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ISSUE 305 OCTOBER 2025

WOOD®

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SHOW OFF AND SHUT UP

IT AIN'T BRAGGING IF IT'S TRUE. OR IF IT'S INSPIRATIONAL. OR EDUCATIONAL. OR A HEARTFELT GIFT. OR GRATITUDE ...

Be honest. The last time you gifted a woodworking project to a friend or family member and said, "I made this," you quickly followed that up with, "But the miters aren't quite tight here," or "There's a bit of a run in the finish there," or "I wish I would have used a different wood for that part."

One of my favorite people in the world, craftsman Jim Heavey, offers this sage advice: "Just shut up!" That's the title of his editorial in the link *below*. And as a woodworker who has said many of those very things in that exact situation, let me quote the line from Jim's article that cuts the heart right out of me:

"You might just as well have said, 'This is nothing special. When I make something that's really not that good, I think of you.'"

I would add these additional implied subtexts to Jim's scenario:

You might just as well have said, "I'm not a very good woodworker; all the time poured into me by my mentors was a waste and should reflect poorly on them."

You might just as well have said, "I finally mastered a skill that I'm proud of. Not only did I learn a lot about the technique, but I learned a lot about perseverance that might encourage others. Instead, I'll discourage them with my shortcomings."

You might just as well have said, "I came up with this idea that helped me out a lot in the shop, but I'll instead point out my failures so nobody else benefits."

Dear Reader, may I humbly suggest that there are times when it is appropriate–a social and moral imperative, even–to brag. To show off. To toot your own horn while you sing your own praises in two-part harmony. To use your fine work as a launching pad for teaching, for gratitude, for encouragement, for inspiration, for generosity, and for general positivity.

That is one of the reasons we hold a lot of space for you, our readers, in the pages of *WOOD*® magazine to talk about yourself. While we see ourselves as cheerleaders for this eccentric little hobby called woodworking, it's you who are the tribe of fanatics who will recruit more people to join in when they see you perform feats that seem superhuman to them.

We want you to tell us about your journey for the *Your Voice* column (*page 6*), send us photos of your projects for *Your Projects* (*page 10*), submit your shop to be featured in *Your Shop* (*page 14*). Ask us your tough questions so everyone benefits from *Ask WOOD* (*page 18*). Send them all to **woodmail@woodmagazine.com**. And then we'll help tell the world.

We are so serious about this that we've even upped the ante for the *Shop Tips* column (*page 20*) by adding a *WOOD* back issue archive to the Top Tip prize package. Send your shop tips to **shoptips@woodmagazine.com** for all to see.

Then take the copy of *WOOD* that bears your name in its pages to your friends, family, and neighbors and proudly say, "I made this."

Then shut up.

Then get out to the shop and keep making things. We'll help.

Lucas

LUCAS PETERS
lucas.peters@woodmagazine.com
@peters.lucas

Shut up and read Jim's article
woodmagazine.com/justshutup

WOOD®
Issue No. 305 | October 2025
Vol. 42, No. 5

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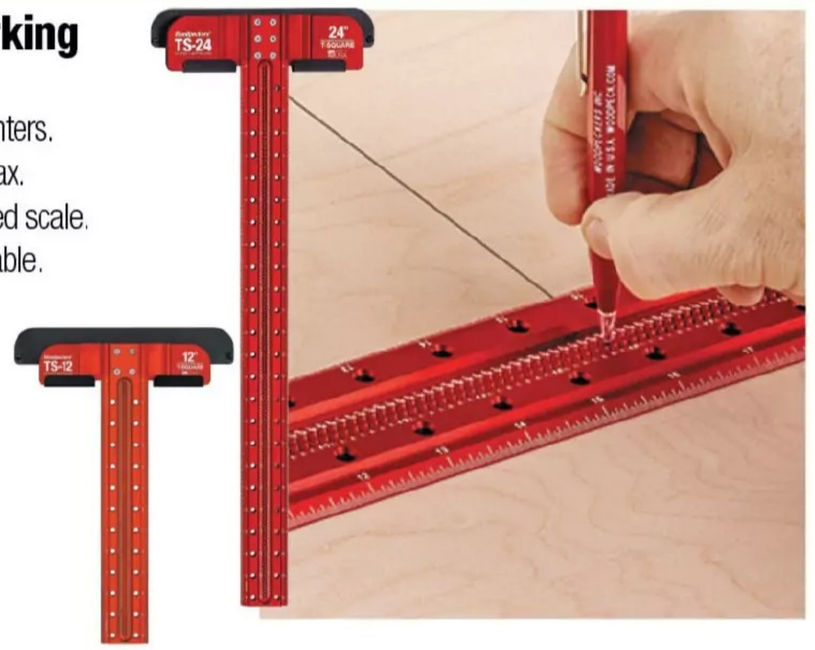

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WOOD®

Issue No. 305 | October 2025

PLANS

ON THE COVER

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MODERN METHODS

My wife noticed the Modirondack chairs on the cover of issue 301 (March 2025) and asked if I would make a pair for our pool deck. Soon after making a prototype, I had orders for seven chairs from family members! Thank goodness for my CNC machine! It made it easy to make multiples. The fun parts for me were using the plans to create all of the CNC toolpaths, along with devising a few small modifications to facilitate assembly.

Robert Bixby
Houston, Texas

MODIFIED MITER FENCE

I enjoyed reading the "Does-It-All Tablesaw Sled" article in issue 300 (December 2024/January 2025). My sled is much shorter and narrower than the project plan, so I had to modify the miter fence assembly. I moved the T-track from the fixed, L-shaped portion of the miter fence to the sliding fence, making it easily adjustable with wing nuts. I also fastened T-track to the top edge, allowing me to hold smaller parts.

George Bergen
Caldwell, Idaho

COLORED CONCRETE

Here's my modified version of the "Wood & Concrete Bench" in issue 298 (October 2024). To provide more contrast with the pavers in our landscape, I tinted the concrete with charcoal-colored concrete dye.

Marc Miesing
Elk Grove, California

WAXING ABOUT SHELLAC

The article "11 Strategies for Water-Based Finish Success" in issue 303 (July 2025) cleared up some issues I had with finishes. One question I still have concerns strategy seven, "Seal With Shellac." While I use sanding sealer and super blonde shellac, I was told by Zinsser that the colored versions, such as amber, contain wax and could affect adhesion. Does this apply only to premixed, store-bought products?

Ed Banz
Dingmans Ferry, Pennsylvania

Wax occurs naturally in shellac, and you're correct that some varieties of premixed shellac have the wax removed to prevent adhesion problems with subsequent finishes. You can still use darker shellac tones as a seal coat, though, by purchasing dewaxed flakes and mixing your own.

David Stone
Managing Editor

continued on page 8

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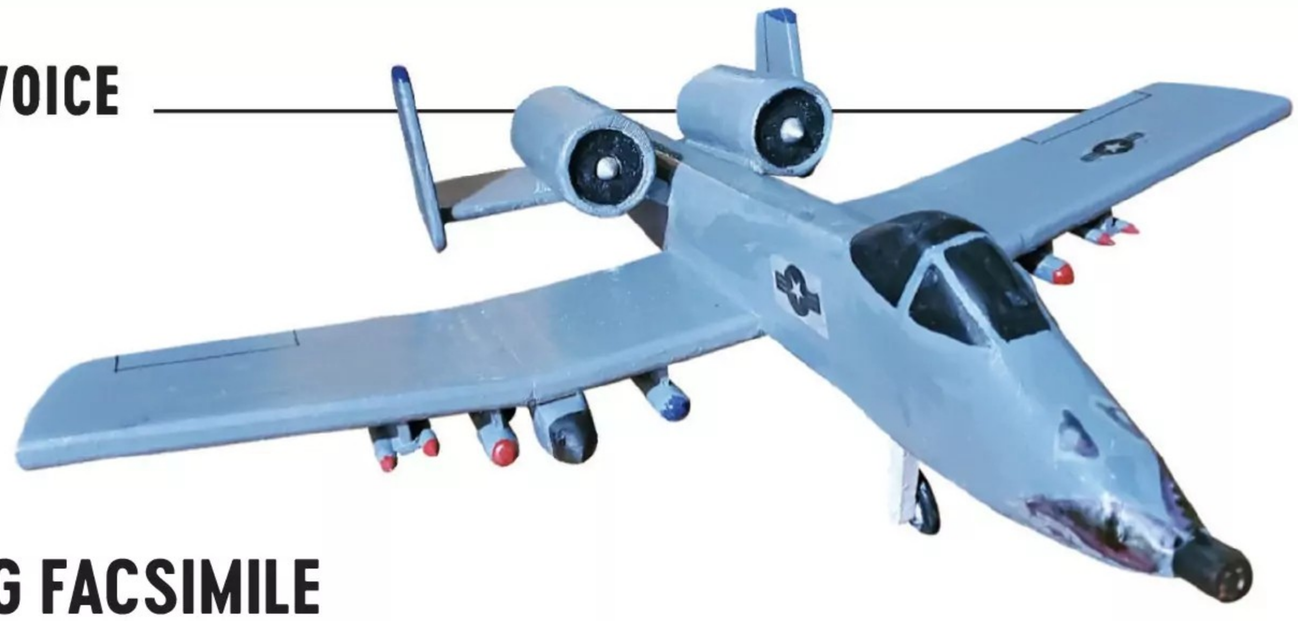
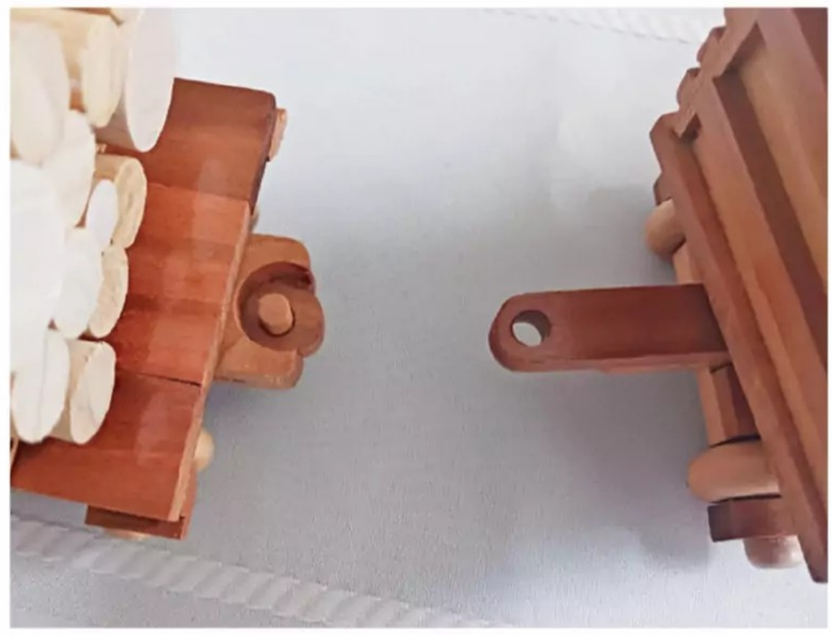


FLYING FACSIMILE

I built a model of an A-10 Warthog for my grandson using the plan from issue 252 (March 2018). I adapted the plan to more closely resemble a real A-10, creating what I think is a reasonably good representation of the actual aircraft.

Michael Windheuser
Lawrence, Kansas

COUPLER CRAFTSMANSHIP



I have been a subscriber to *WOOD*® magazine for a number of years and I particularly enjoyed the 15-piece construction equipment projects from 2008 through 2015. I am now working on the Timber Line Express train series. I enjoy the authentic details.

With an eye to those details, I've modified my train to fit my preference for an all-wood look and feel. Instead of using the brass eye screw as a car coupler, I extend the tongues and drill a hole in the end to fit over the hitch pin of the preceding car.

Richard Brands
Taylorsville, North Carolina

What a great idea, Richard! It's always fun to see how people modify our projects to meet their own tastes and needs. If you're looking for more toys, check out our selection of more than 140 plans for toys and kids furniture at *woodstore.net/toysandgames*.

John Olson
Design Editor

CORRECTION: PUZZLE TRAY PUZZLER

While building the "Portable Puzzle Tray" in issue 291 (October 2023), I noticed a small error in step 7 on page 60. You call for butting an auxiliary rip fence against a ¼" dado set to rabbet the ends of the center support (F). But that won't form the 7/16" dadoes needed. Instead, set the rip fence 7/16" from the far side of the blade and cut each rabbet in two passes; no auxiliary fence needed.

Jack Harrison
via email

continued on page 10

DELBERT MISKE of Stillwater, Minnesota, designed and built a workbench for his grandson. It features drawers, a large shelf, and a pegboard wall in the back. A tool holder and baskets flank the sides. Some of the wood came from his great grandparents' farm, and his uncle 3D printed a custom nameplate.

PAUL RAMM of Bentonville, Arkansas, picked up a vintage air compressor intending to refurbish it but realized the machine had seen the end of its working life. Rather than scrap it, he transformed it into a piece of functional Steampunk-inspired art. He cleaned, sandblasted, and painted the compressor components, and even managed to get the motor running and the pressure gauge moving if desired. He housed it in a display table of red oak finished with a blend of English Chestnut and Early American stains to bring out the grain and give it a warm, aged character. He topped it off with steel piping and a working lamp with a custom, red-oak lampshade.

MICHAEL CHONG of Waterloo, Ontario, built this rocking horse for his 5-year-old granddaughter using woods that match the colors of her real pony: cherry for the body and curly maple for the mane and tail. The seat is walnut, the rockers are ash, and the eyes are blackwood. He finished it with a custom blend of equal parts Minwax tung oil finish, polyurethane varnish, and low-odor mineral spirits.

Brian Cronebach's dad, **BRENT CRONEBACH SR.** of Dover, Ohio, has been woodworking since the early 1960s. He's 80 now. Over the years he has made many different creations including clocks, baskets, quilt racks, and a bathroom vanity (pictured here) made of wormy chestnut. The chestnut came from a cabin in Massachusetts that he helped tear down.

SEND US A PHOTO OF YOUR WORK

Want to see your work showcased in *WOOD*® magazine? Send a high-resolution digital photo of your completed project to ***woodmail@woodmagazine.com.***

continued on page 12

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A fan of the game of craps, **JOHN SULLIVAN** of Yorba Linda, California, engineered and built his own impressive craps table. It took him three months to build. He made the table with sapele and used his CNC machine to engrave dice on the pillars. He added game felt and diamond-pyramid bumper rubber for an authentic Vegas feel, then purchased chips, a croupier stick, and craps dice for wholesome, low-stakes play with friends.

JOSHUA & ROBIN WOLFE of Linton, Indiana, designed this coffee table. They use well-seasoned, rough-sawn white oak boards left over from a boat project. The table features a lift top. Joshua says that the hardest part was making the beveled edges on the underside of the top fit evenly in the base for a solid-block look when closed.

HARRY ROSCOE of Beacon Falls, Connecticut, crafted this airplane rocker from red oak for his grandson. After it was finished, this fabulous flyer quickly became a family room conversation piece.

MARK NEEDHAM of Versailles, Kentucky, crafted this oak, walnut, ash, and black resin table. The inlay in the quartersawn oak tabletop consists of ash segments, walnut and ash slats, and transparent black resin. Ash socks set off the bottom of the tapered walnut legs.

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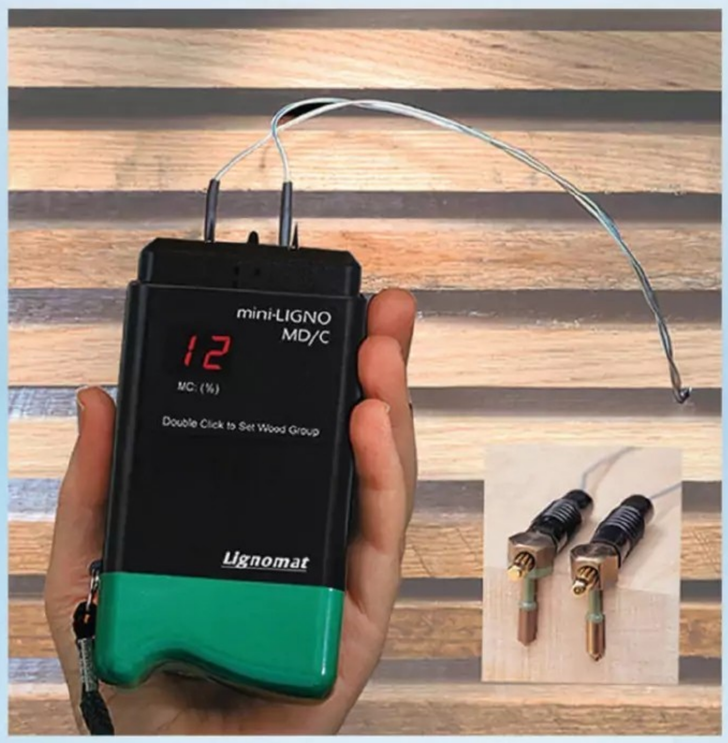

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IN PURSUIT OF A PASSION

A retired research professor feeds her newfound woodworking obsession while advancing her skills in the workshop laboratory.

WRITER: RANDY MAXEY

When Patricia and her husband, Robert, purchased their property, she immediately claimed this standalone building as her "She Shop." (She graciously lets Robert park his lawn tractor here.)

A retired university administrator and research professor, Patricia relies on both her research skills and her creativity to outfit her shop.

Plenty of floor space and mobile tool bases provide flexibility in tool placement to facilitate project workflow.

Dr. Patricia Aceves dabbled in woodworking for years, making a few simple projects. But it wasn't until COVID lockdown in 2020 that she discovered a consuming passion for woodworking.

After retirement in 2021, Patricia and her husband, Robert, purchased a 3-acre property in central Minnesota complete with a detached, two-story, 25×26' workshop with unfinished living space above. The wide-open floor space and large windows make for a roomy, well-lit atmosphere to expand her woodworking knowledge and skills.

To outfit her workshop, Patricia relied on her love of recycling used items, making it the new home for second-hand cabinets and a desk. A few discarded, curbside cabinets with countertops and an old nightstand from her daughter's room round out the storage options. Patricia transformed the dull, gray walls and cabinets by painting them with bright colors to create an inviting, inspirational, and creative maker space.

That same sense of whimsy drove Patricia to name many of her tools and each of her worktables. Her first shop-built workhorse is the "BMW" (Basic Mobile Workbench from Steve Ramsey's online *Weekend Woodworker* course). She rescued "Big Mama" from a destiny at the landfill. The top was black and greasy from its past life as a machinist's

PHOTOGRAPHER: PATRICIA ACEVES; **ILLUSTRATOR:** ROXANNE LEMOINE

SHOW US YOUR SHOP

Send high-resolution digital photos of your shop to ***woodmail@woodmagazine.com*** and we may showcase it in the magazine!

The 14'-high ceilings allow room for two levels of storage cubbies above the work area and a place to mount LED lighting fixtures to illuminate the work area.

bench, so she sanded it and cleaned the vintage vise. Her "AC/DC" workbench, equipped with electrical outlets, serves as the outfeed table for her tablesaw and router-table workstation.

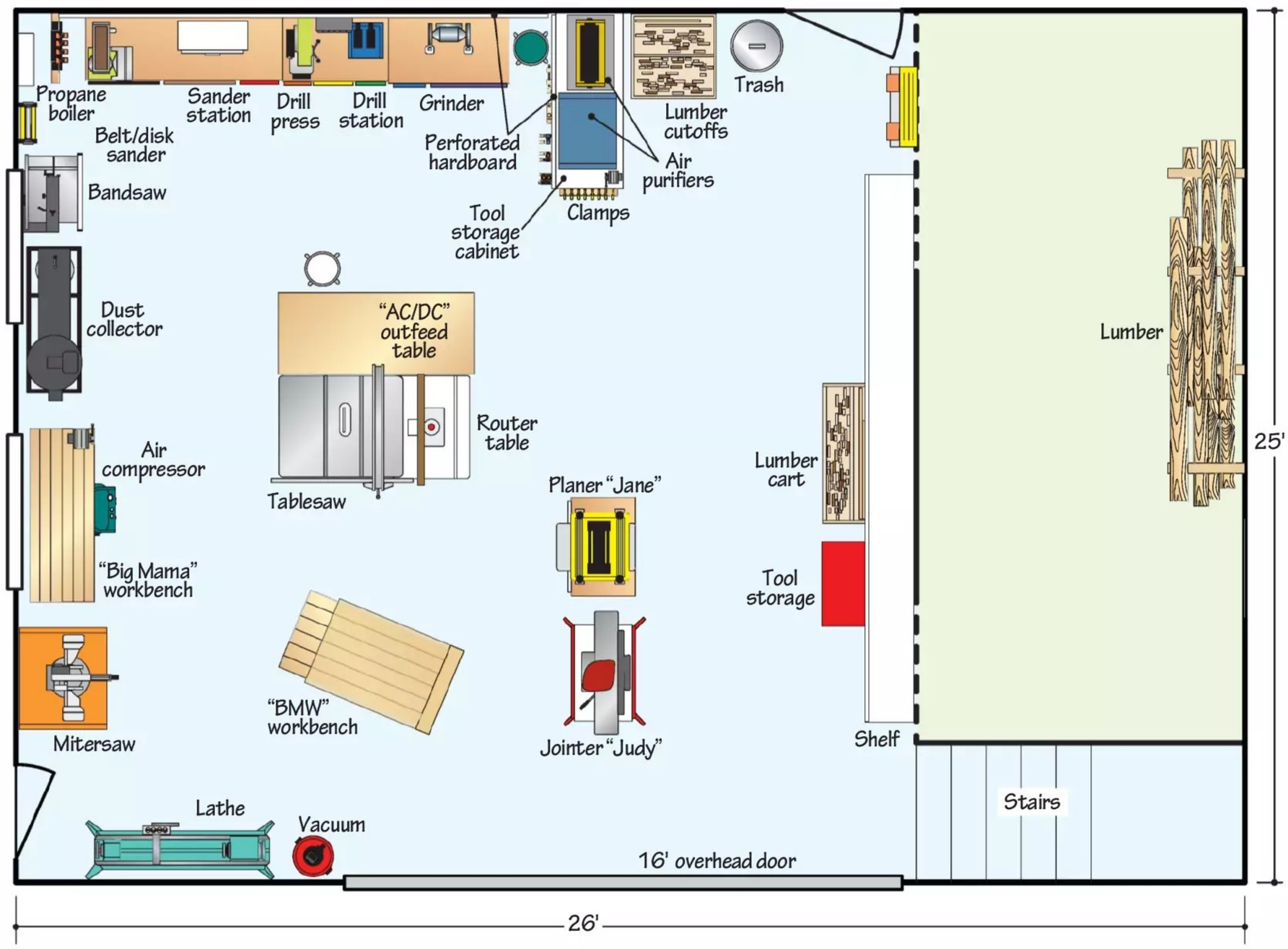
Casters make it easy to move tools and workstations around as needed and to get them out of the way when her shop needs to

TIPS FROM THE SHE SHOP

To encourage more women to join her in her woodworking hobby, Patricia collaborated with friends in the Women of Woodworking Facebook Group—a forum boasting more than 24,000 members—to present these tips.

- Determine what you're interested in making, then research it and learn what tools you need, purchase what you can afford, then upgrade as your skills grow.
- Don't be intimidated by the tools. Learn how they work and keep safety paramount.
- Hand tools can achieve the same result as power tools. Use what you've got!
- Find an online or local community of like-minded folks who will inspire and help you along the way.
- Set up a workspace for *your* needs: height of tables, placement of tools, workflow, etc. The size of the space doesn't matter—woodworking can happen in any space you have.

Find the Women of Woodworking Facebook Group at woodmagazine.com/womenofwoodworking



accommodate a tractor or vehicle. She fashioned custom dust covers from an old drop cloth for many of the tools to keep them dust-free when not in use.

Patricia started out with an old benchtop tablesaw along with a mitersaw and circular saw. But once the woodworking bug bit, Robert encouraged her to upgrade and add tools both for safety and to improve her skills. She selected tools to suit the needs of her current project. True to her researcher roots, before making a purchase, she pored over new innovations and product reviews and consulted Facebook groups for others' opinions about a specific brand or tool.

Arthritis in her hands taught Patricia that some hand tools are too large or heavy for her to comfortably use. For example, she found that her husband's cordless hammer drill was too heavy to operate with one hand, so she bought her own drill and driver that better fit her hands. Battery-operated tools can be heavy so, in some cases, she traded the cordless convenience for a lighter, corded tool.

Patricia prioritizes shop safety, never using a tool without donning the appropriate personal protective equipment including eye, ear, and lung protection,

Patricia added character and brightened the shop atmosphere by painting many of her reclaimed cabinets and tool bases with bright colors.

and steel-toed boots. A wall-mounted first aid kit hangs within easy reach. And if there's a need to summon help, she relies on Alexa, her smartwatch, or phone.

To sum up her appetite for woodworking, Patricia has this to say: "I especially love woodworking because I find the spatial and mathematical aspects quite challenging. Successfully completing a project with angles and tapers brings me great satisfaction. I enjoy noodling on a woodworking challenge until I figure it out." Seeing Patricia's latest work, we think she's well skilled at figuring it out.

PRACTICAL PROGRESS

Patricia's foray into woodworking began more than 25 years ago with a bedside phone shelf for her daughter. Next came a shadow box to display her grandmother's antique brooches built from a 2×4 with a handsaw, hammer, and nails. She says, "It took more than 25 years to ignite the passion, really dig in, and learn how to do woodworking well." The coffee table is one of her more recent projects, showing off her skills and progress.

"MAKE MISTAKES. THEY WILL HAPPEN, BUT DON'T LET THEM DISCOURAGE YOU. TRUST IN THE PROCESS. DO THINGS YOU DIDN'T THINK YOU COULD AND DON'T LISTEN TO THE NAYSAYERS."

-PATRICIA ACEVES

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Q: HOW MANY ROUTERS DOES A WOODWORKER NEED?

For years I've gotten by with owning just one router. Lately I've been thinking that it could be useful to have a second one, but I'm having a hard time deciding whether to get another mid-size router or to go with something like a trim router. Do you have any recommendations?

Randy Boysen
Saginaw, Michigan

A: Having multiple routers at the ready makes life easier in the workshop. A fixed base and a plunge base serve different purposes, which is why we recommend a mid-size (1½- to 2-hp) router kit with both bases as a first router. This gives you the functionality of two routers in one. If you don't already own a plunge base, see whether one is available for your router.

Use the fixed base when routing round-overs, chamfers, and other edge profiles. The plunge base works better when routing mortises, dadoes, or grooves. Armed with both bases, this one router will handle a majority of the tasks that come up in the average woodshop.

If you use mostly small bits or build a lot of small projects, consider adding a trim router (sometimes called a palm router). Although limited to ¼"-shank bits, these small, lightweight routers are handy for edge profiles, hinge mortises, and routing in tight areas. Available in cordless and corded formats, a basic trim router costs as little as $50. Or choose a higher-end model with fixed and plunge bases.

Owning a dedicated router for your router table saves a lot of time and setup hassle. You can get by with purchasing a second fixed base and using the motor from your handheld router. But if you want to add a router lift, swapping out the motor becomes more difficult, so you'll want a dedicated router. We recommend a 2- to 3-hp router for a lift, because a router this size easily powers through heavy cuts and can handle large panel-raising bits.

Finally, if you find yourself changing router setups often, if you're repeating the same setups over and over, or if you consistently need a router for a specific task, that's a good indication that it may be time to consider expanding your router arsenal. Though it may seem like a luxury in a small shop, some woodworkers who consistently use a router for specific tasks will dedicate a router to each one. If, for example, you use a dovetail jig often, dialing in the exact bit setup can take a lot of time. Keeping a router always set up with a dovetail bit simplifies the process. Likewise, an inexpensive trim router with a dedicated chamfer or round-over bit is useful for quickly easing the edges on projects before sanding and finishing. Owning additional routers (as your budget allows) can be a big time saver.

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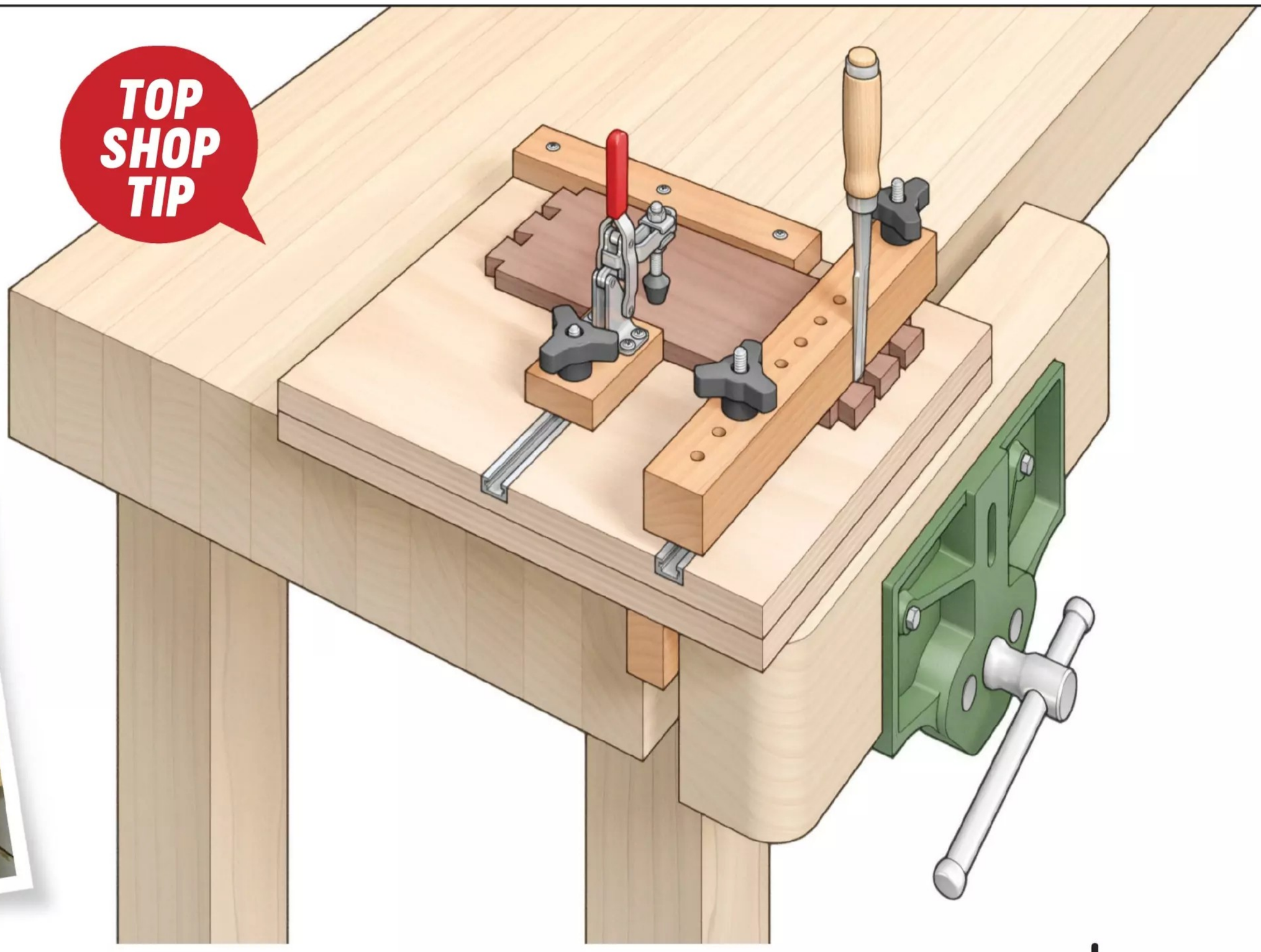

A HEADS-UP FOR TIGHT TAILS

When creating dovetail joints by hand, I struggle to keep the chisel square to and aligned with the baseline while removing the waste. This benchtop jig guides my chisels for consistently clean, accurate cuts.

The base starts with two ¾×12×14" pieces of plywood glued face-to-face. Dadoes on the top fit two pieces of T-track. The front track sits about 2" from the front edge of the base and holds the 1½×1½" clamping bar that also serves as a chisel guide. The rear track anchors a vertical toggle clamp assembly to help secure the workpiece. I attached a cleat along one edge of the base to register the workpiece square to the clamp bar, and a cleat underneath lets me secure the jig into my bench vise.

To use the jig, loosen the knobs and slide the board under the fence, aligning the front edge of the fence with the baseline of the dovetails, then tighten the two knobs. Slide the toggle clamp base against the workpiece and tighten it down. Then chisel the waste out from between the dovetails, ending with the back of the chisel tight against the fence as you pare down the baseline.

Jim Morgan
Smyrna, Tennessee

For his top tip, Jim wins a Fulton Panel Max Glue Press System from Peachtree USA worth $360.

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ILLUSTRATOR: CHRISTOPHER MILLS

HANDY HANGERS

I use drywall screws to make simple hangers for my wall-mounted tools, but I don't like how the threads scratch handles.

The solution is cheap, simple, and versatile. A roll of polyethylene tubing (ice-maker water line), a box of #10 fender washers, and various sizes of drywall screws are all you need. Choose the length of screw needed, slip on a fender washer, then cut a length of tubing to fit the tool you want to hang. If you have a tool with a hole in the handle, just leave off the fender washer.

