**Amp-Up Your Tablesaw Fence** p.46

ISSUE 282 JULY 2022

Better Homes & Gardens

# WOOD®

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- Max. depth of cut: 3⅛" @ 90°, 2¼" @ 45°
- Rip capacity: 28" right
- Dado capacity: 13/16"
- Dust port: 2½"
- Overall size: 28" W x 37½" D x 20½" H (G0869); 41½" W x 37½" D x 41" H (G0870)
- Approx. shipping weight: 72 lbs. (G0869); 106 lbs. (G0870)

c UL us LISTED Table Saw 93K7 E98714

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**G0870 ONLY $705.00** $69 SHIPPING LOWER 48 STATES

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- Motor: 2 HP, 120V/240V (pre-wired for 120V), single-phase, 15A/7.5A
- Rip capacity: 31" right, 16¾" left of blade
- Max. depth of cut @ 90°: 3⅛"
- Max. depth of cut @ 45°: 2¼"
- Table size with extension wings: 40½" W x 27" D
- Distance from front of table to center of blade: 15½"
- Floor-to-table height: 35⅜"
- Arbor diameter: ⅝"
- Arbor speed: 3450 RPM
- Max. width of dado: 13/16"
- Dust port size: 4"
- Overall dimensions: 64" W x 40½" D x 36" H
- Footprint: 21" L x 19½" W
- Approximate shipping weight: 330 lbs.

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c ETL us Intertek 5012917

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## 10" 3 HP 240V CABINET TABLE SAW

- Motor: 3 HP, 240V, single-phase, 14A
- Rip capacity: 32" right, 14" left of blade
- Max. depth of cut @ 90°: 3"
- Max. depth of cut @ 45°: 2⅛"
- Assembled table size: 40" W x 27" D
- Distance from front of table to center of blade: 17"
- Floor-to-table height: 34"
- Arbor diameter: ⅝"
- Arbor speed: 4200 RPM
- Max. width of dado: 13/16"
- Overall dimensions: 66" W x 47" D x 39¾" H
- Footprint: 20½" x 20½"
- Approximate shipping weight: 508 lbs.

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## 1½ HP WALL-MOUNT DUST COLLECTOR WITH CANISTER FILTER

- Motor: 1½ HP, 110V, single-phase, 15A
- Airflow capacity: 1250 CFM
- Maximum static pressure: 10.4"
- Filtration rating: 1-micron
- Filter surface area: 38.75 sq. ft.
- Impeller: 12¾" radial fin
- Machine collection capacity: 2
- Bag capacity: 15-gallon
- Sound rating 75–77dB
- Overall dimensions: 22½" W x 23½" D x 77½" H
- Approximate shipping weight: 77 lbs.

⚠WARNING! †[1]

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## 3 HP DOUBLE CANISTER DUST COLLECTOR

SOUTH BEND SINCE 1906

- Motor: 3 HP, 240V, single-phase, 12A
- Main inlet size: 7" with three 4" adapter inlets
- Airflow capacity: 1429 CFM @ 3.2" SP
- Maximum static pressure: 12"
- Filtration rating: 1-micron
- Filter surface area: 160 sq. ft.
- Impeller: 12¾" radial fin
- Machine collection capacity at same time: 3
- Material collection capacity: 67 gallons
- Sound rating 81-83dB
- Overall dimensions: 58" W x 31½" D x 76" H
- Approx. shipping weight: 237 lbs.

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## 3 HP CYCLONE DUST COLLECTOR

SOUTH BEND SINCE 1906

- Motor: 3 HP, 220V, single-phase, 9A
- Main inlet size: 8" with three 4" adapter inlets
- Airflow capacity: 1941 CFM @ 2.0" SP
- Maximum static pressure: 10.9"
- Filtration rating: 1-micron
- Filter surface area: 46¼ sq. ft.
- Impeller: 16" radial fin
- Collection drum size: 52-gallon
- Sound rating 79-81dB
- Overall dimensions: 44½" W x 46¾" D x 81" H
- Approx. shipping weight: 437 lbs.

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## 6" X 80" BENCHTOP EDGE SANDER

- Motor: 1½ HP, 110V/220V (prewired for 220V), single-phase, 20A/10A
- Sanding belt speed: 1800 FPM
- Sanding belt size: 6" x 80"
- Platen type: Graphite-coated
- Platen size: 6¾" x 29¾"
- Table size: 10½" x 22"
- Table tilt: -60°–60°
- Table travel: 6"
- Floor to table height: 19½"
- Dust port: 4"
- Overall dimensions: 47" W x 17½" D x 34½" H
- Approximate shipping weight: 221 lbs.

⚠WARNING! †[1]

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## KNIFE GRINDER, SANDER, & BUFFER

- Motor: 1 HP, 110V, single-phase, 14A
- Motor speed: 1725 RPM
- Belt size: 2" x 72"–76" range
- Belt speed: 3600 FPM
- Sanding wheel size: 8" dia.
- Left arbor: 8½" extension with ⅝" arbor
- Height with belt arm horizontal: 11½"
- Height with belt arm vertical: 39"
- Overall dimensions: 38¾" L x 29½" W x 39" H
- Approximate shipping weight: 113 lbs.

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## 1 HP OSCILLATING SPINDLE SANDER

- Motor: 1 HP, 120V/240V (prewired for 120V), single-phase, 12A/6A
- Spindle speed: 1725 RPM
- Stroke length: 1½"
- Spindle oscillation: 72 SPM
- Spindle diameters: ¼", ⅜", ½", ⅝", ¾", 1", 1½", 2", 3", 4"
- Spindle length: 5", 6", 9"
- Table dimensions: 25" W x 25" L x 1⅛" T
- Table tilt: 45°F, 15°B
- Floor to table height: 35½"
- Dust port size: 4"
- Overall dimensions: 25" W x 30" D x 44½" H
- Approximate shipping weight: 296 lbs.

c SA us

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# Back to the front

Get plans for this classic porch swing at woodstore.net/classicswing

Last fall, Annette and I did what we always do before starting a big project on our house: We drove to better neighborhoods than ours and scouted for ideas. Several years ago, we hit the Sunday open-house circuit looking for creative kitchen concepts before remodeling our first floor; this time, we cruised for exterior inspiration—siding, stone, etc.

While navigating a suburban maze of winding roads (some of these developments look like they were laid out on a three-day drunk), we stumbled across a concept I'd never seen: a cluster of homes surrounding a cul-de-sac, but the cul-de-sac—and the driveways and garages it served—was *behind* the buildings. This script-flip pushes the front of the house just feet from the sidewalk, inviting conversation between porch-sitters and passersby.

The notion of the front porch brings back romanticized memories of Aunt Bea and Barney relaxing with a cold glass of lemonade on a summer evening while Andy strums and hums a gentle tune. And it brings back romantic memories, too: My first kiss was in a swing on my crush's front porch.

I don't know about you, but I can always use a little more of that easygoing front-porch vibe in my life. The Sweet Swing plan on *page 40* looks like just the ticket.

Today's front porches tend to run smaller than those in 1960s Mayberry, so Senior Design Editor Kevin Boyle designed this swing to better suit 21st-century suburbia. And as a cozy two-seater, it also brings back the romance.

No porch? No problem. Build a free-standing arbor for the swing and hang out anywhere you like. We've got the plans: Search for *arbor* at woodstore.net.

Before you fire up the tools, though, you might want to take a little nap, then head over to the filling station for a bottle of pop.

Say hey to Goober.

*Dave Campbell*
*dave.campbell@meredith.com*
*Facebook and Twitter: @WOODeditor*
*Instagram: @wood_editor*

Watch Dave's favorite front-porch scene from The Andy Griffith Show by pointing your smartphone at this code, or visit woodmagazine.com/heytogoober
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EDITORIAL CONTENT CHIEF **DAVE CAMPBELL**
DEPUTY EDITOR **CRAIG RUEGSEGGER**
ART DIRECTOR **KARL EHLERS**
SENIOR DESIGN EDITOR **KEVIN BOYLE**
DESIGN EDITOR **JOHN OLSON**
TOOLS EDITOR **BOB HUNTER**
DIGITAL PRODUCT MANAGER **LUCAS PETERS**
ADMINISTRATIVE ASSISTANT **SHERYL MUNYON**
CONTRIBUTING DESIGNER **HANNAH COHEN**

CONTRIBUTING CRAFTSMEN **JIM HEAVEY, BRIAN BERGSTROM**
PHOTOGRAPHERS **DERA BURRESON, JASON DONNELLY, JACOB FOX, RACHEL MAREK**
CONTRIBUTING EDITORS **VINCENT ANCONA, ZACH BROWN, RANDY MAXEY, BRYAN NELSON**
CONTRIBUTING ILLUSTRATORS **LORNA JOHNSON, DAVID KALLEMYN, ROXANNE LEMOINE**
PROOFREADERS **SAM CADY, JOE HURST-WAJSZCZUK, BABS KLEIN, IRA LACHER, MARK LANE**

**ADVERTISING AND MARKETING**
SR. VICE PRESIDENT/PUBLISHER **MARK JOSEPHSON**
ACCOUNT EXECUTIVE **BRIAN KOSSACK**
brian.kossack@meredith.com
ONLINE MEDIA KIT **WOODMAGAZINE.COM/MEDIAKIT**

BUSINESS MANAGER **DARREN TOLLEFSON**
CONSUMER MARKETING MANAGER **ED LICHINSKY**
SENIOR PRODUCTION MANAGER **SANDY WILLIAMS**
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# WOOD-WIDE WEB

WOODMAGAZINE.COM

# A RARE JIM, INDEED

There is nothing that Jim Heavey can't do. You think we're just saying that—flattering him to get him on our good side, maybe. But no. We have video evidence.

He once transformed a blank wall into an entire workshop. It only took him three videos. woodmagazine.com/jimbuildsashop

His miters are always perfect.
woodmagazine.com/jimsmitersareperfect

And if—if!—he ever got tired, he would build his own Adirondack chair to relax in. To be clear, he's never been tired. But he did build the chair to show you how to do it, in case you get tired.
woodmagazine.com/jimnevertires

He can make five tablesaw jigs using only a half-sheet of plywood.
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Which color shirt should Jim wear next? Send your nominations to woodmail@woodmagazine.com.

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# Sounding Board

YOUR VOICE

## 'Mazing mods

*It took me awhile, but I completed the Rock 'n' Roll Maze Game in issue 277 (October 2021). My fat fingers had a hard time with all of those small pieces, so I decided to scale everything up to a more manageable size.*

*I nearly doubled the dimensions of the wall pieces to ¼" thick and 1" tall, and upgraded to a ½" ball bearing instead of a marble for the game ball. Of course, that meant I had to increase all of the other dimensions proportionally, as well.*

*All of that led to also beefing up the joystick assembly to accommodate the extra weight. Thanks for the inspiring plans. It's a tough maze to navigate!*

***—Mark Nygard***
*Hazen, N.D.*

*I enjoyed building the Rock 'n' Roll Maze Game and after playing it a few times, I decided to add springs, as shown at* right, *to improve the joystick control. They add a little bit of tension to prevent the maze field from flopping one way or the other, and smooth out the tilting action.*

***—Andy Myers***
*Yorkville, Ill.*

### Skill-ball slip-up

The Materials List for the Skill-ball game in issue 279 (Dec/Jan 2021/2022) inadvertently shows the thickness of the return tops (C) as ¾"; the correct dimension for those parts is ½".

## Midcentury mask

*For the Midcentury Headboard plans in issue 277 (October 2021), you nailed the style with the crisscrossing kerfs in the main panel. But I prefer to darken the lines between the "panels," rather than showing the light color of the plywood beneath the walnut veneer.*

*Here's an easy way to darken the kerfs: Apply painter's tape over the kerf areas before cutting with the tracksaw. Then, after you cut through the tape and wood, you have a protective mask, so you can paint or stain the inside of the kerf without getting any on the veneer.*

***—Pete Borkowski***
*Madison, Wis.*

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## We passed on this joint

*I enjoyed reading the excellent article "Strong, Simple Drawer Joints" in issue 280 (March 2022). However, I was disappointed you didn't discuss the joint made with a lock-miter router bit, or discuss the advantages and disadvantages of this approach. As a "beyond beginner" woodworker, I am intrigued by the apparent simplicity of a bit that cuts both parts of the joint with the same setup.*

*But I also recognize that things are infrequently as easy as first impressions suggest. I would appreciate learning more about this approach and how this joint compares in strength to the others discussed so well in the article.*

***—Rick Youngstrom***
*Imperial, Mo.*

*May I add my 2 cents to the "Strong, Simple Drawers Joints" article? It was a nice overview of options, but I was surprised that the lock-miter joint wasn't covered. It cuts a tight 45° miter corner with greater glue area and "locks" into place. It also eliminates the step of cutting and installing biscuits or splines.*

***—Phil Napoletan***
*Eatonton, Ga.*

The word "simple" in the article title knocked the lock-miter joint, *above*, out of contention. It's true you cut both sides of the joint with one bit setup, but both the bit height and fence position have to be juuuuuust right, which we find fussy and frustrating. And although it looks kind of cool, it offers about the same glue-surface area as a lock rabbet, so no real advantage there. But don't let us talk you out of it: Use our excellent guide to setting up the bit—and troubleshooting the results—at woodmagazine.com/lockmiter, or point your smartphone's camera at this code.

## How's it hanging?

*The Dream-time Hammock in issue 280 (March 2022) looks like a great project. However, you show hanging the hammock using a carabiner between the tree strap and the hammock ends.*

*I have used small carabiners like that for all sorts of things, but never to support any significant weight. In fact, my 60-pound basset hound straightened out a carabiner just like that one when he hit the end of the leash going full speed, and that was a straight pull! (No damage to the hound.) What testing did you do?*

***—Maurice Bresenhan, Jr.***
*Houston*

We didn't stress-test those stainless-steel locking carabiners, Maurice, but they come with the hammock-hanging kit expressly for this purpose. The manufacturer rates their capacity at 2,100 pounds, which would hold all of the people who produced that article, plus you and your basset hound (and maybe our Editorial Content Chief, if he's been intermittent fasting).

*continued on page 8*




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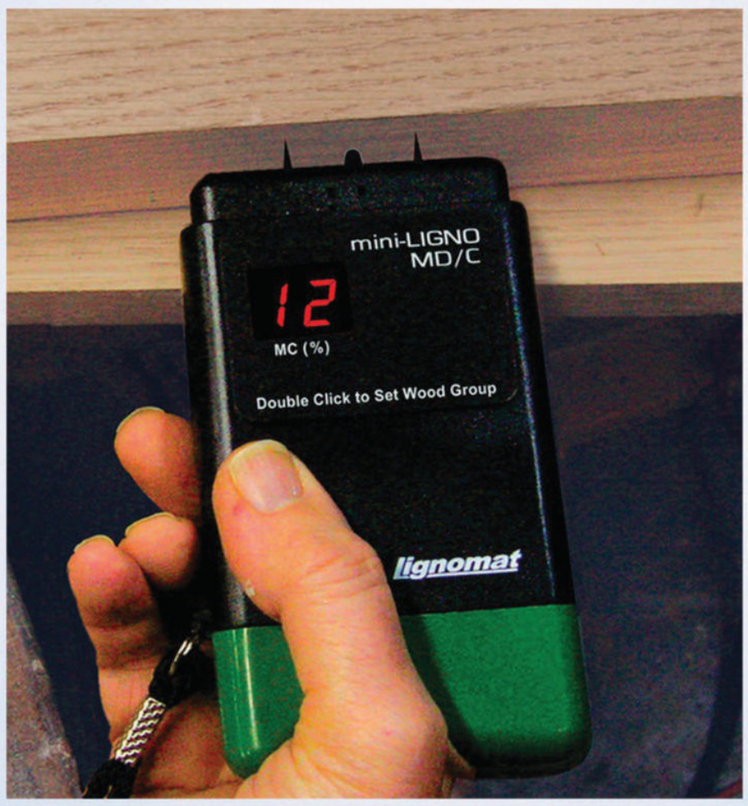


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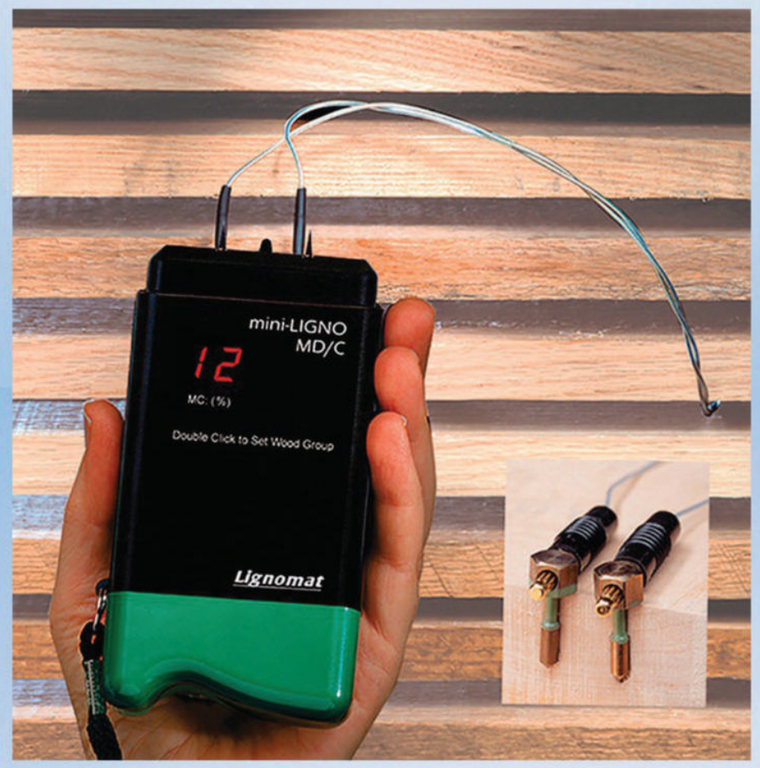


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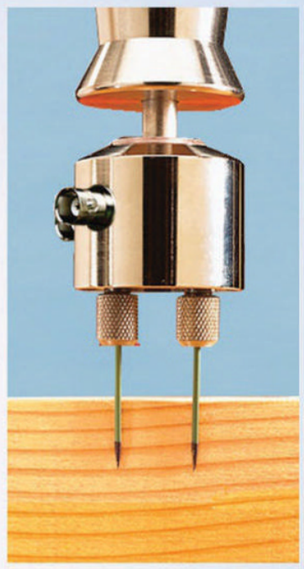

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# Sounding Board

## YOUR PROJECTS

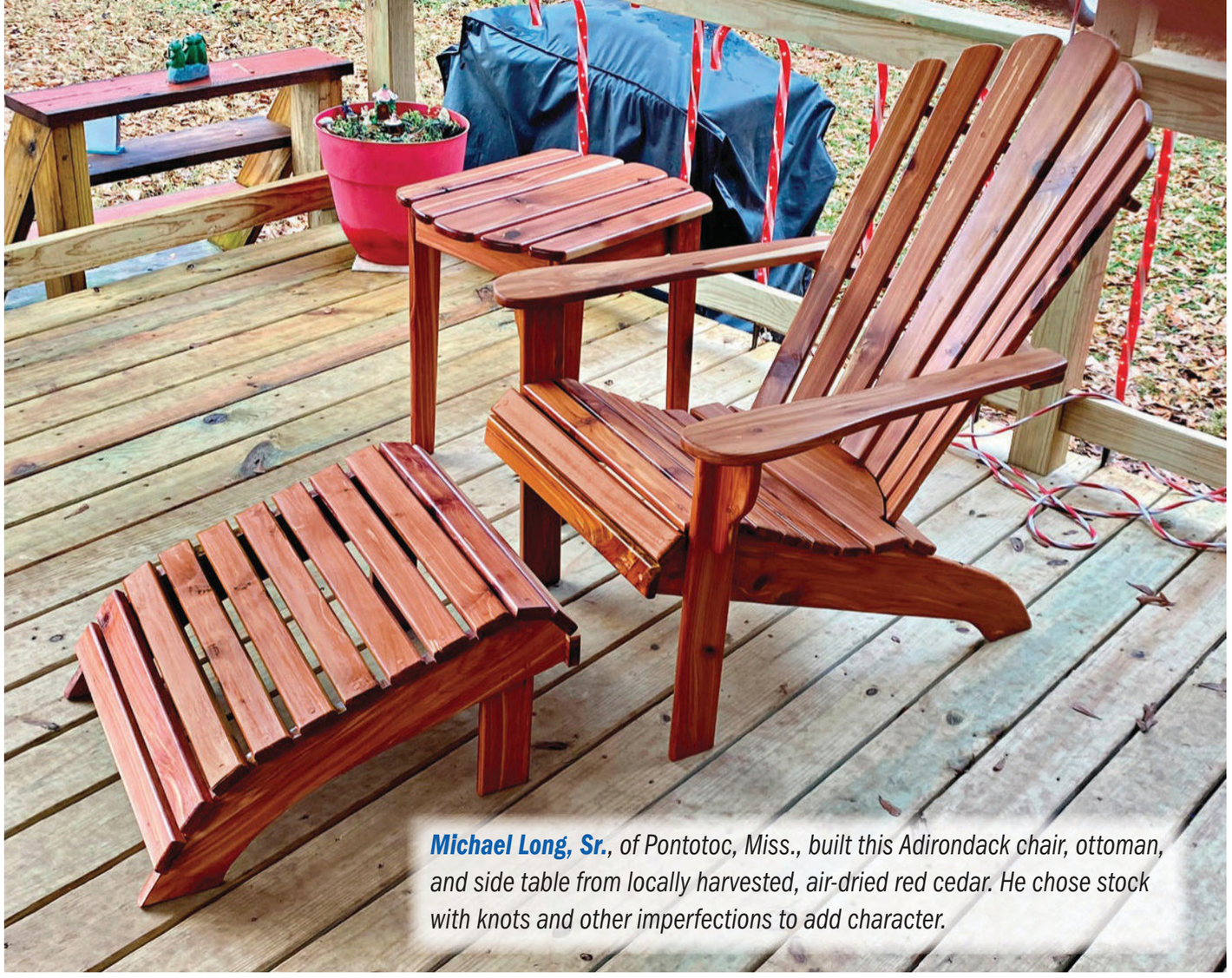
*To honor his father, who taught at Curtiss-Wright in World War II,* ***Ed Sarkisian****, of Greer, S.C., restored this airplane propeller and cowl once owned by his dad. Lost for 47 years, it was rediscovered while clearing up the estate of a family member and returned to Ed.*

*For his daughter's wedding,* ***Terry Fox****, of Robinson, Texas, designed and crafted a walnut cake pedestal that the florist filled with fresh flowers and greenery. Terry CNC-carved filigree into the corners of the removable top.*



***Ron Borg****, of Laporte, Minn., modified the Potting Shed plans in issue 273 (March 2021), upgrading to steel siding, extending the concrete pad to create a little porch, and wiring it for indoor and outdoor lights and outlets.*

*Using hardwood leftovers from his scrap bin, cabinetmaker* ***Ralph Bushell****, of Wichita, Kan., built the Stowaway Mitersaw Stand from issue 280 (March 2022) for his cordless saw. He also replaced the removable pipe legs with folding wood ones.*



***Michael Long, Sr.**, of Pontotoc, Miss., built this Adirondack chair, ottoman, and side table from locally harvested, air-dried red cedar. He chose stock with knots and other imperfections to add character.*

***Marty Soltis**, of Venice, Fla., leveled-up his home's half-bath with this stunning vanity and matching medicine-cabinet door he made from zebrawood and walnut.*

*Borrowing from the Floating-top Hall Table in issue 267 (May 2020), **Ken Hoerig**, of Grafton, Wis., created this one. Ken substituted a natural-edge walnut slab for the top and added a shelf in the ash base.*

## Send us a photo of your work

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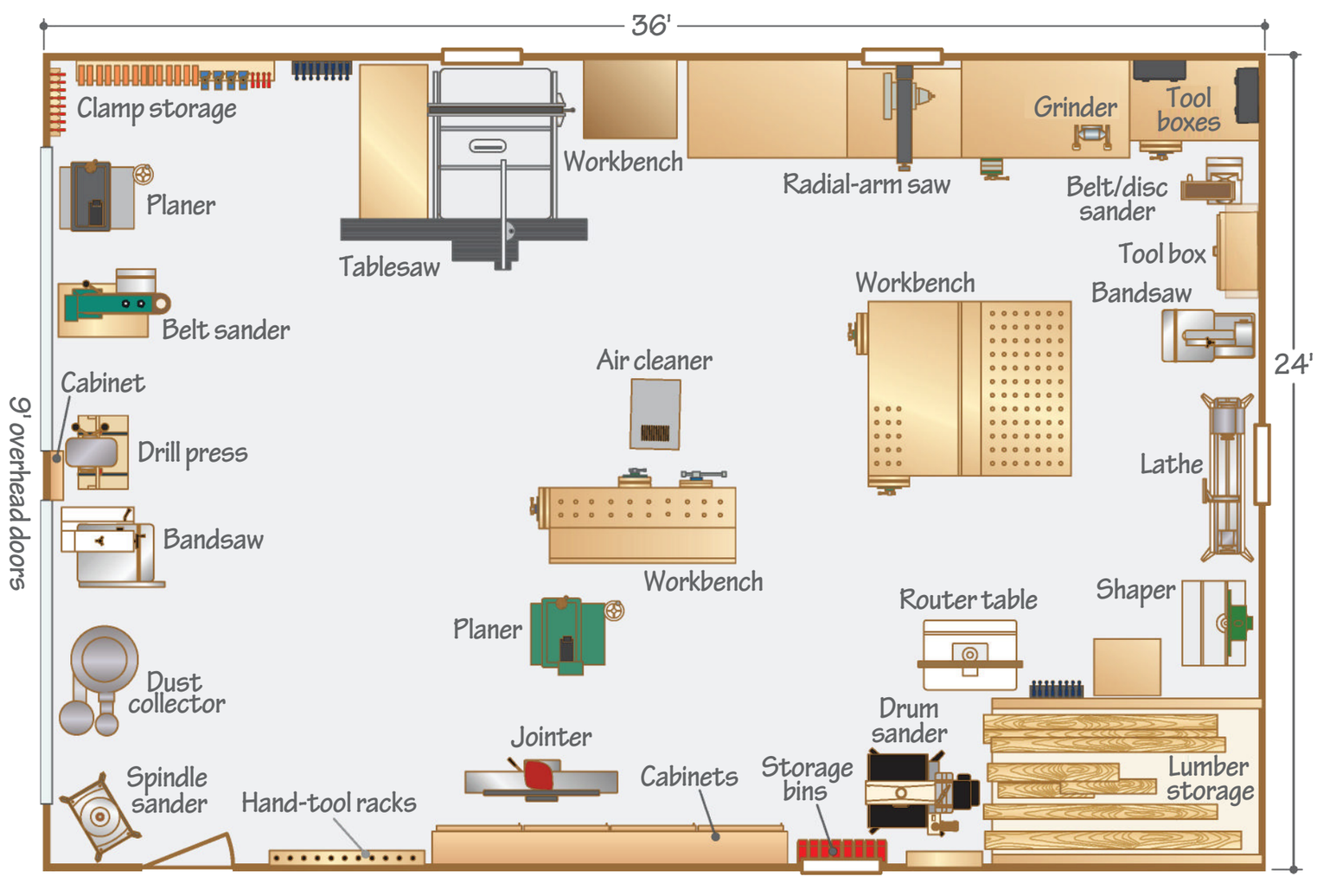
# Showboat Shop

**Dan Janke's multipurpose shop** serves as a classroom, boat-restoration dry dock, and the seat of his chairmaking activities.

When Dan Janke learned *WOOD*® magazine would be featuring his shop, his first response was, "I'll have to move the boat out of the shop so my wife, Judy, can take photos." Fortunately, the 1937 Chris-Craft, which he has been restoring in the midst of chairmaking and other woodworking projects, fits through one of the shop's two 9' overhead doors.

After moving into their current residence, Dan set about improving the shop building, erected in 2005 by the previous owner. One of his first tasks was to rip the old pegboard off the walls. (He admits he strongly dislikes pegboard.) After installing insulation, he sheathed the walls with tongue-and-groove car siding, which provides a solid substrate for his French-cleat system and cabinets. He also converted all of the lights to brighter, energy-efficient LED fixtures.

A variety of shop-made, portable storage boxes hangs on French cleats on the wall and the backs of Dan's workbenches. With this



**Dan's traditional woodworking benches** and a large assembly table offer plenty of space for project staging and assembly.

**Portable storage boxes mounted on French cleats** secure tools such as drills, sanders, and pocket-hole jigs, plus all their accessories.

▶Learn how to make and use a French-cleat system at woodmagazine.com/frenchcleats

system, he keeps the right set of tools at hand without cluttering the benchtops. Dan built the boxes using dovetail and box-joint construction. He discovered that the boxes, which he originally built to replace the plastic, blow-molded cases his tools came in, offer more versatility as a modular storage system.

Dan makes use of all the wall space. A custom cabinet, or till, holds many of his hand tools, including planes and saws. Various racks along the walls keep lathe tools, screwdrivers, wrenches, and many other items within easy reach.

The workshop doesn't lack for bench space. A large assembly table, with dogholes and T-track in the MDF top, makes glue-ups and clamping easy tasks. Three stand-alone benches, plus the long bench that houses his radial-arm saw, incorporate seven vises, all of which are used for the woodworking



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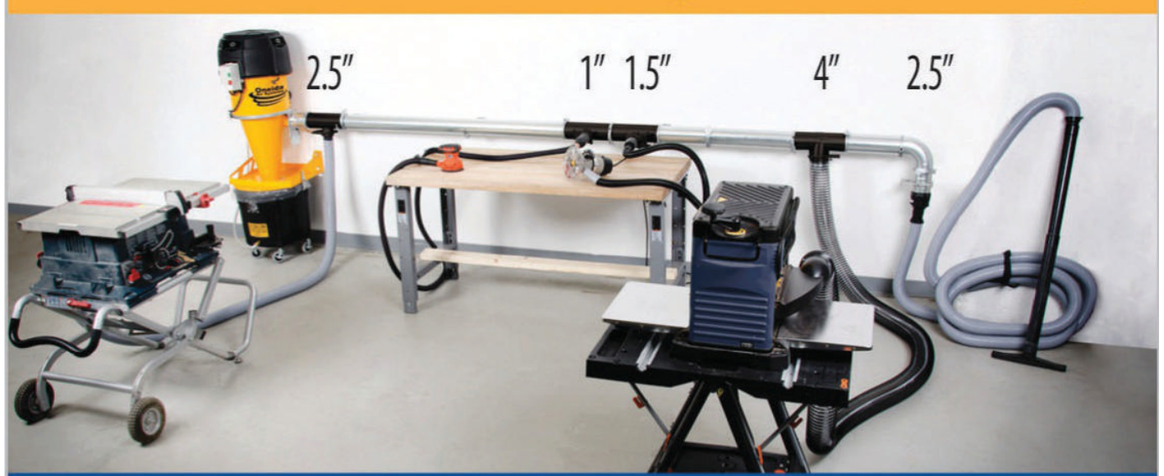


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# Sounding Board

## YOUR SHOP

**A saw till keeps Dan's tools within easy reach** while protecting them from damage. His most-used hand planes fill in the remaining storage space.

**Dan has been restoring this 1937 Chris-Craft boat** for almost a decade.

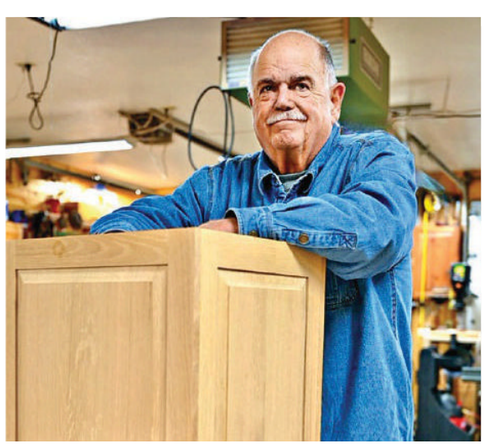
classes he teaches. "Once a year I teach a group of four to five senior-citizen students, focusing on the use of hand tools," Dan says.

Dan keeps his radial-arm saw locked in to make perfect 90° crosscuts: Its primary task is breaking down stock into rough lengths. He relies on it so much, he gave away his sliding compound mitersaw.

A natural-gas heater keeps the shop warm during Wisconsin winters. During the summer, opening the overhead doors keeps the shop at a comfortable temperature. He finds the electrical service installed by the previous owner—a 12-breaker box with 110- and 220-volt circuits—sufficient for his needs.

Dan has maximized every bit of space in his 860-square-foot shop. And when he finally finishes his boat restoration, there's no doubt he'll enjoy having even more space in which to maneuver, and build other projects that have been on his long to-do list.

**This oak toolbox** keeps Dan's chairmaking tools organized and easily accessible. A similar toolbox, made of butternut, protects other planes and hand tools.



**Dan Janke learned woodworking from his father** and has been at it for over 70 years. He is eager to share his knowledge. He retired after 34 years working for a major food company.

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**Composite decking comes in** a variety of colors, including wood tones. Textured lines pressed into the surface of the material during manufacture simulate the look of wood grain.

# Hit the deck for your next project?

**Q** The last time I was in my local home center, I noticed a stack of composite decking that looked a lot like real lumber. Would it be suitable to use for woodworking projects?

*—Delbert Shumaker, Valparaiso, Ind.*

**A** The answer to that question depends on your intended use, Delbert. Composite decking is made from a mixture of wood particles and a plastic binder that is compressed or extruded into boards. This yields a water-resistant product that doesn't require a finish. And as you discovered, some composite decking bears a striking resemblance to real wood. But before you start building your next highboy or grandfather clock out of this material, consider these characteristics.

For starters, composite decking weighs about 45% more than pressure-treated lumber. At the same time, it falls short of real wood in structural strength. Consequently, composite decking tends to sag over time, especially when not adequately supported over long spans, such as you might find in a bookcase or dining table. You also won't find a lot of choices in material thickness, which may limit design options. And most composite decking boards have slightly crowned surfaces, to shed water. For all these reasons, it makes a poor choice as a material for indoor furniture projects.

But for some outdoor projects, such as planter boxes, benches, Adirondack chairs, or even cornhole games, composite decking makes a lot of sense. Its resistance to water and rot helps it stand up to the elements better and last longer than wood. And you won't have to deal with refinishing.

Cut, plane, drill, rout, and even sand composite decking like real wood. Assemble projects with stainless steel screws, or if you need an adhesive, use a 4-hour epoxy. Finally, be aware that composite decking can become uncomfortably warm when exposed to direct sunlight on a hot day. To avoid burning your backside, place chairs or seating made from composite decking under shade, or use seat cushions.

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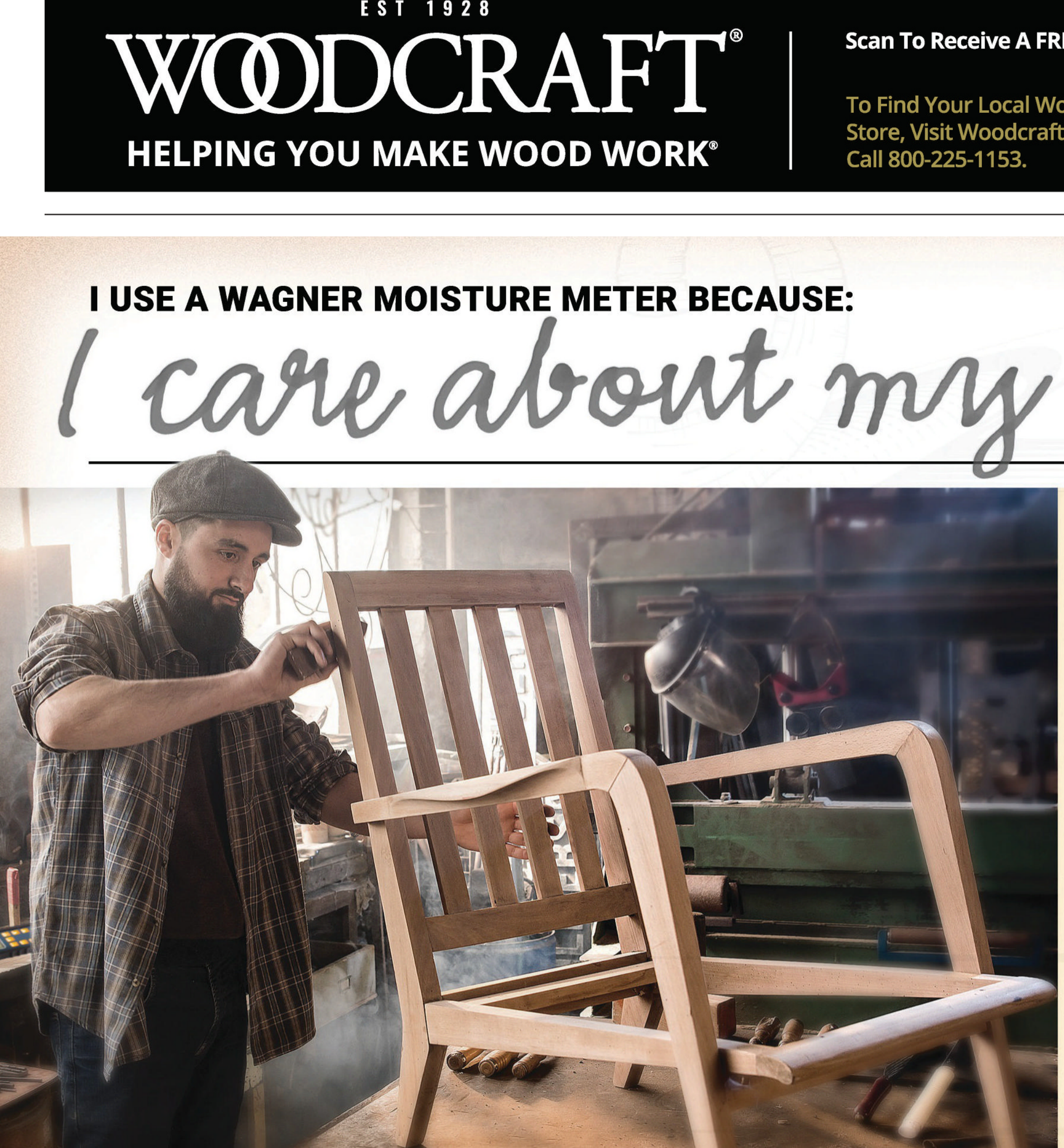

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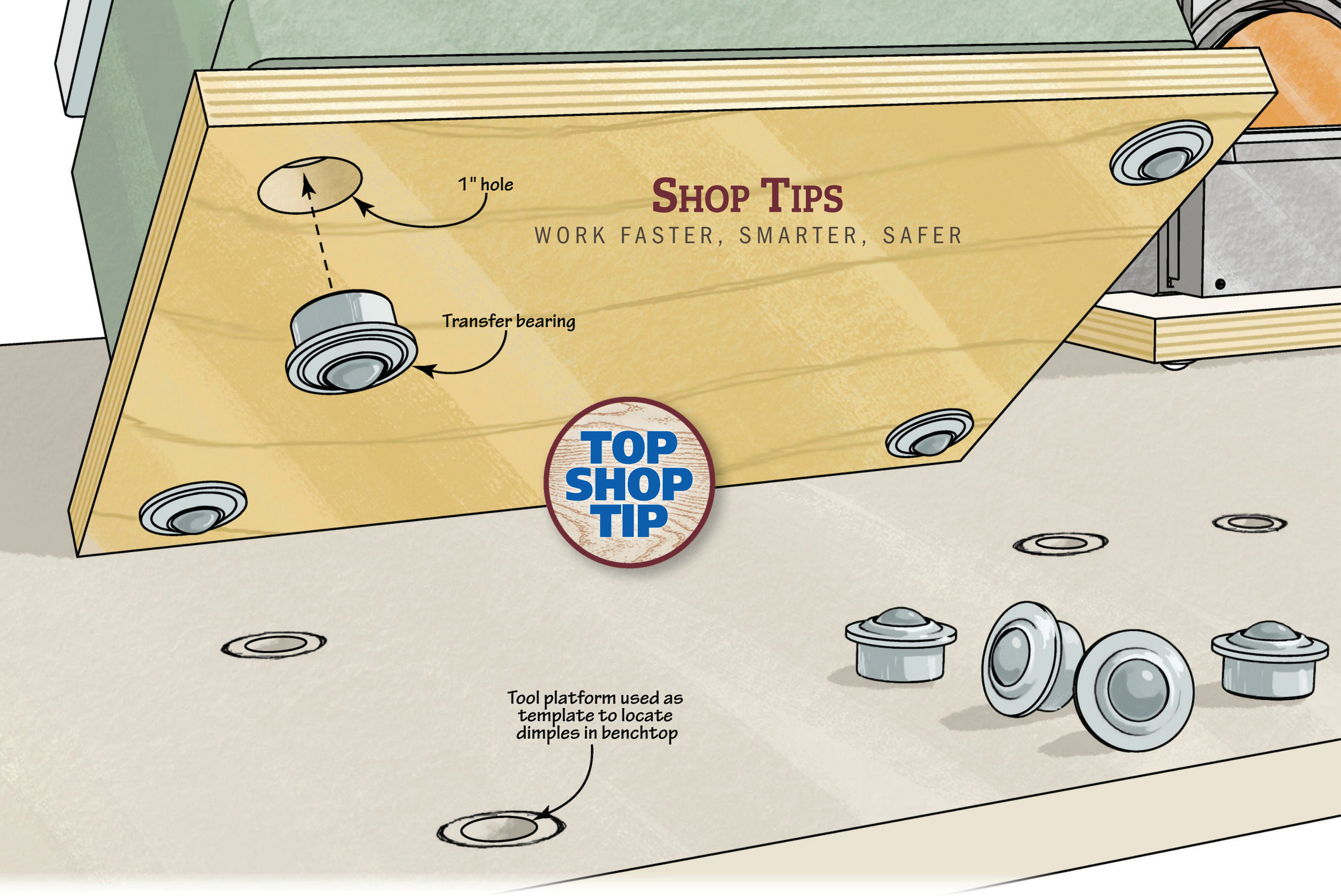


TOP SHOP TIP

## Get your bearings before using benchtop tools

To make it easier to move my benchtop tools out of the way but still lock them in place during use, I came up with a method that uses transfer bearings, like those shown *above*. One bearing in each corner of a plywood platform makes it easy to roll the tool around the benchtop; they drop into dimples in my bench to secure the tool during use.

I started by drilling a 1" hole in each corner of a platform sized at least a couple of inches larger than the tool base. The platform then serves as a template to rout the dimples using a 1"-O.D. guide bushing and a 5/16"-radius core-box bit. I fitted the bushing in each platform hole and plunged to create a dimple about 3/16" deep.

The bearing housing diameter is slightly less than 1" so I secured them in each platform with epoxy. Placing the assembly with the casters engaged in the dimples on the benchtop, I let the epoxy set before mounting the tool to the platform.

*—John Godak, Idaho Falls, Idaho*

▶Get the bearings and a router bushing set.
woodmagazine.com/transferbearing
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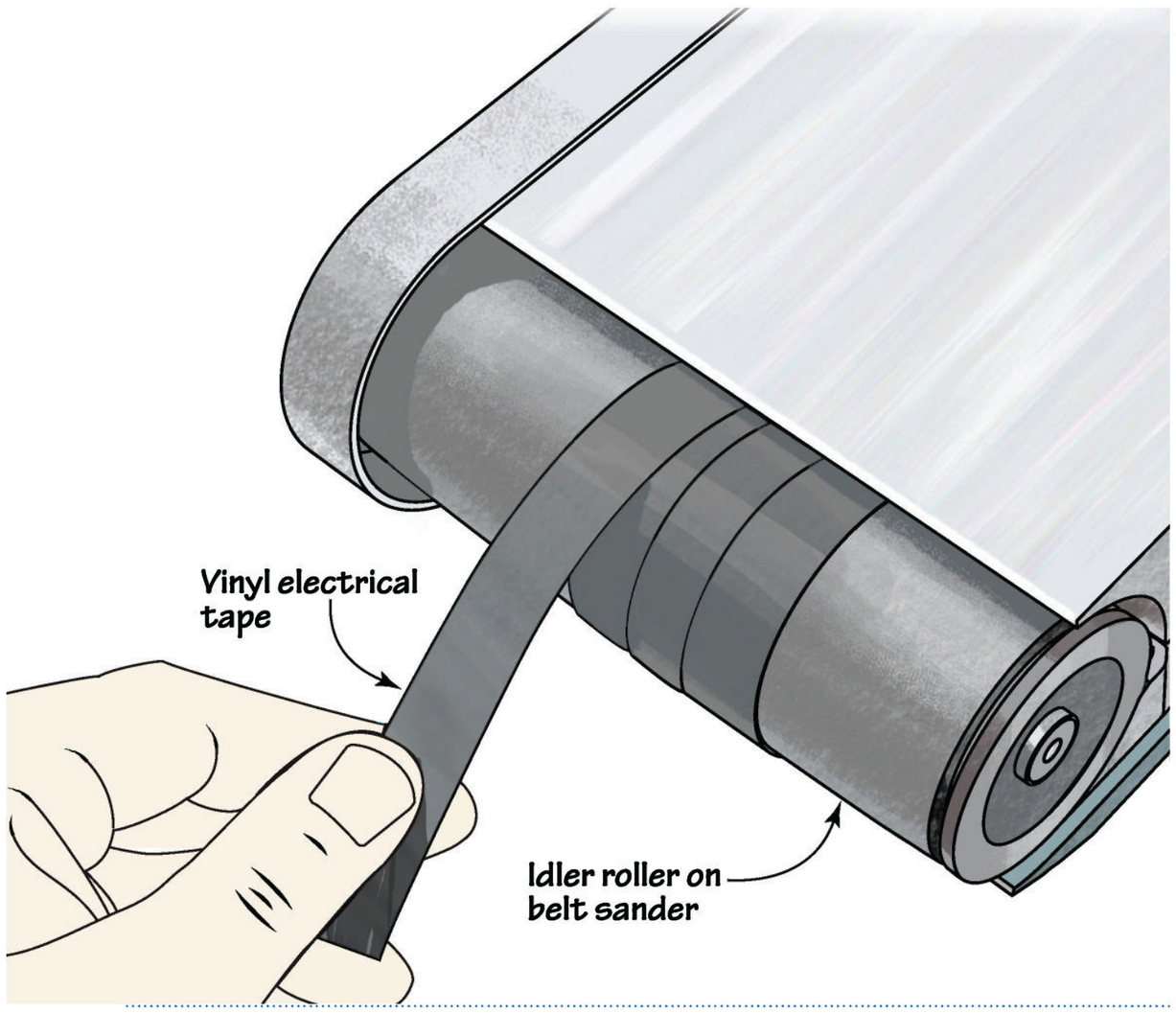
Because we try to publish original tips, please send yours only to *WOOD*® magazine.

*For sending this issue's Top Shop Tip, John receives a selection of tools from Irwin valued at $600.*

## Tape tames belt tracking

Sanding belts on my stationary belt sander consistently slipped off the roller despite my attempts at adjusting the tracking. After discovering that most sander rollers—but not mine—have a crown in the center, I wrapped a few turns of vinyl electrical tape around the center of the idler roller. It doesn't take much to create a crown. Just make sure to wrap the tape in the same direction as the belt rotation to keep it from working loose. The tape lasts a long time before it needs to be replaced.

*—Scott Hunter, Chicago*



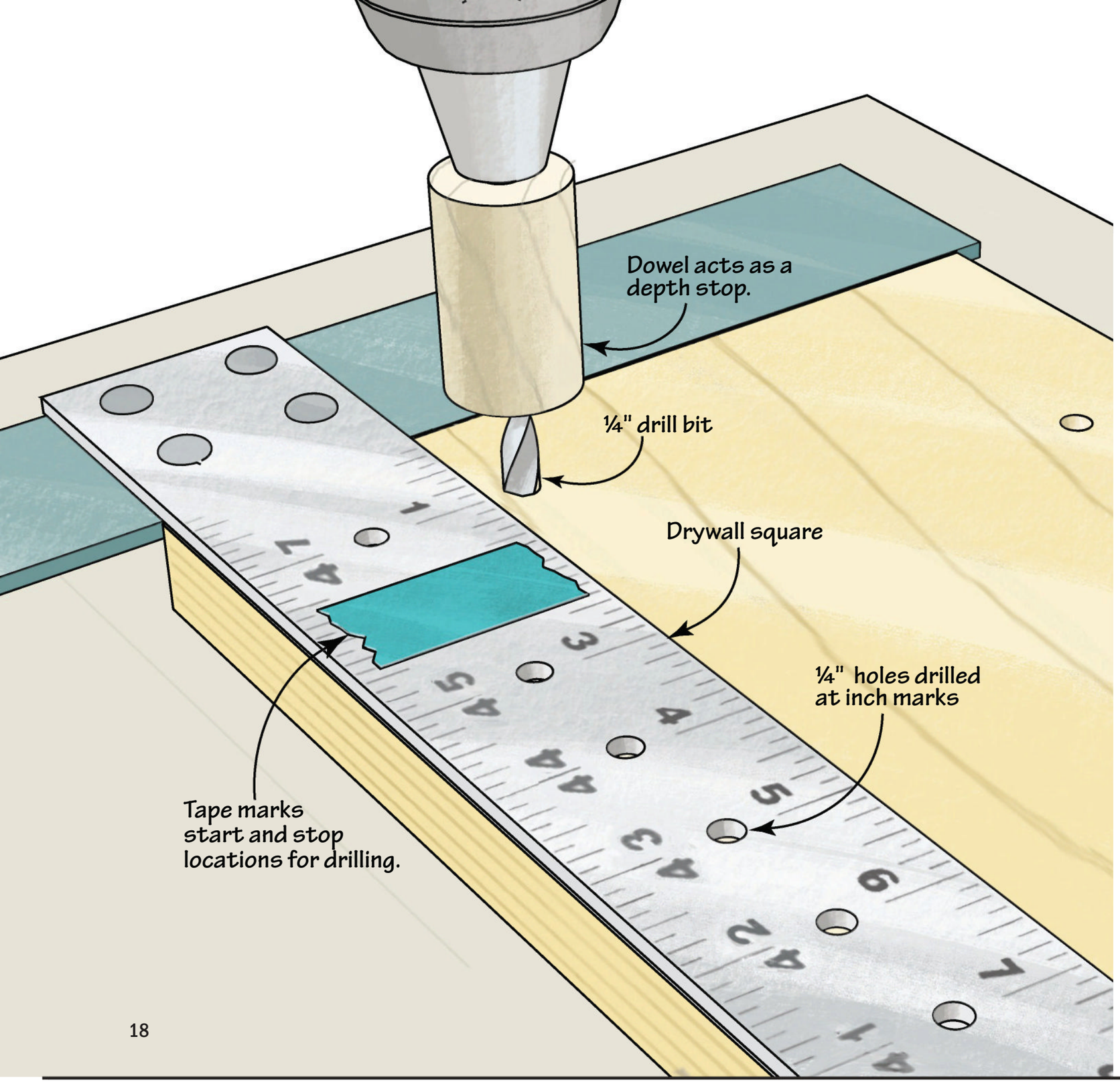

## Watch your noise levels in the shop

My Apple Watch features a Noise app that monitors surrounding sound levels. The watch vibrates and shows a notification if the decibel reading exceeds a specific level for a set amount of time. The app reminds me to reach for hearing protection if the noise level climbs.

