

WOOD®

The World's Most Trusted Woodworking Resource

2021's Most Innovative New Tools

 p.46

Plus These Great Plans

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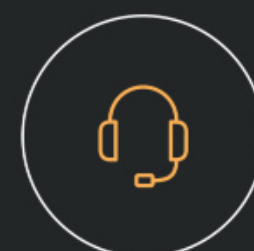
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TAKING MEASURE



Sharing gifts

Once again, it's the most wonderful time of the year, when we gather with family and friends to reflect on the past year and look with hope to the new one. Even media outlets get into the game with their year-end reviews and new-year previews. (Shameless plug: Check out our 2021 Innovate Awards on *page 46*.)

Any look back on the dumpster-fire year of 2020 will undoubtedly focus on the negatives. And there's a cornucopia of crap to spotlight. But—for whatever reason—I'm a glue-bottle-is-half-full kind of guy, believing there are always good stories in the midst of all the bad.

For example, about a month after the pandemic hit, we saw a spike in views on our YouTube channel at the time of year when views generally trend downward, as woodworkers transition to outdoor activities. I also noticed an uptick in emails from readers sharing their project photos with us.

As I checked in with tool manufacturers and woodworking retailers over the next weeks and months, *every one* of them said business was so good, they were running out of product. A few told me they set all-time sales records.

With extra time on their hands, it seems woodworkers are using it to improve their shops, upgrade their equipment, and ratchet

up their skills. And non-woodworkers are trying their hands at making furniture, if only out of sheer boredom. (I'm grateful people are trying out our hobby because I know they'll love it once they do.) Thing is, all those newbies are going to need trustworthy, reliable guidance to grow their skills.

That's where you come in.

If you renew your subscription to **WOOD**® magazine right now, I'll give a **free one-year subscription** to one or two up-and-coming woodworkers you name. To take me up on this offer, visit woodmagazine.com/givetwo or simply point your smartphone's camera at the code, *below*. Do it now so those free issues will start arriving shortly after the holidays.

I hope you'll also invest some of your extra time to mentor and share your gift of knowledge with the recipient. That's the gift that keeps on giving.

Merry Christmas, and I'll see you in the shop!



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GO BIG OR GO HOME!

Did the dovetail-jig workstation on page 58 whet your appetite for more? Well, More is our middle name. That's right: *WOOD More Magazine*. It's an old family name. Only our mom actually calls us that. Usually when she's angry.

MORE DOVETAIL JIGS

We review seven—count them, seven!—dovetail jigs at once. Read about our picks before you slap one on your new workstation.

woodmagazine.com/moredovetails

DOUBLE DOWN ON THE DOVETAILS

Two sets of dovetails in the space of one? Double the dovetails; double the fun. woodmagazine.com/doubledovetails

BIGGER IS BETTER

Anyone who says otherwise is lying. Here's a technique that eliminates the panel-size limits of your dovetail jig. woodmagazine.com/biggerisbetter

GET 'ER DONE FASTER

We're not talking 30-minute dovetails or even 15-minute dovetails. We're talking about using your dovetail template to plow through a whole set of dovetails in 12 minutes.

woodmagazine.com/fasterdovetails

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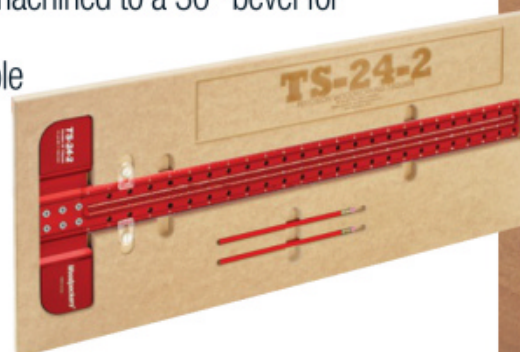
12" 1281 Square....**\$119.99**

12" 1282SS Stainless Steel Square.....**\$159.99**

Other Sizes Available on **Woodpeck.com**

Precision T-Squares

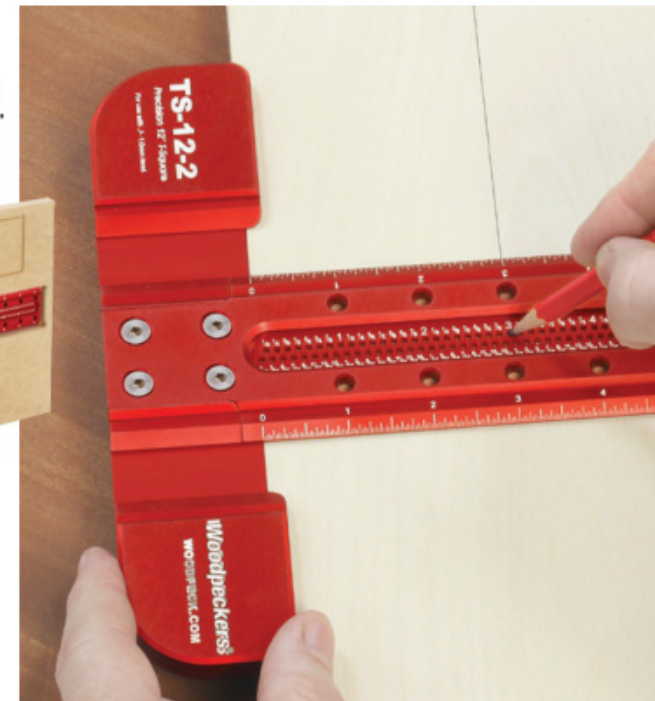
- Precisely spaced 1mm holes machined every 1/16".
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- Outer edges machined to a 30° bevel for easy reading.
- Wall-mountable storage case.



12" TS-12 T-Square.....**\$94.99**

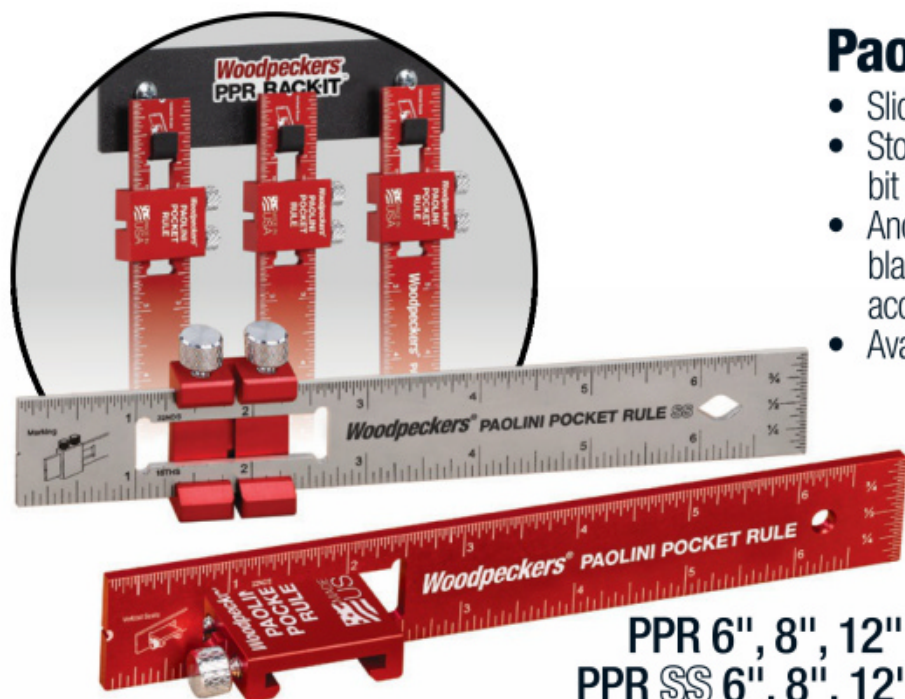
24" TS-24 T-Square.....**\$129.99**

32" TS-32 T-Square.....**\$159.99**



Paolini Pocket Rules

- Sliding stop simplifies repetitive marking.
- Stop doubles as stand to set router bit & saw blade height.
- Anodized aluminum or stainless steel blade with laser engraved scale accurate to $\pm .004"$.
- Available in inch, metric or combination.

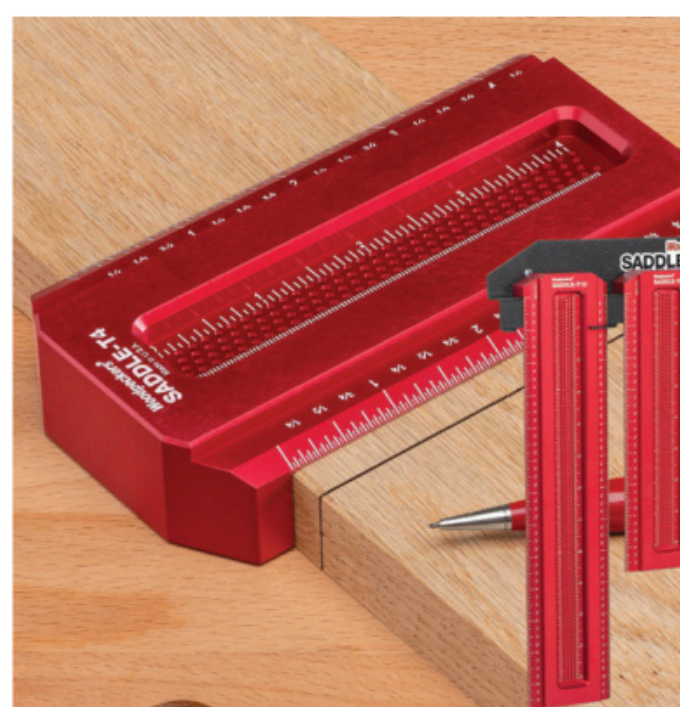


PPR 6", 8", 12" Set & Rack-It.....**\$124.99**

PPR SS 6", 8", 12" Set & Rack-It....**\$149.99**

Saddle T-Squares

- Scribing holes on 1/32" spacing.
- One-piece construction with 3/4" deep wrap-around marking.
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- Available in inch or metric.



4" Saddle T-Square.....**\$54.99**

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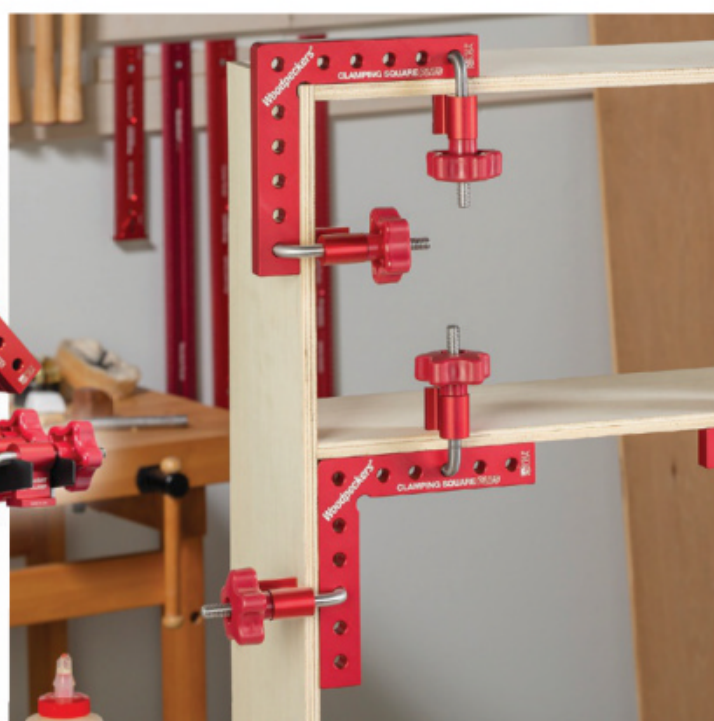
8" Saddle T-Square.....**\$94.99**

12" Saddle T-Square.....**\$114.99**

Saddle T-Square Set
& Rack-It.....**\$299.99**

Clamping Squares PLUS & CSP Clamps

- Positions stock at right angles for joinery & fastening.
- Precision milled for both inside & outside alignment.
- Works with any clamp.
- CSP Clamps add speed & convenience.



Clamping Squares PLUS
Rack-It Kit....**\$239.99**

Clamp Rack-It™

- Holds up to 6 heavy-duty parallel jaw clamps.
- Installs on any stud or solid wall surface.
- Simple installation with (2) lag bolts (included).



Clamp Rack-It 4-Pack....**\$119.96**

Clamps not included.

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by **Woodpeckers®**

Parting Tool-Ci

- Creates crisp, clean, narrow parting cuts.
- Sharpest, longest lasting carbide inserts on the market.
- 3/32" cutting width saves stock & minimizes resistance.
- Two insert profiles:
 - Fluted cutter installed
 - Square cutter optional

Parting Tool-Ci....**\$79.99**

Woodturning Tools

- Eliminate the drudgery of sharpening with nano-grain carbide inserts mounted to hardened alloy steel shafts.
- Sharpest, longest lasting carbide inserts on the market.
- Exclusive shaft design delivers both fast shaping & fine finishing.
- Square, round & detail tools available individually or as a set.

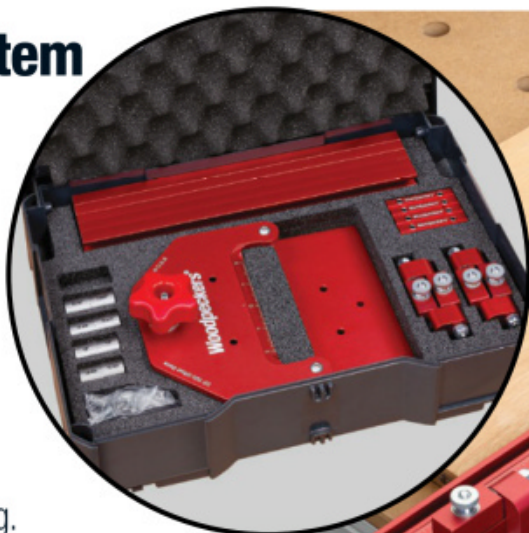
Mid-Size Woodturning Tool Set**\$269.99**



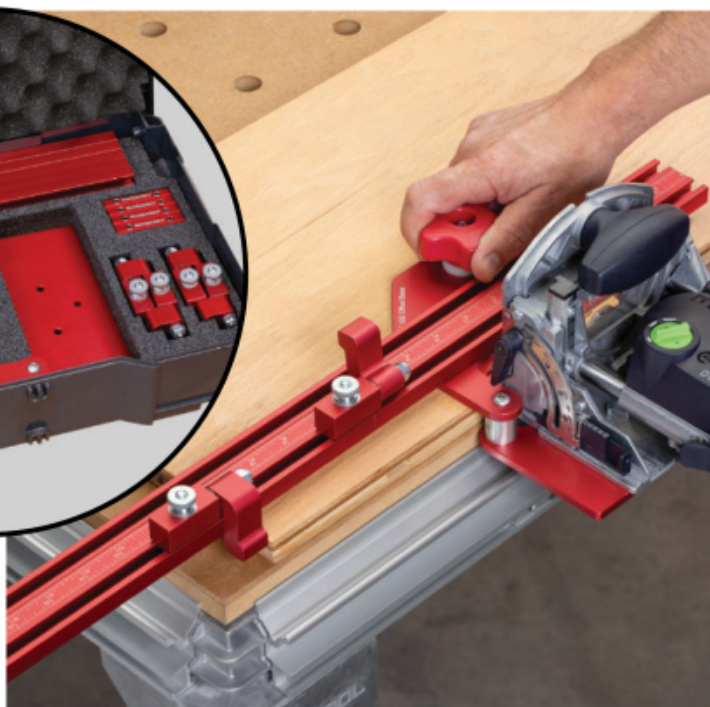
Offset Base System

Made for Festool Domino

- Attaches to both Festool Domino DF-500 & DF-700 XL.
- Wider, deeper referencing surface improves stability.
- Precision-milled spacers center mortise on standard dimensions.
- Outrigger carries stops for accurate repeat spacing.



Offset Base System
with Systainer Case....**\$429.99**



Domino not included.

Parallel Guide System

Made for Festool Track Saws

- Makes repetitive, parallel cuts with table saw accuracy.
- Maximum rip capacity of 52".
- Narrow stock guides deliver accurate results down to 1/4".



Parallel Guide System
with Systainer Case....**\$429.99**

Saw not included.

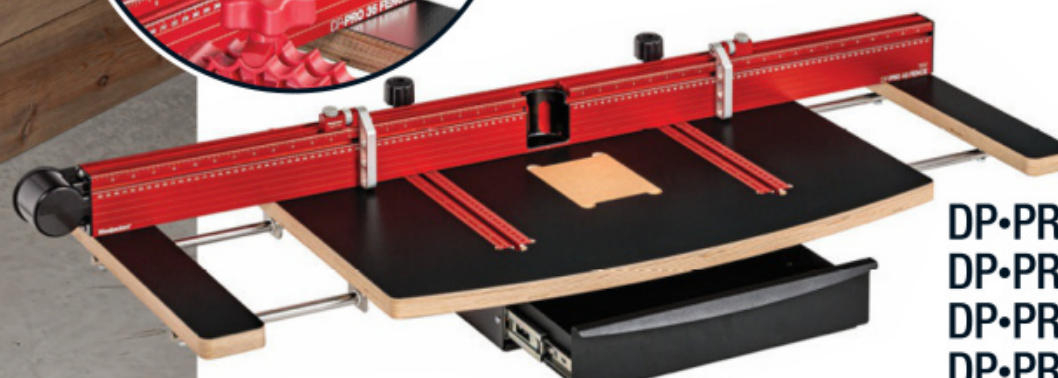
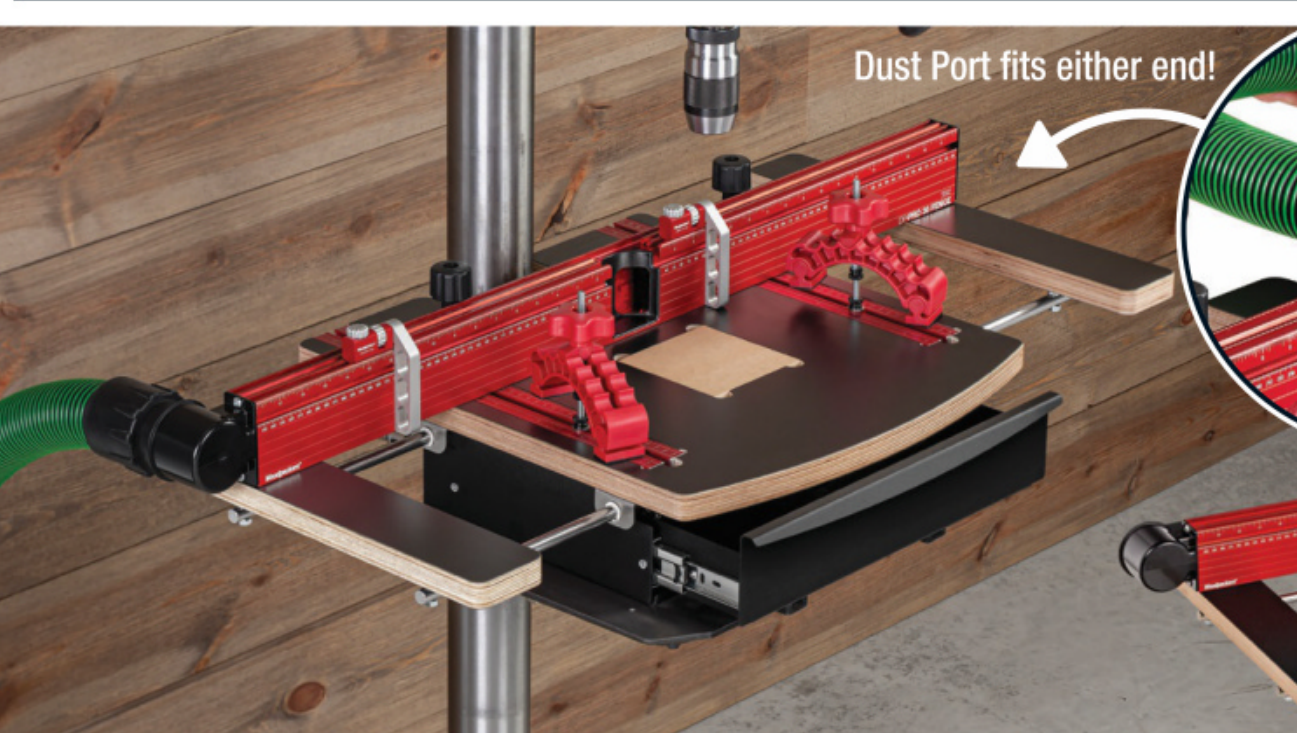
Dust Port fits either end!



DP-PRO Drill Press Table System

- DP-PRO Fence integrates dust collection & delivers accuracy.
- Micro-adjustable DP-PRO Flip Stops.
- DP-PRO Drawer Base simplifies installation on any drill press.
- DP-PRO Tables are full 1" thick with laminate top & bottom.
- Extension Wings for long material support.
- Drawer Base and Fence compatible with all drill press tables.

NEW
TOOL



DP-PRO Master System 36/24.....**\$369.99**
DP-PRO Master System 36/36.....**\$389.99**
DP-PRO Master System 48/36.....**\$419.99**
DP-PRO Master System 48/48.....**\$439.99**

Slab Flattening Mill-PRO

- Wider, thicker, thinner & cleaner than the original.
- Router carriage now has adjustable height & built-in dust ports.
- Standard width of 48-1/2" expands to 62" with optional extension.
- Standard length of 59" expands to 132" with optional extension.
- Flatten stock as thin as 3/4" & up to 3-7/16" without shimming.
- Straight-line edges on stock up to 2" thick.

Rail can be positioned
for narrower slabs or
all the way to the edge!



NEW
TOOL

Basic Slab Flattening Mill PRO.....**\$899.99**
Extended Slab Flattening Mill PRO.....**\$1149.99**

Router, plywood base & connection hoses not included.