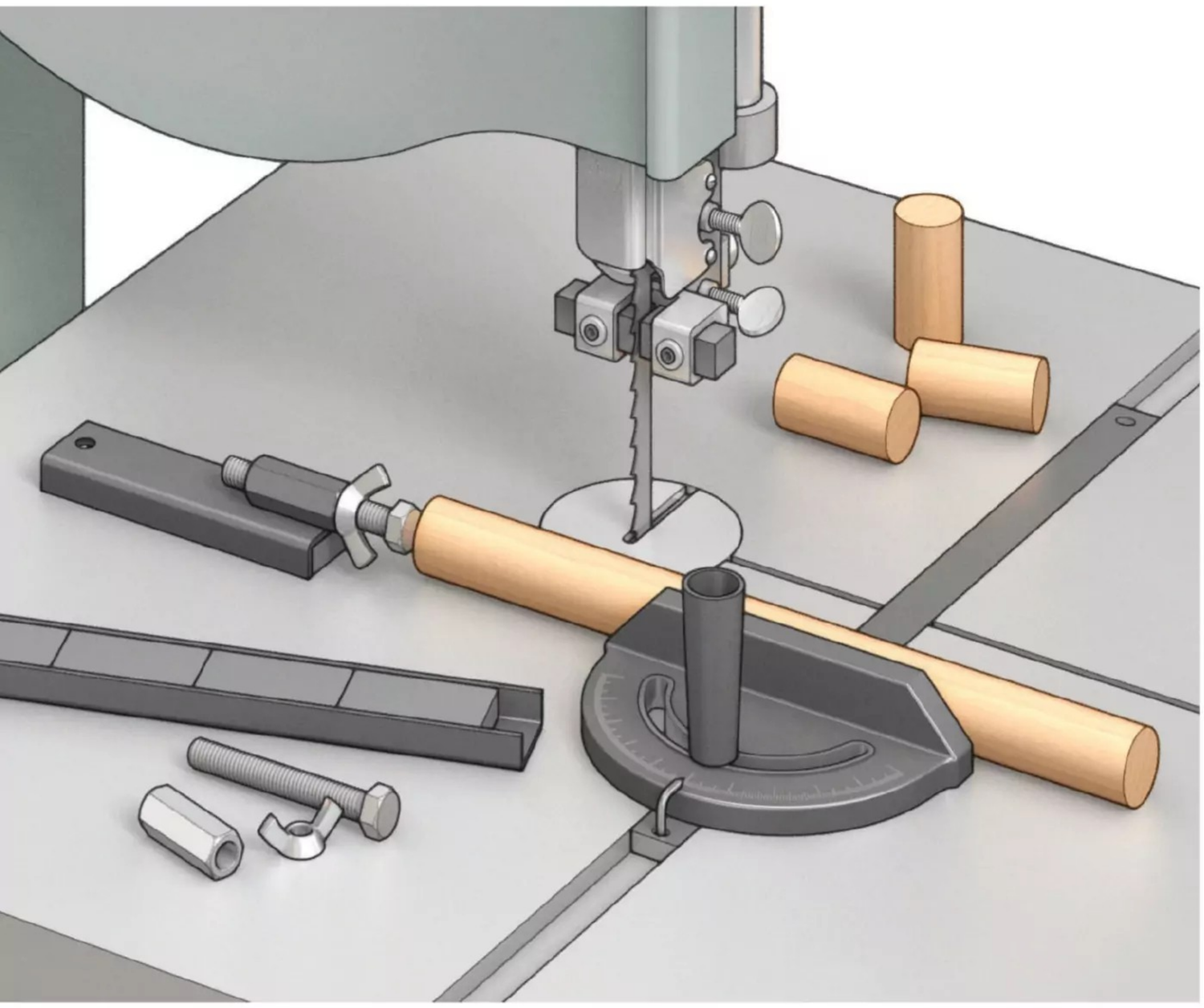
I've also used these hangers in my wooden toolboxes. The washers keep the tools secure while I move the toolbox from job to job.

John Hooper
Greer, South Carolina

SHOESHINE SANDING

When sanding curved surfaces and edges, I use what I call the "shoeshine" technique, pulling a long strip of sandpaper back and forth. I've found that adhesive-backed sandpaper works great. The rolls I buy have a clear plastic backing that I simply leave on. For rolls without a backing, just stick them to a piece of kraft paper or thin cloth.

Emanuel Ringel
Ambler, Pennsylvania



MAGNETIC ADJUSTABLE STOP

Here is an easy-to-make, micro-adjustable stopblock for your tablesaw or bandsaw. You'll need the following items:

- Magnetic tool bar
- ⅜"-16 coupling nut
- ⅜"-16×4" full-thread hex bolt
- ⅜"-16 wing nut
- Epoxy

First, use a hacksaw to cut off a section of the tool bar between the magnets. Adhere the coupling nut to the back of the tool bar with epoxy, making sure the nut extends about ¼" past the end of the toolbar.

Sand or grind the head of the bolt smooth. Thread the wing nut onto the bolt with the wings facing the bolt head. After the epoxy cures, screw the bolt into the coupling nut.

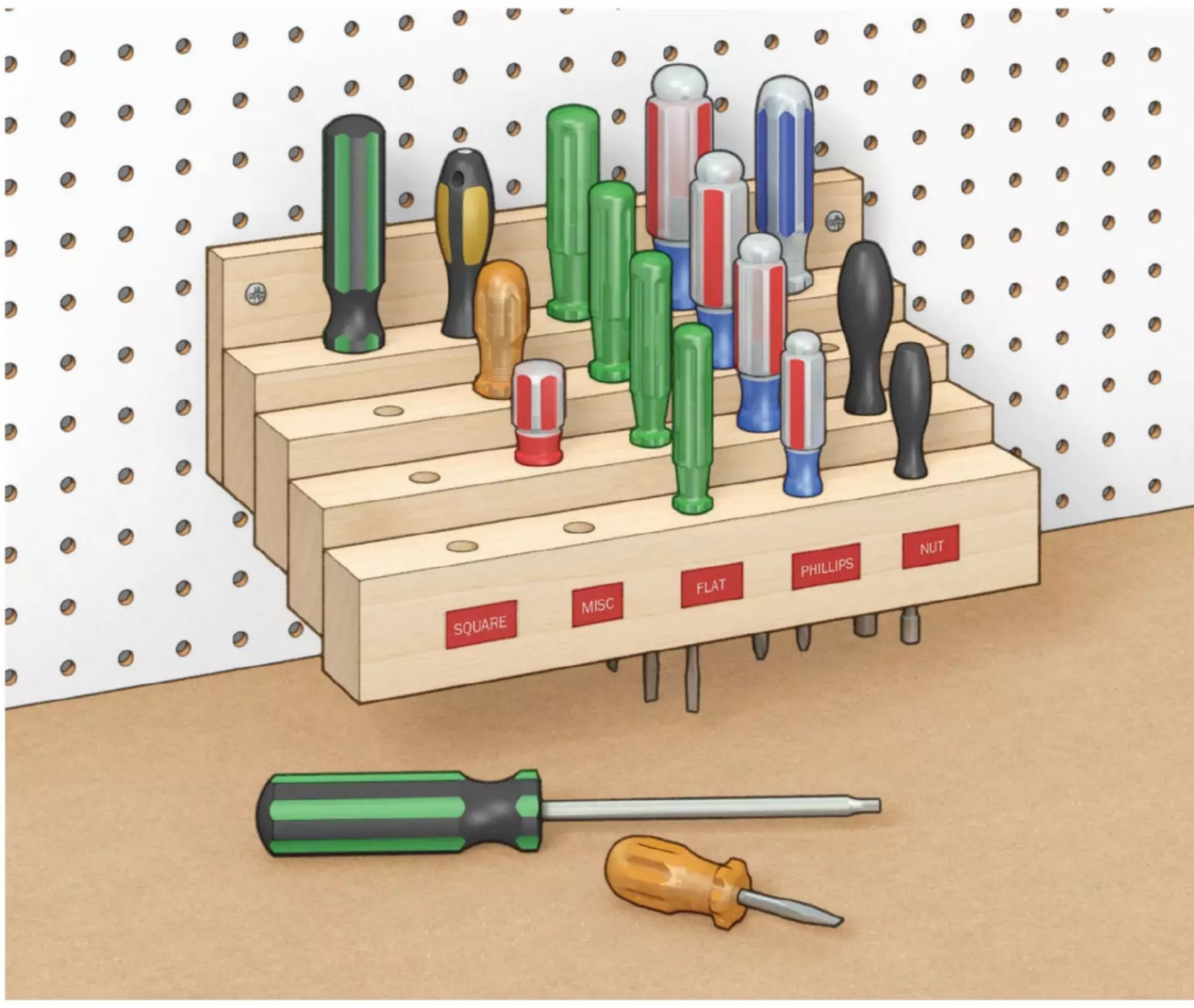
To use the stopblock, stick it to the saw table on the infeed side of the blade. Adjust the bolt to the desired position. Tighten the wing nut to the coupling nut to act as a jam nut, preventing the bolt from spinning.

Bob Grinstead
Mansfield, Texas

DRIVER PARKING

For years, I kept my screwdrivers in a drawer, forcing me to sort through them to find the one I needed. This simple tiered rack made from scrap 1×2 boards solves the problem. I drilled holes through each board to accommodate the driver shanks. Then I glued them together in a stair-step configuration. Labels at the front identify the driver type in each row, making it easy to select the proper tool for the task at hand. Installed on the wall near my workbench, the rack takes up only a small amount of space and keeps the drivers within reach.

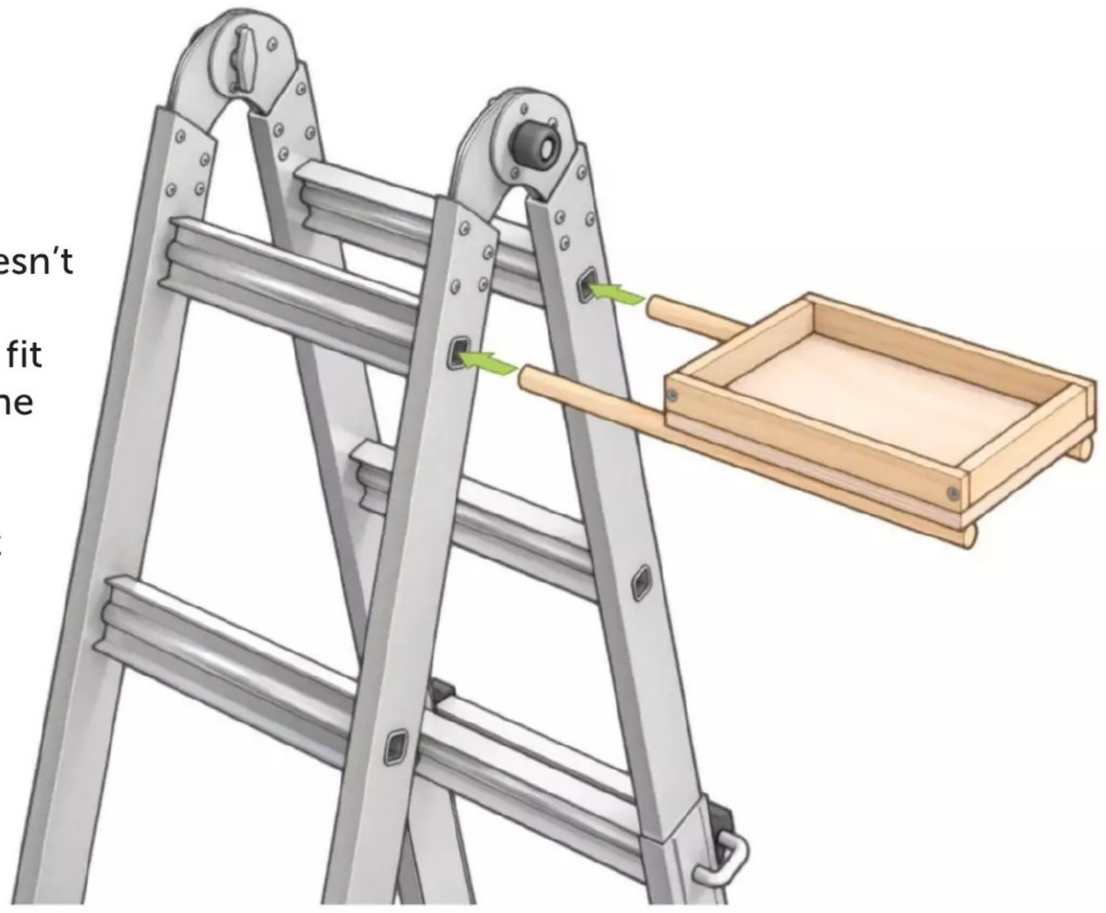
Walt Henry
Centerville, Massachusetts



TEMPORARY TOP TRAY

My A-frame ladder doesn't have a top shelf, so I came up with a tray to fit into the holes where the rungs attach. I used 1" dowels, each fastened with only one screw at the midpoint of the tray so they can pivot slightly, making insertion easier.

John Hoerner
Birmingham, Alabama

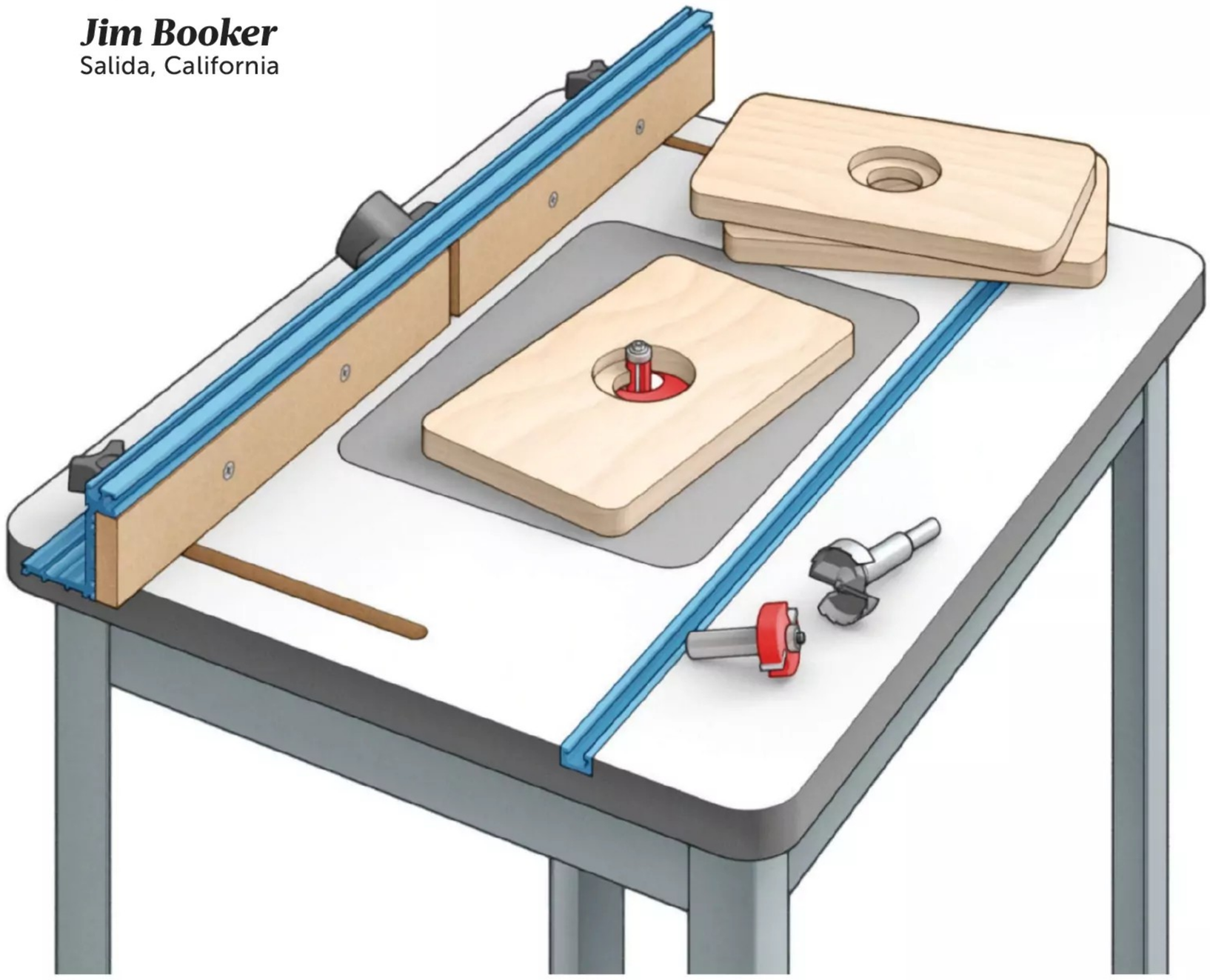


HOLE ENLARGER

I was making a wine caddy and needed to make a 2½" hole for the wine bottle. A hole saw left a rough edge with burn marks that I didn't want to sand smooth.

Instead, I drilled a 1½" hole with a Forstner bit. With a ½" rabbeting bit installed in my router, I formed a shallow rabbet inside the hole. Then I flipped the workpiece over and used a bearing-guided flush-trim bit to enlarge the hole to the desired diameter. This left a clean edge without any burn marks.

Jim Booker
Salida, California



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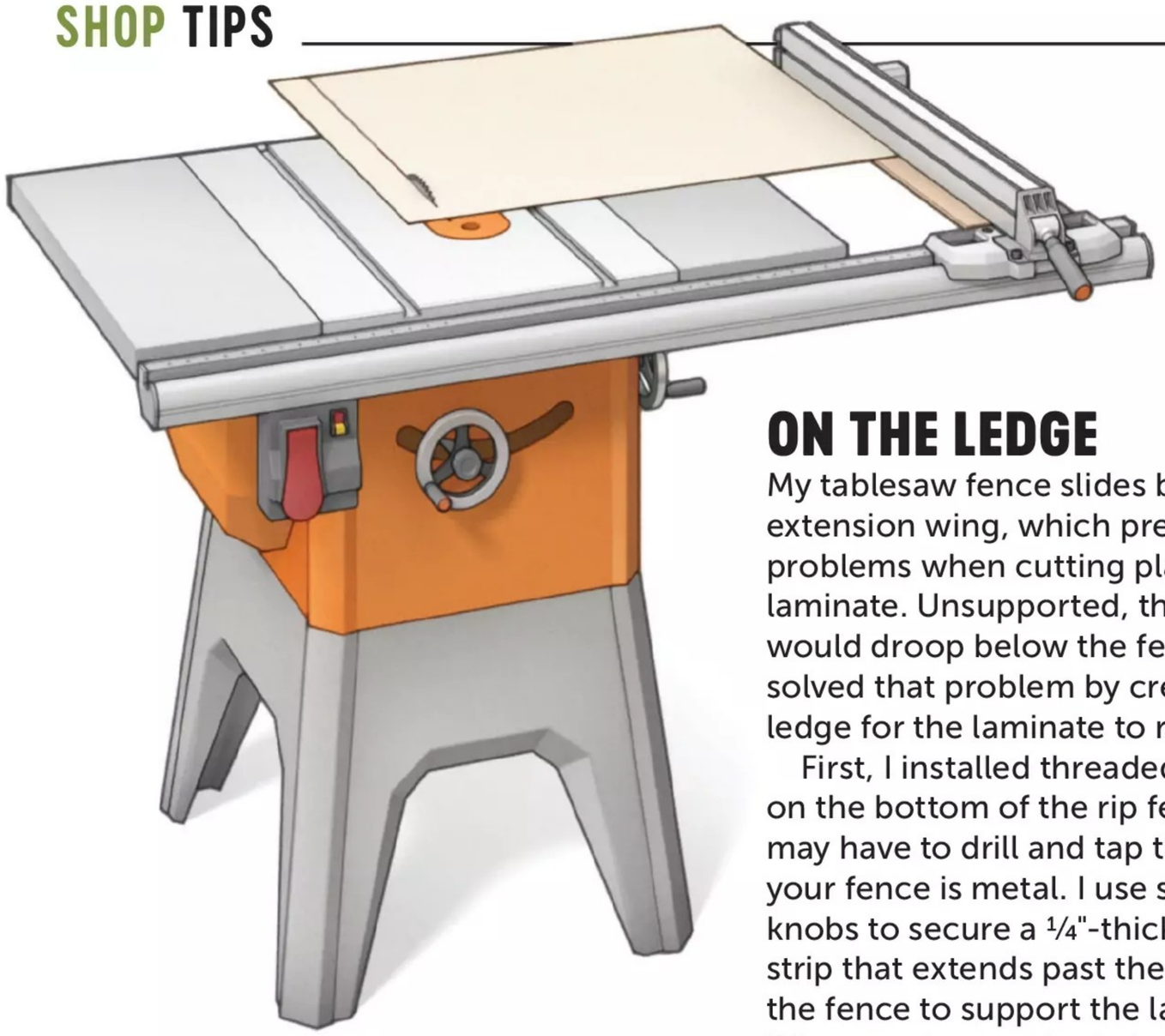
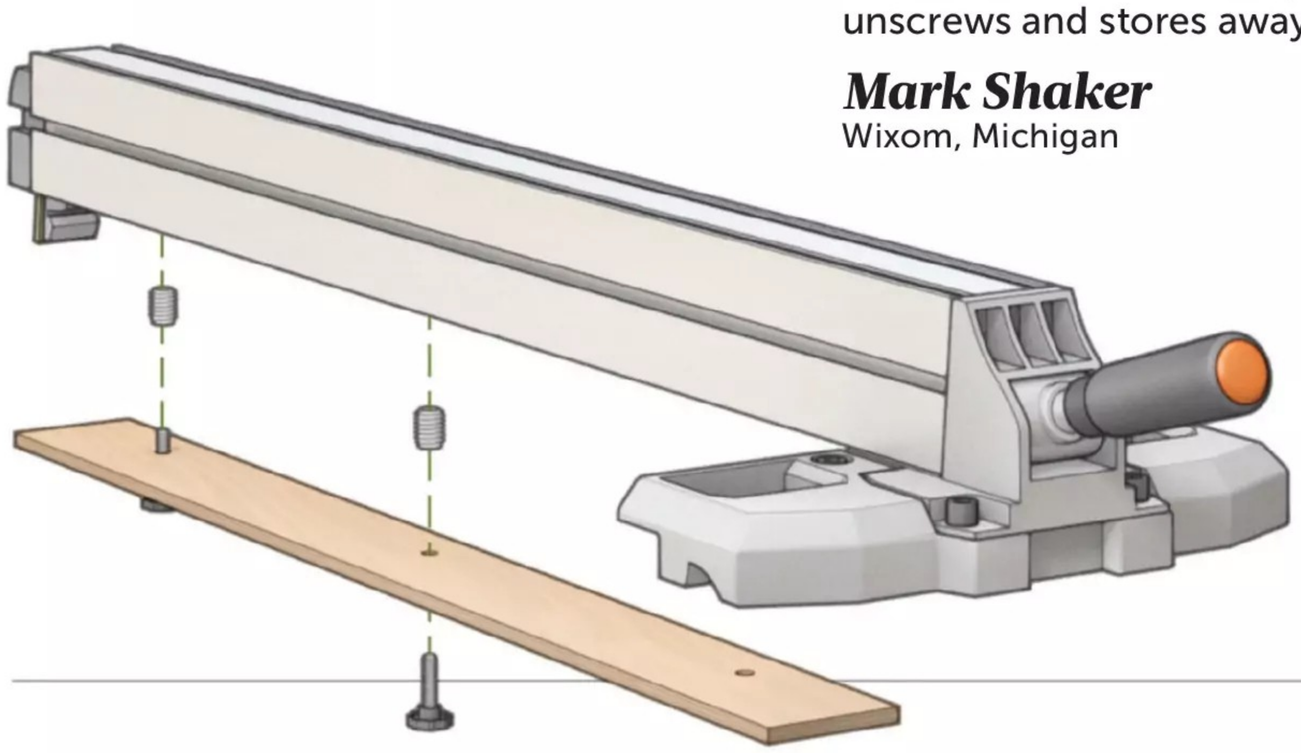


ON THE LEDGE

My tablesaw fence slides beyond the extension wing, which presented problems when cutting plastic laminate. Unsupported, the laminate would droop below the fence. I solved that problem by creating a ledge for the laminate to ride on.

First, I installed threaded inserts on the bottom of the rip fence. You may have to drill and tap the holes if your fence is metal. I use studded knobs to secure a ¼"-thick plywood strip that extends past the face of the fence to support the laminate. When not in use, the ledge easily unscrews and stores away.

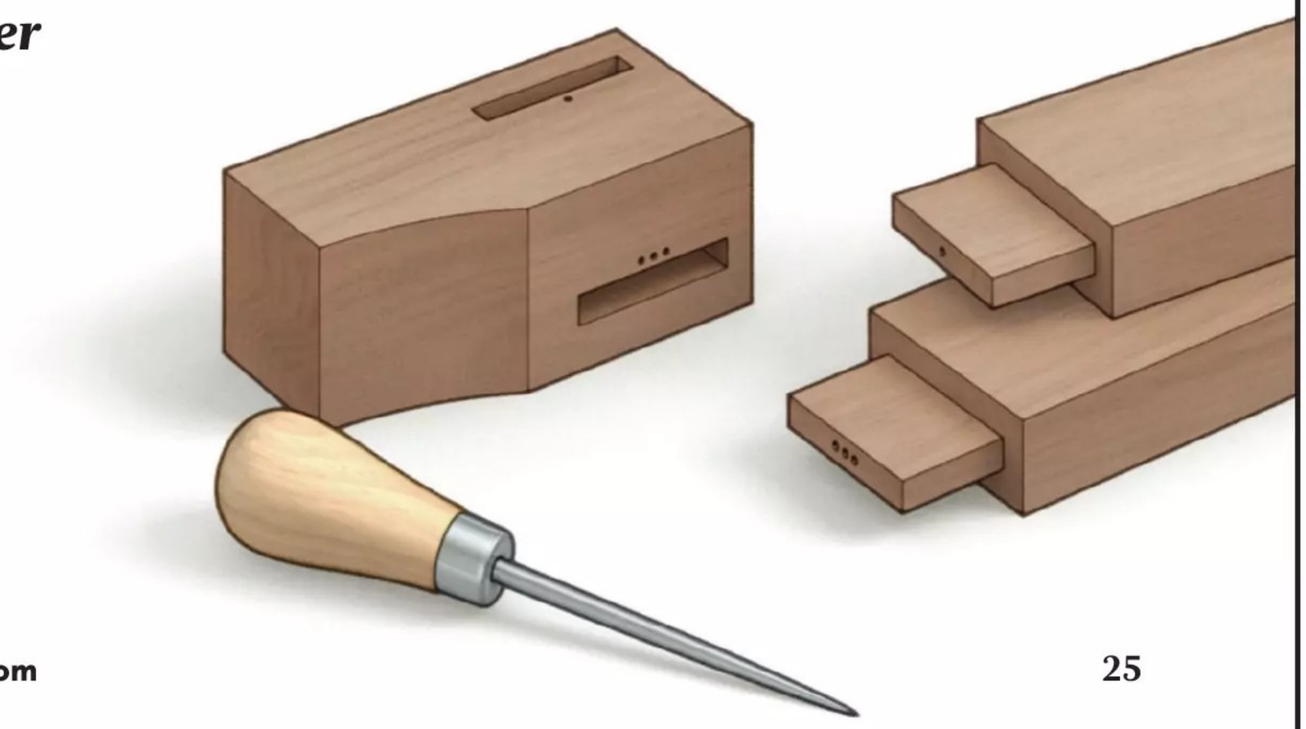
Mark Shaker
Wixom, Michigan



IT'S AWL YOU NEED

While building projects with a number of joints, hand-drawn reference marks can sometimes become unreadable from handling or sanding. Instead, I use an awl to punch small reference marks where they won't be seen after the pieces are glued together. The small punch marks survive sanding, so there is no confusion fitting parts together during assembly.

Scott Hunter
Chicago, Illinois



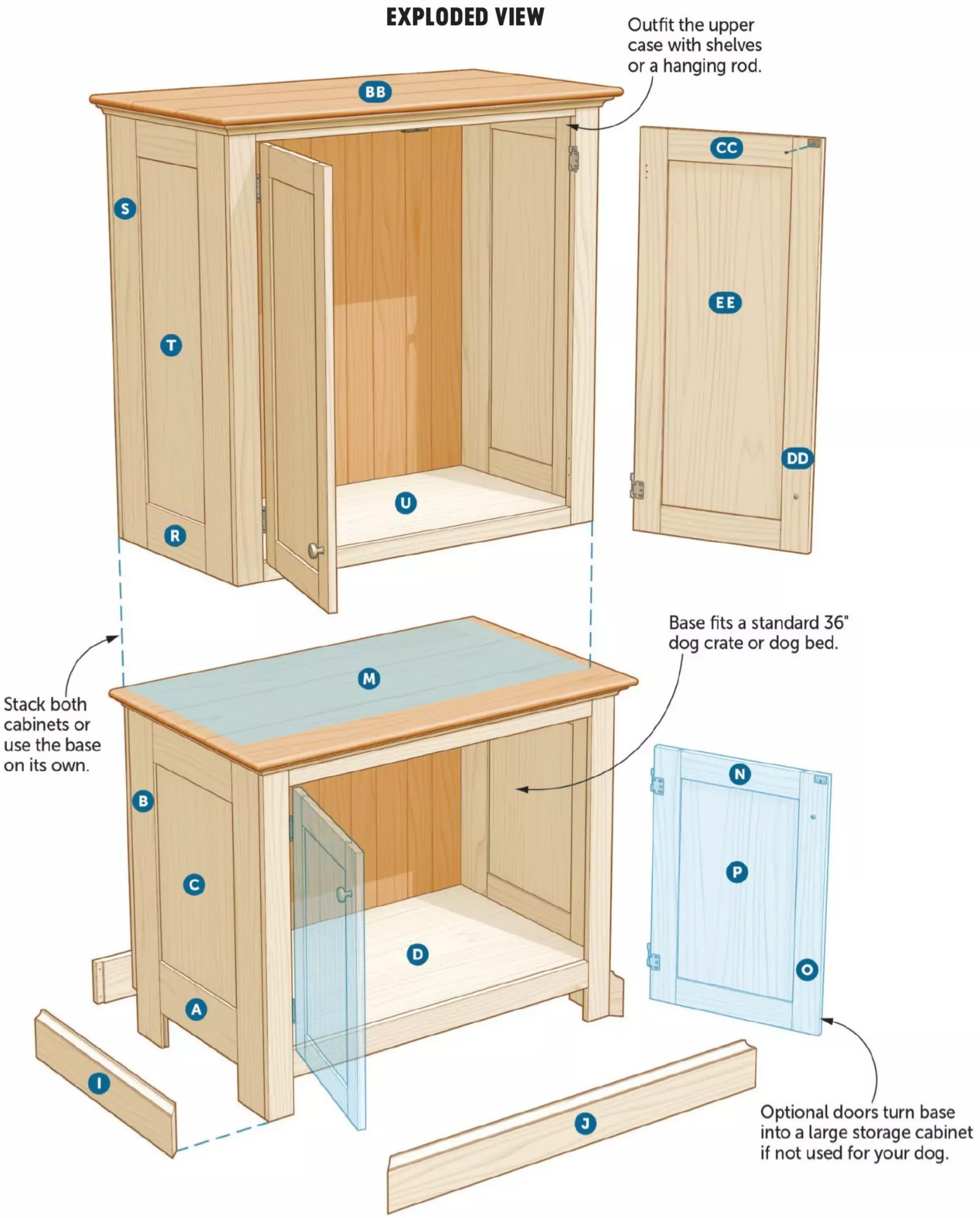
CANINE KENNEL CABINET

Provide a safe place for your pup plus storage for you. No doggo? No problem. Design options teach this cabinet new tricks.

WRITER: ZACH BROWN
DESIGNER: JOHN OLSON
BUILDER: BRIAN BERGSTROM

Disguised as a tasteful cabinet, this multifunction stacked unit fits a standard 36" dog crate or dog bed on the bottom with storage space on top. Build it as stacked lower and upper case, or build the lower case alone. If you don't need hound housing, add doors below to double your storage.

Shaker-style frame-and-panel construction lends a clean, timeless look, and the joinery is easier than you may think (with an investment in a few router bits). We used a combination of natural-wood and painted surfaces to allow endless style options without the expense of solid hardwood throughout.