The watch also serves many other useful functions in the shop. I can verbally ask it to solve math problems, set timers for finish or glue application, and convert measurements between metric and imperial units, just to name a few examples.

*—Sean Cowan, Columbus, Ohio*

*continued on page 18*




## For rows of round holes, turn to a square

When faced with drilling a long run of holes for shelf pins, the cost of commercial jigs gave me a bad case of sticker shock. So instead, I modified a drywall T-square (less than $15) from a home center. Its 4' length covers a lot of ground. I drilled ¼" holes at every inch mark, centering them on the 2" width of the square's blade.

When drilling the holes for shelf pins, I slip a length of dowel over my bit as a depth stop to ensure all the holes are a consistent depth. Painter's tape comes in handy to mark the start and stop points for the row of shelf-pin holes so I don't accidentally drill beyond them. I also use the tape to cover intermediate holes for spacing greater than 1" between holes.

*—Tom Cowles, Mechanicsville, Va.*



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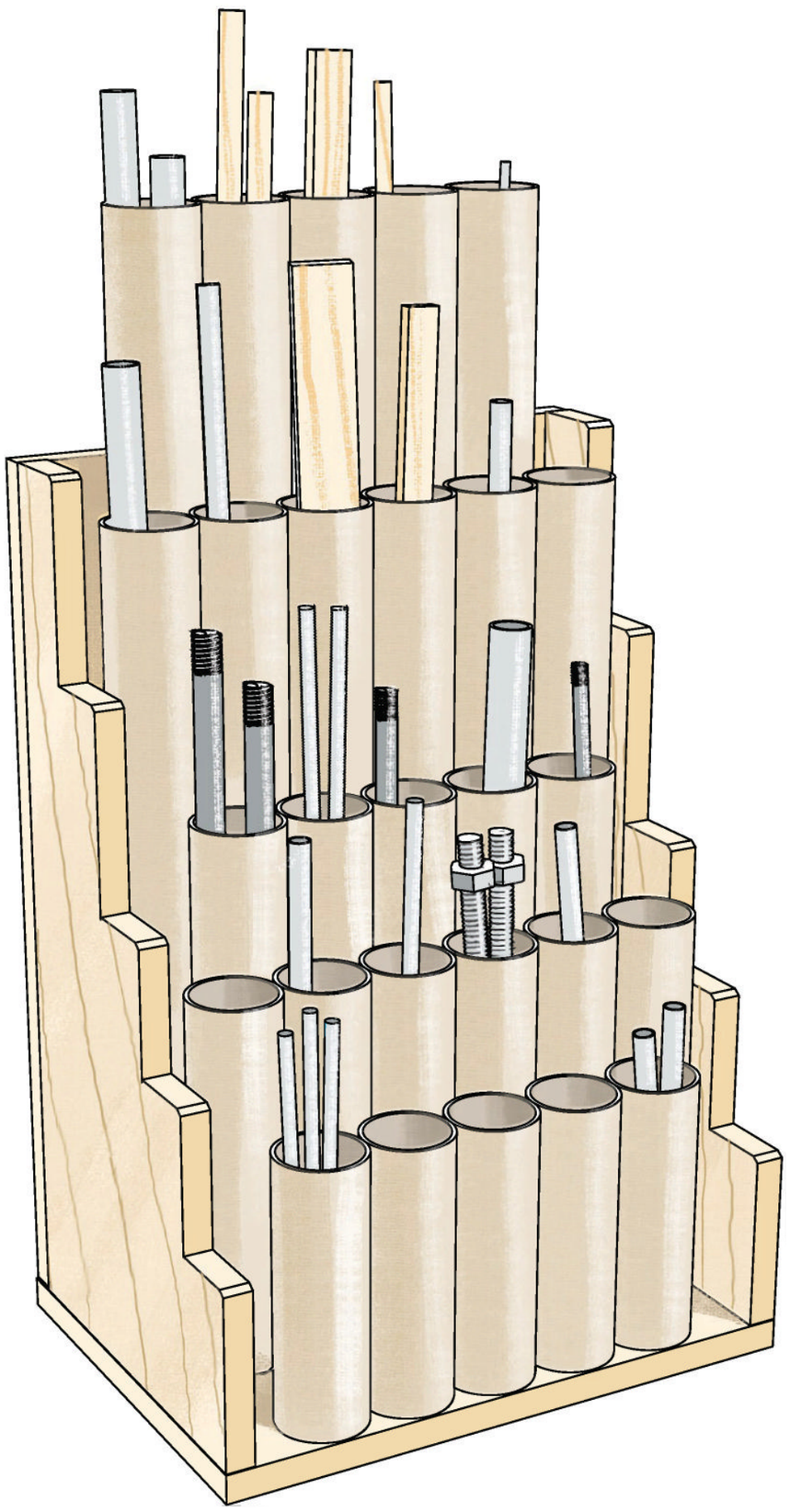

## Totally tubular storage rack for slim stock

Cardboard shipping tubes make great storage racks for dowels, thin cutoffs, threaded rod, bar stock, continuous hinges, and other long pieces. You can find the tubes at shipping centers or online in a variety of diameters and lengths. The ones I used measure 2" in diameter and 36" long.

Use your mitersaw for square ends and cut the tubes to a variety of lengths. Clean up the cuts by sanding lightly with 120-grit sandpaper in the direction of the paper coil.

Lay out the cut tubes in a configuration that works best for you. Fasten uncoated tubes together with wood glue. For coated tubes, use construction adhesive.

Build a rack to corral the tubes and provide a closed bottom. Mount the rack to the wall for easy access.

*—James Dominick, Horseheads, N.Y.*

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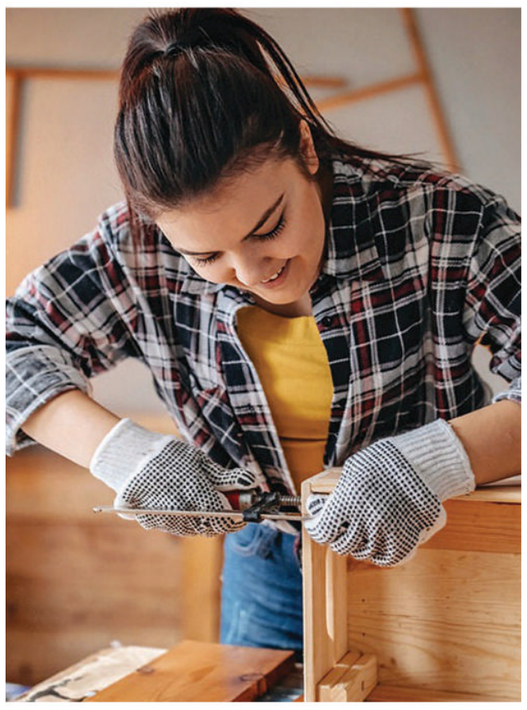

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# Beaded-leg End Table

## One good turn deserves another (or three).

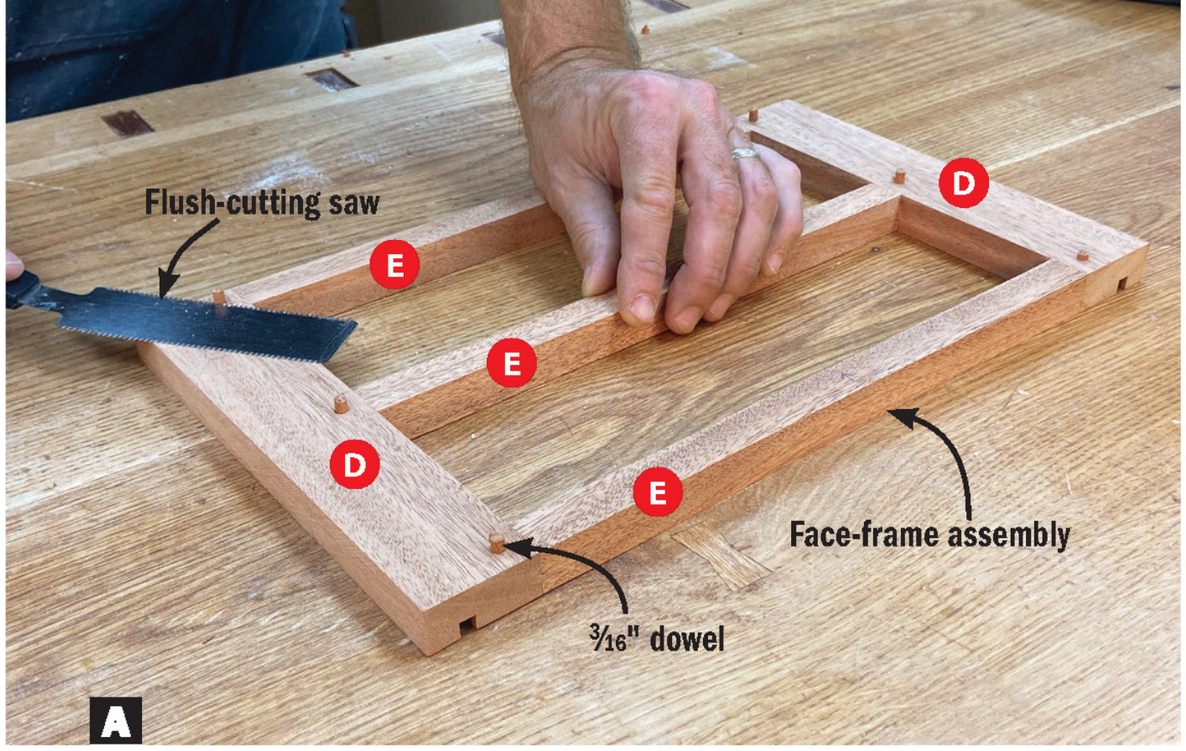
Turning a set of matched legs can intimidate even an experienced turner. But even with a "matched" set, the legs don't have to be truly identical, just passably similar. In fact, slight differences between the legs testify to the handcrafted nature of a project.

The legs on this end table feature a combination of beads, tapers, and curves that require only basic turning skills repeated over and over. By the time you finish, you'll be a turning whiz.

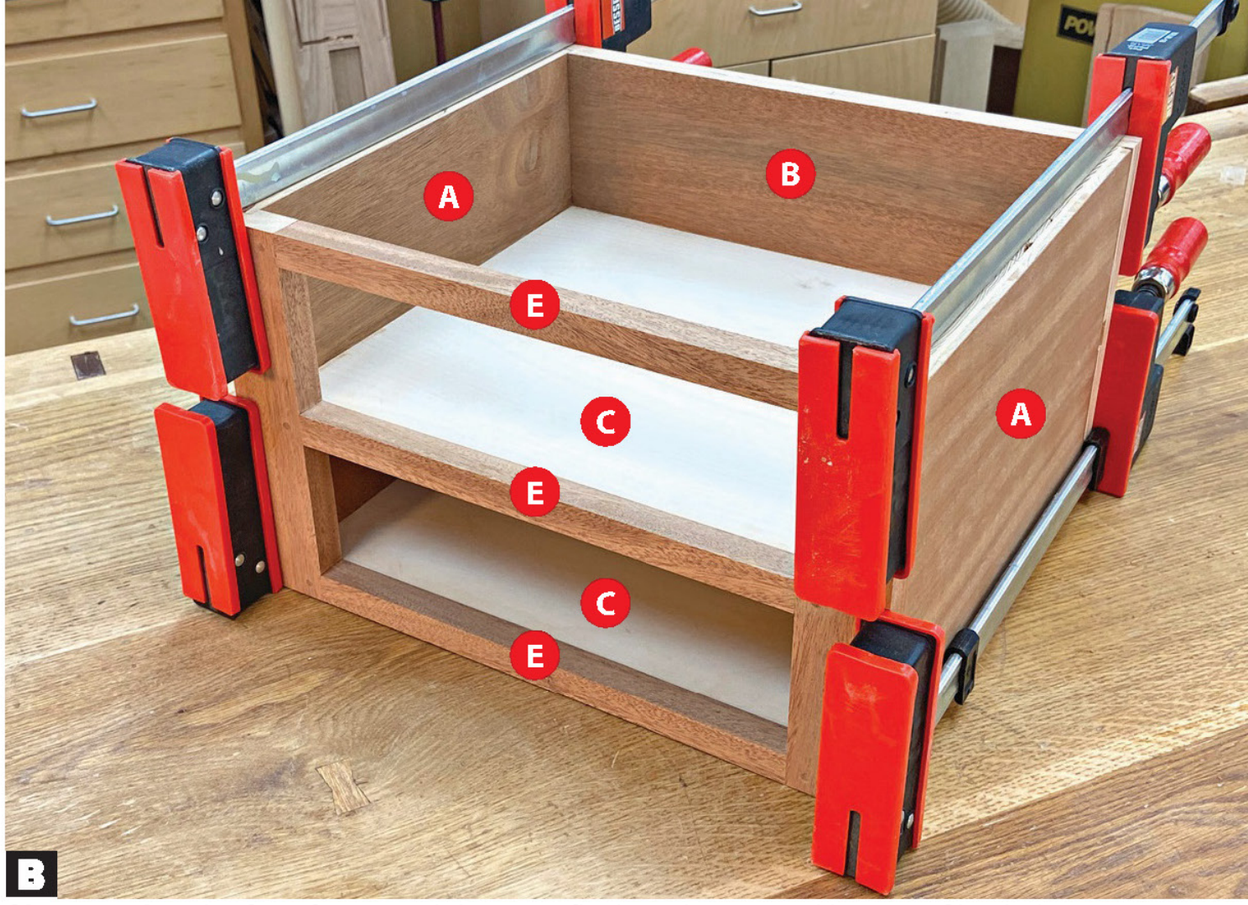
**DIMENSIONS:**
17¼" W × 15¼" D × 28¼" H

Approximate materials cost:
**$350**
Lumber and hardware

**24**
Turned beads




**Trim the dowels flush with the face frame** using either a flush-cutting saw or a chisel.




**Glue together** the face frame and the case flush at the top and bottom. Check the assembly for square.

▶Can't find mahogany plywood? Make your own. woodmagazine.com/veneersmallpanels

## Square off with the case

**1** From ¾" plywood (we used mahogany), cut to size the case sides (A) and back (B) [**Drawing 1, Materials List**].

**2** On the sides and back, cut the grooves, dadoes, and rabbets [**Drawings 1a, 1b**], matching the ¾" rabbets and grooves to the thickness of your plywood.

**3** Dry-assemble the case, then cut to fit and install the case dividers (C) in the grooves and rabbets (no glue). Leave the case dry-fitted for checking the face frame later.

**4** Cut to size the stiles and rails (D, E). Form mortises in the stiles and cut tenons on the ends of the rails to match [**Drawing 1c**]. Glue up the face frame.

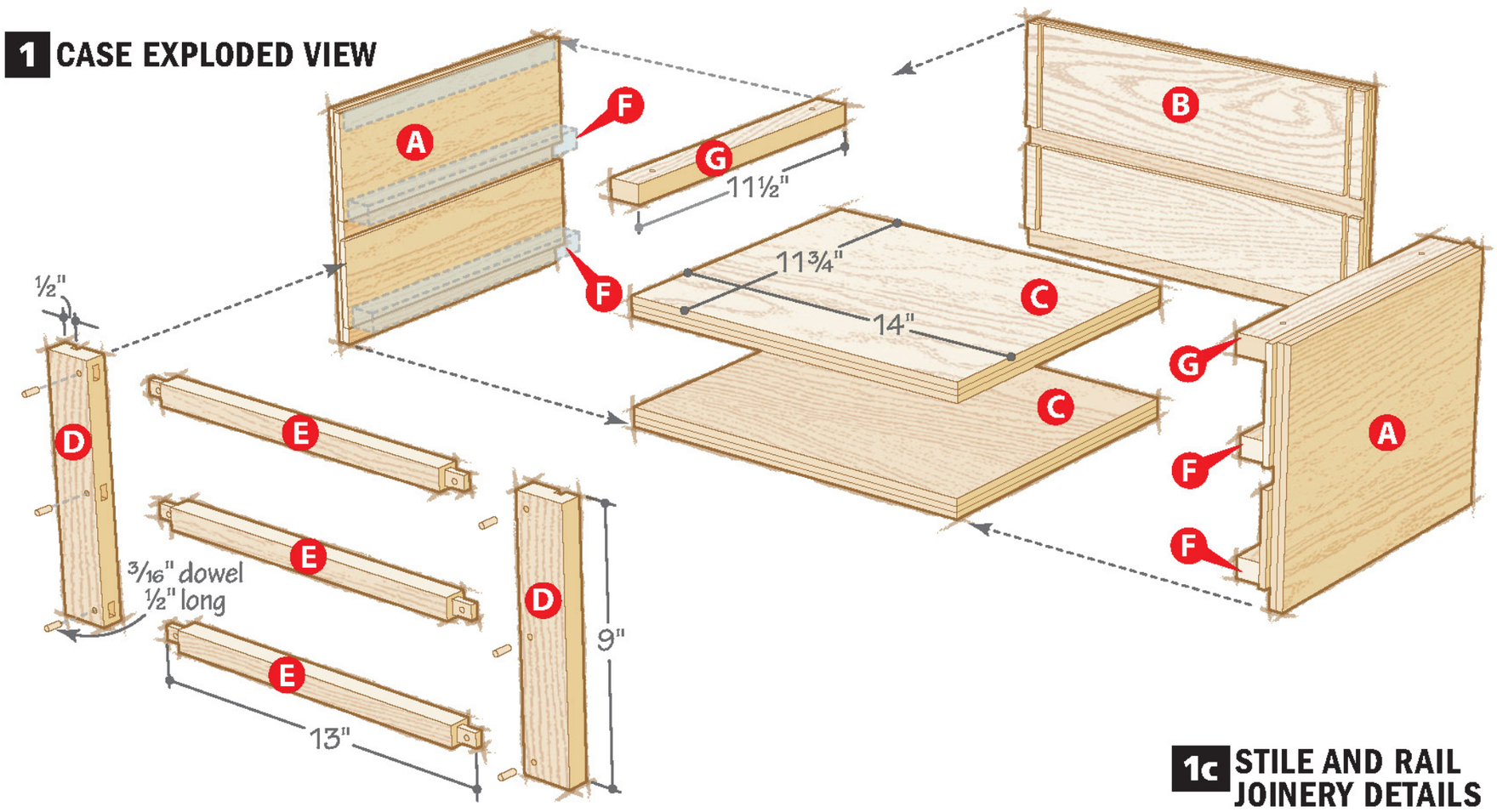
**5** With the glue dry, cut grooves on the back of the face frame (D/E) to fit the tongues on the case sides (A).

**6** Drill holes in the face frame [**Drawing 1c**] and glue in dowels. Trim the dowels flush [**Photo A**].

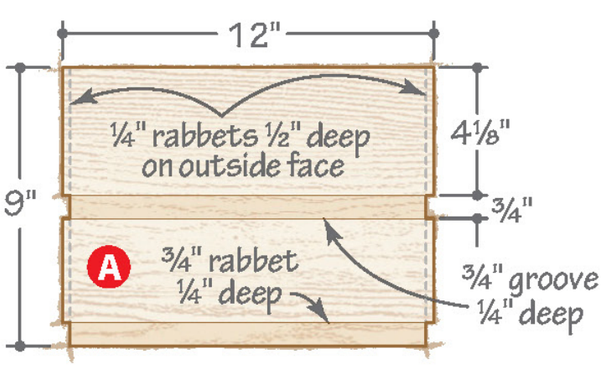
**7** Glue and clamp together the case (A/B/C) and face frame [**Photo B**].

**8** Cut to size the drawer guides (F) and top cleats (G) [**Drawing 1**]. Drill oversize, countersunk holes in the cleats. Glue and clamp the guides and cleats to the case.

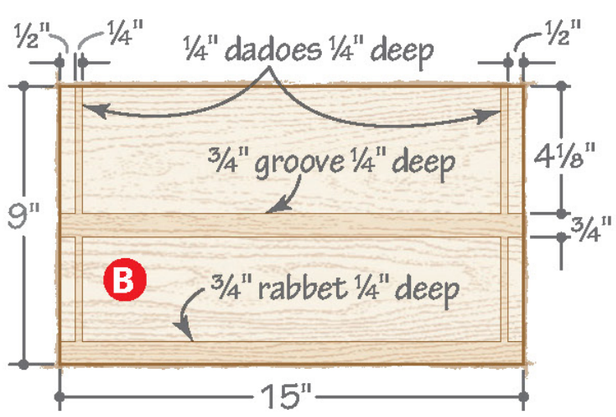
**1 CASE EXPLODED VIEW**



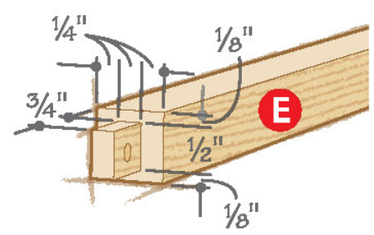

**1a SIDE (Inside face shown)**

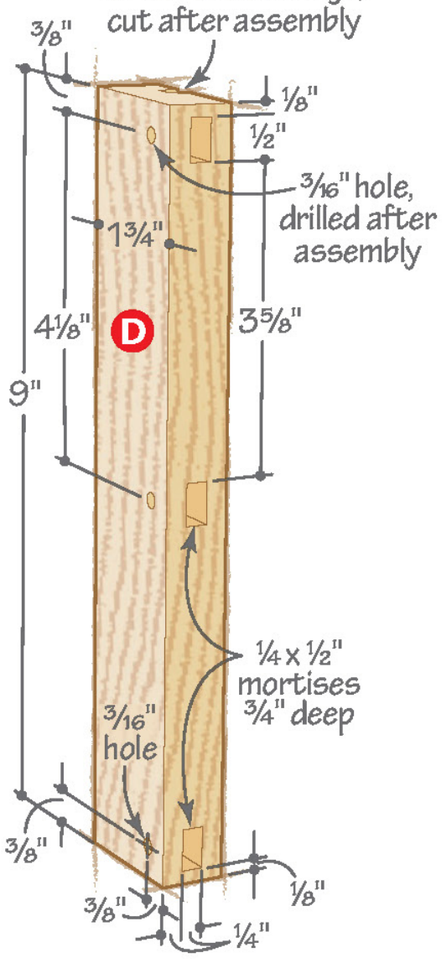



**1b BACK (Inside face shown)**

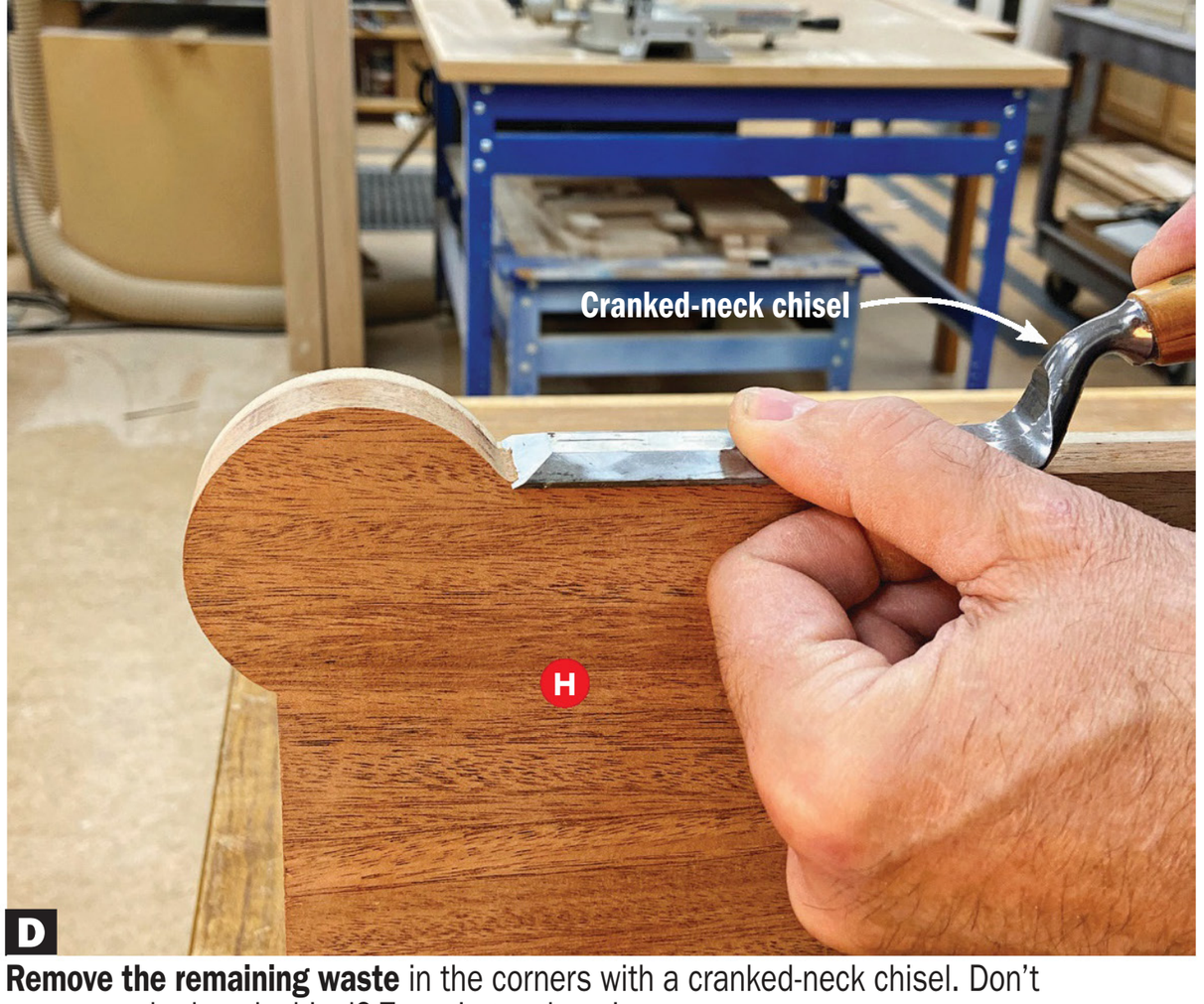



**1c STILE AND RAIL JOINERY DETAILS**

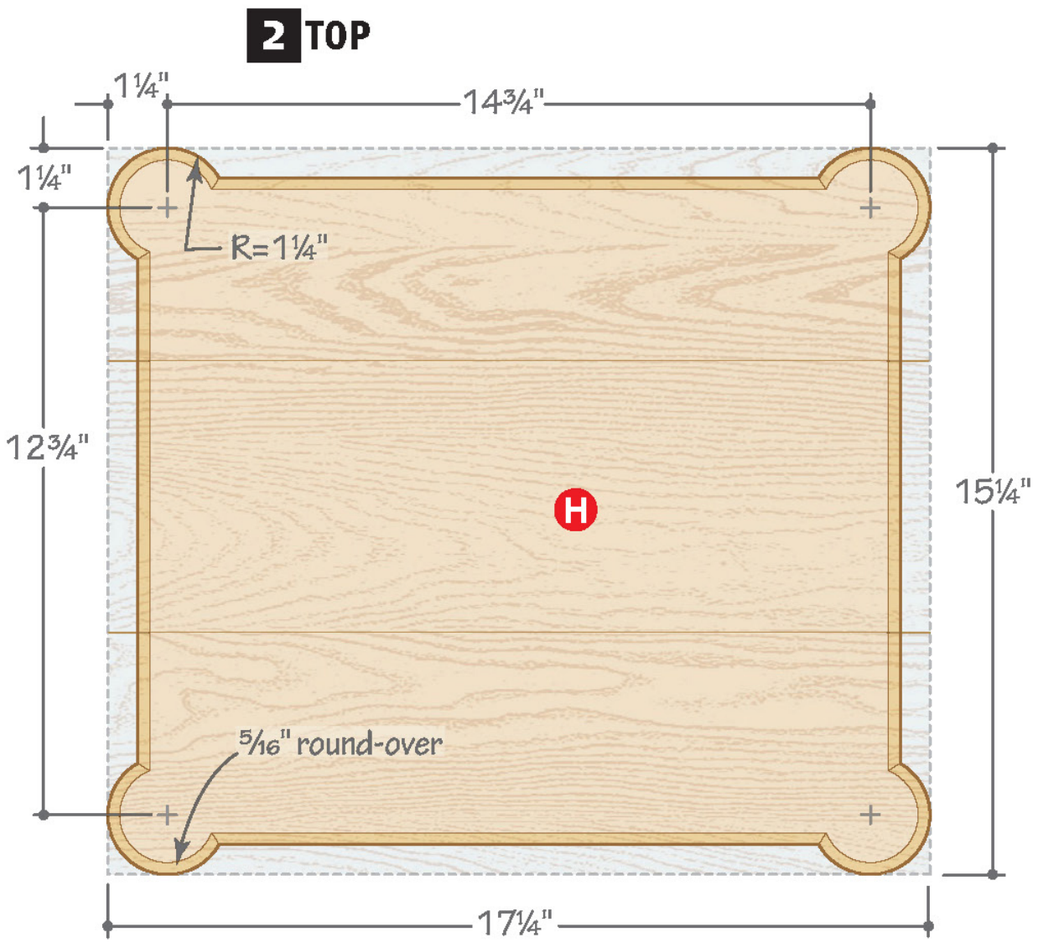


**Using a flush-trim bit,** rout the waste from the edge of the top (H).




**Remove the remaining waste** in the corners with a cranked-neck chisel. Don't own a cranked-neck chisel? Try using a plane iron.







**Using an auxiliary miter-gauge fence** to back up the cut, rabbet the ends of the drawer front (J) first, then the edges.

Watch a video on routing with templates. woodmagazine.com/templaterouting

***Tip!*** *To round over the edges of the top (H), raise the bit just high enough to leave a 1/32" flat for the bearing to ride against when routing the opposite face.*

## Drop the top and your drawers

1 From 5/8"-thick mahogany stock, glue up a 16×18" blank for the top (H).

2 Make a hardboard template of the top [**Drawing 2**], and affix it to the blank with double-faced tape. Bandsaw the top (H) to shape, staying just outside the template. Trim the top flush [**Photo C**], then square the corners where each radius meets the flats [**Photo D**].

3 Finish-sand the edges of the top, then round over the top and bottom faces [**Drawing 2**]. Use sandpaper to blend the round-overs in the corners.

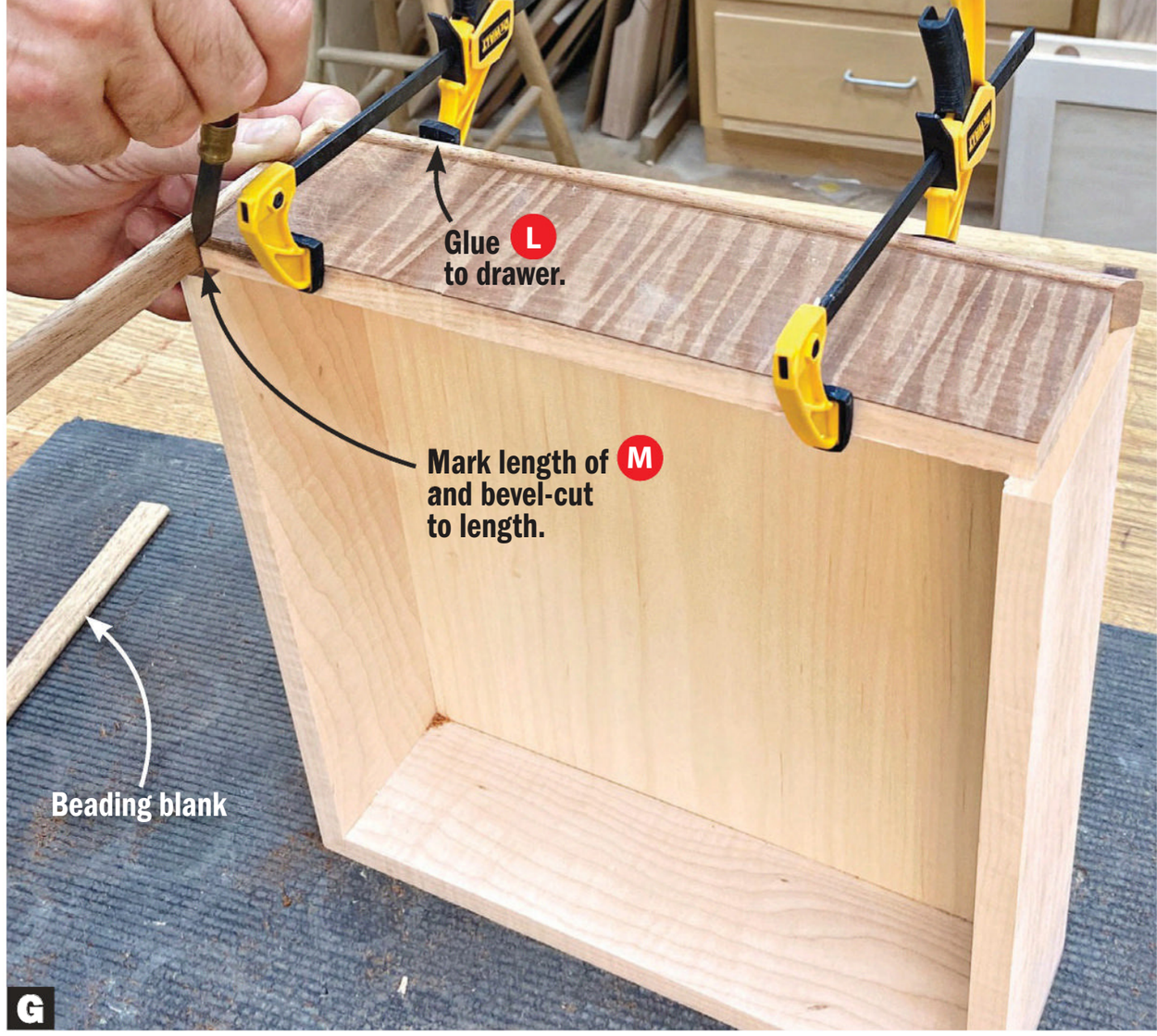
4 Measure the inside depth of the case and cut to size the drawer sides (I) and fronts and backs (J) [**Drawing 3**]. Groove all the parts and rabbet the fronts and backs. Cut the bottoms (K) to size and glue up the drawers.

5 Using a dado blade, rabbet the front face of the drawers [**Photo E, Drawing 3a**].

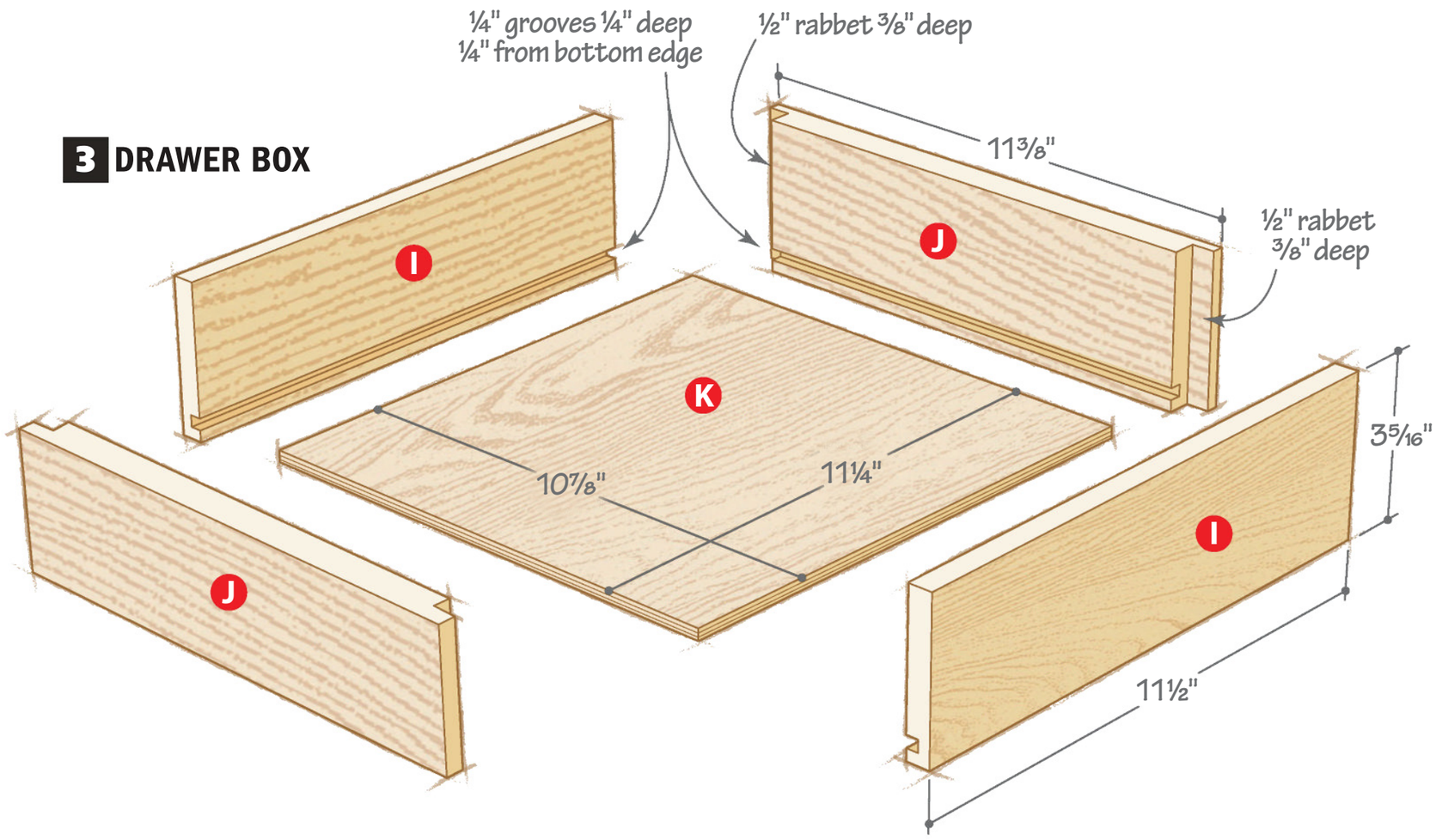
6 Cut a piece of veneer ¼" oversize in each direction to cover each drawer front. Glue the veneer in place, centered on the drawer fronts and overhanging the rabbeted ends and edges. Trim the veneer flush with the drawer fronts [**Photo F**].

***Note:*** *Size drawer so drawer front is flush with face frame.*

**Install a flush-trim bit** in your router and trim the overhanging edges of the figured veneer.



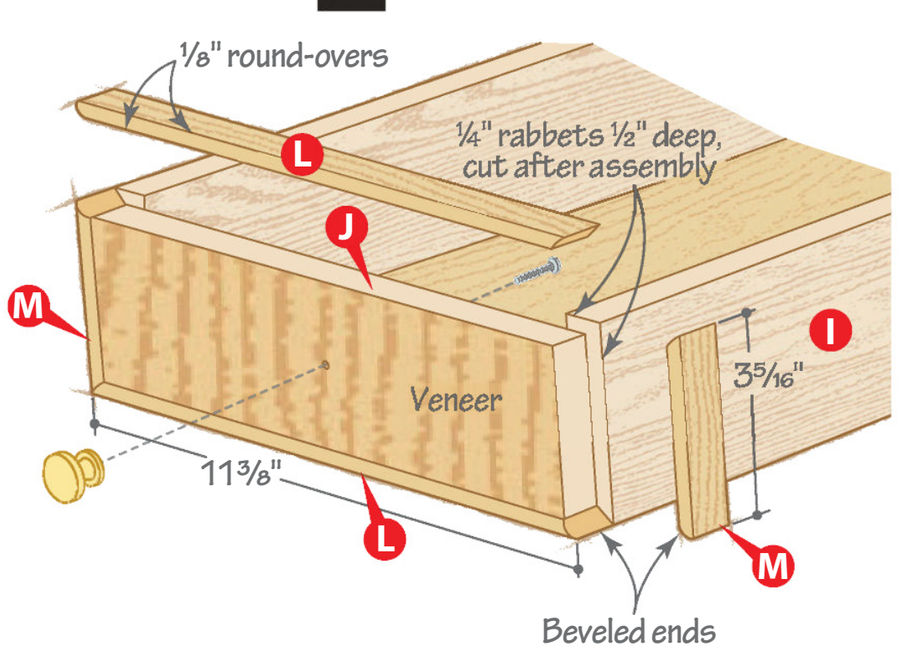

**Dry-fit a beveled beading in a rabbet,** butt the beveled beading blank against it, and mark the length. Bevel-cut the beading blank to length, then repeat as you work your way around the drawer.




**7** From ⅝"-thick stock, rip four ¼×18" blanks for the beading (L, M). Round over one edge of the blanks on both faces [**Drawing 3a**].

**8** Finish-sand the drawer fronts. Bevel-cut and install the horizontal and vertical beading (L, M) [**Photo G, Drawing 3a**].

**9** Drill a centered knob hole in each drawer front and finish-sand the remaining drawer parts.



**Use the kerfs in the story stick** to register your pencil while transferring the locations to your leg blank.

## For legs, turn four

***Tip!*** *Instead of continually resetting your calipers, make a series of hardboard gauges with semi-circular cutouts to size the various leg diameters.*

Before turning the legs of this table, build your confidence by gluing up scrap and turning just a portion of the leg shown, such as the upper half, several times.

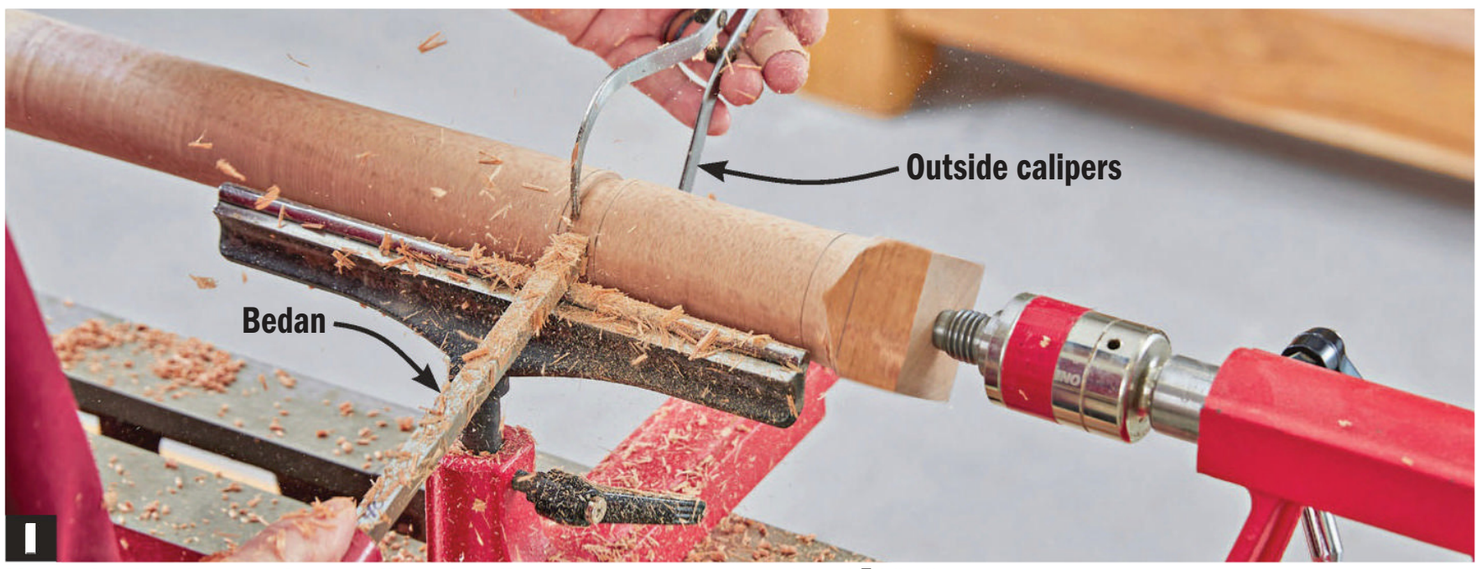
**1** Make a story stick with key dimensions so you can lay out each leg identically [**Drawing 4**]. Using a handsaw, cut a ⅛"-deep kerf at each dimension.

**2** Plane four 2⅛×2⅛×30½" blanks for the legs (N). To shape the legs, start by rounding each blank into a 2"-diameter cylinder, leaving the last 1½" at both ends square. Transfer the locations from the story stick to the leg blank [**Photo H**].

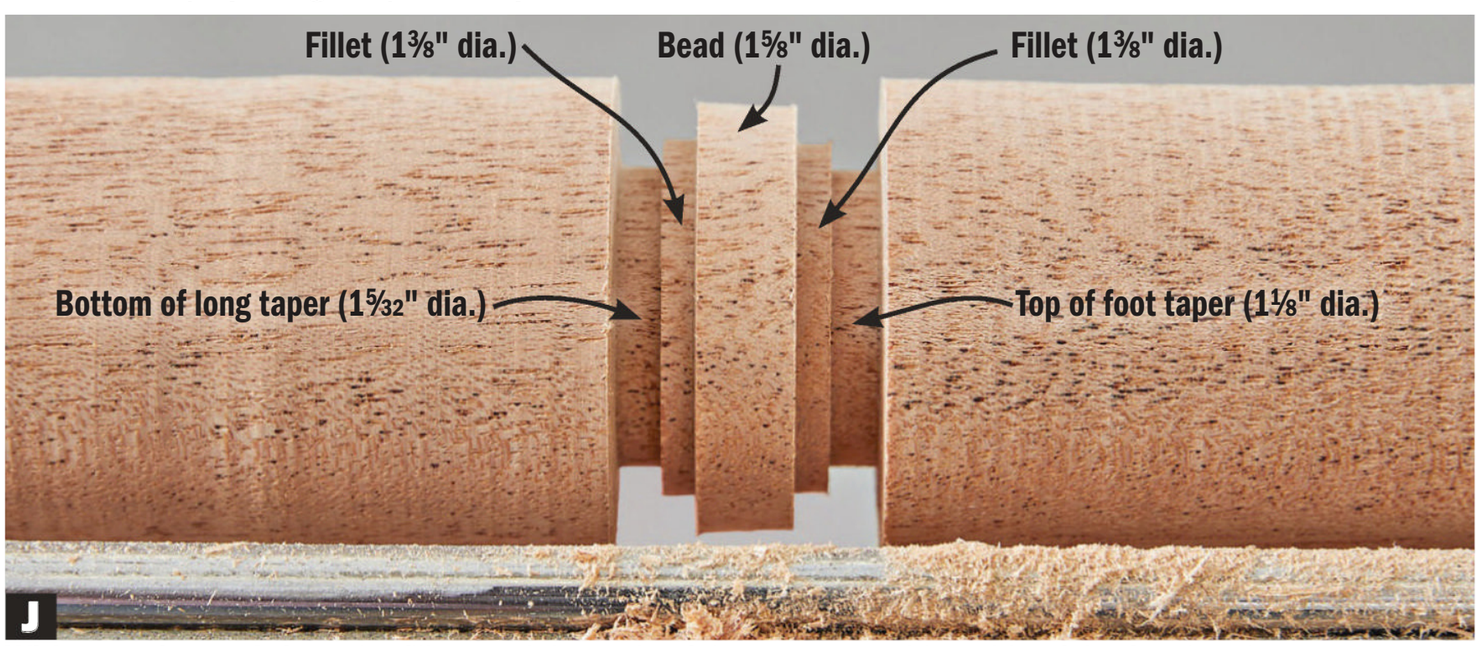
***Note:*** *Make all cuts at between 1,600 and 2,000 rpm.*

**3** Rough out the bead at the foot of the leg [**Photo I**]. Make additional parting cuts to mark the ends of the tapers on either side of the bead [**Photo J**] and at the bottom of the foot.