ULTRA-SHEAR™

by Woodpeckers®

Pen Mill-Ci

- Trims pen blanks square & flush with insert.
- Razor-sharp carbide inserts hold up to exotic materials.
- 12 Pilot Reamers cover almost every pen kit made.
- Cleanest cutting, longest lasting pen mill on the market.



Pen Mill-Ci 13-Pc Set....**\$169.99**

Pen Mandrel System

- Collets on both ends perfectly center & lock the mandrel shaft.
- Tailstock can adjust to exactly the length of your pen project.
- Fits all #2 morse taper head & tail stocks.
- Drive & live centers precision turned from stainless steel.
- Works with almost all pen bushings.
- Matching Precision Pen Bushings available for most popular pens.



Pen Mandrel System**\$139.99**

SOUNDING BOARD

YOUR VOICE



Laminated-veneer
lumber (LVL)

BauBuche

Baltic-birch plywood
(two sheets laminated)

LVL up to keep the lathe-stand cost down

You built the Rock-solid Lathe Stand in issue 270 (October 2020) from an expensive engineered-wood product called BauBuche. In your defense, you suggested laminating Baltic-birch plywood as an affordable alternative, but there's another engineered-wood option: laminated-veneer lumber (LVL) beams.

Although not as attractive as your options, LVL is cheaper and widely available at lumberyards and home centers. If transport is a problem—the beams can be lengthy—take a battery-powered saw along and cut it to more manageable lengths in the parking lot.

—Dan Friderici
Bath, Mich.

You'll also notice that the orientation of the plies is different in LVL and BauBuche, Dan, as shown above. So, LVL looks more like plywood, with its plies visible on the ends and edges, where the plies in BauBuche show on its ends and face.

Some LVL beams have a moisture-resistant coating to protect them from weather on the jobsite. To test for this coating, spritz a little water on the beam: If it beads up, you'll need to remove that coating so glue and finish adhere properly. First, try wiping the beam using a cloth dampened with mineral spirits, and if that doesn't work, you may need to plane or joint the coating away. Spritz again to make sure you removed all of the coating.

Adding virtue to the drill-press vise

When I built the Wood-friendly Drill-press Vise featured in issue 267 (May 2020), I did a few things differently, and I thought you might be interested in my modifications.

First, for the holes that house the threaded-rod shaft, I drilled 1/2"-diameter holes instead of the 3/8" spec'ed. This eliminates friction, and doesn't affect accuracy because the shaft alignment is maintained by the two flanged sleeve bearings and the steel nut. And, although you didn't say specifically to do otherwise, I stacked and drilled all three jaws at once to ensure perfect alignment through the vise.

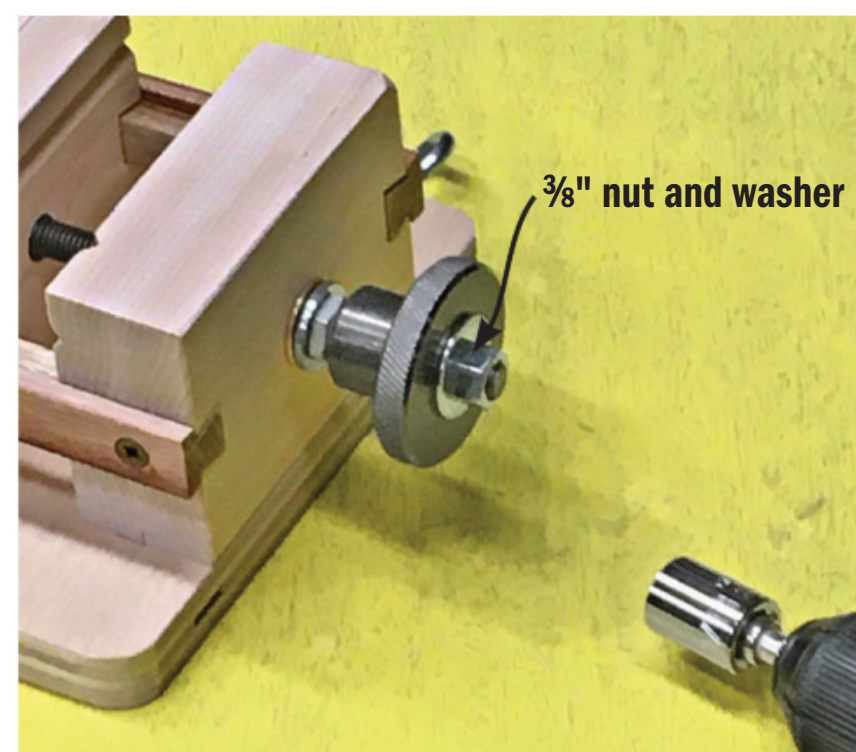
Also, to facilitate disassembly as the jaws wear, I used screws instead of glue and dowels to install the dovetail runners. And I waxed the runners and bottom of the moveable jaw to reduce friction.

But my favorite addition is shown at right. I lengthened the shaft to 10" and installed a washer and nut at the knob end of the shaft. This

allows me to use a 9/16" socket in my cordless drill to quickly move the middle jaw.

I expect my new vise to get a lot of use in my shop, and it has already saved my fingers once.

—Bob Pittelkow
Bloomington, Minn.



She planted the idea, he made a stand

After heart surgery a couple of months ago, I received a bunch of plants as get-well gifts that were beginning to dominate the horizontal surfaces in our condo. When my loving wife mused that we needed a "plant stand" to properly display and cultivate our indoor garden, I took that as the excuse I needed to get back into the shop.

Because of the pandemic, I didn't want to go shopping, so down to the shop I went to see what resources I might find. After a few hours in front of SketchUp, about 75 hours in the shop, and some parts from Amazon, this is what emerged. On close inspection, you may recognize some features, such as the shape of the leaves that form the base of the stand, inspired by the several Phalaenopsis orchid plants that we coax along.

My wife is amazed that she is the proud owner of the only plant stand in the world—maybe the UNIVERSE—just like this one. My heart is doing just fine!

—Harry Schmus
Newtown, Conn.

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Our customers love their Turncrafter Lathes!

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QUICK SPECIFICATIONS		
Model	10" Swing Variable Speed	12" Swing Variable Speed
Belt Positions	2 positions	2 positions
Speeds	Variable 500-1800 1000-3800 RPM	Variable 400-1900 900-3800 RPM
Motor Power	3/4 HP	1 HP
Headstock	1" x 8tpi, #2MT	1" x 8tpi, #2MT
Between Centers	18"	18"
Weight	82 lbs.	106 lbs.
Footprint	31" x 7-1/4"	31" x 9-1/2"
INCLUDED WITH LATHE PURCHASE		
Toolrest(s)	6" & 12" toolrests	6" & 12" toolrests
Faceplate	3" faceplate	3" faceplate
#2 Spur Center Heavy-duty	included	included
Tailstock Center	included	included

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	Lathe Only \$369. ⁹⁵	Basic Starter Set \$426. ⁶⁵	Advanced Starter Set \$647. ⁸⁵	Lathe Only \$459. ⁹⁵	Basic Starter Set \$499. ⁶⁵	Advanced Starter Set \$727. ⁴⁵
UPS Shipping Cost	\$50	\$58	\$60	\$55	\$65	\$65
Item #	#KWL-1018VS	#KWL-10SSB	#KWL-10SSA	#KWL-1218VS	#KWL-12SSB	#KWL-12SSA
Lathe	√	√	√	√	√	√
Slimline Pen Kits		5 (24kt Gold)	20 (Variety)		5 (24kt Gold)	20 (variety)
Slimline Pencil Kits		5 (24kt Gold)	20 (Variety)		5 (24kt Gold)	20 (variety)
Pen Mandrel		√	√		√	√
Mandrel Wrench			√			√
3pc Carbon Steel Chisels		√			√	
Mini Pen Blank Mix		√ (Makes 10 kits)	√ (Makes 40 kits)		√ (Makes 10 kits)	√ (Makes 40 kits)
Mid Cure Epoxy Glue		√	√		√	√
7mm Barrel Trimmer		√	√		√	√
Tube Insertion Tool			√			√
Shellawax Creame		√ (30ML)	√ (250ML)		√ (30ML)	√ (250ML)
Pen Assembly Press			√			√
Pen Making DVD		√	√		√	√



Better lamp than never

With all three of our sons either out of college or performing fully funded research, I suddenly have both the time and finances to indulge myself in my shop. I just completed the Arts & Crafts Table Lamp from issue 148 (May 2003), the electrical parts for which I bought in December 2008. I decided it would look nice on top of your Arts & Crafts Nightstand from issue 159 (November 2004). It does.

I found both of these projects interesting challenges—particularly the lamp—and my skills have increased significantly as a result of doing this work. The shade frame assembly was probably the most detailed, precision-demanding task I have done.

Thank you for playing a pivotal role in building my woodworking skills. I always look forward to the arrival of my next WOOD® magazine.

—David Fortner
Houston



To get plans for the table lamp David built, point your smartphone's camera at this code, or visit woodmagazine.com/tablelamp. For more Arts & Crafts furniture plans, including the nightstand, search woodstore.net.

SOUNDING BOARD

YOUR VOICE

Farmhouse table on a penthouse budget

I was excited to see the Farmhouse Table project in issue 270 (October 2020), but when I looked at the article and saw the approximate materials cost, I was extremely disappointed. A table that simple should not cost more than a grand! I understand white oak is expensive, but the majority of us don't own or run furniture shops for a living. When I started woodworking, it was to produce quality, handmade furniture without taking a loan out to buy the wood to build it.

—Jesse Chastain
Jasper, Ga.

We chose white oak, Jesse, because we like the look and durability of it. You could use almost any wood, though, depending on your taste, preference, and budget. Lumber prices vary greatly by region and retailer, so you may be able to build it out of white oak for less. Or more. But purely as a starting point of reference, now you know what it cost for us to build that project from white oak in Iowa.

We love it when readers modify our plans to make them their own. The project won't fit in your entryway? Make it smaller. We used maple, but your dining room is trimmed in red oak? Make it out of red oak instead. Or pallets, if you want. Permission granted.

It's your project. It's your house. It's your shop. So, make it your own.

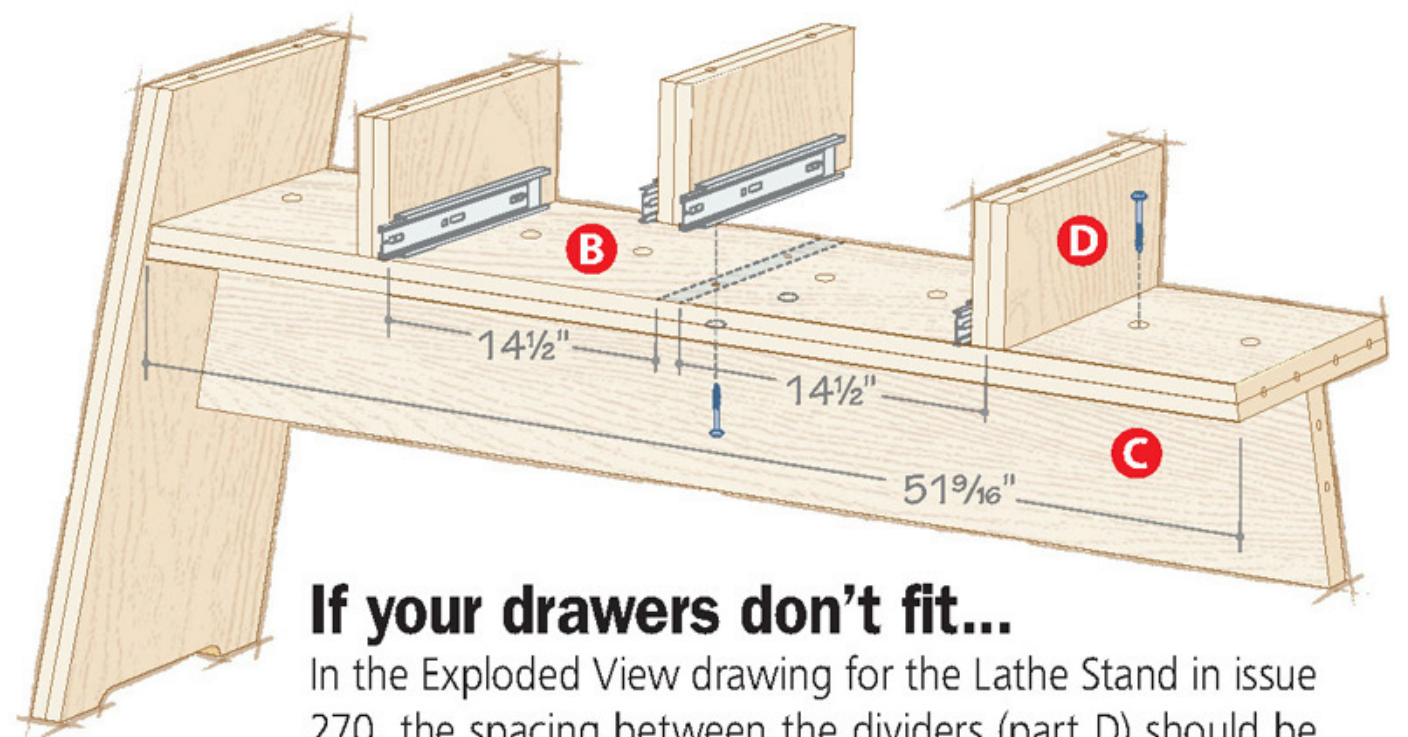
Isn't knee-height right?

I was glad to see your Saw Bench plans in issue 270. I noticed yours is 22" high, where mine and others I have seen are about 19". I've always heard the height should equal the distance from the floor to the bottom of the woodworker's kneecap, which varies from person to person.

—Marvin Morgan
via e-mail

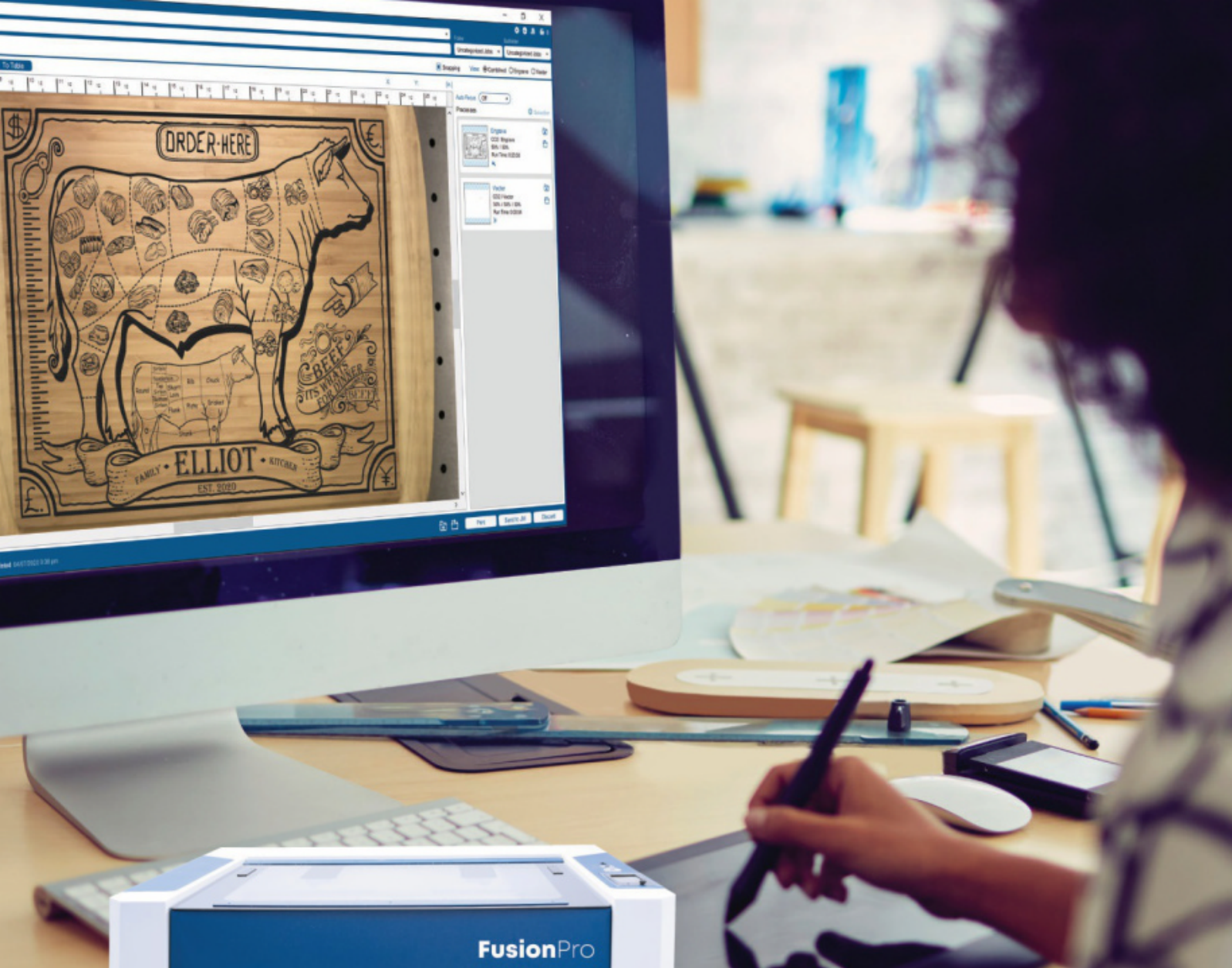
That's a good rule of thumb, Marvin, but you also have to consider the length of your handsaw. Our saw bench's 22" height prevents the blade on my handsaw from hitting the floor. Let's just call that another bit of wisdom earned by experience.

—John Olson, Design Editor



If your drawers don't fit...

In the Exploded View drawing for the Lathe Stand in issue 270, the spacing between the dividers (part D) should be 14 1/2". Center the middle divider on the shelf (B), then attach the remaining dividers 14 1/2" from it.



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YOUR PROJECTS



Tony Coloneri, of Stony Brook, N.Y., meticulously hand-cut the inlaid lettering and diamonds for these mahogany-and-pine jewelry boxes he made and gifted to family members. Tony fashioned the ring holders from rolled-up shelf liner wrapped in felt, both left over from other projects.



Charlie Reitz, of Columbus Station, Ohio, built this wireless Bluetooth speaker from epoxy-infilled walnut. He used waterfall joinery to wrap the grain continuously around the enclosure, which frames the curly-maple front panel. The unit is powered by six rechargeable lithium-ion cells.



John Slinkma, of Vesper, Wis., wanted to make sure he was there—at least in spirit—for all 14 of his grandchildren's weddings, so he made a set of nesting crosses for each one. Get free plans for this project at woodmagazine.com/nestingcross.



For his entry in the local turning club's "Rolling Pin" contest, **Barry Stephens**, of Roseville, Calif., crafted this one with padauk handles and a spiral of thin maple strips inlaid into the walnut roller. The roller rotates on a steel shaft mounted with sealed ball bearings.

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SOUNDING BOARD

YOUR PROJECTS



Born into a long line of carpenters, **Dave King**, of Little Meadows, Pa., comes by his skills naturally, as evidenced by this spiral staircase he built from locally harvested materials. The treads are cherry with maple inlay; the balusters are red oak; the post caps, cedar. Dave made the organic railing from grape vines.



To top off this occasional table made of curly maple, walnut, and cherry, **Rick Percy**, of Lewis Center, Ohio, fashioned this gorgeous veneered top. Framing its bookmatched cerejeira crotch center panel is a strip of ebony/cherry/ebony banding surrounded by claro walnut. It was Rick's first attempt at veneering.



Using salvaged maple gym flooring and walnut from his scrap bin, **Ron Torrey**, of Austin, Texas, built this Krenov-inspired Tall Cabinet from plans in issue 241 (September 2016).



To get plans for this cabinet, point your smartphone's camera at this code or visit woodmagazine.com/krenovcabinet.



John Padgham, of Franklin, Tenn., made this box-jointed breakfast tray for his son out of cherry and sycamore. For an easy-to-clean surface, John sandwiched $\frac{3}{8}$ " MDF between two sheets of plastic laminate. 🌳

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YOUR SHOP

WOOD-inspired Workshop



Eric designed his woodshop with an attached greenhouse to support his gardening hobby. The second floor will house an office, exercise area, and finishing room.

After his retirement, Eric Ralston bought 2½ acres of land in northern Ohio and built a home and the shell of a two-story, 24×24' garage. He also purchased the Complete Digital Archive of *WOOD*® magazine to mine for ideas and plans when building out his shop later.

When that time came, Eric walled off a 12×12' section of the garage to store a garden tractor, dust collector, and larger wood-working tools. The main L-shape shop area includes four workbenches: three based on a plan from *WOOD* issue 163 (June/July 2005), and the fourth from *WOOD*'s Idea Shop 3 in issues 102 (Winter 1997) and 103 (February 1998).

All four benchtops sport replaceable hardboard coverings, edged with hardwood.

A woodstove supplies heat during the winter. The workbench supports sanding operations, with a downdraft table to collect dust.



Eric walled off the machines that generate the most noise and dust in a separate area. The garage door eases unloading of lumber and materials.