PHOTOGRAPHER: CARSON DOWNING; **ILLUSTRATOR:** CHRISTOPHER MILLS

OVERALL DIMENSIONS
Lower cabinet: 44"W × 26⅞"D × 36"H
Upper cabinet: 44"W × 23⅛"D × 42"H
Both stacked: 44"W × 26⅞"D × 78"H

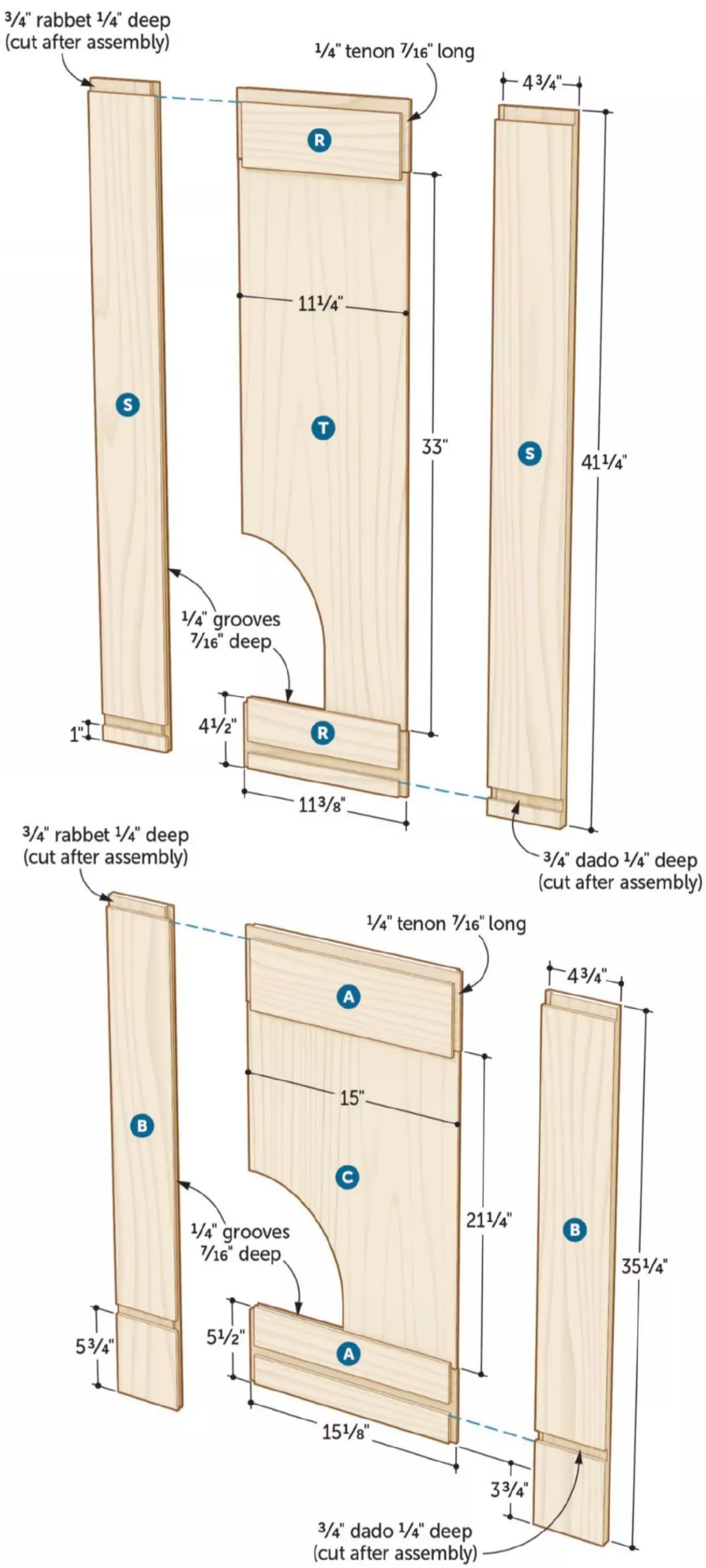
CREATE THE CASES

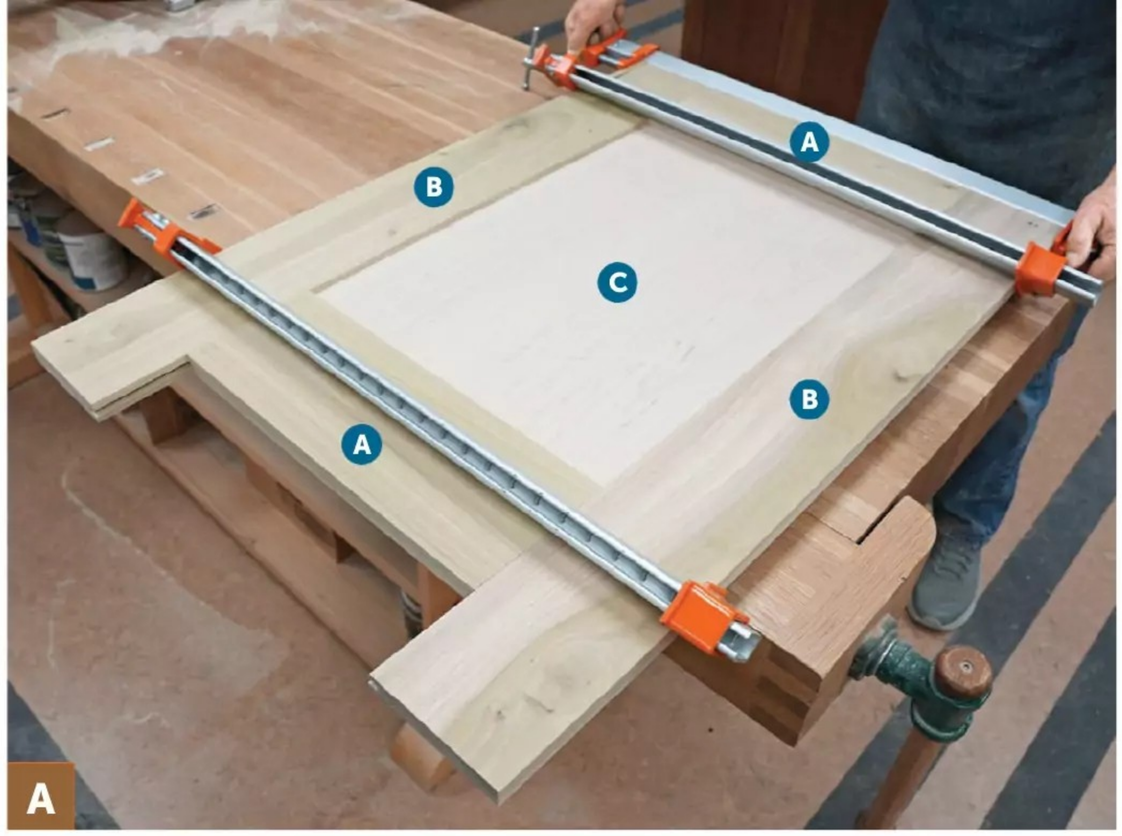
The fun begins at the router table, where a rail-and-stile router bit set makes easy work of shaping the case side frame joinery. For efficiency, we made the similarly constructed lower and upper cases at the same time. If you're building only the lower case (A–Q), ignore the part letters for the upper case (R–FF).

1 From ¾" stock, cut the lower and upper case side rails (A/R) and stiles (B/S) to size **[Drawing 1, Parts List]**. Follow the steps in *Rails and Stiles at the Router Table* on *page 34* to form the groove in the rails and stiles and the tenons on the rails **[Drawing 2]**.

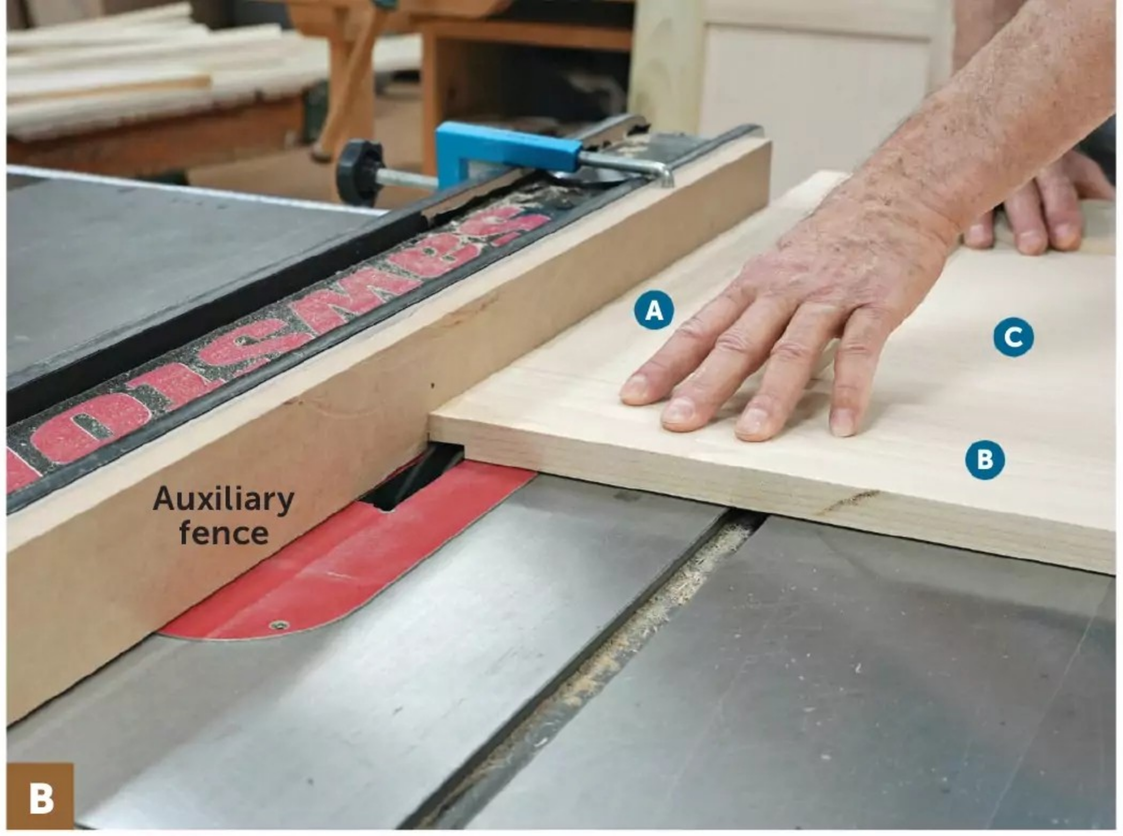
2 Cut the side panels (C/T) to size from ¼" plywood and finish-sand both faces. Apply glue to the rail tenons and clamp together the lower case (A–C) and upper case (R–T) side assemblies **[Photo A]**.

1 SIDE ASSEMBLIES





Clamp together each frame-and-panel side assembly, checking for square. On the lower case sides (*shown*), the stiles (B) extend beyond the lower rail (A) to form feet that will be covered with base trim.

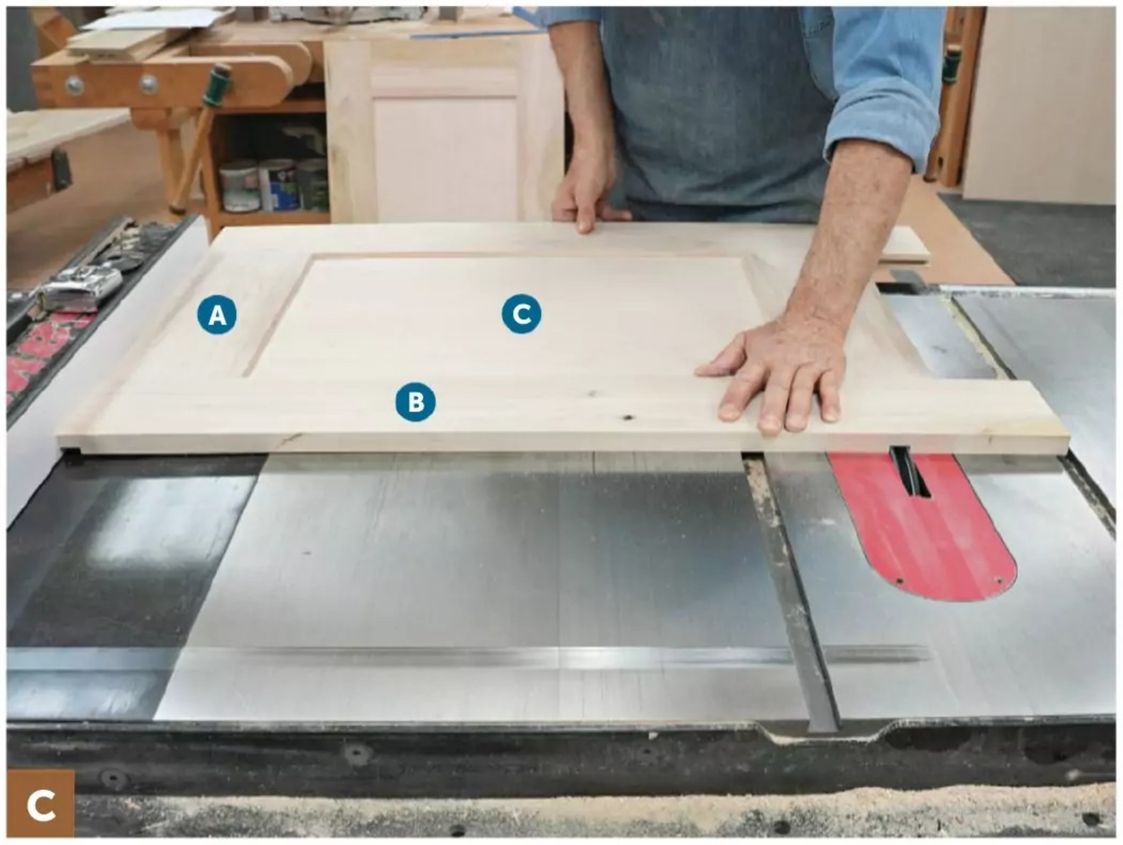


Attach an auxiliary fence to the tablesaw rip fence and position it to just touch the side of the blade. Use firm downward pressure as you rabbet the top end of each side.

TIP!

If your tablesaw lacks rip capacity to cut the lower case side dadoes, attach a temporary straightedge across the feet and cut the dado with the lower end against the rip fence.

3 Install a ¾" dado blade in your tablesaw, adjust the height to ¼", and rabbet the upper end of each side assembly **[Photo B]**. Remove the auxiliary fence and adjust the rip fence to cut the dado in the upper case sides and lower case sides **[Photo C]**.

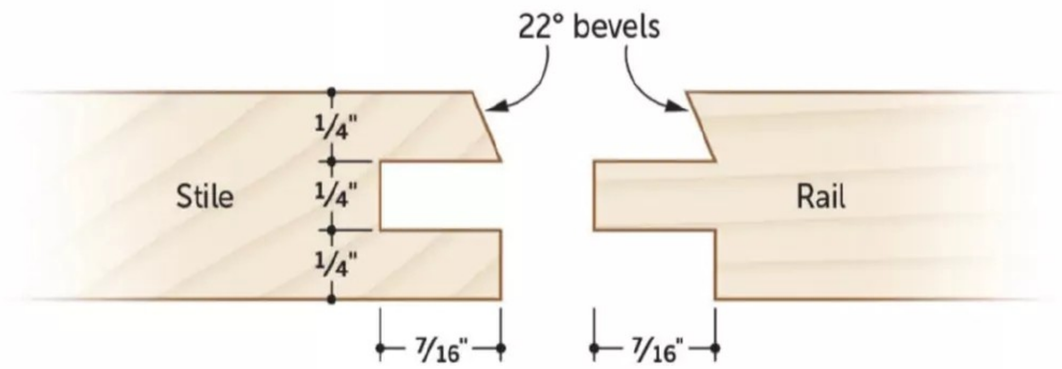


Cut the lower case side dadoes, taking care to press the top end tight against the fence to keep the workpiece from binding between the fence and the blade.

"SLIGHTLY BEVELED EDGES ON THE INSIDE OF THE FRAMES LEND SUBTLE FLAIR FOR A CLASSIC SHAKER LOOK."

-JOHN OLSON, DESIGN EDITOR

2 RAIL & STILE PROFILE

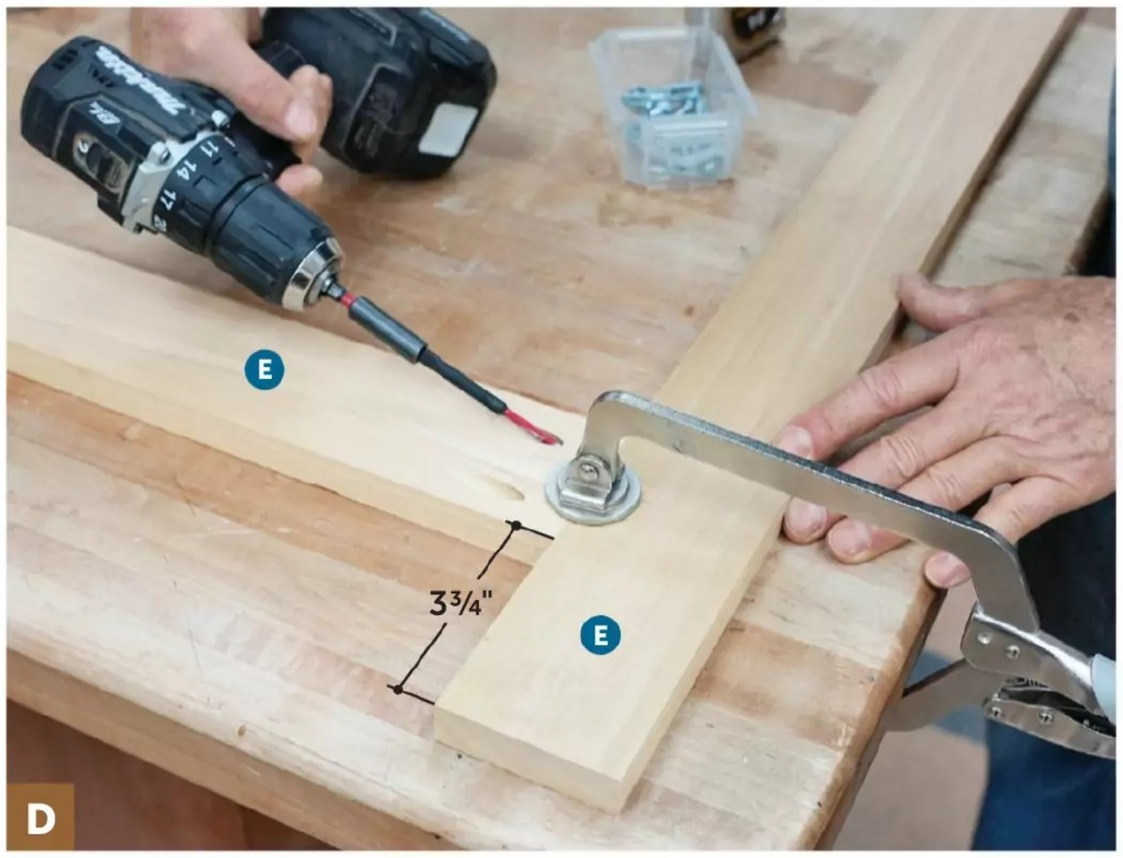


Note: To allow for seasonal movement of the solid-wood tops, drill mounting-screw holes at the back of the subtops and slots at the middle and front.

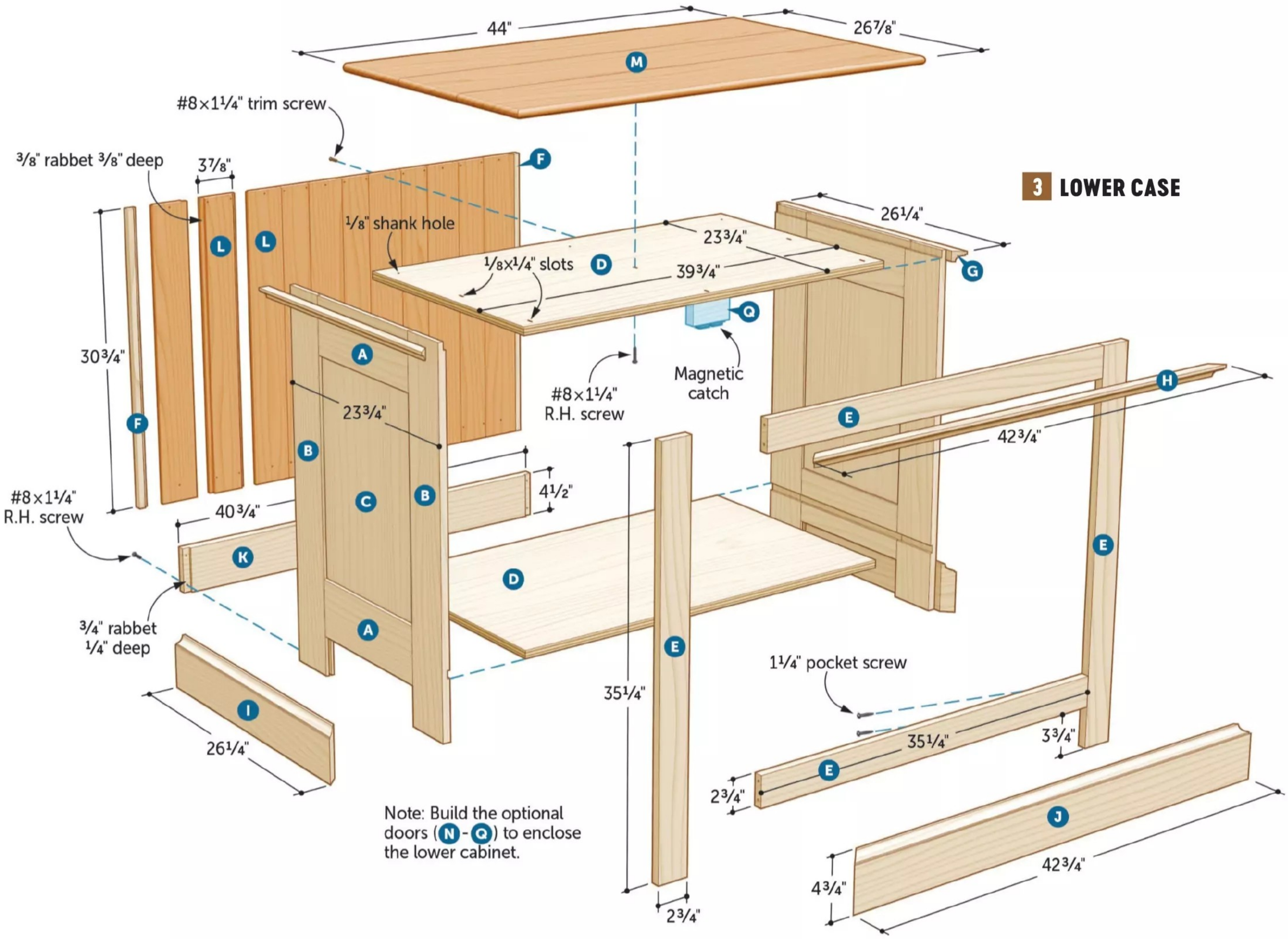
4 From ¾" plywood, cut the case bottoms and subtops (D/U) to size **[Drawings 3, 4]**. Apply glue to the case side dadoes and clamp a bottom between each pair of sides. Then apply glue to the rabbets and add the subtops, checking each case assembly for square.

5 Cut the face-frame rails and stiles (E, V, W) to size. Drill two pocket holes in the ends of each rail; then assemble the face frames **[Photo D]**. Glue and clamp the lower face-frame assembly (E) and upper face-frame assembly (V, W) to each case assembly, flush with the sides and top.

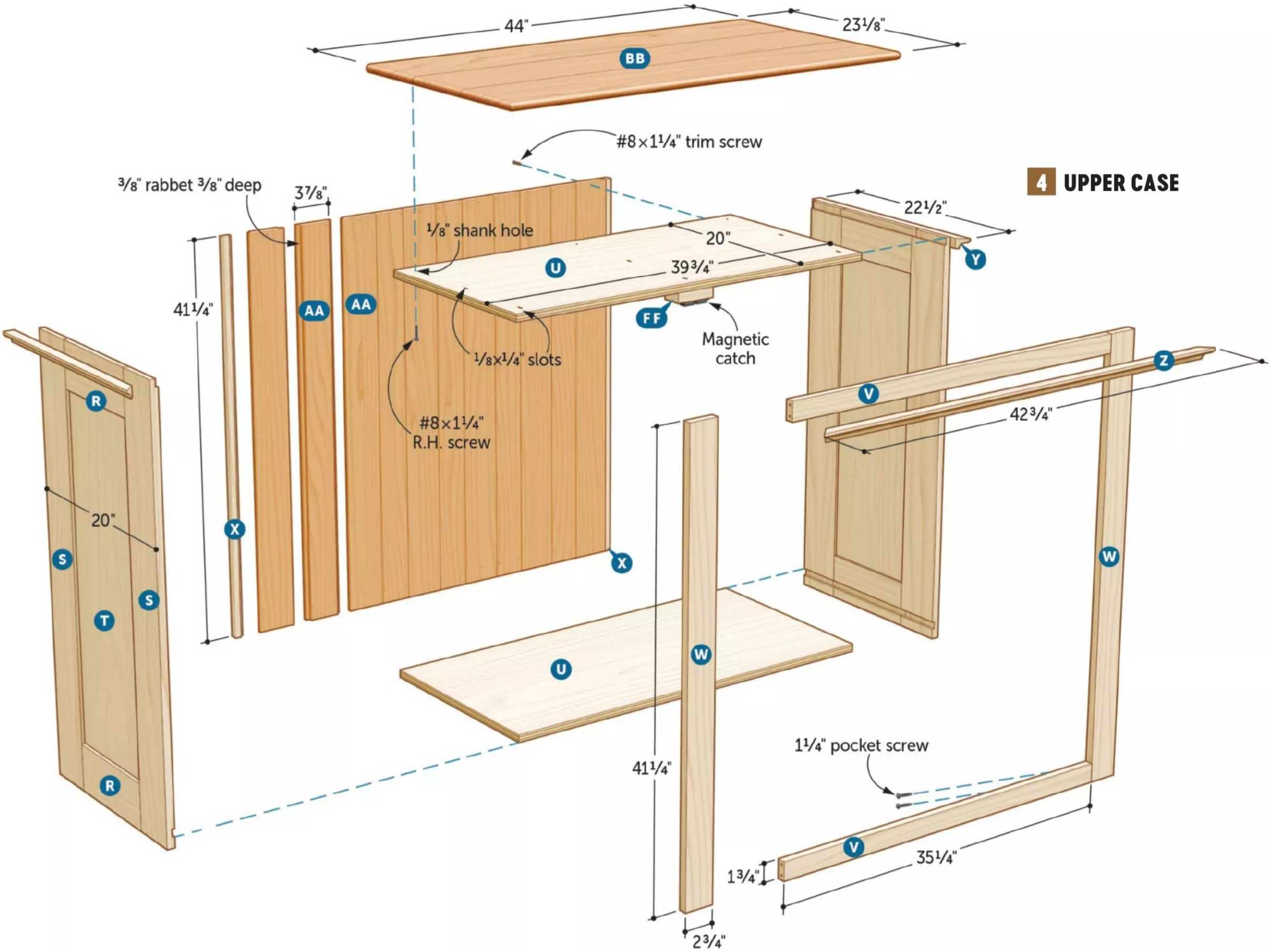
6 Cut the back cleats (F/X) to size and rabbet the inside edge **[Drawing 5]**. Glue and clamp them to the case assemblies, flush with the sides and top. The rabbeted cleats retain the back slats when you add them later, after finishing.



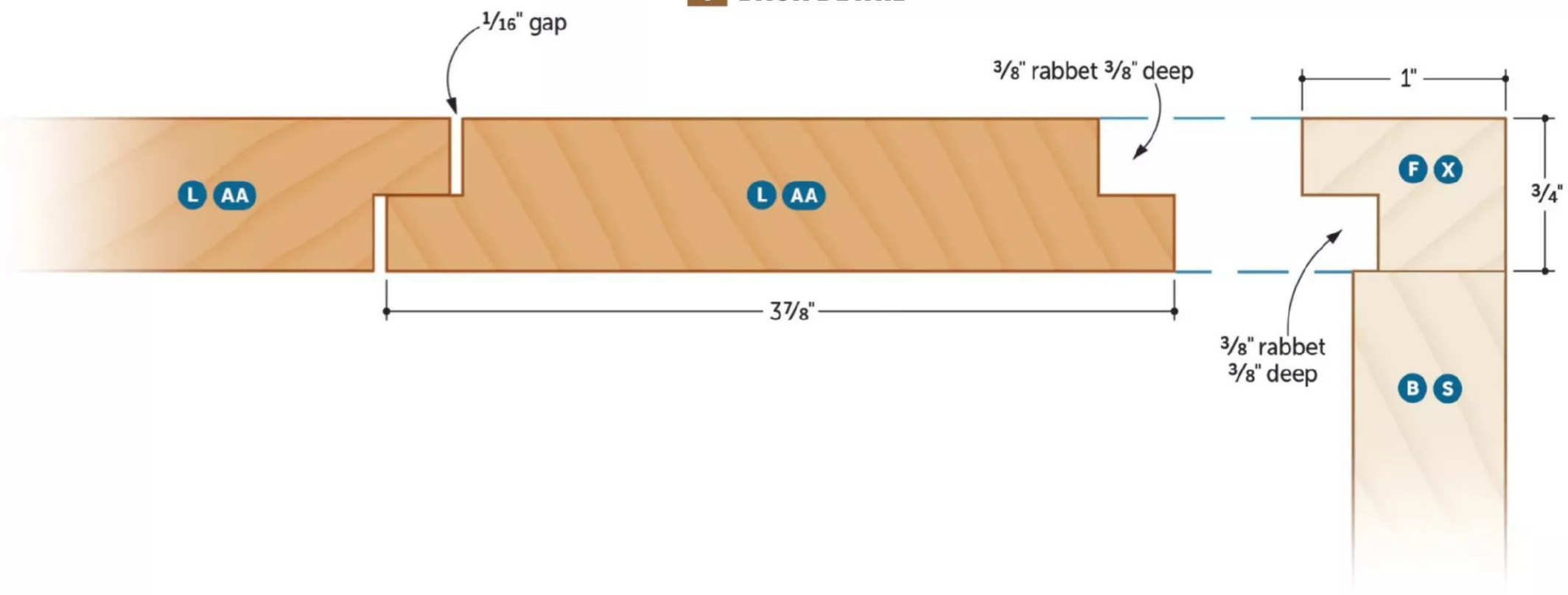
Apply glue to the mating surfaces and clamp the workpieces face-down to your benchtop to help keep the faces flush. Then, screw the face-frame rails to the stiles using 1¼" pocket screws.

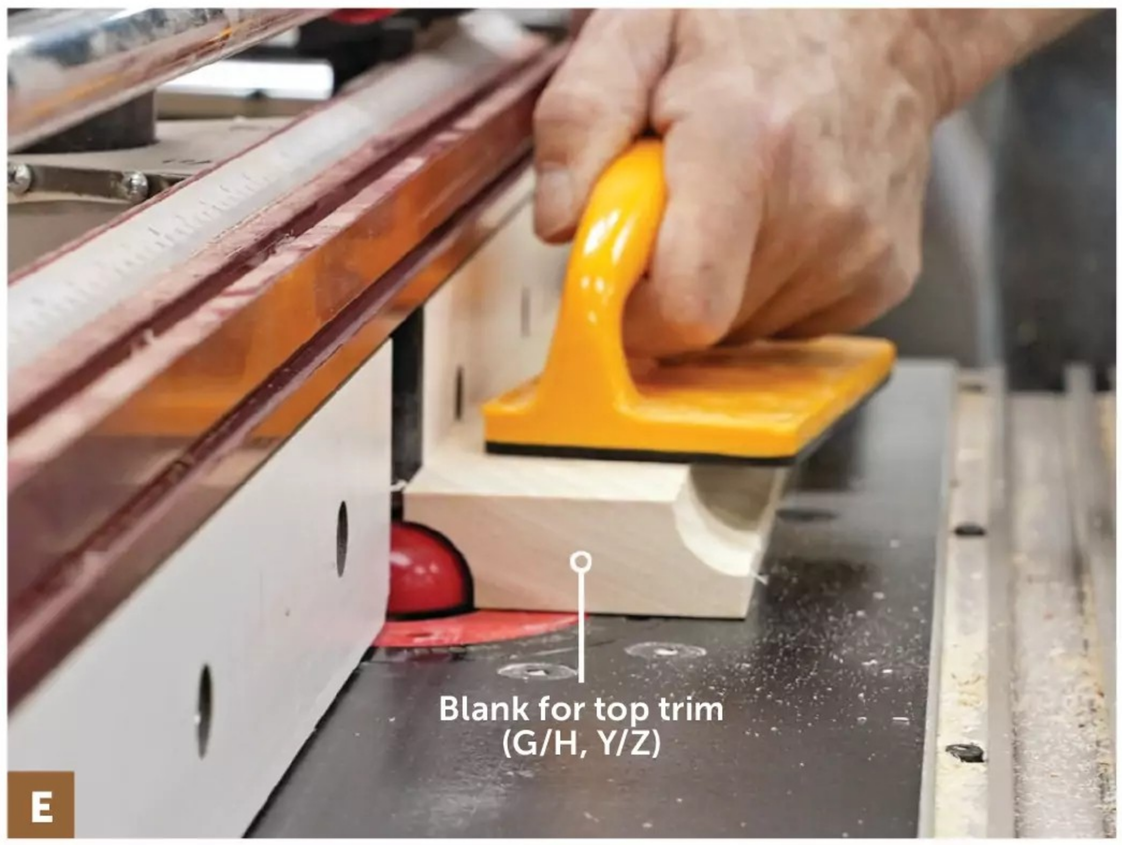


4 UPPER CASE

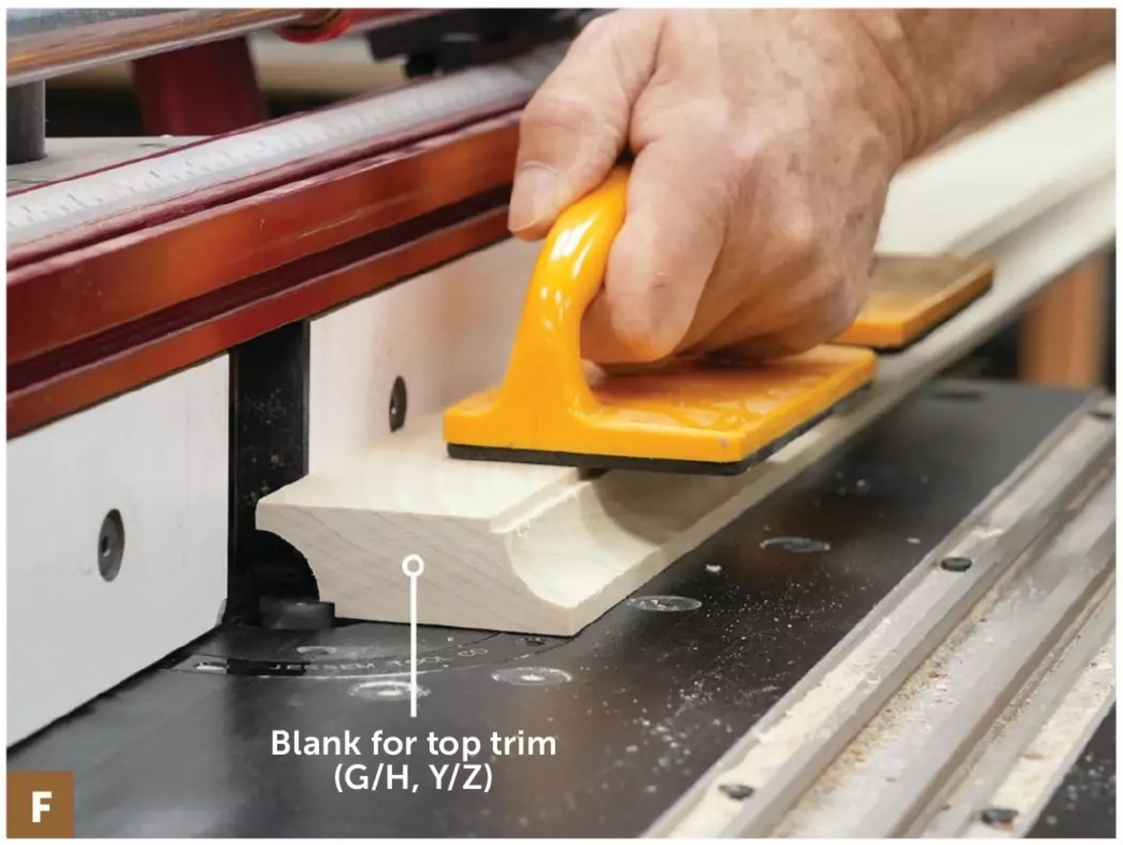


5 BACK DETAIL

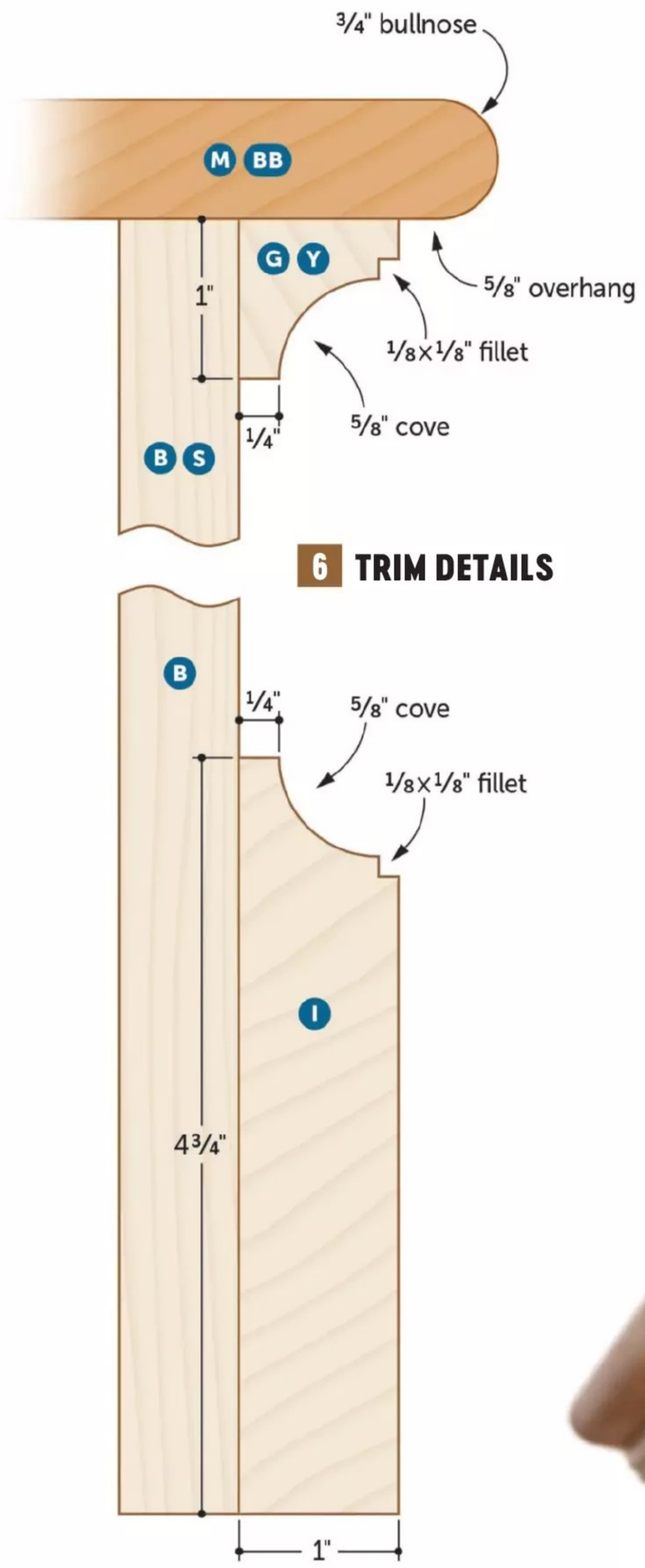




Install a 5/8" cove bit in your router table and adjust the height to 5/8". Align the fence with the bit's bearing and rout a cove on both edges of the 3"-wide blanks and one edge of each base trim workpiece (I, J).