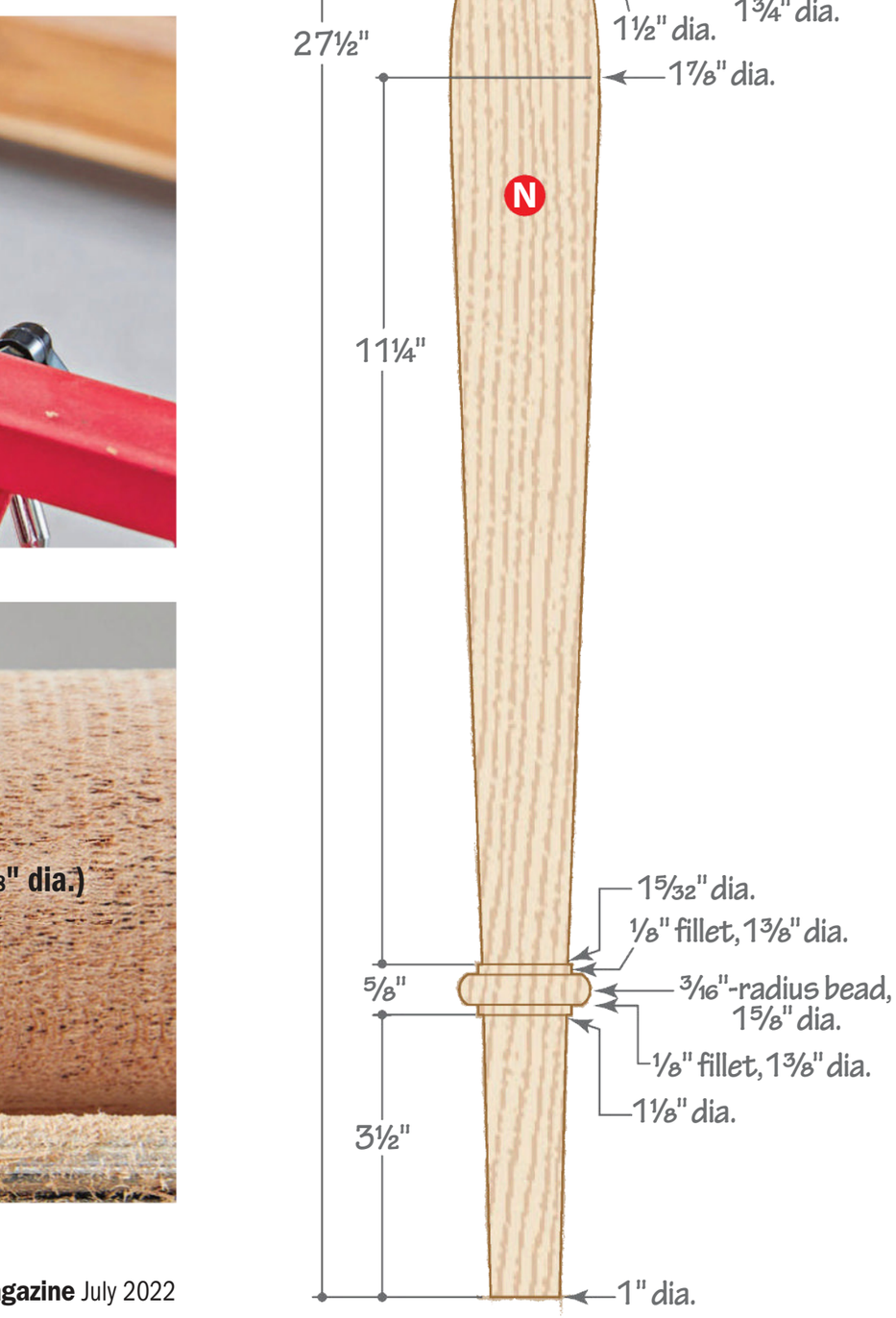
***Tip!*** *Use a bedan (a traditional spindle-turning tool) to turn smooth, convex shapes such as beads.*

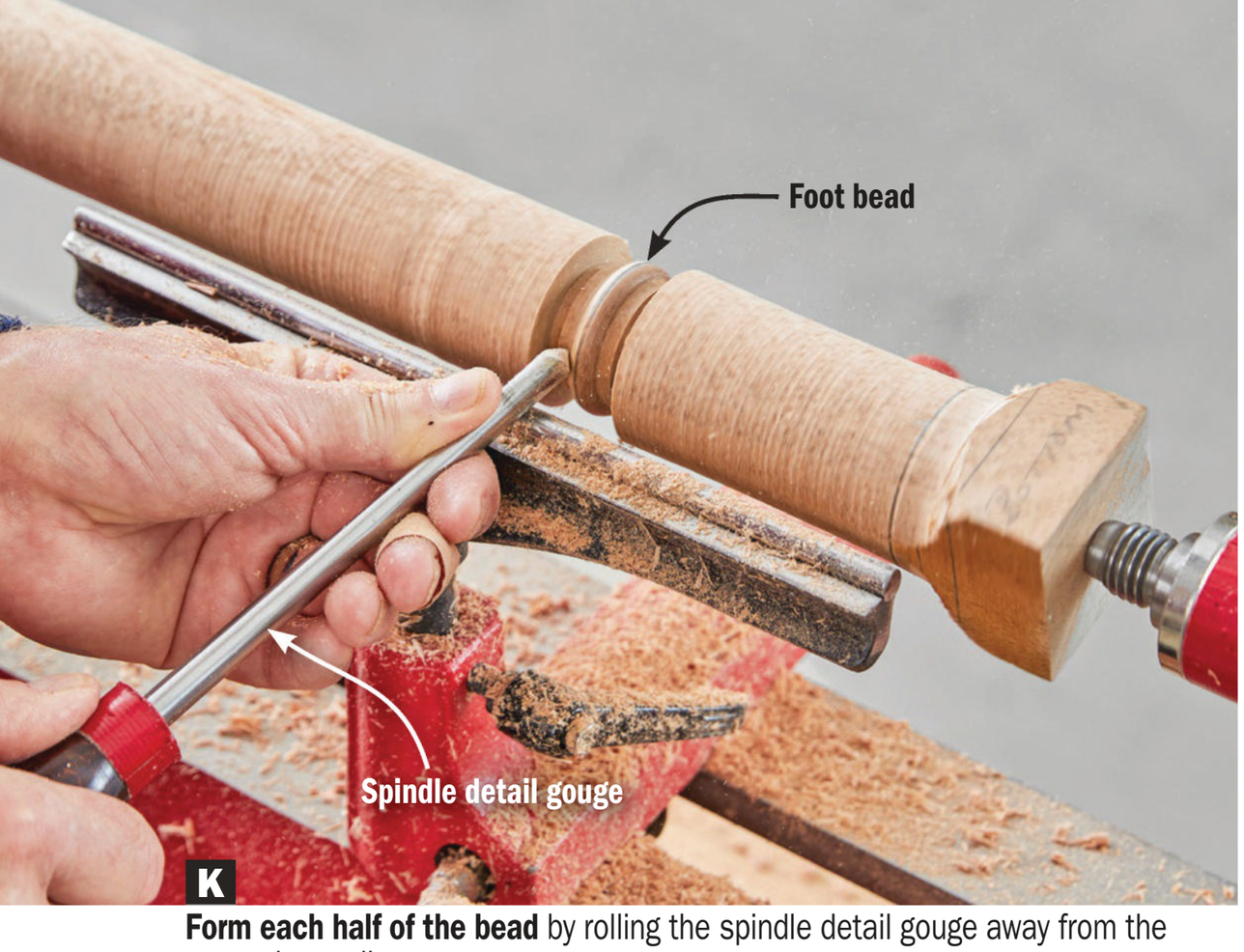



**Use a bedan (or parting tool) and calipers** to turn the bead to 1⅝" diameter.



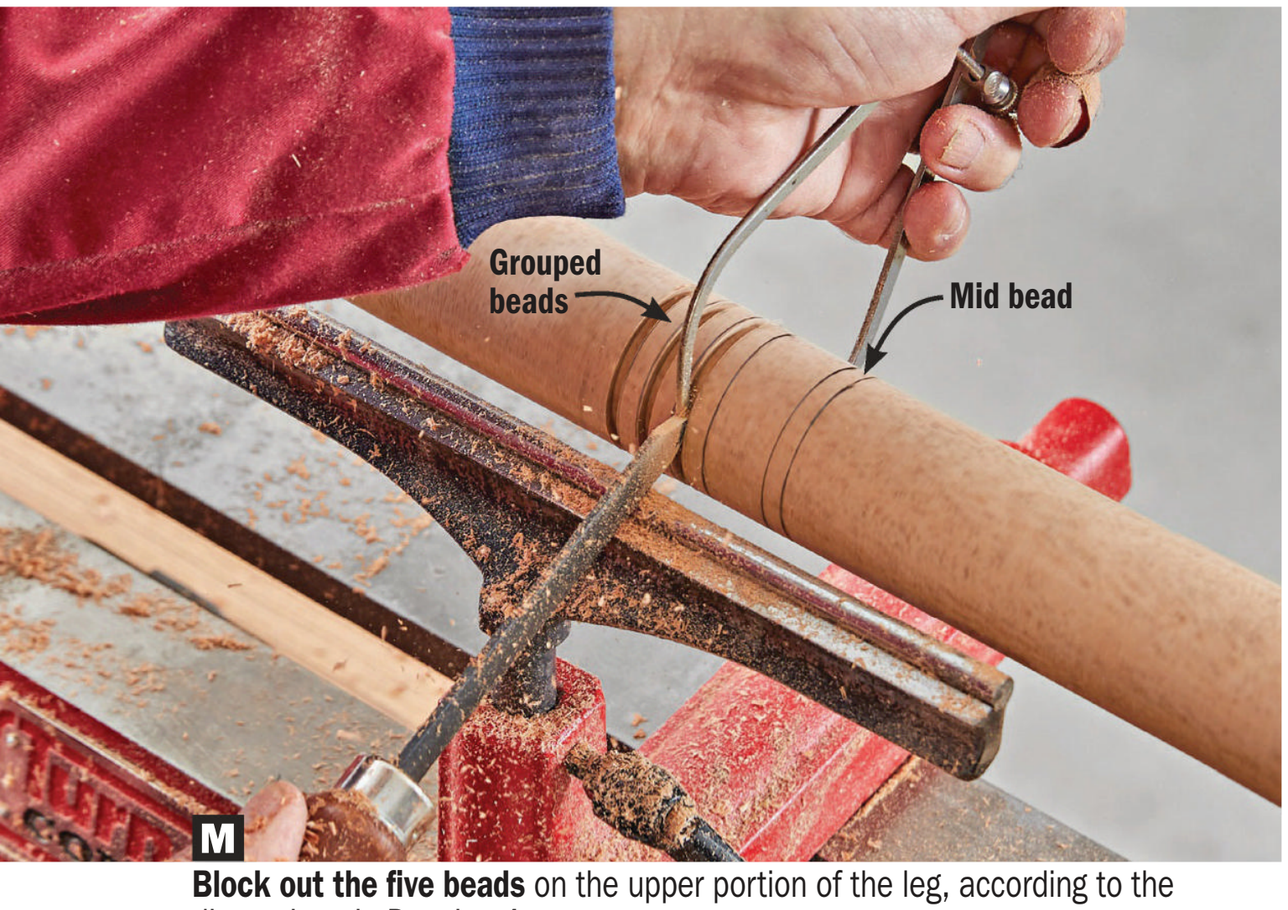

**With a parting tool,** form the fillets and the ends of the tapers on either side of the foot bead.






**Form each half of the bead** by rolling the spindle detail gouge away from the center layout line.

**Taper the foot,** deepening the parting cut at the bottom by ⅛" at a time until you reach the finished diameter (1").




**Block out the five beads** on the upper portion of the leg, according to the dimensions in Drawing 4.

**The mid bead has no fillets,** so shape the tapers on either side right up to the bead.

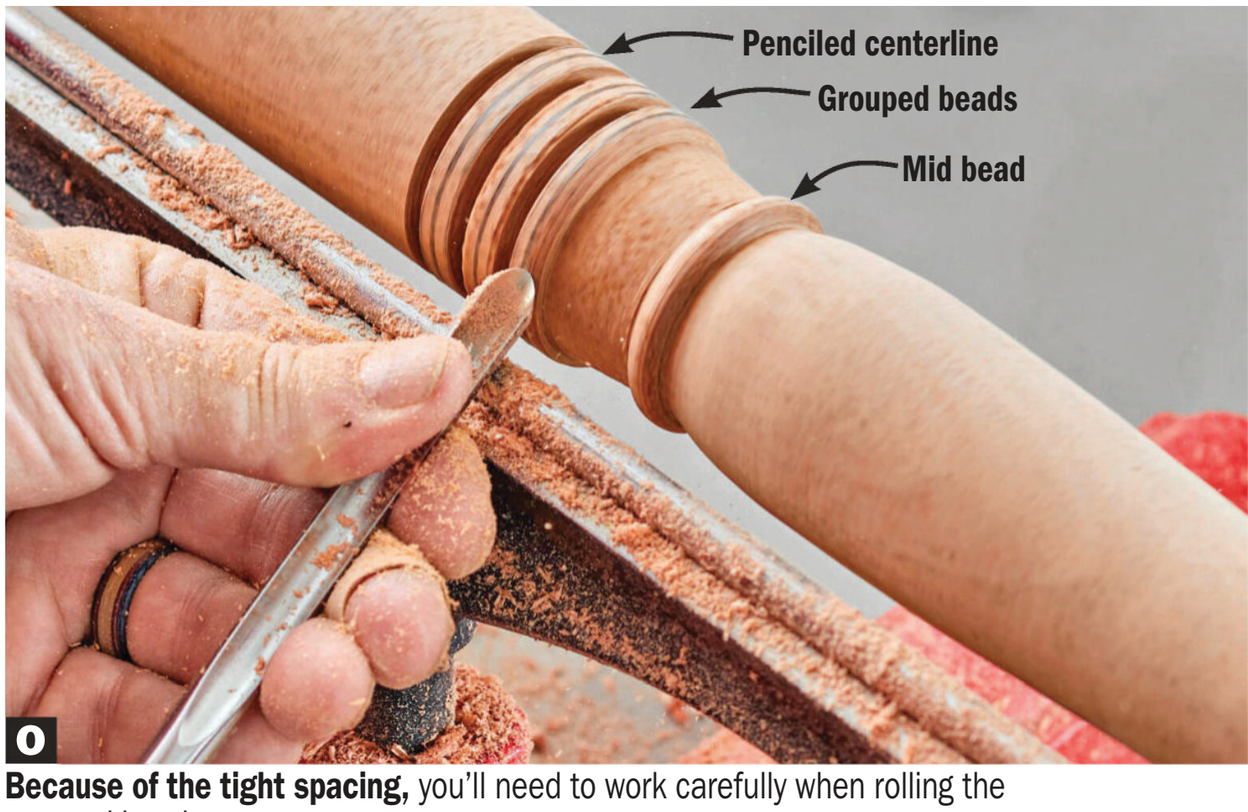
4 Round the foot bead by marking a centerline with a pencil and then turning each side of the bead [**Photo K**].

5 At 15⅜" from the bottom of the foot, part to 1⅞" diameter, defining the widest portion of the long taper. Using a roughing gouge, taper between the parting cuts above and below the foot bead [**Photo L**].

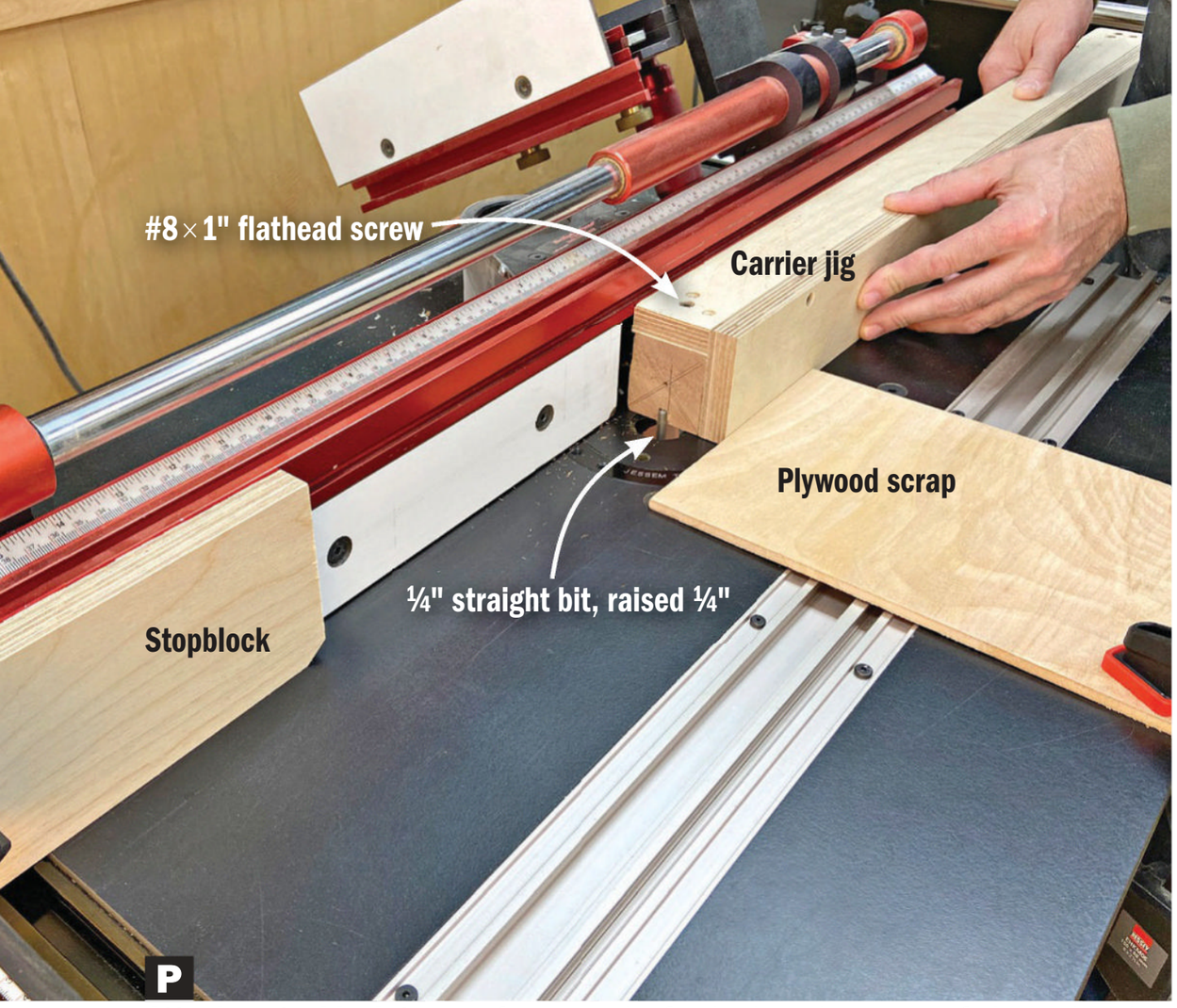
6 Use the parting tool to define the diameters of the top bead, the three grouped beads, and the mid bead [**Photo M**]. Mark the center of each of the four beads with a pencil. With a spindle detail gouge, turn the short taper between the grouped beads and the mid bead, and the upper portion of the long taper just below the mid bead [**Photo N**].

7 Roll the mid bead and the three grouped beads [**Photo O**].

8 Turn the upper portion of the leg to 1½" diameter and then shape the upper bead and fillet. Finally, sand the leg. Leave the square waste areas intact for now. They will be removed after you notch the legs to accept the carcase.

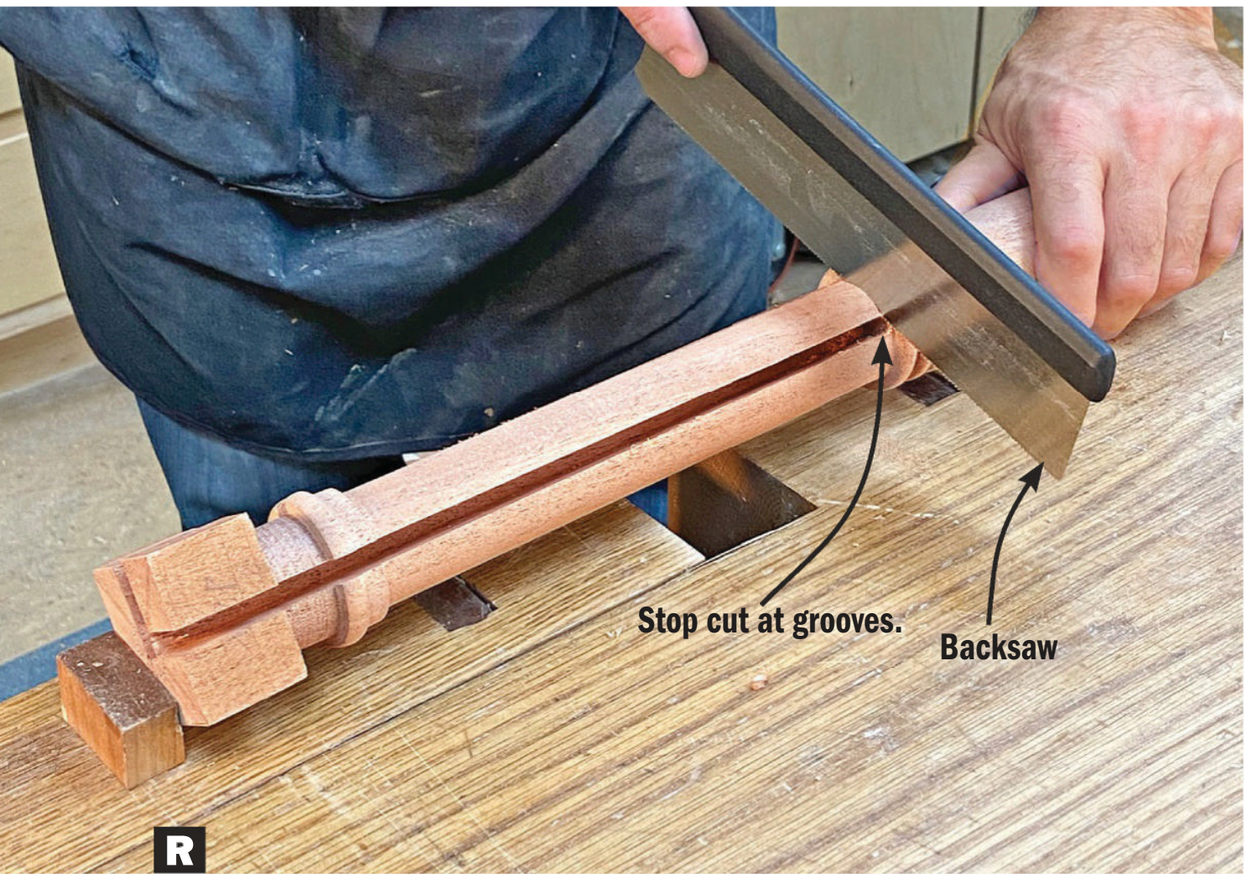



**Because of the tight spacing,** you'll need to work carefully when rolling the grouped beads.

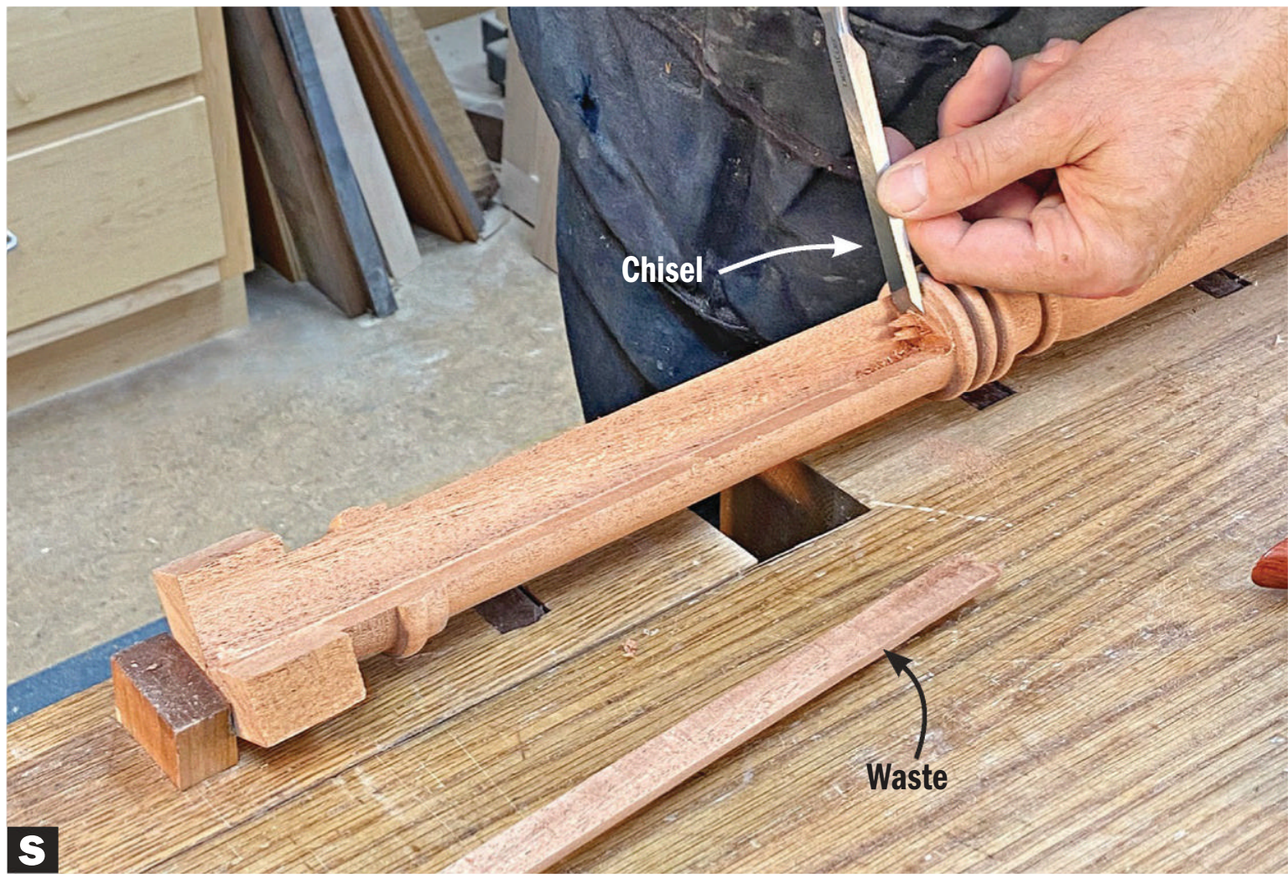


**Attach a stopblock to your fence,** and a featherboard or scrap of plywood to the table to keep the jig pressed against the fence. Rout the first groove in several passes, raising the bit ¼" between each pass.

**For the second groove,** move the fence away from the bit to position the cut on the waste side of the line.




**Cut the shoulder of the notch,** stopping when you reach the routed grooves.




**Pare off the waste,** squaring and flattening the shoulder of the notch.

## Four on the floor

**1** From two pieces of ¾" plywood, make an L-shaped carrier jig to match the width and length of the legs. Lay out the notch on the top of each leg [**Drawing 4**]. Attach a leg to the carrier jig by driving a screw at each end into the square waste area of the leg. Rout the first groove for the notch [**Photo P**]. Repeat this process on the other three legs, adjusting the stopblock as needed to ensure all the notches end just above the top bead.

**2** Rotate one of the legs and reattach it to the jig. Reposition the router-table fence and cut the second groove [**Photo Q**]. Repeat the process on the other three legs.

**3** Cut the end of the notch down to the grooves [**Photo R**]. Break out the waste piece and chisel the bottom of the notch [**Photo S**].

**4** Cut the square waste from the ends of the legs with a handsaw. Sand a slight radius on the bottom ends.

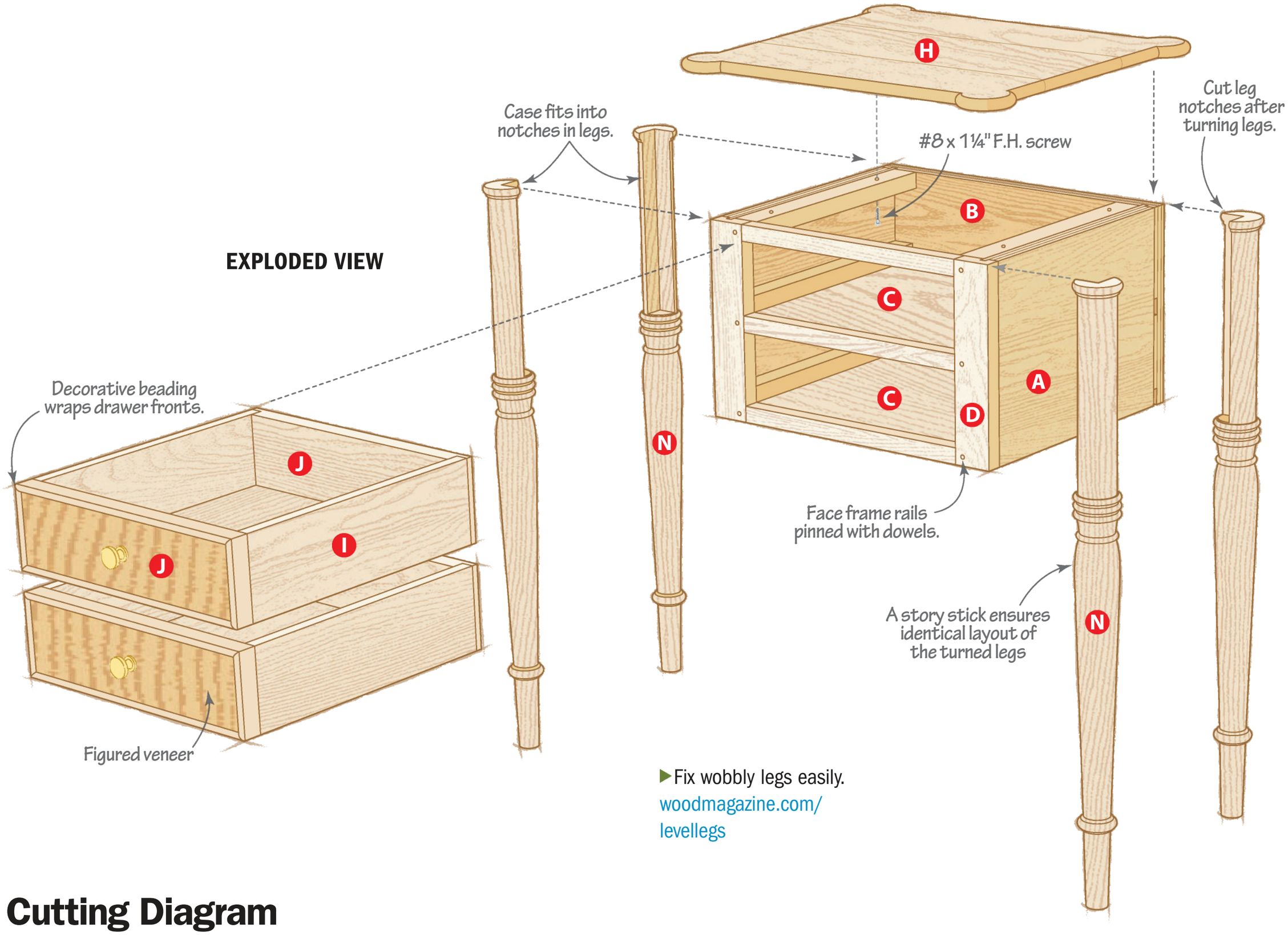
**5** Place the case assembly facedown on your workbench and glue the legs to the case, using band clamps to hold them in place.

**6** Finish-sand the case, top, and drawers and apply a finish. (We used clear Watco oil followed by three coats of flat lacquer.)

**7** Center the top (H) on the case and attach it by driving screws through the cleats (G). Attach the drawer knobs [**Source**] and slide the drawers into the case. Now choose which end of the sofa to place your table.

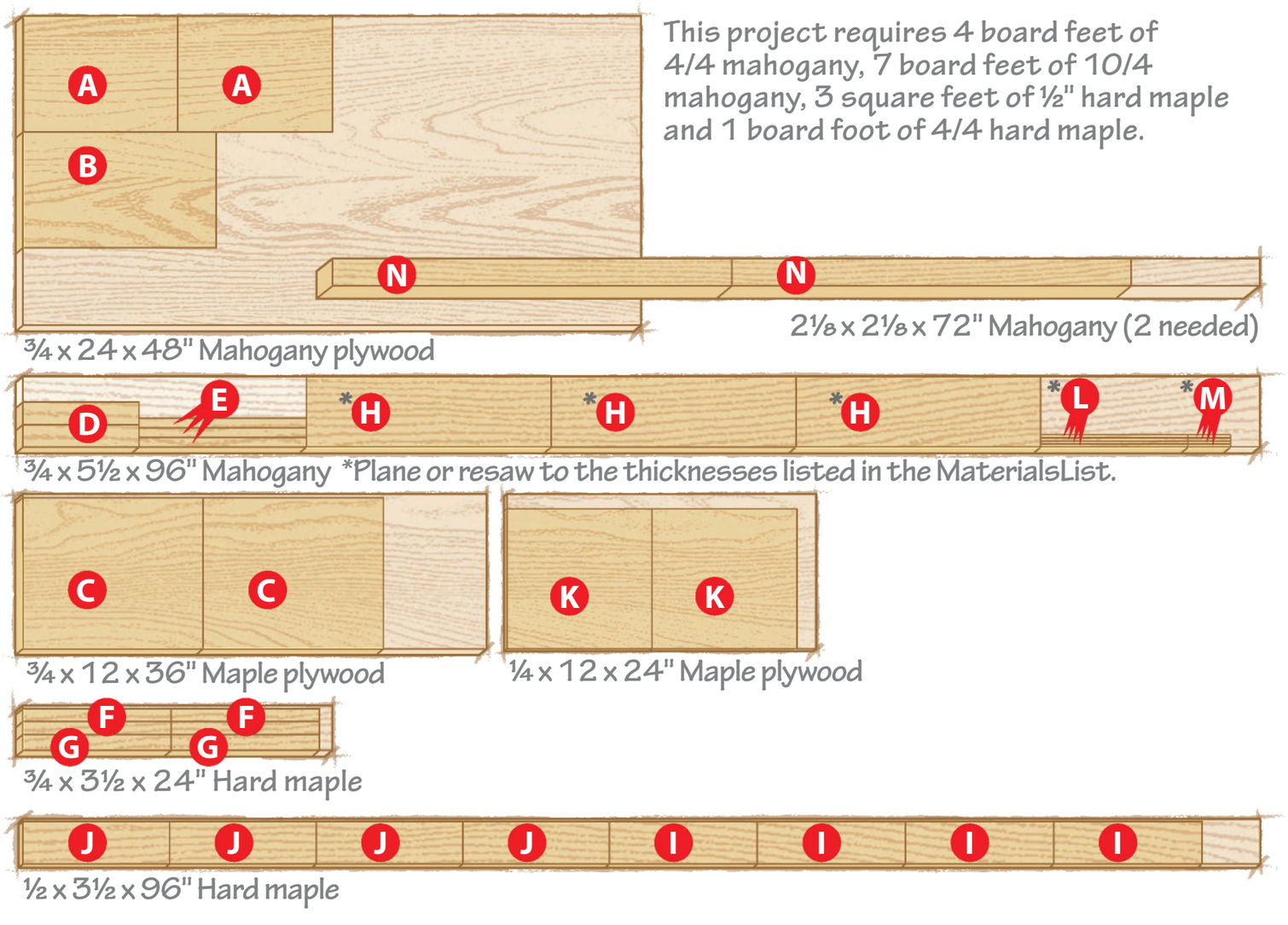
***Tip!*** *Use a stubby screwdriver to drive the screws into the top.*

## EXPLODED VIEW




▶Fix wobbly legs easily.
woodmagazine.com/levellegs

## Cutting Diagram




This project requires 4 board feet of 4/4 mahogany, 7 board feet of 10/4 mahogany, 3 square feet of ½" hard maple and 1 board foot of 4/4 hard maple.

## Materials List

| Part | | FINISHED SIZE T | W | L | Matl. | Qty. |
|---|---|---|---|---|---|---|
| A | case sides | ¾" | 9" | 12" | MP | 2 |
| B | case back | ¾" | 9" | 15" | MP | 1 |
| C | case dividers | ¾" | 11¾" | 14" | MAP | 2 |
| D | stiles | ¾" | 1¾" | 9" | M | 2 |
| E | rails | ¾" | ¾" | 13" | M | 3 |
| F | drawer guides | ¾" | 1" | 11½" | HM | 4 |
| G | top cleats | ¾" | 1¼" | 11½" | HM | 2 |
| H* | top | ⅝" | 15¼" | 17¼" | M | 1 |
| I | drawer sides | ½" | 3⁵⁄₁₆" | 11½" | HM | 4 |
| J | drawer fronts/backs | ½" | 3⁵⁄₁₆" | 11⅜" | HM | 4 |
| K | drawer bottoms | ¼" | 10⅞" | 11¼" | MAP | 2 |
| L* | horizontal beading | ⅝" | ¼" | 11⅜" | M | 4 |
| M* | vertical beading | ⅝" | ¼" | 3⁵⁄₁₆" | M | 4 |
| N* | legs | 1⅞" dia. | | 27½" | M | 4 |

*Parts initially cut oversize. See the instructions.

**Materials key:** MP–mahogany plywood, MAP–maple plywood, M–mahogany, HM–hard maple.

**Supplies:** #8×1¼" flathead screws, #8×1" flathead screws, ribbon-mahogany veneer, ³⁄₁₆" dowel.

**Blade and bits:** Dado set, ⅜"-dia. flush-trim bit, ⅛", ⁵⁄₁₆" round-over bits, ¼" straight bit.

**Source:** Brass ⅝"-dia. knobs (2), no. 35451, $5, Rockler, 800-279-4441, rockler.com.

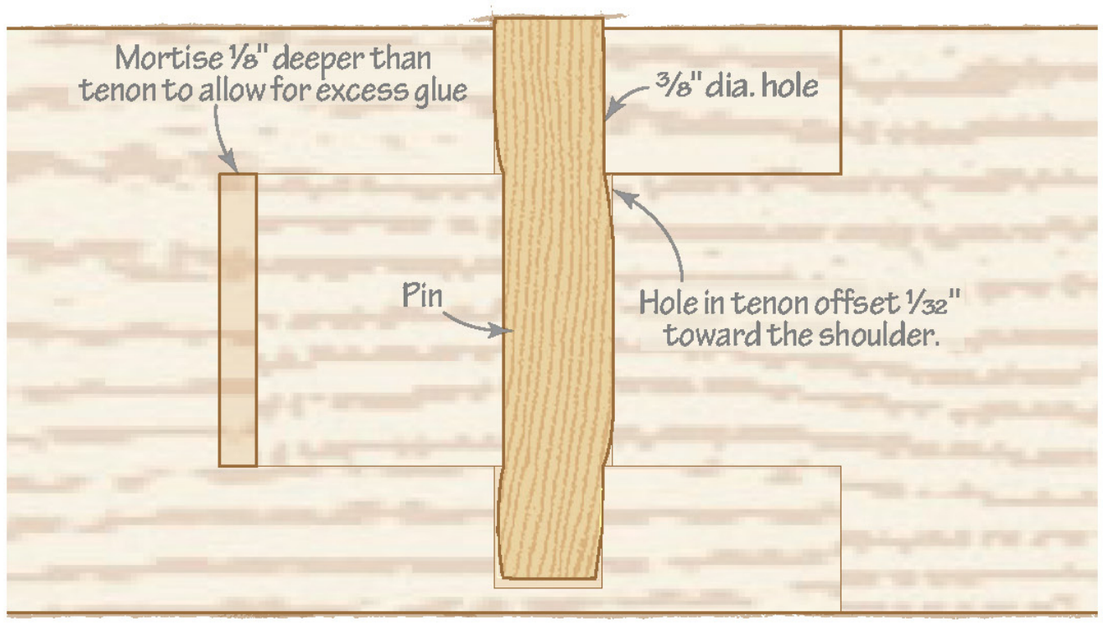
Produced by **Vince Ancona** with **Kevin Boyle** and **Dick Meuler**
Project design: **Kevin Boyle**
Illustrations: **Roxanne LeMoine, Lorna Johnson**

# Drawbore Joinery

*This timeless technique adds strength and beauty.*

By Huy Huynh

**DRAWBORE JOINT (Section view)**




Drawboring increases the strength of a regular mortise-and-tenon joint by driving a wood pin through a hole in the mortised piece and through a slightly offset hole in the tenon, *above*. This draws the shoulder of the tenon tight against the face of the mortise. The pin provides additional mechanical strength that keeps the joint tight, even when your joinery isn't a perfect friction fit. Assembly of the joint doesn't require clamps, which makes drawboring particularly attractive when dealing with large assemblies or oddly shaped pieces.

You'll often find drawbore joints in large, timber-style-framed workbenches, and furniture assemblies that experience a lot of racking, such as the rails and feet of a trestle table [**Photo A**] or the crest rail of a rocking chair. When finished, the driven pin reveals the beauty of contrasting wood grain that accentuates the forethought taken by the craftsperson to ensure a lifetime of use. Creating this joint requires just a few simple steps, as I'll show.

**The centered legs on this table base** create levers of the feet and top rails, amplifying stress on the mortise-and-tenon joints. Drawboring reinforces the joints and adds visual appeal.

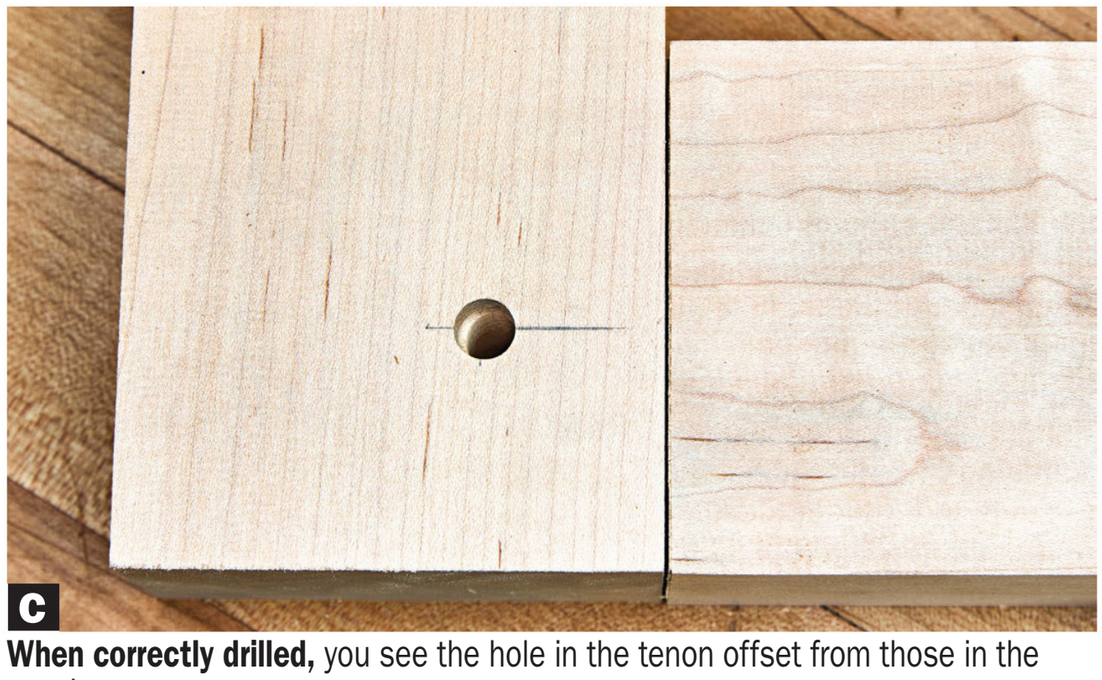
**Place an undersize centerpunch** against the wall of the hole closest to the tenon shoulder. Tap the punch to leave a dimple.

## The hole story

Learn four methods for cutting mortise-and-tenon joints. woodmagazine.com/mt4ways

Form your mortises and tenons however you prefer: on the tablesaw, drill press, router table, or by hand. Once you have a fitted joint (remember, it doesn't need to be a perfect friction fit), bore a hole centered on the depth of the mortise. (I drilled a ⅜" hole.) You can place the hole closer to the workpiece edge, if you like, as long as you allow sufficient material between the edge and the hole to prevent blow-out while driving the pin. There's no need to drill all the way through the bottom mortise wall [**Drawing**], but you can if you want the pin visible on both faces. For a beefy assembly, such as the one shown, I typically drill just deep enough to bury the end of the pin in the far side of the mortise.

Next, dry-fit the joint to locate the offset hole in the tenon, using a centerpunch (or a brad-point drill bit) 1/16" smaller than the hole in the mortise [**Photo B**]. Disassemble the joint and drill on the mark a hole the same diameter as the one in the mortise. Use a backer piece to prevent blow-out as the drill bit exits the tenon. With the joint dry-fit, you can see the offset holes [**Photo C**].




**When correctly drilled,** you see the hole in the tenon offset from those in the mortise.

**D**

**Grip the pin blank in a vise** and drive a chisel into the end grain, parallel to the growth rings.

**E**

**Taper the end with a chisel or block plane** so that the end fits into the dowel former. The tapered end also guides the finished pin through the drawbore.

**F**

**Hammer the blank** through the dowel former. The end will likely mushroom and possibly split. Use the best section for your drawbore pin.

## Let's put a pin in this

**Source:** Veritas dowel former no. 05J6320, $49, Lee Valley, 800-871-8158, leevalley.com.

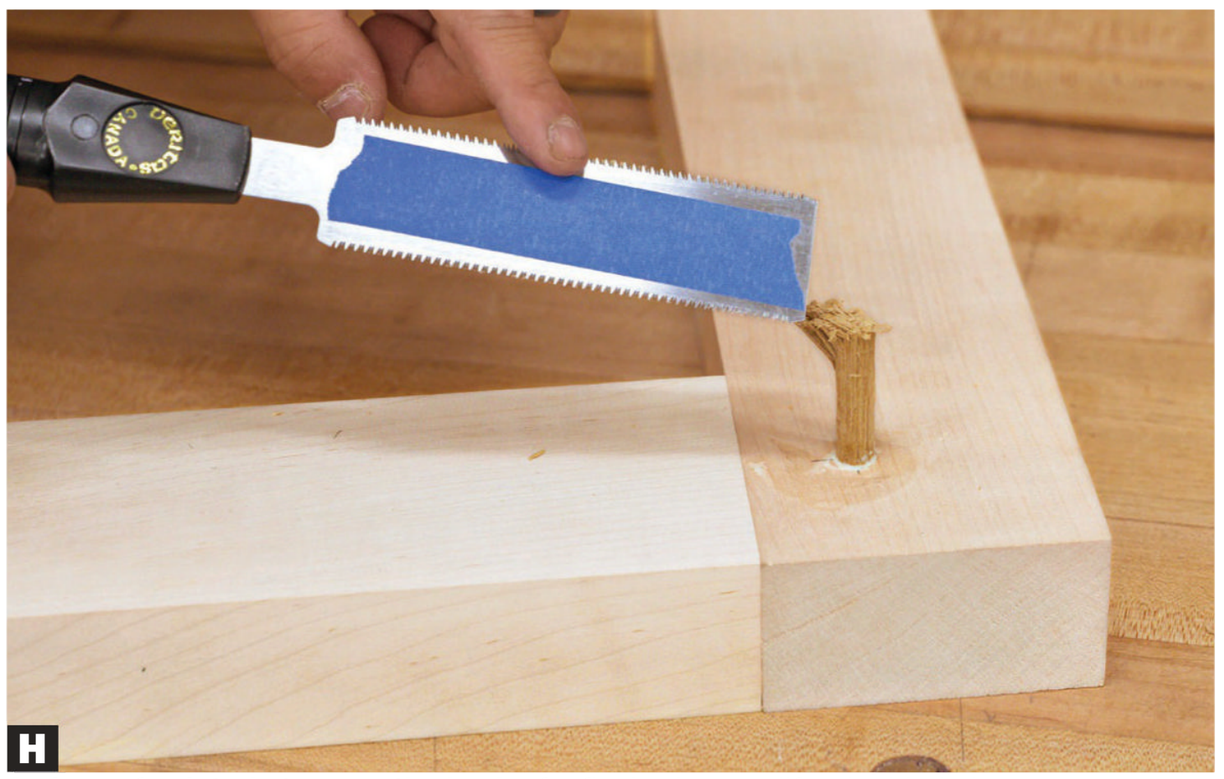
The pins used to drawbore a joint must be flexible, but strong. This requires a straight-grained and stable hardwood—something difficult to find in purchased dowels. Instead, I make my own using scrap stock and a dowel former, a tool with an internal blade that shears the riven wood as you pound it through.

Start by riving a straight-grained white-oak blank about twice as long as the needed pin, shearing off a piece just larger than the desired diameter (⅜") [**Photo D**]. Then, roughly round and taper the blank [**Photo E**]. Place the dowel former over a doghole in your bench, then drive the blank through [**Photo F**].

To assemble the joint, I spread glue within the mortise and on the tenon, squeeze a bead of glue into the drawbore hole, and lightly coat the pin before driving it in. As you drive the pin through, you'll see the tenon being drawn tightly to the mouth of the mortise [**Photo G**]. Trim the excess [**Photo H**], sand the surfaces smooth, and you'll have a mechanically reinforced joint, beautifully accentuated with a contrasting wood.

**G**

**You'll hear the dowel pin bottom out** with a low-toned thud, versus a hollow high-toned "pang" as it's being driven.




**H**

**A piece of painter's tape on the back** of a flush-trim saw lifts the blade just enough to prevent the teeth of the saw from marring your workpiece.

Huy Huynh is a full-time aerospace engineer and part-time woodworker who produces commissioned furniture pieces. He also has a prolific social media presence (@AlabamaWoodworker), where he documents his builds out of his garage workshop in Madison, Ala.

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SHOP TEST

# Router-Table Accessories

*We tested 19 products head-to-head to make sure you get the best ones for your budget.*

## Coping Sleds

▶Learn how to make cope-and-stick joints. woodmagazine.com/copeandstickdoors

Cope-and-stick cabinet doors combine elegant edge profiles with perfectly mating joinery you create with a pair of specialty router bits. It's easy to rout the "stick" profile on the inner edges of the rails and stiles, but a coping sled makes routing across the ends of the rails safer and cleaner. As a bonus, these sleds also aid when routing tenons and half-laps.

Most sleds register against the router-table fence via a clear acrylic "visor," but one tested model registers in the miter slot instead. Although we found no advantage to either method, your router-table setup might dictate which style you buy. For example, the visor on a sled might stand taller than your table's fence, rendering it useless; we provide the minimum fence height in the product summaries.

***Tip!*** *A backer block prevents tear-out when cope-cutting the rail ends. If your sled does not come with one, make one the same thickness as your workpiece. The next time you use the sled, the backer serves as a gauge block to set bit height.*

## Infinity Pro Coping Sled, no. COP–200, $220

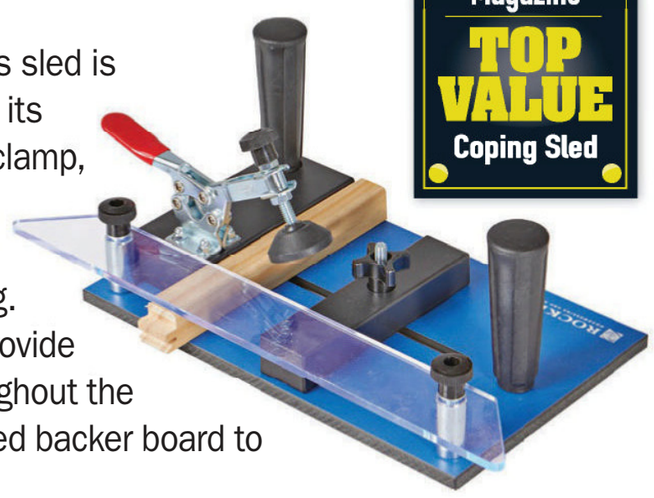
**Min. fence height: 2½"; Max. rail width: 8 3/16"**
**Overall grade: A**

Separate hold-downs for a backer board (not included) mean you reposition or replace only the workpiece for each cut—not the backer board. And the ⅜"-thick aluminum base never deflected when clamping workpieces. An abrasive covering on the base prevents stock from slipping, and a slick film on the bottom face helps the sled glide smoothly; no other sled offers this. The visor can be set to either 2½" or 3" above the table and 11/16" or 1⅞" from the fence—the most flexibility of any tested model. Large knobs make adjusting hold-down tension easy, but Infinity also sells a self-adjusting version for $40 more.