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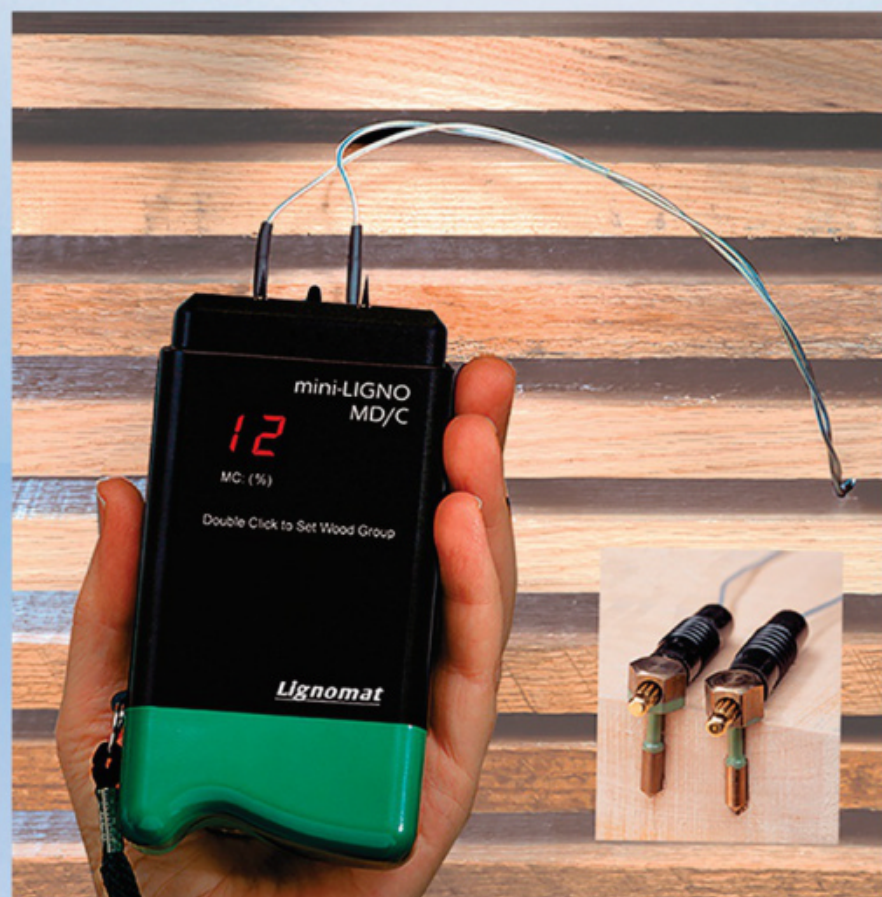


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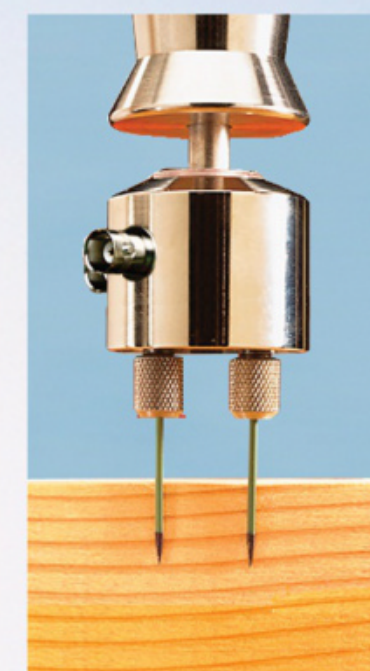
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SOUNDING BOARD

YOUR SHOP



This long workbench houses a flip-up router table and scrollsaw (not shown) that tuck inside the cabinet when not in use.



Eric separated his dust collector's filter housing and motor and mounted them on the wall. A purchased cyclone system collects larger chips into a metal trash can.

Eric extended his fourth workbench to create a mitersaw station with a dust hood, scrap bin, and a fold-down extension inspired by Idea Shop 2000 (issue 119, December 1999). At the opposite end, he mounted a dovetail jig, with a dust port. Eric secured most of his benchtop tools on removable bases that he attaches to one of the workbenches.

To maximize space, many tools rest on mobile bases. Frequently needed tools and accessories hang on pegboard behind three of the workbenches. The 10' ceiling height facilitates moving longer boards. Sheet goods and lumber store on mobile racks in another garage.

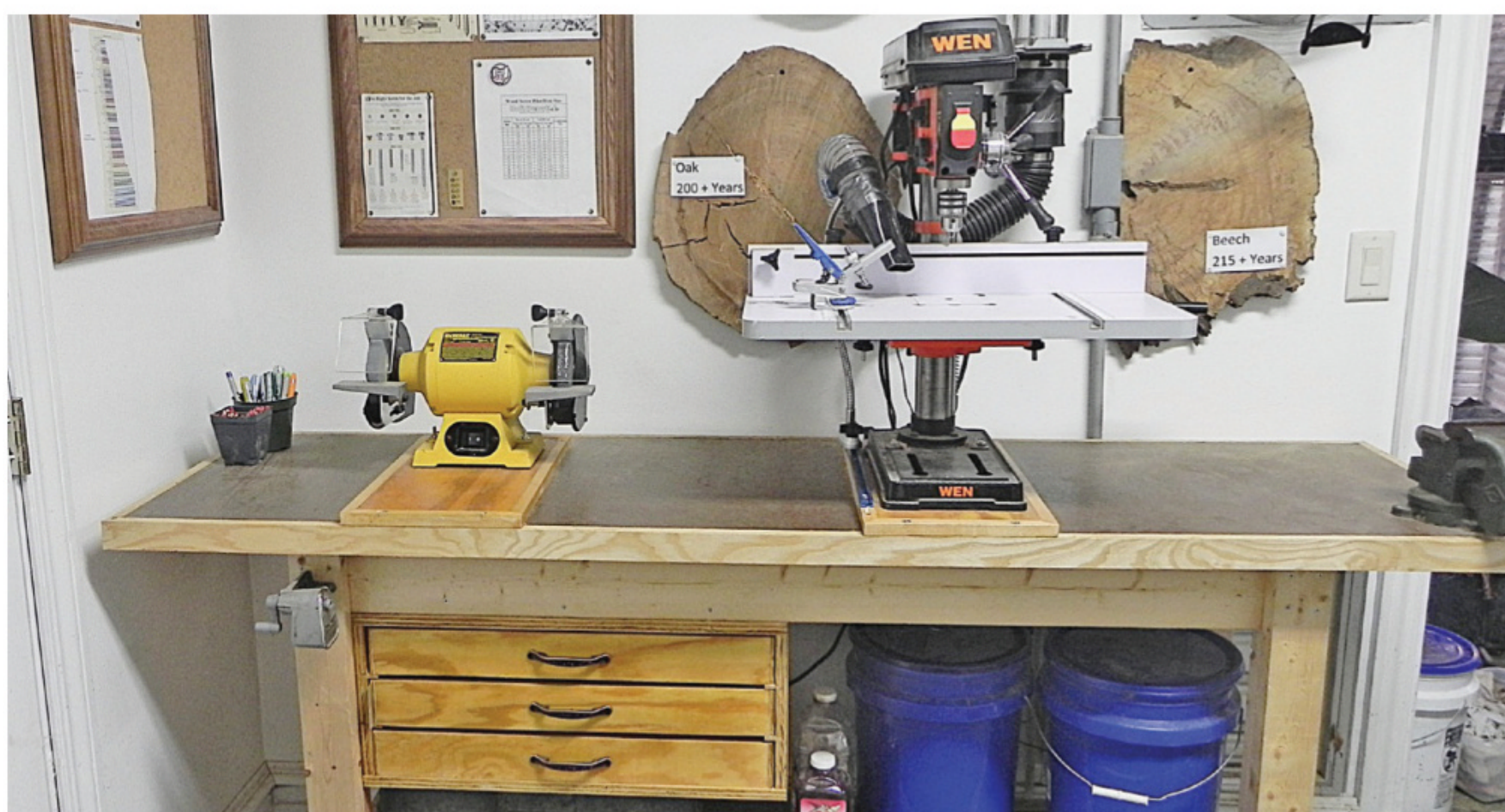
For dust collection, Eric upgraded a standard two-bag collector with a purchased cyclone and pleated filter. He ran fixed ducts to the stationary tools, with flex hose connected to mobile tools as needed.

SOUNDING BOARD

YOUR SHOP



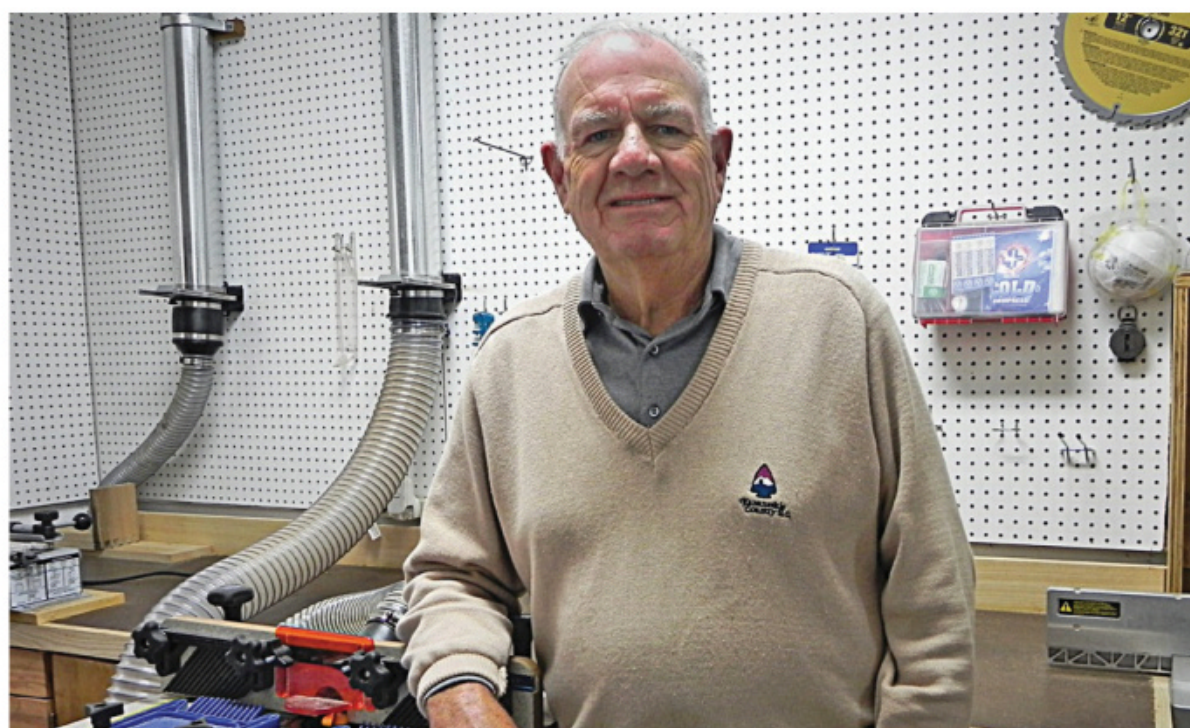
Eric uses the workbench on the right for layout, assembly, and finishing. Tucked beneath it are three tool totes and a holder with a roll of kraft paper that protects the benchtop from glue squeeze-out and finish spills.



Securing a drill press and grinder to bolt-on bases allows for mounting them to a bench, then storing them away to clear the benchtop.

Two stackable assembly stands (*WOOD* issue 225, May 2014), two 3-in-1 work supports (issue 135, September 2001), and a workstation for his air compressor (issue 190, May 2009) also store in the garage. Eric plumbed air from the compressor to the other parts of the shop.

After moving thirteen times during his career and never having much more than a workbench, Eric says he hopes to refine his woodworking by building furniture using cherry, oak, and beech he's already milled from his current property. 🌲



Eric is a retired engineer who still plays more than 100 rounds of golf a year. His woodworking mainly involves projects around the house and property.

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Q Creating a four-corner grain match

I've seen mitered boxes where the grain figure wraps around all four corners of the box, but I've never understood how this is done. Can you tell me the secret?

—Robert Cook, Thetford, N.H.

A

Four-corner grain matching (sometimes called continuous grain matching) is one of those techniques that can make you scratch your head, Robert—until that aha! moment when you discover how it's done. The trick is to resaw a thick blank into two identical, thinner boards. The resawn faces become the outside faces of your box. By removing a minimum of material when miter-cutting the blanks, you preserve the grain wrap around each corner.

► Watch a video on how to resaw lumber. woodmagazine.com/resaw

Tip! When planing, remove the bulk of the material from the outside faces of the blank. This preserves the grain match of the book-matched halves.

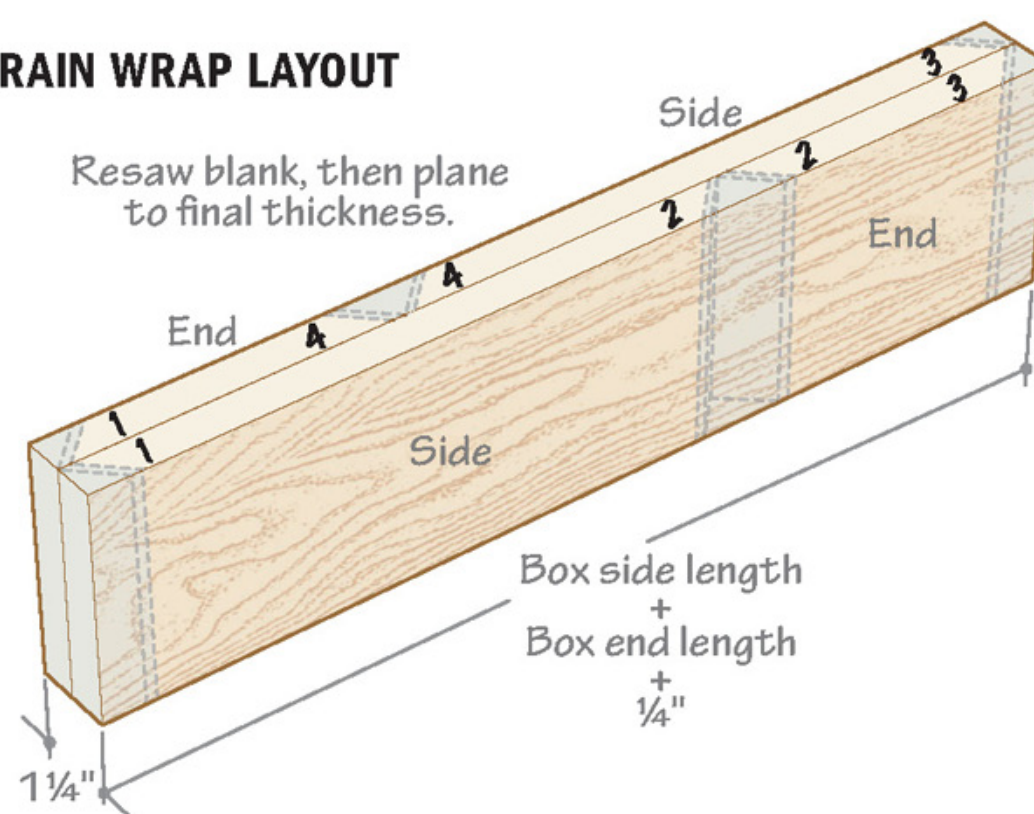
Start with a blank at least $\frac{1}{8}$ " thicker than twice the thickness of the finished walls of your box. Joint and rip the blank to the finished width of the box walls. Trim the blank to about $\frac{1}{4}$ " longer than the combined length of one side and one end of the box [Drawing 1]. Resaw the blank into two halves and mark them to maintain the original orientation. Then plane them both to final thickness. These pieces will exhibit mirror-image grain patterns on the resawn faces.

Lay out and label the parts of your box on the blanks, numbering the mating corners [Drawing 1]. Miter-cut the parts to length, trimming the same amount from the ends of both blanks to maintain the grain match [Drawing 2]. Dry-assemble the box, orienting the parts so the numbered ends mate up correctly [Photo], then glue them up for a box with a near-perfect grain match on all four corners. 🌲

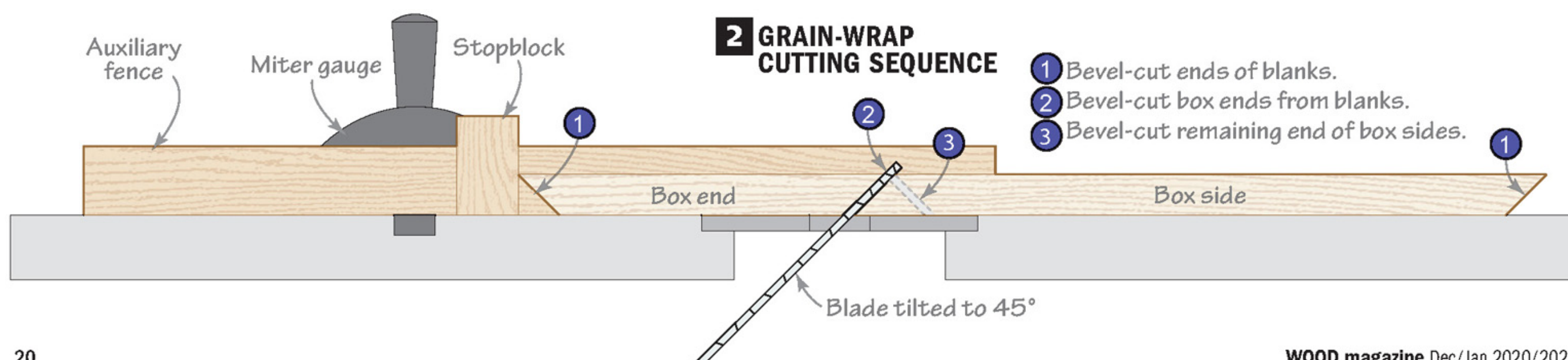
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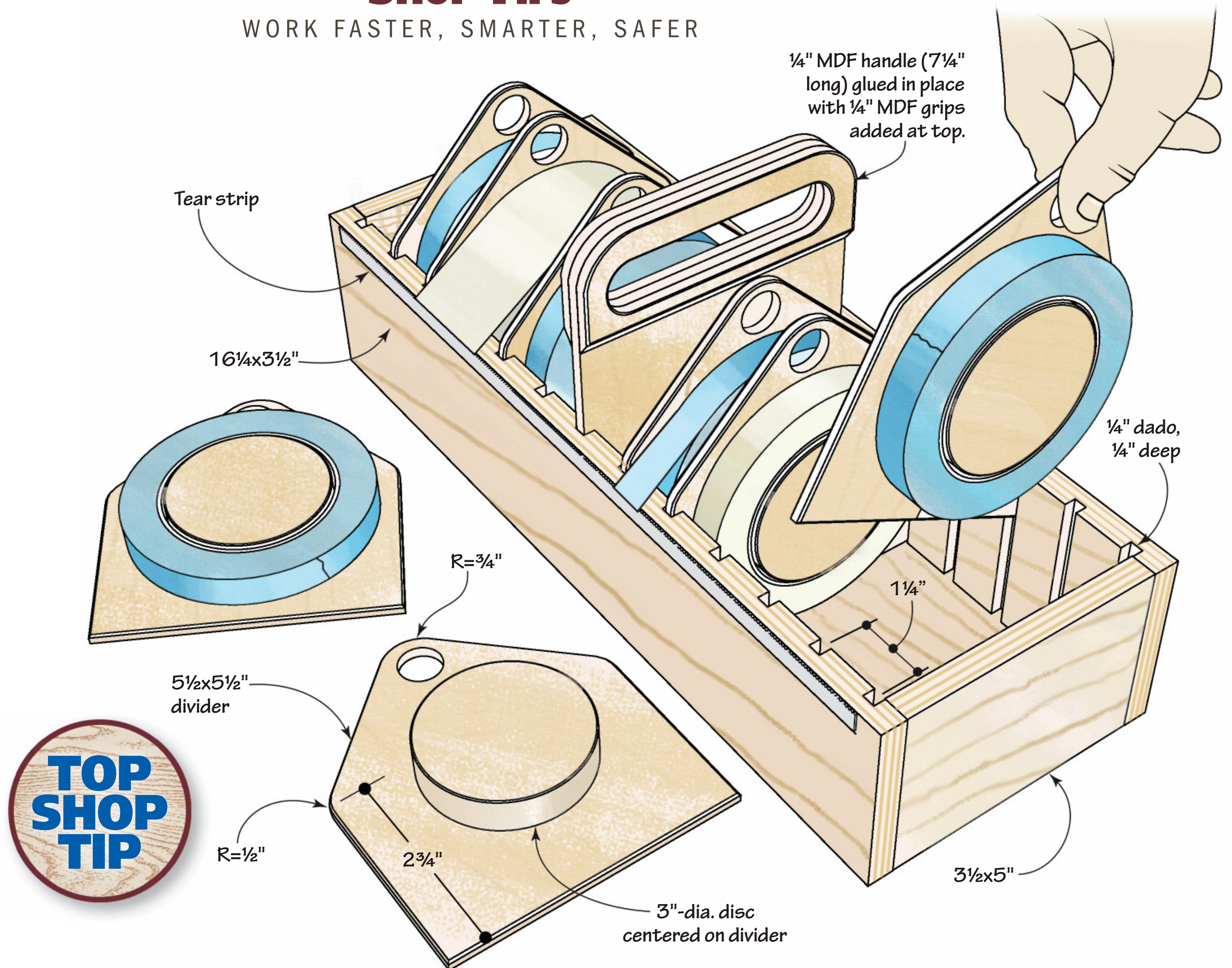
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SHOP TIPS

WORK FASTER, SMARTER, SAFER



Get stuck on this portable tape caddy

I use a lot of different kinds of tape in my shop, and this handy caddy keeps my tape rolls in one place. The dividers are removable to make it easy to install a new roll. The handle makes the caddy portable, so I can keep it near my work area.

I made the tape caddy out of 1/2" Baltic-birch plywood with 1/4"-thick MDF removable tape holders, each with a 3" disc that fits inside the tape roll. Most of the tape I use is 0.93" wide, so I spaced the dados 1 1/4" center-to-center, which also allows for 2" and wider rolls. I attached the tear strip from an empty parchment-paper dispenser, using double-faced tape for easier replacement if the tear strip wears out.

—Dennis Volz, Parker, Colo.

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For sending this issue's **Top Shop Tip**, Dennis receives a Delta mitersaw worth \$650.