Change the router bit to a 3/4" straight bit (or any straight bit larger than 1/8") and adjust the height to 1/8". Position the fence to rout a 1/8×1/8" fillet along the edge of each cove.



6 TRIM DETAILS

TACKLE THE TRIM AND TOPS

The upper and lower cabinets are both adorned with identical upper trim that features a 5/8" cove with a small 1/8" fillet. The lower cabinet also gets a wide base with the same profile **[Drawing 6]**.

1 To make the top trim, mill three 1"-thick blanks. You'll need a 1×3×30" blank for the lower trim sides (G), a 1×3×25" blank for the upper trim sides (Y), and a 1×3×45" blank to make both lower and upper trim fronts (H/Z). While you're at it, mill the lower case base trim (I, J) to thickness and width, but 4" longer than listed.

2 Create the profiles by first routing the coves on the trim workpieces **[Photo E]**. Repeat this process on one edge of the base blanks (I, J). Then, change bits to rout the fillet and complete the profile on the trim blanks **[Photo F]**, as well as the base blanks.

TIP!

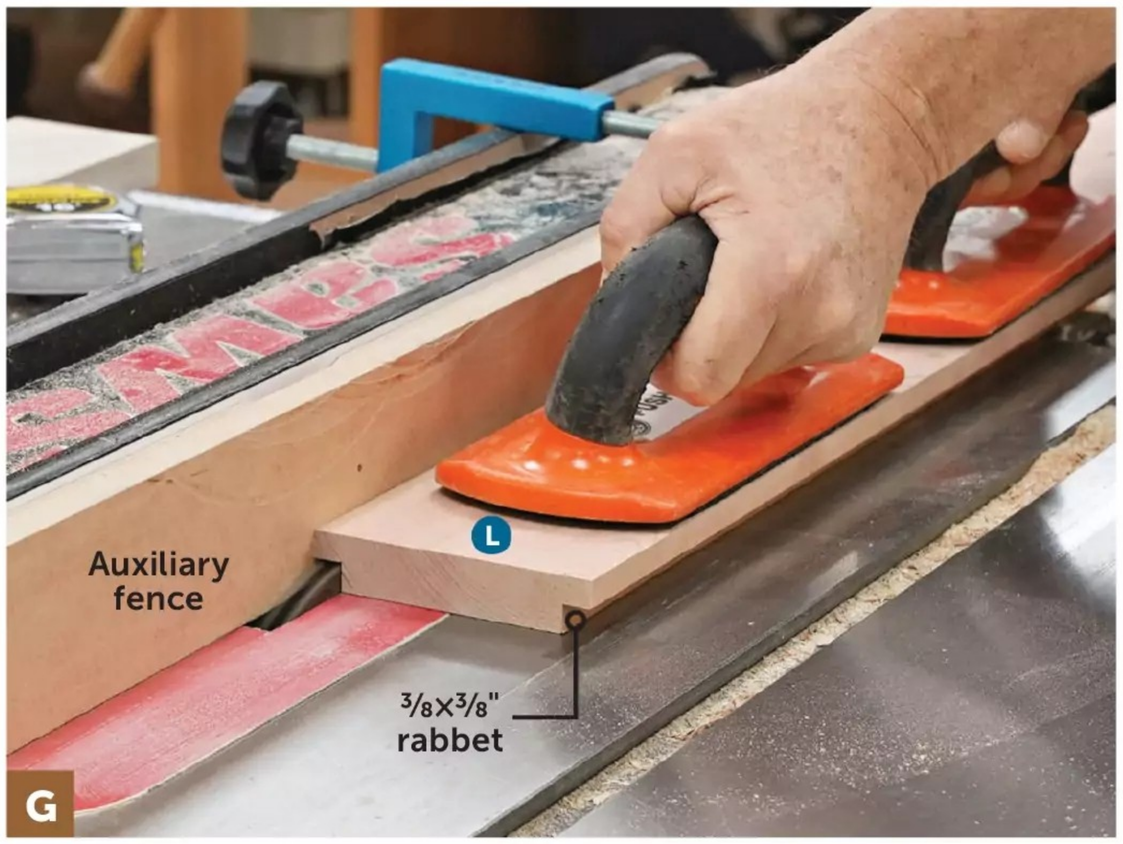
Use pin nails instead of clamps, to hold the trim in position while the glue dries.

3 From the 3" blanks, rip-cut the top trim (G/H, Y/Z) to width. Measure the front and sides of each case assembly and cut the trim to length to fit, miter-cutting the front corners **[Drawings 3, 4]**. Glue and clamp the top trim to the case assemblies, flush with the subtops (D, U).

4 Cut the lower base rear cleat (K) to size and rabbet both ends **[Drawing 3]**. Glue and screw the cleat to the rear side stiles (B), flush with the bottom ends. From the base blanks, cut the side (I) and front (J) base trim to fit the lower case assembly, bevel-cutting the front corners. Glue and clamp the base trim to the lower case.

5 Cut the back slats (L/AA) to size. To contrast with the painted cases, we made the slats from cherry. Install a ⅜" dado blade in your tablesaw and rabbet both edges of each slat **[Drawing 5, Photo G]**.

6 From ¾" cherry, glue up a panel for each top (M/BB) and cut them to length. Install a ⅜" round-over bit in your router table, align the fence with the bearing, and rout the front and sides of each top on the upper and lower faces to form the ¾" bullnose **[Drawing 6]**.



Attach an auxiliary fence to the rip fence and position it to just touch the blade. Adjust the blade height to ⅜" and rabbet the rear face of six slats and the front face of the remaining five for each cabinet.

DOORS AND FINISH

If you intend to leave the lower cabinet open for Princess Peanut Butter, ignore the part letters for the lower doors (N-Q) in the following steps.

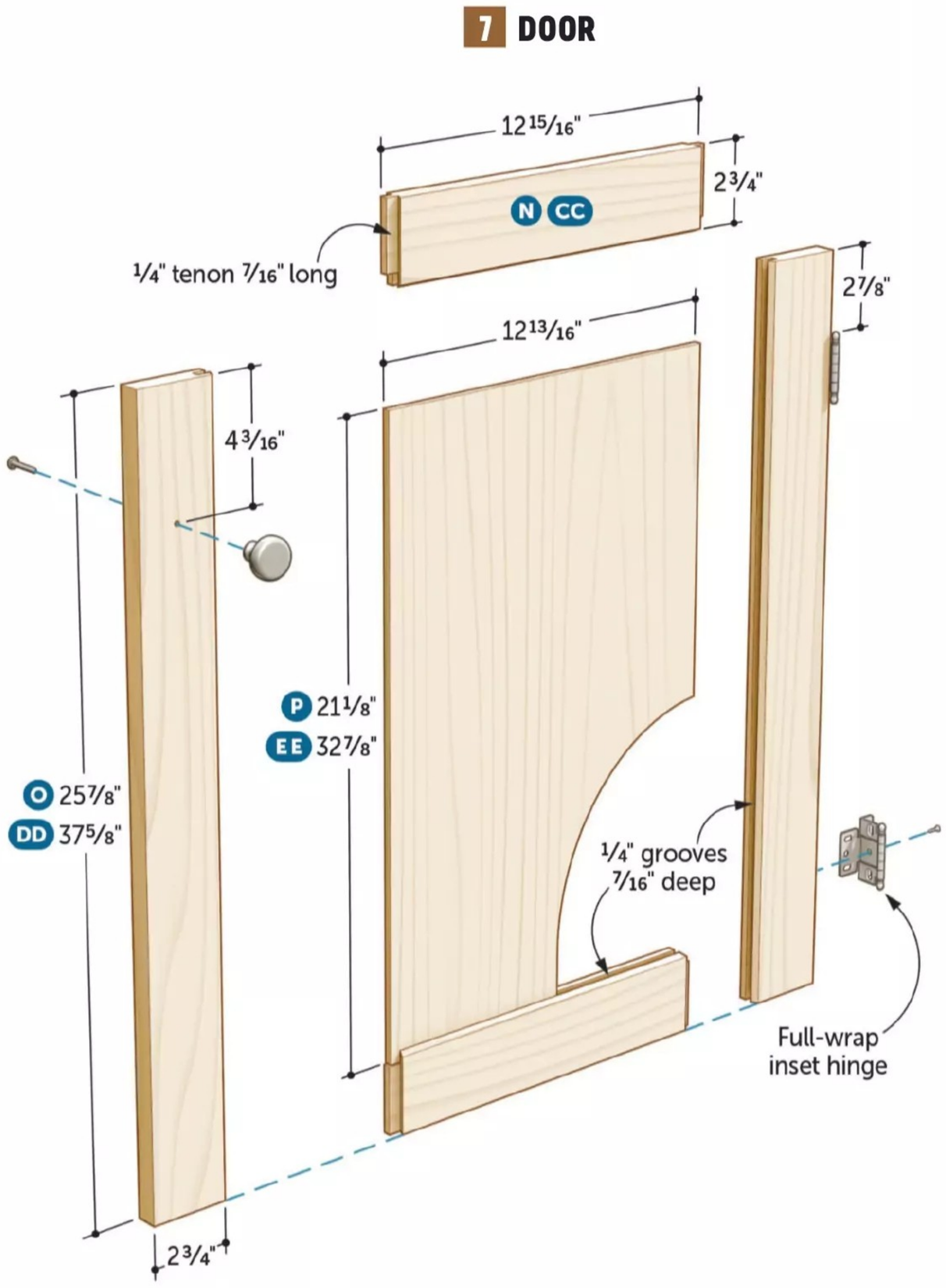
1 Cut the door rails (N/CC) and stiles (O, DD) to size. Using the same rail-and-stile router bit set you used for the side frame joinery, rout the groove in the door rails and stiles and the tenons on the rail ends **[Drawing 7]**.

2 From ¼" plywood, cut the door panels (P, EE) to size and finish-sand both faces. Apply glue to the rail tenons and clamp together the lower cabinet doors (N-P) and upper cabinet doors (CC-EE), checking each for square.

3 Cut the door catch spacers (Q/FF) to size and glue and clamp them to the back of the upper face frame rail on each cabinet, centered and flush with the bottom edge **[Drawings 3, 4]**. (Face-glue the lower cabinet spacer to the back of the rail but edge-glue the upper cabinet spacer.)

4 Attach the doors to the cases using full-wrap inset hinges **[Drawing 7, Sources]**. Install the magnetic catches to the doors and catch spacers, and attach a pull to each door. Then remove the doors and hardware to prepare for finishing.

Learn more about fitting and installing inset doors.
woodmagazine.com/fitinsetdoors



RAILS AND STILES AT THE ROUTER TABLE

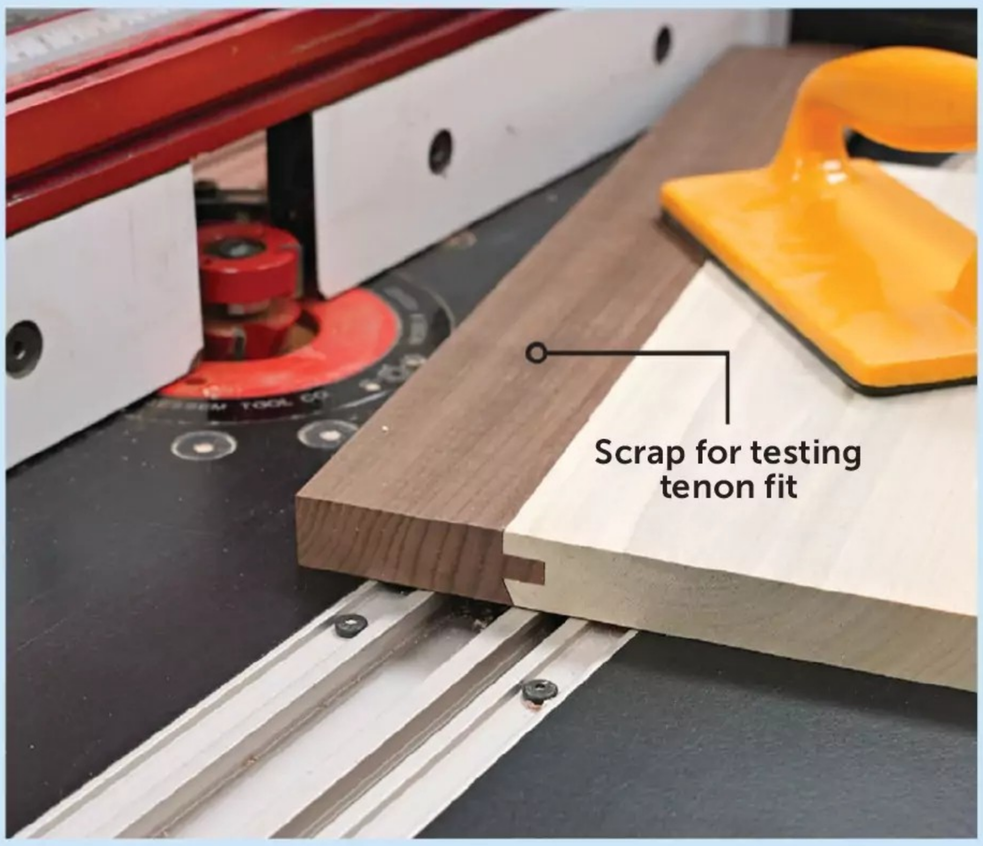
With your router table and a cope-and-stick bit set, you can bring personality beyond square edges to surround your panels with style.

Simple rail-and-stile assemblies can be made on the tablesaw by forming grooves and stub tenons, but adding decorative profiles changes things up. Router bit sets provide an easy way to make rail-and-stile joinery that includes profiled edges.

The stile (or sticking) bit cuts the groove for the center panel along with a decorative profile on the inside edge of the stiles and rails. The rail (or coping) bit forms the tenon with a mating profile in the ends of the rails. For this project, we chose a Shaker profile, which adds a subtle bevel.

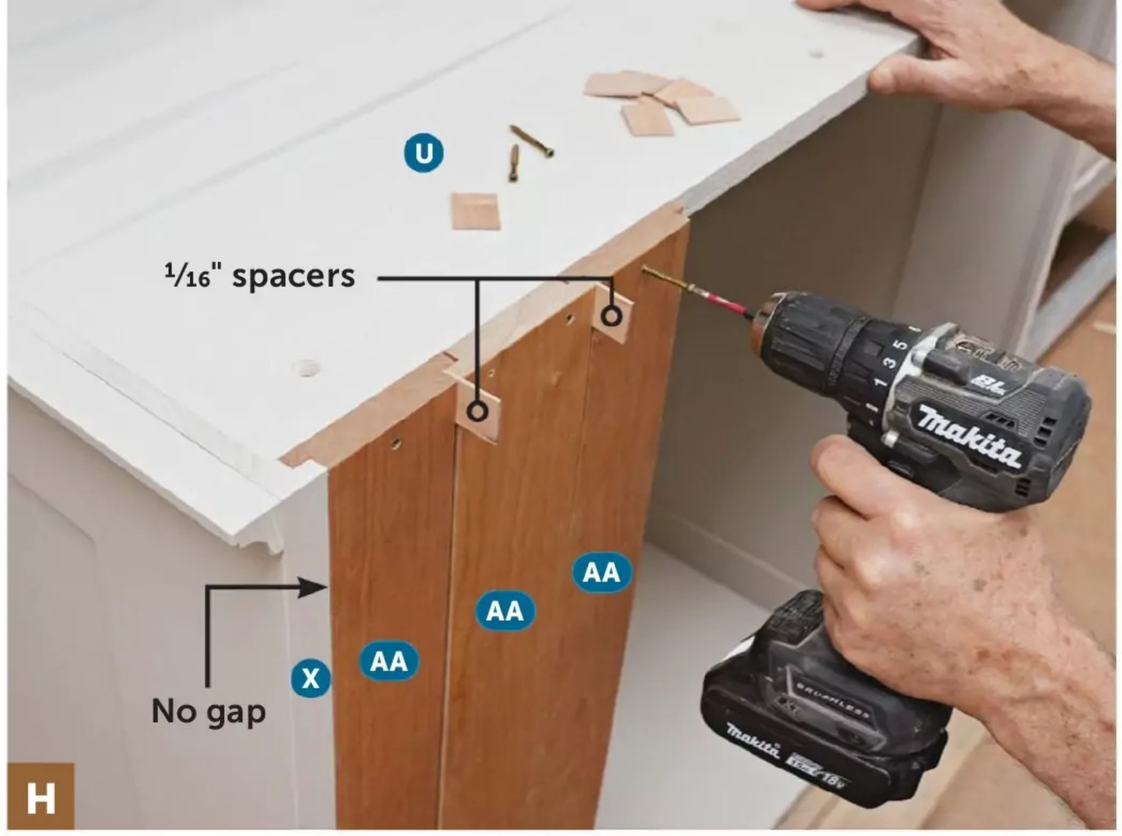
The key to success is precisely matching the cutting heights and depths of both bits. To make the case and door joinery, install the stile bit and rout a groove along one edge of each rail and stile (*right*). Install the rail bit and use a piece of scrap the same thickness as your rails and stiles to dial in the bit height (*below left*). Finally, use the same scrap as a backer block when routing the tenons on the ends of each rail (*below right*).

Adjust the bit height and fence to cut a centered groove, 7/16" deep, in each rail and stile.



Rout the coped tenon on a piece of scrap, adjusting the bit height and fence until you have a good fit in the groove and the faces are flush.

Rout the tenon on each end of the rail using the test scrap as a backer, mating the profiles for routing one end (above), then flipping it to back the square edge for the other.



Screw on the first back slat (L/AA) with a tight fit in the back cleat (F/X) rabbet. Then, use 1/16" spacers to create a gap between each one, alternating slats with front-facing and rear-facing rabbets.

5 Finish-sand the case assemblies, doors, tops, and back slats; then apply a finish. We sprayed on three coats of matte lacquer on the tops and back slats, and painted the case assemblies and doors with a primer coat followed by two coats of Sherwin-Williams Accessible Beige.

6 Once the finish dries, screw on the back slats **[Photo H]**, then the tops, flush with the slats and centered side-to-side **[Exploded View, Drawing 3]**. Reinstall the doors and hardware and stack the cabinets in place. Place your kennel in the cabinet and let your dog (and your craftsmanship) have its day.

PARTS LIST

PART		FINISHED SIZE T	W	L	Matl.	Qty.
LOWER CASE						
A	SIDE RAILS	3/4"	5 1/2"	15 1/8"	P	4
B	SIDE STILES	3/4"	4 3/4"	35 1/4"	P	4
C	SIDE PANELS	1/4"	15"	21 1/4"	PP	2
D	BOTTOM/SUBTOP	3/4"	23 3/4"	39 3/4"	PP	2
E	FACE FRAME RAILS/STILES	3/4"	2 3/4"	35 1/4"	P	4
F	LOWER BACK CLEATS	3/4"	1"	30 3/4"	P	2
G*	LOWER TRIM SIDES	1"	1"	26 1/4"	P	2
H*	LOWER TRIM FRONT	1"	1"	42 3/4"	P	1
I*	BASE SIDES	1"	4 3/4"	26 1/4"	P	2
J*	BASE FRONT	1"	4 3/4"	42 3/4"	P	1
K	REAR CLEAT	1"	4 1/2"	40 3/4"	P	1
L	LOWER BACK SLATS	3/4"	3 7/8"	30 3/4"	C	11
M	TOP	3/4"	26 7/8"	44"	EGC	1
N	DOOR RAILS	3/4"	2 3/4"	12 15/16"	P	4
O	DOOR STILES	3/4"	2 3/4"	25 7/8"	P	4
P	DOOR PANELS	1/4"	12 13/16"	21 1/8"	PP	2
Q	DOOR CATCH SPACER	1"	2"	4"	P	1
UPPER CASE						
R	SIDE RAILS	3/4"	4 1/2"	11 3/8"	P	4
S	SIDE STILES	3/4"	4 3/4"	41 1/4"	P	4
T	SIDE PANELS	1/4"	11 1/4"	33"	PP	2
U	BOTTOM/SUBTOP	3/4"	20"	39 3/4"	PP	2
V	FACE FRAME RAILS	3/4"	1 3/4"	35 1/4"	P	2
W	FACE FRAME STILES	3/4"	2 3/4"	41 1/4"	P	2
X	UPPER BACK CLEATS	3/4"	1"	41 1/4"	P	2
Y*	UPPER TRIM SIDES	1"	1"	22 1/2"	P	2
Z*	UPPER TRIM FRONT	1"	1"	42 3/4"	P	1
AA	UPPER BACK SLATS	3/4"	3 7/8"	41 1/4"	C	11
BB	TOP	3/4"	23 1/8"	44"	EGC	1
CC	DOOR RAILS	3/4"	2 3/4"	12 15/16"	P	4
DD	DOOR STILES	3/4"	2 3/4"	37 5/8"	P	4
EE	DOOR PANELS	1/4"	12 13/16"	32 7/8"	PP	2
FF	DOOR CATCH SPACER	1"	2"	4"	P	1

*Parts initially cut oversize. See the instructions.

MATERIALS KEY: P–poplar, PP–poplar plywood, C–cherry, EGC–edge-glued cherry.
SUPPLIES: #8x1 1/4" roundhead screws, #8x1 1/4" trim screws, 1 1/4" pocket screws.
BLADE AND BITS: Tablesaw dado-blade set, 5/8" cove router bit, 3/4" straight router bit, 3/8" round-over router bit.
SOURCES: Full-wrap inset hinges satin chrome (8) no. 01H3082, $7 each; 1 1/4" satin nickel knobs (4) no. 02A2094, $9, leevalley.com; 15-lb double magnetic catches (2) no. 50621-R, $2, hardwareresources.com; Freud Shaker rail and stile set no. 99-762, $140, freudtools.com.
PROJECT COST: It cost us about $1,200 to build this project. Your cost will vary by region and source.

CUTTING DIAGRAM

We purchased 46 board feet of 4/4 poplar, 16 board feet of 5/4 poplar, and 60 board feet of 4/4 cherry. Before cutting parts to size, we planed them to the thicknesses shown in these example boards.

¾x5½x96" Poplar

¾x5½x96" Poplar (2 needed)

¾x3½x96" Poplar (2 needed)

1x3½x96" Poplar

1x5½x96" Poplar

1x5½x96" Poplar

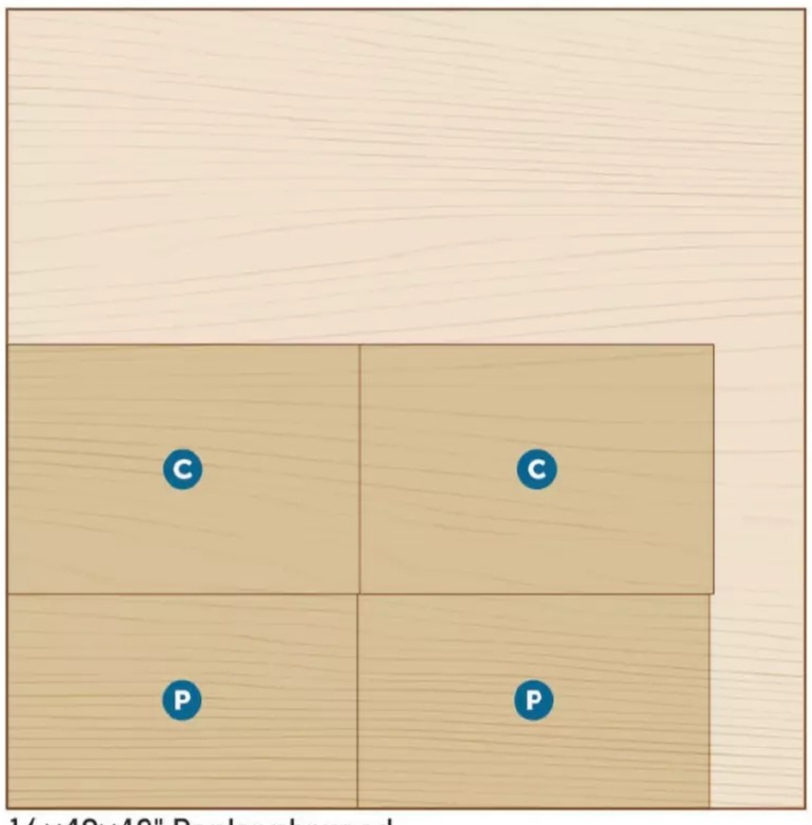
¾x5½x96" Cherry (3 needed)

¾x5½x96" Cherry

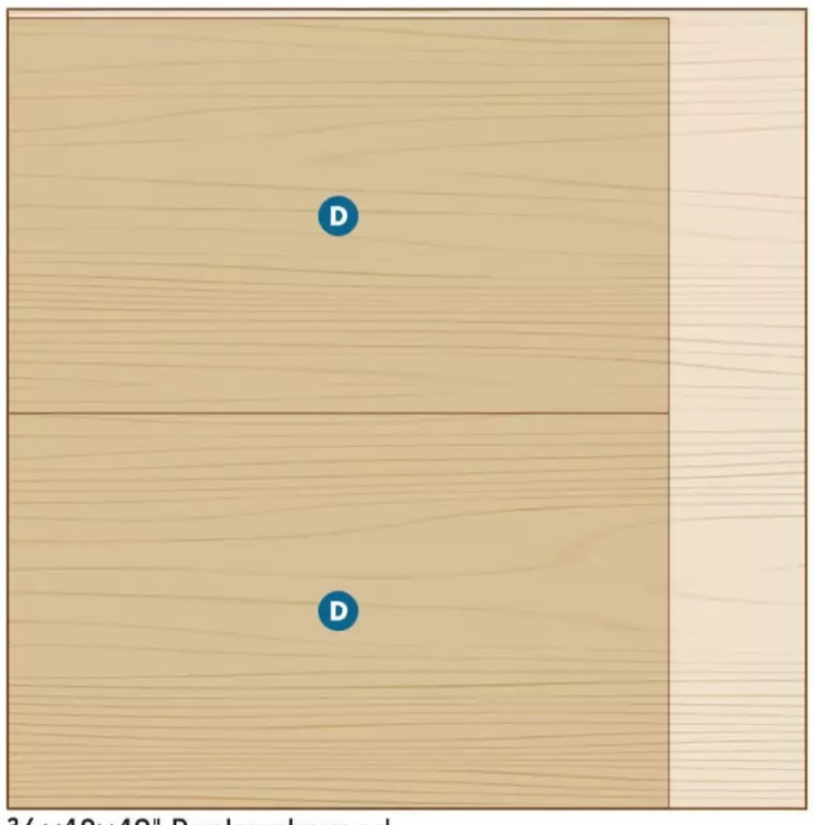
¾x9¼x96" Cherry

¾x9¼x48" Cherry

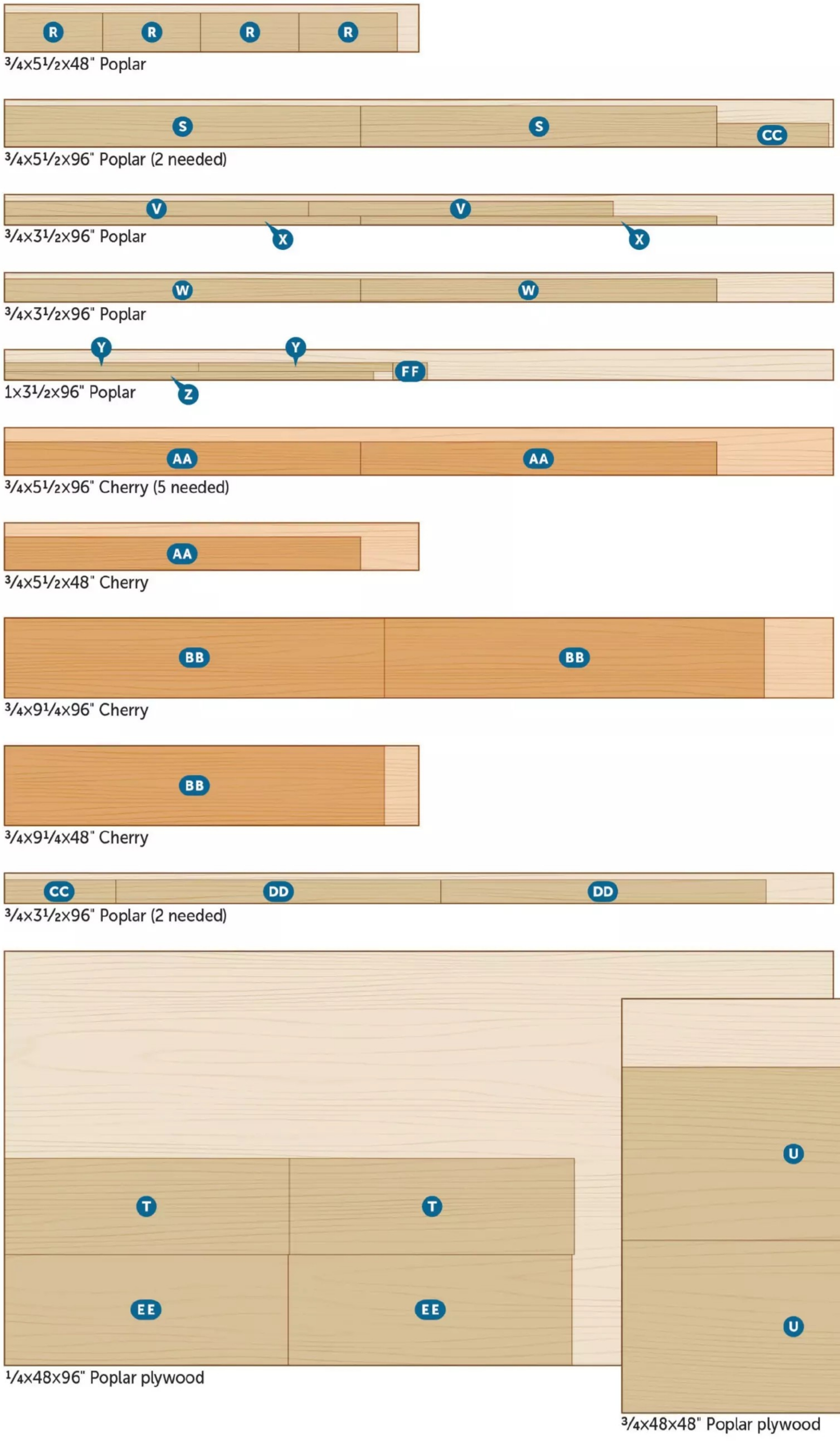
¾x3½x96" Poplar (2 needed)



¼x48x48" Poplar plywood



¾x48x48" Poplar plywood


R
R
R
R
¾x5½x48" Poplar
S
S
CC
¾x5½x96" Poplar (2 needed)
V
V
X
X
¾x3½x96" Poplar
W
W
¾x3½x96" Poplar
Y
Y
FF
Z
1x3½x96" Poplar
AA
AA
¾x5½x48" Cherry (5 needed)
AA
¾x5½x48" Cherry
BB
BB
¾x9¼x96" Cherry
BB
¾x9¼x48" Cherry
CC
DD
DD
¾x3½x96" Poplar (2 needed)
T
T
EE
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¼x48x96" Poplar plywood
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U
¾x48x48" Poplar plywood

GLASS-TOP TABLE TRIO

Traditional mortise-and-tenon joinery gets a twist in this contemporary table set.