**877-872-2487, infinitytools.com**

## Rockler Rail Coping Sled, no. 52149, $80

**Min. fence height: 2"; Max. rail width: 6⅛"**
**Overall grade: A–**

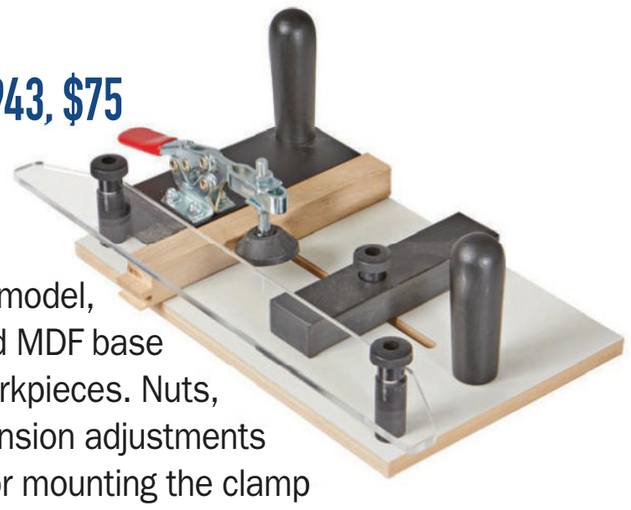


The only flashy thing about this sled is its attractive price, but it does its job well. With only one toggle clamp, which held stock securely, we had no trouble with the ⅜"-thick phenolic base bowing. Large, comfortable handles provide a good feeling of control throughout the cut. Screws secure the included backer board to the rear clamp block.

**800-279-4441, rockler.com**

## Fulton Coping Sled Pro, no. 2943, $75

**Min. fence height: 2⅛"**
**Max. rail width: 6"**
**Overall grade: B–**

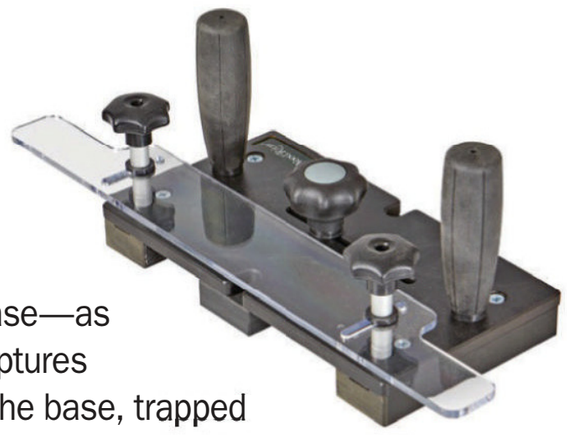


This sled resembles the Rockler model, but its ½"-thick melamine-coated MDF base bowed slightly when clamping workpieces. Nuts, instead of knobs, make clamp tension adjustments cumbersome. Machine screws for mounting the clamp bottomed out in the included cap nuts—we had to cut ⅛" off each screw to make them work.

**888-512-9069, ptreeusa.com**

## WoodRiver Deluxe Coping Sled, no. 164579, $123

**Min. fence height: 1⅞"**
**Max. rail width: 5 7/16"**
**Overall grade: D**



Rather than clamping on top of the base—as with all the other sleds— this sled captures workpieces in a 13/16"-deep cutout in the base, trapped between the rear "foot" and the movable clamp block. But we could not get sufficient clamping force to prevent workpieces from pushing away from the bit once in the cut, resulting in an incomplete cope profile. Also, without a clamp to hold workpieces against the table, rails thinner than 13/16" thick frequently lifted once they contacted the bit, again resulting in a flawed cut.

**800-225-1153, woodcraft.com**

## Woodhaven Medium Coping Sled, no. 526, $168

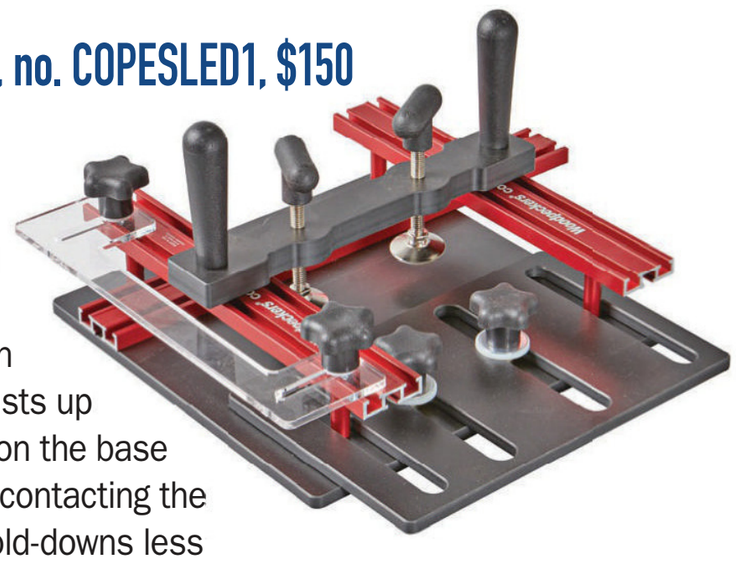
**Max. rail width: 7"**
**Overall grade: A**

This miter-slot-guided sled differs from the other models in several ways. First, two sliding posts (rather than a clamping block) anchor against the rail front edge, with rear clamps holding the rail securely. One post hits the front handle, limiting workpiece width to 5¾", but removing the handle extends that capacity to 7". The heft of the ½"-thick phenolic base and fence gives this sled a solid feel and eliminates vibration. A backer board (not included) secures to the fence face with screws. With six miter-bar mounting positions to choose from, it should fit most router tables. (This model can be run against the fence instead of using the miter bar, but doing so results in routing into the base and potentially the aluminum fence.)

**800-344-6657, woodhaven.com**

## Woodpeckers Coping Sled, no. COPESLED1, $150

**Min. fence height: 3"**
**Max. rail width: 5 11/16"**
**Overall grade: B+**

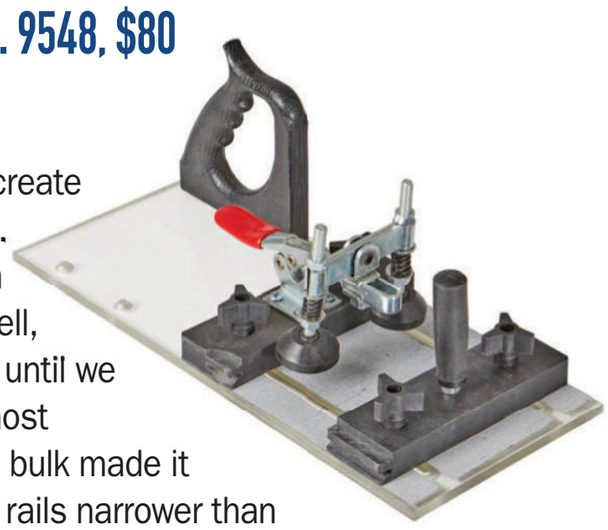


The heft of the aluminum and phenolic parts of this sled greatly reduces vibration when routing. The slotted visor adjusts up to 1½", allowing you to position the base as close as you want without contacting the bit. We found the threaded hold-downs less convenient than quick-release toggle clamps, and that they easily exert more downforce on the workpiece than needed: Even moderate tightening caused the base to bow slightly. We'd also prefer to have the handles mounted at the front and rear of the base for a more natural feeling of control. You must secure a backer board (not included) to the base with double-faced tape—no clamp or screw-mounting—to prevent scooting.

**800-752-0725, woodpeck.com**

## MLCS Pro Deluxe Coping Sled, no. 9548, $80

**Max. rail width: 4 9/16"**
**Overall grade: C**

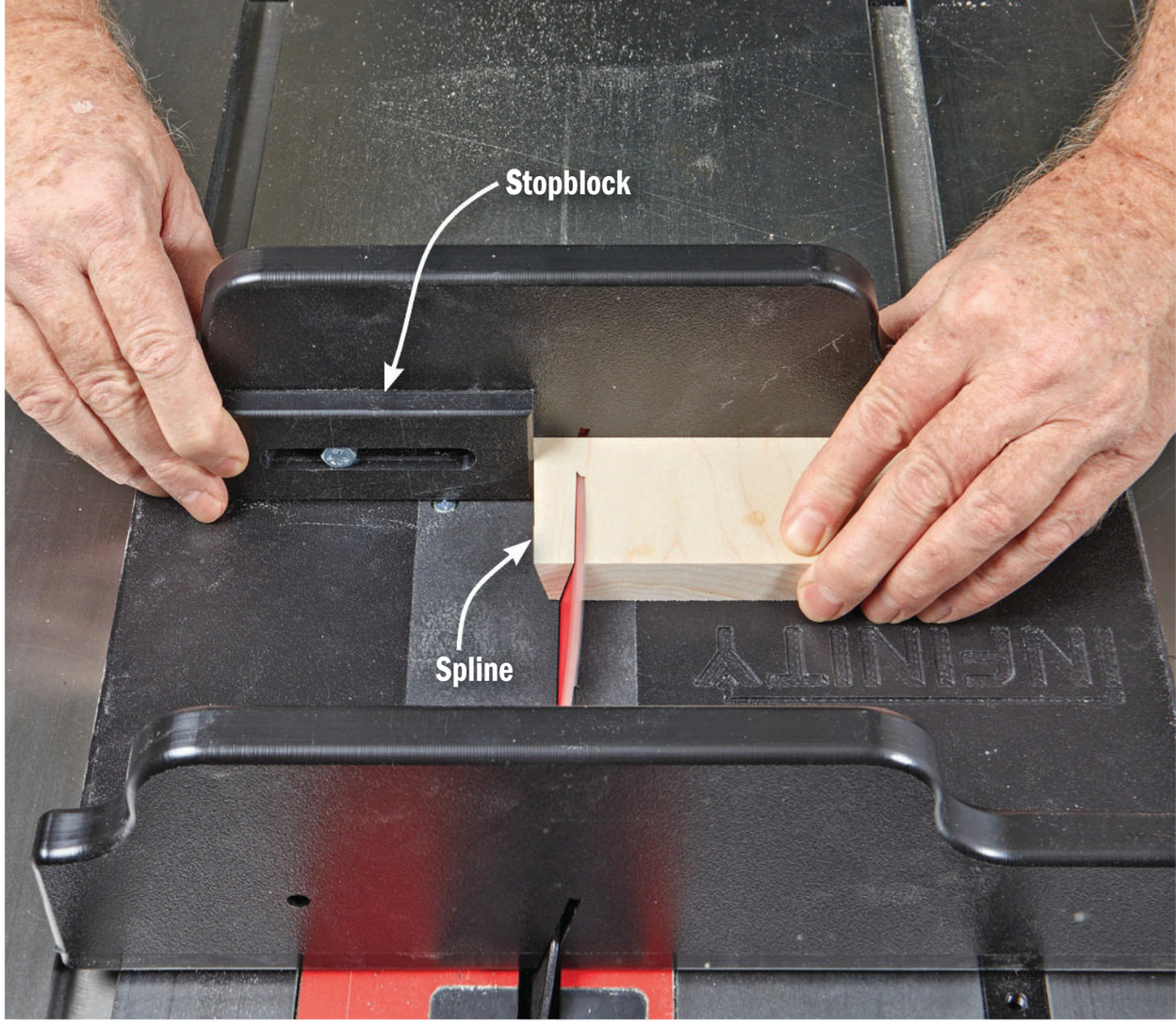


After some fussing, we were able to create perfect coped rail ends with this sled. Its unique dual-pad toggle clamp with spring-loaded spindles holds stock well, but the 5/16"-thick acrylic base bowed until we reduced the clamping force to an almost uncomfortable level. And the clamps' bulk made it awkward to grip the front handle with rails narrower than 2½". We'd prefer tool-free knobs to hex nuts for easier adjustments. Without a visor, the sled's base rides directly against the fence, so the bit cuts into the base and clamping blocks. That's okay as long as you use the same bit every time, but you'll need replacement clamp blocks for different bits.

**800-533-9298, mlcswoodworking.com**

# Splined-Miter Sleds

Splines add a decorative touch while reinforcing miter joints by adding long-grain glue surface. These sleds help cut precise spline slots by carrying the assembly across the bit. The MLCS and Rockler sleds work with dovetail bits as well as V-groove and straight/spiral bits; the Infinity uses only dovetail bits. If you use a router lift, two of the jigs (MLCS and Rockler) cover the wrench holes used for setting bit height, so you might have to do this by trial and error: adjust, set the jig in place, adjust, reset the jig, until you dial it in.




**With the joint centered** between two fingers and clamped to the Infinity jig, slide one finger against the guide bushing through the workpiece, and then back along the other finger to rout the full tapered slot.

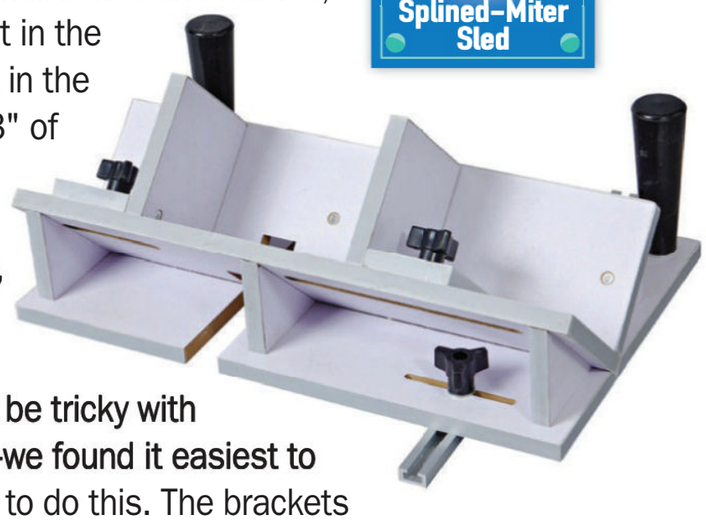
**Infinity provides a small crosscut sled** for cutting tapered dovetail splines to fit the routed slots. Tilt your tablesaw blade to the same angle as the dovetail bit, cut one edge, flip the blank, and cut it away.

## MLCS Router-Table Spline Sled, no. 9537, $105

2022 WOOD Magazine TOP TOOL Splined-Miter Sled

**Overall grade: A**

This sled works best with small boxes and frames, but any assembly you can fit in the cradle will work. Registering in the miter slot, this sled allows 3" of front-to-back adjustment to align it over the bit. With your assembly in the cradle, slide the entire sled in the miter slot to rout the spline slots. Setting bit height can be tricky with assemblies wider than 4"—we found it easiest to remove one of the brackets to do this. The brackets close as narrow as 1", so for anything narrower, you'll need to add a spacer to fill the void. For anything wider than 9", remove one of the brackets. You don't get zero-clearance support against tear-out—the cradle bottom is open—so push the jig slowly across the bit and keep bits sharp. If using dovetail or V-groove bits to cut the slots, use these same bits to create the splines. The base and cradle, made from melamine-coated ½" MDF, come mostly assembled.

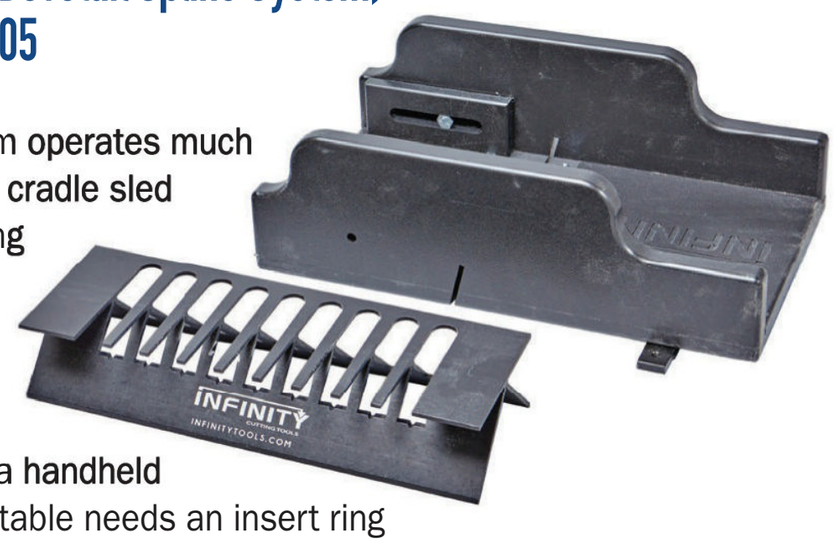


**800-533-9298, mlcswoodworking.com**

## Infinity 12" Tapered Dovetail Spline System, no. 100-040.SET, $205

**Overall grade: A**

Infinity's spline system operates much like a dovetail jig: The cradle sled follows a guide bushing around a 14° dovetail bit to cut tapered spline slots (*top left*). It works both on the router table and with a handheld router, so your router table needs an insert ring to hold the included ⅝" bushing; the jig works with dovetail bits up to ⅝" wide. You can follow the spacing on the sled to cut multiple slots, or mark where you want splines and reposition the jig after routing each slot. To make matching tapered splines, use the crosscut sled on your tablesaw. To do this, cut a blank 2–3" long and at least 5" wide, and cut splines from the blank, as shown *top right*; adjust the stop until you get a perfect fit. Be careful to not over-drive the splines or you could split the joint. It's an elegant, almost foolproof system. (Infinity also sells an 18" sled that allows for using larger-diameter dovetail bits.)

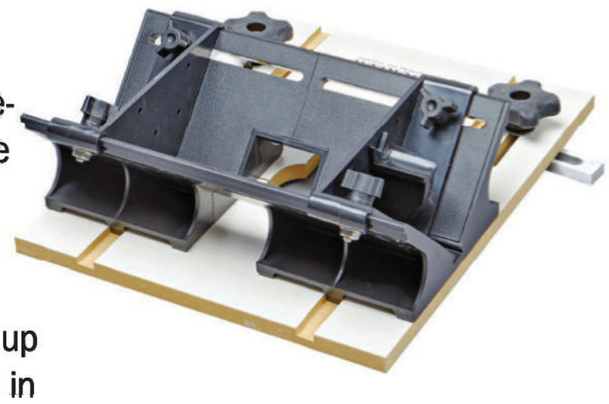



**877-872-2487, infinitytools.com**

## Rockler Router-Table Spline Sled, no. 59288, $100

**Overall grade: A–**

Instead of moving the whole sled to cut spline slots, the ½"-thick melamine-coated MDF base of Rockler's jig locks into the miter slot. The plastic cradle then slides front-to-back over the bit; reposition the workpiece within the cradle to rout additional slots. Both carriage brackets close fully, with a maximum opening of 8⅛", but you can remove one bracket for wider assemblies. The brackets slide rather stiffly side-to-side but should loosen up over time. Although the cradle slides smoothly in the base, sawdust settles in the slots, often impeding travel until cleaned out.



**800-279-4441, rockler.com**

# Box-Joint Jigs

Making box joints on a router table requires three things: a straight or upcut spiral bit, a jig to hold the workpiece, and an indexing key to ensure consistent spacing between the jig's fingers. Once set up, you simply cut a notch, fit it over the indexing key, and step-and-rout notches across all workpieces. As with the splined-miter jigs, some of these jigs block router-lift adjusters when in position.

**To use router-lift controls to set bit height**, position the Rockler jig to the side of the bit (with the router unplugged), rest a workpiece on the base, and raise the bit until it stands slightly taller than the workpiece.

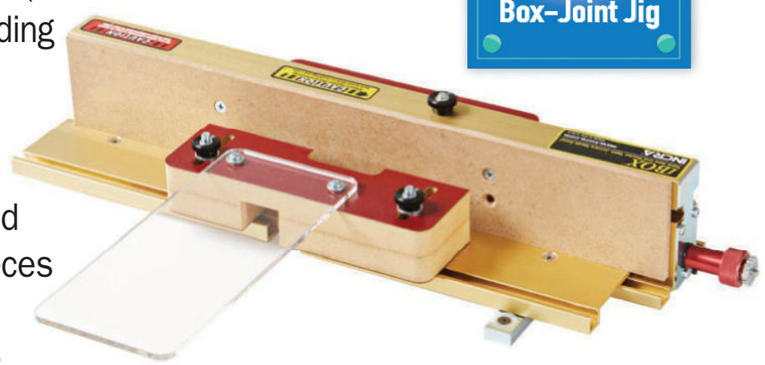
**Adjust a joint's fit with the Woodhaven jig** by loosening the fence and moving it side-to-side as needed. Adjust the indexing keys to match the bit diameter.

## Incra I-Box Box-Joint Jig, no. I-BOX, $190

2022 WOOD Magazine TOP TOOL Box-Joint Jig

**Overall grade: A**

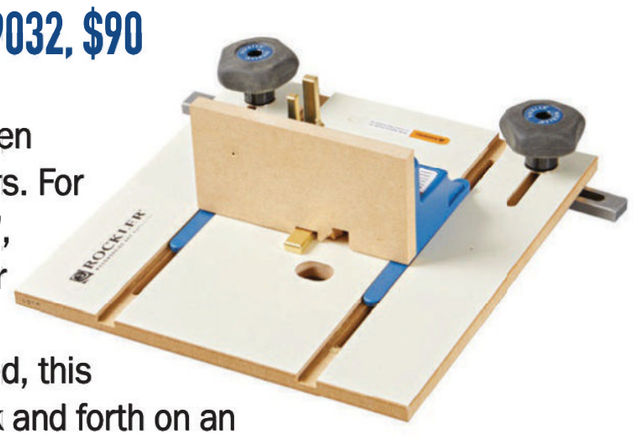
A pair of pin plates—adjustable in .001" increments—set the spacing (⅛–¾") incredibly well, though not intuitively. (Watch Incra's video to get the best understanding of this function.) The jig includes a miter bar with nylon adjusters to snug up the fit in the miter slot and eliminate wiggle. Workpieces rest on a platform rather than on the table surface, and a replaceable MDF backer board provides zero-clearance support against tear-out. We found it easier to remove the front and rear guards before setting bit height; replace them before making any cuts. When cutting box joints, chips can build up around the key plates; we had to blow them out frequently to prevent any problems. I-Box also works on a tablesaw, but switching between the tablesaw and router table requires partial disassembly and recalibration of the jig.



**972-242-9975, incra.com**

## Rockler Box-Joint Jig, no. 59032, $90

**Overall grade: A–**



This compact jig works best when making small boxes and drawers. For workpieces wider than about 6", we recommend making a longer subfence to improve support. Like Rockler's spline-cutting sled, this jig's plastic carriage slides back and forth on an MDF base locked in the miter slot. Brass indexing keys in ¼", ⅜", and ½" provide the spacing to match bits (not included), and a ½" MDF subfence provides zero-clearance support against tear-out. Set the spacing between the key and bit using a spacer or setup bars (not included) equal to the bit diameter. Because it lacks a microadjuster, setting the jig may take multiple test cuts and adjustments until you get a good fit. During routing, chips build up in the left carriage slot, sometimes to the point of impeding carriage travel.

**800-279-4441, rockler.com**

▶Buy a set of brass setup bars.
woodmagazine.com/brassbars

## Woodhaven Box-Joint Jig, no. 4555, $83

2022 WOOD Magazine TOP VALUE Box-Joint Jig

**Overall grade: A–**

The jig consists of a 24" aluminum fence (with multiple T-track slots) with a bit/blade cutout and replaceable MDF subfences; it mounts to almost any miter gauge. Two aluminum keys provide the adjustable spacing (⅛–$^{13}/_{16}$"), shown *top right*, but the lack of a microadjuster means making trial-and-error test cuts and adjustments to achieve a perfect fit. Once dialed in, the jig proves easy to use. Like the Incra, this jig can also be used on the tablesaw.

**800-344-6657, woodhaven.com**

## Leigh Box-Joint and Beehive Jig, no. B975, $109

**Overall grade: A–**

This jig looks and behaves like a traditional through-dovetail jig, but instead creates ½" and ¾" box joints. (It originated from an initiative to make beehive boxes to help the worldwide honeybee crisis.) It works just as well with a handheld router as on a router table. To start, screw the template and sidestops to a beam/fence that you provide—we laminated two pieces of ¾" MDF—then install the provided guide bushing in your router table, and you're ready to roll. Rotating the elliptical bushing fine-tunes the fit of the joint: Each mark makes .002" of adjustment. Although precise, it relies on you holding and sliding the jig in the same orientation for each cut. After you rout the first pair of workpieces, position the second set against the flip-stop for the correct offset. The included ½"-diameter bit cuts both joint sizes.

**800-663-8932, leightools.com**

# Other Helpful Jigs and Accessories

## Rockler Dust Right Dado Dust Chute, no. 57495, $28

**Overall grade: A**

This dust chute captures debris that spews out ahead of the workpiece. It attaches with two screws to almost any router table, and you can lower it below the table surface when not needed. The bristles around the dust hood's rim deflect chips into the dust port while the workpiece passes over unimpeded. We attached it with a wye connector and flex-hose to the existing dust-collection hose. A blast gate lets you close it when not needed.

**800-279-4441, rockler.com**

## Rockler Router Fence Storage Tray, no. 51061, $20

**Overall grade: B**

Holding up to five bits and other small accessories, this tray provides an easy-reach storage solution for the items you're using at the moment. It attaches easily to a T-slot on the top or back of your fence and slides anywhere along the fence, but may interfere with the locking knobs. We keep the hex wrench that came with it in the tray so we can quickly loosen the socket screws and reposition the tray as needed.

**800-279-4441, rockler.com**

## Rockler Small Piece Holder, no. 57896, $70

**Overall grade: A**

This handy gadget excels at exactly what you'd expect: holding small workpieces securely, while keeping your hands safely away from the bit. It works great for routing profiles, in conjunction with either the fence or a bit's bearing.

**800-279-4441, rockler.com**

## MLCS Vertex Multiangle Sled, no. 9545, $150

**Overall grade: A–**

We like this jig for cutting tenons, half-laps, and any other joint best cut vertically. Because it registers in the miter slot, you don't need to worry about positioning the router-table fence other than for dust collection. Without a microadjuster, dialing in a precise cut requires repeated test cuts, but works well once achieved. And you must manually align the toggle-clamping bars 90° to the table for precise square cuts. In addition to the 90° fence blocks, this jig comes with blocks for angling the clamping face to 45°, 60°, and 75°. This jig also works on the tablesaw.

**800-533-9298, mlcswoodworking.com**

## Infinity Vertical Router Sled, no. VRS-100, $160

**Overall grade: B+**

Unlike the MLCS jig, this sled registers against the fence rather than in the miter slot, so you have to keep the workpiece pressed flat against the fence for an even cut. That gets tricky with pieces narrower than 3", so an adjustable guide (Infinity calls it a foot) provides a second point of contact with the fence. However, this guide won't work on fences shorter than 3⅛".

**877-872-2487, infinitytools.com**

Produced by **Bob Hunter** with **Jan Svec** and **Vince Ancona**

# Swing Low, Sweet Swing

*X marks the spot for rest and relaxation when summer calls.*

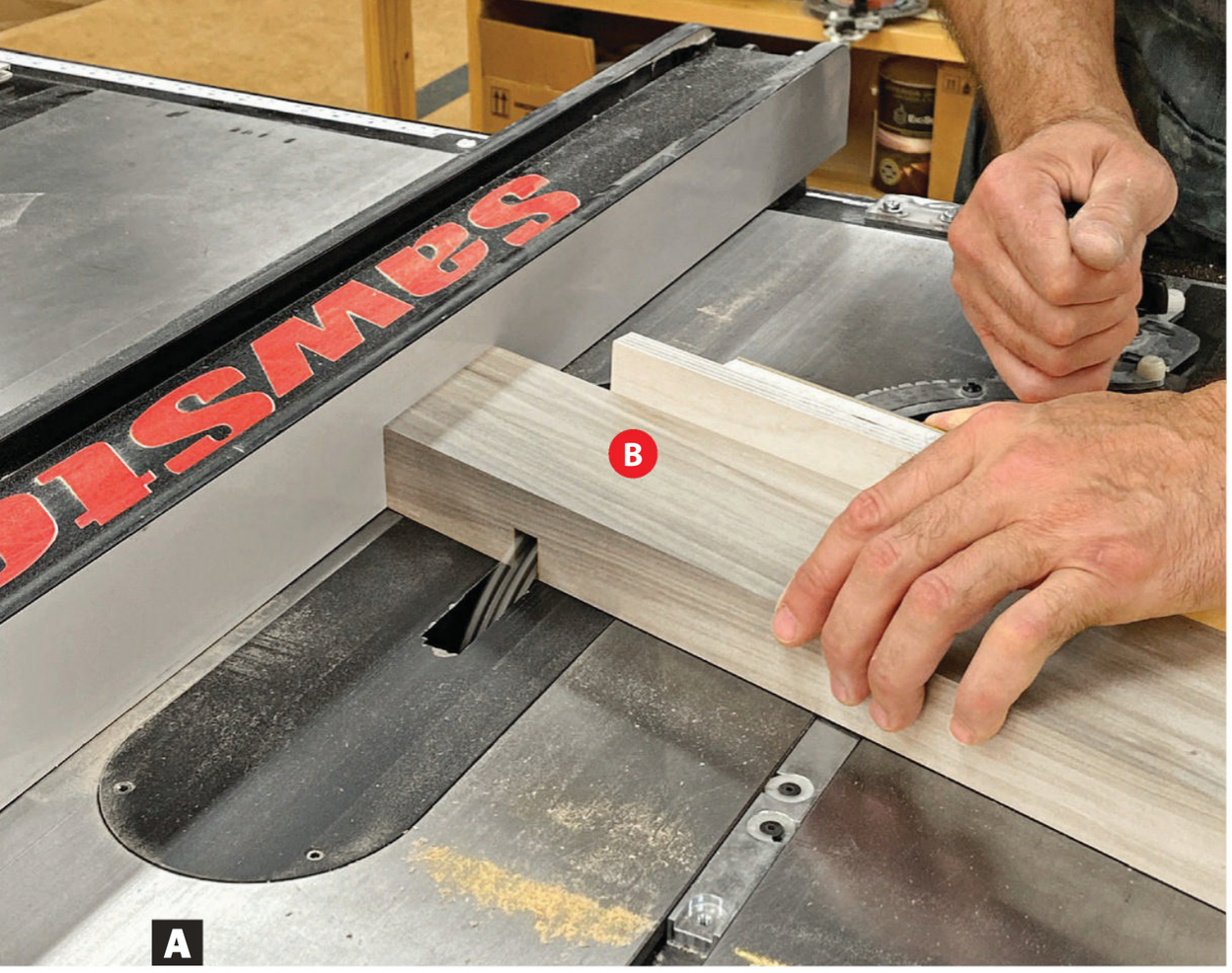
You won't find a better way to pass the summer than swingin' to and fro in this comfy seat for two. And this project will get you there fast with basic skill-building, rock-solid joinery.

We painted our poplar version, but it would look just as great in a classic outdoor wood, such as white oak or teak. Make your choice and head to the shop!

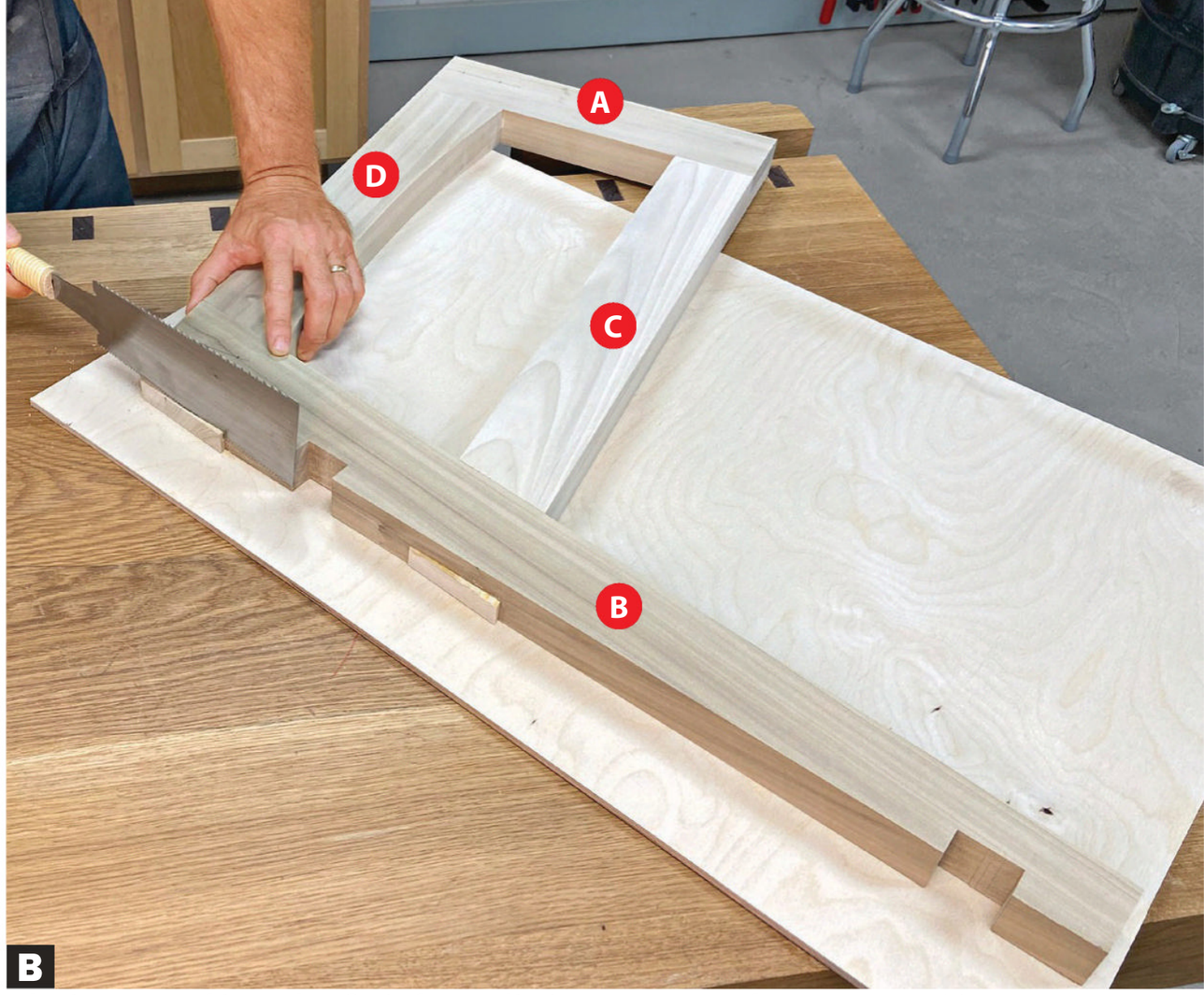
**DIMENSIONS:**
54" W × 29" D × 29" H

Approximate materials cost:
**$230**
Lumber and hardware

**40**
plugs for smooth faces all around




**Use the rip fence as a stop and cut** the 15° angled rabbets for the half-lap joints on one end of the back legs (B) and rails (C, D), and the dado in the back legs. Reset the miter gauge to 90° to rabbet the remaining ends.




**Trim the ends of the rails (C, D) flush with the** back edge of the back legs (B).

▶Build a super-simple tapering jig. woodmagazine.com/taper

## Work from the sides in

1 Cut the legs (A, B), side rails (C, D), and seat support (E) to size [**Materials List**].

2 Miter-cut the ends of the back legs (B) and rails (C, D) [**Drawing 1**].

3 Lay out the half-laps on the legs (A, B) and rails (C, D) [**Drawing 1**], then cut them using a dado blade in your tablesaw [**Photo A**].

4 Taper each back leg (B), then notch the back edges where shown [**Drawing 1**].

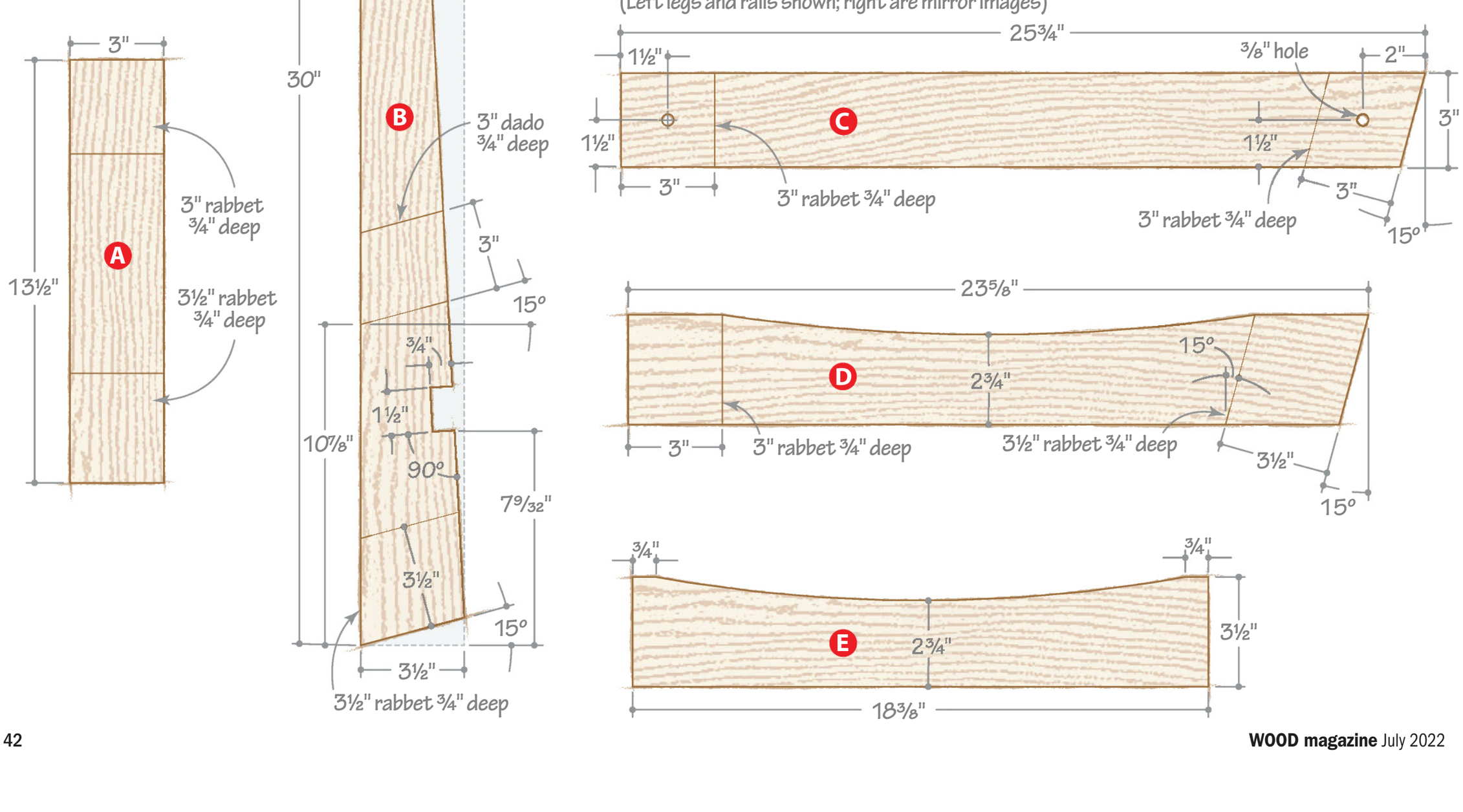
5 Bandsaw the curve on the top edge of the lower side rails (D) and seat support (E), then sand the edges smooth [**Drawing 1**]. Set the seat support aside for now.

6 Glue up the side assemblies [**Drawing 2**]. Once the glue dries, trim the rails [**Photo B**] and sand them smooth.

▶Lay out curves with this handy shop helper. woodmagazine.com/fairing

▶Learn about the best outdoor adhesives. woodmagazine.com/outdoorglue

### 1 LEGS, RAILS, AND SEAT SUPPORT



## Frame it up

***Tip!*** *Use exterior-grade screws to ensure a long-lasting assembly.*

1 Cut the seat rails (F) to size [**Materials List**], then drill counterbored pilot holes centered along the outside faces [**Drawing 2**].

2 Glue and screw the seat rails to the seat support [**Drawing 2**].

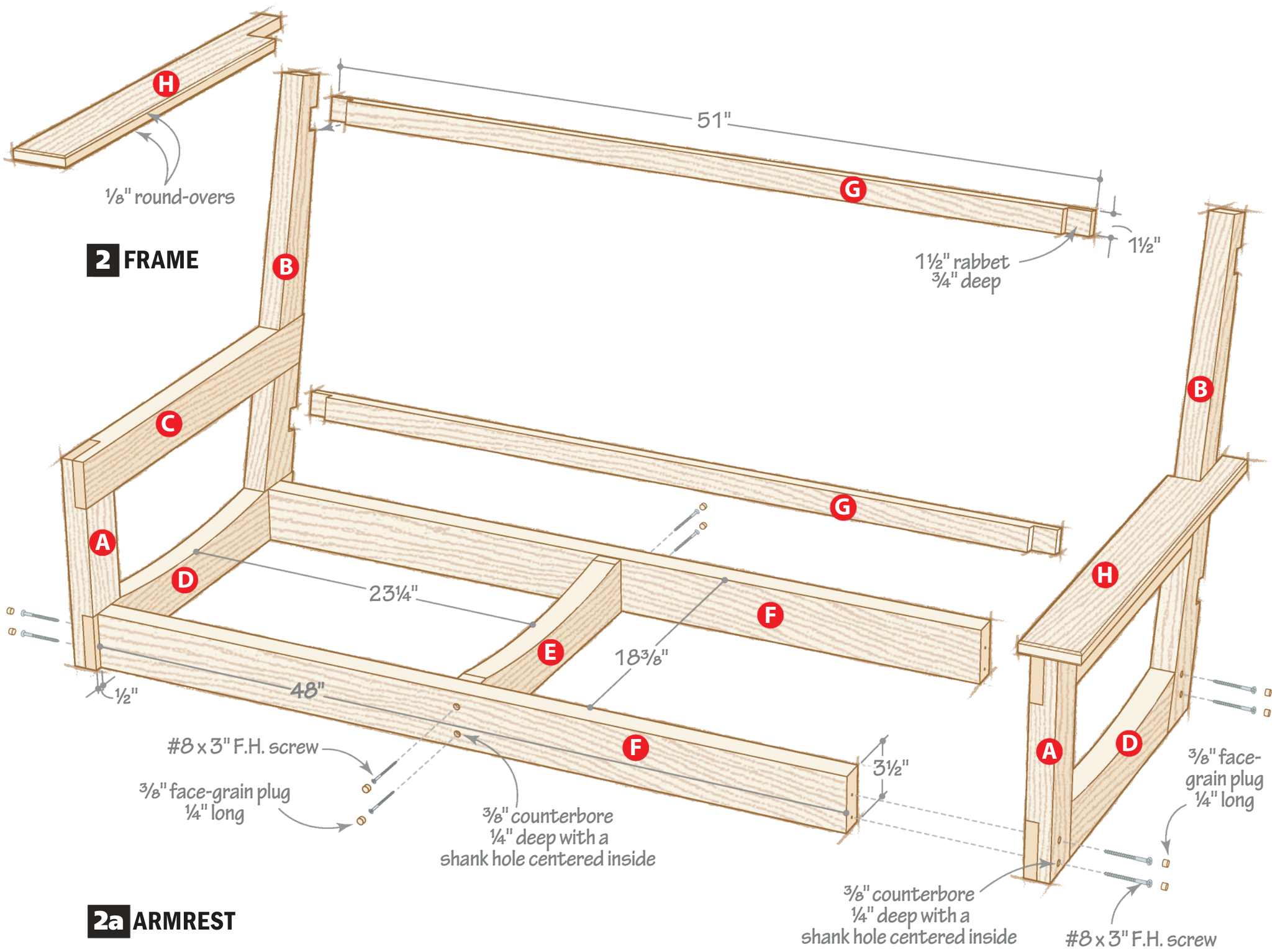
3 Drill pilot holes in the side assemblies (A–D) [**Photo C, Drawing 2**], then glue and screw the assemblies to the seat support assembly (E/F) .

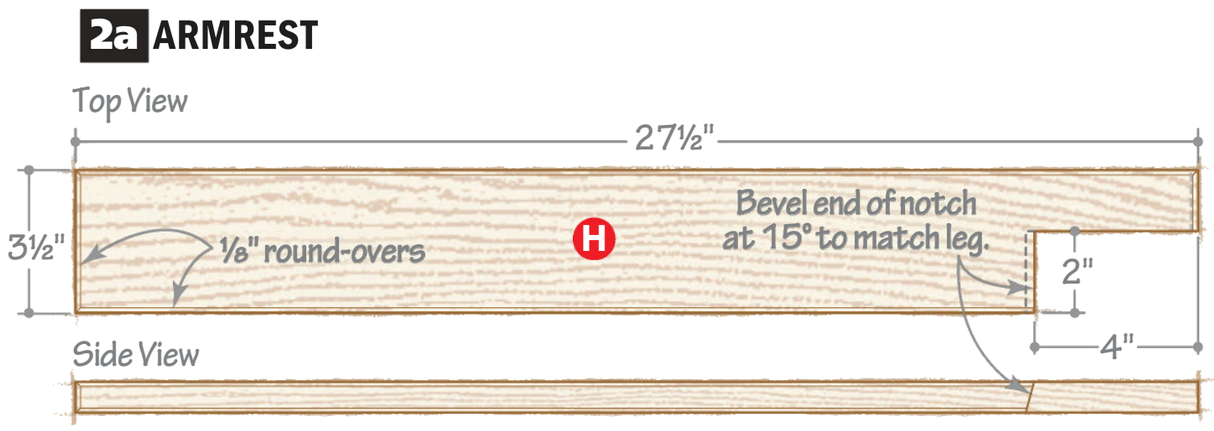
4 Cut the backrest supports (G) to size, rabbet each end, then glue them into the notches in the back legs (B) [**Drawing 2**].

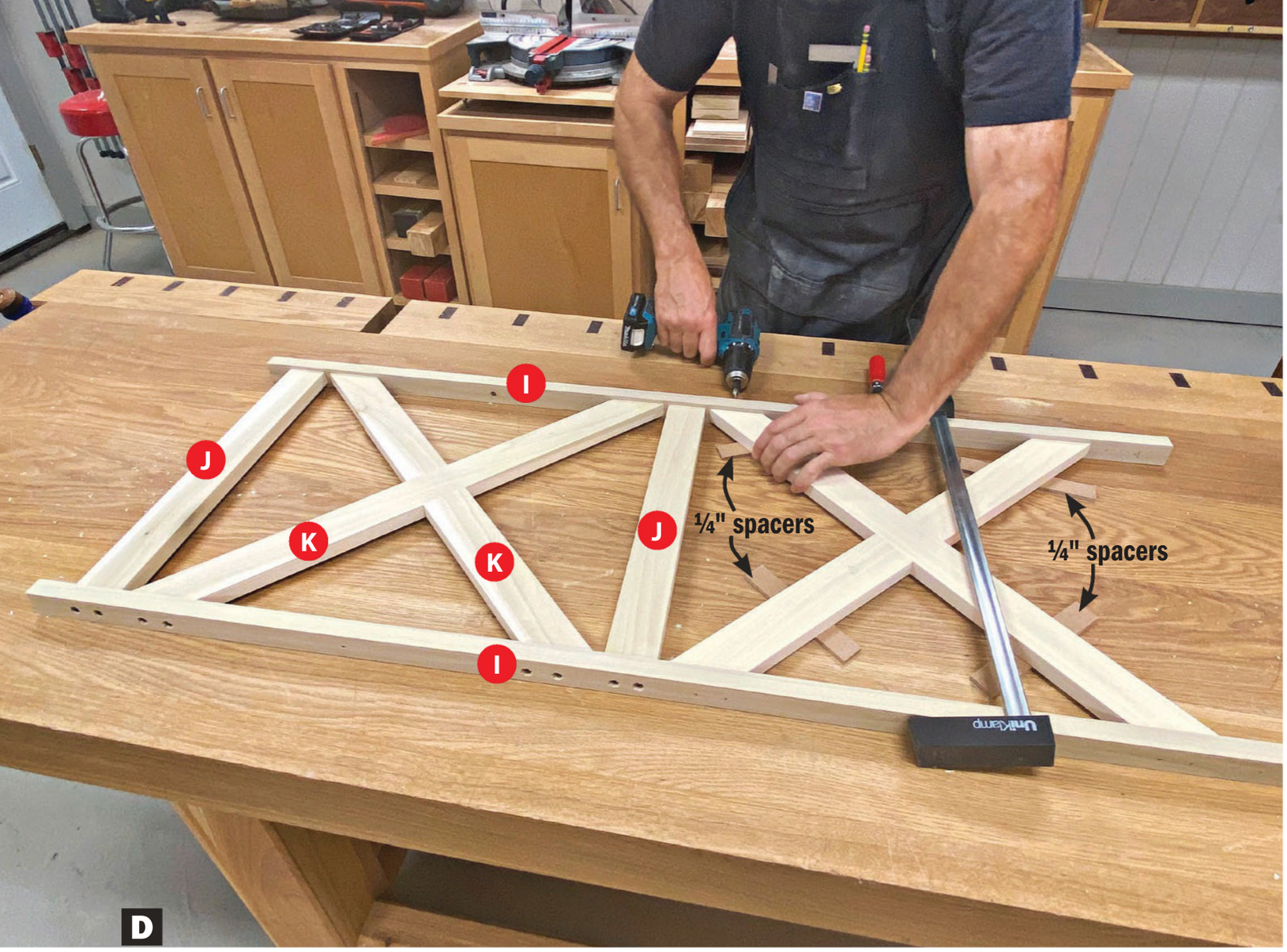
5 Cut the armrests (H) to size, then round over the top and bottom faces [**Drawing 2**].

6 Use a dado blade to form the beveled notch at the back end [**Drawing 2a**], then glue the armrests to the top of the front leg (A) and upper side rail (C) [**Drawing 2**].

