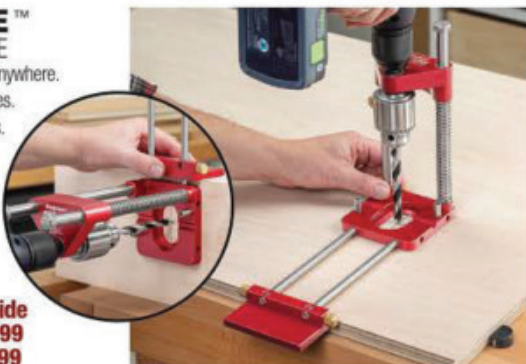
48" Table, 48" Fence....\$569.99



Drill Press & Hose not included.

AUTO-LINE™ DRILL GUIDE

- Perpendicular holes anywhere.
- Fence fits on all 4 sides.
- Works with most drills.
- 1" inside frame.
- 2" capacity outboard.
- Deluxe Kit includes extensions.



Auto-Line Drill Guide
Drill Guide....\$269.99
Deluxe Kit....\$369.99

Drill not included.

THIN RIP GUIDE™

- Safe, accurate jig for repeat cutting of thin strips.
- Works with 3/8" x 3/4" T-slot table grooves.
- Easily calibrated scales in both inch & metric.
- Ball bearing contact for smooth feeding.



Table Saw not included.

ThinRip Guide....\$149.99

Available for
**Powermatic/
Biesemeyer
& SawStop**

RIP-FLIP Fence Stop System™

- Relocates rip fence perfectly.
- Flips out of the way when not needed.
- Couple 2 stops for perfect fitting dados.
- Extra stops & dado couplers available.



Table Saw not included.

RIP-FLIP Fence Stop System

Fits SawStop®

36" Capacity....\$209.99

52" Capacity....\$219.99

Powermatic/Biesemeyer®

30" Capacity....\$219.99

50" Capacity....\$229.99

Multi-Router the Joinery Machine

- Heavy-duty, true 3-axis linear control.
- Machined aluminum templates for flawless joinery.
- Versatile, multi-directional clamping.
- Built-in dust collection.

Digital readout, pneumatic clamps & other accessories available.

**Multi-Router
w/Dust Cabinet**
....\$2999.00



Shown with optional
Machine Stand.

**Mortise
& tenons,
dovetails,
box joints
& more.**



Exact-90 Miter Gauge

- Square cuts every time.
- Miter bar self-adjusts 3/4" slots.
- Micro-adjust flip stop & 45° extension.
- 24" cross-cut capacity on most saws.
- Miter Bar available separately.



Table Saw not included.

**Exact-90
Miter Gauge....\$329.99**
25.5" Miter Bar....\$69.99

AUTOANGLE™ DRILL GUIDE

- Precision drilling without a drill press!
- Drill perfectly vertical or at any angle from 90° to 40°.
- Entry point is constant at any angle.
- Fence & stop system speeds repetitive work.
- Works with most hand drills.



Drill not included.

AutoAngle Drill Guide
Standard....\$549.99
Deluxe Kit....\$649.99

AUTOSCALE™ Miter Sled

- Scale accurate at any angle.
- Miter bar fits any 3/8" x 3/4" slot.
- Flip stop with micro-adjust.
- Stop extends to 50°.
- Stops for 3-, 4-, 5-, 6-, 8- & 12-sided miters.



Table Saw not included.

AutoScale Miter Sled
Deluxe....\$1089.99
Left-or-Right Miter Sled....\$529.99
Drop Zone....\$129.99

Visit **Woodpeck.com** for hundreds of other American Made Tools!

*NOTE: The Festool, SawStop, Powermatic & Biesemeyer brand names are the registered trademark of the respective company and is not associated with Woodpeckers, LLC.

NEW
TOOL

Woodpeckers® in-DEXABLE

COMBINATION • DOUBLE • PROTRACTOR • CENTER FINDER • MINI
SQUARES

Since its invention in 1878, the combination square has been copied countless times, but few have actually tried to make it better (*and even fewer have succeeded*). Woodpeckers has added a patent pending feature to their new in-DEXABLE Combination Square System that takes it to an entirely different place than any other combination square at any price. Like any quality combination square, you can lock the head anywhere along the blade, but if you depress a simple button, the head will lock precisely on a full inch mark. Now the laser-accurate scribing guides are ready to strike lines perfectly parallel to the edge of your stock on 1/16" centers. Rounding out the system are a center finding head, protractor head and double square head, all with the same indexing feature.

The in-DEXABLE Deluxe Set comes with Center Finder, Protractor, Combination Square and Double Square Heads along with 6", 12" & 18" Blades (Double Square and other Blades not shown).

MADE IN
USA

Woodpeck.com



A Sideboard Cloaked in Osgood Oak

When Jere Osgood was closing his New Hampshire workshop several years back and selling off his extraordinary trove of wood, John Cameron wandered into a small shed and found a stack of badly warped boards sawn $\frac{1}{4}$ in. thick and coated with years of grime. Brushing off a board, he saw it was quartersawn English brown oak. Usable? He wasn't at all sure. But he was inspired, and back at his shop in Gloucester, Mass., he got to work designing a sideboard. He cleaned the boards, then repeatedly soaked them with a mixture of glycerin, alcohol, and water and stacked and weighted them. After a week of coaxing, the wood was just pliable enough that with a bandsaw jig he devised, he could press the planks temporarily flat and resaw them in two. He thickness-sanded them at a friend's shop, and when they were about $\frac{1}{16}$ in. thick, he says, "this cantankerous wood magically stopped fighting and became beautifully behaved and perfectly flat." With a little more magic in the making, Osgood's old boards soon cloaked Cameron's new sideboard. The cabinet's interior is ash, its drawers are holly, and its base is toasted ash. Cameron engraved acanthus leaves on the nickel-silver escutcheon.

—Jonathan Binzen