WRITER: CRAIG RUEGSEGGER
DESIGNER/BUILDER: KEVIN BOYLE
PHOTOGRAPHER: CARSON DOWNING
ILLUSTRATOR: CHRISTOPHER MILLS

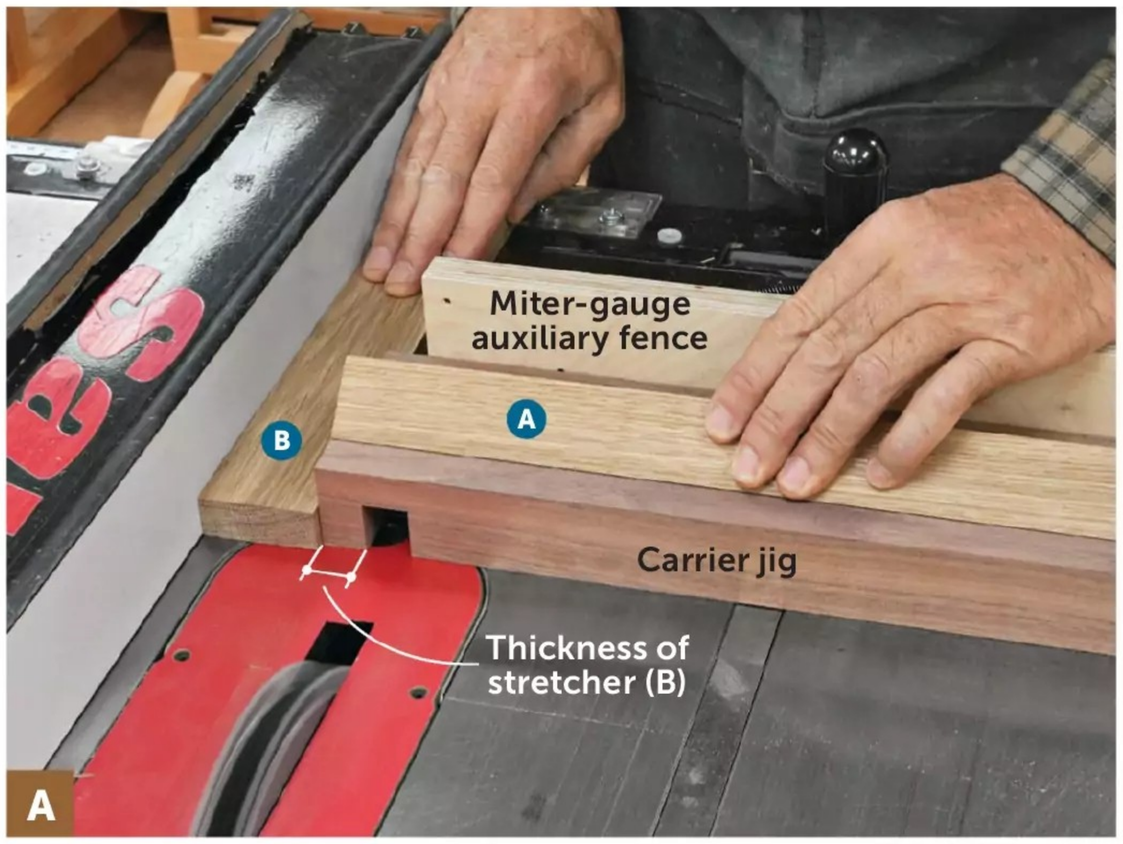
OVERALL DIMENSIONS
Sofa Table: 48"W x 17"D x 32"H
Coffee Table: 42"W x 21"D x 16"H
End Table: 24"W x 19"D x 22"H

Rounded legs with aprons mortised into the 90° corners may look like a head-scratcher for joinery. But a simple cradle that works at both the tablesaw and mortiser makes cutting the mortises and the notches for the aprons easy.

The tables share identical construction and joinery; only the lengths of parts change. If you're building more than one table, speed construction by machining like parts for all tables at the same time to reduce tool setups.

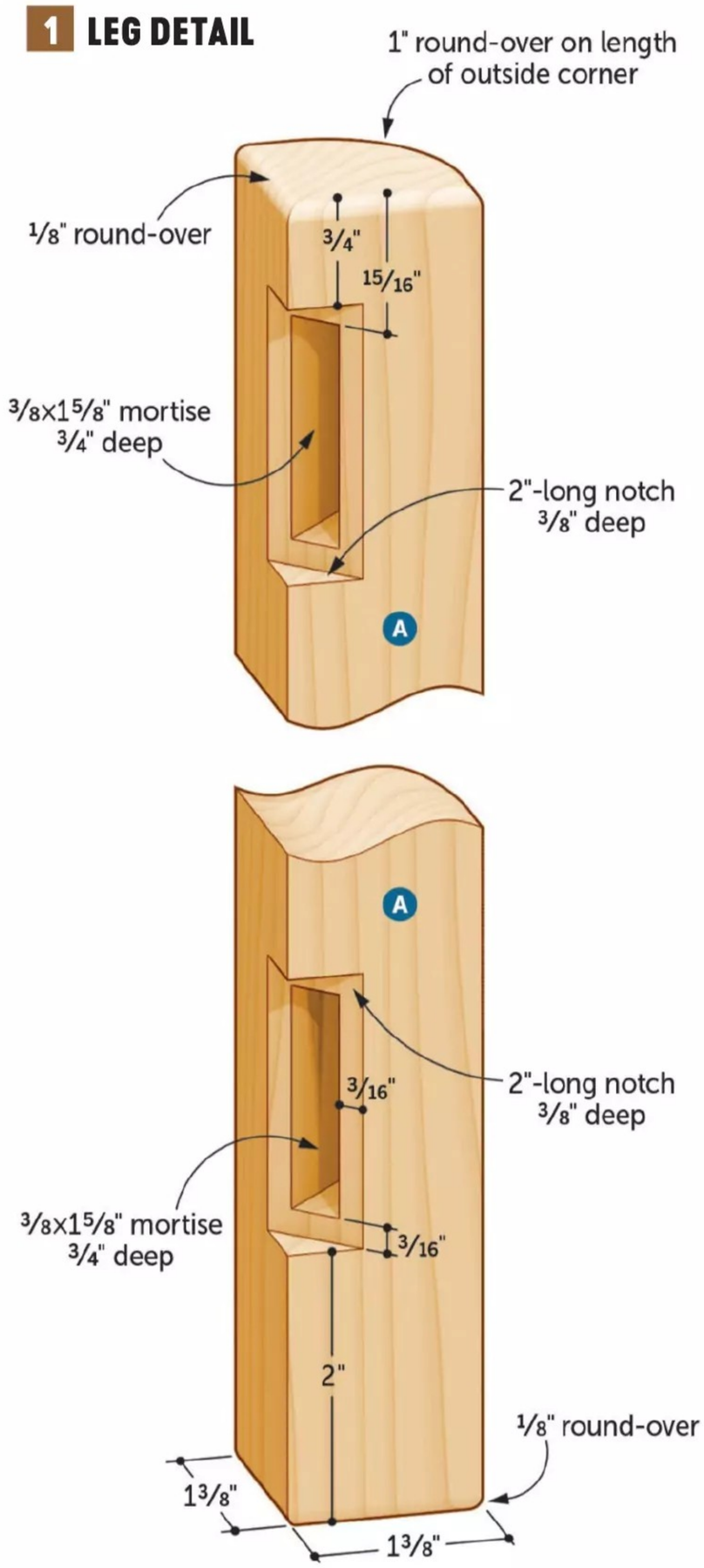
CORNER THE LEG JOINERY

1. Plane 8/4 stock to 1⅜" for the legs (A) and cut them to size **[Parts List]**.
2. Cut the end stretchers (B) and front/back stretchers (C) to size.



Position the rip fence against a stretcher (B) resting against the carrier jig. Place a leg (A) in the carrier and butt the end against the stretcher. Without moving the stretcher, make a pass over the blade.

1 LEG DETAIL



Turn the stretcher on edge, butt the leg against it, and make another pass to cut the other end of the notch. Make additional passes to remove the waste between the cuts.

Install a ⅜" chisel in your mortiser (or a ⅜" Forstner bit in your drill press). Position the carrier jig under the bit and drill the mortises in each leg (A). Clean up the mortises with a chisel.

3 To help cut the joinery on the legs, mill a piece of 1½×4×18" stock to serve as a carrier jig. Tilt your tablesaw blade to 45° and make intersecting bevel rips to create a centered 90° cradle, 1" deep, with a trough at the bottom to prevent chips from collecting. Refer to **Photo C**.

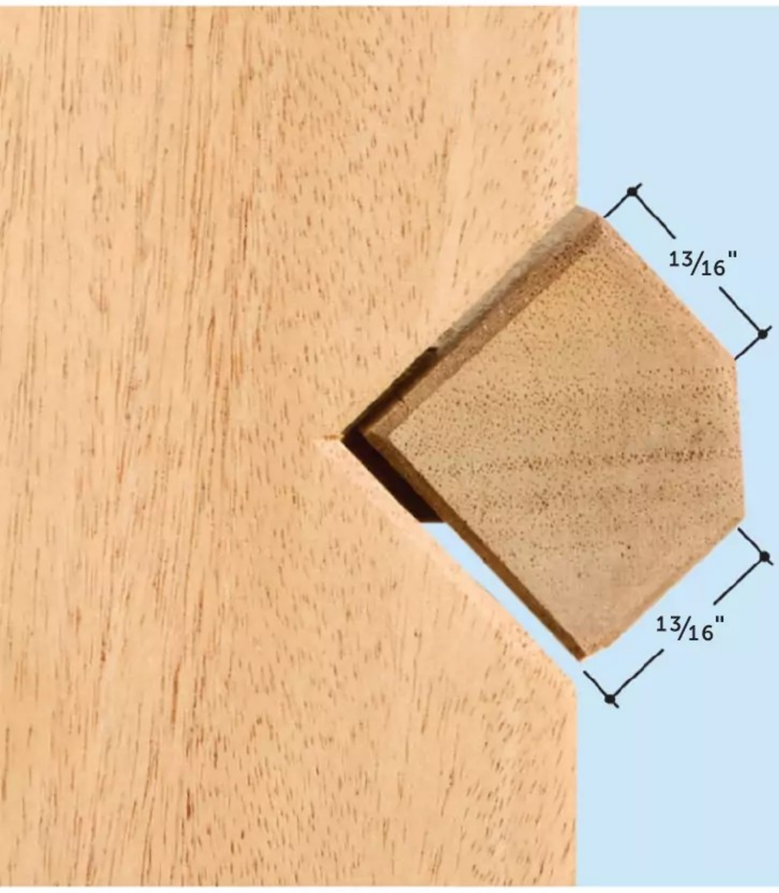
4 Install a ¾" dado stack in your tablesaw. Using a stretcher (B) as a gauge, attach the carrier jig to your miter gauge so the carrier extends to the right of the blade the thickness of the stretcher. Make test cuts in scrap to set the blade for a ⅜"-deep cut **[Drawing 1]**.

5 To cut the top notches, use an end stretcher (B) to position the rip fence **[Photos A, B]**. Reset the rip fence 4" from the end of the carrier and again use the width and thickness of the stretcher against the fence to position the leg to cut the lower notches.

6 Lay out the mortises within each notch **[Drawing 1]**. Use the carrier jig to position the legs while you drill the mortises **[Photo C]**. Drill ¾" deep, as measured from the bottom of the notch.

7 Install a 1" round-over bit in your router table and round the outer leg corners (opposite the notches and mortises), making several shallow passes to reduce chip-out and burning. Then, rout the ⅛" round-over on the top and bottom ends of each leg. Finish-sand the legs and set them aside.

Note: **See *Cutting Corners below* for other leg profiles.**



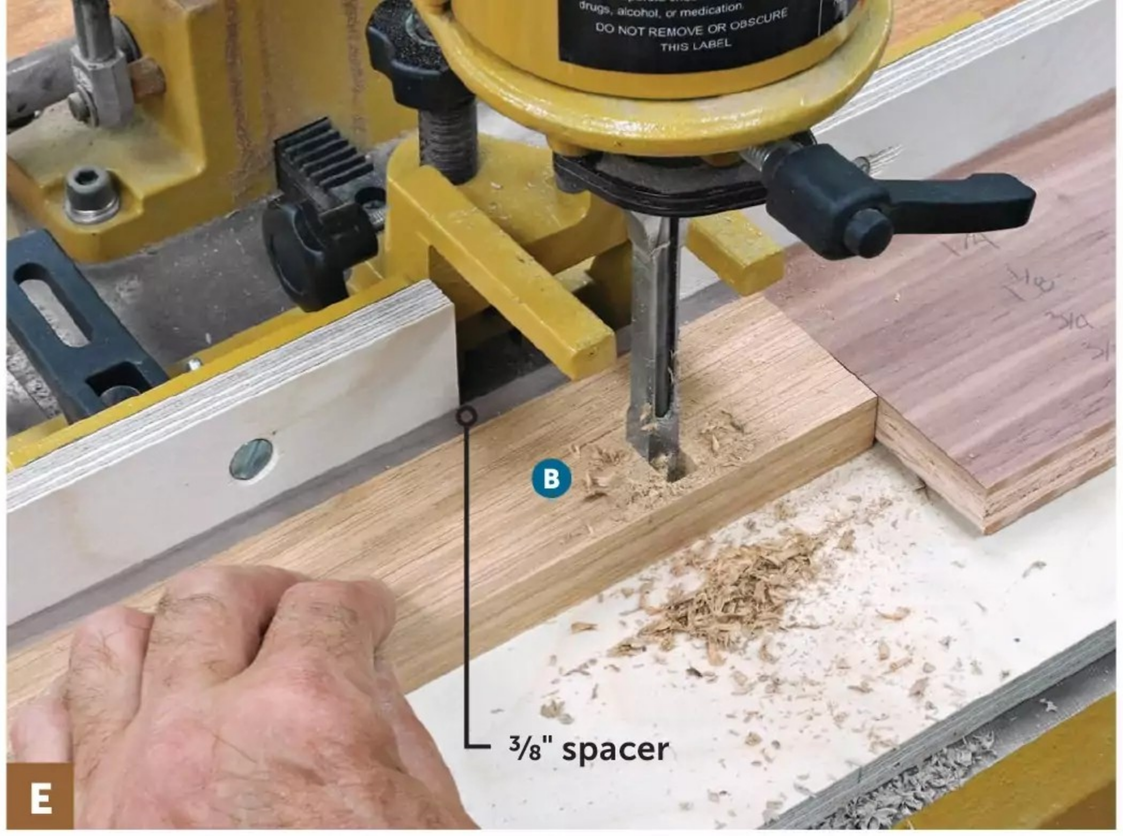
CUTTING CORNERS

For a crisper look to your table legs, chamfer the corner opposite the mortises, leaving a 13/16" exposure on the adjacent faces, *left*.

For a dressier look, follow up that chamfer with flutes, *right*, by mounting a 1" bullnose bit in your router table, raised ⅛" above the table. Set your fence to center the bit on the chamfered face of a leg and rout the chamfered face of each leg. Reposition the fence to center the bit on the adjacent faces, then rout those flutes.

Rout ⅛" round-overs around the top and bottom ends of each leg and ease any sharp edges with sandpaper.

Position the mortiser fence so the first cut is 3/16" from the near edge of the end stretcher (B). Make the first cut for each mortise with the end stretcher against the fence and the stopblock.



Add a 3/8" spacer between the fence and stretcher and make the next cut in each mortise. Add each 3/8" spacer in turn and repeat. Then use only the 1 1/4" spacer for the final plunge.

MAKE MORE MORTISES

1 Remove the carrier jig from the mortiser. Clamp a 4"-wide stopblock against the mortiser fence 2 1/16" from the right side of the chisel. Cut three 3/8×12" spacers and one 1 1/4×12" spacer.

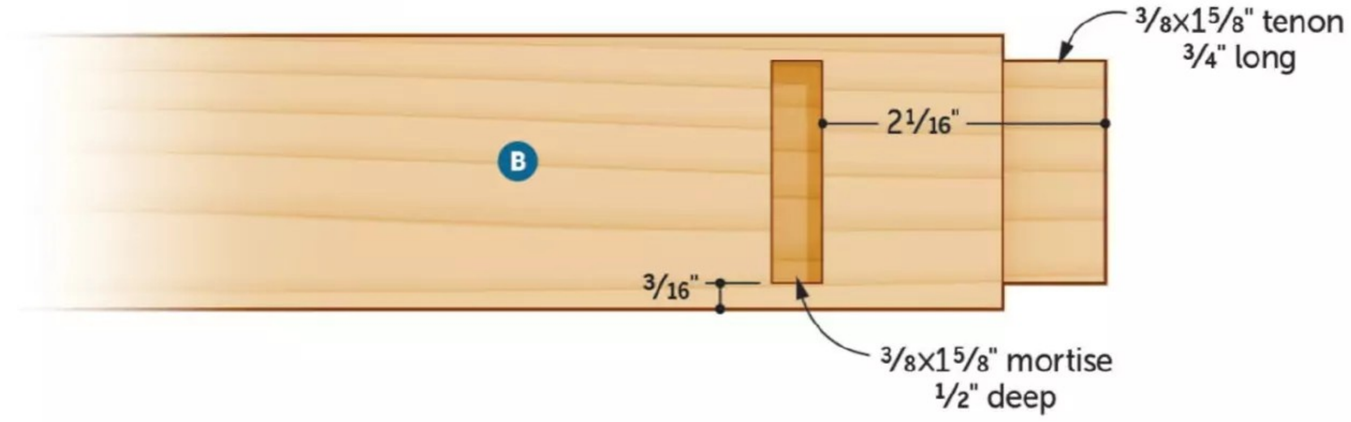
2 Lay out the mortise locations on the end stretchers (B) **[Drawing 2]**. Use a 3/8" chisel to form the mortises, making the first cut in each end stretcher **[Photo D]**. Then add a 3/8" spacer **[Photo E]** and extend each mortise. Repeat this process with the remaining spacers.

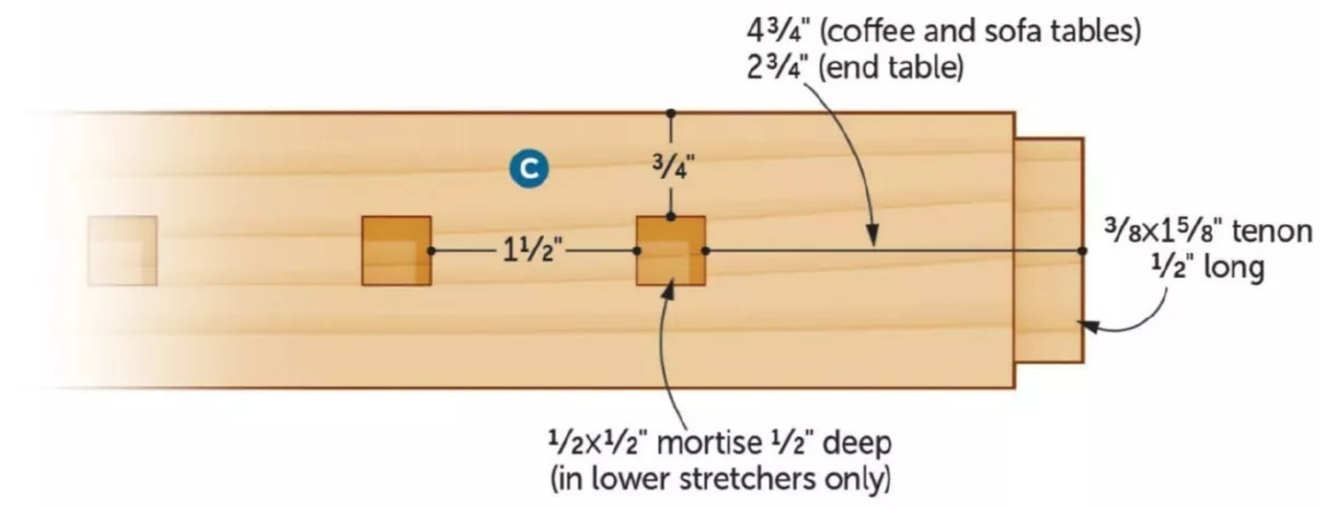
3 Retrieve the bottom front/back stretchers (C). Clamp the two stretchers together edge to edge with the inside faces up. Lay out the mortise locations **[Drawing 2, Exploded Views]** centered on the stretchers' widths, extending the layout marks across both pieces. Use a 1/2" mortising chisel to mortise the stretchers. Then clean out any debris with a bench chisel.

4 From 1" stock, cut the crossbars (D) to size and set them aside.

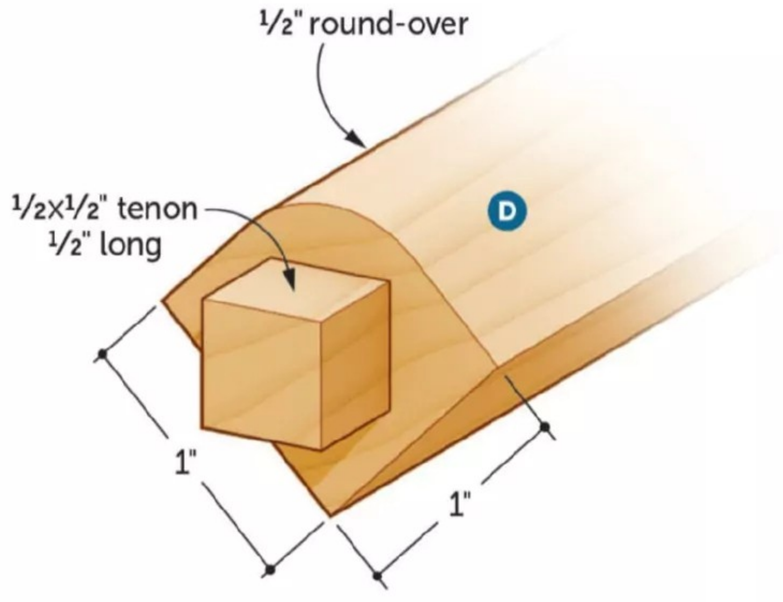
5 Install a 3/4" dado stack in your tablesaw and add an auxiliary face to the rip fence. Raise the dado blade into the auxiliary face to just under 3/16"

2 STRETCHER DETAILS





3 CROSSBAR DETAIL

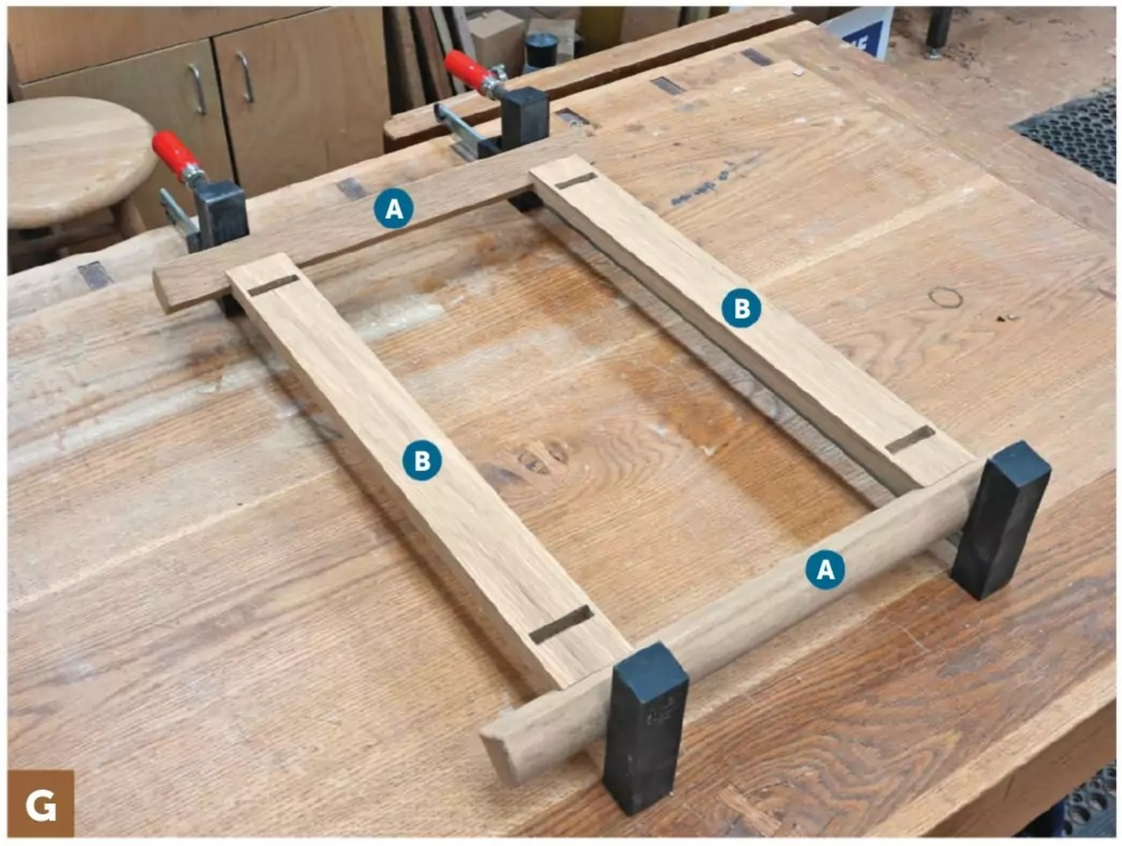


height, leaving 1/2" of its width exposed. Add an auxiliary fence to your miter gauge and use it to cut the tenons on the front/back stretchers (C) **[Drawing 2]**. Test the fit in the end stretchers (B), raising the blade as needed for a snug fit. Adjust the rip fence to expose the full 3/4" dado stack to cut the tenons on the end stretchers (B).

6 Move the rip fence away and attach the carrier jig to the miter gauge, realigning the jig's notch with the dado blade. Raise the blade to cut the 1/2"-square tenons on the ends of the crossbars (D) **[Drawing 3, Photo F]**.

7 Install a 1/2" round-over bit in your router table and round over the best-looking corner of each crossbar **[Drawing 3]**. Finish-sand the stretchers and crossbars (B, C, D).

Attach a stopblock to the carrier jig to establish the 1/2" length of the tenons. Make a pass on all four sides of the crossbar (D) to create the centered tenon. Repeat on the opposite end.



Check that the stretchers (B) fully seat against the notches in the legs (A) before adding glue. Make any needed adjustments, then glue and clamp the assemblies and check for square.

ESTABLISH A BASE

1 Glue the end stretchers (B) between the legs (A) **[Photo G]**. Glue the crossbars (D) between the lower front/back stretchers (C) with the rounded corners up **[Exploded Views]**. Check the crossbar assembly for square before setting it aside to dry.

2 Glue the crossbar assembly (C/D) and the remaining front/back stretchers (C) between the leg assemblies (A/B) **[Exploded Views]**. Check for square.

3 After the glue has dried, drill counterbores in the top front and back stretchers (C) for figure-8 fasteners **[Exploded Views]**.

> **"THE CROSSBARS CAN SERVE AS A SHELF, BUT THE SPACE BETWEEN THEM, ALONG WITH THE GLASS PANELS, REALLY LIGHTENS THE LOOK OF THE TABLES."**
>
> ***-KEVIN BOYLE, SENIOR DESIGN EDITOR***

MAKE A GLASSY FRAME

1 From ¾" stock, cut the frame front/back and ends (E, F) to width, but 2" overlong **[Exploded Views]**.

Note: **Taping the frame pieces together guarantees identical lengths and notch placement without the need for stops.**

2 Using double-faced tape, attach the frame front and back (E) face-to-face with their edges flush. Miter-cut the pieces to finished length. Do not separate the pieces yet. Repeat this process for the frame ends (F).

3 Lay out the notches for the legs (A) in the frame front and back (E) **[Exploded Views]**. Note that the placement is different on each table. Bandsaw just inside the lines, then clean up to the lines with a file and sanding block. Separate the frame pieces.

4 Mark and cut slots for #20 biscuits in the miter of each frame piece. Then rabbet the top inside face of each frame piece.

5 Glue up the frame, drawing the corners together with a strap clamp. Measure the rabbeted opening and order ¼"-thick glass 1/16" smaller in width and length. For safety, choose tempered glass. See *Maintain Your Temper, page 46*. We had the glass shop seam the edges to remove the sharp edges.

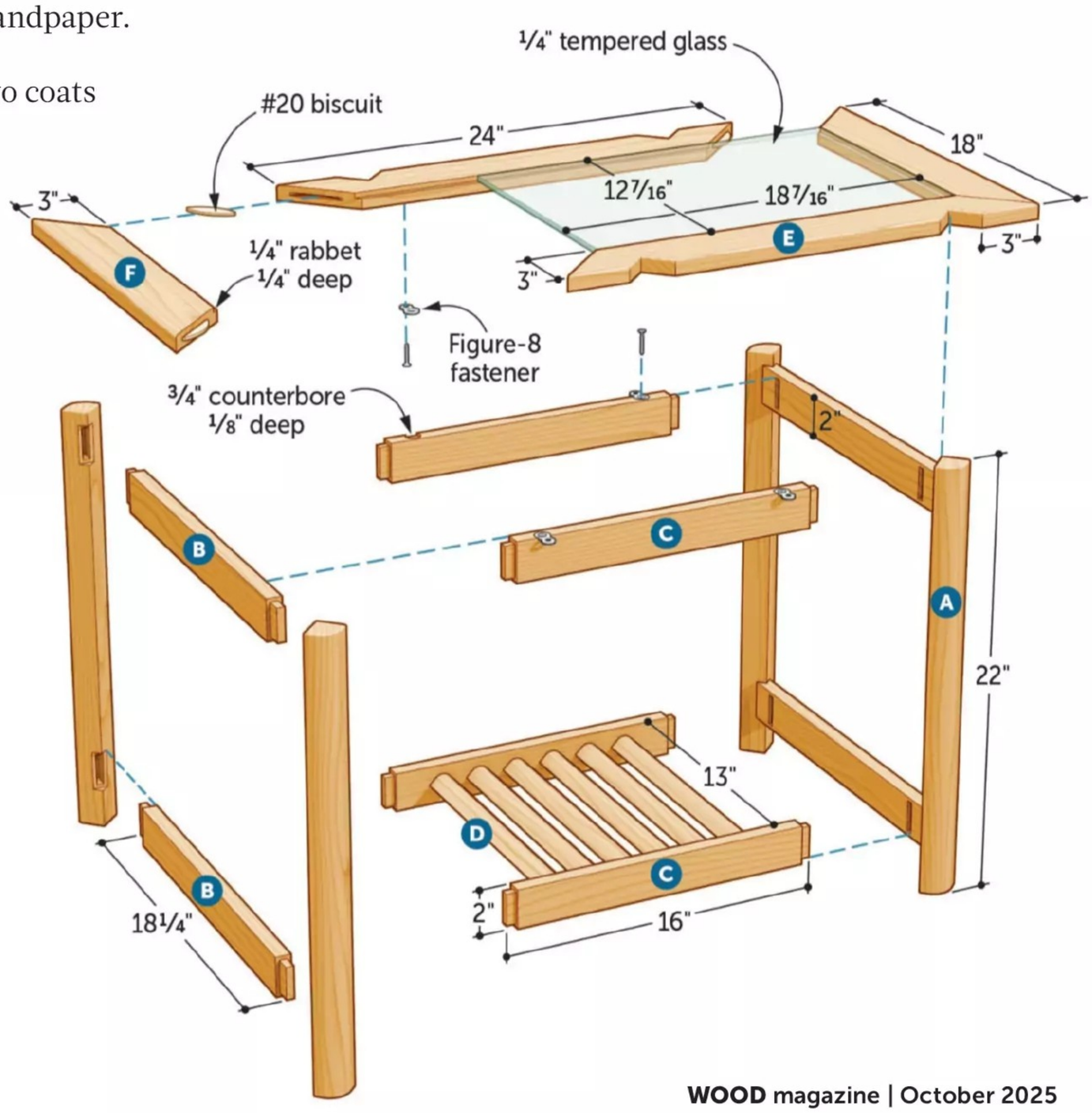
6 After the glue dries, rout a ⅛" round-over around the frame's outside edge, including the notches. Complete the round-overs in the corners of the notches with a file and sandpaper. Finish-sand the top frame.

Note: **There should be a small gap between each leg and the notches in the frame front/back (E).**

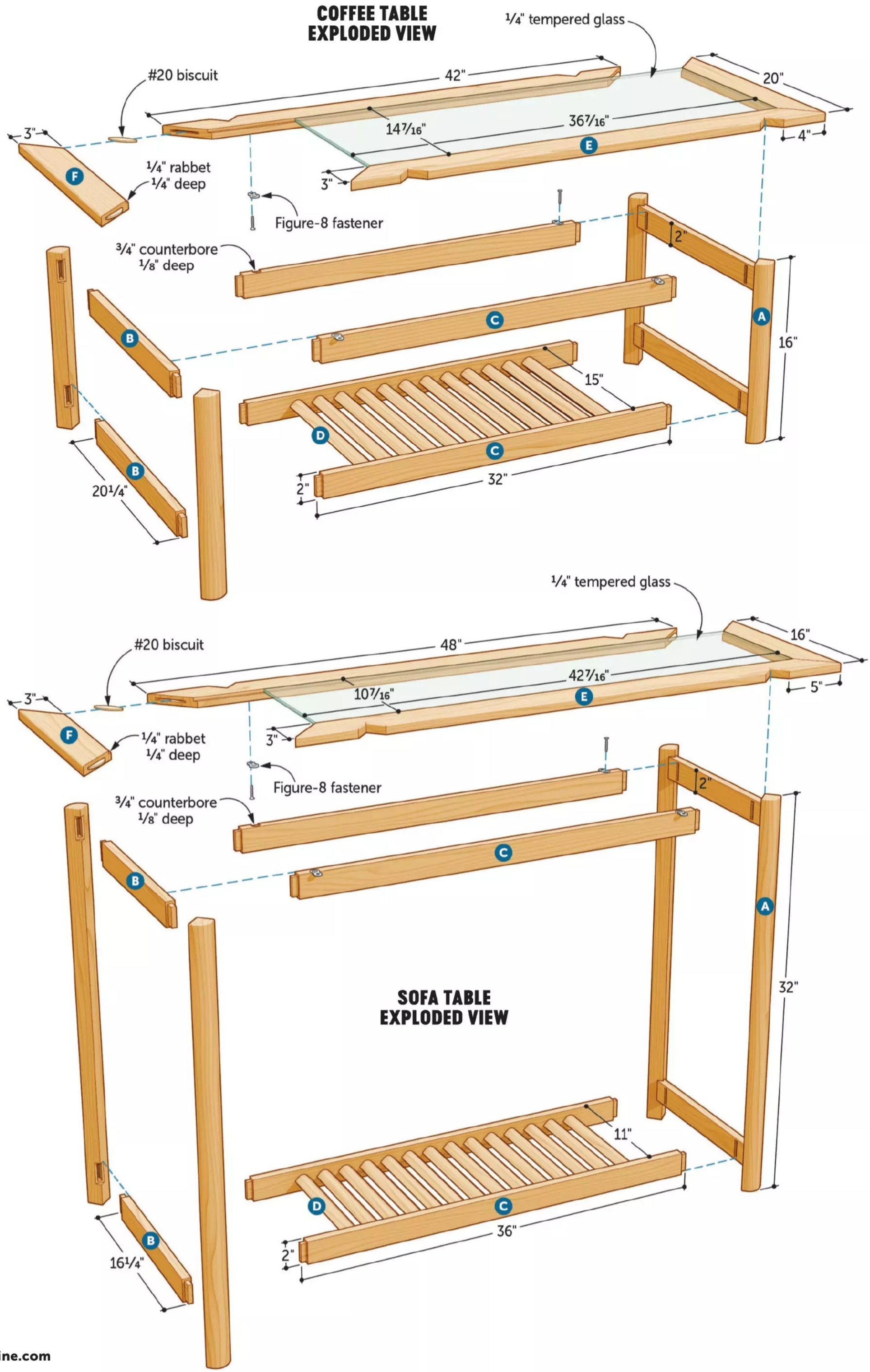
7 Apply a finish. We used two coats of clear wipe-on oil. Install figure-8 fasteners on the front and back stretchers. Flip the frame over on your bench, center the base on the frame, and secure it through the figure-8 fasteners. Set the glass in place and polish it up to reflect on your handiwork.