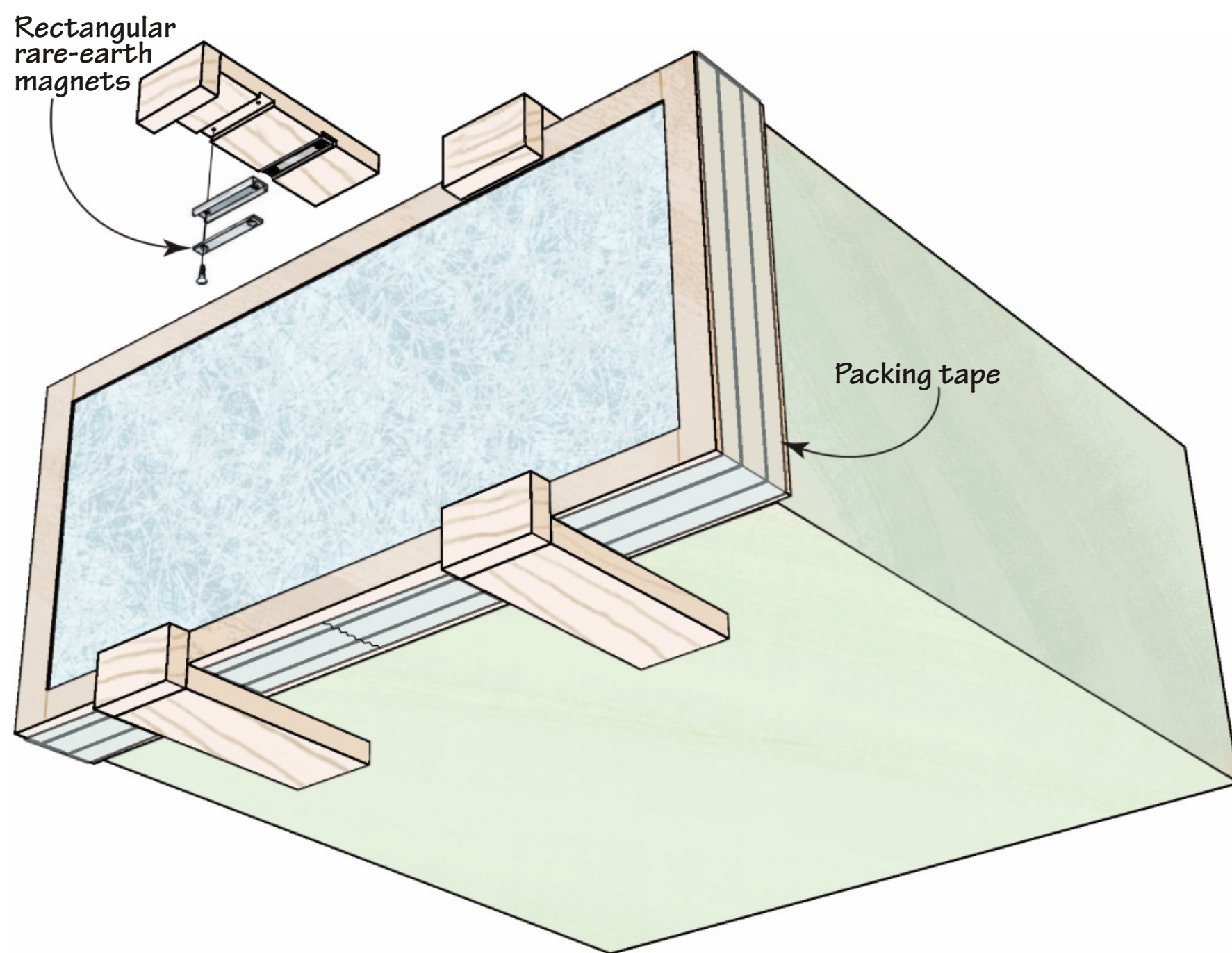
SHOP TIPS

Snare the dust without going bust

The replacement filters for my ceiling-mounted air filter are an odd size and rather expensive. I tried at several home centers to find a reasonably priced filter the same size to no avail.

Instead, I found that a standard $12 \times 25 \times 1$ " filter fits nicely on the outside of the filter cabinet. To hold the filter in place, I made a few brackets that hold rectangular rare-earth magnets (woodmagazine.com/rectanglemagnet). Each magnet comes with a steel U-channel that fits into dadoes in the brackets so the magnets sit flush. A couple of screws secure the assembly to the bracket. The magnets snap to the top and bottom of the filter cabinet, holding the filters in place. I stack three filters together, so I made the brackets long enough to support all three.

—Matt Lynch, Wichita, Kansas



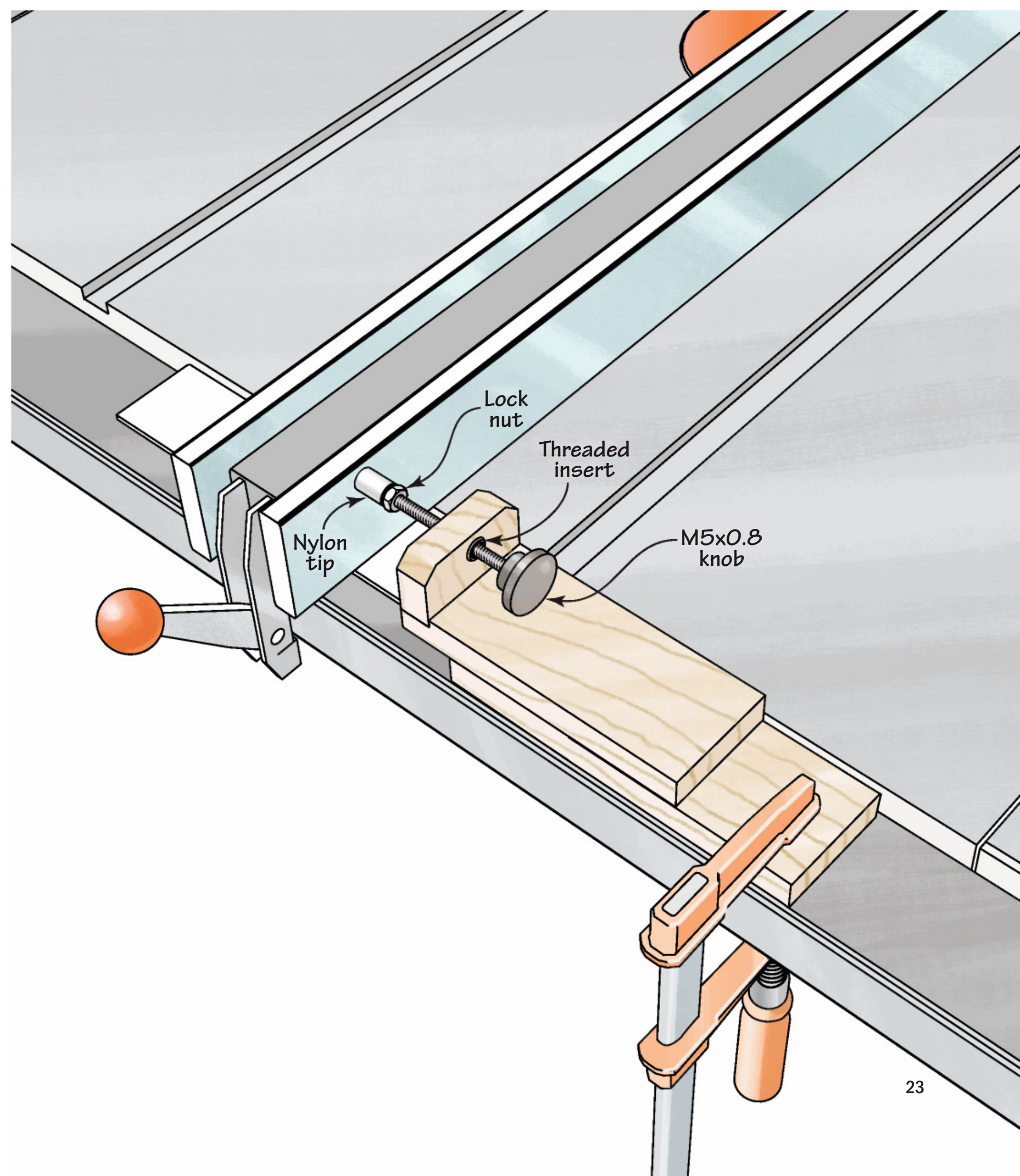
Micromanage your rip fence

One of the frustrations throughout my 50 years of woodworking is fine-tuning the tablesaw rip-fence position. Being a retired mechanical engineer, I decided to address this problem.

My solution: a simple adjusting block that clamps to the rail of the saw, as shown. I used a metric M5×0.8 threaded rod and insert. With this thread, one turn of the thumb knob turns the shaft 0.031"; one-half turn, 0.015"; one-quarter turn, 0.0075"—very accurate. I added a nylon tip and lock nut to prevent marring my rip fence. (Get all this hardware at woodmagazine.com/microadjust.)

To tweak the fence position, simply unlock the fence and nudge it closer to the blade by turning the knob. If I need to move the fence away from the blade, I back off the threaded rod and bump the fence to it.

—Steven Pietrowicz, Cresco, Penn.



SHOP TIPS

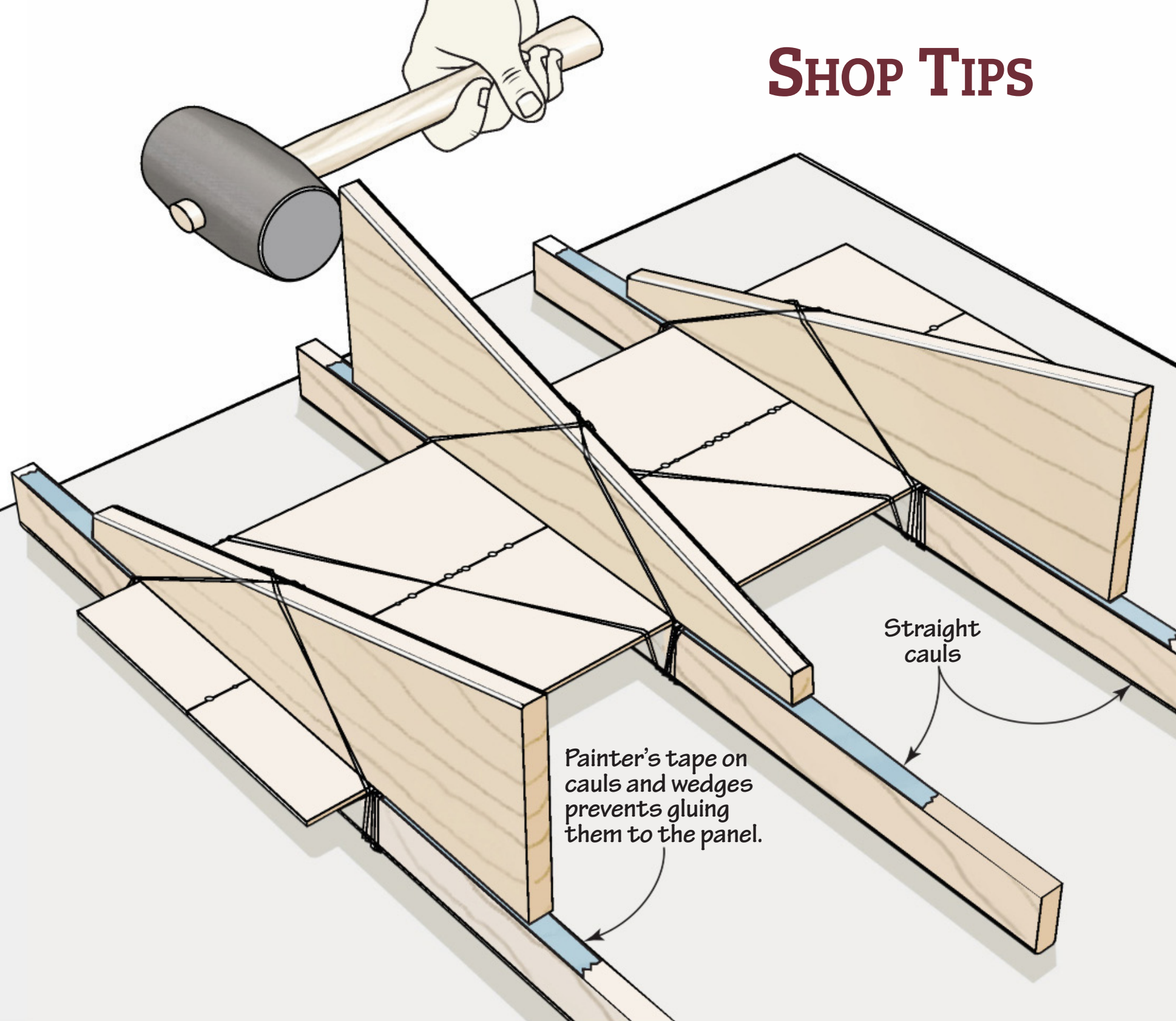
Get wedged in when edge-gluing thin stock

A luthier friend, who makes stringed instruments, showed me this tip for gluing up thin panels and keeping them flat using large wedges, straight cauls, and strong cord.

Start by arranging the cauls on the workbench to support the workpieces. Apply glue to the workpiece edges, lay the pieces across the cauls, and wrap the cord in a figure-8 pattern over the workpieces and around the cauls underneath, leaving a bit of slack. Then insert a wedge between the cord and workpieces directly over the caul. Repeat this process down the length of the workpieces, alternating the taper direction.

To clamp, gently tap the wedges in deeper, a bit at a time. The downward pressure pushes the pieces against the cauls and together at the glue joint. After the glue sets, tap the wedges back out.

—Keith Mealy, Oregonia, Ohio



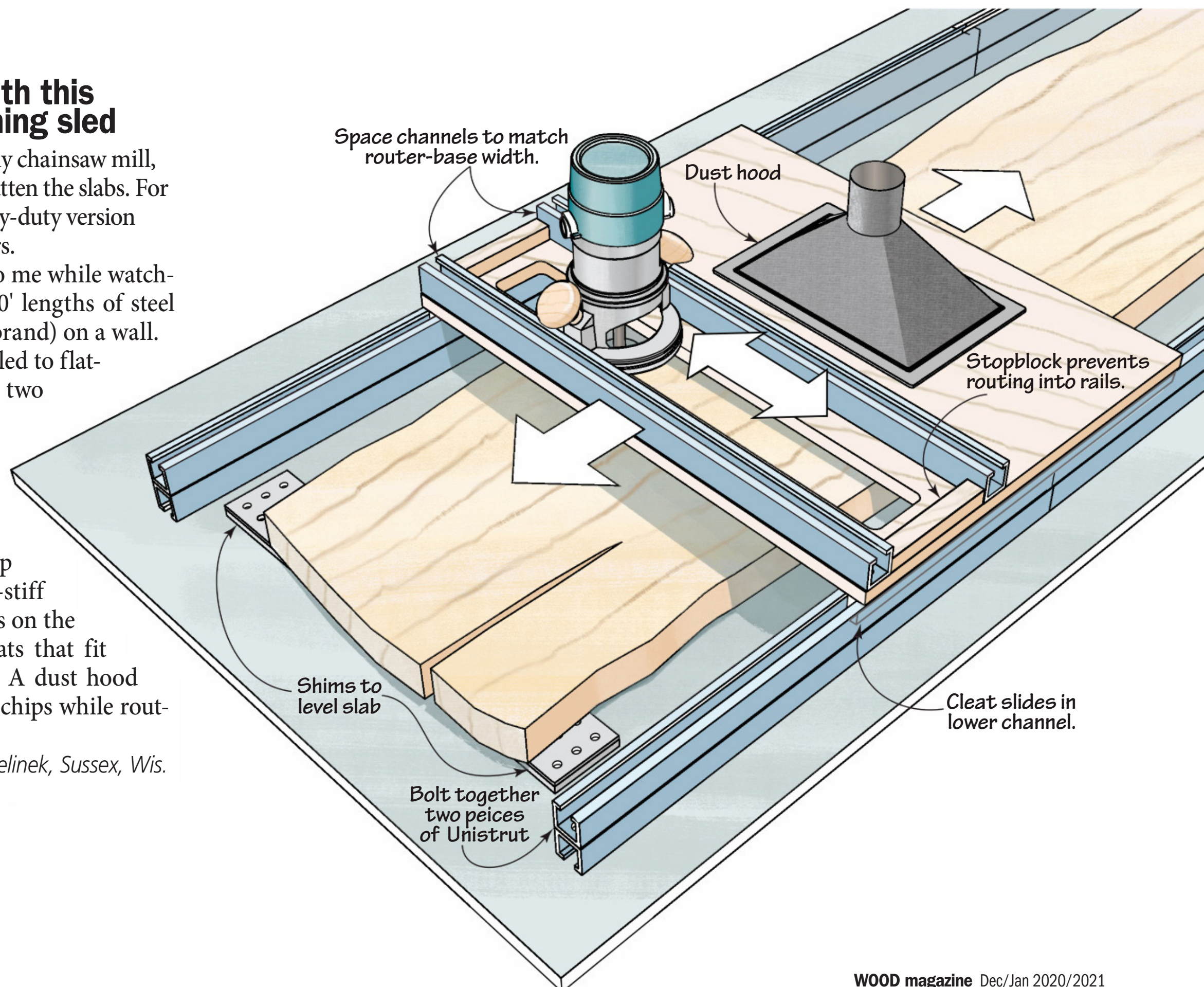
Strut your stuff with this shop-made flattening sled

After slabbing a log with my chainsaw mill, I needed a router sled to flatten the slabs. For less than \$90, I built a heavy-duty version that should last me for years.

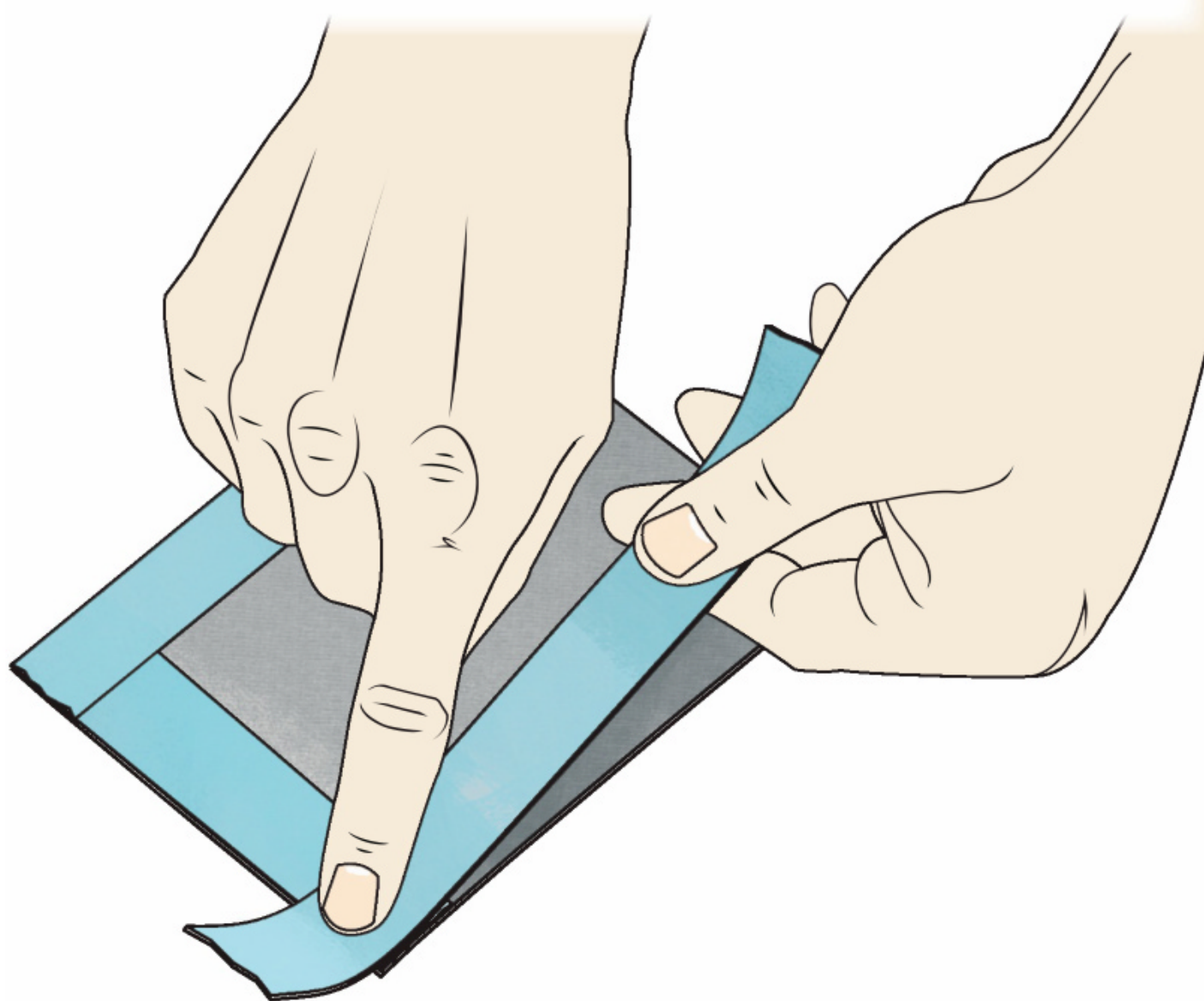
The inspiration came to me while watching an electrician hang 10' lengths of steel channel (Unistrut is one brand) on a wall. This length is ideal for a sled to flatten 8' boards, and stacked two high, I can easily flatten thicker slabs. I used $1\frac{1}{4} \times 1\frac{1}{4}$ " 14-gauge channel to reduce weight.