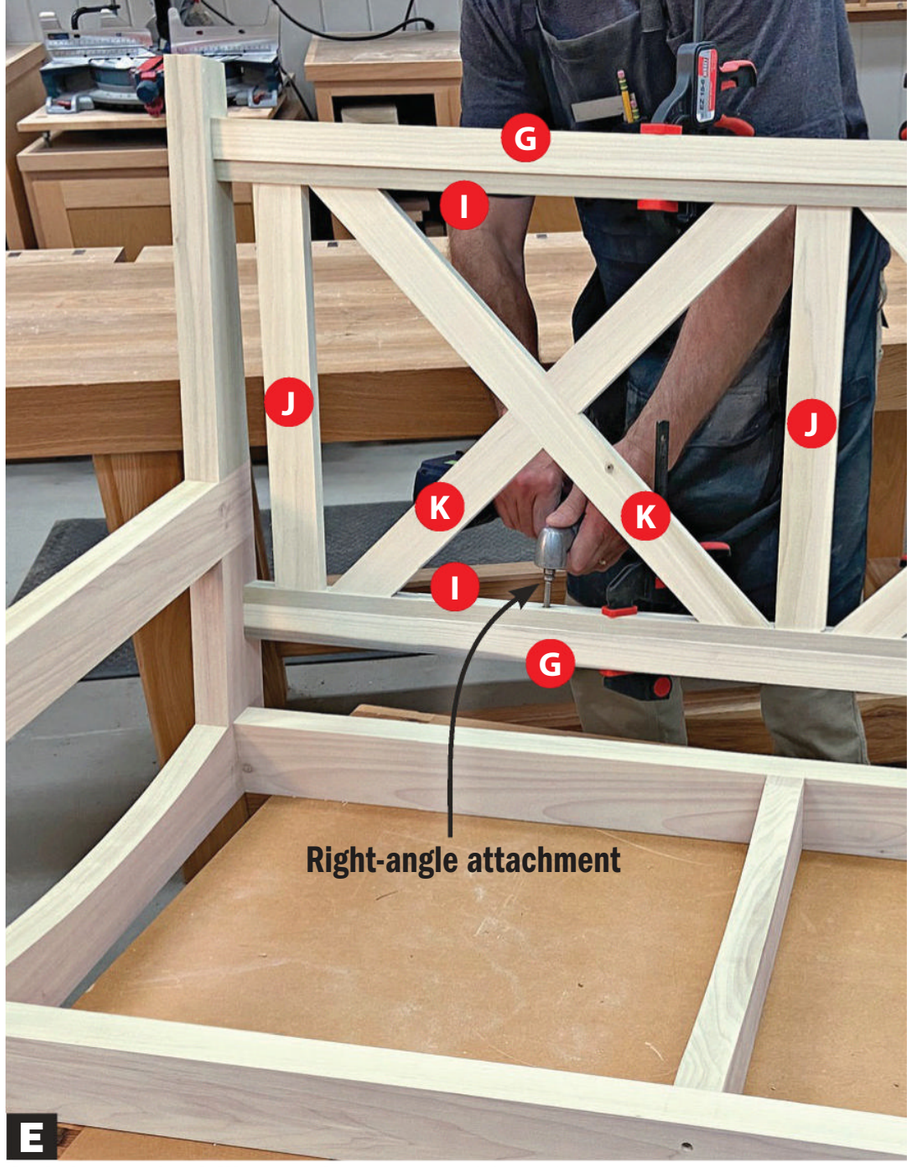
**Clamp the side assemblies** to the seat support assembly, then drill counterbored pilot holes into the front rails (F).






**Use ¼" spacers under the vertical supports (J)** and crosses (K) to center them on the cross supports (I) during assembly.




**A right-angle drill attachment** provides clearance for drilling the pilot holes and installing the screws to attach the backrest to the backrest supports (G).

## This double cross won't betray

**1** Cut the cross supports (I) to fit snug between the back legs (B) and then clamp the cross supports to the backrest supports (G) [**Exploded View**].

**2** Measure between the cross supports (I), then cut the vertical supports (J) to this length [**Drawing 3**] and set them aside.

**3** Cut 27"-long blanks for the crosses (K) and miter-cut one end of each at 45°. Place the mitered end of one cross on the top of the lower cross support (I) and mark the top 45° miter. Add an extension and stop to your tablesaw miter gauge and cut all the crosses (K) to final length.

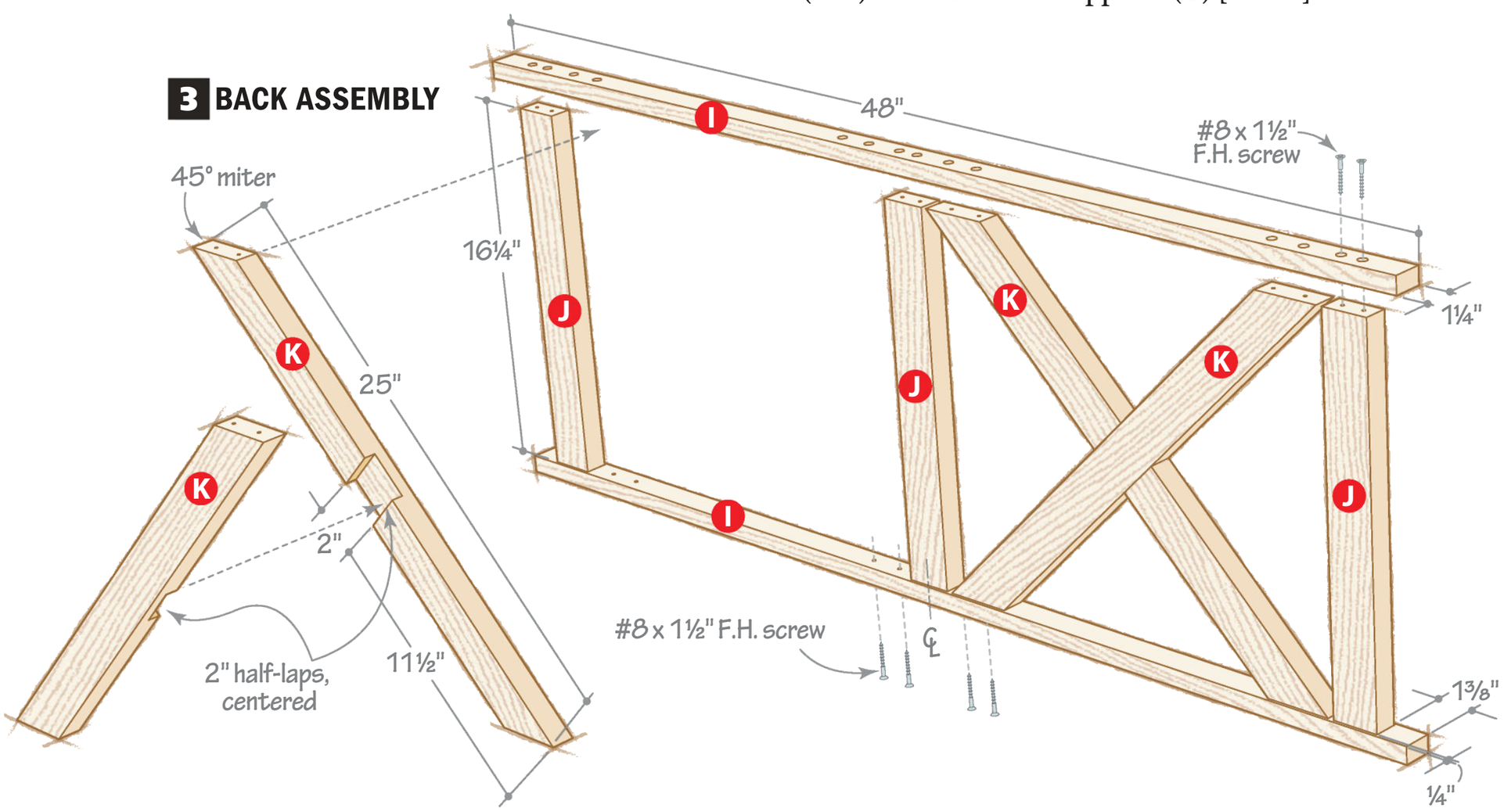
**4** Lay out the half-laps in the crosses and cut them with a dado blade [**Drawing 3**].

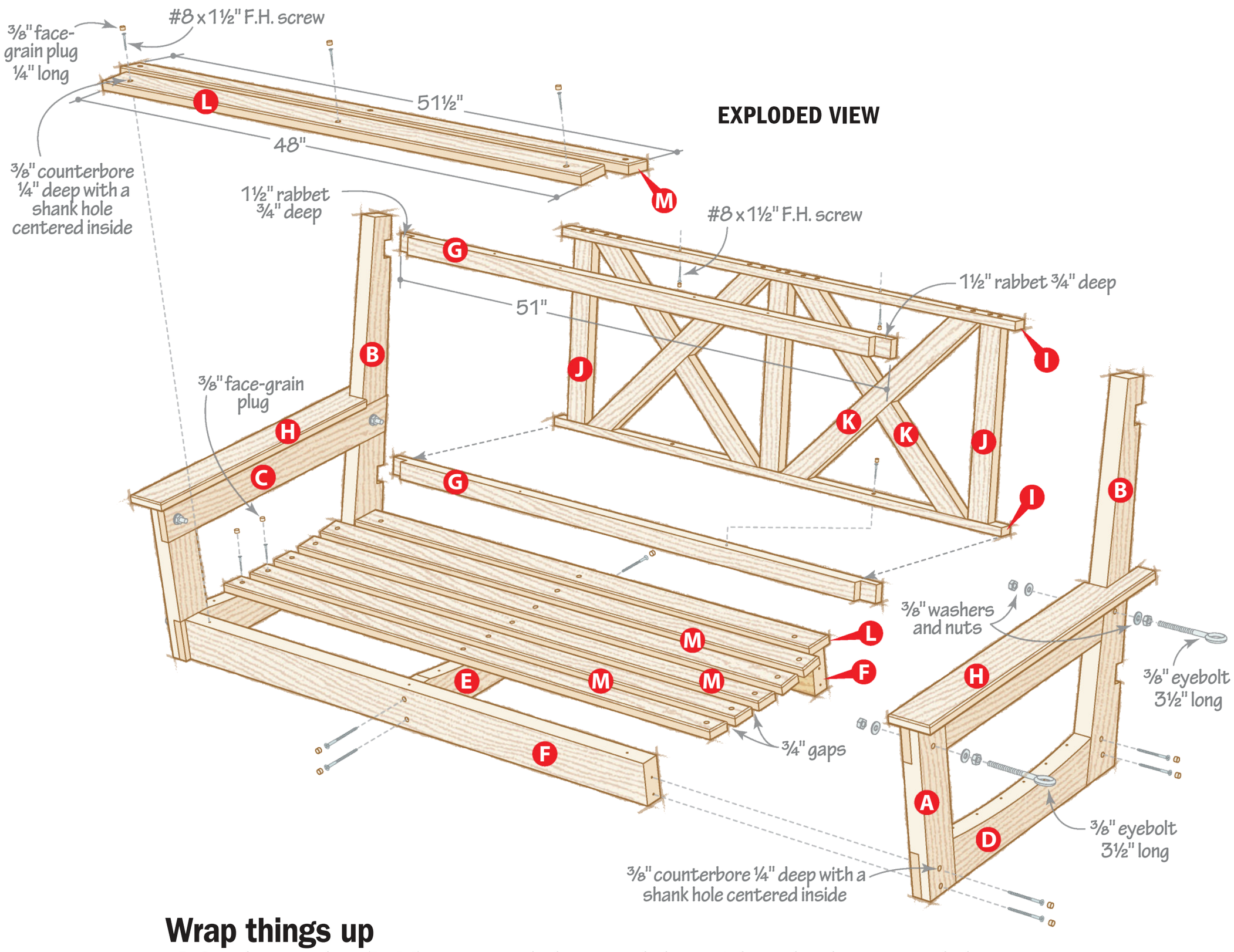
**5** Glue and clamp the half-laps to form a pair of Xs [**Drawing 3**].

**6** Assemble the backrest by counterboring and screwing one vertical support (J) centered on the cross supports (I). Counterbore and screw a cross (K/K) and an additional vertical support to one side. Repeat the process for the other side [**Drawing 3, Photo D**].

**7** Glue and screw the backrest assembly (I–K) to the backrest supports (G) [**Photo E**].

▶Learn to cut precision half-laps. woodmagazine.com/halflap






## Wrap things up

1 Cut the seat slats (L, M) to size and glue and screw them to the frame [**Exploded View**].

2 Cut a set of face-grain plugs from a scrap of project stock and glue them into all the counterbores, then finish-sand the entire swing.

3 Drill holes for the eyebolts [**Drawing 1, Exploded View**], then prime and paint the swing your desired color.

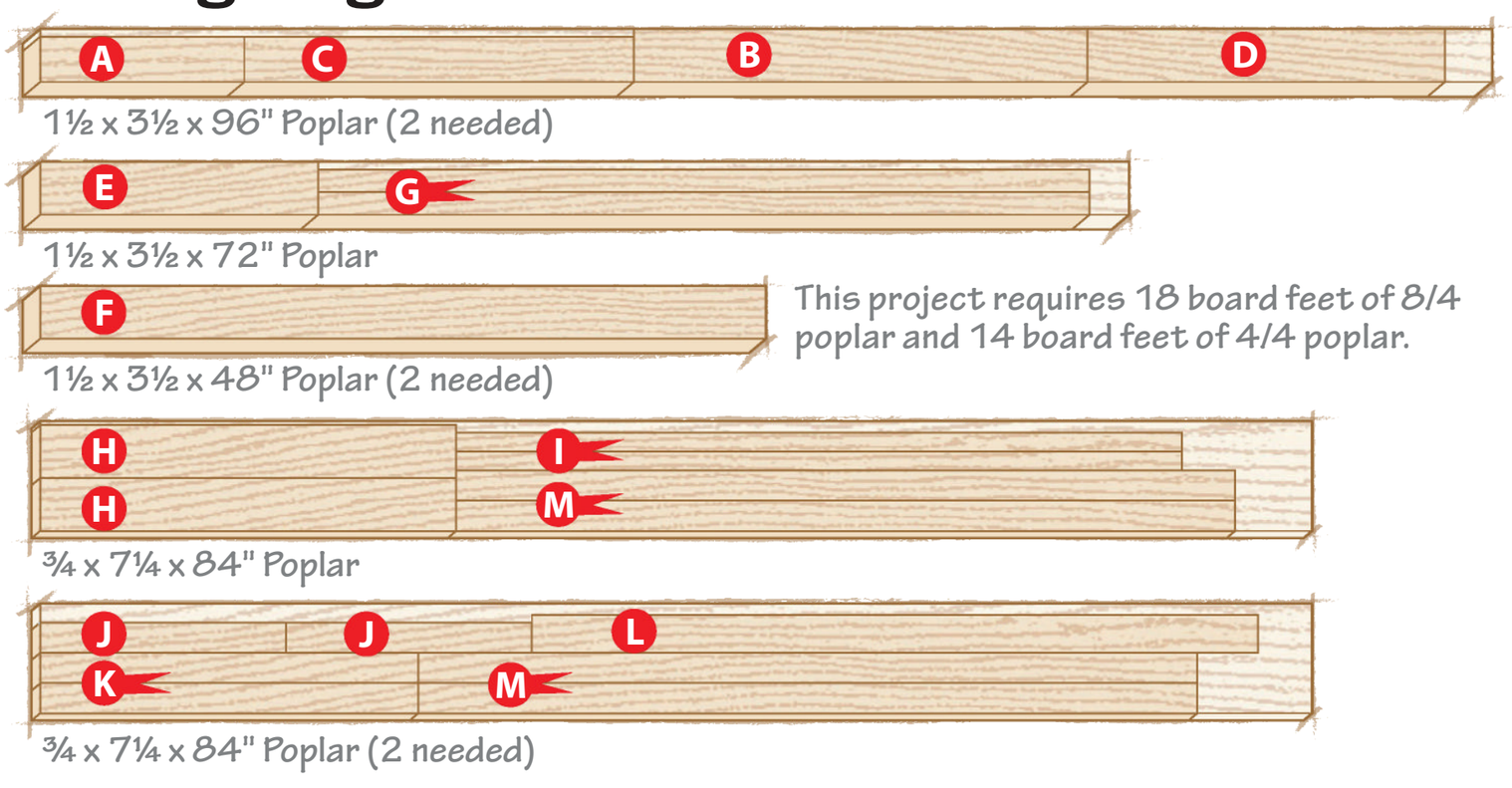
4 Install the eyebolts and hang the swing from a secure structure with quick links and chain. Adjust the chain as needed to get the right "lean" of the seat [**Opening photo**].

5 Now grab a drink, kick back, and relax; you've earned it!

▶ Install perfect plugs in six steps. woodmagazine.com/perfectplugs

Produced by **Bryan Nelson** with **Kevin Boyle** and **Brian Bergstrom**
Project design: **Kevin Boyle**
Illustrations: **Roxanne LeMoine, Lorna Johnson**

## Cutting Diagram




## Materials List

| Part | | FINISHED SIZE T | W | L | Matl. | Qty. |
|---|---|---|---|---|---|---|
| A | front legs | 1½" | 3" | 13½" | P | 2 |
| B | back legs | 1½" | 3½" | 30" | P | 2 |
| C | upper side rails | 1½" | 3" | 25¾" | P | 2 |
| D | lower side rails | 1½" | 3½" | 23⅝" | P | 2 |
| E | seat support | 1½" | 3½" | 18⅜" | P | 1 |
| F | front/back seat rails | 1½" | 3½" | 48" | P | 2 |
| G | backrest supports | 1½" | 1½" | 51" | P | 2 |
| H | armrests | ¾" | 3½" | 27½" | P | 2 |
| I | cross supports | ¾" | 1¼" | 48" | P | 2 |
| J | vertical supports | ¾" | 2" | 16¼" | P | 3 |
| K* | crosses | ¾" | 2" | 25" | P | 4 |
| L | front/back slats | ¾" | 2½" | 48" | P | 2 |
| M | slats | ¾" | 2" | 51½" | P | 6 |

*Parts initially cut oversize. See the instructions.

**Materials key:** P-poplar.

**Supplies:** ⅜" hex nuts (8), ⅜" flat washers (8), ⅜ × 3½" eyebolts (4), 2/0 straight link chain, chain quick links (8), #8 × 1½" flathead screws, #8 × 3" flathead screws.

**Blade and bits:** Dado set; ⅛" round-over router bit; ⅜" plug cutter.

# Amp Up Your Tablesaw Fence

*A little TLC plus a few jigs and accessories will improve your rip fence's performance.*

**Run a dial indicator along the fence face** to make sure it varies no more than .002" along its length. A continuous increase or decrease means the fence needs realignment; small "waves" of variance could indicate delamination.

**Spray on a dry lubricant,** let it rest for a minute, then buff the fence faces for a slippery-smooth finish. Do the same for the tablesaw top.

## Mending fences

The accuracy of the jigs and fixtures you use with your fence depends on the fence itself. So make that right first with these tips to keep your fence in tip-top shape:

■ **Ensure alignment.** Occasionally a saw or fence gets knocked out of alignment. So check this every few months with a reliable gauge [**Photo A**]. After paralleling the blade to your saw's miter slots, do the same with your rip fence.

■ **Looks like a face-off.** If the plastic laminate covering your fence's sideboards begins to peel away, reattach or replace it. To do this, soften the adhesive behind the laminate with a heat gun or hair dryer and *gently* peel away the laminate. Remove any residual adhesive with a solvent, such as lacquer thinner. When dry, reattach with contact cement. Should the laminate break as you're removing it, simply cut a new piece of laminate to fit.

■ **Make it slick.** To reduce friction and help workpieces slide easily, apply a coat of paste wax or dry lubricant to the fence's sideboards [**Photo B**]. We like Bostik GlideCote [**Sources**].

■ **Give it scale.** If your saw's rip-fence scale has become unreadable [**Photo C**], replace it. It's a simple process: Mark the zero location on the rail, peel or scrape off the old scale, remove any residual adhesive, and then apply the new self-adhesive scale, aligning it with the zero mark.

## Add-ons protect and serve

An auxiliary fence—one that attaches to the factory-supplied fence—prevents damage to your fence's sideboards and, in some cases, adds functionality. You can use an auxiliary fence in two ways. First, place the fence against the blade or dado set—stacked to the exact width you need—so you cut a perfect rabbet. Or, install a dado set wider than your needed rabbet, then bury the part you don't need under the auxiliary fence. Raise the spinning blade to your desired height.

■ **A basic auxiliary fence.** It doesn't get any simpler than this: Cut a piece of plywood or MDF and clamp it to your rip fence. If you find that regular clamps get in the way of your workpiece, use specialty fence clamps for an obstruction-free face [**Photo D, Sources**].

▶Jim Heavey shows how to tune up your tablesaw.
woodmagazine.com/tstuneup

***Tip!*** *Home centers carry plastic laminate—though maybe not in white or solid colors. You might find a local cabinet or countertop shop willing to give you a scrap big enough for the job.*

▶Replace your saw's rip-fence scale.
woodmagazine.com/ripfencescale

▶Learn to cut rabbets on the tablesaw.
woodmagazine.com/rabbets

**Heavy use rubbed the most-used first 5"** off this rip-fence scale, drastically reducing its readability. A new scale will make the dimensions legible again.

**Fence clamps** fit into a hole or, in the case of these Matchfit clamps, dovetail slots routed into the auxiliary fence with a dovetail bit.

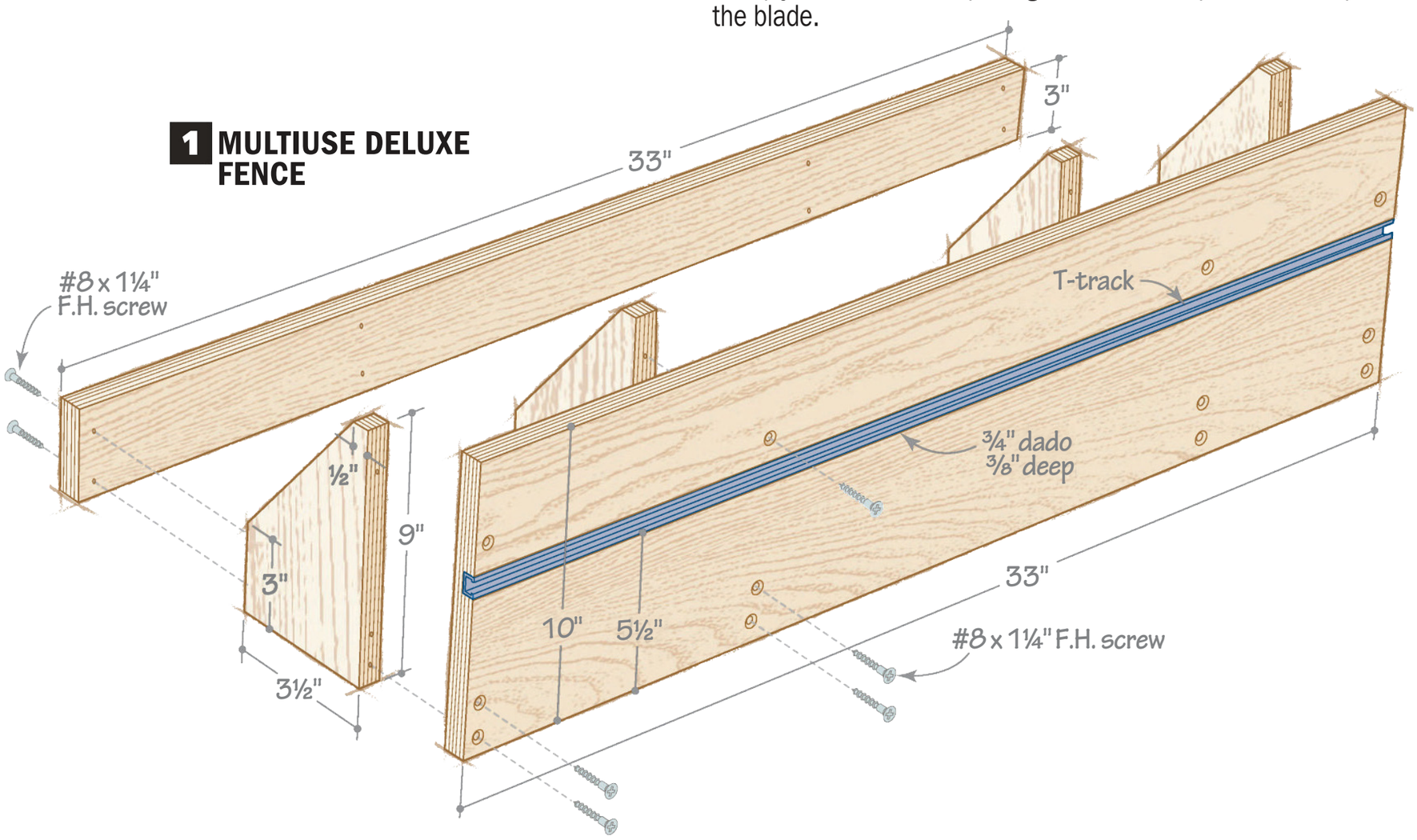
***Tip!*** *Build this fence in a whole-inch width, such as 5", so you can set it accurately using your rip-fence scale without any calibration.*

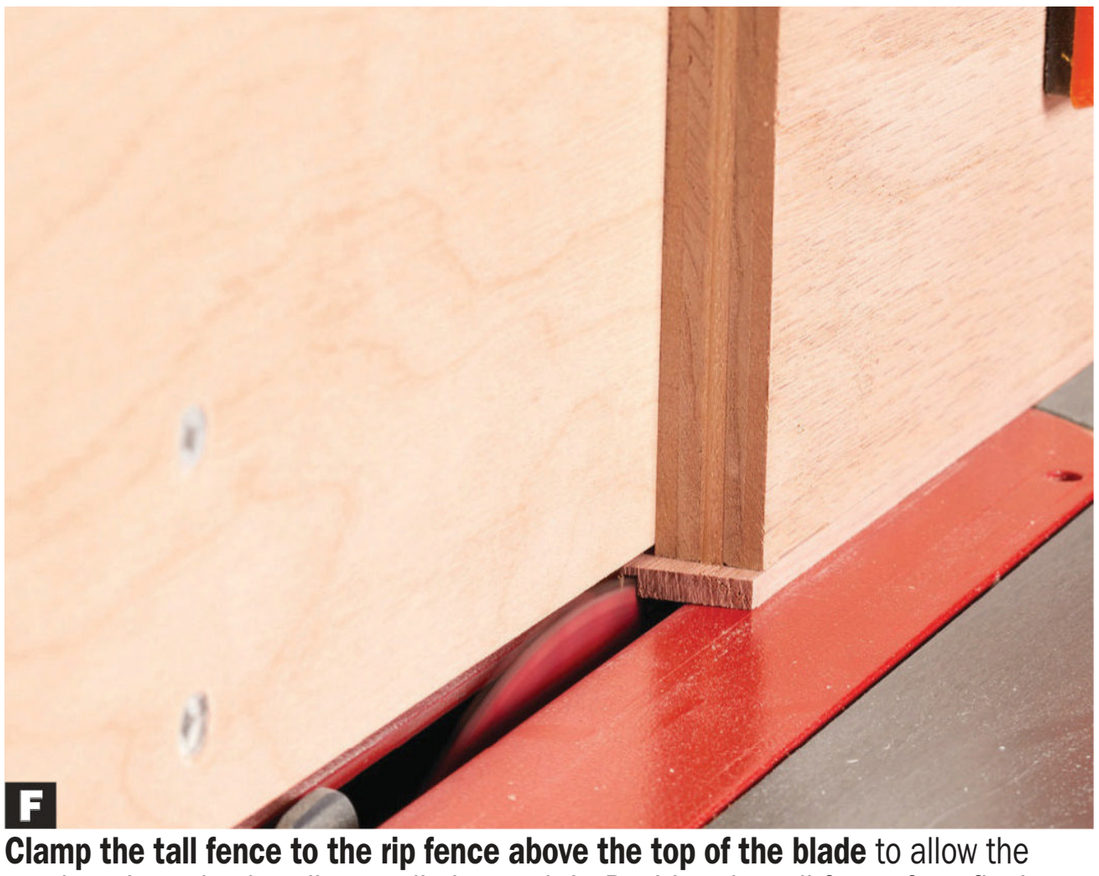
■ **An easy-clamp fence.** Build the fence shown in **Photo E** so you can use clamps you likely already own. And by building with screws only—no glue—you can replace the outer face when it gets cut up from use without having to rebuild the whole fence.

■ **A multiuse deluxe fence.** This tall fence [**Drawing 1**] stabilizes workpieces taller than the fence for tasks such as beveling edges for a door panel [**Page 46**] or trimming edge banding [**Photo F**]. T-track [**Sources**] in the front face accepts a featherboard or hold-down [**Photo G**].

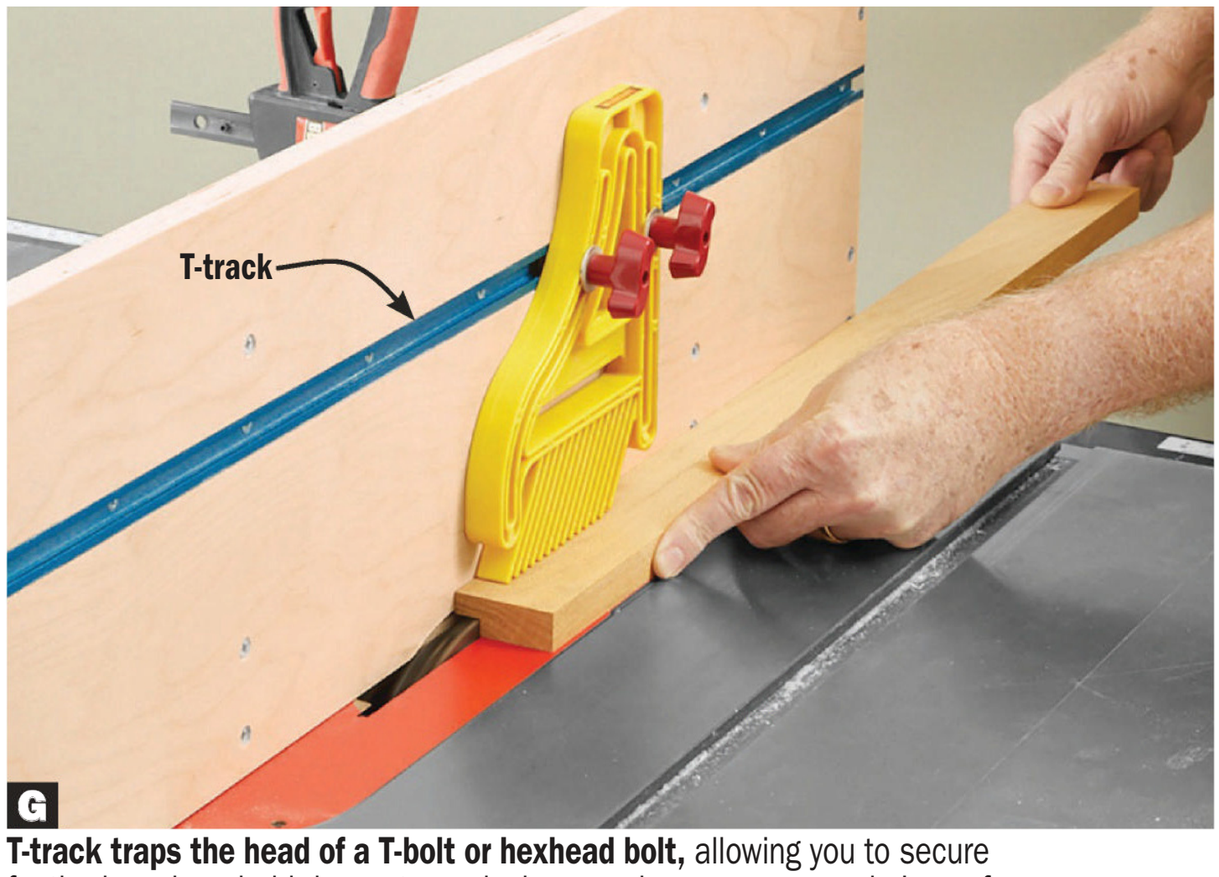
**Make this auxiliary fence** with spacers long enough to provide clearance so the clamp jaws fit into the openings. Locate the spacers to keep screws away from the blade.

**1 MULTIUSE DELUXE FENCE**




**Clamp the tall fence to the rip fence above the top of the blade** to allow the overhanging edge banding to slip beneath it. Position the tall fence face flush with the outermost teeth of the the blade. Then trim the edge banding flush.




**T-track traps the head of a T-bolt or hexhead bolt,** allowing you to secure featherboards or hold-downs to apply downward pressure on workpieces for safety and consistent cutting depth.

H

**Hold the tenoning jig down** while pushing it through the cut to ensure consistent cutting depth. Replace the backer block when it no longer provides zero-clearance support behind the workpiece.

I

**Position the rip fence to locate the slots** where you want them. Then, hold the mitered box snugly in the cradle and slide the jig over the blade to cut the slot. Repeat for all four corners, then reposition for more cuts.

## Saddle up for joinery

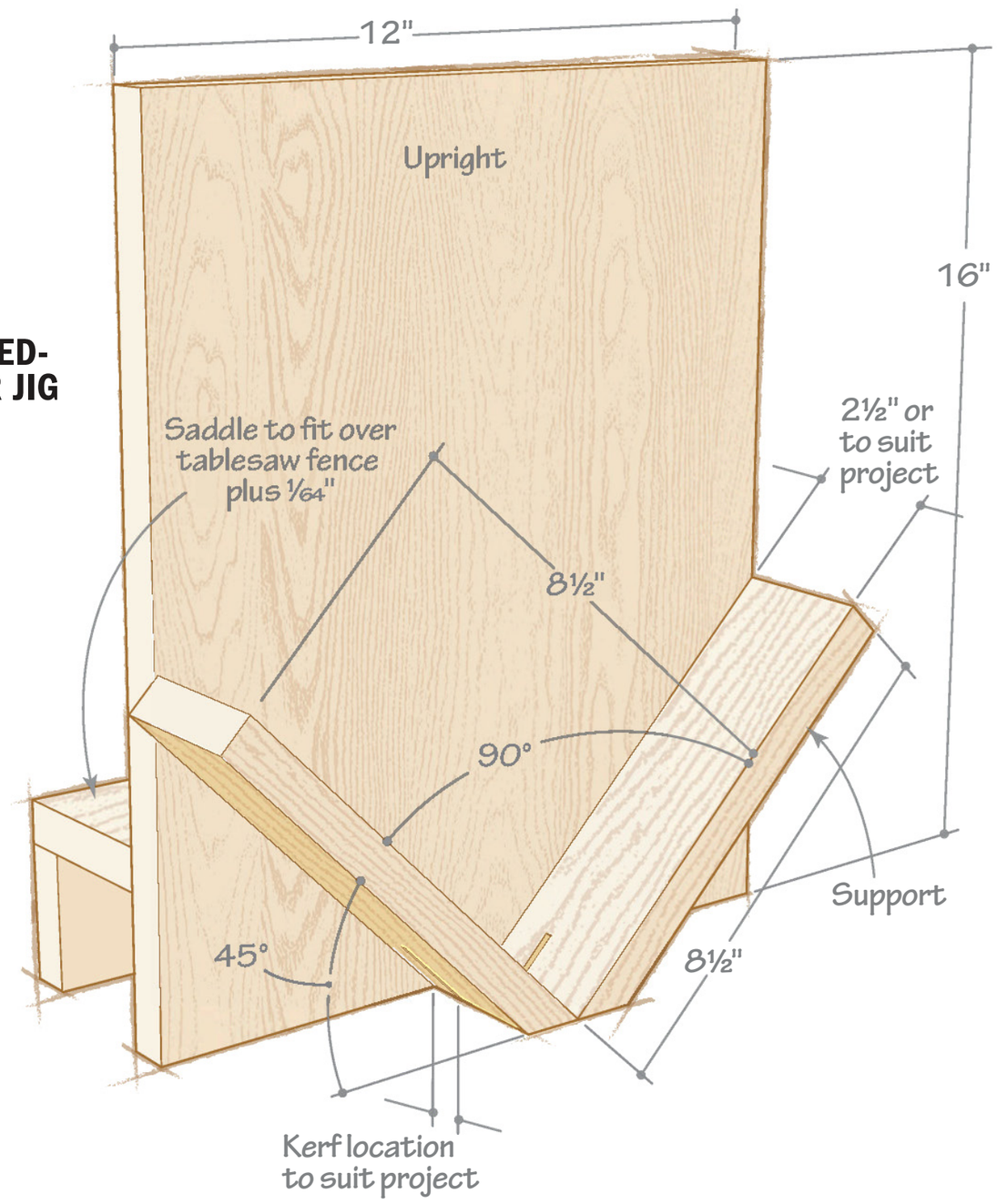
Custom saddle jigs that straddle the rip fence make for safe and secure cutting. To build one, cut pieces of plywood to form a lower-case "h." Cut the horizontal bridge between the two uprights about 1/64" wider than needed, and insert a piece of paper between the fence and short upright during assembly. This allows the jig to slide freely.

■ **Tenoning jig.** Cutting tenons with this jig [**Photo H**] leaves smooth cheeks that require less cleanup and bond better with the mortise.

■ **Splined-miter jig.** This jig cradles mitered boxes and frames while you cut precise slots for splines to reinforce the miters [**Photo I, Drawing 2**].

▶Learn how to make splined-miter joints using this jig. woodmagazine.com/splinedmiters

**2 SPLINED-MITER JIG**




**Sources:** Bostik GlideCote dry lubricant, no. 97594, $27, Rockler, 800-279-4441, rockler.com.
Matchfit Dovetail Clamps (pair), $45; 14° dovetail router bit, $30; MicroJig, 855-747-7233, microjig.com.
Universal Fence Clamps (pair), no. 31373, $17, Rockler.
Universal T-track, 36", no. 26420, $20, Rockler.

Produced by **Bob Hunter**
Illustrations: **Roxanne LeMoine, Lorna Johnson**

# No-wiring Wall Sconce

*Let the beauty of wood shine.*

Add instant ambiance anywhere with the warm glow of wood highlighted by a battery-powered LED. The back of the sconce takes center stage, making it a great use for that small piece of figured wood you've been saving. In fact, you can probably source most of these small parts from scrap you already have.

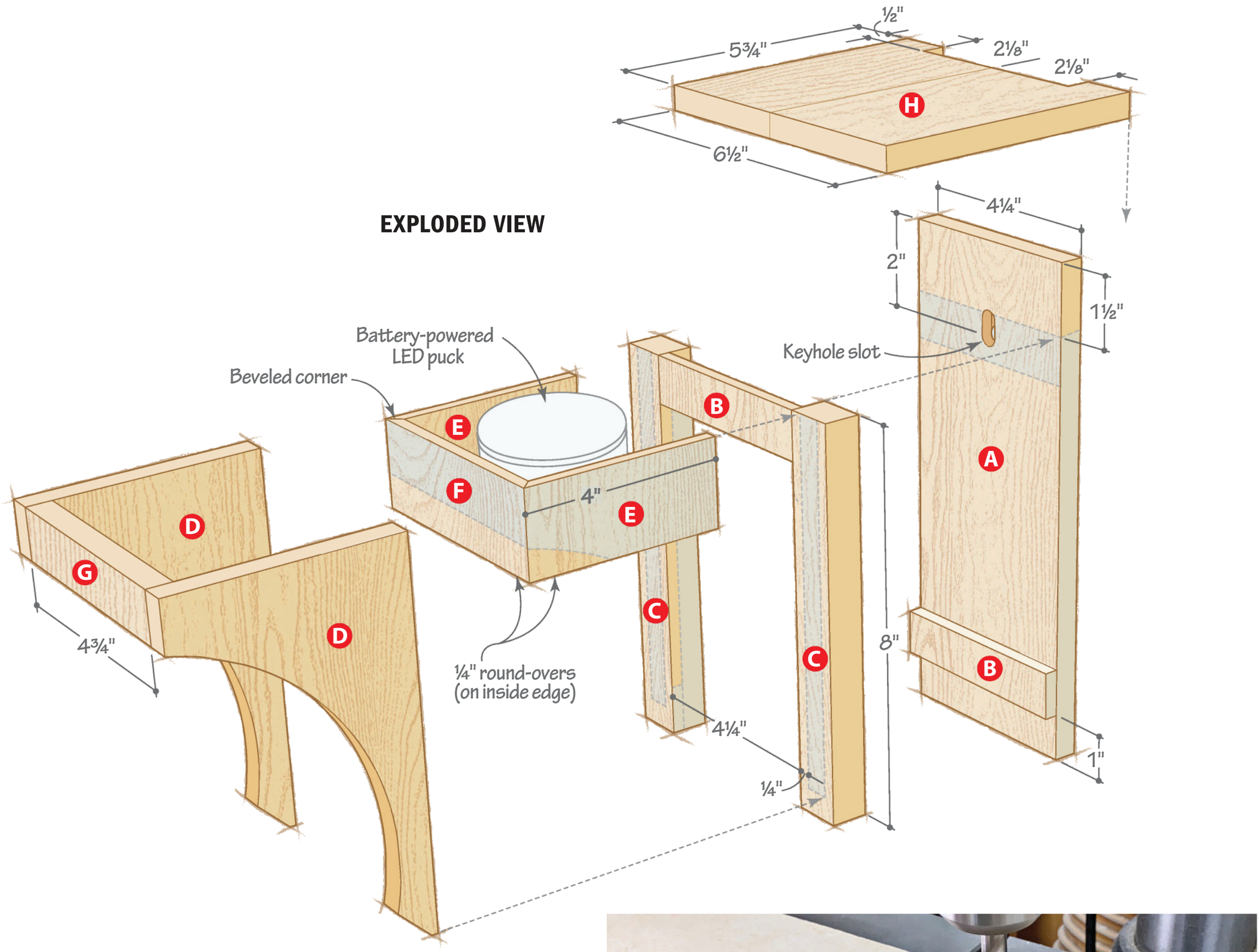
**Note:** *The LED puck light that we used [***Source***] turns on and off and dims with a remote control.*

**DIMENSIONS:**
6½" W × 5¾" D × 10½" H

**Approximate materials cost:**
**$10**
using scrap you have on hand

**100**
hours of light from 3 AA batteries (estimated)

## EXPLODED VIEW

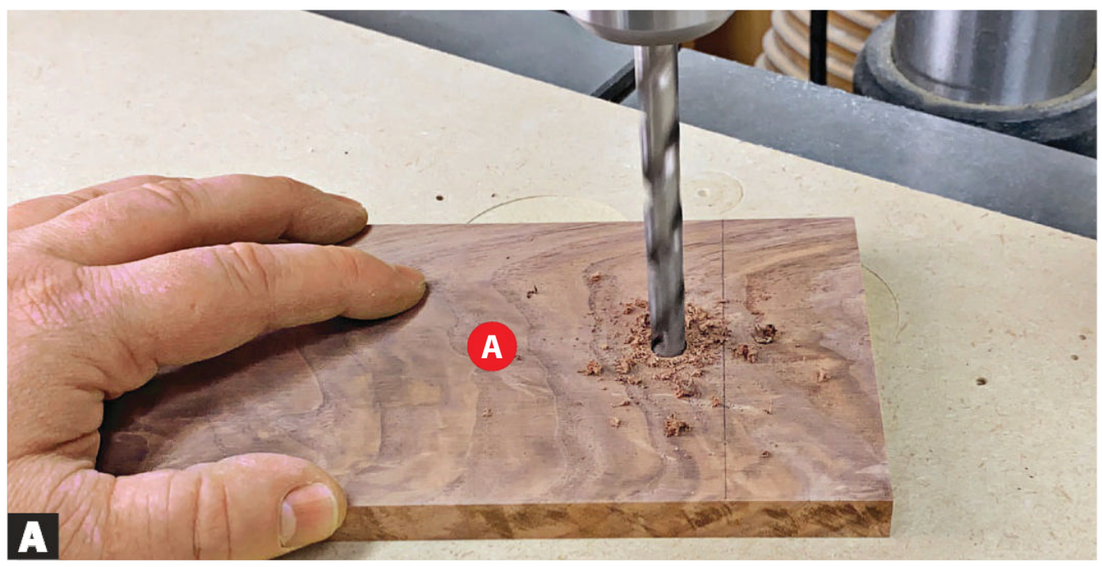



## Put your back into it

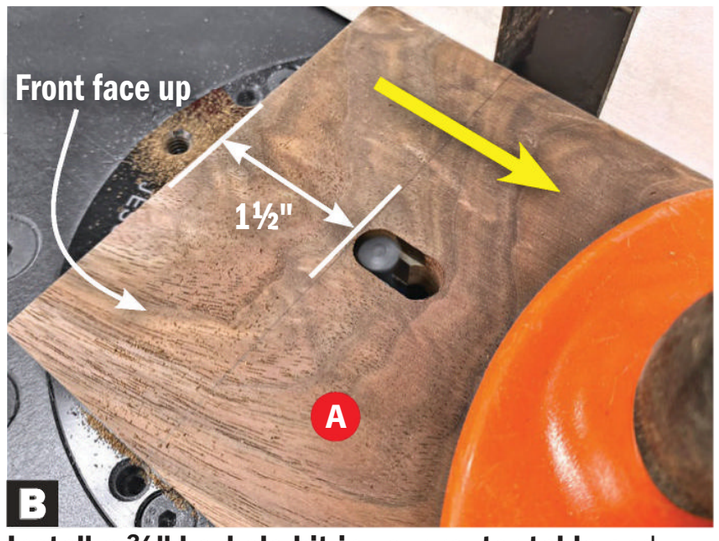
***Note:*** *On several sconce parts, such as the rails (B), their widths (the dimension* across *the grain) measure greater than their lengths (the dimension* with *the grain).*

**1** Cut to size the back (A) [**Materials List**], then form the keyhole slot [**Exploded View, Photos A, B**]. Cut to size the rails (B) and glue them to the back [**Photo C**].

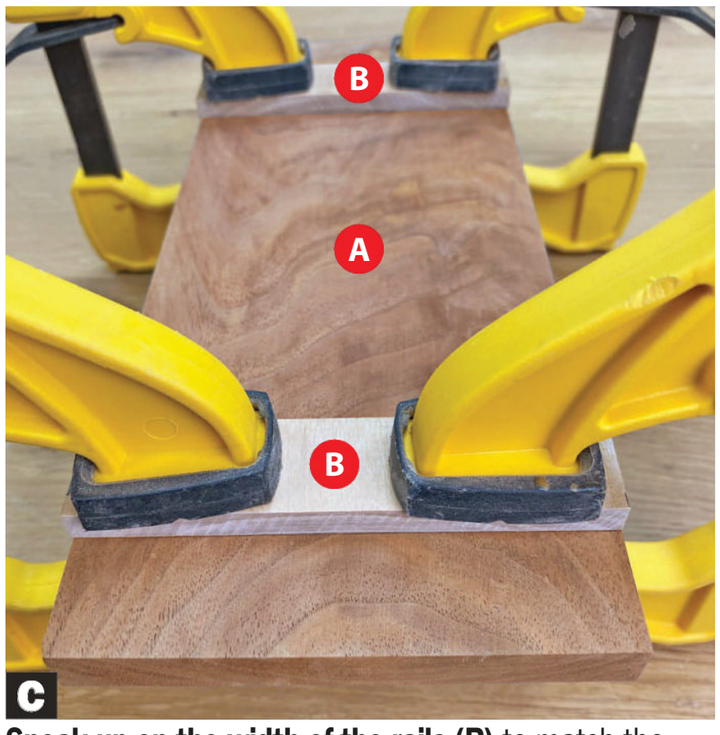
**2** Measure from one installed rail to the other to determine the length of the stiles (C). Cut them to size and glue them to the edges of the back and rails [**Photo D**], completing the frame.



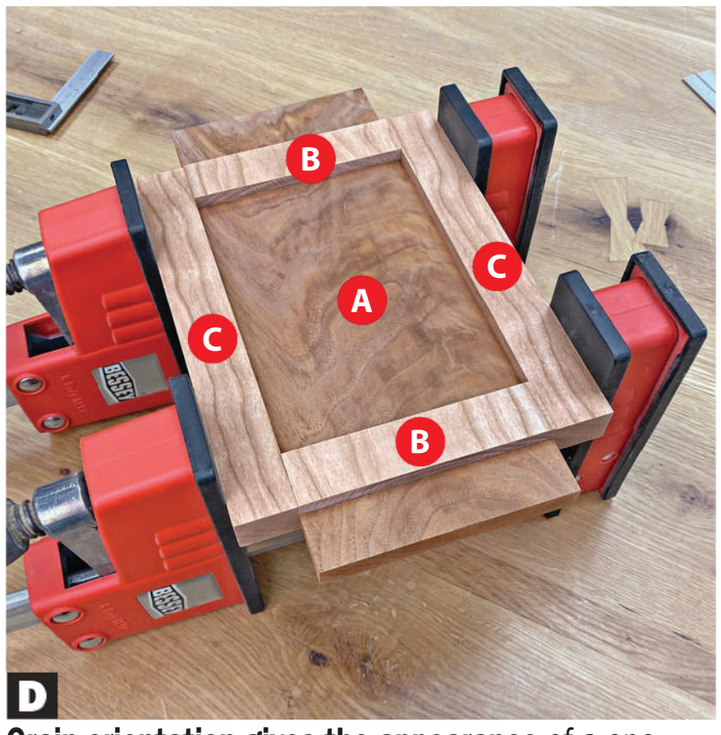

**Start the keyhole slot** with a ⅜" hole, 2" from the top and centered side-to-side.




**Install a ⅜" keyhole bit in your router table** and adjust its height to match the thickness of the back (A). Place the hole over the bit and adjust the fence to just touch the workpiece edge. Keeping a firm hold on the board, turn on the router and pull the workpiece toward you, stopping the slot 1½" from the end.




**Sneak up on the width of the rails (B)** to match the width of the back (A). Glue and clamp them to the back.




**Grain orientation gives the appearance** of a one-piece frame and avoids a cross-grain lamination.

▶Get the sticky on double-faced tape. woodmagazine.com/dftape

**3** Cut two 4½×7½" blanks for the brackets (D) [**Drawing 1**]. Stack them with double-faced tape, then cut and sand them to shape. Glue and clamp the brackets to the frame assembly [**Exploded View, Photo E**].