Learn more about selecting glass.
woodmagazine.com/glasstypes

END TABLE EXPLODED VIEW



COFFEE TABLE EXPLODED VIEW



MAINTAIN YOUR TEMPER

Glass used in a tabletop or as a shelf needs the strength to support items placed on it. In addition, simply picking up and placing things on the glass increases the chances of it breaking. For those reasons, choose tempered glass for these applications.

Tempered glass undergoes an extra heating and cooling process that makes it up to five times stronger than regular glass of similar thickness. The other big benefit to tempered glass is that if it does break, it shatters into many small pieces, rather than the sharp, jagged pieces of regular glass—a far better outcome if one of the kids drops a toy onto your coffee table.

Tempered glass cannot be cut after tempering, so you must order it at the specific size you need.

Regular glass breaks into irregular shards with razor-sharp edges that require gloves to handle and a sturdy box to hold the broken pieces.

Tempered glass breaks into many small pebble-like clumps and pieces with edges less likely to cut you. The small pieces can be cleaned up with a shop vacuum.

> **TO ENSURE YOUR GLASS FITS WELL, DON'T ORDER IT UNTIL THE FRAMES ARE DONE.**
>
> ***-KEVIN BOYLE, SENIOR DESIGN EDITOR***

PARTS LIST–END TABLE

PART		FINISHED SIZE T	W	L	Matl.	Qty.
A	LEGS	1⅜"	1⅜"	22"	O	4
B	END STRETCHERS	¾"	2"	18¼"	O	4
C	FRONT/BACK STRETCHERS	¾"	2"	16"	O	4
D	CROSSBARS	1"	1"	14"	O	6
E*	FRAME FRONT/BACK	¾"	3"	24"	O	2
F*	FRAME ENDS	¾"	3"	18"	O	2

PARTS LIST–COFFEE TABLE

PART		FINISHED SIZE T	W	L	Matl.	Qty.
A	LEGS	1⅜"	1⅜"	16"	O	4
B	END STRETCHERS	¾"	2"	20¼"	O	4
C	FRONT/BACK STRETCHERS	¾"	2"	32"	O	4
D	CROSSBARS	1"	1"	16"	O	12
E*	FRAME FRONT/BACK	¾"	3"	42"	O	2
F*	FRAME ENDS	¾"	3"	20"	O	2

PARTS LIST–SOFA TABLE

PART		FINISHED SIZE T	W	L	Matl.	Qty.
A	LEGS	1⅜"	1⅜"	32"	O	4
B	END STRETCHERS	¾"	2"	16¼"	O	4
C	FRONT/BACK STRETCHERS	¾"	2"	36"	O	4
D	CROSSBARS	1"	1"	12"	O	14
E*	FRAME FRONT/BACK	¾"	3"	48"	O	2
F*	FRAME ENDS	¾"	3"	16"	O	2

*Parts initially cut oversize. See the instructions.

MATERIALS KEY: O–oak.
SUPPLIES: #20 biscuits, figure-8 fasteners, ¼×12⁷⁄₁₆×18⁷⁄₁₆" tempered glass (end table), ¼×14⁷⁄₁₆×36⁷⁄₁₆" tempered glass (coffee table), ¼×10⁷⁄₁₆×42⁷⁄₁₆" tempered glass (sofa table).
BLADES AND BITS: Dado blade, ¼" rabbeting bit, ⅛", ½", 1" round-over bits, ⅜" and ½" hollow mortise chisels.
PROJECT COST: It cost us about $150 to build the end table, $220 to build the coffee table, and $215 to build the sofa table. Your cost will vary by region and source.

CUTTING DIAGRAM

For the end table, we purchased 6½ board feet of 4/4 oak and 4 board feet of 8/4 oak.
For the coffee and sofa tables, we purchased 10 board feet of 4/4 oak and 8 board feet of 8/4 oak for each table.
Before cutting parts to size, we planed them to the thicknesses shown in these example boards.

END TABLE

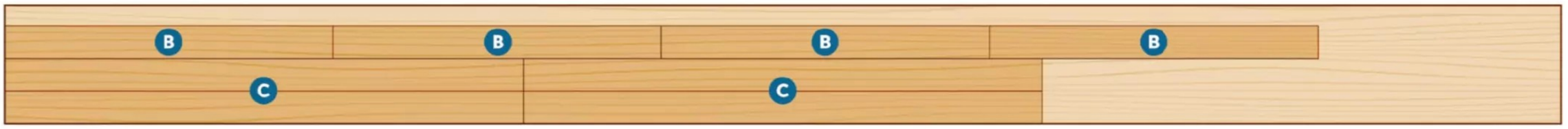
1⅜x5½x48" Oak †Plane or resaw to the thickness listed in the Parts List.

¾x5½x96" Oak

¾x7¼x48" Oak

COFFEE TABLE

1⅜x5½x96" Oak †Plane or resaw to the thickness listed in the Parts List.



¾x7¼x96" Oak

¾x7¼x96" Oak

SOFA TABLE

1⅜x5½x96" Oak †Plane or resaw to the thickness listed in the Parts List.

¾x7¼x96" Oak

¾x7¼x96" Oak

• SHOP TESTED •

BENCHTOP MORTISERS

These machines promise accurate, smooth-walled mortises with the pull of a lever. We tested nine to see which ones win fair and square.

WRITER: MARK LANE with DAVE STONE
TESTER: MARK LANE

Note: You can produce multiple mortise sizes using a single chisel and bit set by creating overlapping holes to expand the length and width.

Creating mortises can be time consuming and intimidating. A drill press speeds drilling overlapping holes to hog out the waste, but you still have to straighten the sides and square the ends by hand using chisels.

A mortising machine accomplishes both tasks simultaneously with a nifty trick: drilling square holes. It does this by spinning an auger bit inside of a captured hollow square chisel. Pulling a lever drives both the chisel and bit into the workpiece. The bit removes most of the wood, while the chisel squares the hole by paring away the area around the bit. With proper setup, a mortiser turns a time- and skill-demanding task into one that's fast and simple.

We tested nine benchtop mortising machines to see which ones simplify the process with accuracy and minimal fuss. While all of the machines look remarkably similar, we found that details make a difference in setup and performance.

POST UP FOR THE PLUNGE

To work accurately and repeatably, a mortiser needs to plunge predictably. It also needs to lower then raise the heavy powerhead—which holds the motor, chuck, and cast-iron chisel holder—with each plunge while simultaneously driving a chisel into a workpiece. That requires robust support.

To accommodate the forces involved, the Delta 14-651, Grizzly G0645, Powermatic PM701, and Rikon 34-260 all employ an adjustable dovetail key on a cast iron column, *below*. Jet's JBM-5 mounts the powerhead on a single column, while the Grizzly T33127, Shop Fox W1671, Vevor MS3612A3, and Wen 43013 mount the head on dual cylindrical columns. We prefer the adjustability and robustness of the dovetail column, followed by the beefy single-post Jet design, but didn't experience problems we could attribute to the design of two-column mortisers.

Dovetail-columns (*left*) offer precise vertical movement of the powerhead and are adjustable to remove side-to-side play. Jet's cylindrical single column (*middle*) also allows play adjustment. Dual-column machines (*right*) rely on column positioning to prevent powerhead side-play.

PHOTOGRAPHER: JACOB FOX

Most handles are straight, which places your wrist in an awkward position as you plunge the mortiser. Three mortisers bend the handle at 90° for a more natural wrist position.

Stop collars allow adjusting handle length.

GET A HANDLE ON IT

Moving that heavy powerhead and plunging the chisel and bit into the wood require leverage, which is provided by a long handle. Some handles work better than others (See *Chiseling Away At the Results* on *page 54*).

When plunging the bit and chisel, especially into dense hardwoods, a longer handle helps, and Powermatic and Shop Fox handles are the longest. Those two, plus the Rikon, allow length adjustment and have an ergonomic bend at the end, *above*. That places your wrist horizontal, allowing you to reach up and pull down without awkward bending. All of the handles except the Rikon and Vevor index, meaning you can rotate them around the handle's hub to position the handle for better leverage, *right*.

TIP!

Periodically lubricate the rack and pinion as well as the posts with a very light coat of grease. Protect unpainted surfaces with wax or cast-iron sealer, and blow or vacuum sawdust off after each use.

On all of the machines, the handle drives a rack-and-pinion mechanism that moves the head. The Powermatic handle and gearing give it the best action in the test. It's also the only handle that attaches on the right or left side of the powerhead. The others mount on the right only. The Delta and Grizzly G0645 required more effort to pull. Among the three similar dual-column mortisers, the Grizzly T33127 operated most smoothly and comfortably. All the mortisers use a gas strut to help lift the heavy head back up with little effort.

Most of the indexable handles such as Shop Fox's, shown, allow you to rotate the handle and lock it in at six positions. Powermatic's handle tops the field with ten.

Jet's robust depth-stop rod (*left*), along with the similar Shop Fox, proved simple and reliable. Powermatic's dovetail-grabbing stop (*right*) could be knocked loose with an overly aggressive plunge.

Collars on two-post machines like the Grizzly T33127 (*left*) work well with adequate tightening. The Grizzly G0645 (*right*) and the Delta use a hooked stop that comes to rest on top of the post and flexes easily.

PULL OUT ALL THE STOPS

A stop allows you to plunge the chisel repeatedly to a consistent depth, and this important feature proved one of the most fickle in our tests. Given the amount of leverage afforded by the arms, we could make all of the depth stops slip when we applied high force with the handle. But some slipped when we weren't trying.

The simple Jet and Shop Fox stops resemble stop rods on a plunge router and worked most reliably, *above left*. The Powermatic's stop rides on the same dovetail key used by the powerhead. Lubricating grease, required by the powerhead, could cause the stop to slip if too much was present. The remaining two-post machines (Grizzly T33127, Vevor, and Wen) use a simple collar that holds reasonably well, *above right*. The Delta and Grizzly G0645 use a bent rod. Rikon's unique stop wobbled and flexed excessively.

TIP!

Move the workpiece side to side along the fence to elongate a mortise. To widen a mortise, use spacers between the stock and fence rather than repositioning the fence.

When machining mortises, you want the workpiece to stay put, but you also need to be able to shift it easily for the next chisel plunge. All of the tested mortisers except the Rikon use an adjustable hold-down fork, mounted to a post on the fence, that prevents the workpiece from lifting up when you withdraw the chisel, *right*. These hold-downs work well on most of the mortisers, although the Jet's loosened occasionally.

Quick-release hardware simplifies the adjustment of the hold-down on all models except the Shop Fox, which requires an Allen wrench—an inconvenience on an often-used adjustment. Only Powermatic's hold-down adjusts using a threaded post with a knob, making it easy to set precisely.

Fences are critical for positioning your workpiece, and our test group shows a few design variations. The Delta, Grizzly G0645, and Powermatic adjust using a rack and pinion, which is handy but not a necessity. The rest, except Rikon, have a simple rod that the fence assembly slides on. All fences adjusted easily and held their position well.

The fence height on six of the mortisers prevents fully lowering the hold-down fork (*left*), requiring spacers under thin stock. Split fences on the Powermatic (*right*), Delta, and Grizzly G0645 do not.

Rikon brings a wholly different design to its table and fence that emulates a vertical milling machine, with three handwheels that position and secure the workpiece, *below*. The setup required fiddling to eliminate play, and it strikes us as overkill for mortising wood. The table is also the smallest by far in our test. Plus, the front handwheel that moves the table (and workpiece) from side to side hangs inconveniently low, so it has to be positioned off the edge of a worksurface or boosted by a riser. While setup of the Rikon table does take longer, once dialed in it made side-to-side movement fast and easy while drilling long mortises. This mortiser also is the only one that includes outriggers with stops: a boon for production work.

Rikon's clamp holds workpieces securely, but resetting it for different workpiece sizes proved tedious. The side-to-side travel worked well, but requires locking with a handle after each adjustment.

SUREFIRE SETUP AT THE FIVE AND DIME

Set how far the auger bit protrudes past the end of the chisel by first bottoming out the bit inside the chisel, then raising both into the mortiser, with the chisel in its collar and the bit in the chuck. Then slide a coin between the chisel and its collar as you snug the bit in the chuck. A dime works great for small chisels, and a nickel for larger ones. Remove the coin, slide the chisel up tight to its collar, then fully tighten it and the chuck.

FIT THE CHISEL AND BIT

All of the tested mortisers accept chisel-and-bit sets in a range of sizes (see the chart on *page 54*). Most came with three or four sets except Shop Fox, which included only one 1/2" chisel, and Jet and Powermatic, which sell sets separately. Grizzly, Shop Fox, and Wen also separately sell upgraded sets made from higher-quality steel. All have a round shank that fits into a collar. To use another brand or aftermarket set in your mortiser, check the shank size and length to ensure compatibility.

TIP!

Orient the chisel's slot to eject chips either to the front or into the already-cut portion of the mortise.

Installing and adjusting chisels is a multistep process of locking the chisel in its collar, chucking up the auger bit, and then adjusting one or both to create a gap between the end of the bit and the chisel. This allows chips to travel through the hollow chisel and be ejected out of the slot in one chisel face. See *Surefire Setup at the Five and Dime, above*, for an easy setup tip. Powermatic greatly simplifies the procedure by incorporating a tool-free chisel lock and built-in gapping spacers for auger bit clearance, *next page*.

To create consistent, smooth-walled mortises, the chisel must be set square to the fence on these machines. Lower the powerhead, place a reliable piece of stock between the chisel and fence, rotate the chisel so one face rests against the stock, and then tighten the chisel, making sure it stays tight against the collar to maintain chip clearance.

All chisels held their edge during our testing, although we experienced several auger failures. The slender 1/4" augers that came with the Grizzly T33127 and Wen mortisers broke right away. We replaced them with premium Wen chisel-and-bit sets for the remainder of our testing that performed better in both machines. The 3/8" chisel-and-bit set that came with the Delta jammed with chips several times in a row, plus several of the Delta augers were too long and needed to have the quill end ground shorter to fit properly. The Vevor chisels also suffered from poor quality control, with inconsistent machining that left rough faces on the chisels.

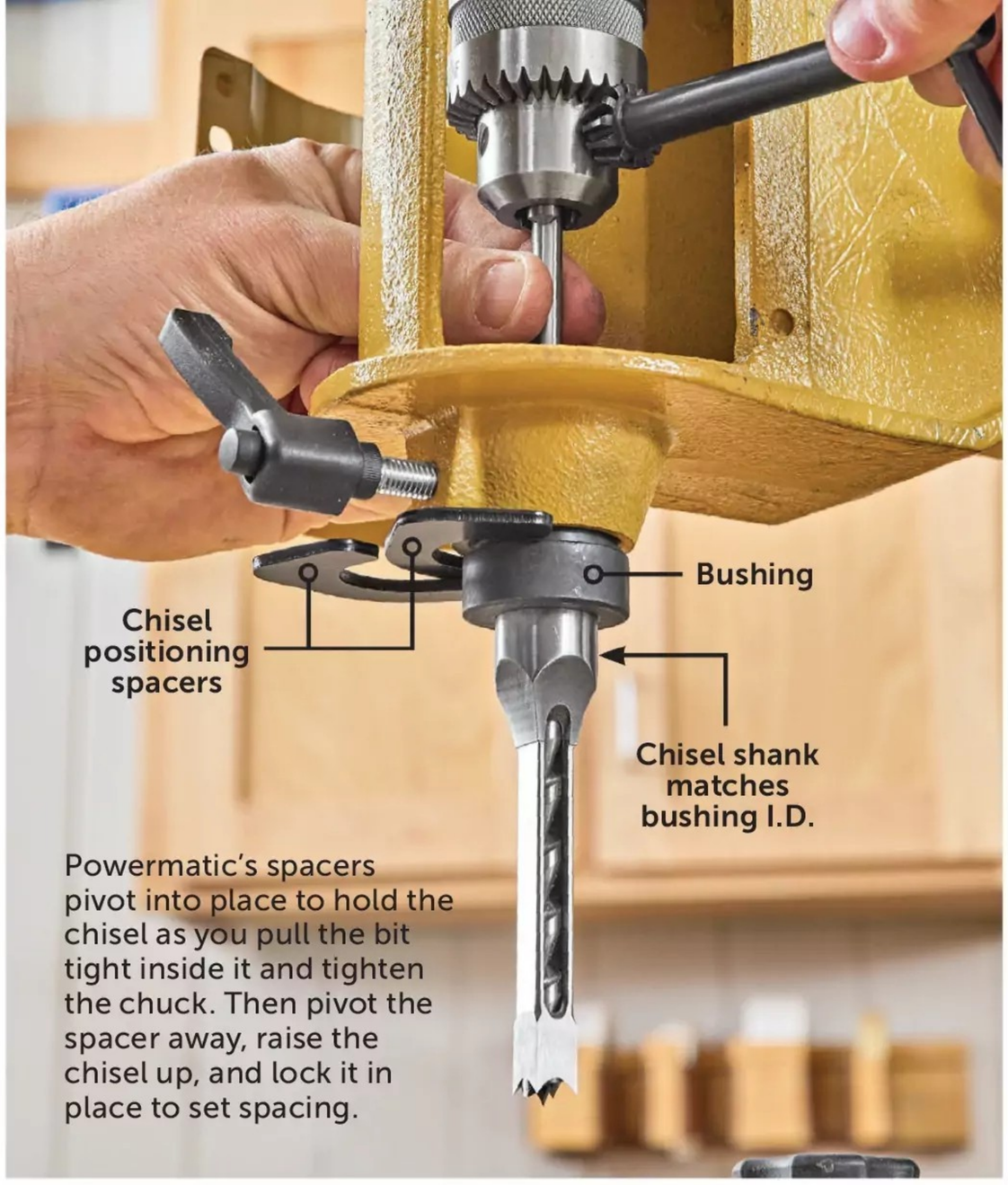
POWER UP AND GET SQUARE

A mortiser needs to be both a smooth operator and a powerhouse to drive the aggressive auger bit and chisel to create accurate mortises. We tested each machine by repeatedly plunging a 3/8" chisel 1" deep into red oak.

TIP!

Pull the lever far enough to press the chisel and bit partway down, and then ease up pressure to allow chips to clear. Repeat the process until you achieve full depth.

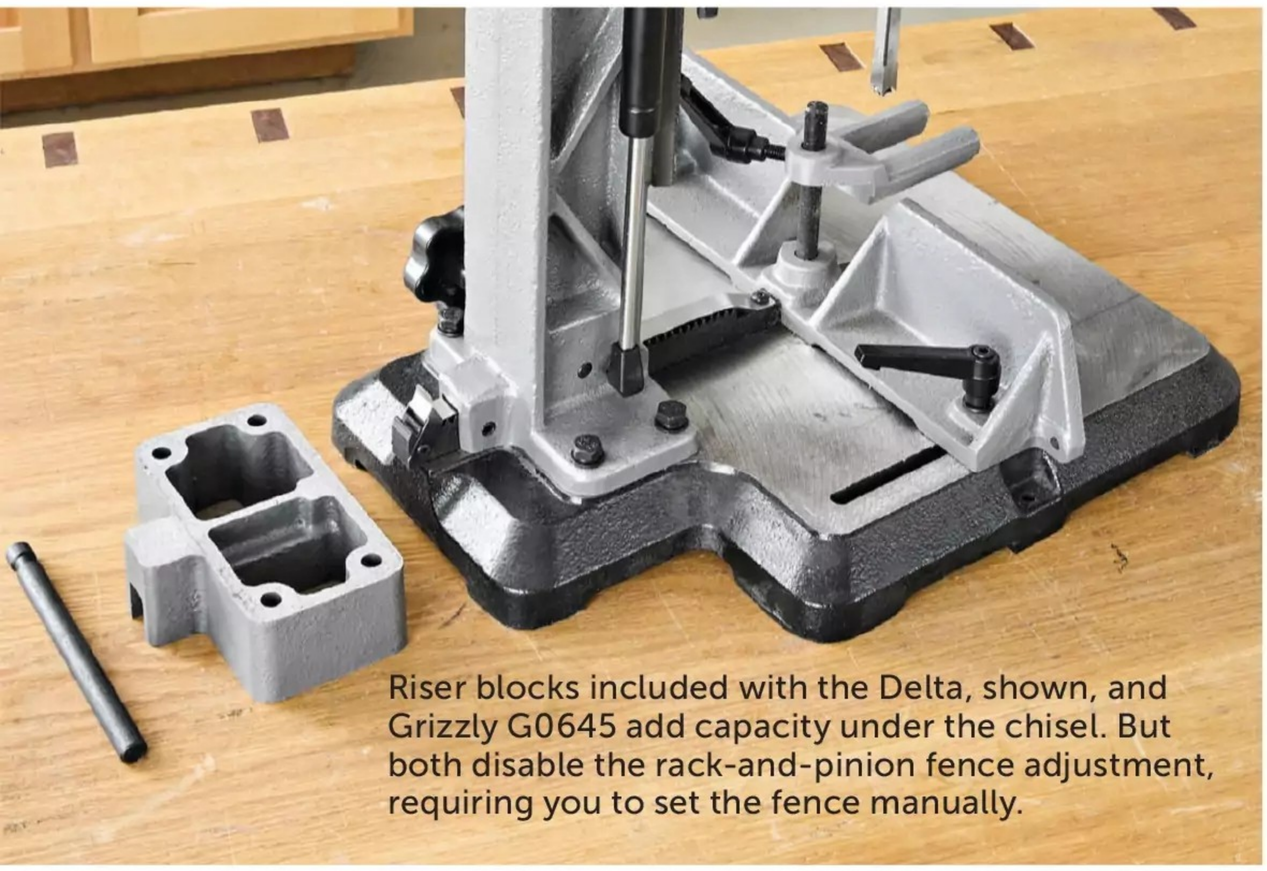
All nine got high marks for operation, and all powered through the mortises acceptably, although most required incremental pulls and pauses to clear chips and let the motor keep up. The Powermatic, Shop Fox, and Vevor fared the best. For the Shop Fox and Vevor, we attribute that to their motors that spin at 3,450 and 3,400 rpm, respectively—twice as fast as the other mortisers. The trade-off was more generated heat that can wear auger bits and dull chisels faster. The Shop Fox and Powermatic are each equipped with a 3/4-hp motor; the others have 1/2-hp motors.



Powermatic's spacers pivot into place to hold the chisel as you pull the bit tight inside it and tighten the chuck. Then pivot the spacer away, raise the chisel up, and lock it in place to set spacing.

We also ran time trials with each machine, milling a series of 1/4×3/4×3/4" mortises (using a 1/4" chisel) in walnut, oak, and hard maple and averaging the times. The Powermatic, Rikon, and Shop Fox performed best in these tests.

Finally, we created 3/8×1×2" mortises looking at smoothness of operation, as well as the wall quality and accuracy. All nine mortisers did a fine job, tying with a solid A- score. So, we didn't include this in the chart as a performance criterion.



Riser blocks included with the Delta, shown, and Grizzly G0645 add capacity under the chisel. But both disable the rack-and-pinion fence adjustment, requiring you to set the fence manually.

OTHER CONSIDERATIONS

Distance from the table to the bottom of the chisel limits workpiece thickness capacity on all the mortisers. If you long for more, all except the Grizzly T33127, Vevor, and Wen allow rotating the mortiser 180° on its base, which increases the clearance below the chisel for working with thicker pieces or allows you to hang the mortiser over the edge of your workbench to mortise the ends of long workpieces. You can use the fence and hold-down in this position, but you'll need to get creative with securing upright workpieces. And you'll absolutely need to mount the machine to a solid surface because these top-heavy machines will fall over in this reversed configuration.

TIP!

Mount your mortiser to a benchtop or to a plywood base that can clamp down securely. They're top heavy and may tip otherwise.

Two of the mortisers—the Delta and Grizzly G0645—also allow installing a riser block, *previous page*. Both include a 2¼" block plus longer bolts and hold-down rod. In lieu of a riser block, Shop Fox lets you set the head in a low, medium, or high zone along its extra-tall column, allowing for thicker workpieces, although the strut always limits the overall chisel travel, and moving the strut to different zones requires moderate effort.

“A MORTISER INCREASES MY EFFICIENCY, MAKING IT POSSIBLE TO USE MORTISE-AND-TENON JOINTS MORE OFTEN.”

-MARK LANE, PRODUCT TESTER

·2025· WOOD® TOP TOOL BENCHTOP MORTISERS

Powermatic
PM701

CHISELING AWAY AT THE RESULTS

MODEL	PERFORMANCE RATINGS (1)																	
	POWER (2)	SPEED (3)	CHISEL/BIT QUALITY	WORKHOLDING	DEPTH STOP ACCURACY	MORTISE WALL QUALITY	EASE OF CHISEL & BIT INSTALLATION	QUALITY OF INCLUDED TOOLS, WRENCHES	FENCE FUNCTIONALITY	PLUNGE SMOOTHNESS UNDER LOAD	HANDLE FUNCTIONALITY & ERGONOMICS	INCLUDED CHISEL SIZES	INCLUDED CHISEL COLLAR BUSHINGS (INSIDE DIAMETER)	TESTED HOLD-DOWN CAPACITY MIN–MAX (4)	MAXIMUM CAPACITY FENCE TO CHISEL CENTER	MAXIMUM CLEARANCE, TABLE TO CHISEL (4)	MAXIMUM PLUNGE STROKE	COLUMN TYPE (5)
DELTA 14-651	A-	C+	D	A-	B-	B+	B	B+	A-	B+	B+	¼", 5/16", ⅜", ½"	⅝"	⅝"–4½"	3¾"	4¼"	4½"	D
GRIZZLY G0645	A-	B	A-	A-	B-	A	B	A-	A-	B+	B	¼", 5/16", ⅜", ½"	⅝"	⅝"–4½"	4"	4¼"	3¼"	D
GRIZZLY T33127	B+	C	C-	A-	B	B+	C+	B+	A-	A-	B-	¼", ⅜", ½"	¾"	21/16"–5"	3¼"	4¾"	4¼"	DC
JET JBM-5	A-	A-	N/A	A-	A-	A	B	B	B+	B	B+	N/A	⅝", ¾"	1¾"–4¾"	3¼"	4⅛"	4¾"	SC
POWERMATIC PM701	A-	A	N/A	A-	B-	A	A	A-	A-	A	A	N/A	⅝", ¾"	0–5¼"	4½"	5⅛"	5¼"	D
RIKON 34-260	B	D	B	A	C	B+	B	B+	B	B	C	¼", 5/16", ⅜", ½"	⅝", ¾"	N/A	2¼"	4¾"	4⅝"	D
SHOP FOX W1671	A	A-	A-	B	A-	C+	B	B	B+	A	A	½"	⅝", ¾"	2¼"–4⅝"	3"	5"	4"	DC
VEVOR MS3612A3	A	B	C-	A-	B-	C	C+	C	A-	A	C	¼", ⅜", ½"	¾"	2"–5½"	1¾"	4½"	5"	DC
WEN 43013	B-	B-	C-	A-	B	B+	C+	B-	A-	B-	C	¼", ⅜", ½"	¾"	2"–5½"	1¾"	5¾"	4⅞"	DC

AND THE WINNERS ARE

After we finished making chips fly, the Powermatic stood as our Top Tool. Its speed, smoothness, and ergonomics put it at the top, along with a robust design and extra features like a built-in chisel sharpening cone and dense rubber bumpers that can fit into the table to hold workpieces against the fence. Its ability to power through cuts, its comfortable handle, and good workholding make it a solid choice for frequent and extended mortising sessions.

Top Value goes to the Grizzly T33127. Though it looks remarkably similar to the Vevor, and Wen, it rises above the other lowest-cost machines with better hardware and superior function.

Grizzly
T33127

REPOSITIONABLE HEAD (YES/NO)	TABLE DIMENSIONS	TABLE MATERIAL (CAST IRON, MDF)	OVERALL DIMENSIONS	STANDARD EQUIPMENT (6)	OPTIONAL ACCESSORIES (7)	WARRANTY (YEARS)	WEIGHT (LBS.)	PRICE (8)
Y	12 1/8×8 1/4"	CAST	14×20×31"	B, C, T	C	5	63	$489
Y	12 1/8×8 1/4"	CAST	14×19 1/2×30 3/4"	B, C, T	C, P	1	70	$490
N	13 3/8×5 3/4"	MDF	13 1/2×15 1/8×30 3/4"	C, T	C, P	1	60	$325
Y	13 5/8×5 7/8"	MDF	14×15×30 1/4"	N/A	C	5	48	$529
Y	13×11 1/4"	CAST	15 1/4×20 1/2×34"	SH, T, W	C	5	87	$1,049
Y	7 1/8×3 7/8"	CAST	20 1/4×22 1/4×31 1/4"	C, S, T, W	C	5	90	$600
Y	16×5 7/8"	MDF	15 1/2×19 5/8×43"	C, T	C, P	2	85	$570
N	13 3/8×5 3/4"	MDF	13 3/8×16 5/8×31 3/4"	C, T	C	1	58	$223
N	13 3/8×5 3/4"	MDF	13 1/2×15×30 1/2"	C, T	C, P	2	61	$277

1. A Excellent
   B Good
   C Fair
   D Poor
   N/A Not applicable

2. Observed by creating 3/8×1" mortises in red oak

3. Based on average time to create a 1/4×3/4×3/4" mortise in various hardwoods using a 1/4" chisel

4. With powerhead in standard position above table

5. **(D)** Dovetail column
   (DC) Dual column
   (SC) Single column

6. **(B)** Riser block
   (C) Chisel(s)
   (S) Table stops
   (SH) Sharpening cone
   (T) Tool and chisel rack
   (W) Workpiece retainers

7. **(B)** Riser block
   (C) Chisel(s)
   (P) Premium chisels

8. Prices current at time of article production and do not include shipping, where applicable.

RIP-RIDING TABLESAW CADDY

This custom accessory straddles your tablesaw fence to keep pushsticks and essential measuring and marking tools safely at hand.

WRITER: KERRY GIBSON
DESIGNER/BUILDER: KEVIN BOYLE

PHOTOGRAPHER: JACOB FOX; **ILLUSTRATOR:** CHRISTOPHER MILLS

Working at the tablesaw requires, at a minimum, a steel rule or a depth gauge to set blade height, hex keys or screwdrivers to adjust the miter-gauge fence, pushsticks for safety, and a pencil—or two—for marking stock. This caddy keeps these items within easy reach yet safely away from the blade. Custom fit to your saw's fence, it easily slides out of your way or lifts off completely.

Using the rip fence as a stop, cut a dado in the ends (B). To match the divider (C) stock thickness, cut the dado in multiple passes, adjusting the fence between cuts to sneak up on the final dado width.

Apply glue to the dadoes and bevels, then assemble the box, first inserting the divider (C) in the ends (B), then adding the sides (A), before snugging with a band clamp as you check for square.

BUILD A BOX

Custom-fit the caddy to your rip fence by measuring the height of the fence faces and cutting box sides to matching width. Our SawStop fence measures 2⅝".

1 From ½" stock, cut the box sides (A), ends (B), and divider (C) to width and slightly overlength **[Exploded View, Materials List]**. Tilt your tablesaw blade to 45° and, using your miter gauge with an auxiliary fence, bevel-cut the sides and ends to final length.

2 Install a ¼" dado blade in your tablesaw at a height of ¼". Mark the location of the dadoes in the ends (B) **[Exploded View]**. Use the rip fence as a stop and make a first pass on each box end. Adjust the fence and make a second pass **[Photo A]**, then check the fit of the divider (C).

3 Install an auxiliary fence on the rip fence and adjust the fence so it just touches the blade. Cut a rabbet in the bottom edge of the sides and ends, making sure the ends mirror each other.