Two shorter pieces of channel attached to a scrap of plywood make a super-stiff router sled. The sled slides on the long rails, guided by cleats that fit inside the long channels. A dust hood helps remove most of the chips while routing the slab.

—Shawn Jelinek, Sussex, Wis.



SHOP TIPS



Call for reinforcements when sanding

My projects require a lot of fine sanding, so before I attach a new sheet of sandpaper to my palm sander, I reinforce the edges with blue painter's tape. The tape keeps the edges from getting tattered and extends the life of each sheet.

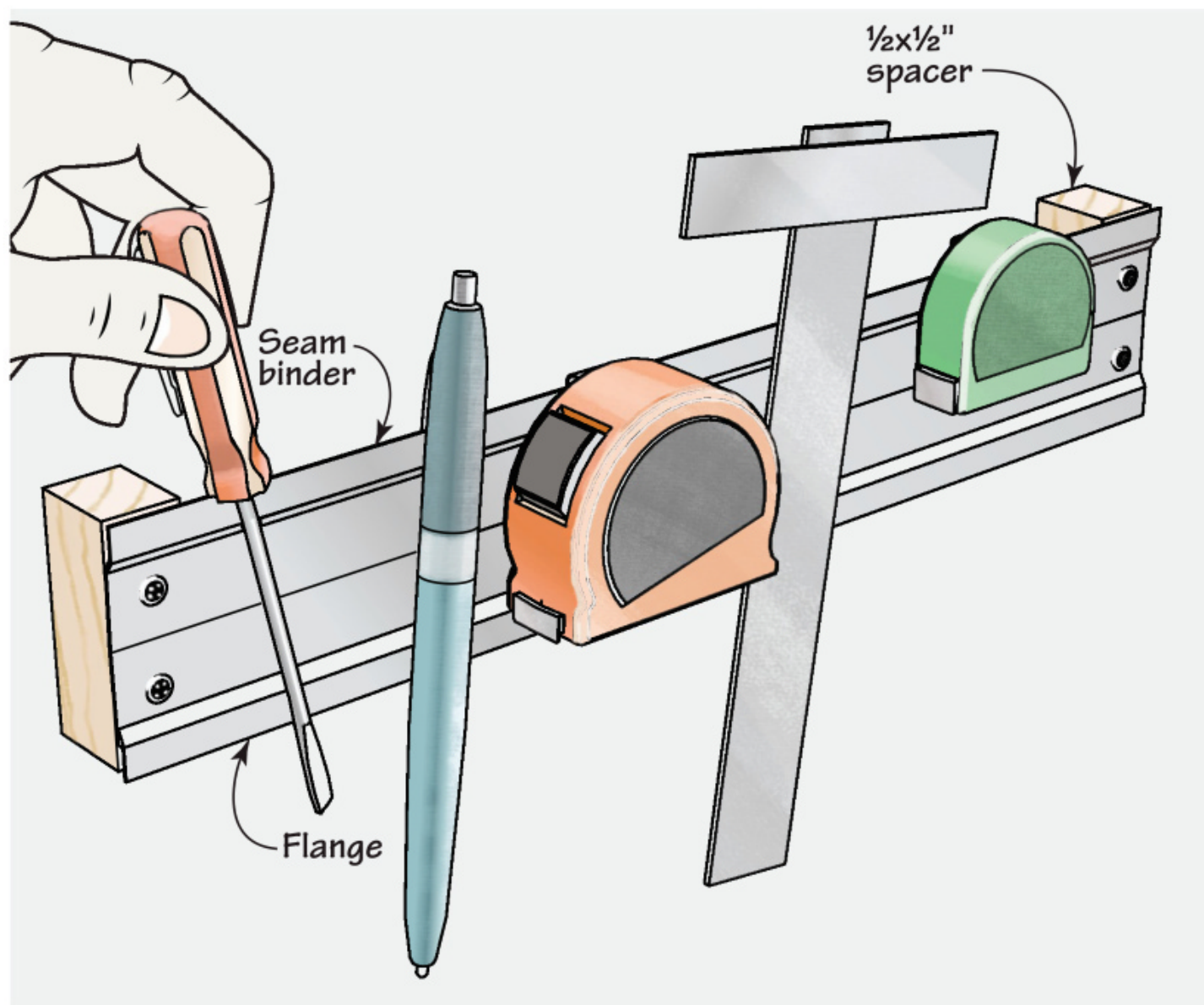
—Wanda Polasek, St. Hedwig, Texas

Transition to better tool organization

Looking for a way to store tape measures and other tools that have a belt or pocket clip, I came up with an inexpensive wall-mounted rack, made from a flooring transition strip, sometimes called a seam binder. Find this metal strip, with beveled edges, at home centers.

I mounted the strip to the wall with spacers behind it to provide clearance for the belt clips. Mount the strip with the flanges of the bevels facing out, so tools slide on and off easily. 🌿

—Richard Keirn, Auburn Hills, Mich.



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Splendid Settee

This Arts & Crafts classic blends comfort and style.

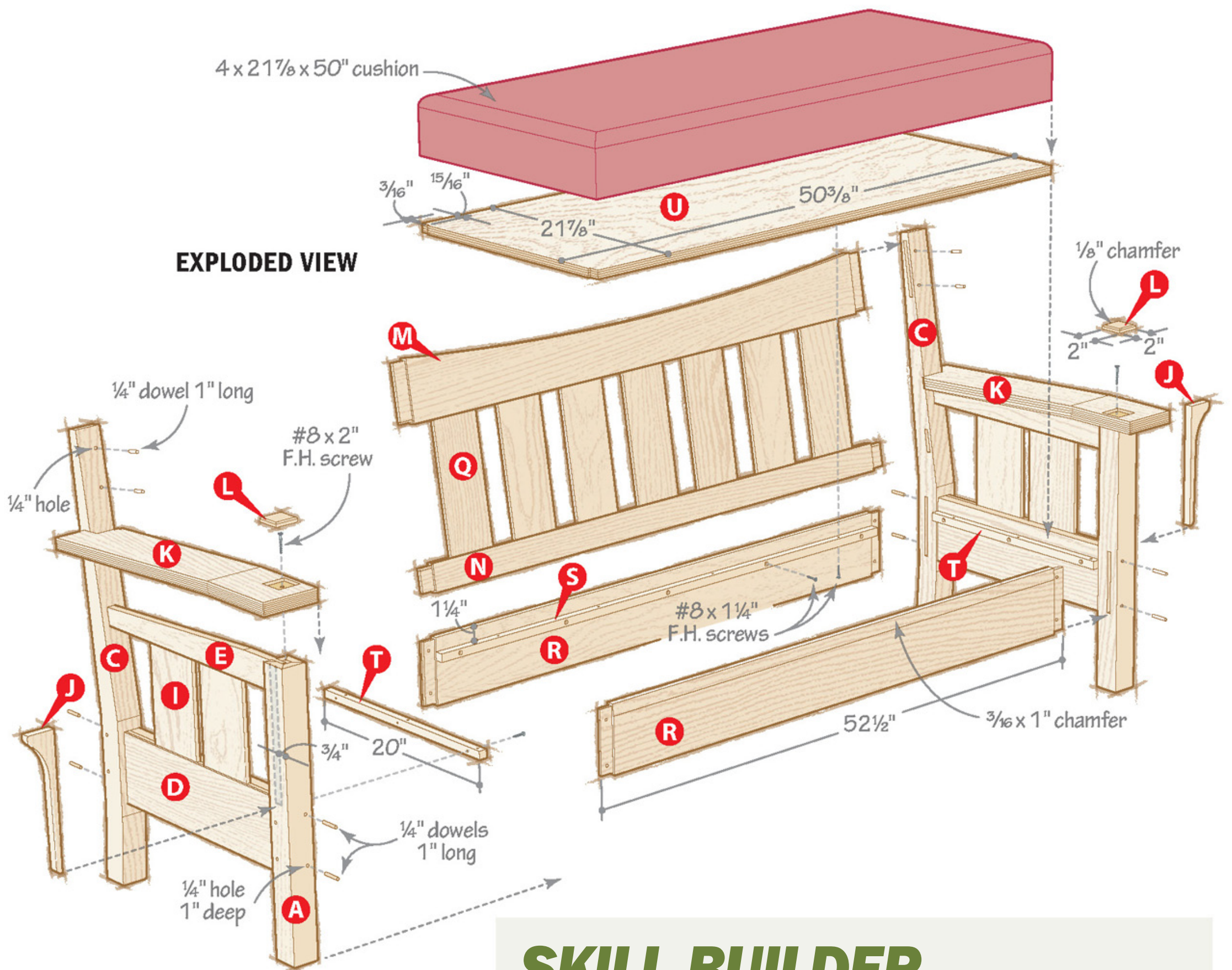


► See a video of the settee being built.
woodmagazine.com/setteebuild

Bent-laminated arms plus traditional mortise-and-tenon joinery put this Stickley-style mission settee into the first rank of handcrafted furniture.

Wood grain represents a key element of the Arts & Crafts look, so select lumber carefully. (We chose quartersawn oak, but cherry also works well.) Lay out parts with an eye toward grain display as well as uniformity of color.

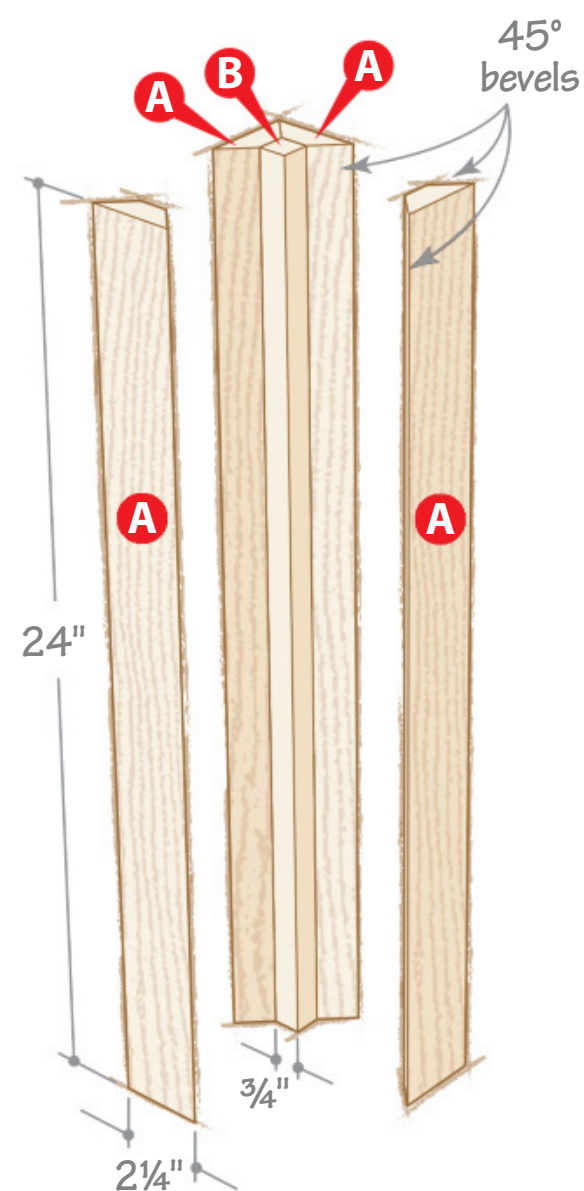
► Watch a video about attractive grain display.
woodmagazine.com/woodgrain



Make the front legs first

1 Cut the leg staves (A) $\frac{1}{4}$ " wider and 1" longer than shown [Drawing 1, Materials List]. Bevel-rip one edge of each stave to 45°. Then, set the fence to bevel-rip the other edge of each stave to width [Skill Builder].

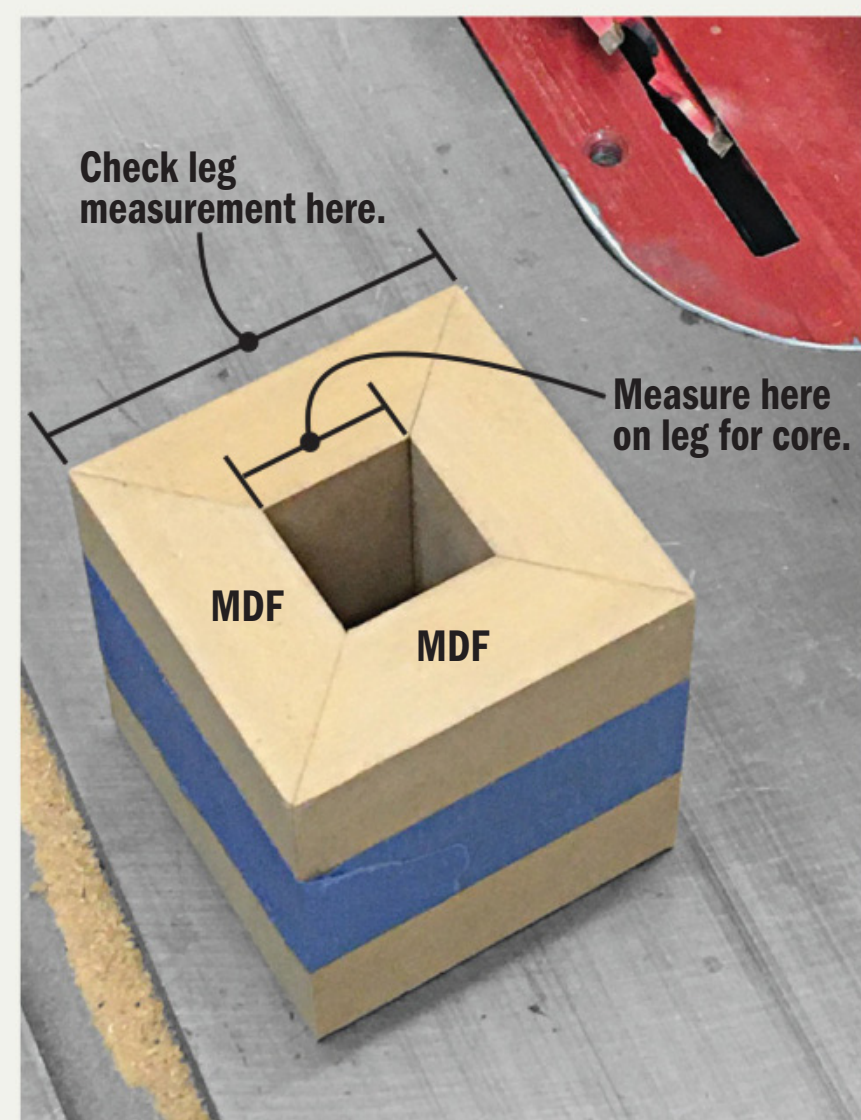
1 FRONT LEG ASSEMBLY



SKILL BUILDER

Finesse the fence position

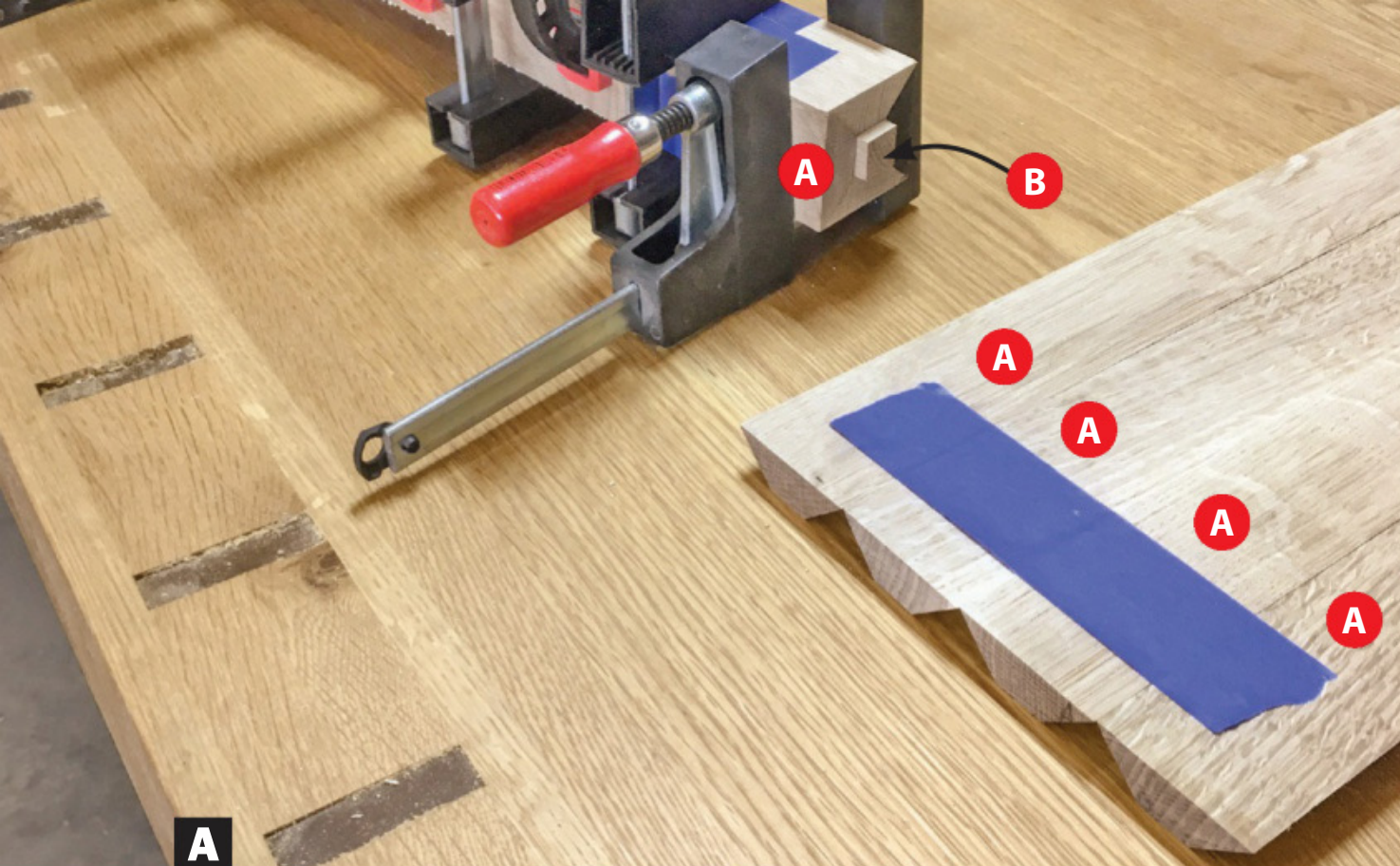
Before sawing your carefully selected project stock, bevel-rip one edge of a $\frac{3}{4}$ x $2\frac{1}{2}$ x 12" piece of MDF. After verifying that the blade angle is correct, set your fence to the final width for the staves (A), and bevel-rip the other edge. Crosscut the MDF into 3" lengths and tape them together [photo below]. Measure the sides; adjust the fence if needed. Then, cut the staves.



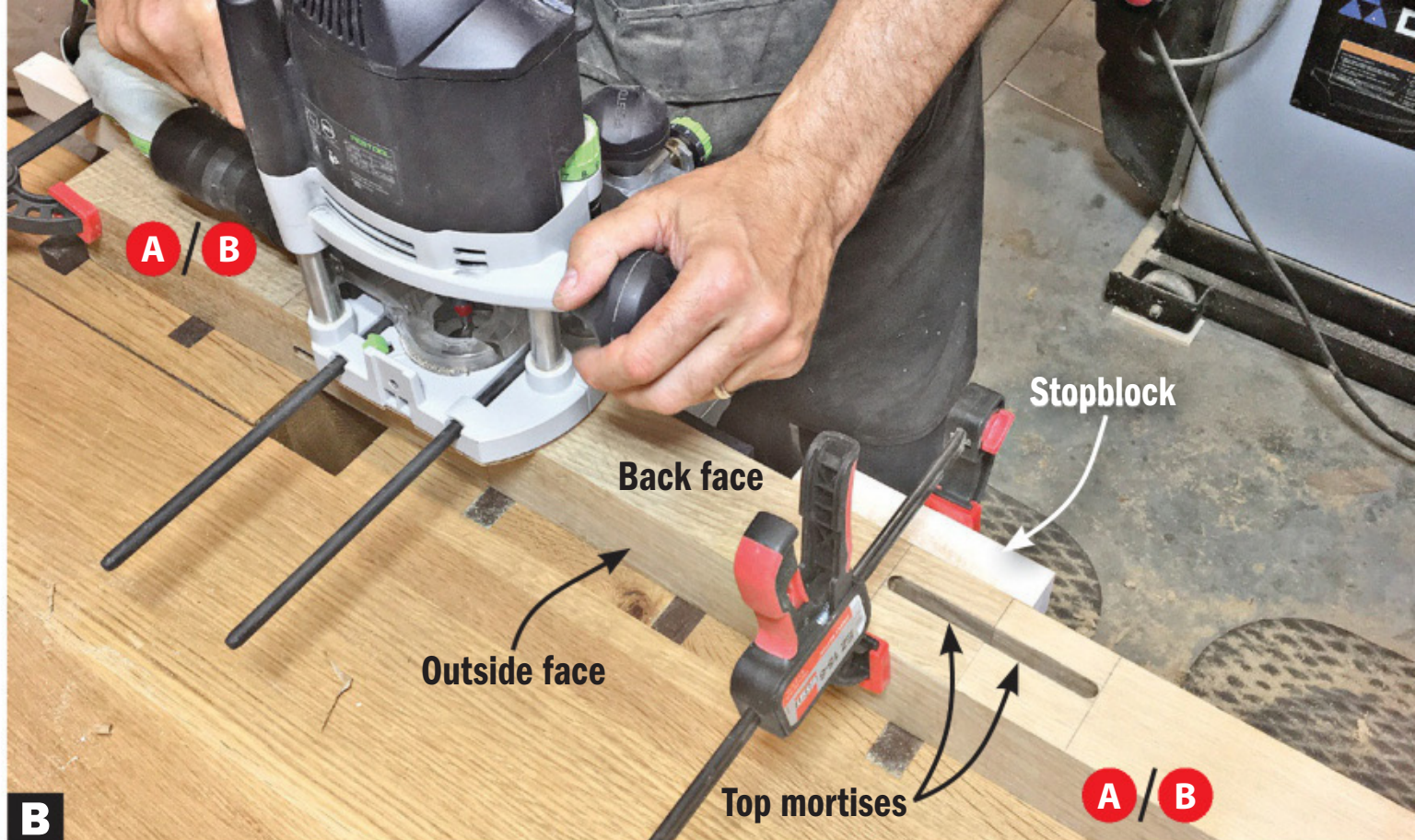
DIMENSIONS:
60" W x 28 3/8" D x 37" H

Approximate materials cost:
\$400
Lumber only

Seats
TWO
comfortably
for coffee or
cocktails.