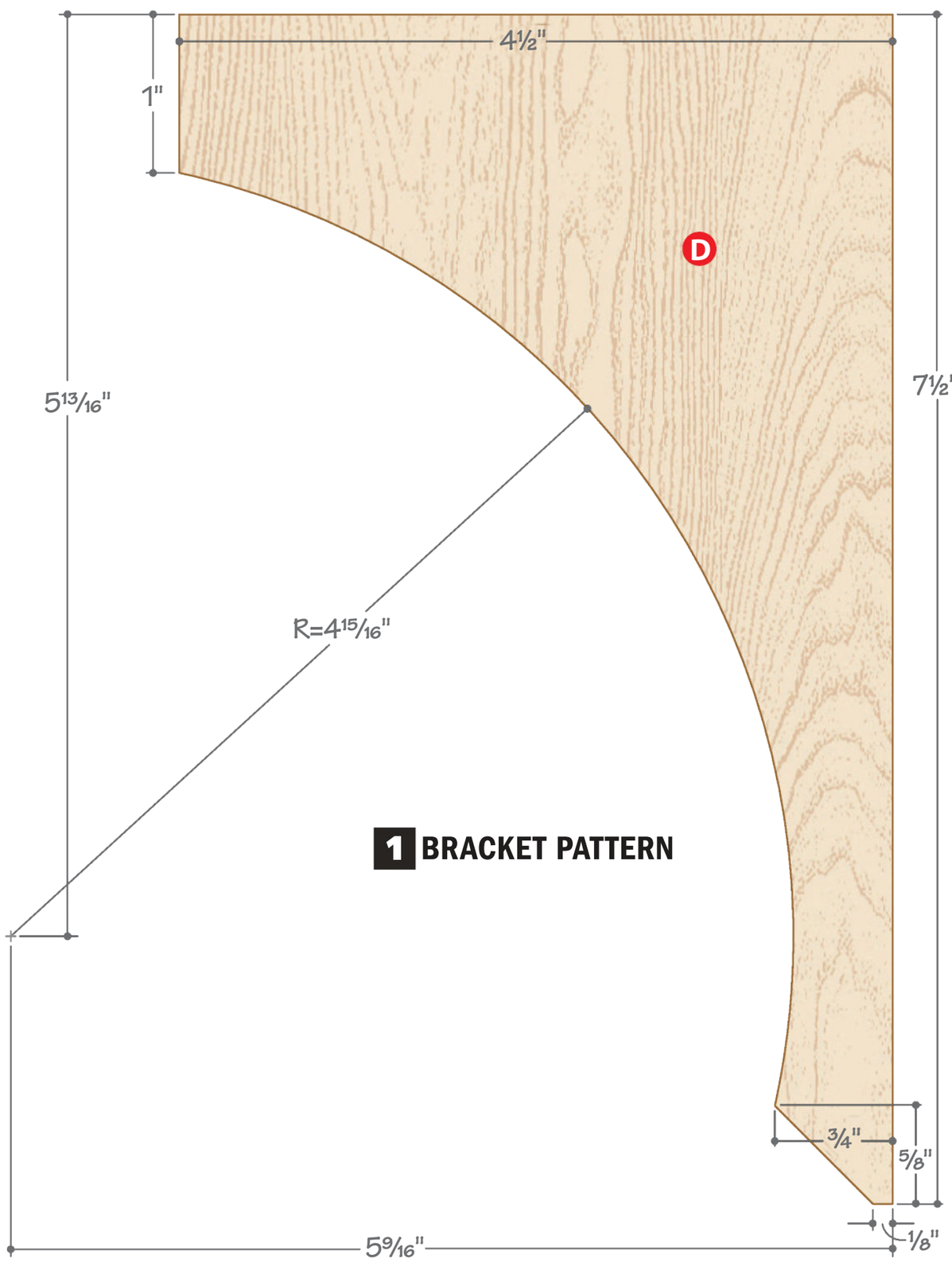
## What a lovely shade of brown

▶Crosscut small parts safely. woodmagazine.com/smallcrosscut

**1** Cut to size a 5×12" blank for the shade sides and front (E, F). Shape the bottom end profile [**Photo F**] and crosscut to length three shade blanks.

**2** From the blanks, bevel-cut to width the shade sides (E) and front (F), then glue and clamp them to the bracket/frame assembly [**Photo G**].

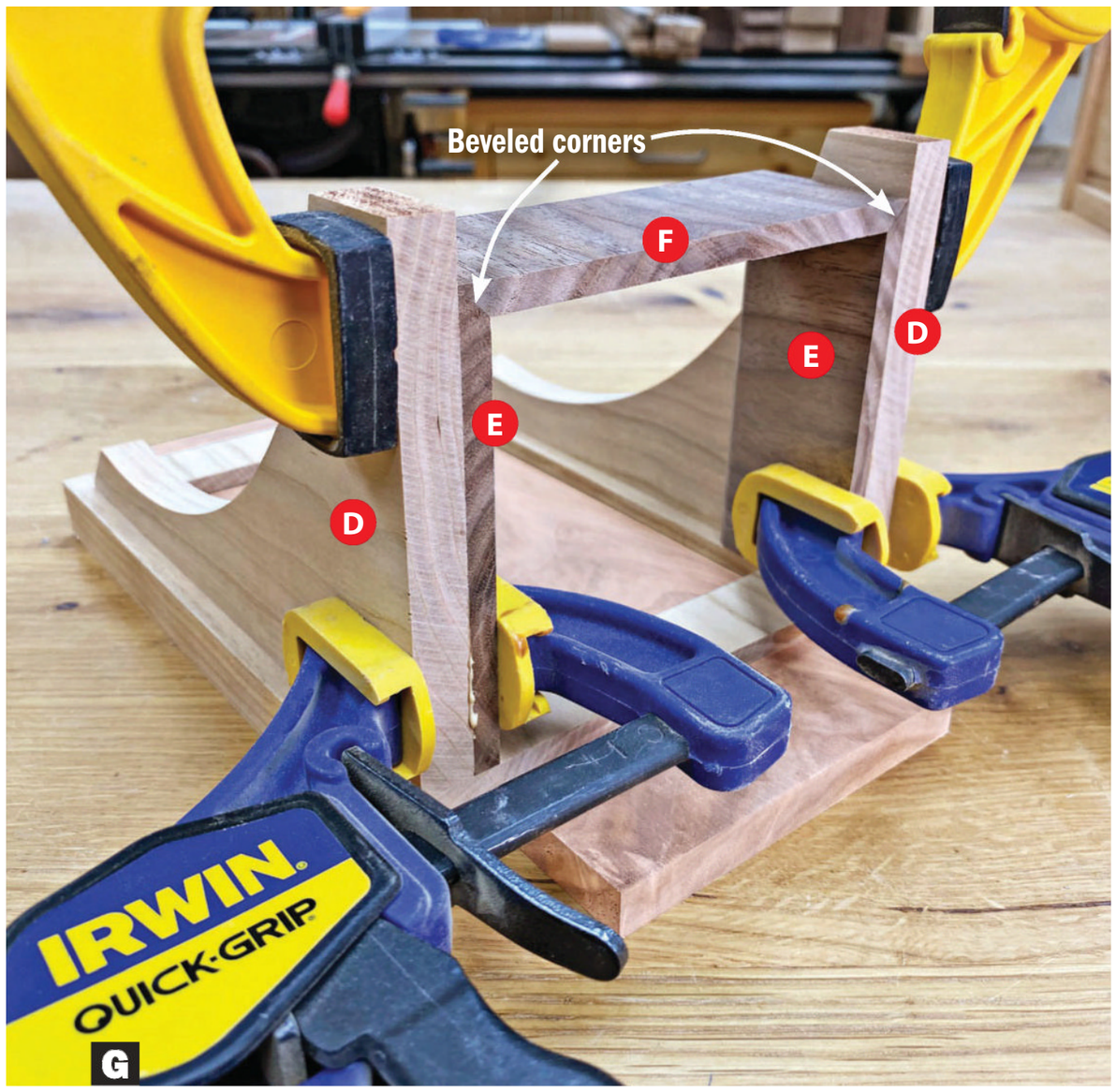
**3** Measure between the brackets (D) and cut the return (G) to fit between them. Glue and clamp the return to the shade front (F), flush at the top [**Exploded View**]. After the glue dries, sand it flush with the front edges of the brackets.




**1 BRACKET PATTERN**

**Glue the brackets (D) centered on the stiles (C)** and flush at the top.

**Round over one end of the shade blank**, then crosscut the routed end to 1¾" long. Rout and crosscut two more times to make the shade front and sides (E, F). Trimming the parts to final width removes any router tear-out.




**Bevel-cut the front edges of the shade sides (E)** and both edges of the shade front (F). Sneak up on the width of the front to match the distance between your brackets.

**Use light clamping pressure** to edge-glue the two halves of the top (H). If you need to increase the width of the notch to fit around the back (A), use a chisel to shave a little from each side.

4 Make the top (H) from two halves by first cutting two 3¼×5¾" workpieces, then notching one end of both pieces [**Exploded View**]. Edge-glue the two halves together [**Photo H**]. After the glue dries, glue and clamp the top to the sconce.

## Battery-powered brightness

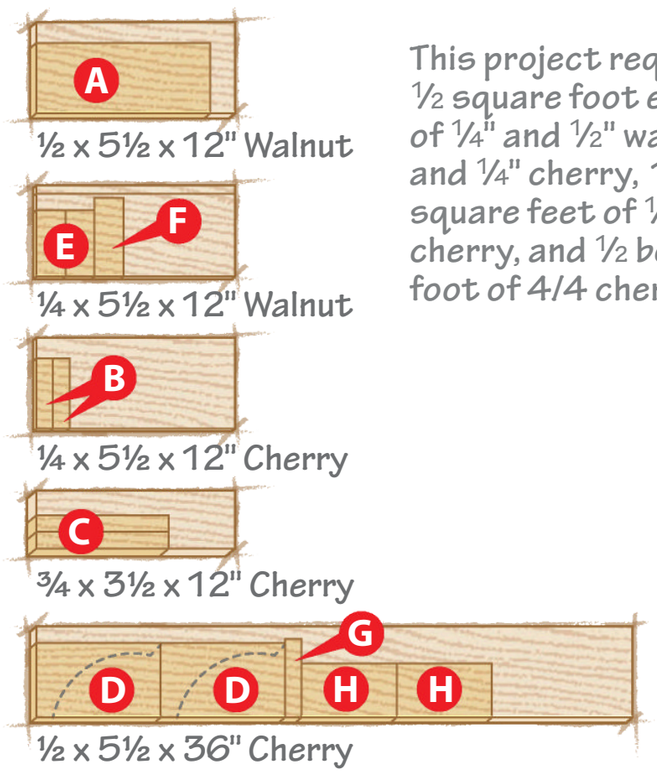
1 Finish-sand the sconce to 220 grit, then apply a clear finish. We sprayed on a semigloss lacquer.

2 Center the LED puck [**Source**] on the bottom face of the top (H), mark and drill pilot holes, then screw it into place.

3 Hang the sconce on a wall using the keyhole slot and enjoy the warm glow.

Produced by **Zach Brown** with **John Olson**
Project design: **John Olson**
Illustrations: **Roxanne LeMoine, Lorna Johnson**

## Cutting Diagram




This project requires ½ square foot each of ¼" and ½" walnut, and ¼" cherry, 1½ square feet of ½" cherry, and ½ board foot of 4/4 cherry.

## Materials List

| Part | | FINISHED SIZE T | W | L | Matl. | Qty. |
|---|---|---|---|---|---|---|
| A | back | ½" | 4¼" | 10½" | W | 1 |
| B | rails | ¼" | 4¼" | 1" | C | 2 |
| C | stiles | ¾" | 1" | 8" | C | 2 |
| D | brackets | ½" | 4½" | 7½" | C | 2 |
| E* | shade sides | ¼" | 4" | 1¾" | W | 2 |
| F* | shade front | ¼" | 4¾" | 1¾" | W | 1 |
| G | return | ½" | 4¾" | 1" | C | 1 |
| H | top | ½" | 6½" | 5¾" | EC | 1 |

*Parts initially cut oversize. See the instructions.

**Materials key:** W-walnut, C-cherry, EC-edge-glued cherry.
**Supplies:** AA batteries (3).
**Bits:** ¼" round-over router bit; ⅜" keyhole router bit.
**Source:** Brilliant Evolution LED puck light (pack of 2) with remote, $18; Bosch ⅜" keyhole router bit, $19, woodmagazine.com/ledpuck.

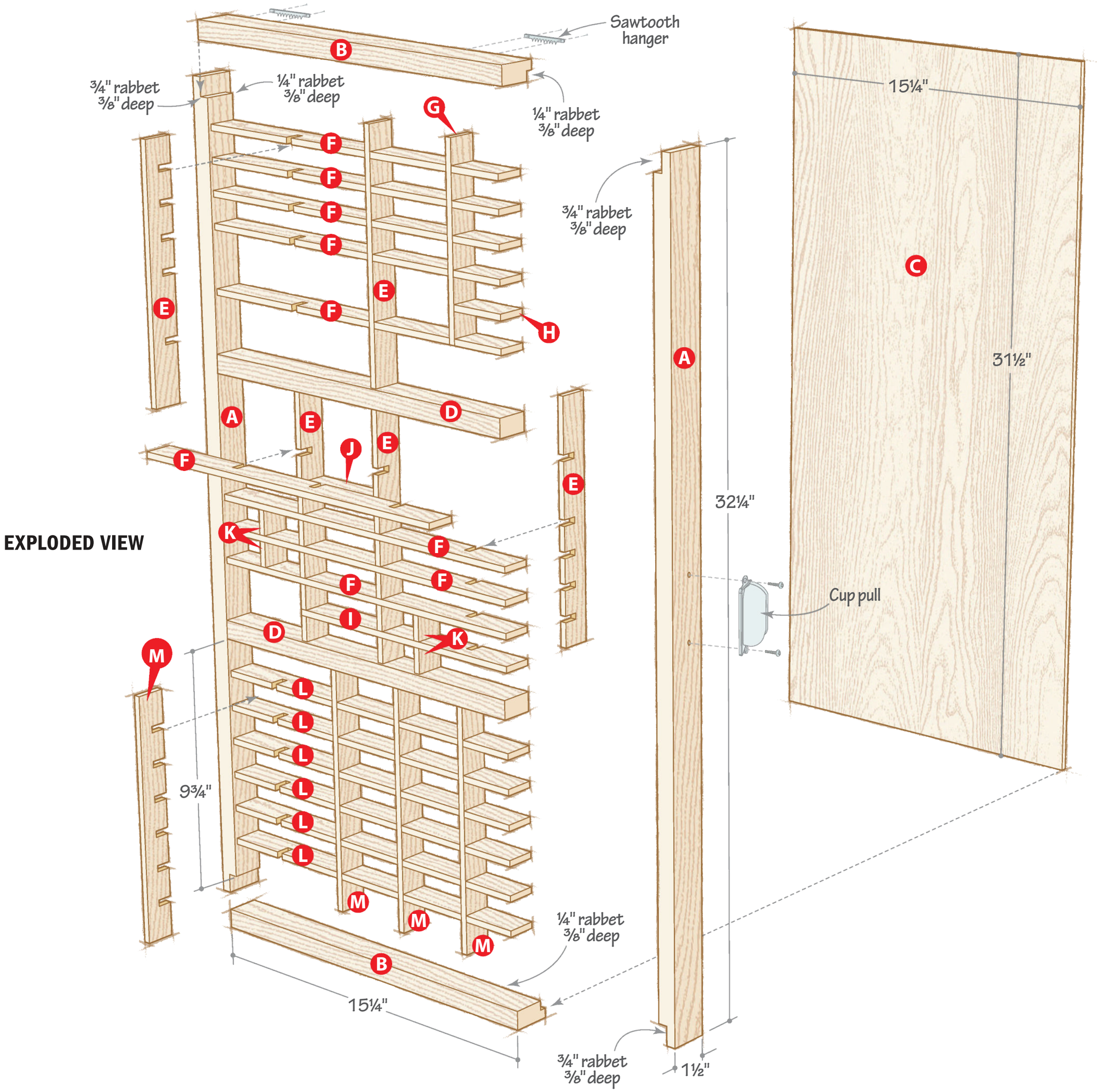
# Collector's Display Tray

*This gridwork shadow box highlights a few of your favorite things.*

**DIMENSIONS:** 16¾" W × 1½" D × 32¼" H

Approximate materials cost: **$65**

**87** compartments for your tiny treasures




**EXPLODED VIEW**

Back in the o-l-d days of publishing (our Editorial Content Chief had just started at *WOOD*® magazine, sweeping the shop), printers sorted lead blocks of lettering for printing presses in trays such as this one, earning the drawers the moniker "printer's trays." As technology made this storage obsolete, the compartmentalized trays became prized by collectors to display miniatures and other small items.

Finding an authentic antique printer's tray in good condition can be difficult and costly. Luckily, with a few evenings of work, you can create a new one.

## Start with a super-simple box

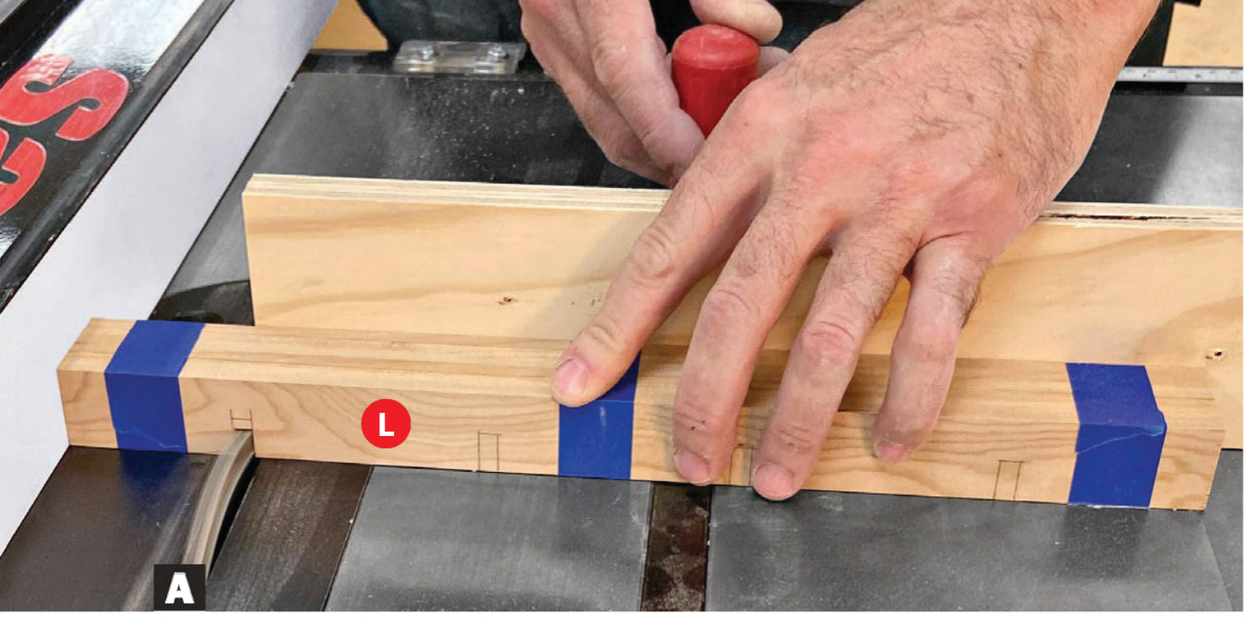
1 Cut the sides (A) and top and bottom (B) to size [**Materials List, Exploded View**]. Rabbet one edge of all pieces, then rabbet the ends of the sides. Finish-sand the inside faces.

2 Glue the top and bottom between the sides. To ensure the frame sits square, check for identical dimensions when measuring diagonally across corners.

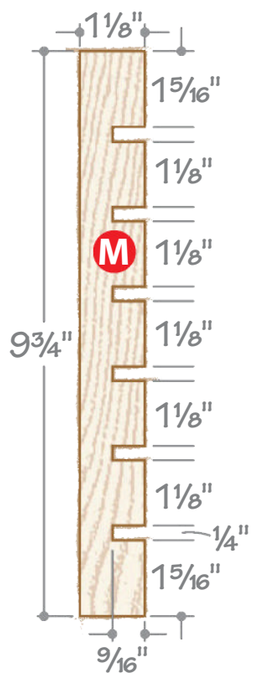
3 Cut the back (C) to fit the rabbets in the frame, finish-sand it, and glue it in place.

4 Cut the major dividers (D) to fit in the frame, finish-sand them, and glue them to the back [**Exploded View**].

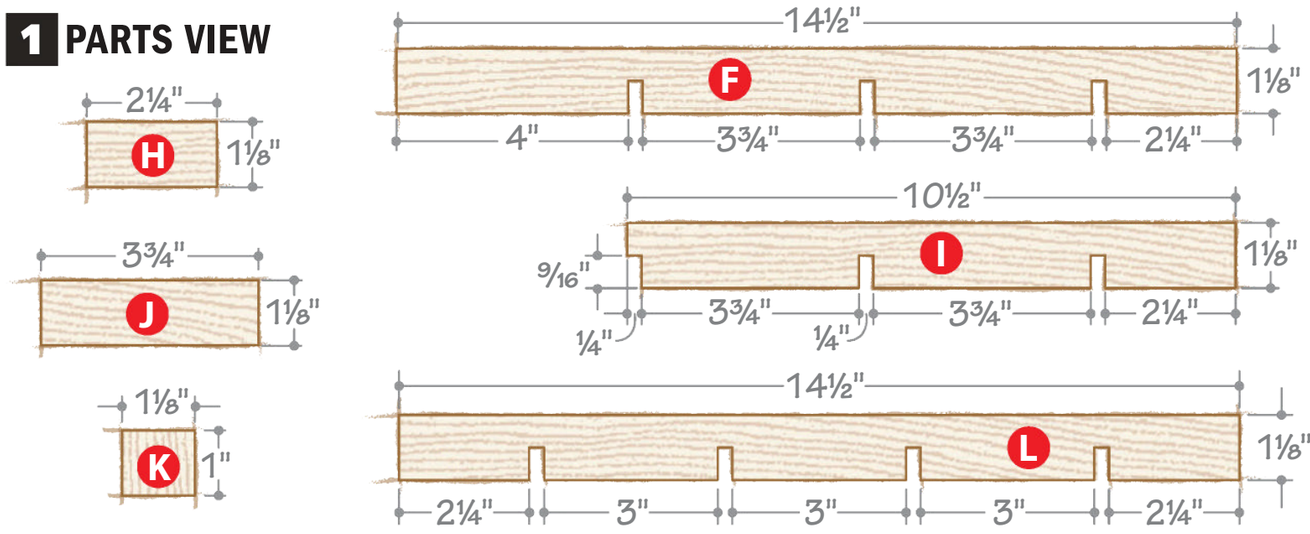
▶ Learn five ways to cut rabbets. woodmagazine.com/rabbetedges



**On the packet for parts L,** make the outermost cut, then butt the opposite end of the workpiece bundle against the fence and repeat. Because this isn't a through cut, you can safely use the miter gauge and rip fence together. Reset the fence for the next set of dadoes on L and repeat the process.




**1 PARTS VIEW**




## Divide in multiples

**1** For the dividers (E–M), prepare at least 31 linear feet of ¼"-thick stock 1⅛" wide [**Cutting Diagram**]. Cut the dividers to length, making sure parts E, F, L, and M fit snug in the frame openings [**Exploded View**].

**2** Gang like parts together with the ends and edges flush and secure each bundle with painter's tape. Label each bundle with its part letter and lay out the slot locations on the outside faces of the bundles.

**3** Set up a ¼" dado blade in your tablesaw and position the rip fence 2¼" from the blade. Cut one dado in parts F/I, and on both ends of E/G and L [**Drawing 1, Photo A**]. Then, cut the remaining dadoes on parts L [**Photo B**]. Use the same end-for-end method to cut the dadoes in M. For the remaining parts, simply cut to the layout lines.

**4** Separate the packets, keeping the parts organized by part letter. Finish-sand the dividers. Then, assemble each of the three grids as shown in the **Exploded View**, using a drop of CA glue (super glue) at each intersection. Center dividers H, J, and K in their openings.

**5** After the glue cures, ease the top edges of the dividers with sandpaper. Spray on a finish (we used aerosol satin lacquer), then glue the divider grids to the back (C) using drops of CA glue at several intersections.

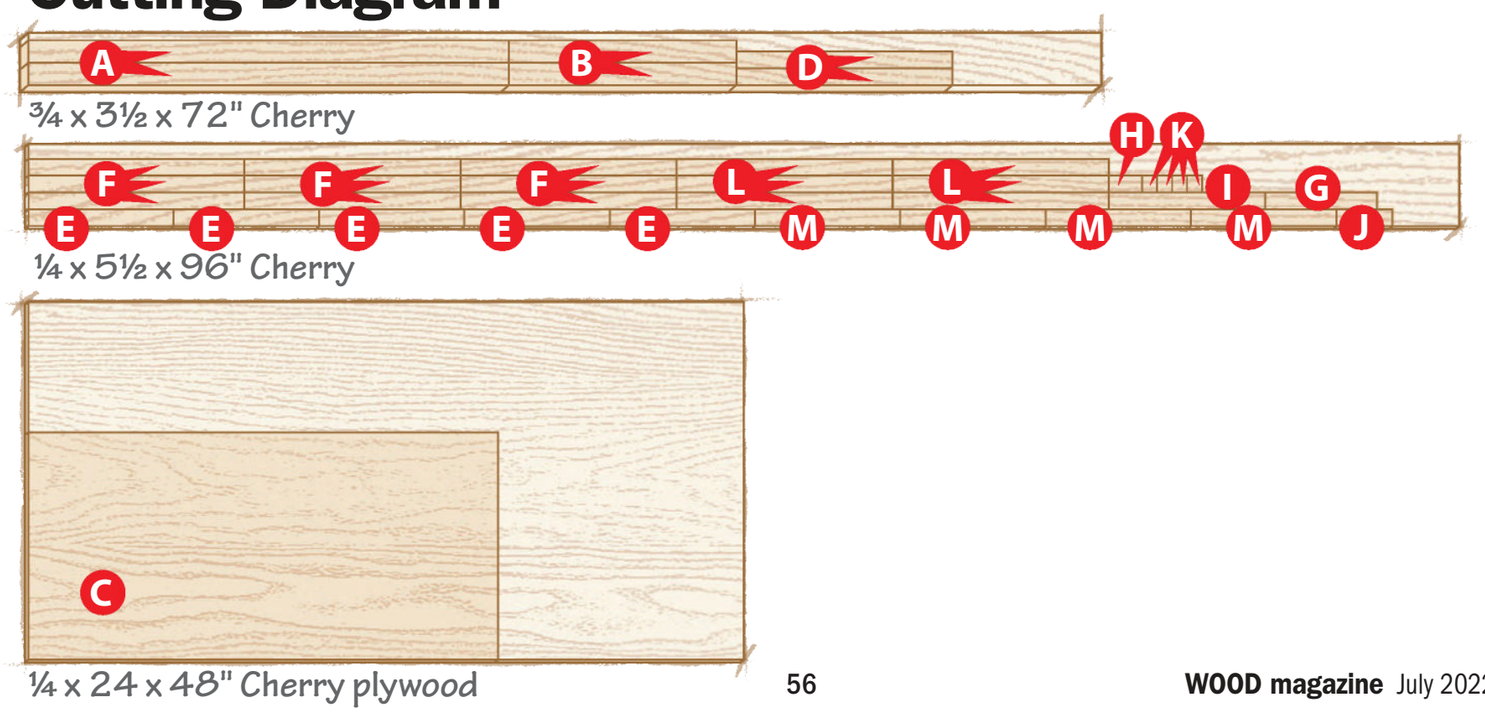
**6** Screw sawtooth hangers to the top (B) [**Exploded View**]. Screw the pull [**Sources**] to a side (A), centered, then drive screws into the wall for hanging your tray.

***Note:*** *The dado spacing on part G matches that of part E, so bundle them together. The same goes for parts I and F.*

***Tip!*** *Dry-fit the assemblies to check their fit in the frame. Disassemble and glue the dividers one by one.*

Produced by **Craig Ruegsegger** with **Kevin Boyle**
Project design: **Kevin Boyle**
Illustrations: **Roxanne LeMoine, Lorna Johnson**

## Cutting Diagram




## Materials List

| Part | | FINISHED SIZE T | W | L | Matl. | Qty. |
|---|---|---|---|---|---|---|
| A | sides | ¾" | 1½" | 32¼" | C | 2 |
| B | top/bottom | ¾" | 1½" | 15¼" | C | 2 |
| C | back | ¼" | 15¼" | 31½" | CP | 1 |
| D | major dividers | ¾" | 1⅛" | 14½" | C | 2 |
| E | top vertical dividers | ¼" | 1⅛" | 9¾" | C | 5 |
| F | top/center horizontal dividers | ¼" | 1⅛" | 14½" | C | 9 |
| G | top short vertical divider | ¼" | 1⅛" | 7½" | C | 1 |
| H | top short divider | ¼" | 1⅛" | 2¼" | C | 1 |
| I | center mid divider | ¼" | 1⅛" | 10½" | C | 1 |
| J | center short divider | ¼" | 1⅛" | 3¾" | C | 1 |
| K | short vertical dividers | ¼" | 1⅛" | 1" | C | 4 |
| L | bottom horizontal dividers | ¼" | 1⅛" | 14½" | C | 6 |
| M | bottom vertical dividers | ¼" | 1⅛" | 9¾" | C | 4 |

**Materials key:** C–cherry, CP–cherry plywood.
**Supplies:** Sawtooth hangers (2).
**Blade:** Dado set.
**Source:** Solid-brass cup pull, polished chrome no. DEL-73349, $11.21, knobs4less.com, 516-333-4386.

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# Carve Out Pockets with Your CNC

*Take the plunge and dig yourself into a hole.*

By Randy Johnson

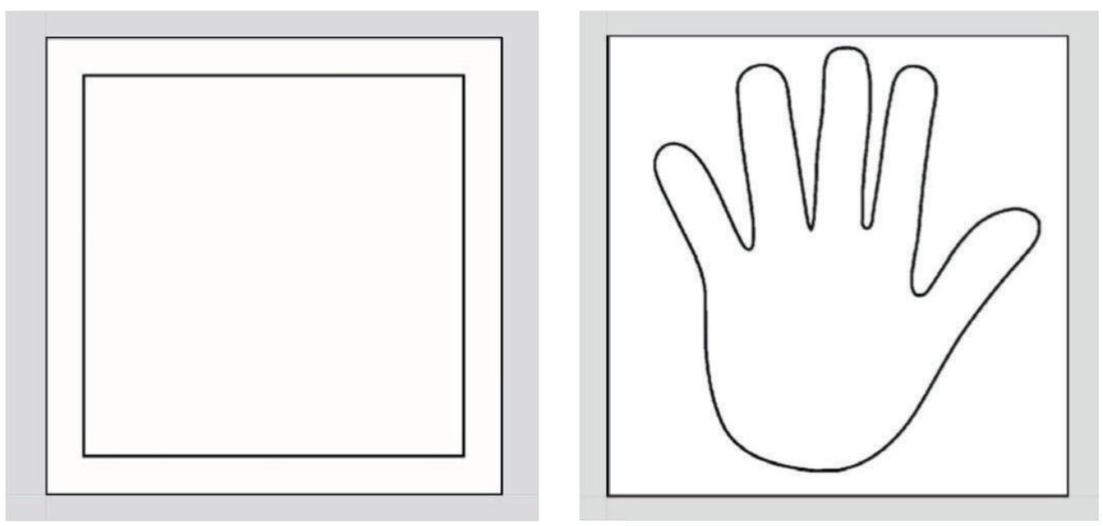
▶In this article, I use Vectric VCarve software (vectric.com) to illustrate setting up and using a pocket toolpath. All CNC software packages have a pocket toolpath, although it may go by a different name.

One of the most used toolpaths in CNC woodworking, the pocket toolpath works for many applications, such as carving recesses for inlays and trays, mortises and other joinery, and more. Once you understand the basic concepts, the door to creatively using pocket cuts swings wide open.

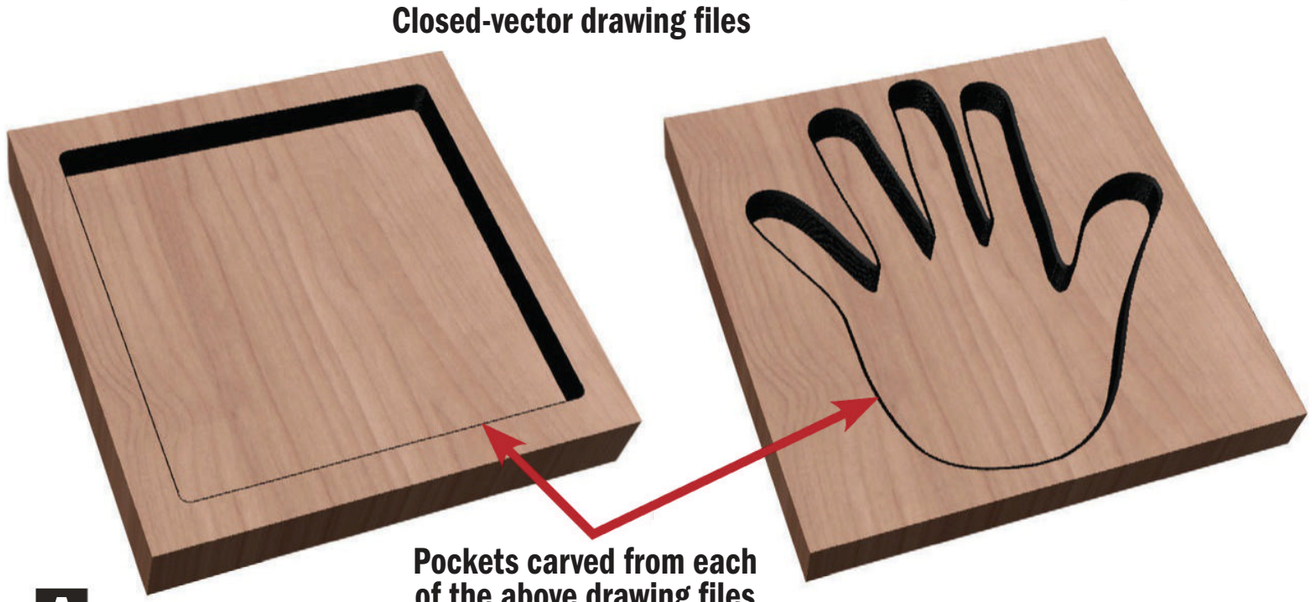
## The basics

The primary function of a pocket toolpath is carving out the inside area of a design, such as the square or hand shown in **Photo A**. The shape must be a continuous line, or a *closed vector* as it's referred to in VCarve. Selecting this line allows you to use the *Pocket Toolpath* panel [**Photo B**] to assign a bit to rout out this area, and control how that bit moves and cuts.

When you first look at the Pocket Toolpath panel, the many settings may seem overwhelming. You may not use all of them, but focusing on the primary ones will increase your CNC capabilities.

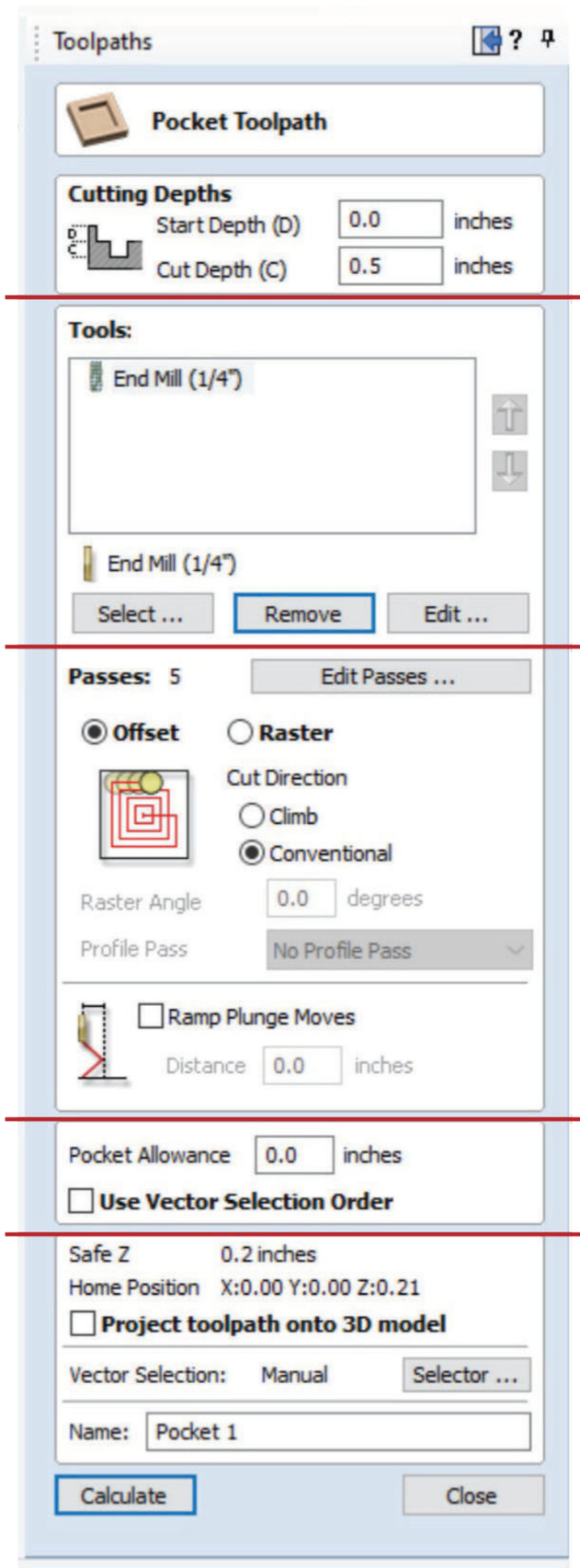


Closed-vector drawing files




**A**

**Simple and complex designs work** with the pocket toolpath. Within that line, the router bit cuts a depth that you specify. You cannot use open shapes or unconnected lines.

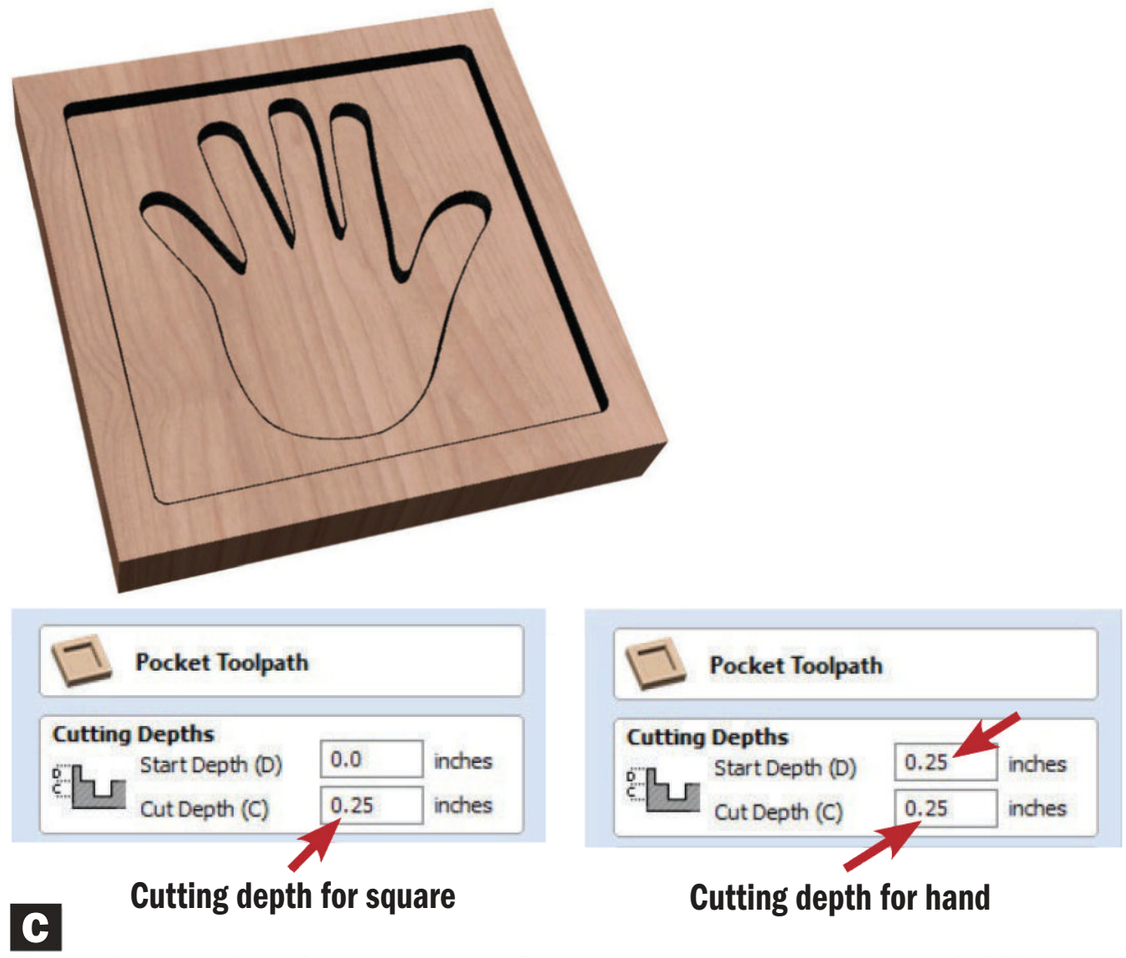



**B**

**This article breaks the Pocket Toolpath panel,** *right*, into five smaller sections. I'll walk you through the functions of each section.

## How deep will you go?

Starting at the top of the Pocket Toolpath panel, you find the *Cutting Depths* setting [**Photo C**]. These settings often confound new CNC users, because they are additive. The *Start Depth* represents where the bit starts cutting, and generally this setting is left at zero, so the bit starts cutting on the top surface of your board. The *Cut Depth* represents the amount of material to be removed. If you already have a pocket cut on your project (for example, the square in **Photo C**) and want to cut a deeper pocket (the hand) inside the first, set the Start Depth to begin cutting at the bottom of the first pocket and the Cut Depth to the amount of additional material to remove. This saves time because you don't "cut air" when beginning the second pocket cut.

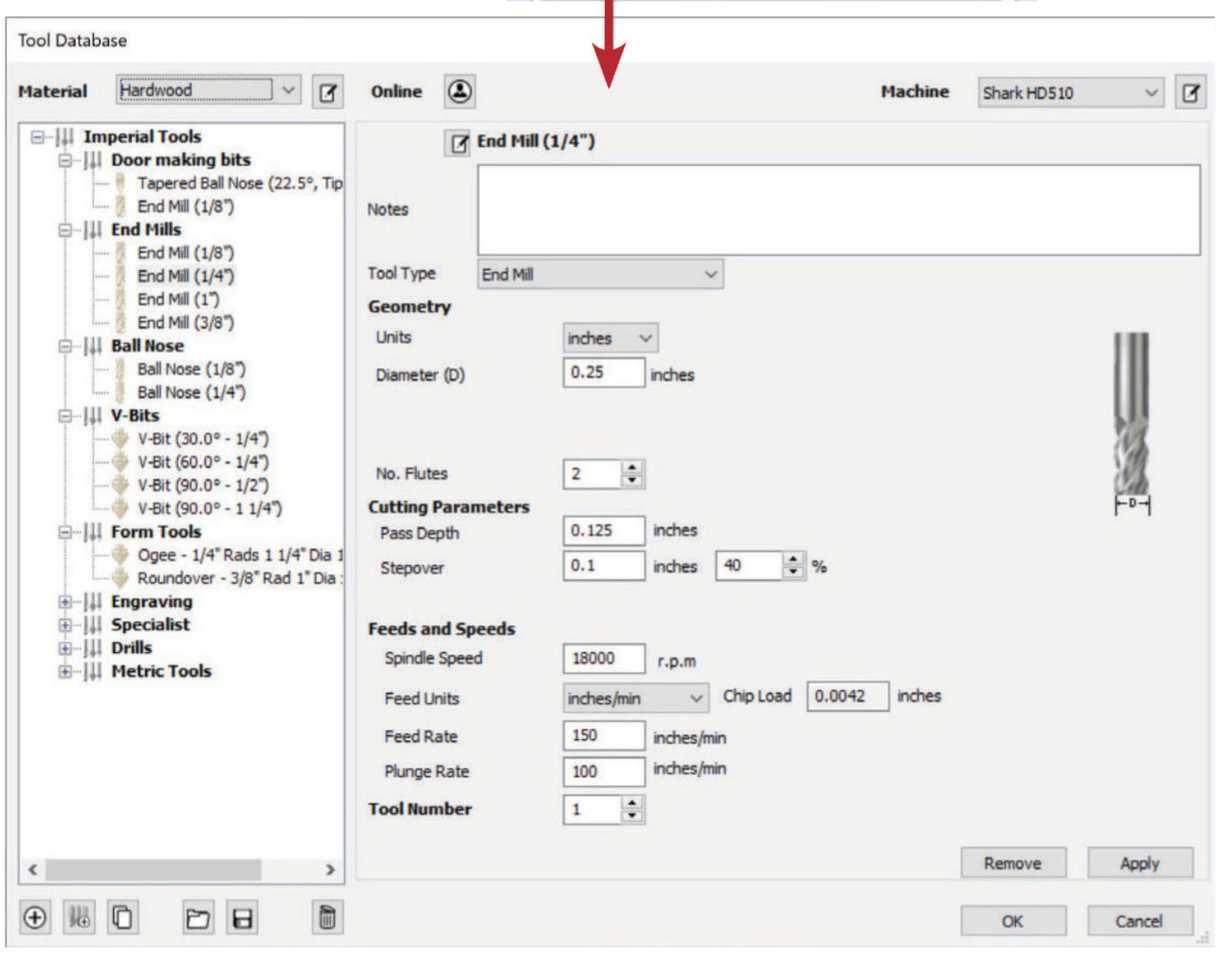



**C**

**The options on the left were used to first cut the square to a depth of .25".** The options on the right then cut the pocket-within-a-pocket hand starting at .25" depth, removing another .25".

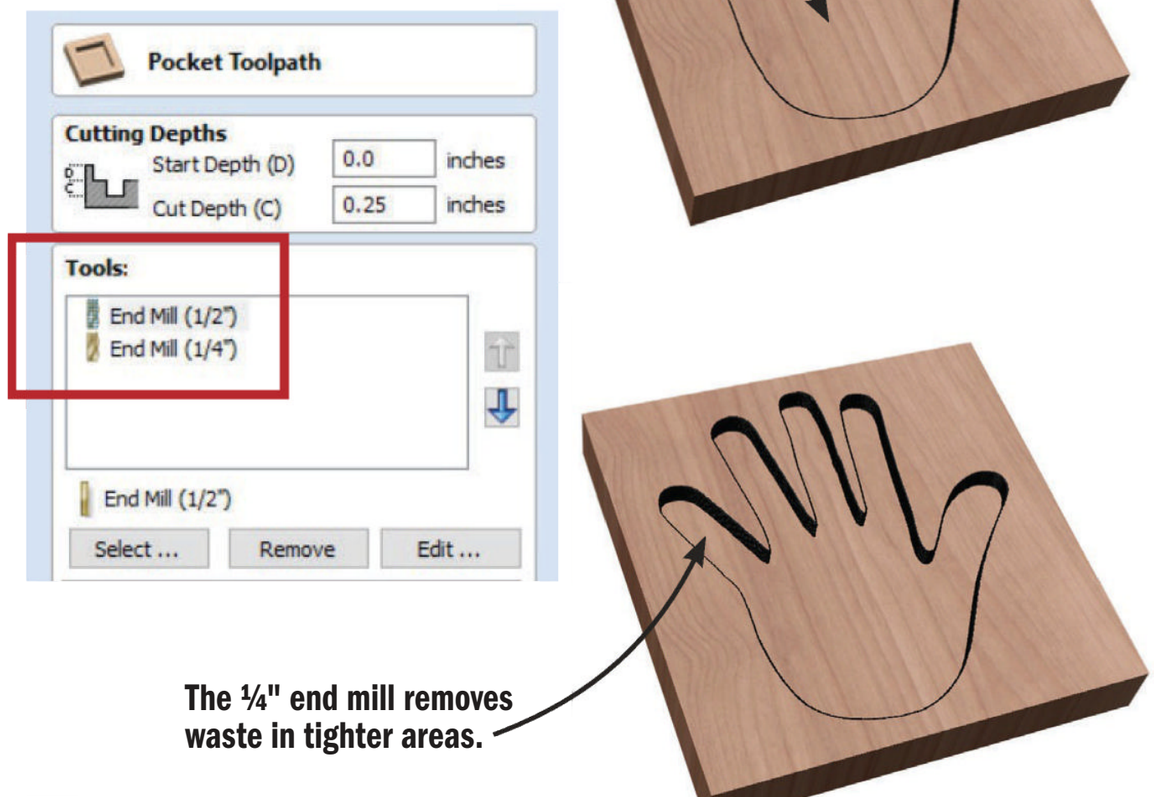
## Pick a bit and set its options

Moving down the panel, find *Tools*. In this section, select and configure the router bit(s) you want to use with the pocket toolpath. Clicking on the Select… button opens the *Tool Database* [**Photo D**]. From this list, select the bit(s). If you choose two or more bits, the toolpath uses the largest bit to clear out most of the material, and the smaller bit cleans up the details [**Photo E**].




**D**

**Customize the tool database's options** to match your router-bit collection and the settings for cut depth, speed, and more that you want to use with each bit. The window above the Select… button shows the bits that you choose for a job.



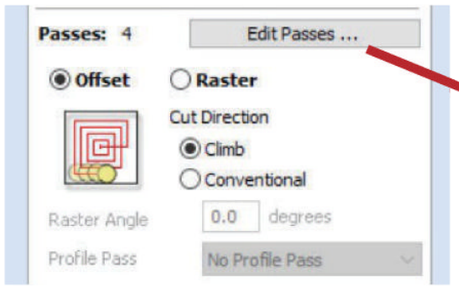

**E**

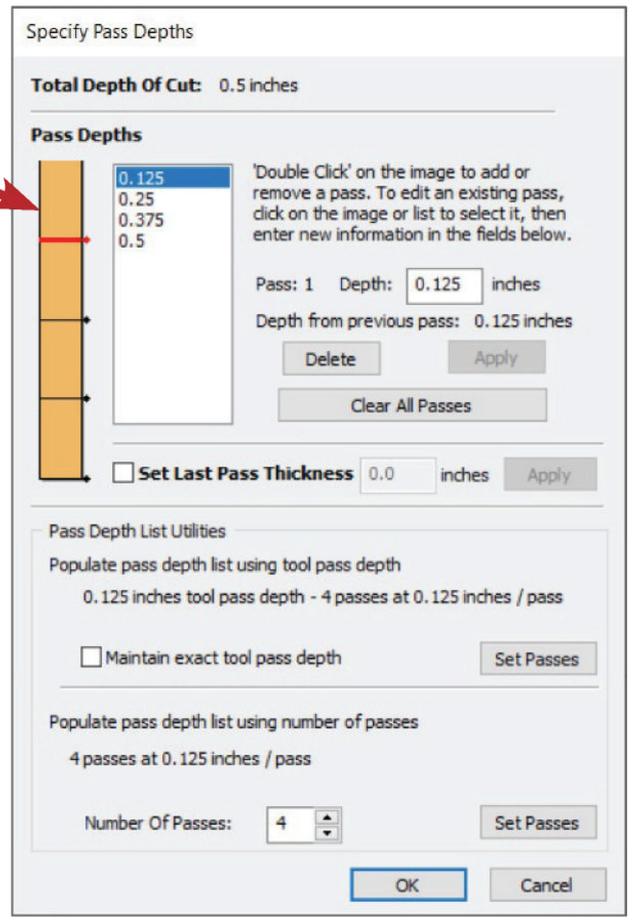
**Using two bits allows you to use a large bit** to clear large areas of the pocket quickly and cleanly, and a smaller bit for cutting finer details. The smaller bit skips areas cut by the larger bit.