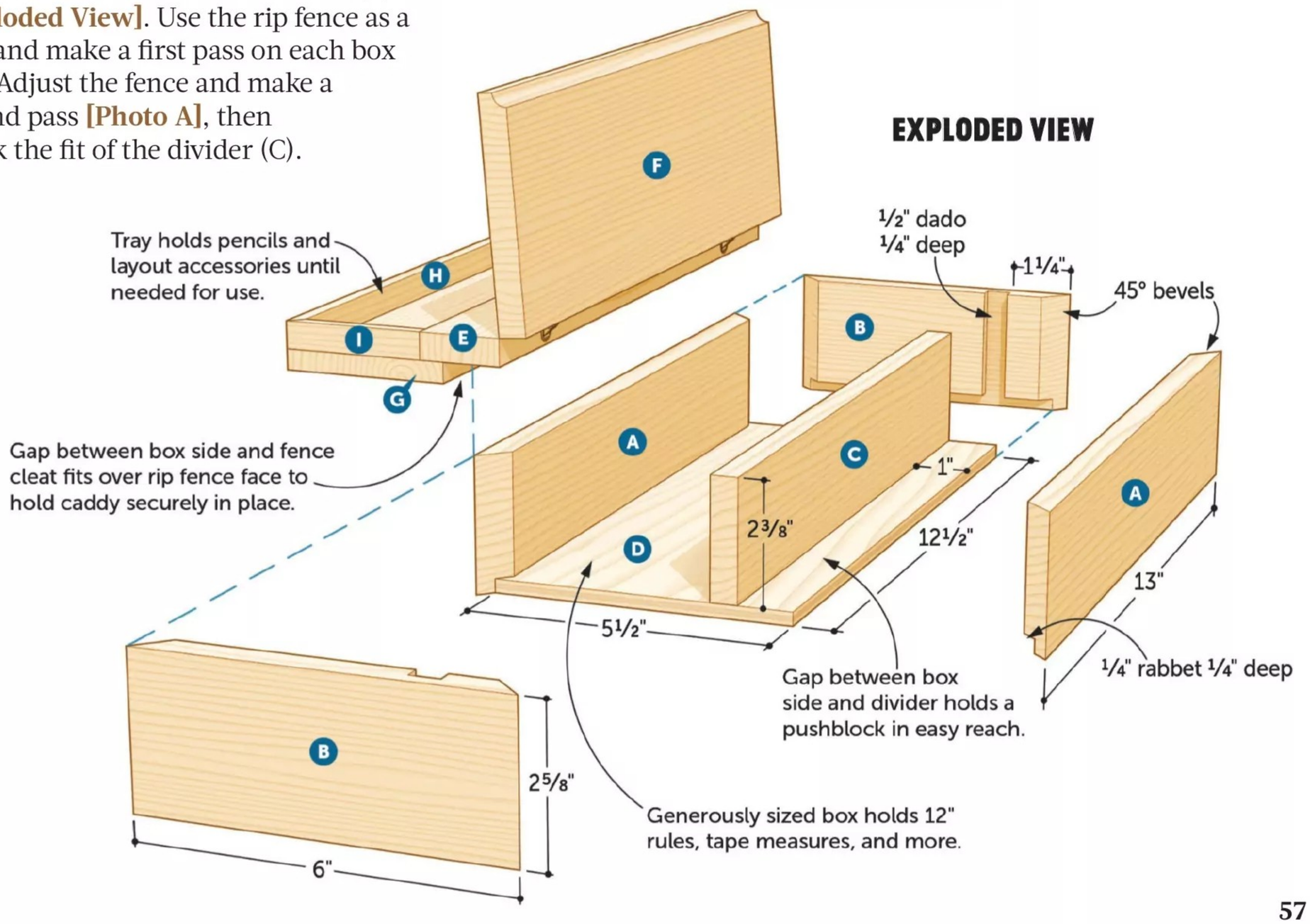
4 Dry-fit the box sides and ends (A, B), then measure and cut the divider (C) to final length. Assemble the sides, ends, and divider **[Photo B]**.

5 When the glue dries, cut the bottom (D) to size from ¼" plywood. Then glue the bottom into the rabbets in the sides and ends.

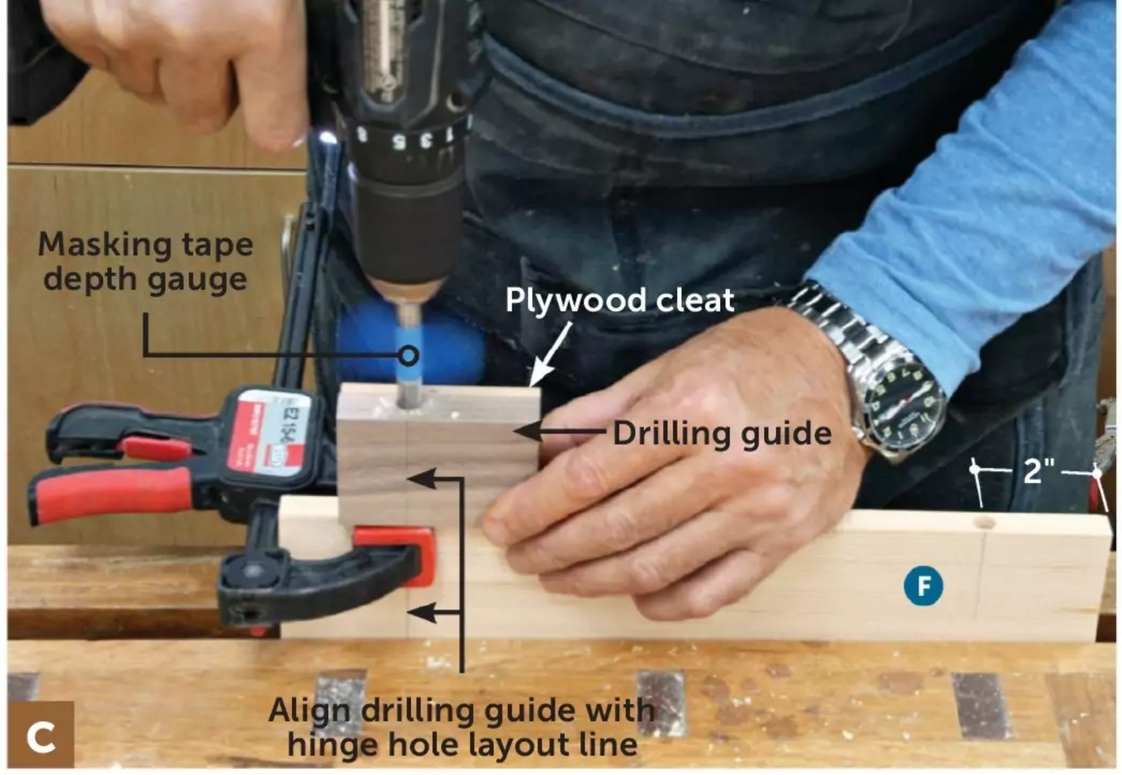
TIP!

When forming dadoes to match stock that is already milled, using multiple passes with a ¼" dado blade lets you sneak up on the precise width.

EXPLODED VIEW



OVERALL DIMENSIONS
9⁹⁄₁₆"W × 13"D × 3⅛"H



Position the drilling guide on the edge of the lid (F) and align the guide with the layout line. Clamp the plywood face of the guide to the inner face of the lid and drill the holes. Repeat for the bridge (E).

Tap a barrel hinge partially into the hole. Fold the hinge and check that it sits at 90° to the board face. Use pliers to rotate the hinge if necessary. Flip the hinge back to its closed position and tap it in.

ADD A LID TO THE BOX

TIP!

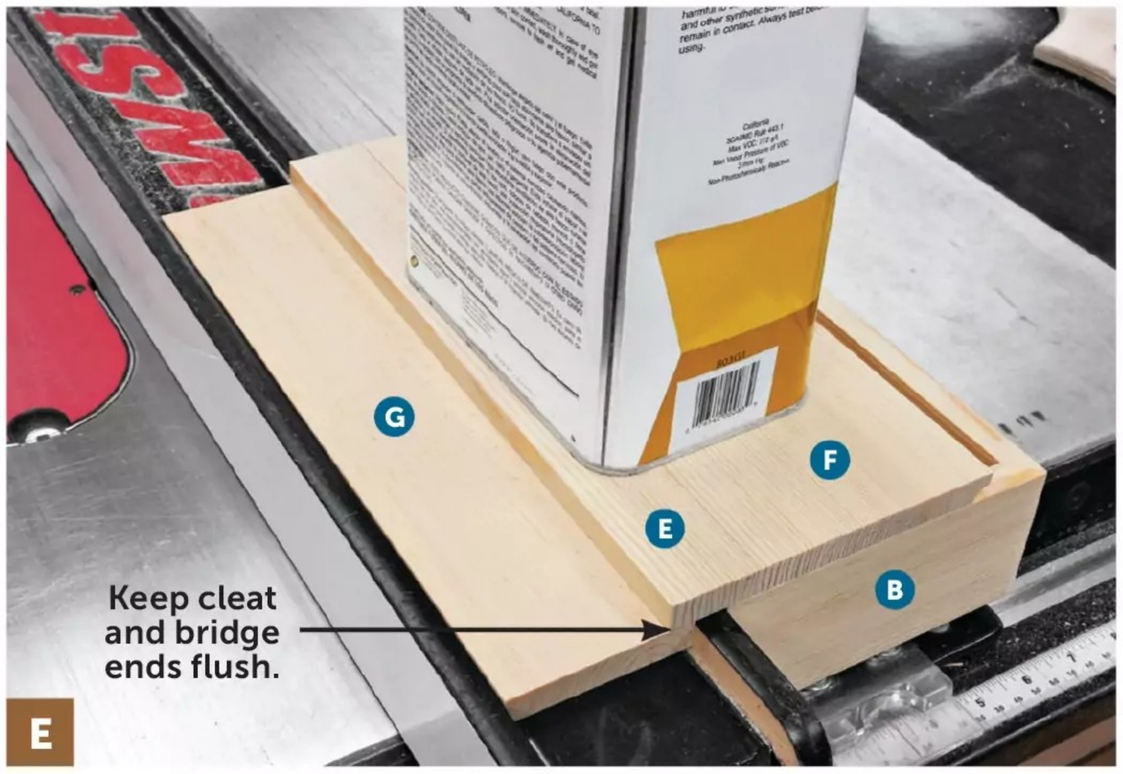
Cut the fence bridge and lid from the same board so the grain pattern matches.

1 From 1/2" stock, cut the fence bridge (E) and lid (F) to size **[Materials List]**. Clamp them face to face with their mating edges and ends flush and lay out the location of the barrel hinges 2" from each end **[Drawing 1]**. Use a square to transfer the mark across both pieces.

2 Make a scrapwood guide for drilling the barrel-hinge holes. Lay out lines on one face and edge of a 3/4×2×3" block. Drill a 25/64" hole at the drill press, on the layout line and 1/4" from one face of the block. Then cut a 3×6" cleat from 1/4" plywood and glue it to the block face closest to the hole. Using the guide, drill test holes in 1/2" scrap. When you reach the correct depth for your barrel hinges, mark the bit with masking tape. Then use the guide to drill the hinge holes in the bridge and lid **[Photo C]**.

4 Rout a 1/4" cove in the underside of the opposite edge of the lid to provide a finger grip **[Drawing 1]**.

5 To install the barrel hinges, start by tapping them into the lid (F), checking their alignment and adjusting as needed **[Photo D]**. Then align the hinges with the holes in the bridge (E) and tap the bridge to drive the hinges home.



Place coins beneath the cleat (G) if needed to bring its top face just proud of the height of the fence faces. Place a weight on the bridge/lid (E, F) to keep it tight against the cleat until the glue dries.

6 Apply glue to the edge of the box side (A) opposite the pushstick slot. Align the edge of the bridge (E) with the inside face of the box side (A) while keeping the ends flush, then clamp the assembly together.

PARTS LIST

PART		FINISHED SIZE T	W	L	Matl.	Qty.
A*	BOX SIDES	1/2"	2 5/8"	13"	P	2
B*	BOX ENDS	1/2"	2 5/8"	6"	P	2
C*	DIVIDER	1/2"	2 3/8"	12 1/2"	P	1
D	BOTTOM	1/4"	5 1/2"	12 1/2"	Ply	1
E	FENCE BRIDGE	1/2"	1 1/2"	13"	P	1
F	BOX LID	1/2"	4 3/16"	13"	P	1
G	FENCE CLEAT	1/2"	3"	13"	P	1
H*	PENCIL TRAY SIDE	1/4"	1/2"	13"	P	1
I*	PENCIL TRAY ENDS	1/4"	1/2"	2 9/16"	P	2
J	PUSHSTICK	1/2"	5 1/2"	11 3/4"	Ply	1

*Parts initially cut oversize. See the instructions.

MATERIALS KEY: P–pine, Ply–Baltic birch plywood.
BLADE AND BITS: dado blade, 25/64" drill bit, 1/4" cove and 1/8" round-over router bits.
SOURCE: 10mm hidden barrel hinges (1 pair) no. 28555, $17, rockler.com.
PROJECT COST: We built this for about $20 from scrap boards and plywood. Your cost will vary by region and source.

WRAP THINGS UP

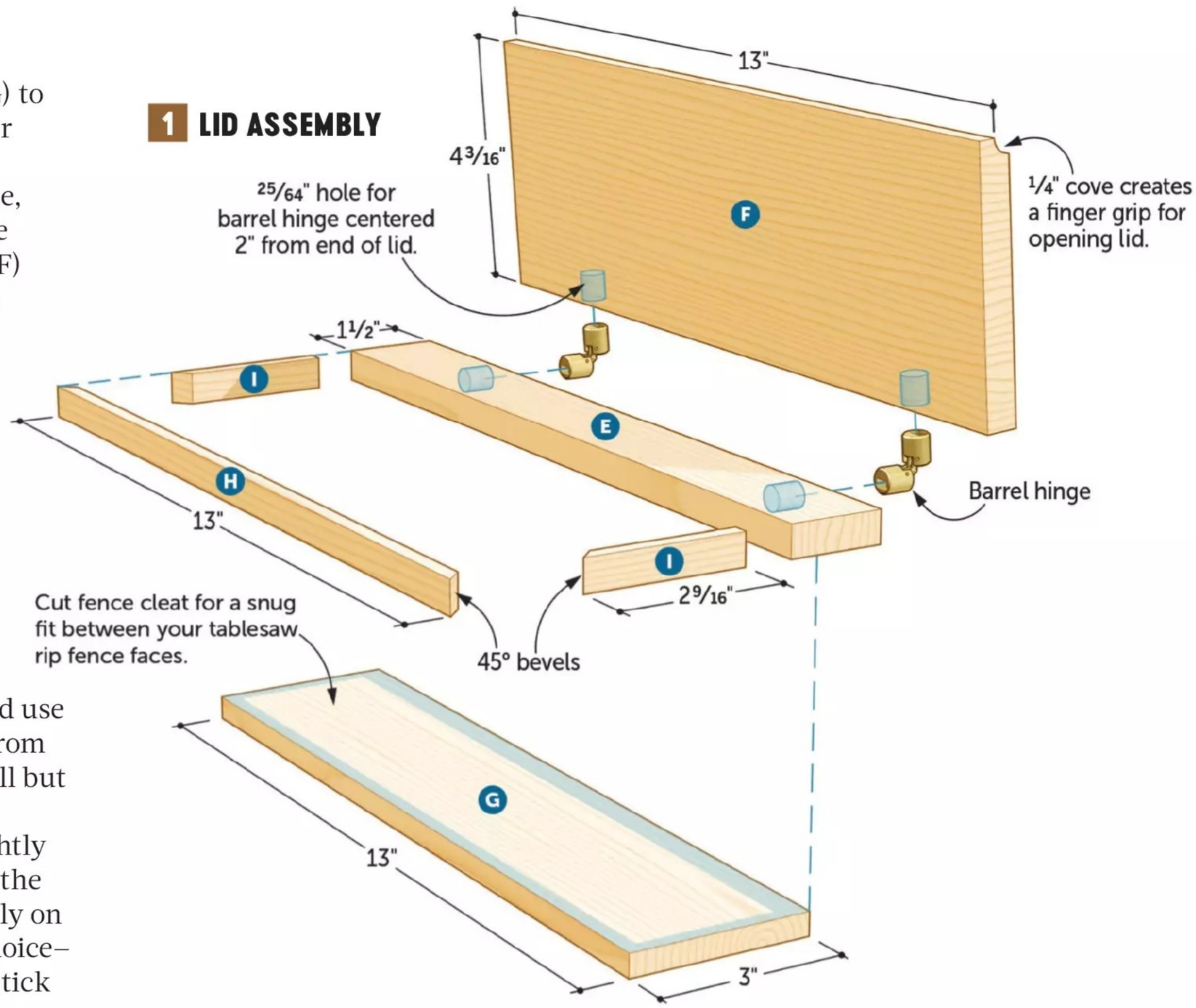
1 From 1/2" stock, cut the fence cleat (G) to a width that fits snugly between your tablesaw fence faces and to final length **[Drawing 1]**. Place the cleat on your fence, apply glue sparingly to one face near one edge, and position the box assembly (A-F) against the fence so it overlaps the fence cleat **[Photo E]**.

2 From 1/4" stock, cut the pencil tray side and ends (H, I) to width and slightly overlength. Bevel-cut the tray side to final length and bevel-cut one end of each end piece. Dry-fit the pieces to mark the tray ends for length, then trim the square ends as marked. Glue the tray side and ends into place and use painter's tape to hold them firmly until the glue dries.

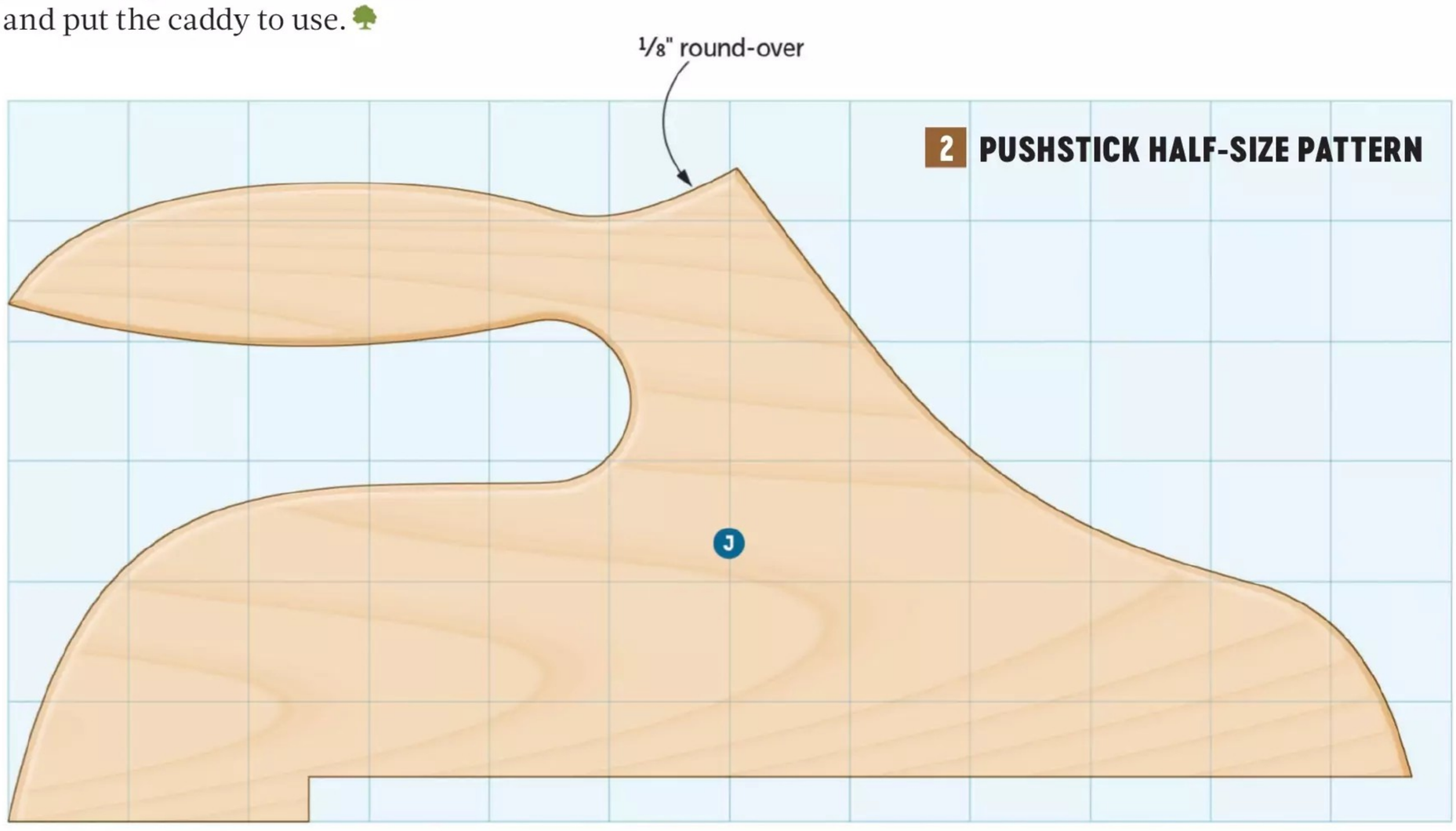
3 Enlarge the pattern **[Drawing 2]** and use it to cut the pushstick (J) to shape from 1/2" plywood. Rout a 1/8" round-over on all but the bottom edges.

4 Finish-sand the entire project, slightly rounding over the bottom edges of the fence cleat (G) to ensure it slides smoothly on the rip fence. Apply the finish of your choice—we used aerosol lacquer. Drop the pushstick into its slot, round up your other tablesaw accessories and put the caddy to use.

1 LID ASSEMBLY



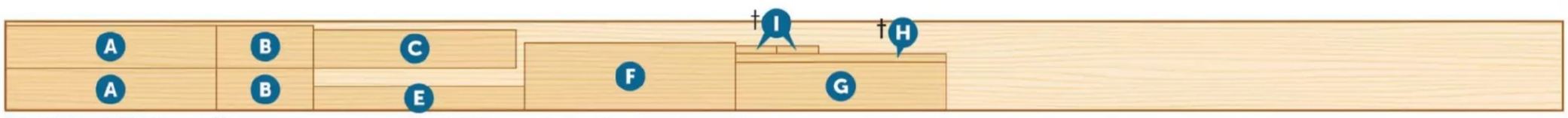
2 PUSHSTICK HALF-SIZE PATTERN



One square = 1"

CUTTING DIAGRAM

We used a clear pine 1×6×8' for this project. Before cutting parts to size, we planed them to the thicknesses shown in this example board.



1/2×5 1/2×96" Pine †Plane or resaw to the thickness listed in the Parts List.

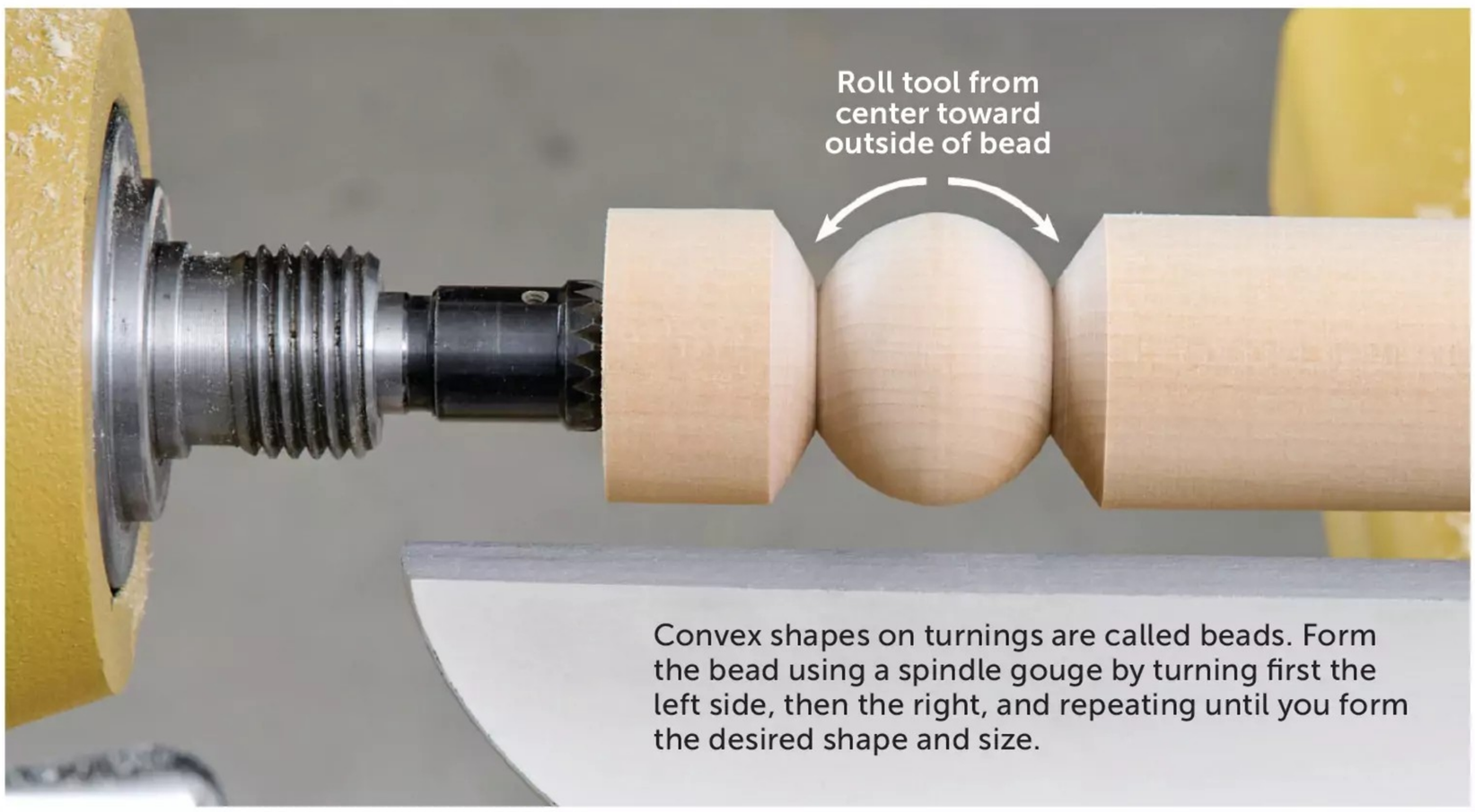
FIRST TOOLS FOR LEARNING TURNING

Purchasing a lathe is just the first step toward turning beautiful objects. You need to tool up, too. We narrow down your shopping list to the essential tools and accessories that will let you quickly pile up the savings—and the savings.

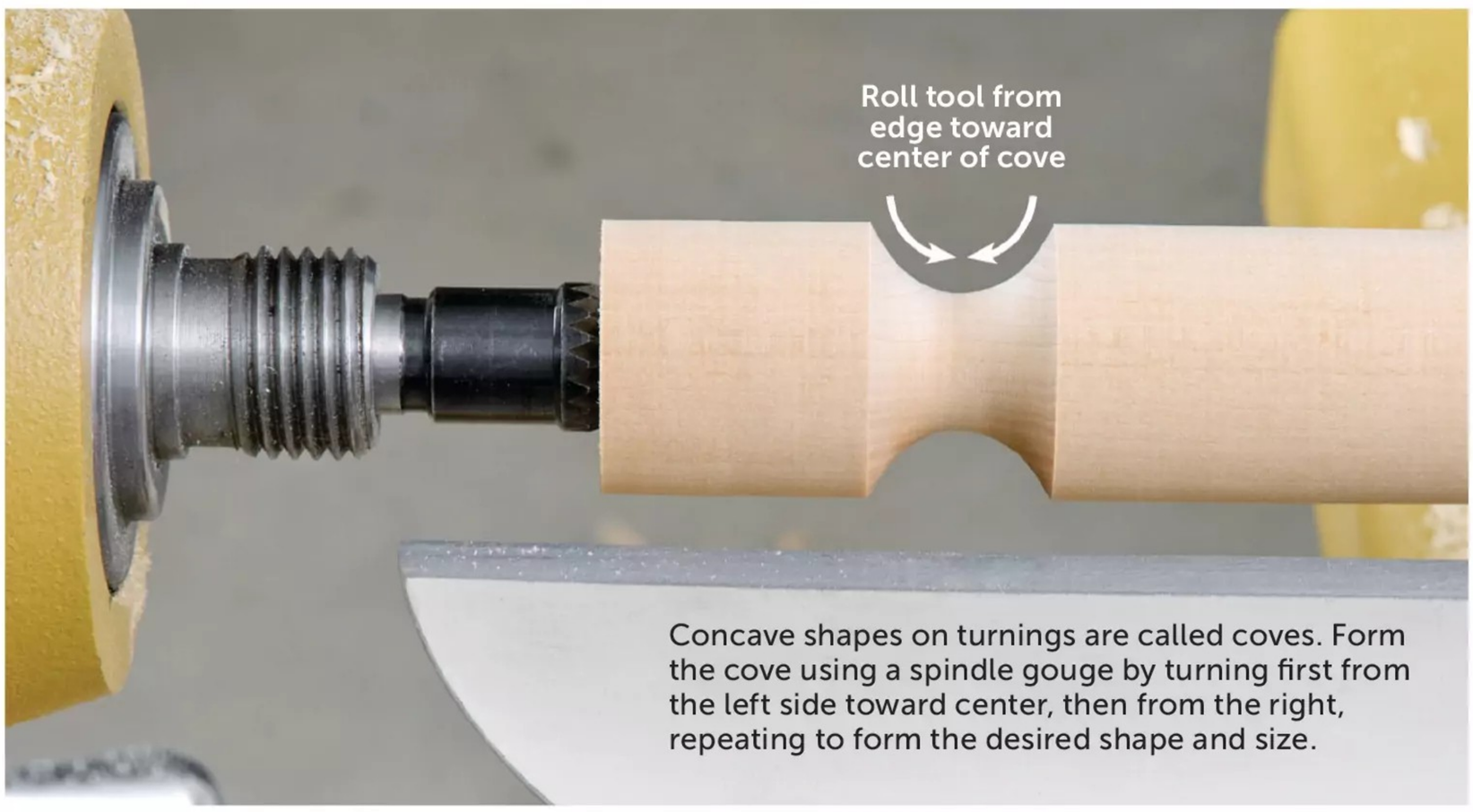
WRITER: BRIAN SIMMONS

PHOTOGRAPHER: JACOB FOX

A lathe without tools is like a router without bits. And like router bits, you'll find turning tools in a broad range of general purpose and highly specialized categories. (See *Dos and Don'ts for Tool Buying, page 63*). But the main consideration that should influence your first purchases is the type of turning you intend to do. At the most basic level, turning projects can be divided into spindle turning and bowl turning. With spindle turning, the grain of the workpiece runs parallel to the lathe axis. In bowl turning, the grain is perpendicular to the lathe axis. Choosing the correct tool depends first on the grain direction and, second, on the shape, or cut, you want to produce.



Convex shapes on turnings are called beads. Form the bead using a spindle gouge by turning first the left side, then the right, and repeating until you form the desired shape and size.



Concave shapes on turnings are called coves. Form the cove using a spindle gouge by turning first from the left side toward center, then from the right, repeating to form the desired shape and size.

START SHAPING SPINDLES

Any turning that places the wood grain parallel to the lathe axis is considered a spindle. To turn one, break it down into individual elements, which generally are a combination of raised beads, *top*, recessed coves, *above*, V-grooves, and straight lines. From those basic shapes, you can create an endless variety of spindle designs, but creating them only requires four tools: Two spindle gouges, a skew, and a parting tool, *next page*, and **Sources**.

Get tips for better spindle turning.
woodmagazine.com/spindleturning

TIP!

Facebook Marketplace and local woodturning clubs are great places to find deals on used turning tools.

Spindle-roughing gouge. This tool excels at turning a square piece of wood round, as well as removing a lot of material in a short amount of time. The tool is broad with a deep gullet and typically shaped with a 45° bevel set square across the end. This gouge serves mostly for rough work, but also proves useful for turning broad coves or beads. But it can't be used for bowl turning–where the grain is oriented perpendicular to the lathe axis. It isn't constructed to handle the forces applied to the cutting edge when interacting with the grain in this orientation.

Spindle gouge. Sometimes called a detail gouge, this turning tool shapes a spindle into its final form, one detail at a time. Use it to turn beads and coves of any size and shape. The tool is highly versatile with a 35° bevel and a fingernail grind. You'll typically use it with its bevel rubbing against the wood. However the edge of the wings can be used for shear scraping–contacting the wood with the cutting edge at a high angle that produces a fine shaving and a smooth surface. A spindle gouge can function as a roundnose scraper for hollowing end grain, a unique subcategory of spindle turning. Its shallow flute allows it to fit into tight details where other gouges won't reach.

FINGERNAIL GRIND

A cutting edge shape routinely used on spindle and bowl gouges, resembling a long fingernail because of its swept back wings.

A hardworking starter set for turning spindles includes (from top to bottom) a 1¼" spindle-roughing gouge, ½" spindle gouge, 1" skew chisel, and ⅛" parting tool.

A parting tool cuts a narrow slot perfect for locating and establishing the diameter of a spindle detail. Calipers set to the correct dimension make it easy to gauge the diameter.

Skew chisel. Think of this as the hand plane of the lathe. It excels at straight lines, like smoothing cylinders and tapers, and it's well suited for cutting V-grooves. With experience, it's also an excellent choice for turning beads, especially where beads intersect with other crisp details. The skew chisel might bear a resemblance to daily-use woodworking bench chisels, but mastering its 65° cutting angle held at 45° to the spinning workpiece can be one of the most challenging woodturning achievements. But practice will pay off with this versatile tool.

Parting tool. With a flat, narrow point (commonly 1/8" or 1/4" wide) this tool cuts quickly and leaves a flat surface. It serves two main purposes: First, as its name implies, to "part" or separate waste material from the finished project and, second, to establish a specific diameter in the turning's design, *previous page bottom*. Once established, those initial utility cuts become guides to inform the depth of finished decorative cuts.

ADD TOOLS TO TURN BOWLS

Brush up on bowl turning basics.
woodmagazine.com/bowlbasics

Just as you would switch between crosscut and rip-cutting blades on the tablesaw, your approach and tool choice should change when the grain is oriented across the lathe axis. This grain orientation is most commonly used for bowls, making the **bowl gouge** the tool best suited for the task, *below right*.

The design of the bowl gouge handles the additional forces applied by the interaction with end grain and side grain. The handle is typically a bit longer than other tools for added leverage when hollowing bowls. In contrast to spindle gouges, its unique parabolic flute quickly shapes your bowl yet provides the finesse needed to leave a smooth finish. With a 65° bevel and a fingernail grind, you can still rub the bevel inside bowls or shear-scrape an elegant exterior shape without tearing the grain.

If you fall very far down the bowl-turning rabbit hole (and you should), strongly consider adding a four-jaw chuck. (See *Next Step? Accessorize, next page.*) For that, you'll need to add a 1/2" **square scraper** to your bowl-turning tool lineup.