A Fold the taped staves (front) into a square column. With the core (B) in place, clamp the leg from both directions, keeping the corners aligned.



B Abut the leg (A/B) tops with the back faces up to rout the top mortises. Stopblocks for the router's edge guide limit the length of each mortise.

Note: Double-check to ensure you've laid out left- and right-side legs before mortising. Then form the mortises in several progressively deeper passes with a $\frac{3}{8}$ " spiral upcut bit and plunge router.

2 Lay the staves (A) side by side with the wide faces up, and tape them into two sets of four with the bevel points firmly in contact [Photo A]. Fold the staves into squares, verify the dimensions for the leg cores (B), and cut the cores 1" overlength. Unfold the staves, keeping the tape on. Glue the bevels and inside faces, refold the legs around the cores, and clamp [Drawing 1, Photo A].

3 After the glue dries, cut the front legs to final length. Clamp the legs to your workbench and rout both top mortises at the same time [Drawing 2, Photo B]. Then, mortise the back and inside faces.

Build the back legs

1 Lay out the back leg (C) [Drawing 3] onto $\frac{1}{8}$ ×5×37" hardboard to make a full-size template, and cut it out.

2 Trace the template onto each of three $\frac{3}{4}$ ×5×65" boards [Cutting Diagram] and band-saw them apart between the front tapers. Stay about $\frac{1}{16}$ " outside the lines.

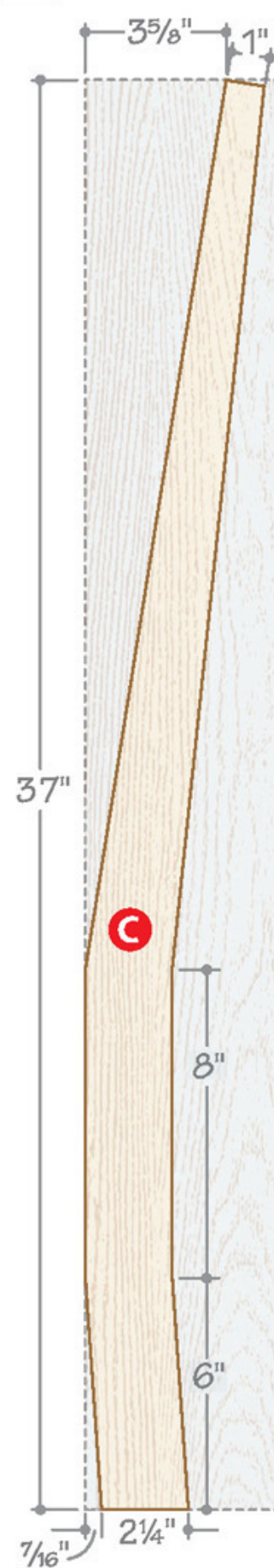
3 Glue the separated blanks into two three-layer laminations with the ends and

straight back edges flush. Bandsaw the legs to shape after the glue dries, and hand-plane and sand the edges smooth.

4 Mortise the inside face and the lower front edge of each back leg (C) [Drawing 4, Photos C, D]. Do not mortise the front edge on the upper part of the leg yet.

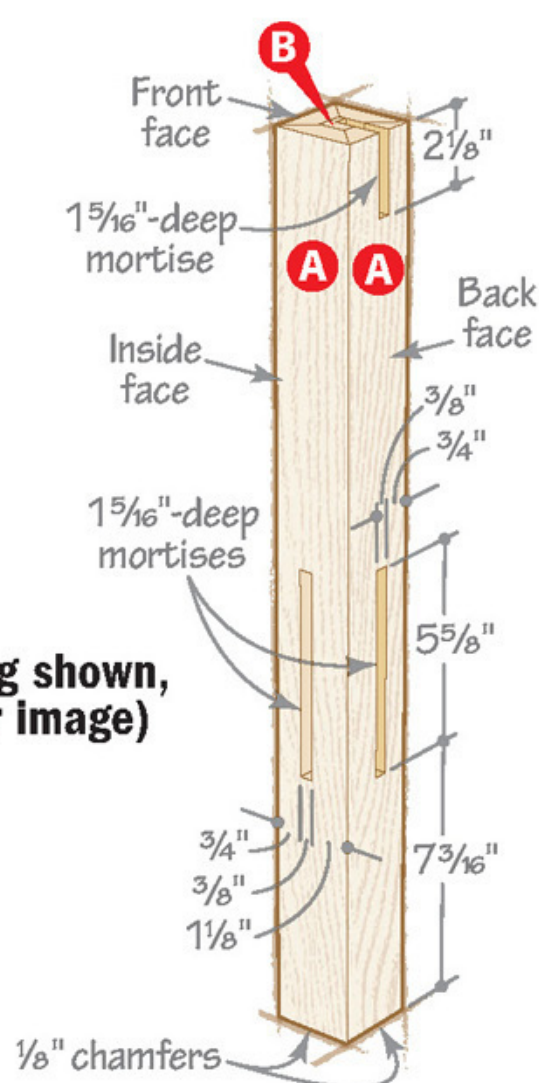
5 Chamfer the front (A/B) and back (C) leg bottoms, and finish-sand.

3 BACK LEG LAYOUT



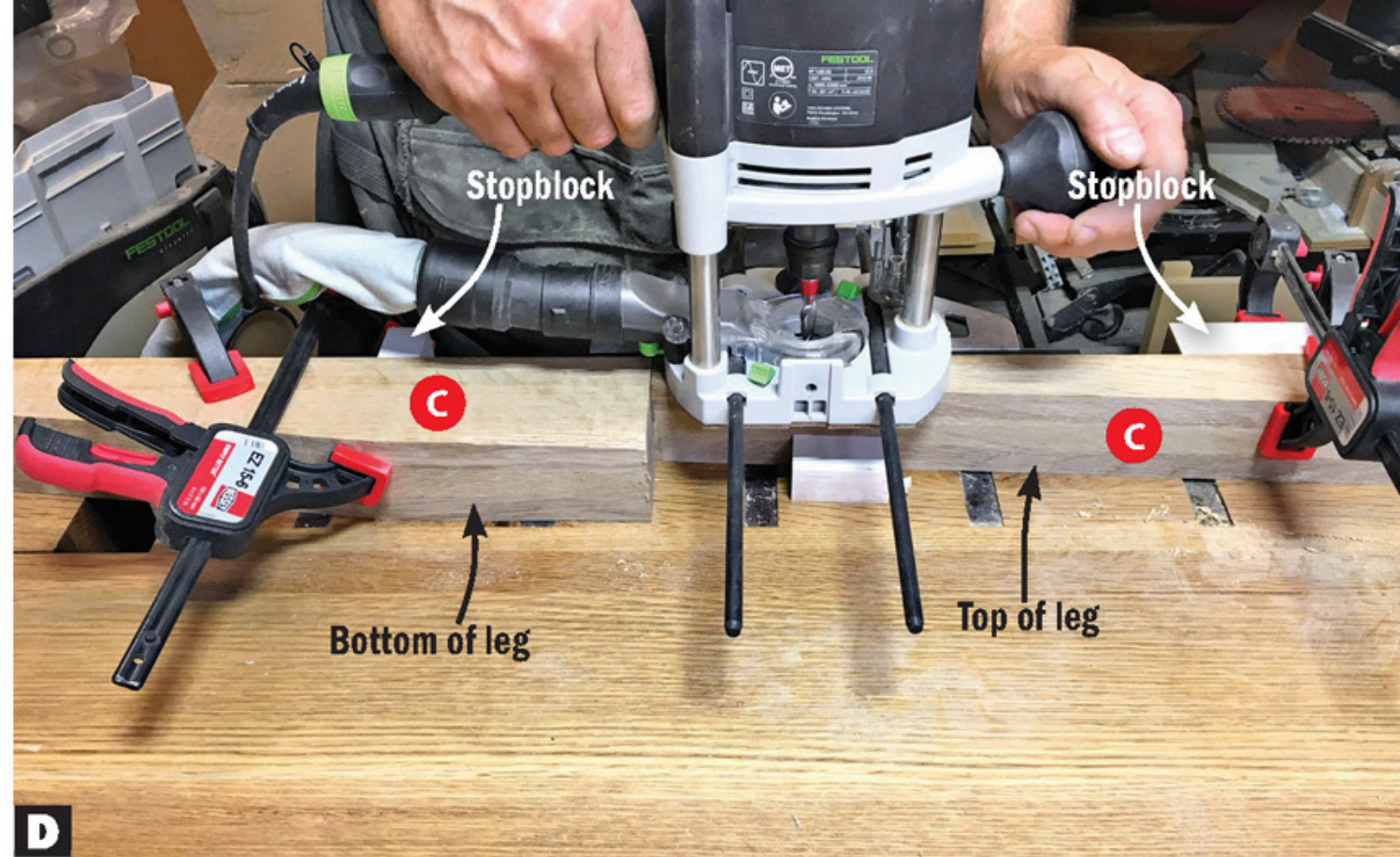
4 BACK LEG MORTISES (Left leg inside face shown, right leg is a mirror image)

2 FRONT LEG (Left leg shown, right leg is a mirror image)





C Set up stopblocks again to set the mortise length. Rout the front mortise carefully so the router doesn't tip as it approaches the angled portions of the leg.



D When routing the upper back-leg mortise, place the bottom of the other back leg against the top to support the router and allow stopblock clamping.

Note: We made stretchers M, N, and R and spacers O and P out of sequence to avoid repeating setups later.

Cut some rail tenons

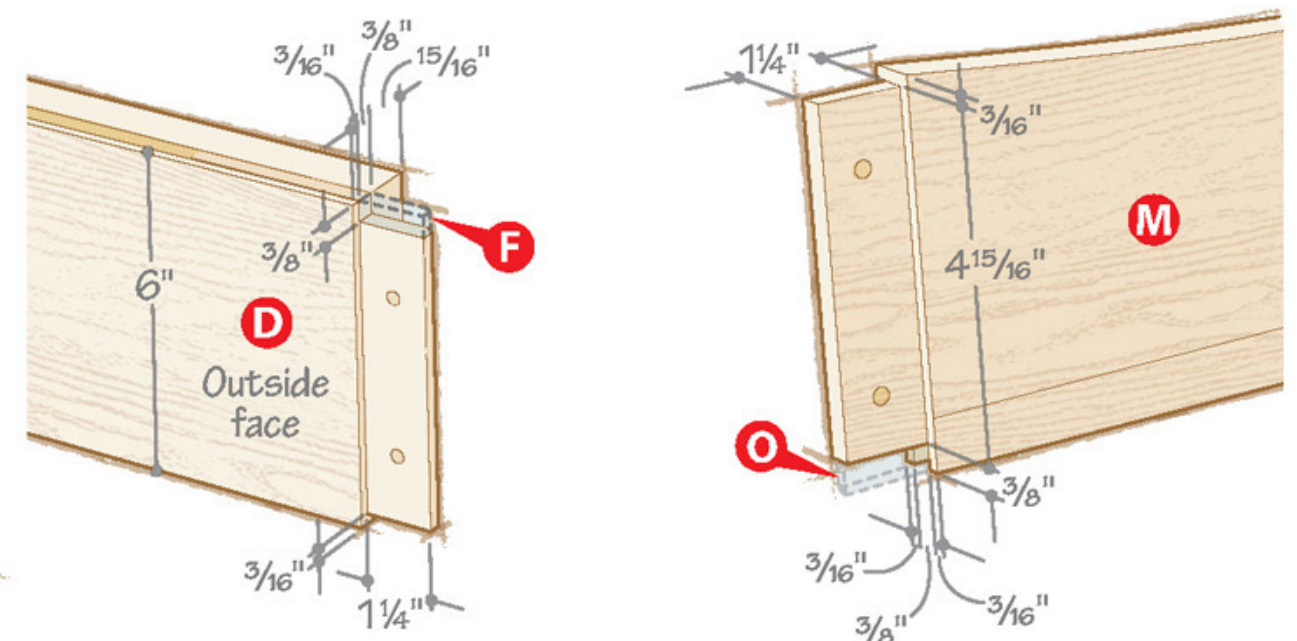
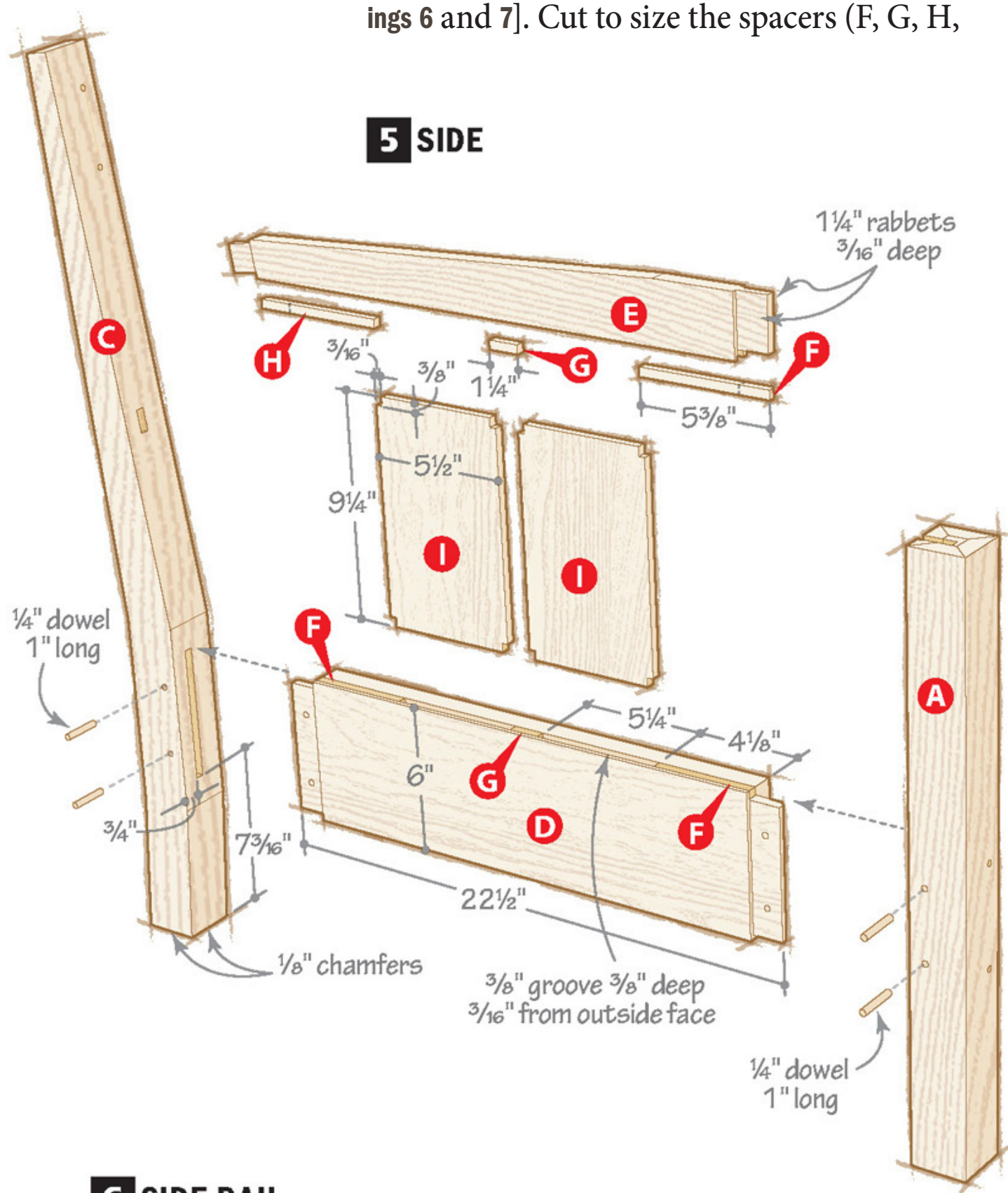
1 Cut the side bottom rails (D) to size and cut blanks for the side top rails (E) about 24½" long [Drawing 5]. Also cut the backrest top and bottom stretchers (M, N) and the leg stretchers (R) to size [Exploded View].

2 Groove the top edges of parts D and N and the bottom edges of E and M [Drawings 6 and 7]. Cut to size the spacers (F, G, H,

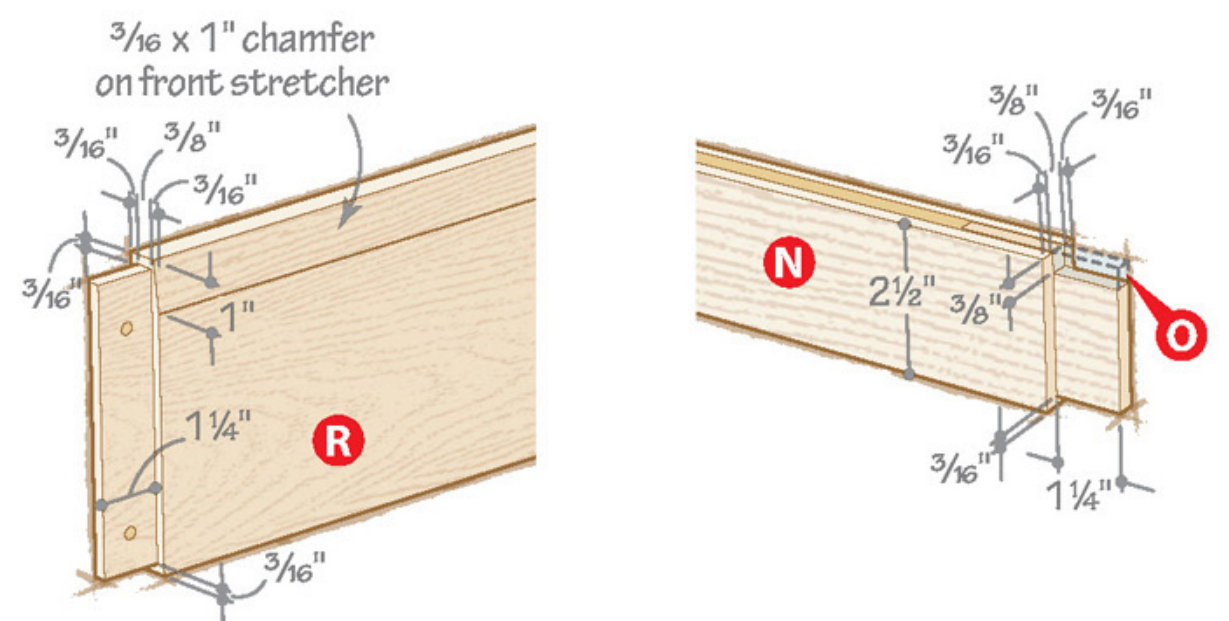
O, and P) and glue them into the grooves [Drawings 5 and 11].

3 Form tenons on both ends of parts D, M, N, and R [Drawing 7] and the front end of each side top rail (E) [Drawing 6]. Round the edges of the tenons with a rasp and 80-grit sandpaper to fit the mortises. Set aside the back stretchers (M, N) and leg stretchers (R).

Tip! Cut the tenons on your tablesaw in overlapping passes with a ¾" dado set.