## Get your pass and directions

The *Passes* section of the panel defines the number of passes it takes to reach the bottom of the pocket [**Photo F**]. Fewer, deeper passes reduce cutting time but increase the strain on the bit. In this section, you can also add a shallow final pass to improve the cut quality at the bottom. For starting out, I recommend using the defaults and running a few tests before changing the settings here.

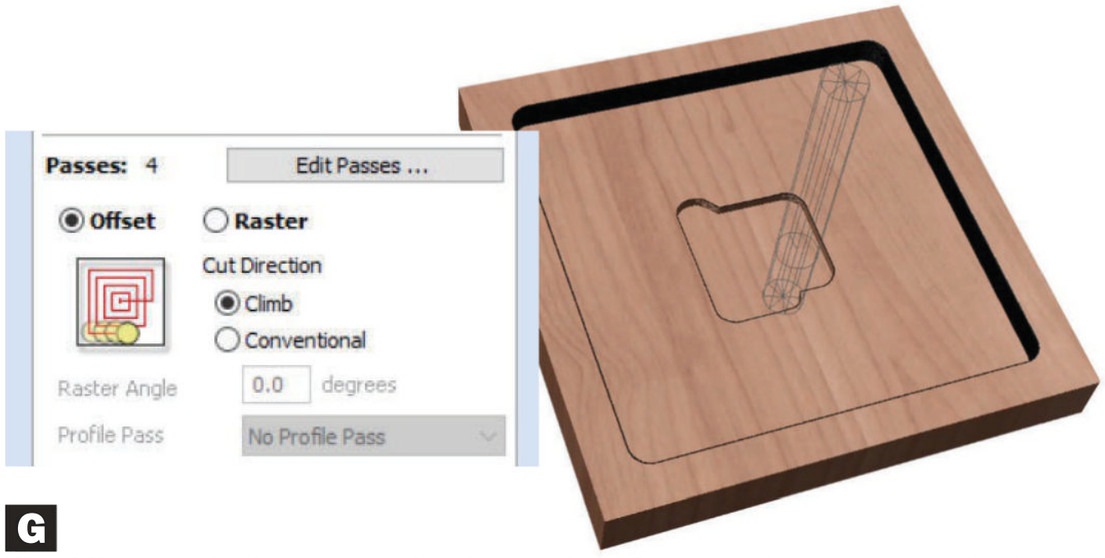
Below the Passes setting, you can specify an *Offset* or *Raster* method for cutting the pocket [**Photos G, H**]. Using the *Ramp Plunge Moves* setting reduces pressure on your bit and machine, improving the cut quality at the point of entry [**Photo I**].




**F**

**You can override the pass depth settings** in the Tool Database by clicking on the Edit Passes... button. You can also adjust the depth of each pass with the settings at the top of the window.

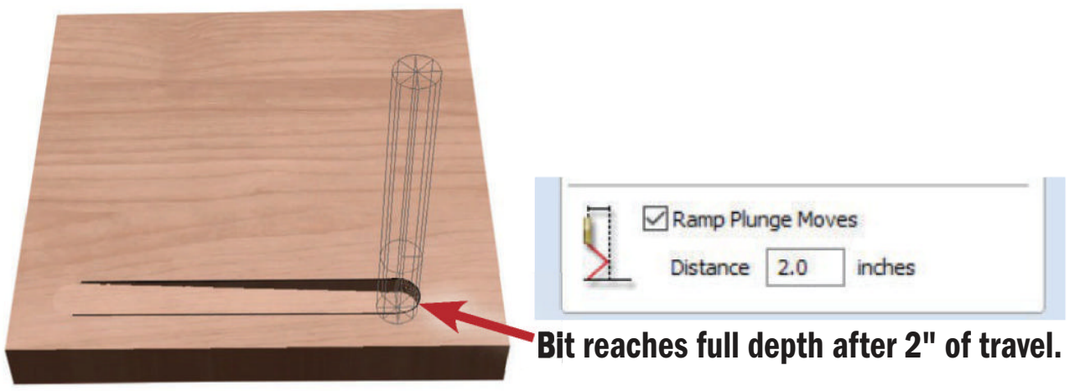



**G**

**The Offset method cuts a pocket** in a series of concentric passes starting in the center of the pocket. Although this method leaves a spiral pattern of tool marks at the bottom of the pocket, it cuts 10–20 percent faster than the Raster method, so it's a good choice when cutting hidden pockets, or in materials such as MDF and plywood. You can also select a *Climb* or *Conventional* cutting direction. Like climb-cutting with a typical router, the climb direction reduces chipping and tear-out when cutting solid woods.

**H**

**The Raster method cuts the pocket** with a series of back-and-forth passes. This leaves less-noticeable tool marks when run with the grain of the wood, so it's often the preferred method when cutting solid wood. The Climb/Conventional setting applies only to the *Profile Pass* (perimeter cut) since the actual raster cutting alternates between climb and conventional as it switches feed direction. The *Degrees* setting controls the direction of the raster. You can choose to cut the profile pass first, last, or not at all.




**I**

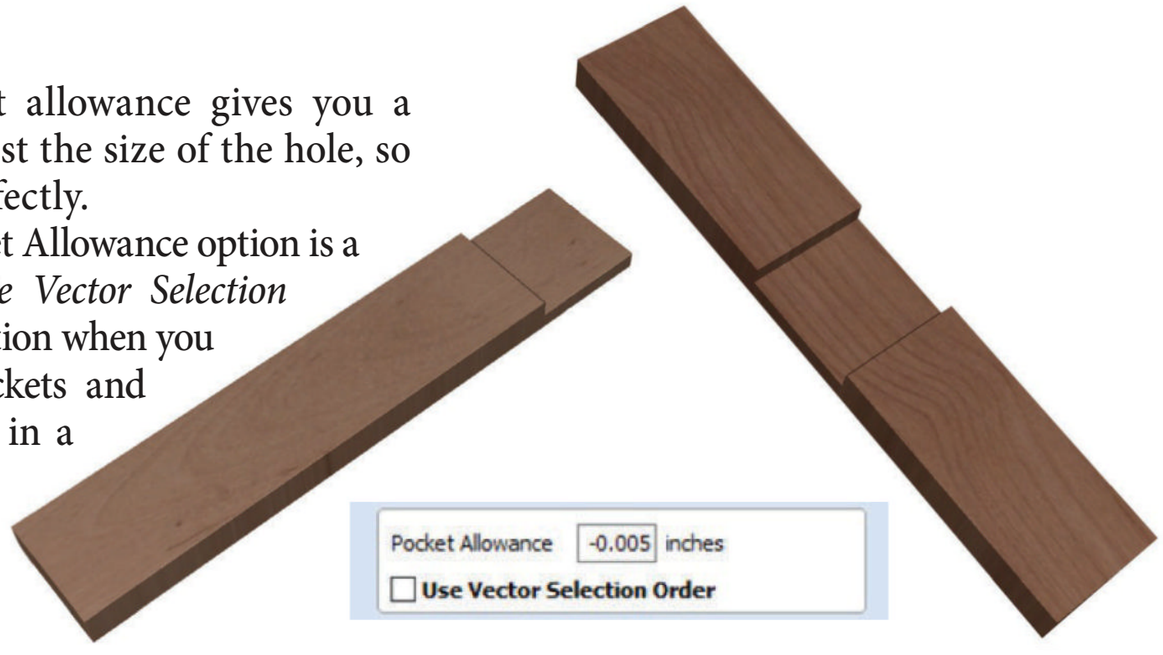
**Adding Ramp Plunge Moves eases the bit** into the material and reduces the dwell marks that often occur when plunging straight down into the material. This even applies to end mill bits but is essential for a non-end mill bit. On small benchtop machines, a ramp of 4–8 times the bit's diameter works well.

**Bit reaches full depth after 2" of travel.**

## Save your allowance

The *Pocket Allowance* provides a way to overcut or undercut the sides of the pocket, a useful feature when you make parts that must fit together, such as a half-lap joint [**Photo J**]. Because a good CNC cuts parts precisely, adding some pocket allowance prevents parts from fitting *too* tightly. I also find it useful when the pocket must accommodate a part cut on a different machine, such as a tablesaw, because the part from the tablesaw may be slightly over- or undersized, or may have changed size due to shifts in humidity. This setting is also helpful for dowels that vary in size. Using the pocket allowance gives you a quick way to adjust the size of the hole, so the dowel fits perfectly.

Below the Pocket Allowance option is a check box for *Use Vector Selection Order*. Use this option when you have multiple pockets and want to cut them in a specific order.




**J**

**The Pocket Allowance setting precisely increases** or decreases the pocket's width and length. Adding a negative allowance increases the size of the pocket; a positive allowance decreases it.

▶Get even more info about using a CNC. woodmagazine.com/cnc

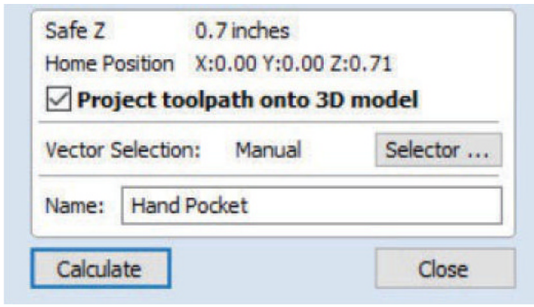
## Specialty pocket options

Find a couple of advanced settings at the bottom of the Pocket Toolpath panel. First, *Project toolpath onto 3D model* does just what it says [**Photo K**]. The next one, *Vector Selection*, allows you to select a particular vector type from your design. For example, if your design includes a variety of circles, use this option to select and associate all the circles of a specific size for this toolpath. It proves useful with complex designs or in production situations.

## A few more tricks

Although it is common to use a straight bit with the pocket toolpath, you can also use other types. For example, combine a bowl bit with the pocket toolpath to create shallow bowls and trays [**Photo L, Opening photo**].

The pocket toolpath can also make finger and mortise-and-tenon joints. Because a router bit leaves rounded corners, VCarve provides two methods to allow the parts to fit together [**Photo M**]. Although using a profile toolpath, which cuts only the perimeter of the opening, is sometimes quicker, it leaves a small chunk of wood in its center that can jam the bit or damage the joint. I prefer using the pocket toolpath because it routs away all the material inside the mortise or finger opening.

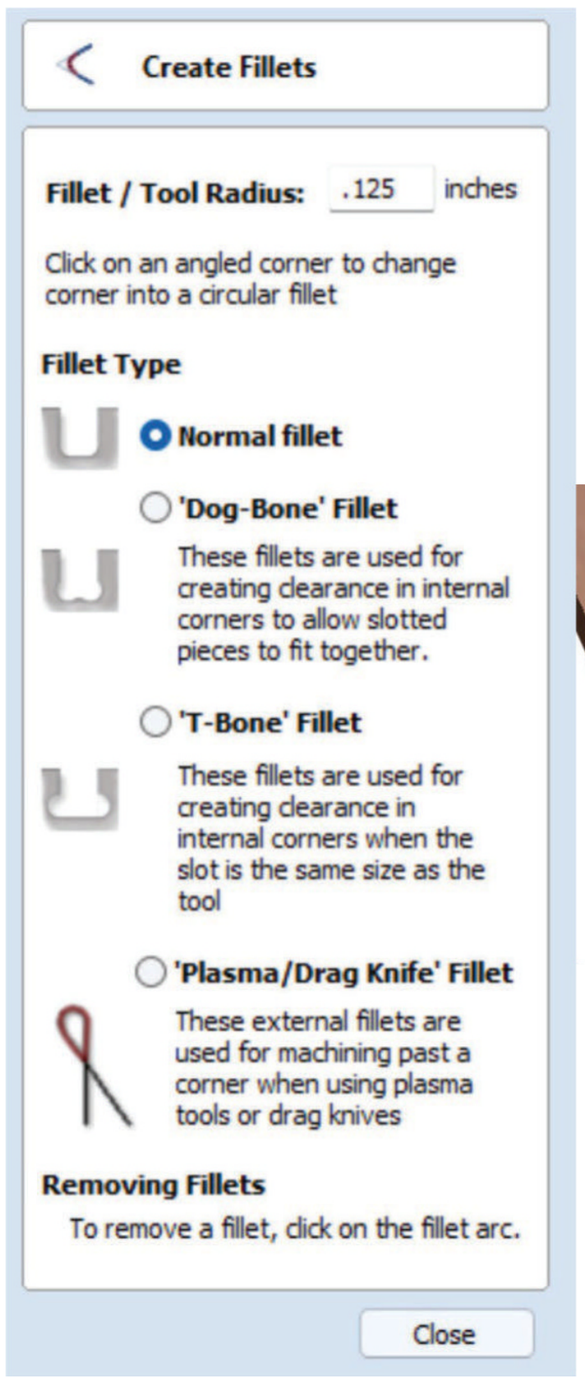


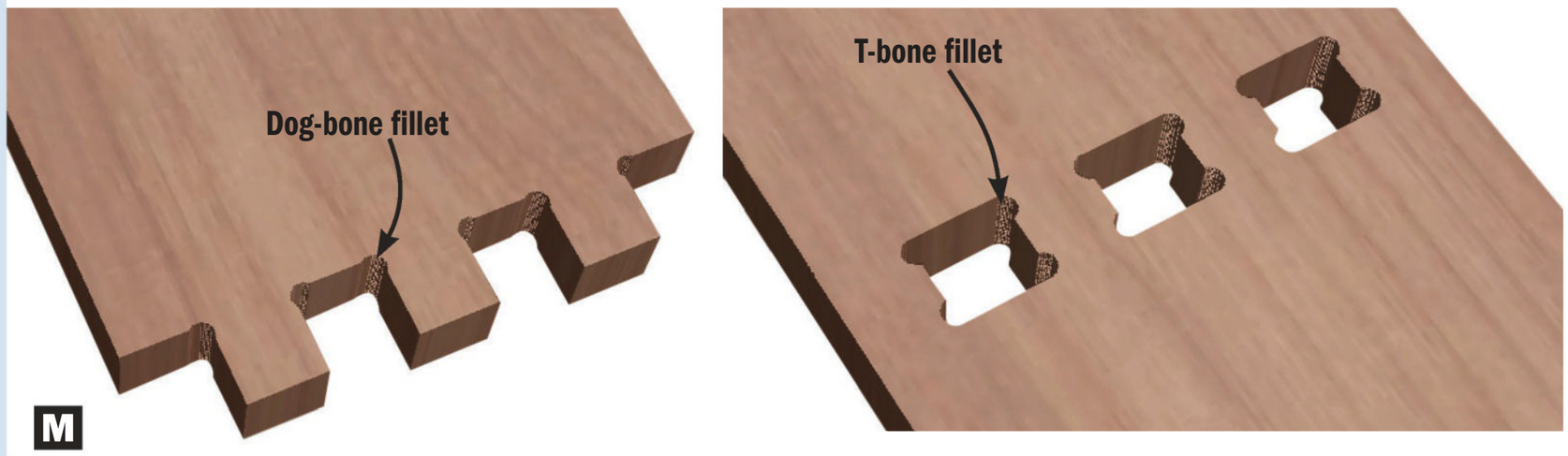
**K**

**The Project toolpath onto 3D model option bends** the pocket to the contour of the 3D model. In this case, the hand pocket cut wraps to the top of the dome shape. Be aware that you may have to adjust tool settings to get the desired results. For example, when testing this design, I switched to a bullnose bit because a straight bit left a rough texture.

**L**

**A bowl bit combines an end mill's flat end-cutting** ability with the radiused corners of a ball-nose bit. This combination leaves a clean, flat bottom with a rounded transition to the wall.




**M**

**To address the rounded corners left by a router bit,** VCarve can slightly overcut the corners. The first method, the dog-bone fillet, *left*, extends diagonally out from the corner. As a result, a portion of it remains visible after assembly. The T-bone fillet, *right*, extends only one side of the pocket and the adjoining part hides it. However, the T-bone fillet reduces gluing surface and may weaken parts with closely spaced fingers or mortises. Of course, you can skip the fillets and chisel out the corners by hand, which is what I usually do in hardwoods.

Randy Johnson is the author of the book "CNC Router Essentials." He also hosts CNC webinars and VCarve design classes at cnclearnandbuild.com and in person at Marc Adams School of Woodworking.

# Overhead Smash

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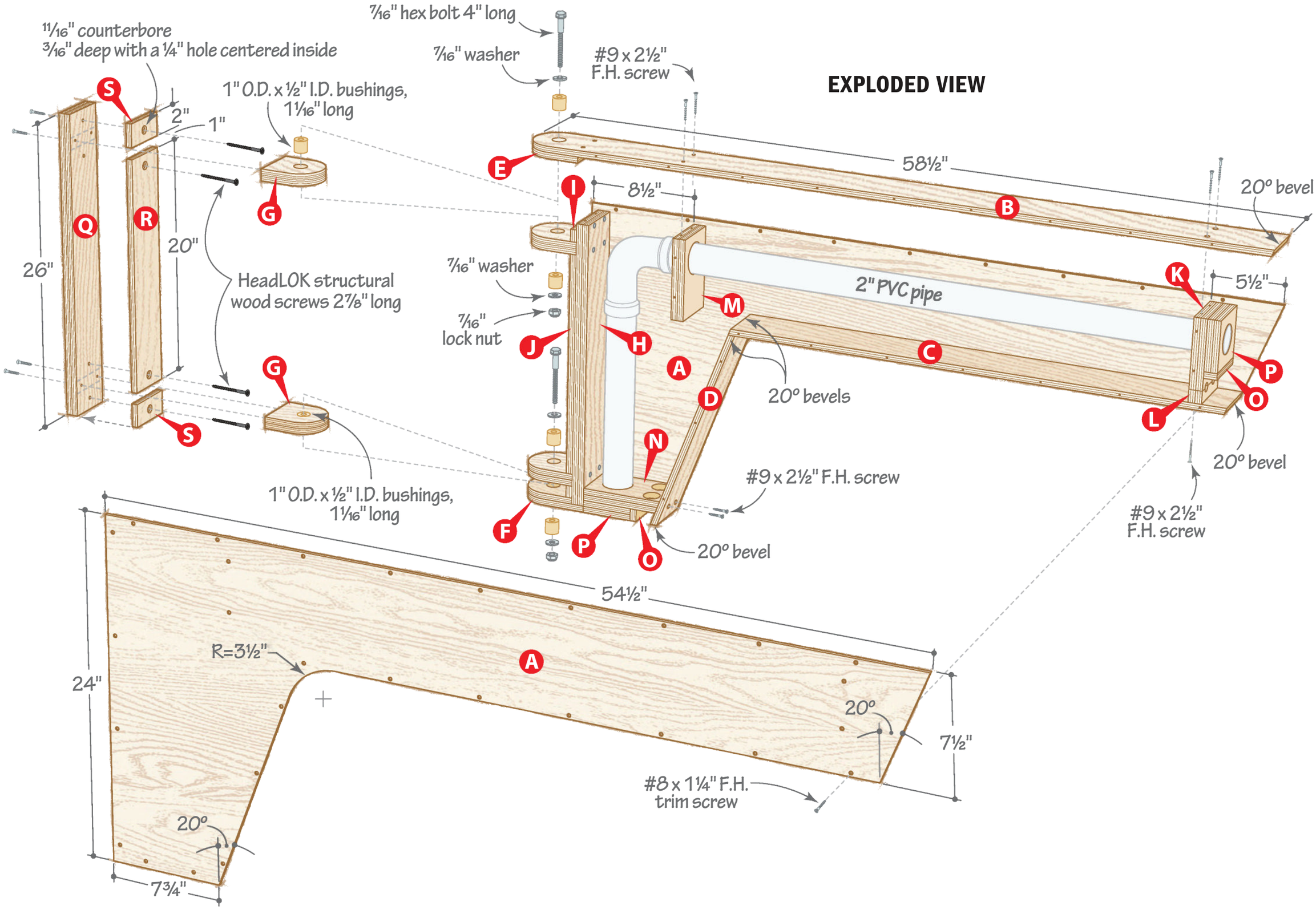
**DIMENSIONS:**
4½" W × 60" D × 26" H

**Approximate materials cost:**
**$200**
Lumber and hardware

**3**
shop needs,
**1**
simple solution




## Crank up the boom box

▶Learn to lay out plywood projects. woodmagazine.com/preciselayout

Baltic birch plywood comes in metric thicknesses close to, but less than, ¼" and ½". Measure assemblies as you go, and adjust dimensions to accommodate the variance.

**1** Cut the sides (A) to overall size [**Materials List**]. Lay out the shape of the sides [**Exploded View**], then make a stopped ripcut at the tablesaw 7½" from the top edge of each side.

**2** Jigsaw the sides to shape [**Exploded View, Photo A**]. Miter-cut the ends of the sides (A), then sand the edges smooth.

***Note:*** *When ripping, remember, the kerf on the bottom face extends farther than what you see on the top face.*

**A**

**Cut the angle and radius** for the side (A) with a jigsaw and fine-tooth blade (16–20 tpi) to minimize chip-out.

**Epoxy the bushings into each laminated** assembly. Packing tape on a scrap of plywood prevents adhesion while centering the bushings.

**Glue and clamp the hinge block (G)** to the spacer (I), then clamp it tight to the hinge mount (H).

## Time to start stripping

**1** Rip seven 4×60" strips from ½" plywood for the remaining parts of the boom arm. Laminate four of the strips to create two 1"-thick strips. All the remaining parts will be cut to length from these sets of strips.

**2** Cut the top (B), bottom (C), and support (D) to size, bevel-cutting the ends as indicated [**Materials List, Exploded View**]. Set these parts aside.

## Here comes the pivotal part

**1** Cut the hinge plates (E, F) to size [**Drawing 1**] but don't cut the radius yet. Glue one hinge plate (E) to the large hinge plate (F) flush at one end [**Drawing 2**]. Glue a second hinge plate to the unbeveled end of the top (B).

**2** Crosscut the hinge blocks (G) to length [**Drawing 1**].

**3** Lay out the centerpoint of the 1 1/16" bearing hole and the 2" radius on each hinge block (G) and the hinge plate assemblies (B/E, E/F) [**Drawing 1**]. Drill the bearing holes with a Forstner bit, bandsaw the radius on each, and sand the edges smooth.

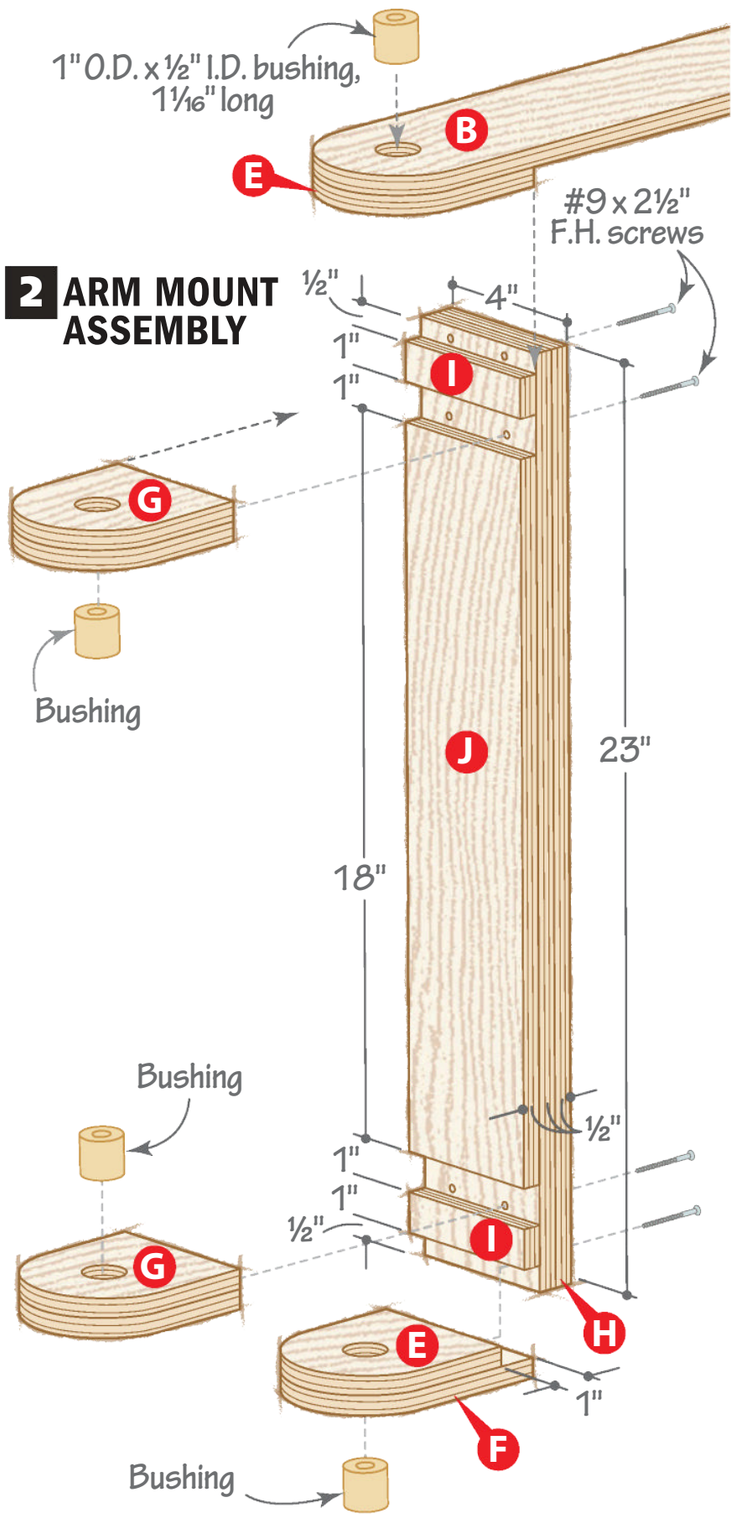
**4** Hacksaw six bushings from a tube of 932 bearing bronze [**Sources**] 1/16" longer than the thickness of the hinge blocks [**Drawing 2**]. Attach 150-grit sandpaper to a flat surface and square up the ends of the bushings by hand. Epoxy the bushings in place [**Photo B**].

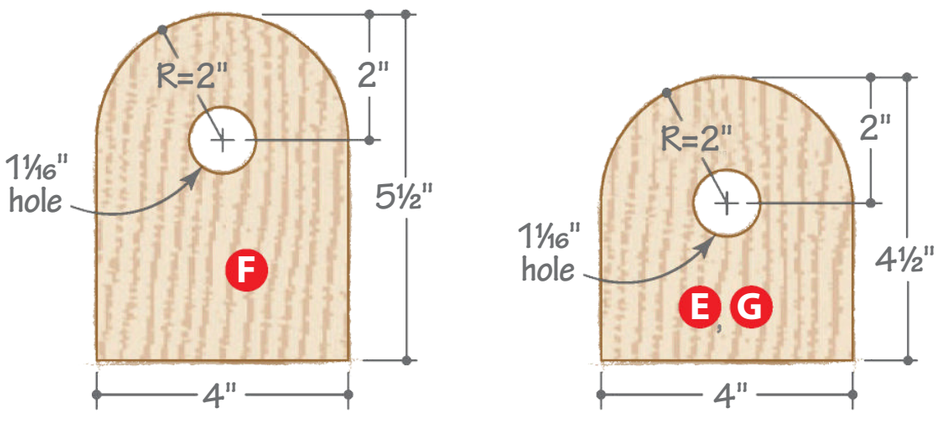
▶Check out these guidelines for choosing epoxy. woodmagazine.com/epoxyguide

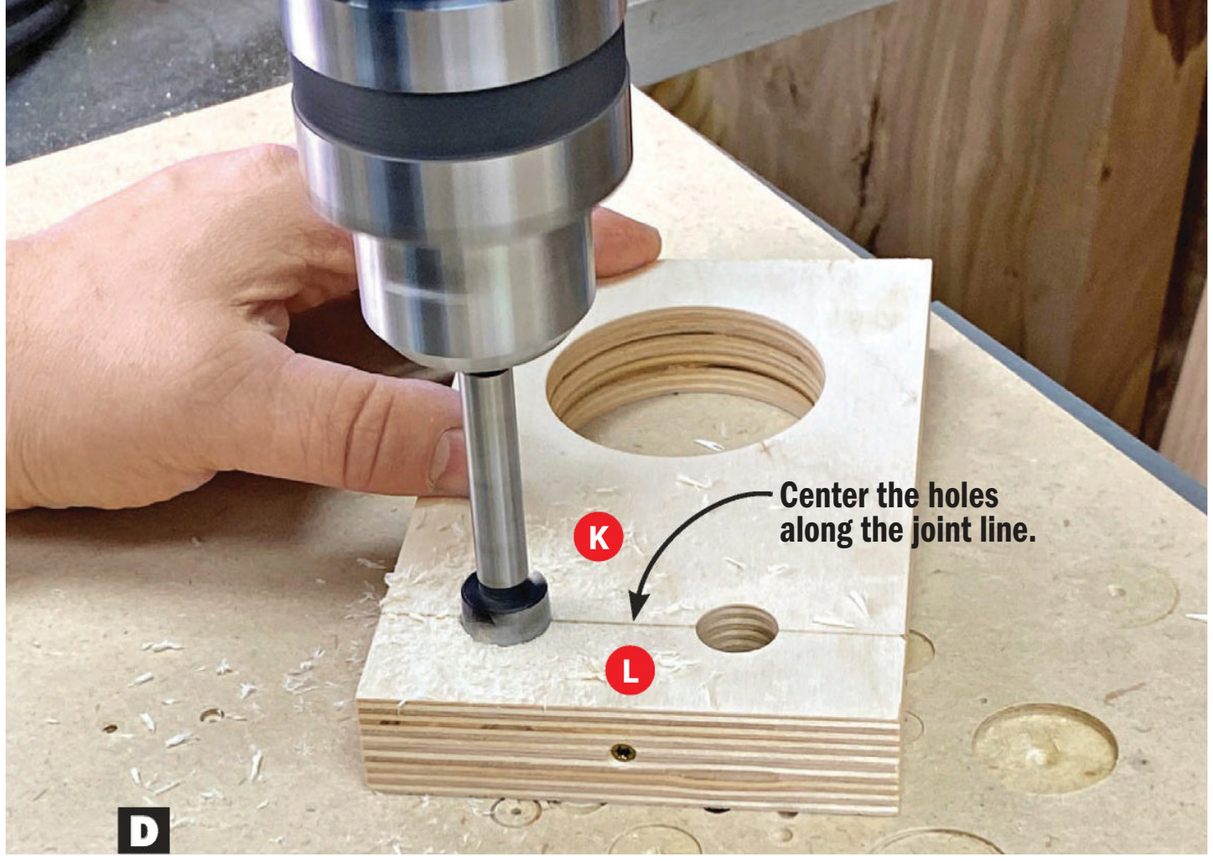
Once the epoxy sets, file and sand the excess epoxy and bushings flush.

**5** Cut the hinge mount (H), spacers (I), and filler (J) to length [**Drawing 2**].

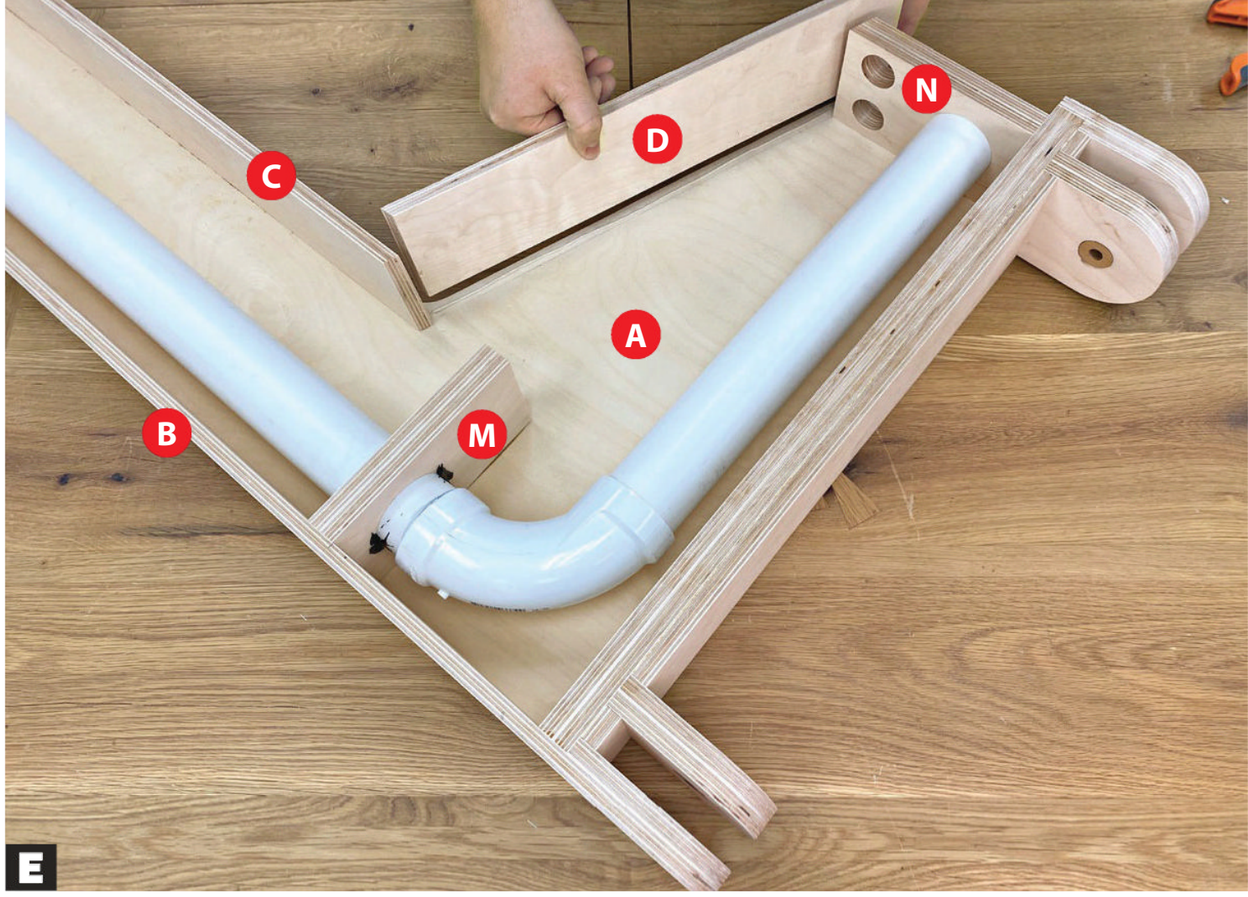
**6** Glue the hinge mount (H) to the top assembly (B/E) [**Drawing 2**]. Then, glue on a hinge spacer (I) and hinge block (G) [**Photo C**]. Once the glue dries, reinforce the assembly with screws.






**Temporarily screw together** the upper pipe bracket (K) and cord lock (L). Measure the diameters of the base of your power cord plug and the connector of the pneumatic hose, then drill holes slightly smaller to "pinch" them.




**Glue and clamp the bottom (C) and support (D)** to the arm assembly after installing the PVC pipe.

**7** Attach the hinge filler (J), second hinge block (G), and remaining hinge spacer (I) [**Drawing 2**]. Glue the lower laminated block (E/F) to the bottom and reinforce the joints with screws.

**8** Glue the completed hinge assembly to one of the sides (A), flush with the end [**Exploded View**].

## Do some upper-arm work

**1** Cut the pipe brackets, cord lock, bracket spacers, and hose adapters (K–P) to length [**Drawing 3**]. Set the bracket spacers (O) and hose adapters (P) aside for now. Bevel-cut one end of the lower pipe bracket (N).

**2** Lay out and drill the PVC-pipe clearance holes in the brackets (K, M, N). Drill clearance holes sized to accommodate the ends of your power cord and pneumatic hose in the lower bracket (N) [**Drawing 3**].

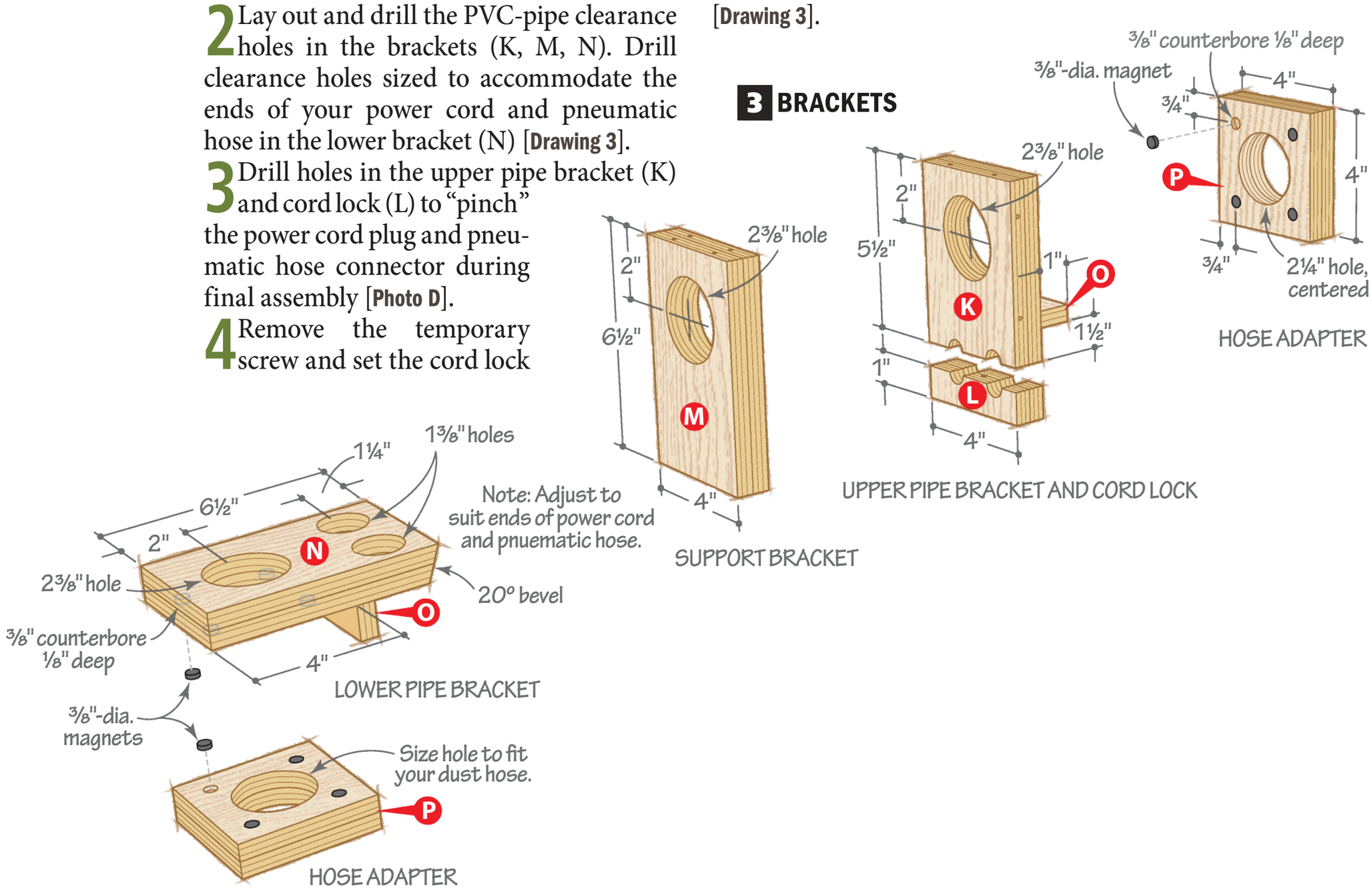
**3** Drill holes in the upper pipe bracket (K) and cord lock (L) to "pinch" the power cord plug and pneumatic hose connector during final assembly [**Photo D**].

**4** Remove the temporary screw and set the cord lock (L) aside. Glue the brackets (K, M, N) to the arm assembly [**Exploded View**].

**5** Cut two lengths of 2" PVC and dry-fit them to a wide-sweep elbow in the arm assembly, then mark and cut the pipes to length flush with the upper and lower pipe brackets (K, N) [**Exploded View**].

**6** Use PVC cement to join the pipes to the elbow using the brackets (K, M, N) to align and support the pipes. Epoxy the PVC to the support bracket (M) to prevent shifting.

**7** Install the bottom (C) and support (D) [**Exploded View, Photo E**]. Then glue the bracket spacers (O) to the pipe brackets [**Drawing 3**].



## An attractive hookup

1 Retrieve the hose adapters (P). Drill a centered hole in each adapter to provide a friction fit to each hose. Make additional adapters to suit other hoses you plan to use.

2 Drill counterbores in each adapter to accept a set of rare-earth magnets [**Sources, Drawing 3**]. Then drill matching counterbores in the exposed faces of the upper and lower pipe brackets (K, N). Epoxy the magnets into the counterbores.

***Note:*** *Verify the polarity of the magnets (you want them to attract) before installation.*

## Providing a solid mount

1 Cut the wall mount (Q) to length [**Exploded View**]. Double-check the hinge mount spacing on the arm assembly, then cut the wall-mount filler (R) and ends (S) to size.

2 Drill counterbores in the filler and ends for the mounting screws, then glue the filler, ends, and remaining hinge blocks (G) to the wall mount (Q) [**Exploded View**].

3 Add screws through the back of the wall mount (Q) into the hinge blocks (G), then drill through-holes centered in the counterbores in the filler and ends [**Exploded View**].

## Let's finish this up

1 Position the remaining side (A) and drill screw holes [**Exploded View**].

2 Screw the side in place (no glue). Using only screws provides access for installing and changing cords and hoses in the future. Finish-sand and apply a finish. We sprayed three coats of lacquer.

3 Remove the side (A) and feed the power cord and pneumatic hose through the lower pipe bracket (N) and capture them in the upper pipe bracket (K) and cord lock (L). Screw through the bottom (C) into the cord lock (L), positioning the screw clear of the holes for the cord and air hose [**Exploded View**].

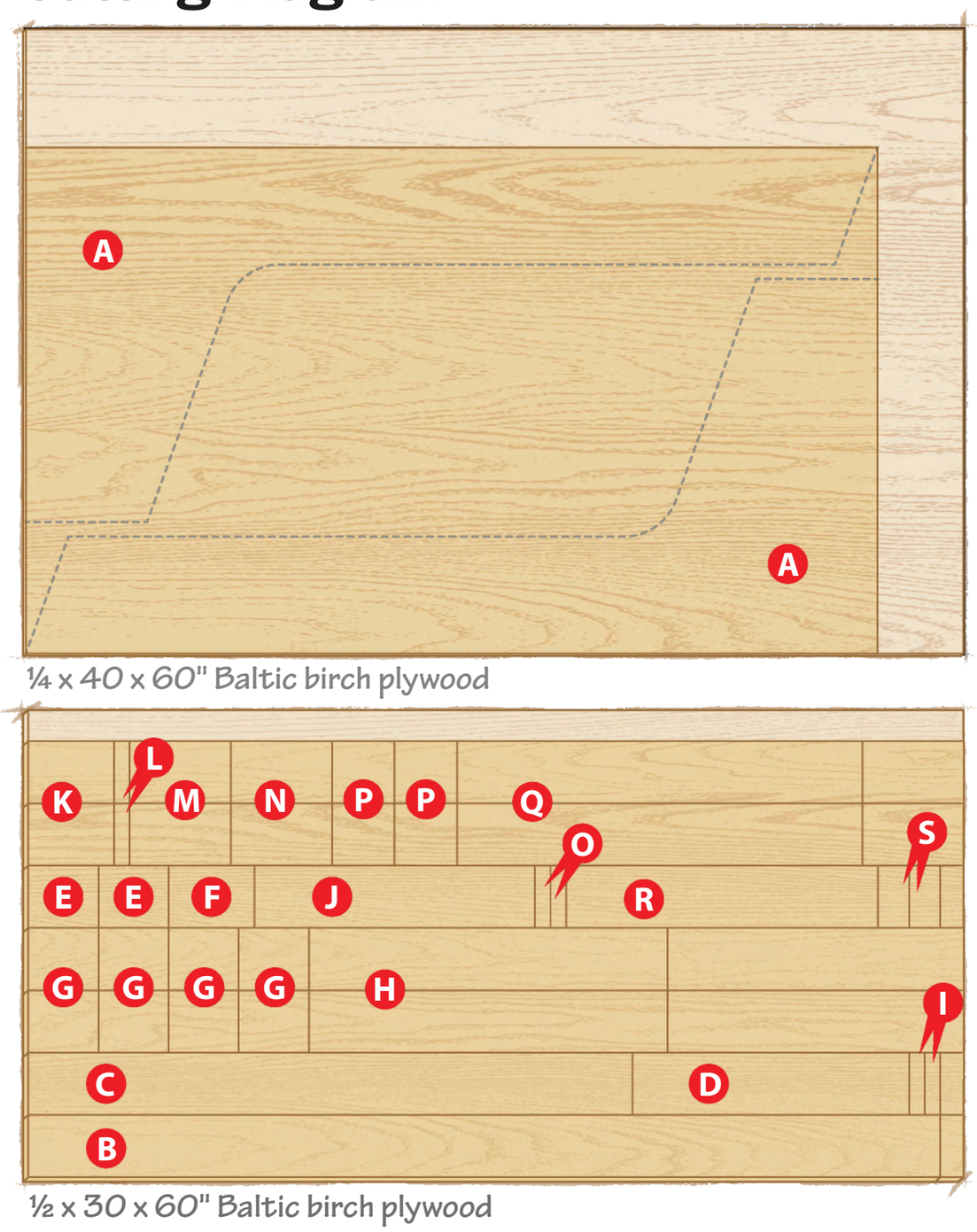
4 Pick the mounting location for your dust boom and screw the wall-mount assembly to a wall stud using structural wood or lag screws [**Exploded View**].

5 Slip the hinge blocks of the arm assembly around the hinge blocks of the wall mount and secure everything with hex bolts, washers, and lock nuts.

6 Attach your dust hose to the adapter plate, plug in your tool, and hook up the compressor hose. Now you're free and clear to work without the clutter!

Produced by **Bryan Nelson** with **John Olson**
Project design: **John Olson**
Illustrations: **Roxanne LeMoine, Lorna Johnson**

## Cutting Diagram




## Materials List

| Part | | FINISHED SIZE T | W | L | Matl. | Qty. |
|---|---|---|---|---|---|---|
| A | sides | ¼" | 24" | 54½" | BB | 2 |
| B | top | ½" | 4" | 58½" | BB | 1 |
| C | bottom | ½" | 4" | 38¾" | BB | 1 |
| D | support | ½" | 4" | 17¾" | BB | 1 |
| E | hinge plates | ½" | 4" | 4½" | BB | 2 |
| F | long hinge plate | ½" | 4" | 5½" | BB | 1 |
| G | hinge block | 1" | 4" | 4½" | LBB | 4 |
| H | hinge mount | 1" | 4" | 23" | LBB | 1 |
| I | hinge spacers | ½" | 4" | 1" | BB | 2 |
| J | hinge filler | ½" | 4" | 18" | BB | 1 |
| K | upper pipe bracket | 1" | 4" | 5½" | LBB | 1 |
| L | cord lock | 1" | 4" | 1" | LBB | 1 |
| M | support bracket | 1" | 4" | 6½" | LBB | 1 |
| N | lower pipe bracket | 1" | 4" | 6½" | LBB | 1 |
| O | bracket spacers | ½" | 4" | 1" | BB | 2 |
| P | hose adapters | 1" | 4" | 4" | LBB | 2 |
| Q | wall mount | 1" | 4" | 26" | LBB | 1 |
| R | wall-mount filler | ½" | 4" | 20" | BB | 1 |
| S | wall-mount ends | ½" | 4" | 2" | BB | 2 |

**Materials key:** BB–Baltic birch plywood, LBB–laminated Baltic birch plywood.
**Supplies:** #9×2½" flathead screws, #8×1¼" flathead trim screws, 7/16×4" hex bolts (2), 7/16" lock nuts (4), 7/16" washers (2), 2" PVC schedule 40 90° wide-sweep pipe elbow, 2"×5' PVC schedule 40 pipe (2), epoxy, PVC primer, PVC cement.
**Blade and bits:** 16-20 tpi jigsaw blade, 1 1/16" Forstner bit, 1⅜" Forstner bit, 2¼" holesaw bit, 2⅜" holesaw bit.
**Sources:** 932 bearing bronze tube (13"), no. 8911K318, $40; ⅛×⅜" rare-earth magnets (16), no. 5862K104, $19, McMaster-Carr, 630-833-0300, mcmaster.com; HeadLOK structural wood screws (2⅞"), no. 201402, $21 (box of 50), Lowe's, lowes.com.