DOS AND DON'TS FOR TOOL BUYING

- ***DON'T*** buy lower-priced tools made from carbon steel. They sharpen easily but dull quickly.
- ***DO*** choose high-speed steel (HSS). These tools hold their edges longer and don't overheat in use or during sharpening.
- ***DO*** look for tools manufactured in England and North America. They're the highest quality.
- ***DON'T*** buy tools in sets. They often compromise quality and selection to hit a particular price. Invest in individual tools that meet your needs.
- ***DO*** choose full-size turning tools even if you have a mini or midi lathe. You can create small shapes with big tools, but you can't create big shapes with small tools.
- ***DON'T***, while you are learning, choose tools with replaceable carbide tips. They're essentially scrapers, meaning they don't account for grain direction, and will not yield results as good as traditional tools for a beginner.

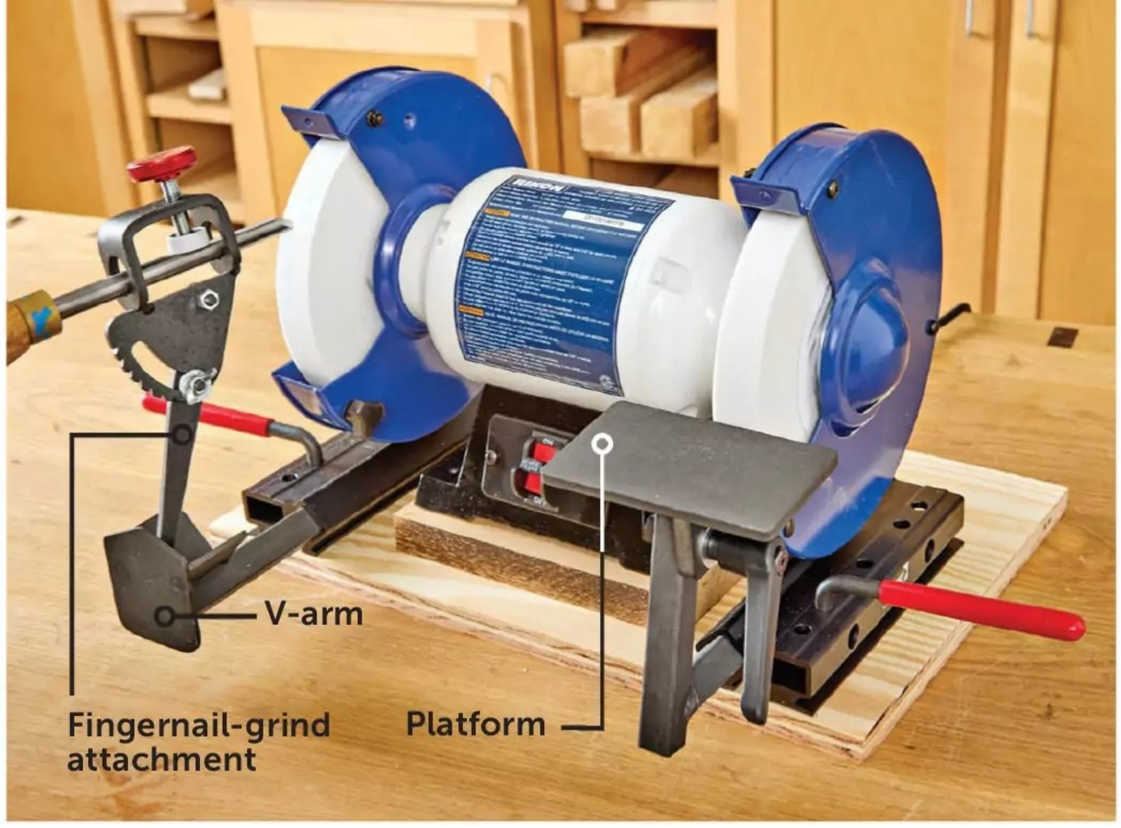
The deep flutes and sturdy design of a bowl gouge (*top*) make deep cuts needed to shape the inside and outside of a bowl. A square scraper (*bottom*) creates tenons or recesses used to mount to a four-jaw chuck.

LOOK SHARP

Turning tools dull quickly and require frequent sharpening–sometimes multiple times during a single project. These tools are sometimes ungainly, and have bevel angles and odd shapes not at all like bench chisels. So, even folks skilled at sharpening woodworking tools sometimes get thrown off. Thankfully, lathe tools don't require precision sharpening like bench chisels. You just need to restore a sharp edge quickly and repeatedly.

A **bench grinder** equipped with a 60– to 80–grit aluminum-oxide wheel provides the most efficient way to sharpen turning tools. Even though high-speed steel won't overheat when sharpening, a slow-speed grinder still proves the best choice. It keeps the tools cooler to the touch, and won't grind away large amounts of steel quickly like a standard grinder will.

To make the process even easier, invest in a **grinding jig**, *above right*. While a grinding jig won't ensure your tools are sharpened perfectly, it will ensure they're sharpened consistently. That lets you focus on your turning, rather than having to constantly adapt to a different feel caused by inconsistent bevel angles from one sharpening to the next.



The platform on a Wolverine jig holds flat tools at a consistent angle. The V-arm holds the handle on cylindrical tools as you grind rounded bevels, and it accepts an attachment for sharpening fingernail grinds.

A four-jaw chuck can grip a tenon formed on the top face of a bowl blank as you shape the bowl's exterior. Use a square scraper to carve a recess on the bottom, then flip the bowl around so the jaws can expand outward to grip the recess.

NEXT STEP? ACCESSORIZE

TIP!

Turn bowls without a four-jaw chuck using a wooden face plate and super-sticky turner's tape.

You can turn bowls without a **four-jaw chuck**, *right*. Once you've used one, though, you'll wonder how you lived without it. This accessory mounts in place of the drive center on the lathe headstock. Its moving jaws compress inward to grip a tenon, *above*, or press outward to grip the walls of a recess.

A chuck is great for bowls, but also handy for knobs, pulls, handles, vases, finials, *page 60*, and more.

Whether you become a bowl turner or you stick with spindles, a set of **outside calipers** is another must-have turning accessory. Simply set them to the dimension you want, and then gauge your depth of cut as you turn to dial in precisely measured details on a spindle, *page 63*, or to find consistent wall thickness on a bowl, *below*.

Most lathes use No. 2 Morse tapers to mount the drive center in the headstock and the live center in the tailstock. That allows you to upgrade centers to higher-quality versions, *right*. And you can even borrow the drill chuck from your drill press to bore holes using drill bits at your lathe.

With these basic tools and your selected accessories, it's time to collect a bunch of scrap and start practicing your spindle- and bowl-turning techniques. You'll be making boring, square pieces of wood into attractive rounded shapes in no time.

An aftermarket live center (*top*) will outlast most stock centers and offers versatile tailstock support. A safe-drive center (*bottom*) acts as a slip clutch between the lathe and wood in the event of a catch.

> **"A SET OF BASIC TOOLS AND A FEW ACCESSORIES PROVIDE ALL YOU NEED TO TACKLE A WIDE ARRAY OF PROJECTS WHEN YOU BECOME FAMILIAR WITH THEIR CAPABILITIES."**
>
> ***-BRIAN SIMMONS, PROFESSIONAL WOOD TURNER***

Wall thickness of a bowl can be hard to visualize or to feel with your bare hands. A set of outside calipers, adjusted to the thickness you desire, makes checking easy so you get consistent results.

SOURCES:

- Sorby 1¼" spindle-roughing gouge no. S84349, $130; Sorby ½" spindle-detail gouge no. SZ00010, $70; Crown ¾" skew chisel no. CN270RAZW, $60; Sorby ⅛" parting tool no. S83042, $60; Sorby ⅜" bowl gouge no. S84245, $100; Crown ½" square scraper no. CN00253, $49; woodworkingshop.com
- Rikon 8" slow-speed bench grinder no. 58541. $180; Oneway Wolverine grinding jig no. 24707, $104; Oneway Wolverine Vari-Grind attachment no. 24714, $71; Sorby calipers no. GRP2465, $45; rockler.com
- Oneway Talon Chuck no. 1036470002, $267; Oneway Safe Driver no. 1031860001, $49; Oneway Multi-tip Live Center no. 1046300002, $139; woodturnerscatalog.com

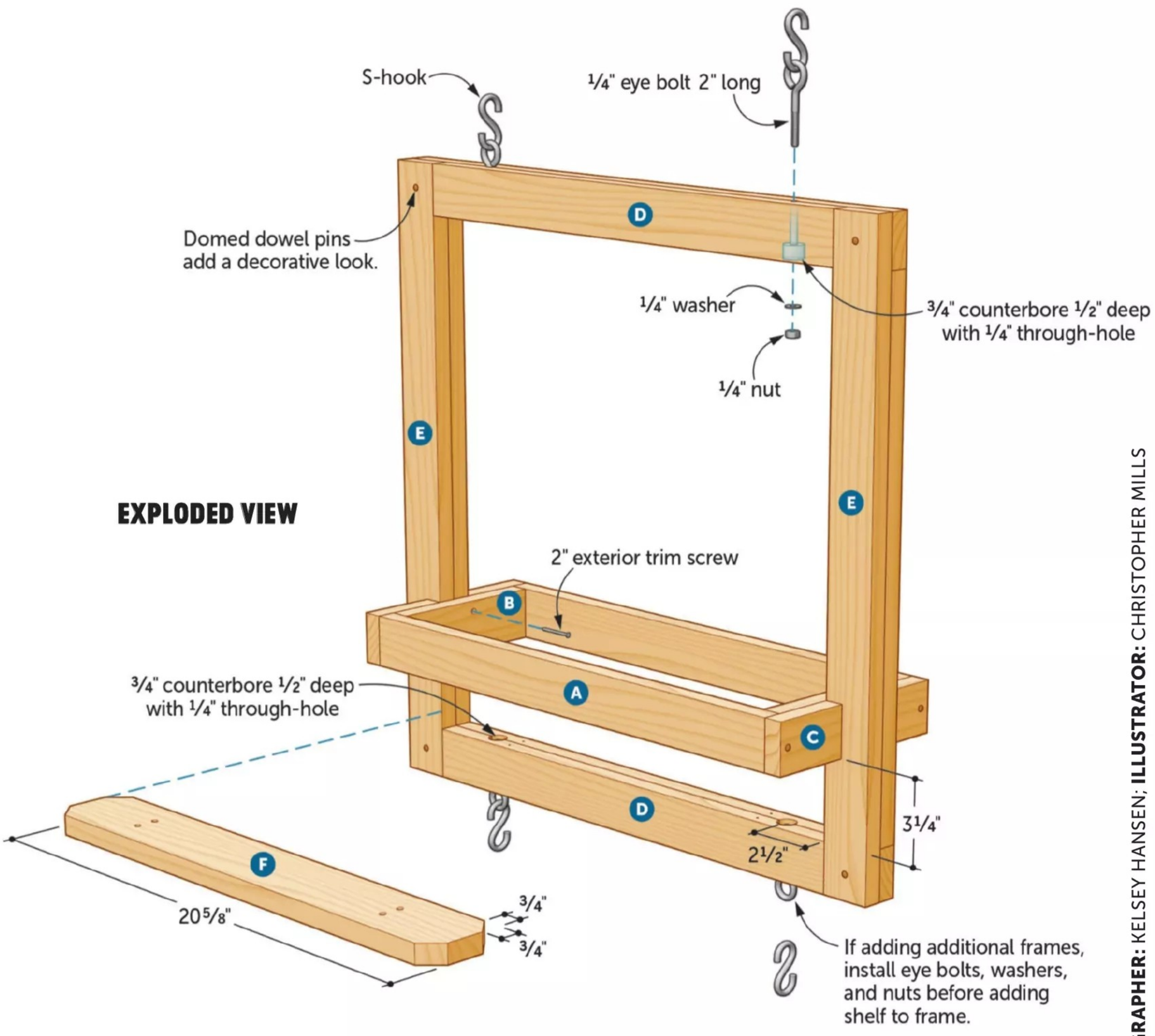
HANGING GARDEN

Create an outdoor wall of cascading flowers or greenery with these easy-to-build, easy-to-love planters.

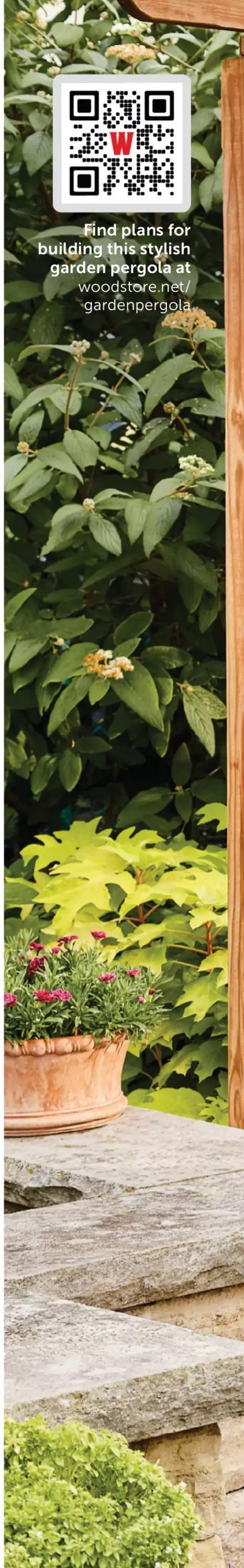
WRITER: VINCE ANCONA
DESIGNER/BUILDER: JOHN OLSON

Whether you're short on space or just want to add some greenery to a balcony or terrace, these modular planter frames are just what the gardener ordered. Suspended from an eave or trellis, they don't require any floor space. Start with one, then add extras as your garden grows.

EXPLODED VIEW



OVERALL DIMENSIONS
24⅝"W × 7⅞"D × 27"H



Find plans for building this stylish garden pergola at woodstore.net/gardenpergola

PHOTOGRAPHER: KELSEY HANSEN; **ILLUSTRATOR:** CHRISTOPHER MILLS

RACK 'EM UP

Each module consists of two components: a rack to hold the pots and a frame to support the rack. We sized our rack to hold three 6" clay pots. To tailor the design for other sizes, see *A Planter With Pot-ential, below.*

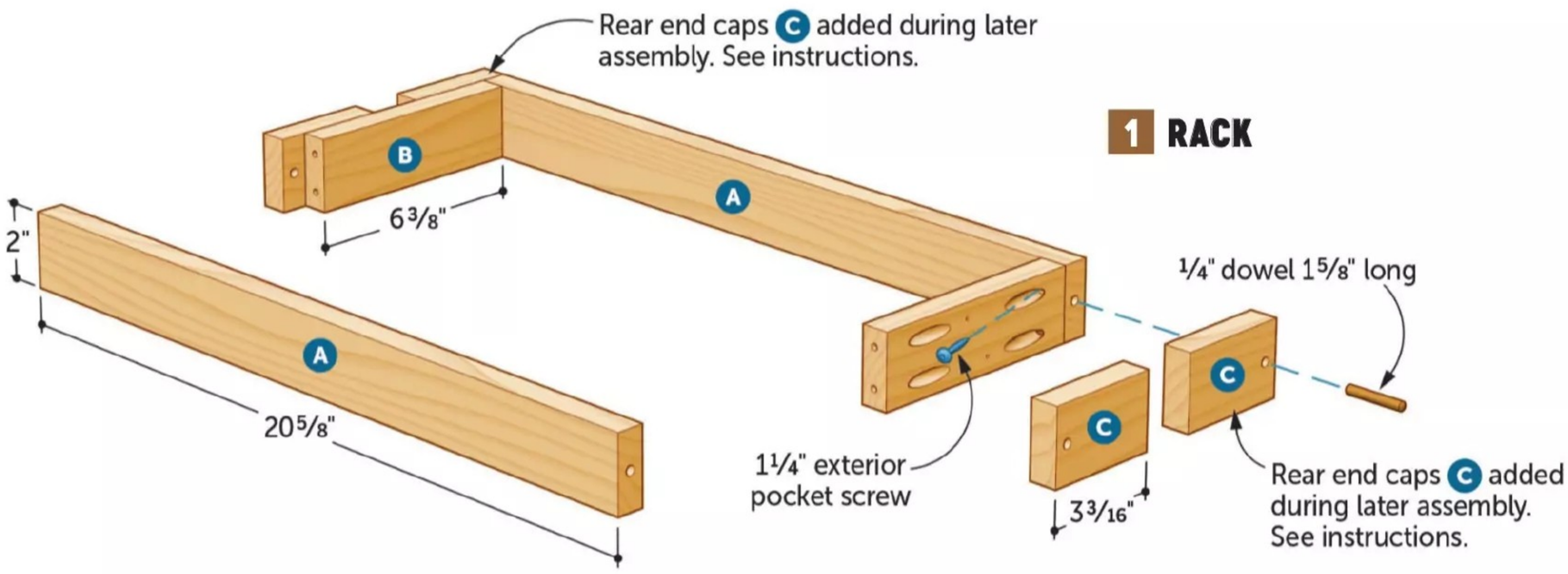
TIP!

Choose a wood suitable for outdoor use, such as cedar or redwood.

1 Cut the rack front/back (A) and ends (B) to size **[Parts List, Drawing 1]**. Drill pocket holes in both ends of each rack end (B) **[Drawing 1]**.

2 Glue and clamp the ends between the front and back, with the pocket holes facing outward. While the glue starts to set, screw the corner joints together **[Photo A]**.

3 Cut the end caps (C) to size **[Drawing 1]**. Glue two of the end caps to the ends of the rack, flush to the front **[Exploded View]**. Leave the end caps for the back off for now.



A PLANTER WITH POT-ENTIAL

Because terra cotta pots may vary in diameter from manufacturer to manufacturer, it's a good idea to have your pots on hand before you begin building. This allows you to size the rack and frame parts to fit. Place three pots in a row and measure the overall length and width, *right*. Add ¼" to each dimension for clearance and size the rack so the inside opening matches these dimensions. Keep in mind that changing the length of the rack will also require you to change the length of the frame pieces.

Using an exterior-grade glue (like Titebond III), glue and clamp the rack ends (B) between the front and back (A). Then drive exterior pocket screws into the joints.

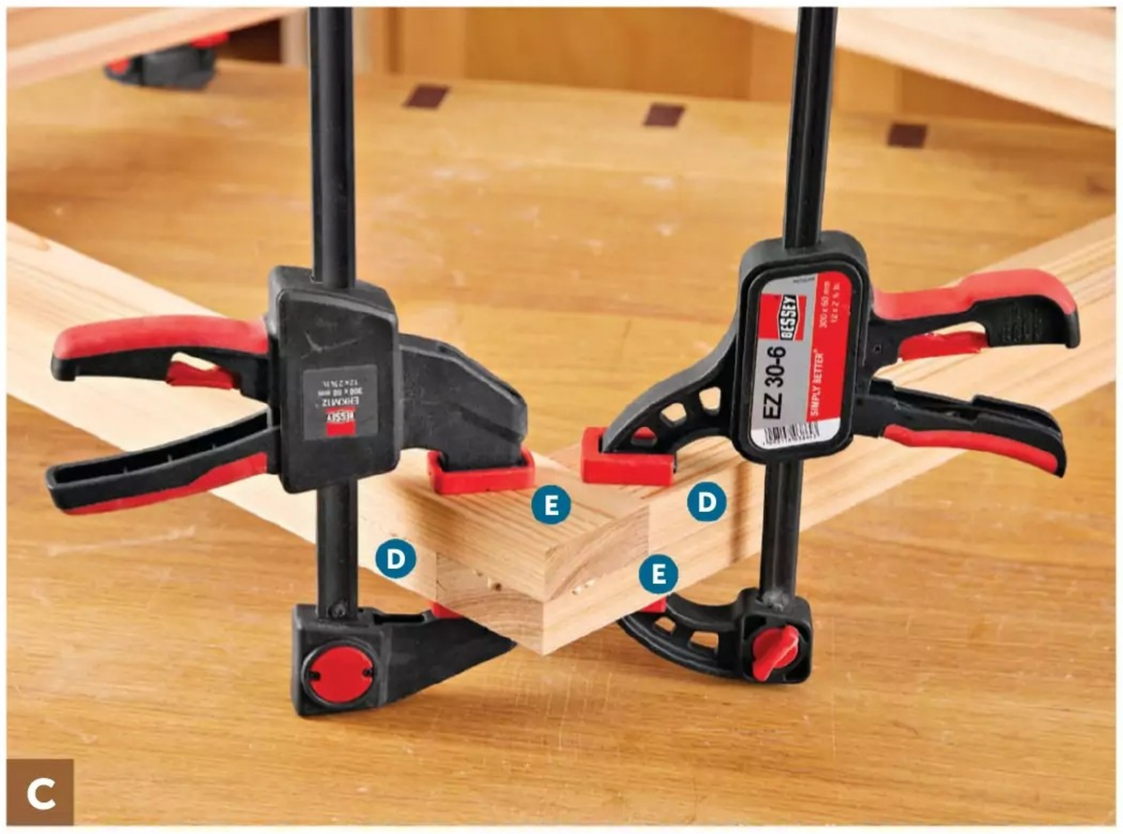
Glue and clamp the frame pieces (D, E) together, checking for square. Then drive pocket screws through the short rails (D) and into the long rails (E). Repeat the process for the second frame assembly.

CREATE A STURDY FRAME

1 Cut the short (D) and long (E) frame rails to size **[Drawing 2]**. Drill pocket holes in the ends of the shorts rails.

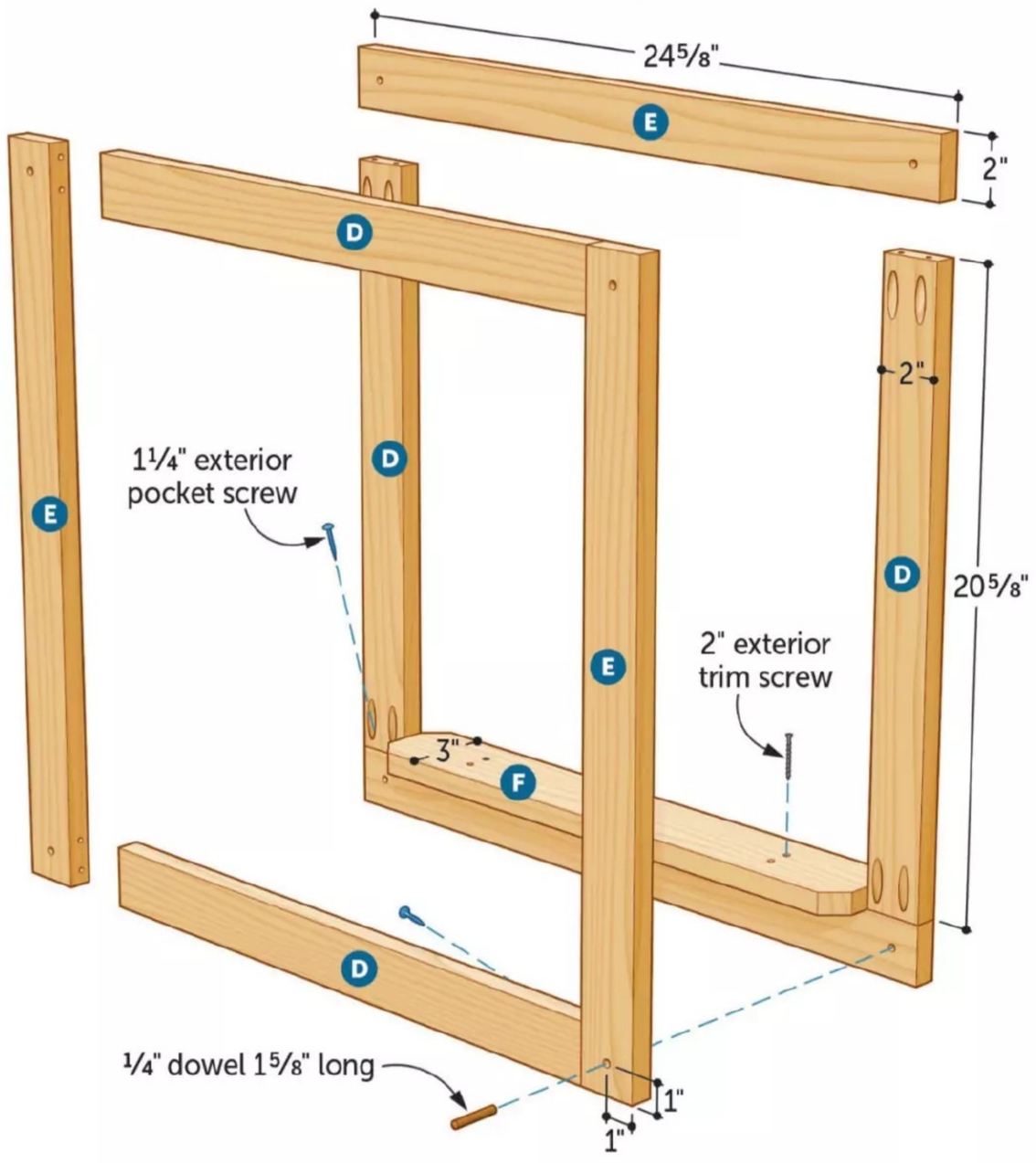
2 Glue and clamp the shorts rails between the long rails, keeping the ends and edges flush, then drive the pocket screws home **[Photo B]**.

3 Glue and clamp the frame halves together in pairs, overlapping the corner joints **[Photo C]**.



Glue the frame halves together with the pocket holes facing inward and the orientation of the short and long rails alternating. Keep the frames flush and aligned as you tighten the clamps.

2 FRAME



> **CUSTOMIZE THE SIZE OF THE RACK TO FIT YOUR POTS AS WELL AS YOUR SPACE. A WELL-PLANNED SET OF THESE HANGING RACKS INTERCONNECTS TO CREATE A PRIVACY SCREEN FOR A PATIO OR BALCONY.**
>
> ***-JOHN OLSON, DESIGN EDITOR***

4 Cut eight ¼" dowels to 1⅝" length and round over the ends of each **[Photo D]**. Drill a hole through each corner of the frame **[Drawing 2]**. Glue four of the dowels into place through the holes **[Photo E]**. Set the remaining four dowels aside.

5 Glue and screw the rack assembly (A–C) to the inside edges of the frame **[Photo F]**.

6 Glue the remaining two end caps (C) to the ends of the rack. Drill a ¼" hole through the face of each end cap and into the ends of the rack front and back (A), then glue the remaining dowels in place **[Photo G]**.

“TO PROVIDE A VISUAL DETAIL, I CUT WALNUT DOWELS TO LENGTH AND DOMED THE ENDS TO STAND SLIGHTLY PROUD OF THE FRAMES.”

-JOHN OLSON, DESIGN EDITOR

Using a core-box bit, rout a groove down the center of a piece of scrap and apply adhesive-backed sandpaper. Chuck the dowel in a drill and spin it over the abrasive on low speed to dome the end.

Drill holes through the center of the corner joints, steering clear of the pocket screws. Spread glue near the ends of the dowels and drive them in with a mallet so they protrude equally from each face.

Attach the rack 3¼" from the bottom rail of the frame assembly with glue and exterior-grade trim screws. Stagger the screws to avoid the joint line between the two halves of the frame.

Glue and clamp the remaining end caps (C) to the rack assembly. After the glue dries, remove the clamp, drill holes, and drive a dowel pin into each corner.

SHELVE THIS PROJECT

1 Cut the shelf (F) to size **[Parts List]** and test the fit in the frames. Miter-cut the corners **[Exploded View]** and set the shelf aside for finishing.

2 Working from inside the frame, drill counterbored holes at the top for eye bolts to hang the frame and at the bottom if you intend to add more frames **[Exploded View]**.

3 Apply exterior finish to the frame, rack, and shelf. We applied three coats of water-based spar varnish, sanding with 320-grit sandpaper between coats to knock down the raised grain. Make sure to work finish into the eye bolt holes.

4 Mount the eye bolts with washers and nuts. Screw the shelf to the frame with exterior trim screws. Then hang your garden frame, fill it with pots, and let your green thumb take over.

PARTS LIST (for one frame)

PART		FINISHED SIZE T	W	L	Matl.	Qty.
A	RACK FRONT/BACK	¾"	2"	20⅝"	C	2
B	RACK ENDS	¾"	2"	6⅜"	C	2
C	END CAPS	¾"	2"	3 3/16"	C	4
D	FRAME SHORT RAILS	¾"	2"	20⅝"	C	4
E	FRAME LONG RAILS	¾"	2"	24⅝"	C	4
F	SHELF	¾"	3"	20⅝"	C	1

MATERIALS KEY: C–cedar
SUPPLIES: ¼" walnut dowel, ¼×2" stainless steel eye bolts, ¼" stainless steel washers, ¼" stainless steel hex nuts, 2" stainless steel S-hooks, 1¼" coated pocket screws, 2" exterior trim screws
BITS: ¾" Forstner bit, ¼" brad-point bit, ½" core-box router bit
SOURCES: 6" orange clay pots (3) no. 94450, $4 each, lowes.com
PROJECT COST: It cost us about $60 (per frame) to build this project. Your cost will vary by region and source.

CUTTING DIAGRAM

We purchased dimensional cedar boards in the sizes shown. If you're buying rough lumber instead, you'll need 8 board feet of 4/4 cedar. Before cutting parts to size, plane rough boards to the thicknesses shown in these example boards.

¾×5½×96" Cedar

¾×5½×96" Cedar

KEEP YOUR WORK ON TRACK

A collection of workholding accessories from Milescraft (milescraft.com) creates more ways to utilize T-tracks incorporated into a benchtop, jig, or CNC bed. Slip any of these holders into a standard track to help keep project pieces in place.

PHOTOGRAPHERS: CARSON DOWNING, JACOB FOX

Stops for flat and curved shapes

CamStops work like bench dogs but slip into T-track, where they can rotate 360° and lock down. MultiStops do the same with the twist of a knob, but have two small ears that separate the contact points to better hold curved or irregular shapes.

CamStops no. 4031, $17 (set of four); MultiStops no. 4034, $17 (pair)

Small stops go big

The CamStop XL works just like its smaller sibling, but offers a 6"-long face and two locking cams that combine to offer better support for large workpieces.

CamStop XL no. 4032, $17 (pair)

Half- and whole-sized hold-downs

Hold-downs in two sizes prove handy for pressing workpieces down against the benchtop. Both sizes are reversible and have soft rubber pads on both ends to increase holding power and prevent marring.

HoldDown 100 no. 4035, $17 (pair); HoldDown 200 no. 4036. $22 (pair)

Get in-line

In-line clamps secure workpieces against the included ClampStops (or your existing bench dogs). With 360° rotation and 3¾" of travel, they're versatile and adjust easily. At less than ¾" tall, they also stay safely below the face of most materials.

In-line clamps, no. 4030, $33 (pair)

Multi-angle corner catcher

Detents every 5° lock the fences on the AngleStop in place at 60° to 180° from one another to hold corner assemblies in place. Adjustment range actually extends beyond the stops but without marks to indicate the angle. Locked in, the angles prove accurate and hold well.

AngleStop no. 4033, $22

continued on page 74

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SHOP-TESTED

RETRACTABLE CASTERS LIFT AND LOCK WITH EASE

Tester: Dave Stone

I've tried several types of casters for my tool stands and workbenches that were designed to flip up or swing away when not needed, leaving the stand sitting on its legs. Most proved clumsy or unreliable or lacked sufficient weight capacity. So I tried Smart Casters with skepticism.

These casters, though, work as advertised. Simply lift the end of the stand or workbench up 1" and each caster drops down and locks in place, holding the leg off the floor. Lift again, and the casters automatically retract into their housings as you set the leg back down. It's simple and worked every time. Each caster swivels and rolls easily over my moderately smooth shop floor. Capacity is 175 lbs per caster.

I was also pleasantly surprised with how easy the casters were to install. They come with square-drive screws and the long drill and driver bits needed to reach through the caster bracket during installation. I tried a set of four on a workbench, as well as a pair on a shop-built stand that has large wheels on one end but whose other end is too heavy to carry. Not anymore. Now it rolls easily with a simple lift but stays put when in use.

Retractable Caster, *retractablecaster.com*
Smart Caster no. R7, $70 (set of four)

SHOP-TESTED

ROUTER JIG CUTS DOVETAIL SLOTS FOR MATCHFIT CLAMPS

Tester: Dave Stone

I like MicroJig's MatchFit system of clamps that slide in dovetail slots cut into a worksurface. I haven't liked routing the grid of slots the system depends upon. It's a two-step process, requiring a straight bit to rout away most of the waste, then a dovetail bit to finalize each slot's shape.

The company's new router guide makes routing the grid easy. The guide comes with a base that holds your router, along with the ¼" straight bit and ½"×14° dovetail bit required (both in ¼" shank so they'll fit full-size or trim routers).

Using the jig proved easy. It centers the router automatically over the hole and secures it with a pair of onboard clamps. Install the straight bit, then make a pass with the long key on the underside of the jig base riding along the edge of your surface. Move the jig over, placing the key in the slot you just cut, and make another pass to cut a parallel slot 4" away. Then repeat. After completing your desired grid, swap to the dovetail bit and rout again, working from the opposite direction to ensure the key fits tight in each slot.

With this simple and foolproof system, I anticipate incorporating MatchFit clamping into many more worksurfaces and jigs

MicroJig, *microjig.com*
MatchFit Grid Router Guide Kit no. MFRG-400-025, $99

SHOP-TESTED

GRIPPY TRAYS GRAB SHARPENING STONES

Tester: Kerry Gibson

My sharpening stones don't reside in dedicated holders, so I used to rely on a pan and a piece of shelf liner to hold them in place and contain the water as I sharpened my chisels and irons.

Rockler's silicone sharpening trays make the process a whole lot easier. I was impressed with the heft and sturdiness of each 6×12" tray. The silicone is thick, and the raised center area, at 3×9", is large enough to support any stone I own. The deep well surrounding the raised area contains the water, so there's no mess. I appreciate that the trays, which are sold individually, lock together side by side, so I could line up my stones and work from grit to grit easily. You can also stack the trays or hang them for storage while allowing them to drip dry.

Rockler, *rockler.com*
Silicone Sharpening Stone Tray no. 74995, $20

Triple Play

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• 3-piece set: 9" overall fixed knife with 5" blade; 4 ⅛" trapper knife with two 3 ⅜" blades; 4" overall lockback knife with 3" blade • Stainless steel blades with antler patterned resin handle • Comes in decorative display box

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WHAT'SAHEAD

A GLIMPSE INSIDE THE NOVEMBER ISSUE (ON SALE OCTOBER 17)

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