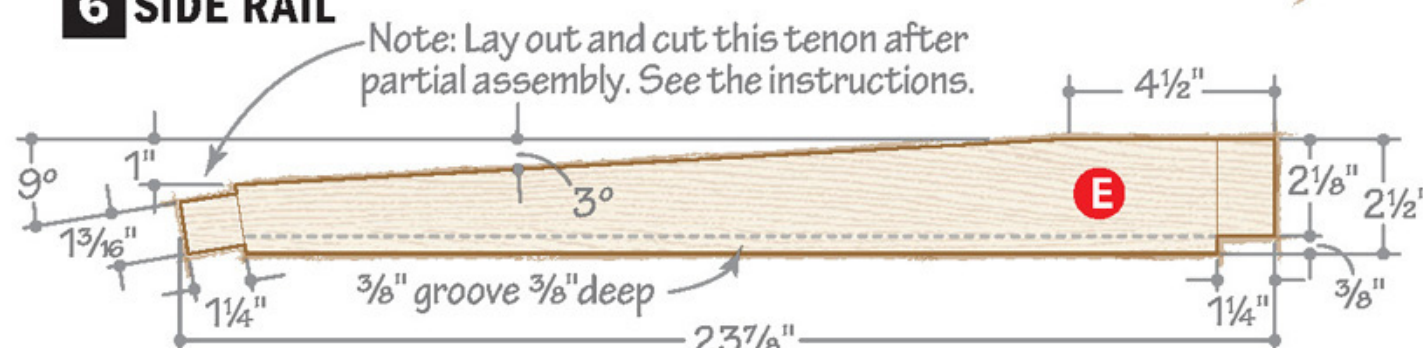
7 TENON DETAIL

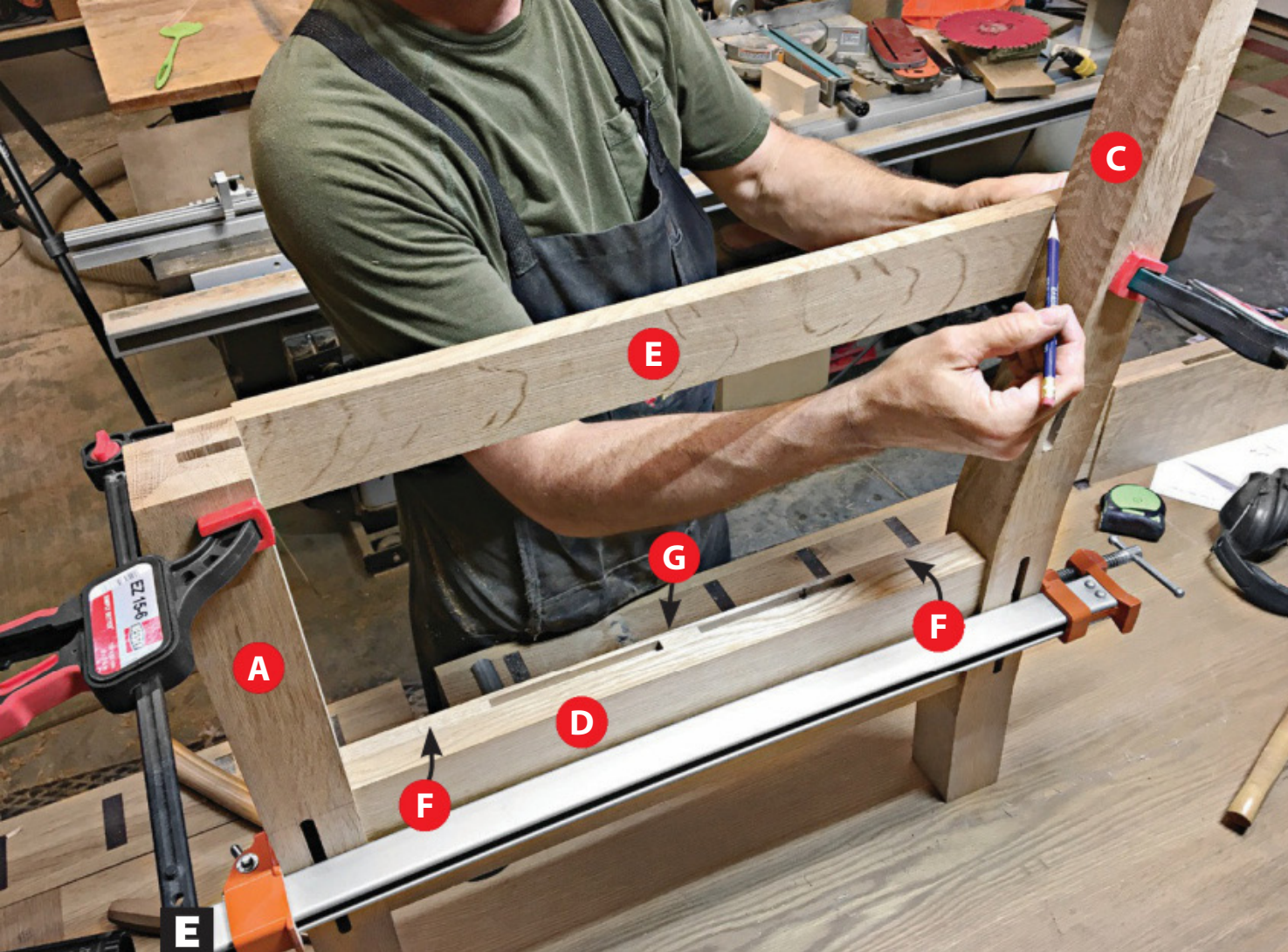


Note: Glue spacers **F** and **O** into the grooves in rails **D** and stretchers **M** and **N** before cutting the tenons. See the instructions.

Note: Round tenon edges to fit mortises.

6 SIDE RAIL





Align the top edge of the rail (E) flush with the top of the front leg (A/B) and make the rails (D, E) parallel. Then scribe the tenon shoulder on the top rail (E).

Tip! Mark the rail (E) bottom on the back leg to facilitate positioning it in the same spot later.

Note: We completed the rail tenons with a handsaw and chisel.

Assemble the sides

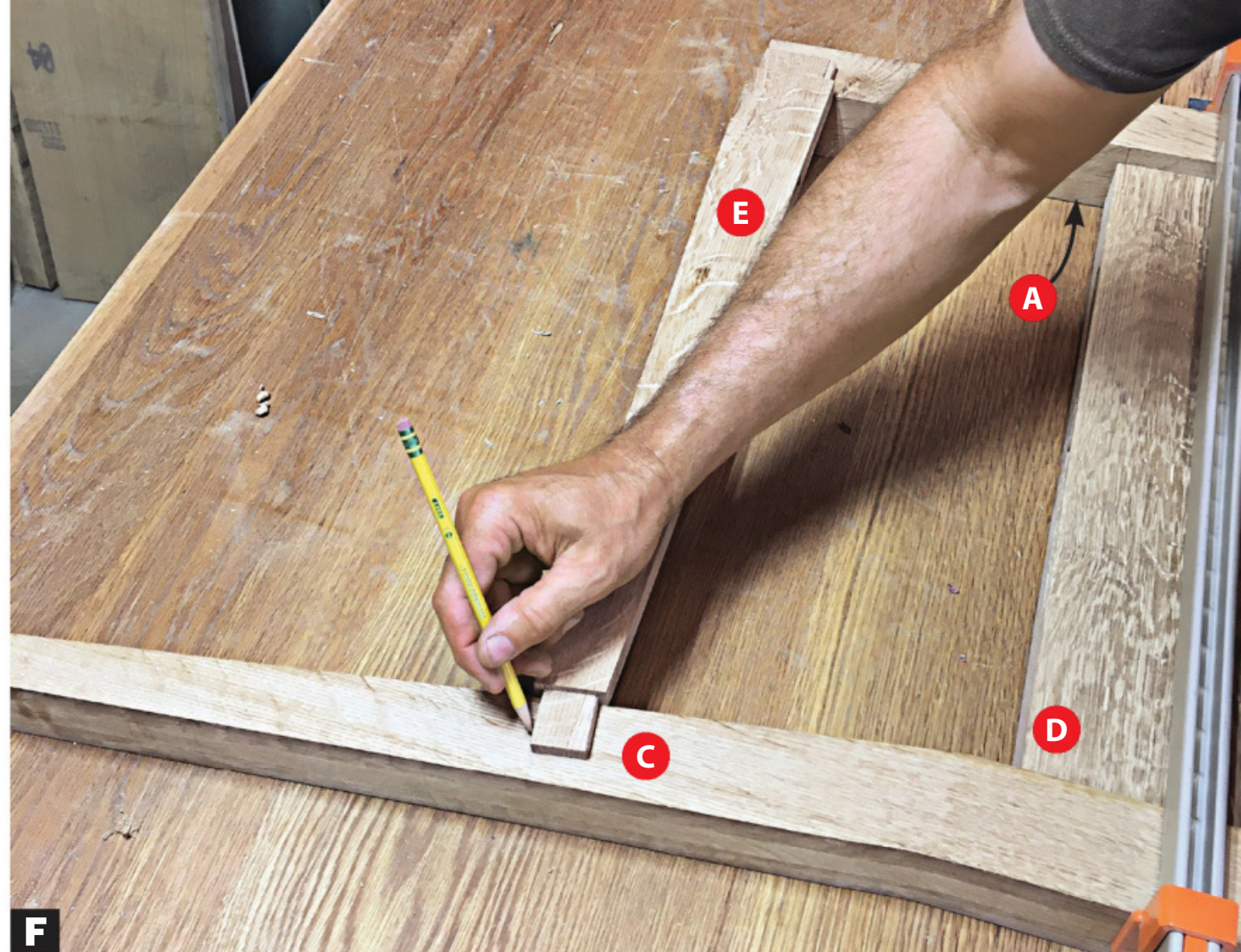
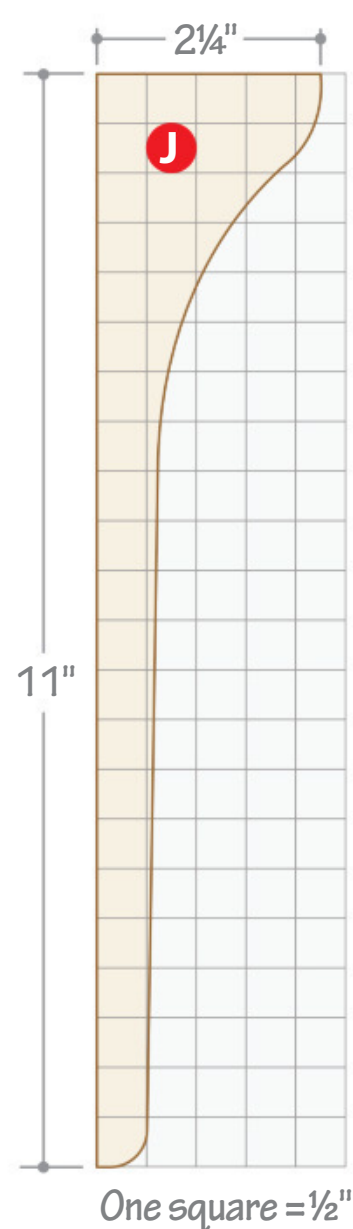
1 Dry-assemble (no glue) and clamp the front leg (A/B), back leg (C), and bottom rail (D) for each side. Clamp the top rail (E) against the outside of each assembly with the front tenon shoulder snug against the leg and mark the rear tenon shoulder [Photo E].

2 Set your tablesaw miter gauge to the shoulder angle scribed on the rail. Cut one tenon cheek on each rail. Transfer the cutline to the other rail face, reset the miter gauge to the opposite angle, and cut the other cheeks.

3 Saw the sloped top edge on the rails [Drawing 6] and trim the tenon top and bottom shoulders and the tenon length. Put the top rail (E) against the clamped-up bottom rail and legs assembly again, and mark the top-rail mortise location on the side [Photo F].

8 CORBEL GRIDDED PATTERN

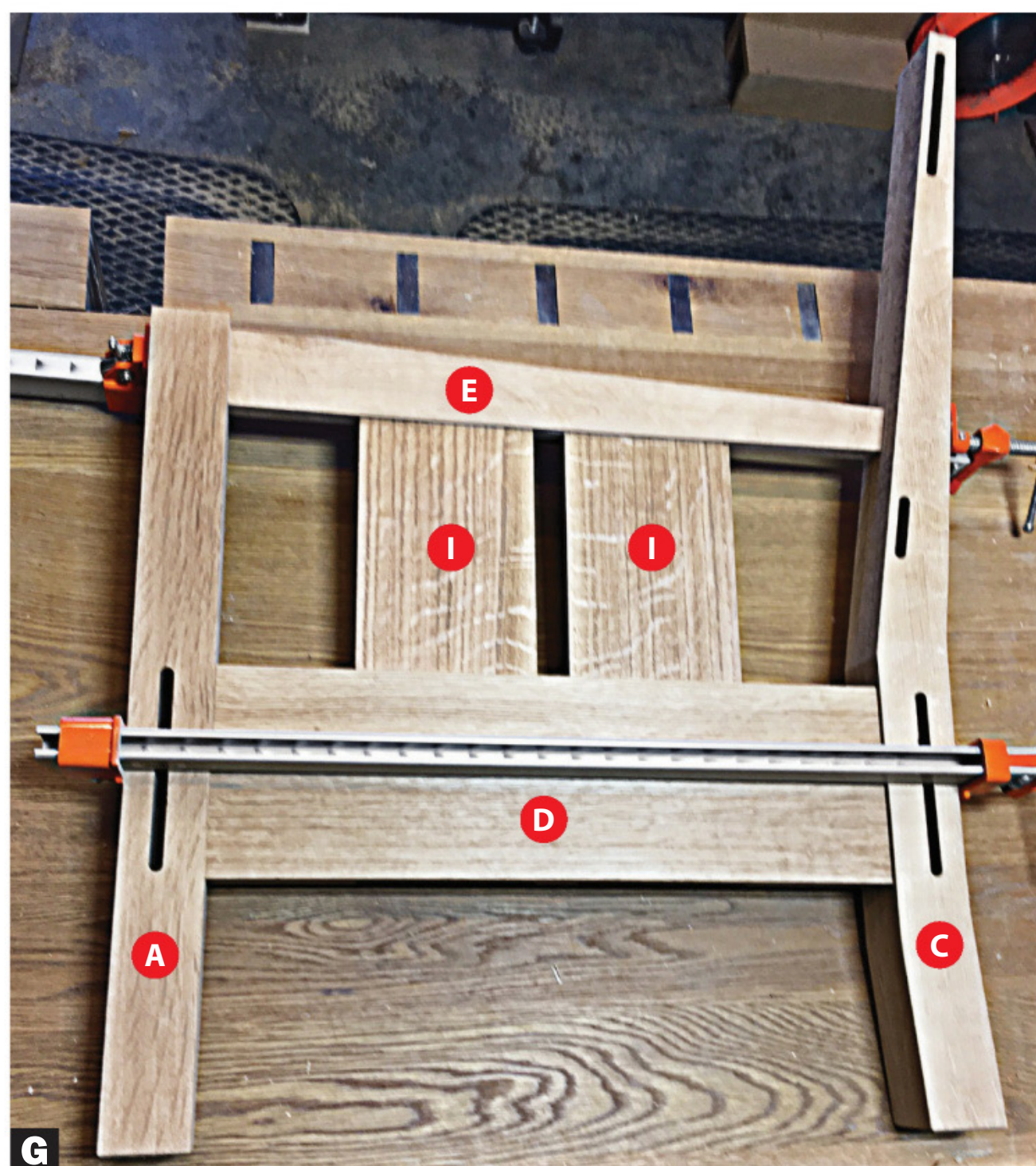
► Learn how to enlarge gridded patterns.
woodmagazine.com/griddedpattern



F Trace the rail (E) tenon onto each back leg (C) side. Transfer the locations to the front faces of the legs and rout the mortises.

4 Cut the slats (I) to size and notch the corners [Drawing 5]. Finish-sand the legs, rails, and slats, then glue them into left- and right-side assemblies [Photo G]. To allow the solid-wood slats to move with humidity changes, glue them into their slots at their middles only.

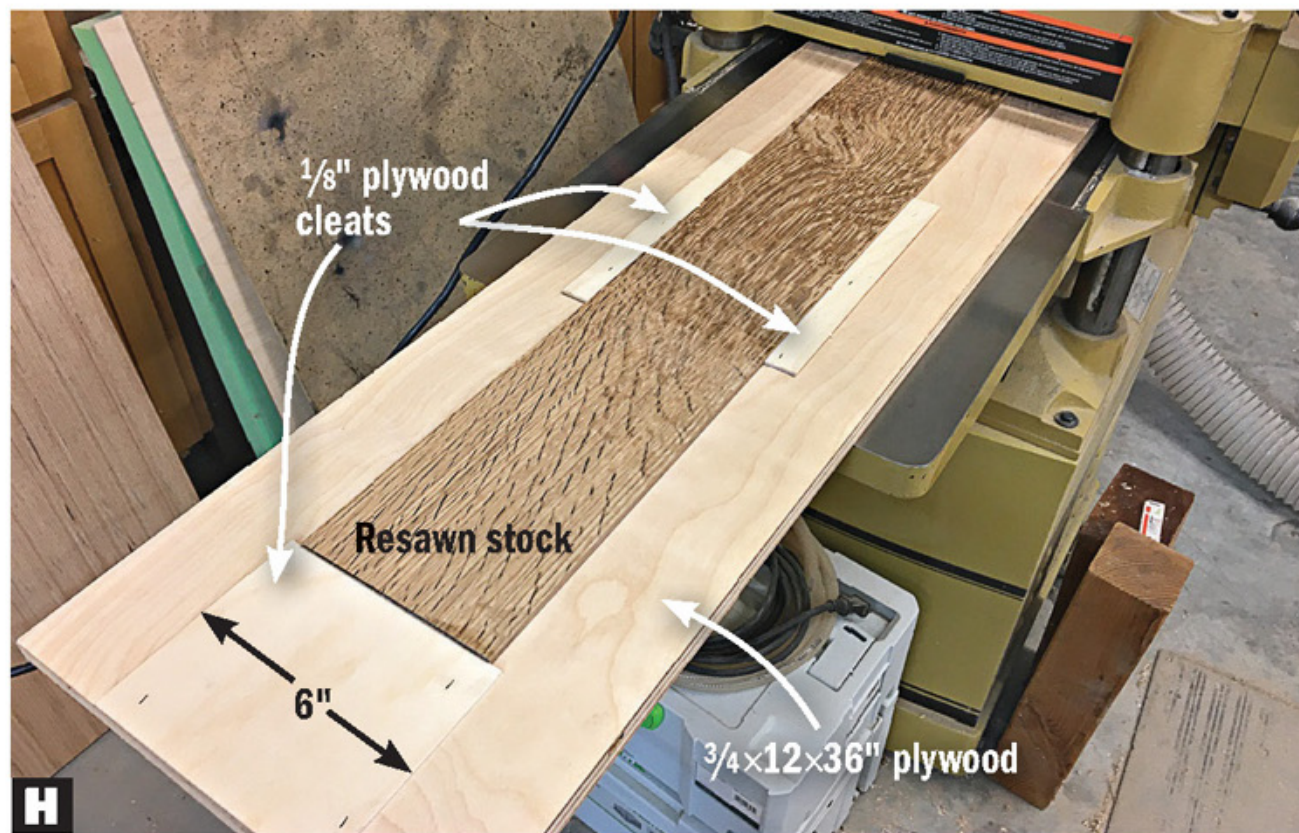
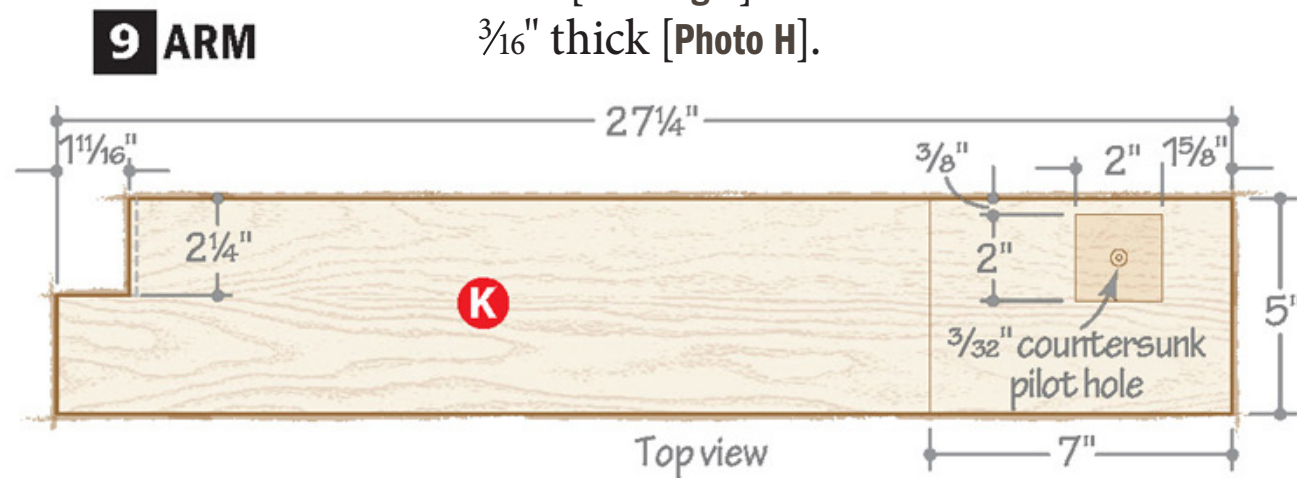
5 Bandsaw the corbels (J) [Drawing 8], sand the edges smooth, finish-sand them, and glue them to the outside of the front legs (A/B), centered and flush with the leg tops [Exploded View].



G Make sure the top edge of the rail (E) and its tenon lie flush with the top end of the front leg when you assemble the sides.

Make the arms

1 For the arm (K) laminations, joint one face of three $1\frac{3}{4} \times 5\frac{1}{4} \times 29$ " blanks, resaw a $\frac{1}{4}$ "-thick lamination from each blank, joint the blanks again, resaw again, and so forth until you have 12 laminations, six for each arm [Drawing 9]. Plane the resawn material to $\frac{3}{16}$ " thick [Photo H].