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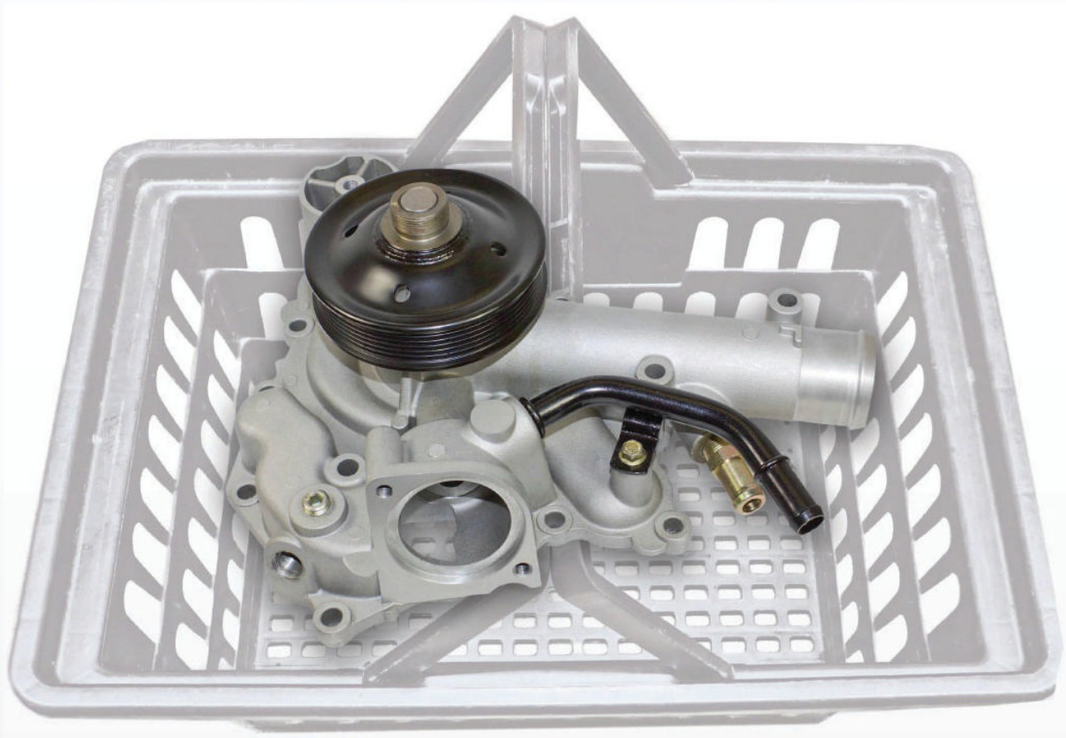

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# Doin' the Hand(screw) Jive

***These odd-looking contraptions serve as the utility infielders of clamps. Discover why you should add a few to your lineup.***

Aside from the switch from wooden screws to metal threaded rods, the design of the venerable handscrew clamp has changed little over the last 120 years. Still, nothing beats the versatility of these simple clamps. Thanks to the ability to offset their jaws, handscrews easily clamp non-parallel surfaces, *previous page*. They come in a range of sizes, *right,* and it's worth having a few different ones on hand. Take a look at some of the other ways we use handscrew clamps in the *WOOD*® magazine shop.

▶Hans Jorgensen (one of the founders of the clamp company that bears his name) patented the modern handscrew clamp design in 1901.

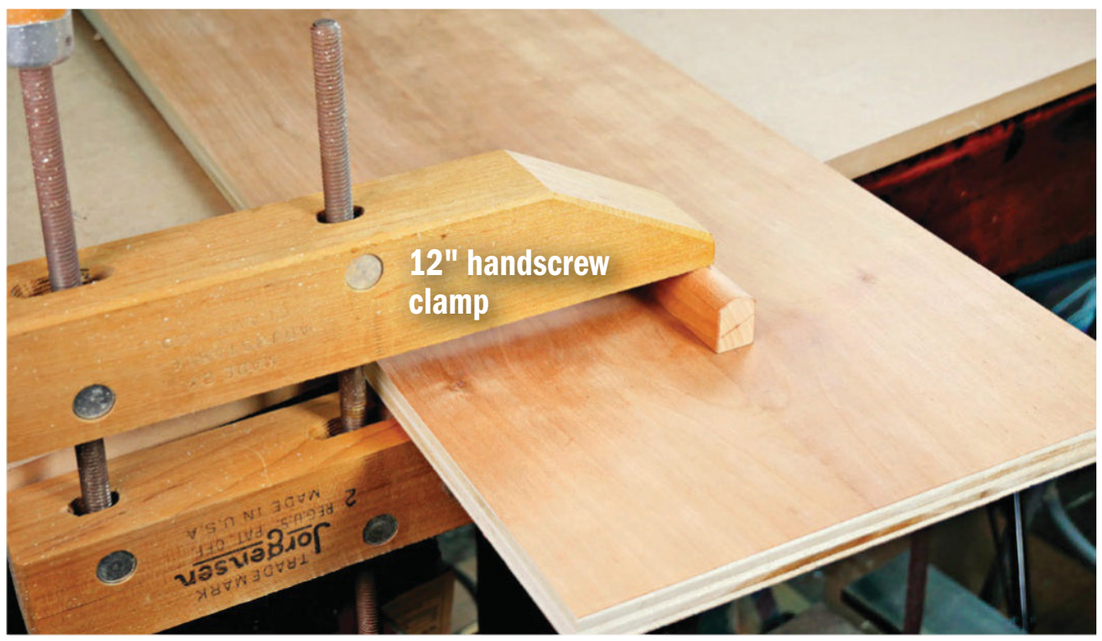
## Handscrew clamps by the numbers

Today, most manufacturers offer only four or five sizes of handscrew clamps, indicated by the overall jaw length. (4", 6", 8", 10", and 12" are common jaw lengths.) But early handscrew clamps came in a wide range of sizes and were designated by a numbering system instead of jaw length. This chart shows the system, along with the corresponding jaw length. Also included is the maximum jaw opening, as well as the clamping depth (reach) from the tip of the jaw to the threaded rod.

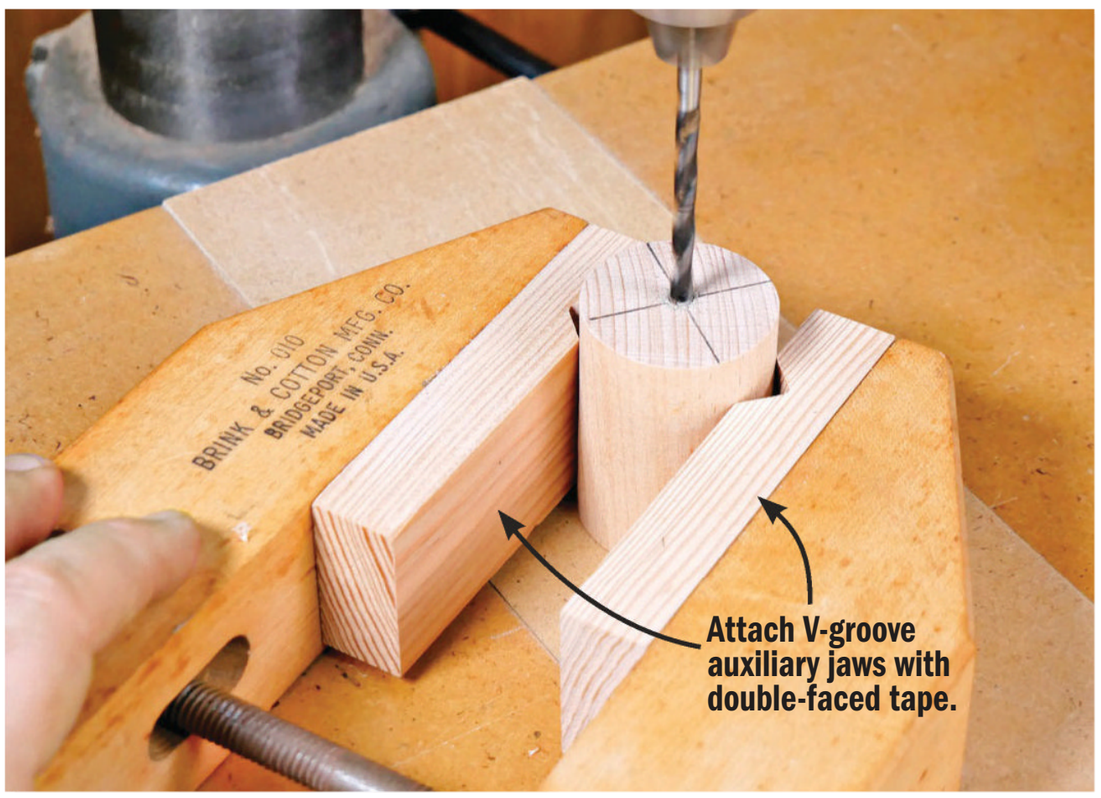
| Clamp size | Overall jaw length | Max. jaw opening | Max. reach |
|---|---|---|---|
| 5/0 | 4" | 2" | 2" |
| 4/0 | 5" | 2½" | 2½" |
| 3/0 | 6" | 3" | 3" |
| 2/0 | 7" | 3½" | 3½" |
| 0 | 8" | 4½" | 4" |
| 1 | 10" | 6" | 5" |
| 2 | 12" | 8½" | 6" |
| 3 | 14" | 10" | 7" |
| 4 | 16" | 12" | 8" |
| 5 | 18" | 14" | 9" |
| 6 | 20" | 14" | 10" |
| 7 | 24" | 17" | 12" |

# PINCH HITTERS

The unique design of handscrew clamps allows them to work in tricky situations where other clamps can't.

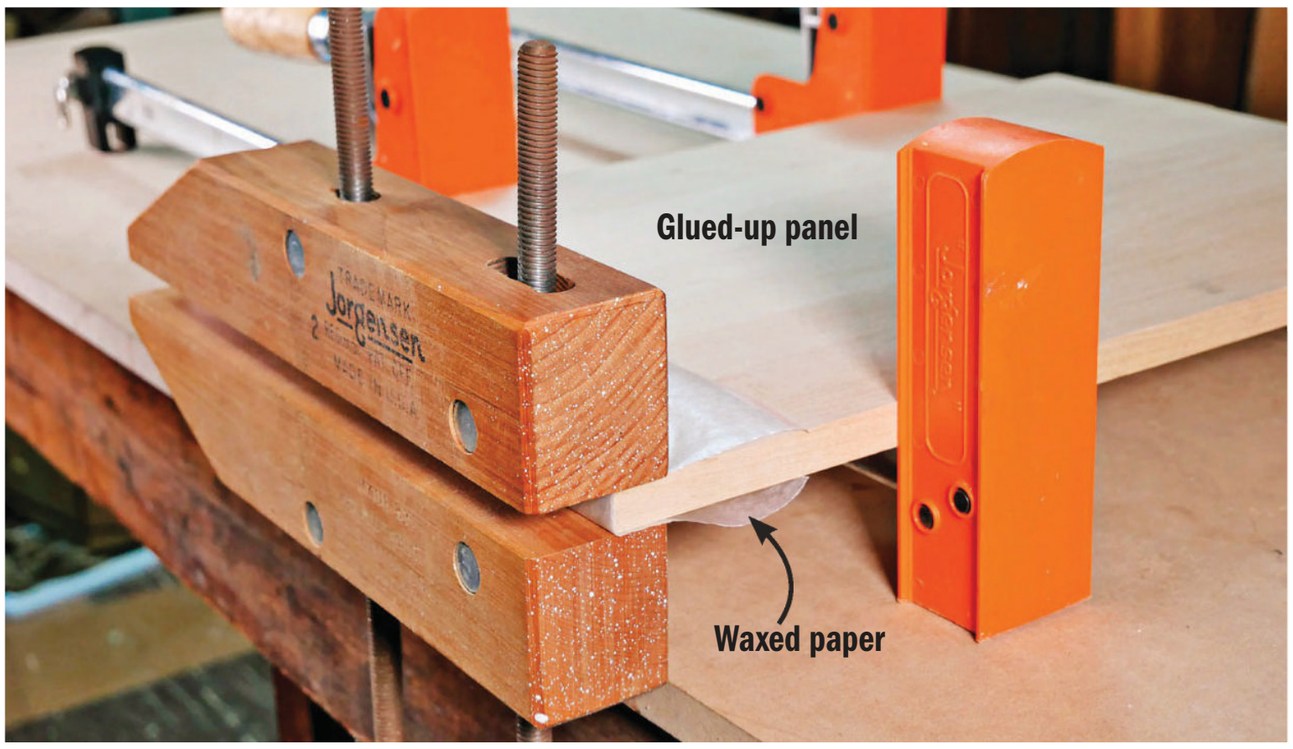



**1** The deep reach of handscrew clamps comes in handy when clamping moldings or a pull (*shown*) to the center of a panel.



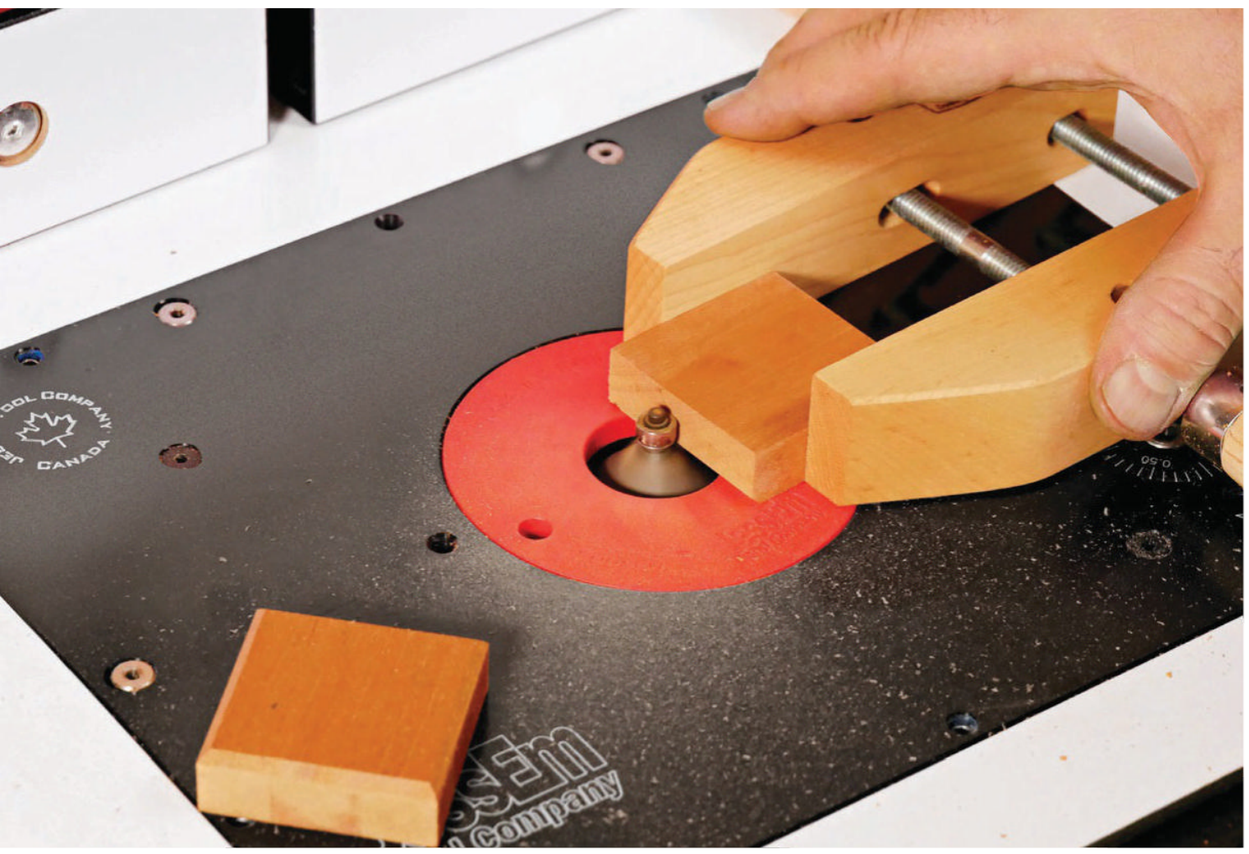

**2** To hold balls or dowels for end drilling, attach grooved auxiliary jaws to the handscrew clamp, or simply notch the jaws of the clamp.

**3** When gluing up wide panels, a handscrew clamp keeps the ends of the boards flush. Use waxed paper or painter's tape to prevent gluing the clamp to the panel.



# GET A GRIP

In addition to assembly tasks, handscrew clamps can serve as an extra pair of hands for workholding.



**4** "Enlarge" small parts by securing them in a handscrew clamp while routing or drilling to keep your fingers a safe distance from the bit.

**5** Use handscrew clamps as kickstands to hold panels or subassemblies upright during glueup or assembly.

**6** To support and steady a long board secured in a face vise, clamp the board in a handscrew clamped to your workbench.

**7** No face vise? Clamp a handscrew to any worksurface to grip a workpiece.

**8** Clamping a large handscrew in a vise raises small parts to a more comfortable working height.

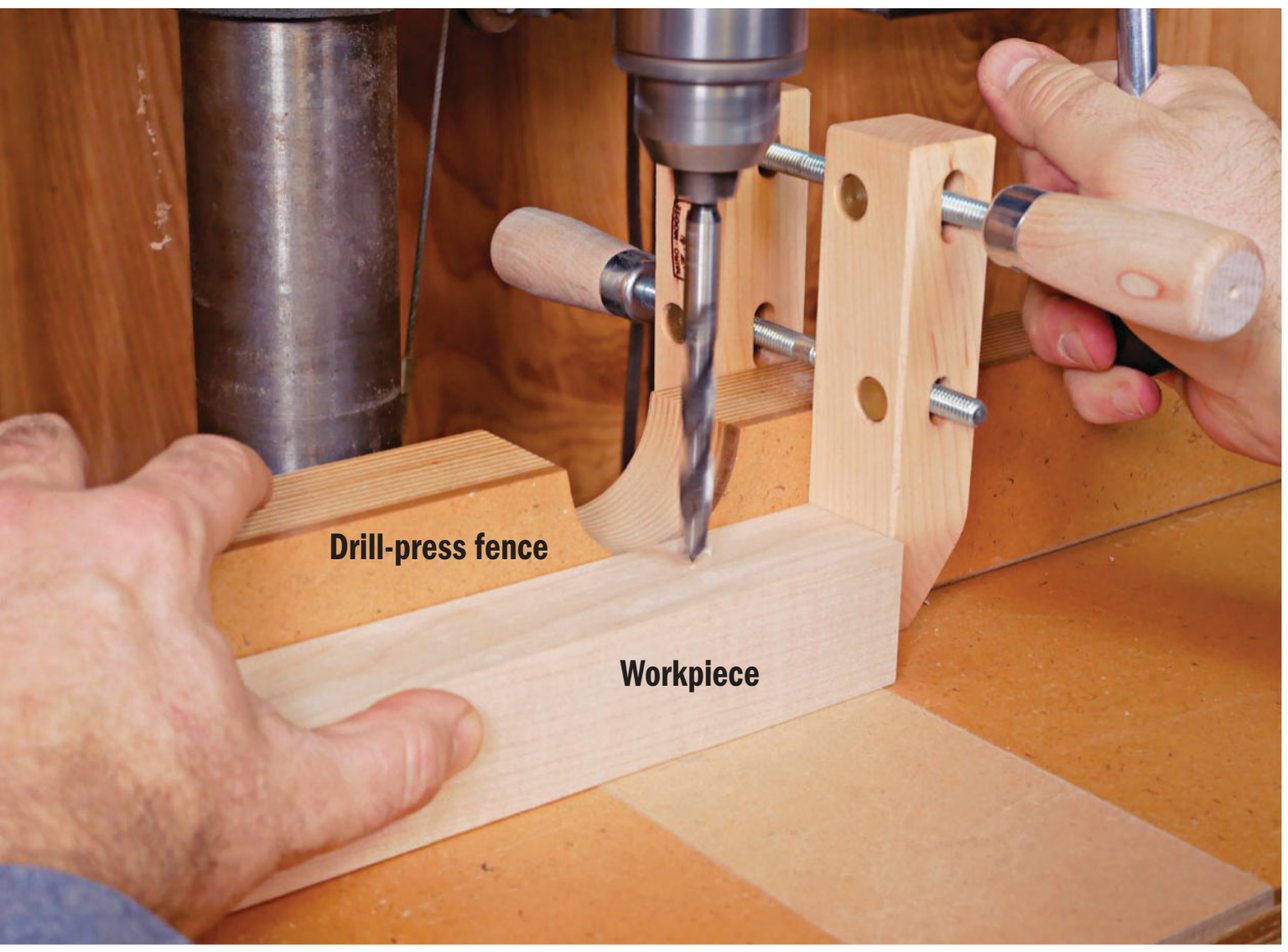
## Like riding a bike

Because handscrew clamps have regular and reverse threads, using them can be a bit counterintuitive. Start by closing the jaws completely to bring them parallel. With the jaws pointing up, place your right hand on the upper handle and your left hand on the lower handle as shown. (Remember, “right high, left low.”)

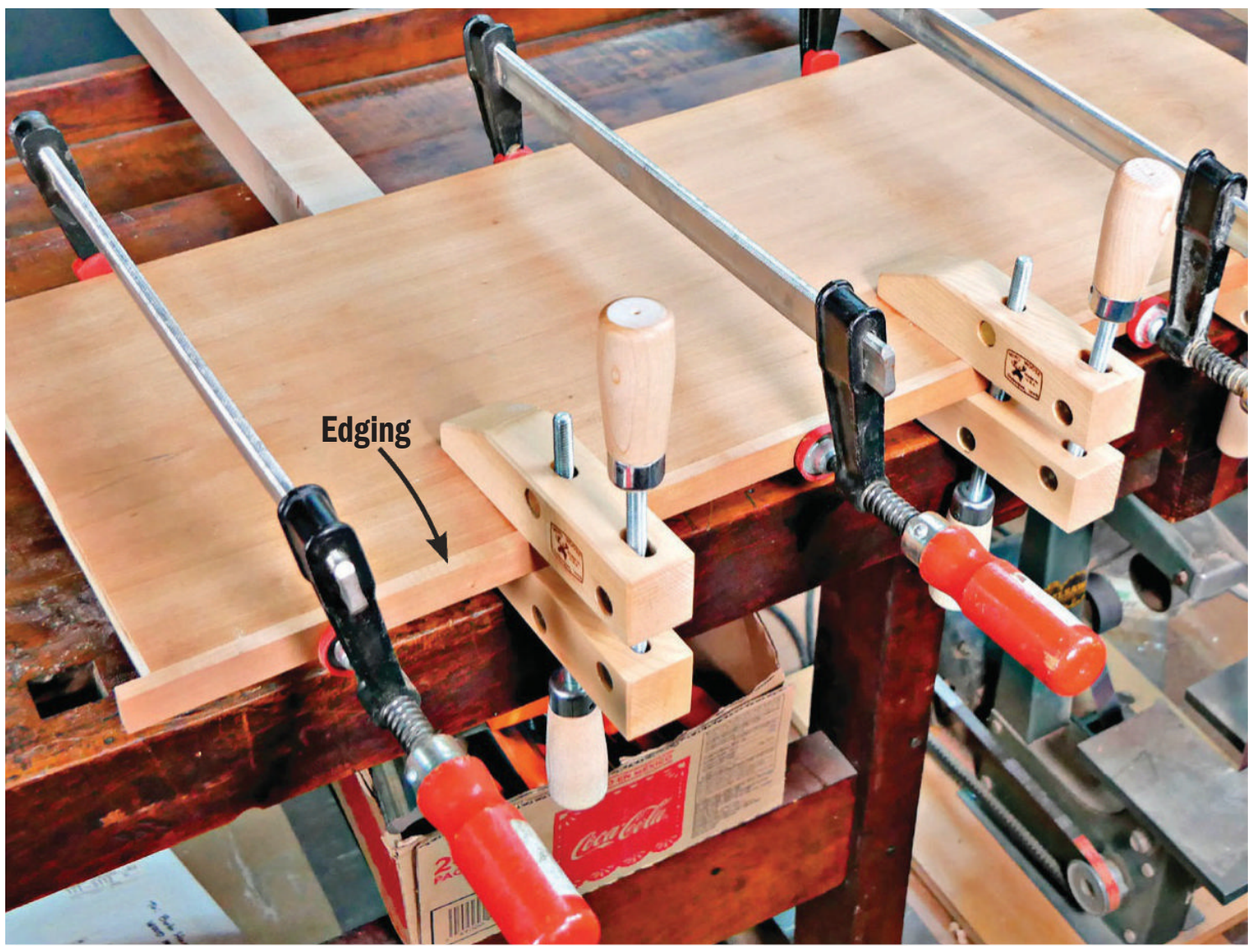
To open the clamps, rotate your hands the same way you would pedal a bicycle. Spread the jaws evenly until they just fit over your workpiece(s), then tighten the lower handle to apply clamping pressure.

# ALL-STAR PLAYERS

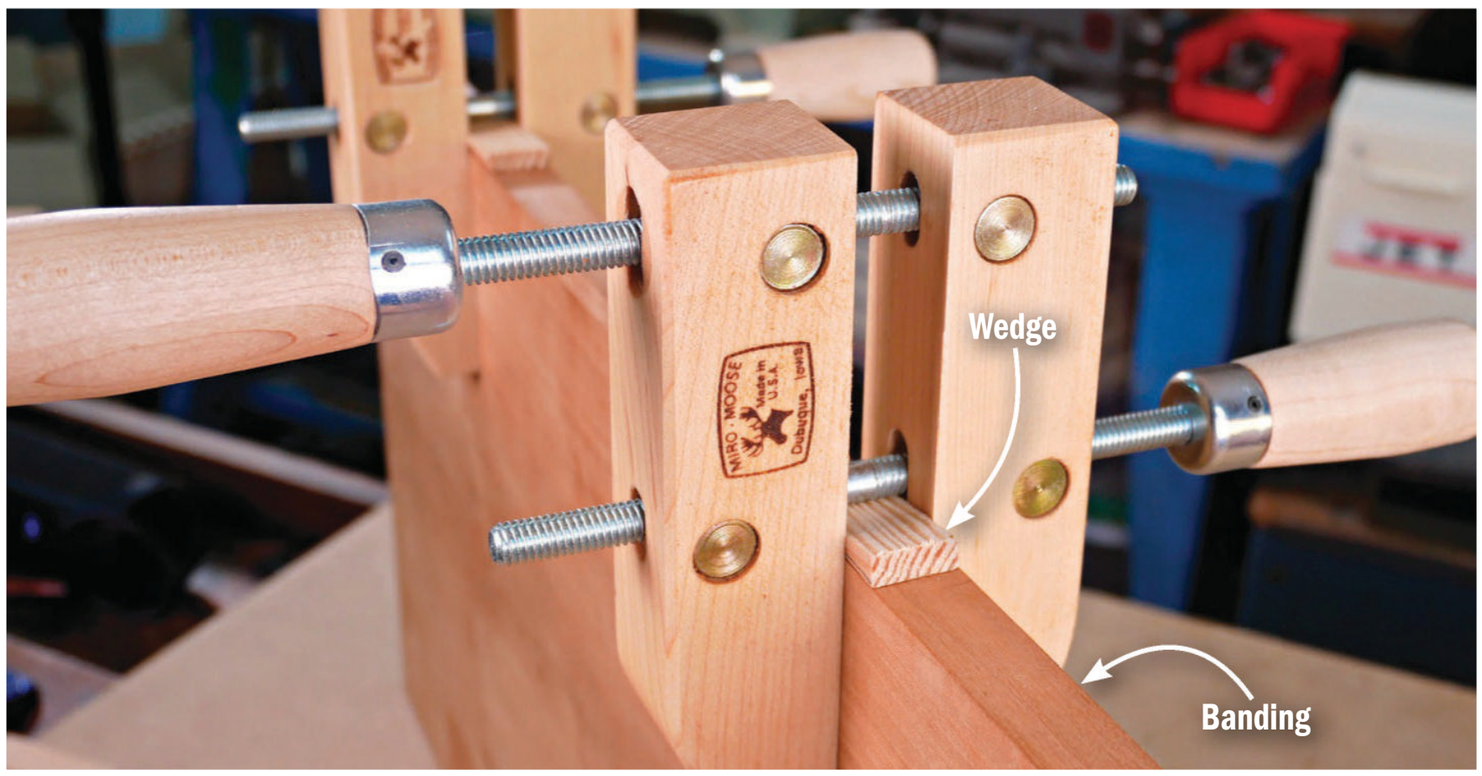
Think outside the box for even more creative uses for handscrew clamps.




**9** When machining multiple identical parts, a small handscrew clamp acts as a stop on the fence of a router table, mitersaw, or drill press.




**10** While gluing and clamping edging strips in place, handscrew clamps keep hardwood edging aligned with the faces of a panel.




**11** Clamp banding to the edge of a plywood panel with fewer clamps by driving wedges between the threaded rod of the handscrew clamp and the banding.

Produced by **Vince Ancona**

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# Belt It Out

When you need a tool to remove material in a hurry—smoothing glued-up panels or rough-sawn boards, for example—few tools beat a belt sander. In our experience, a sander that weighs 9–10 pounds, provides the best control without being too heavy. We tested nine models and recommend these.

## Best Overall (tie)
### Metabo HPT SB8V2, $140

**Belt size: 3×21"**

Deftly balancing aggressiveness and control, this 9½-pound sander scored high in all of our tests. Its 5¼"-long platen—the flat "footprint" where sanding takes place—exceeds all other 3×21" models. It collected in its bag nearly all the dust it created, and performed even better when connected to a shop vacuum.

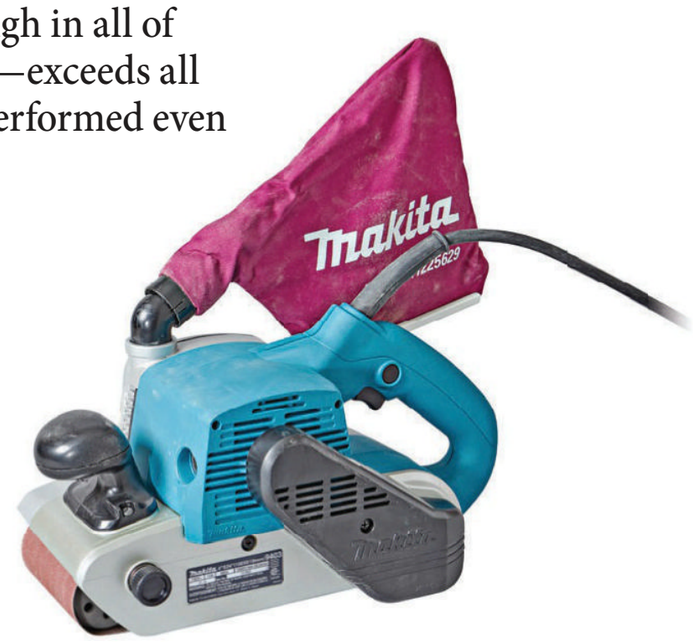
800-706-7337, metabo-hpt.com

## Best Overall (tie)
### Makita 9903, $250

**Belt size: 3×21"**

This model (also 9½ pounds) performed as effectively as the Metabo HPT in aggressiveness and control and even better at dust collection. It also topped our tests in tracking and ease of belt changes.

800-462-5482, makitatools.com



## Most Aggressive
### Makita 9403, $280

**Belt size: 4×24"**

With the largest belt and platen in the field, this sander removed material faster than any other sander we tested. But at 12½ pounds, it's also the heaviest.

800-462-5482, makitatools.com

## Best Cordless
### Ridgid R86065B, $139
**(without 18-volt battery or charger)**

**Belt size: 3×18"**

We haven't found a cordless belt sander that matches the performance of most corded sanders. But for small jobs where a cord would be inconvenient or impossible, the Ridgid (8 pounds with a 4.0-amp-hour battery pack) delivered 20–30 minutes on a charge.

866-539-1710, ridgidpowertools.com

## Best Value
### Skil 7510-01, $60

**Belt size: 3×18"**

Despite its small belt size, this sander removed material nearly as quickly as the Metabo HPT and Makita 9903 while maintaining control. Throw in its light 6-pound weight and low price, and it's a no-brainer.

877-754-5999, skil.com



*continued on page 76*

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## Finally, the snipe hunt comes to an end

**15" planer with helical cutterhead, no. JWP-15BHH, $3,400**

In 15 years as Tools Editor at *WOOD*® magazine, I've heard dozens of "snipe-free" boasts from planer manufacturers, most of which didn't live up to the promise. But the first board I ran through Jet's new 15" planer exited the machine without a lick of snipe on either end. I planed lots more boards of varying densities, thicknesses, widths, and lengths, and the only time I could detect even a whisper of snipe was in soft pine—and that measured only .0003" deep. That's impressive! The folks at Jet say the machine's Precision Air Strut System (PASS) maintains upward pressure against the head, preventing the cutterhead from dropping and gouging boards.

As for cut quality, the carbide insert cutters created the cleanest surfaces I've ever seen from a helical-head planer. I was able to quickly sand away the shallow linear ridges from hard maple with 150-grit sandpaper. I'll take that every day, especially given the longer cutting life of the carbide cutters and the significantly lower noise this planer delivers.

I have only one gripe with it: The chip-collection hood's 4" port faces the operating side (where the power switch and height crank reside) and cannot be reversed. As a result, the attached hose gets in the way during use.

*—Tested by Bob Hunter, Tools Editor*

**Jet**
**800-274-6848, jettools.com**

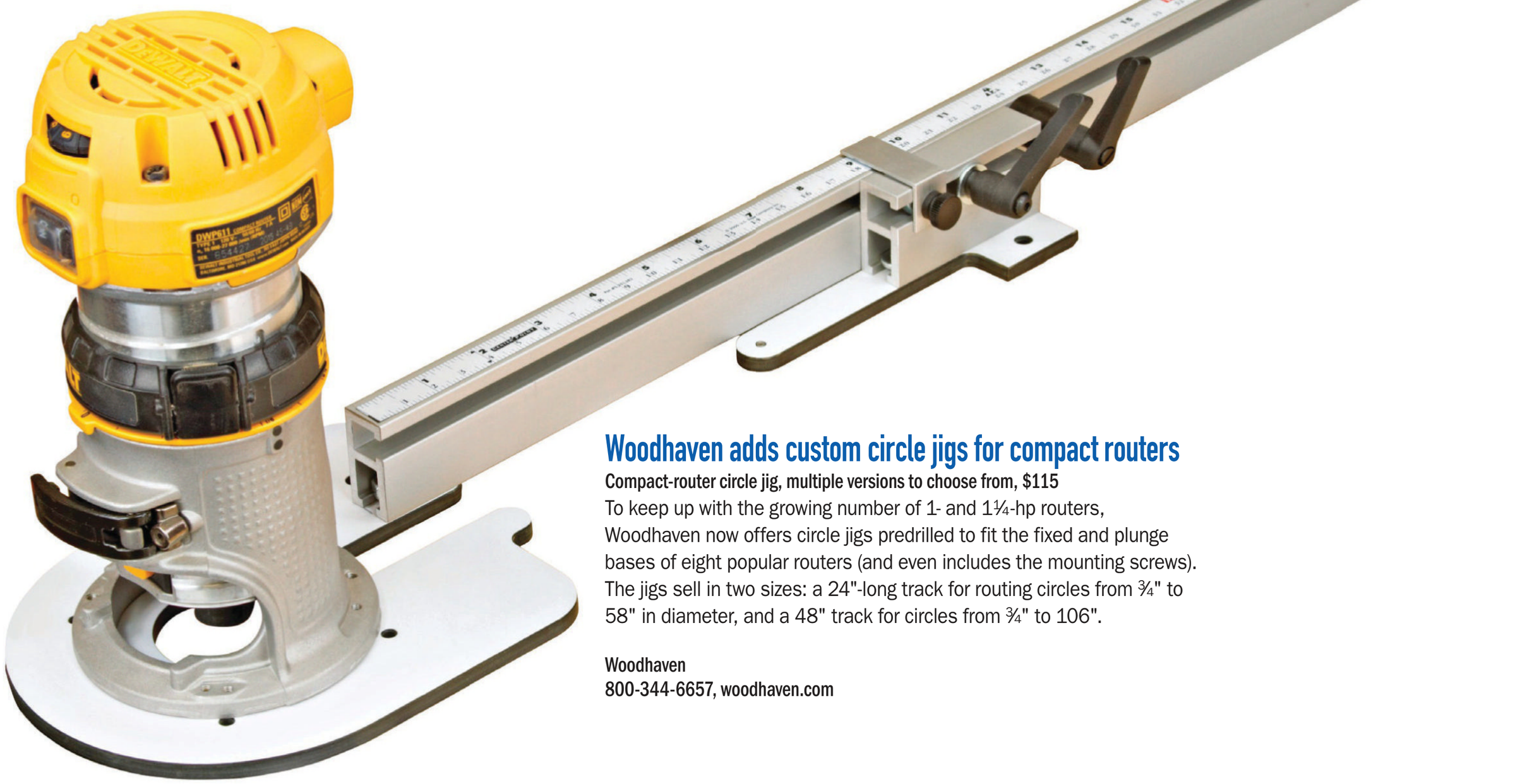
## Clean up big messes quicker

**QuikLid clip-on dustpan, $6**

QuikLid adds the sweepability of a dustpan to a 5-gallon bucket (or equivalent rim size) to make cleaning up big messes a breeze. The pan clips easily to the bucket and works really well. I found it especially useful for cleaning up the huge volume of shavings resulting from turning several green-wood bowl blanks. It might be the best $6 accessory you'll ever add to your shop.

*—Tested by Bob Hunter*

**QuikLid**
**quiklidatlowes.com**



## Woodhaven adds custom circle jigs for compact routers

**Compact-router circle jig, multiple versions to choose from, $115**

To keep up with the growing number of 1- and 1¼-hp routers, Woodhaven now offers circle jigs predrilled to fit the fixed and plunge bases of eight popular routers (and even includes the mounting screws). The jigs sell in two sizes: a 24"-long track for routing circles from ¾" to 58" in diameter, and a 48" track for circles from ¾" to 106".

**Woodhaven**
**800-344-6657, woodhaven.com**

## Clean bits and blades in one unit

**Circular saw blade and router-bit cleaning system, $100**

MicroJig's BladeClean system allows you to clean saw blades up to 12" in diameter by immersing them one at a time in a cleaning solution of your choice (not included). The magnetic handle prevents your hands from touching the cleaning solution. Spin the immersed blade slowly while it rests on an aluminum-oxide pad (think of it as a 12"-diameter dish-scrubber pad), then repeat for the other side. To clean router bits in the removable holder, first soak them in the solution, then buff them with your rotary tool, using one of the included soft-abrasive discs and mandrel.

MicroJig
855-747-7233, microjig.com

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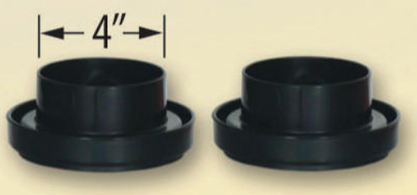


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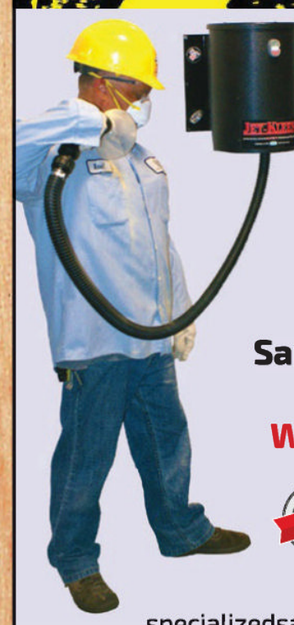

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# What's Ahead

## A GLIMPSE INSIDE THE SEPTEMBER ISSUE (ON SALE JULY 1)

**Arts & Crafts plant stand**
Learn a simple way to make those orderly rows of openings using your tablesaw.

**Solar kiln**
Put the power of the sun to work, drying hundreds of board feet of freshly cut hardwoods. When you're done, simply break down the kiln and set it aside.

**Bicycle hanger**
Elevate your cycling storage with this space-saving unit that works as well on an apartment wall as in the garage.

**Heirloom tool chest**
Give your favorite hand tools a fitting home in this handsome five-drawer chest.

**Shop test: Cordless jigsaws**
These battery-powered beasts don't cut any corners when it comes to cutting corners with precision.



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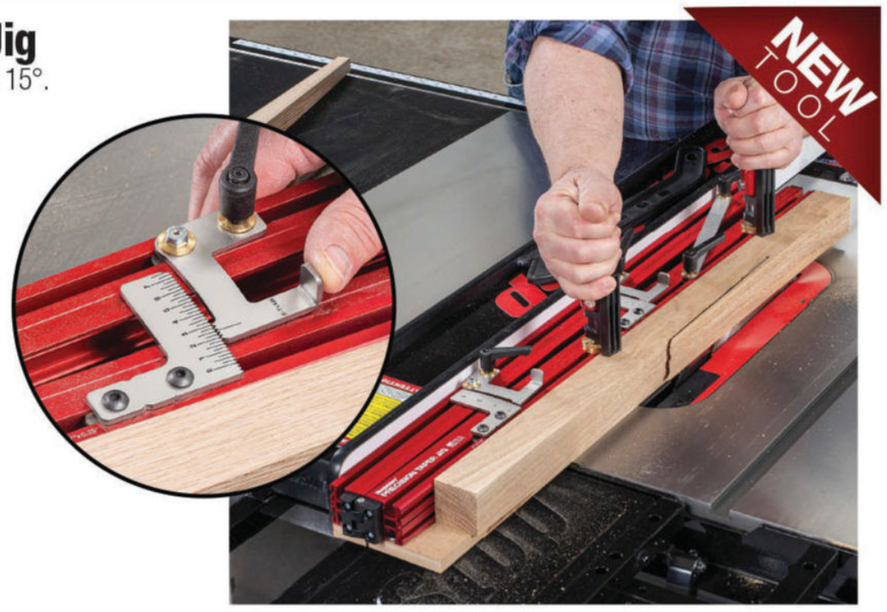


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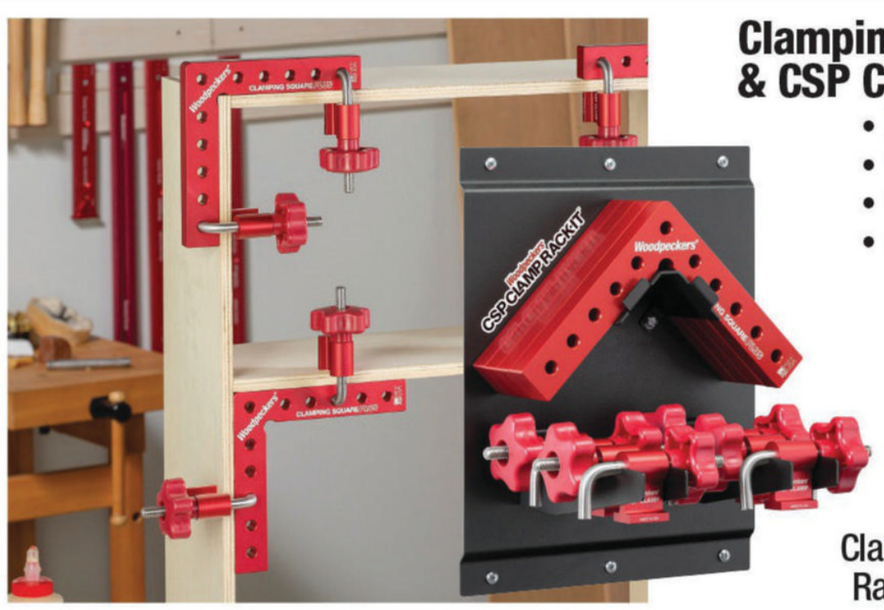


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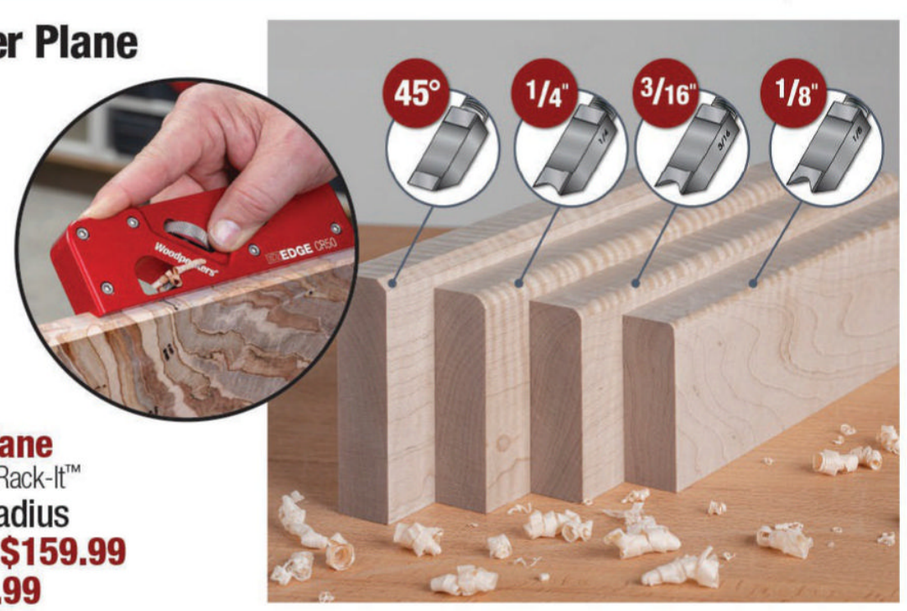


**EZ Edge Corner Plane**
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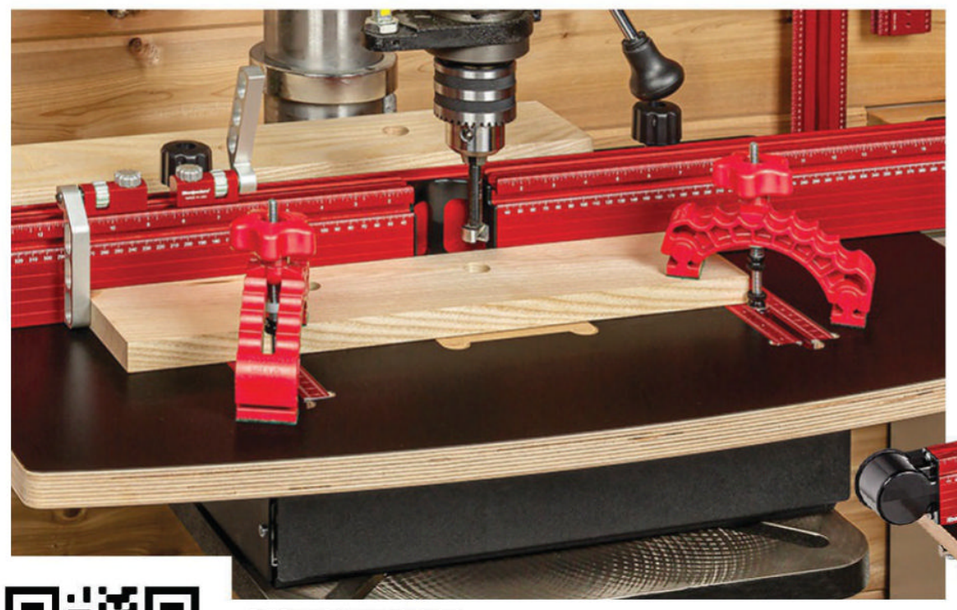
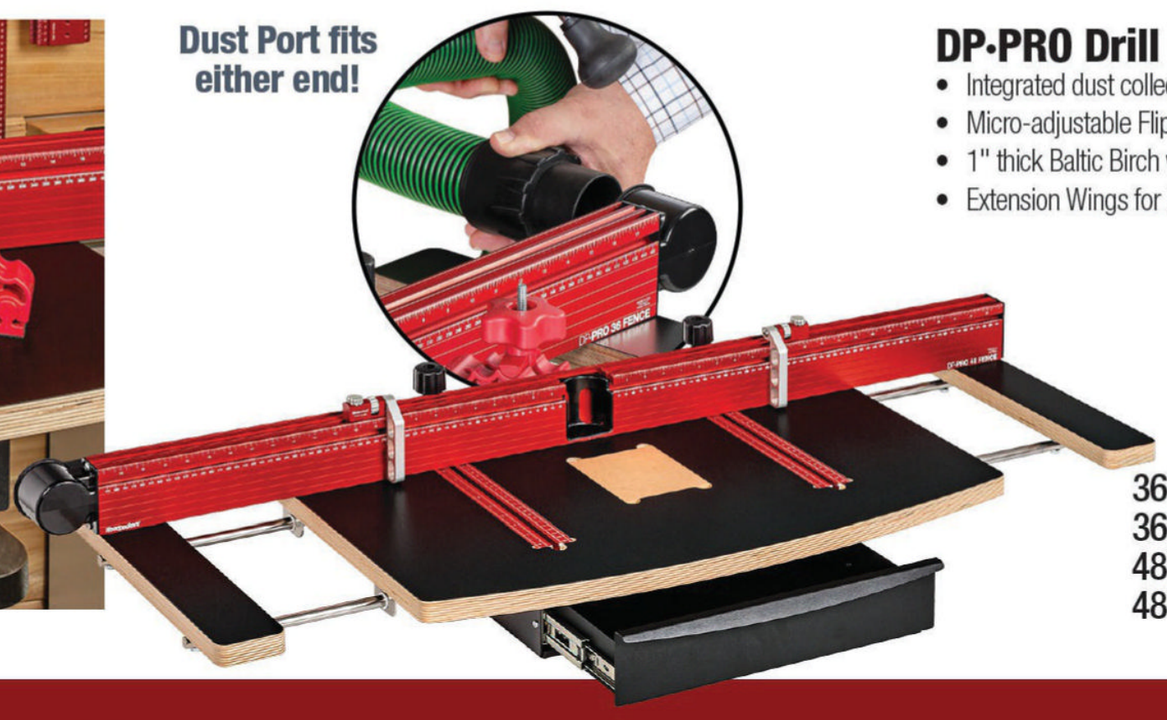


Drill Press & Hose not included.

**Dust Port fits either end!**



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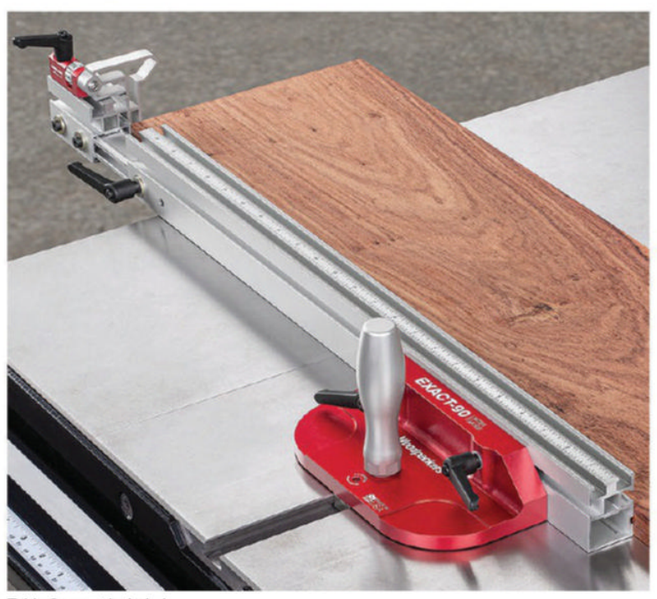

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