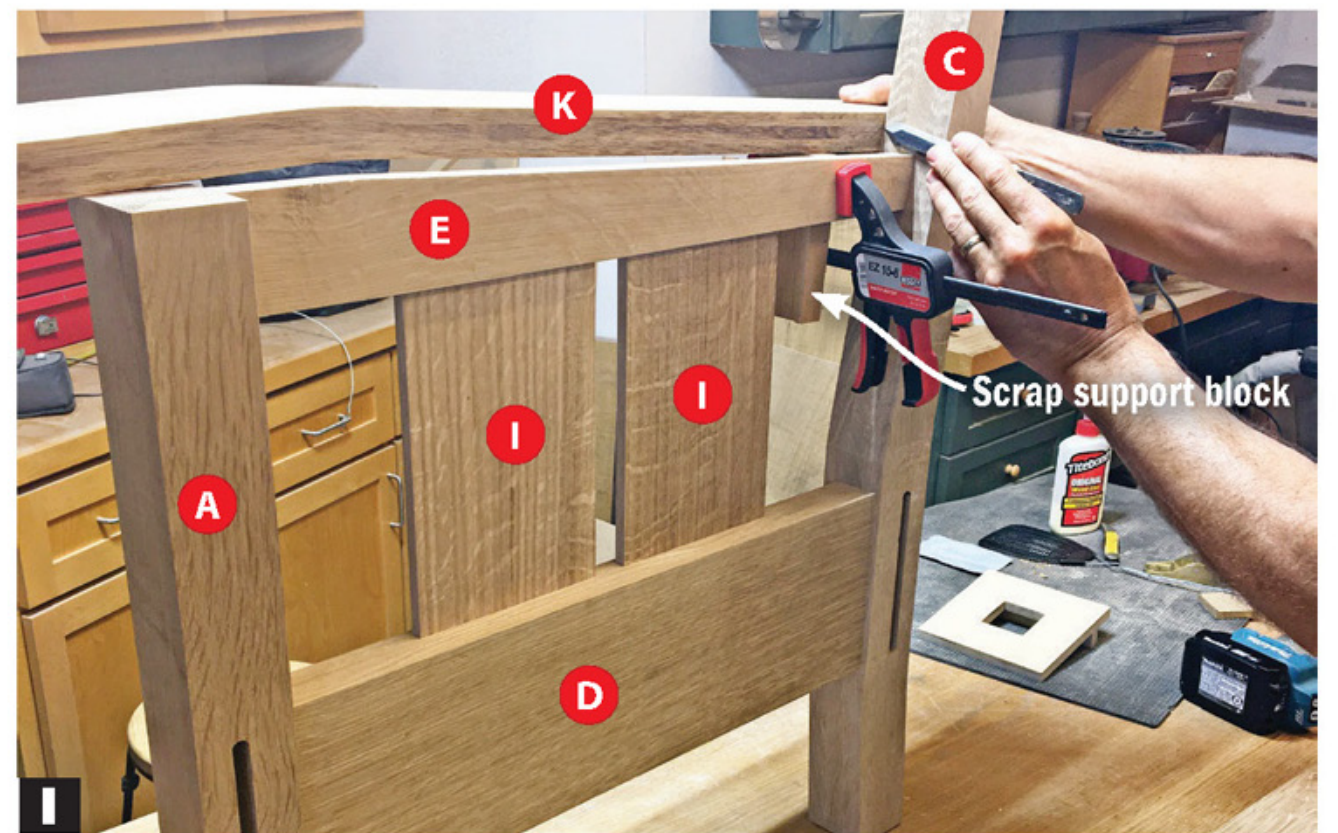
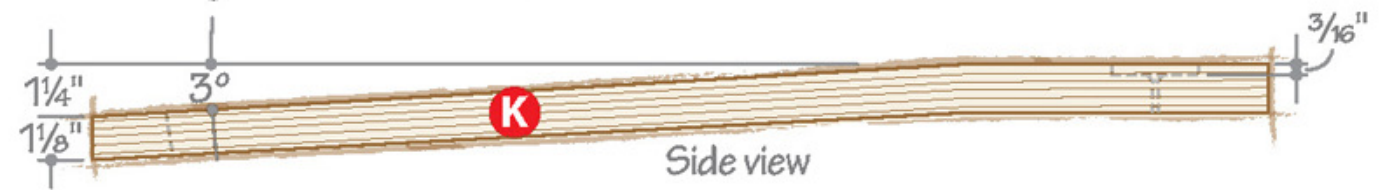


Safely plane thin stock on a sled. Attach the cleats with a brad nailer. With double-faced tape, attach the resawn stock to the sled, jointed face down.

2 Construct the arm form and laminate six layers of thin stock to make each arm [Skill Builder].

3 Joint one edge of the dried laminations and rip them to width [Drawing 9]. Trim the end of each arm 7" from the bend.

4 Clamp a scrap block to the outside of each side top rail (E) flush with the rail top near the back leg (C). Lay an arm across the corbel (J) and block and mark the back notch angle on each arm [Photo I].



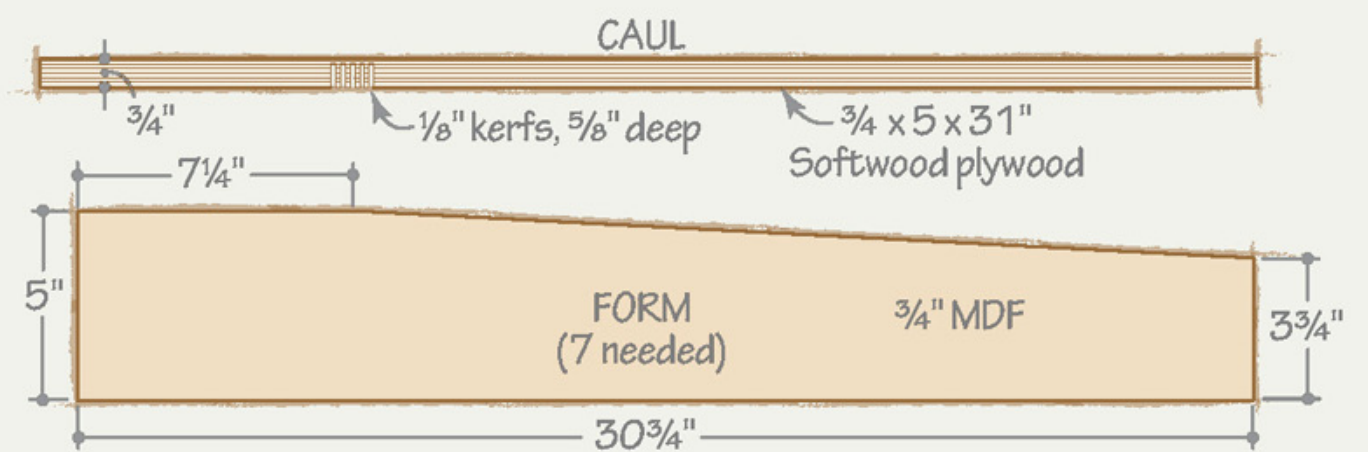
Extend the arm end $1\frac{1}{2}$ " past the leg (A/B) front, then scribe the angle at the front of the back leg (C) on the inside edge of the arm.

SKILL BUILDER

Get those arms in shape

Cut seven pieces of MDF $\frac{3}{4} \times 5 \times 30\frac{3}{4}$ " for the arm form. Lay out the taper on one blank (as shown in the drawing), and use it to set up a tapering jig. Cut all the pieces [below, left] and laminate them to complete the form [below, center]. Saw kerfs in a $\frac{3}{4} \times 5 \times 31$ " piece of plywood for a clamping caul [Drawing].

Glue together six arm laminations (no glue on the outside faces), keeping the edges and ends as flush as possible. Lay the sandwich on the form with the caul on top of it, the kerfed side at the bend facing down [below, right].



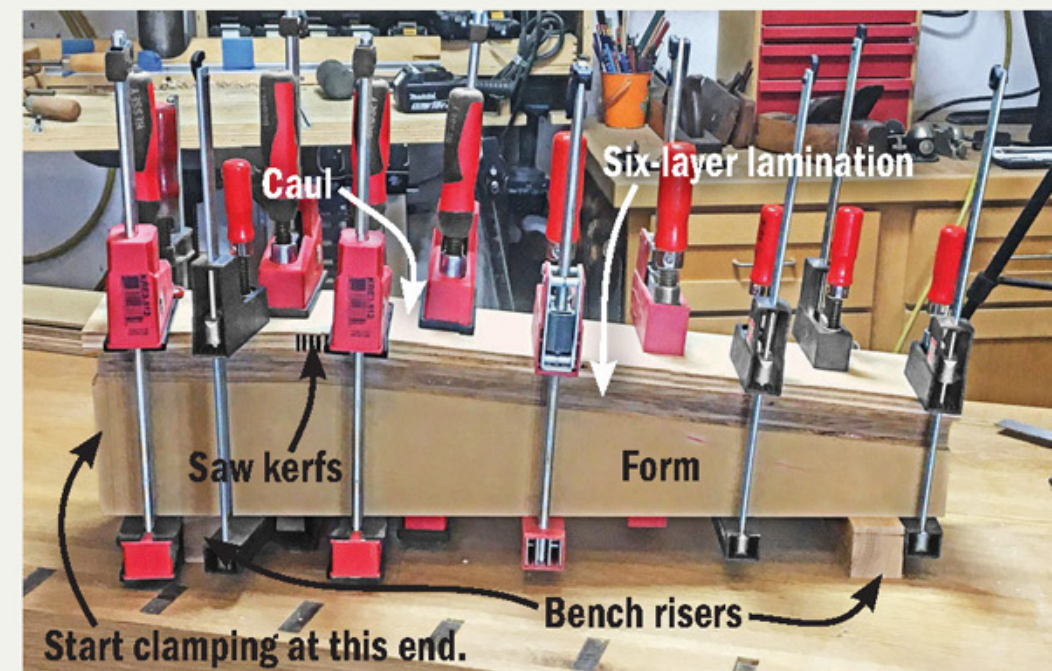
Note: We glued the arm laminations with Titebond III because it offers long open time, and let each arm dry overnight.



A sled with two cleats positions the blanks for precise tapering. Learn about making and using a tapering jig at woodmagazine.com/taper.



Keep the angled top edges flush as you glue and clamp the form. Brad the layers together as you build up the form to prevent slipping when clamped.



Start clamping at the arm front. Keep the edges flush, and the arm front end about $\frac{1}{8}$ " from the form end. Clamp firmly on both sides of the bend.



J Raise the tablesaw blade to 2 1/4" and cut the front of the arm notch with the miter gauge adjusted to the correct angle for each arm.



K Set the blade height to the lowest edge of the angle cut and saw the notch. Clamp the arm to the miter-gauge fence for stability. Finish with a handsaw.

5 Extend the edge mark to the top and bottom faces of the arm, and lay out the notch [Drawing 9]. Repeat for the other arm.

6 Measure the angle scribed on the arm edge, set your tablesaw miter gauge to that angle, and cut the arm at the mark [Photo J]. Repeat for the other arm. Then, return the miter gauge to 0° and complete the notches [Photo K].

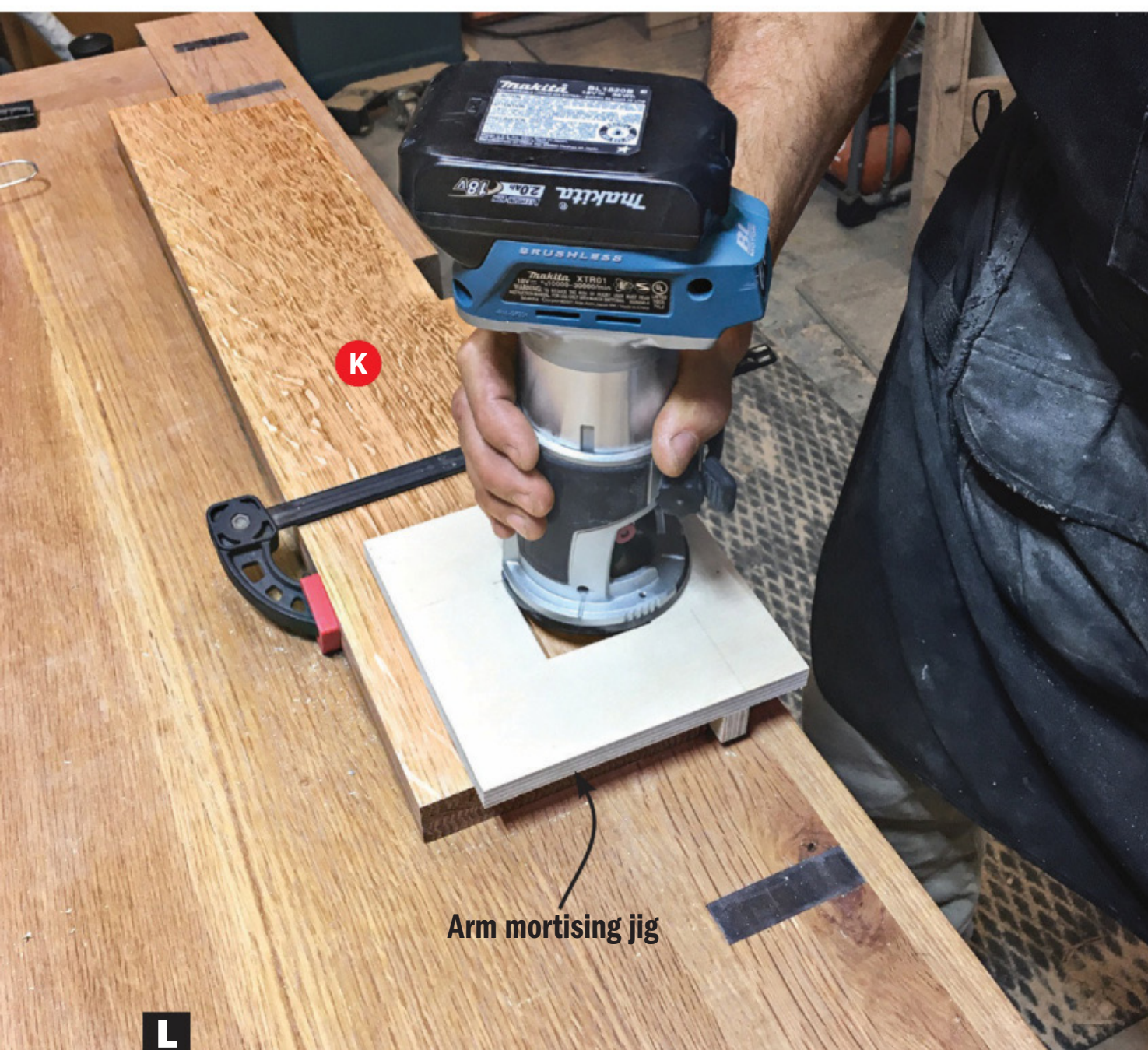
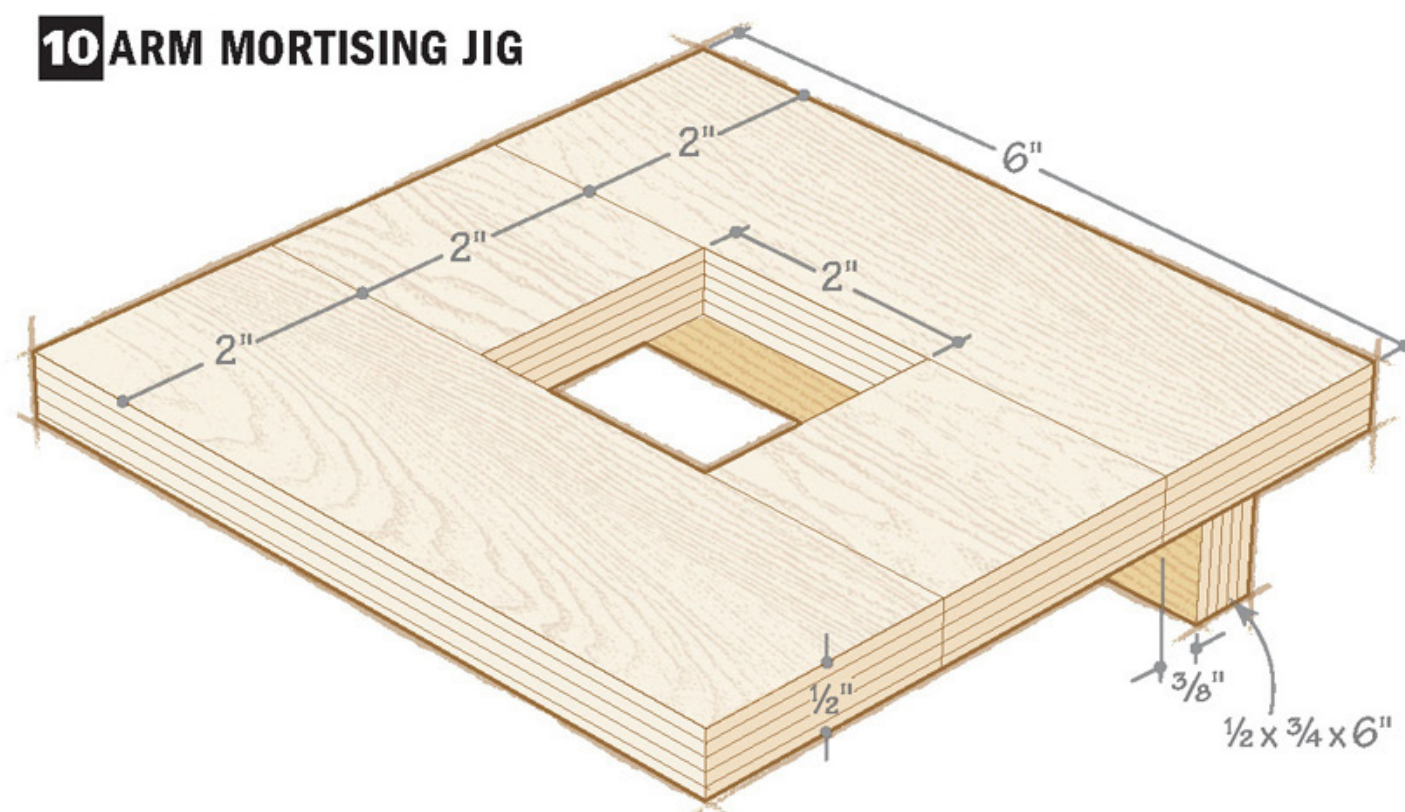
7 Make the mortising jig [Drawing 10] for the arm buttons (L). Lay out the mortises on the arms [Drawing 9], position and clamp the jig, then form the mortises [Photos L, M].

8 Cut the arm buttons (L) [Exploded View], chamfer the edges, finish-sand, and set them aside.

9 Glue the arms (K) to the side assemblies (A-J). After the glue dries, center a pilot

hole in each arm mortise and screw the arms to the front legs [Exploded View]. Glue the arm buttons in place.

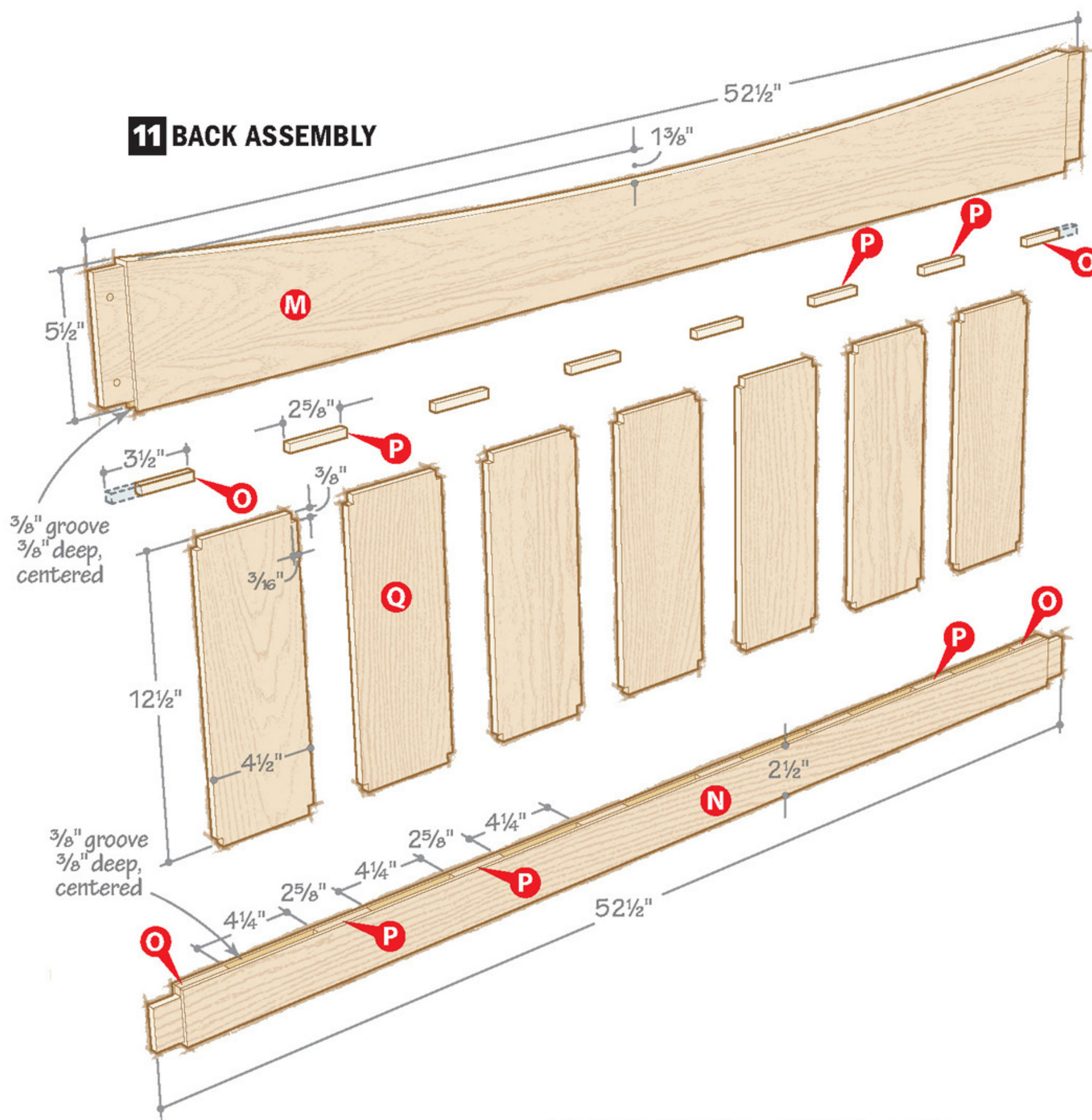
10 ARM MORTISING JIG



L Rout the mortise with a dado clean-out bit and the mortising jig.



M After routing, leave the jig in place as a chisel guide to square the corners.



Put it all together

► Lay out that top curve easily.

woodmagazine.com/fairingstick

1 Bandsaw the curved top edge on the back top stretcher (M) [Drawing 11]. Sand the edge smooth, and finish-sand it and the bottom stretcher (N).

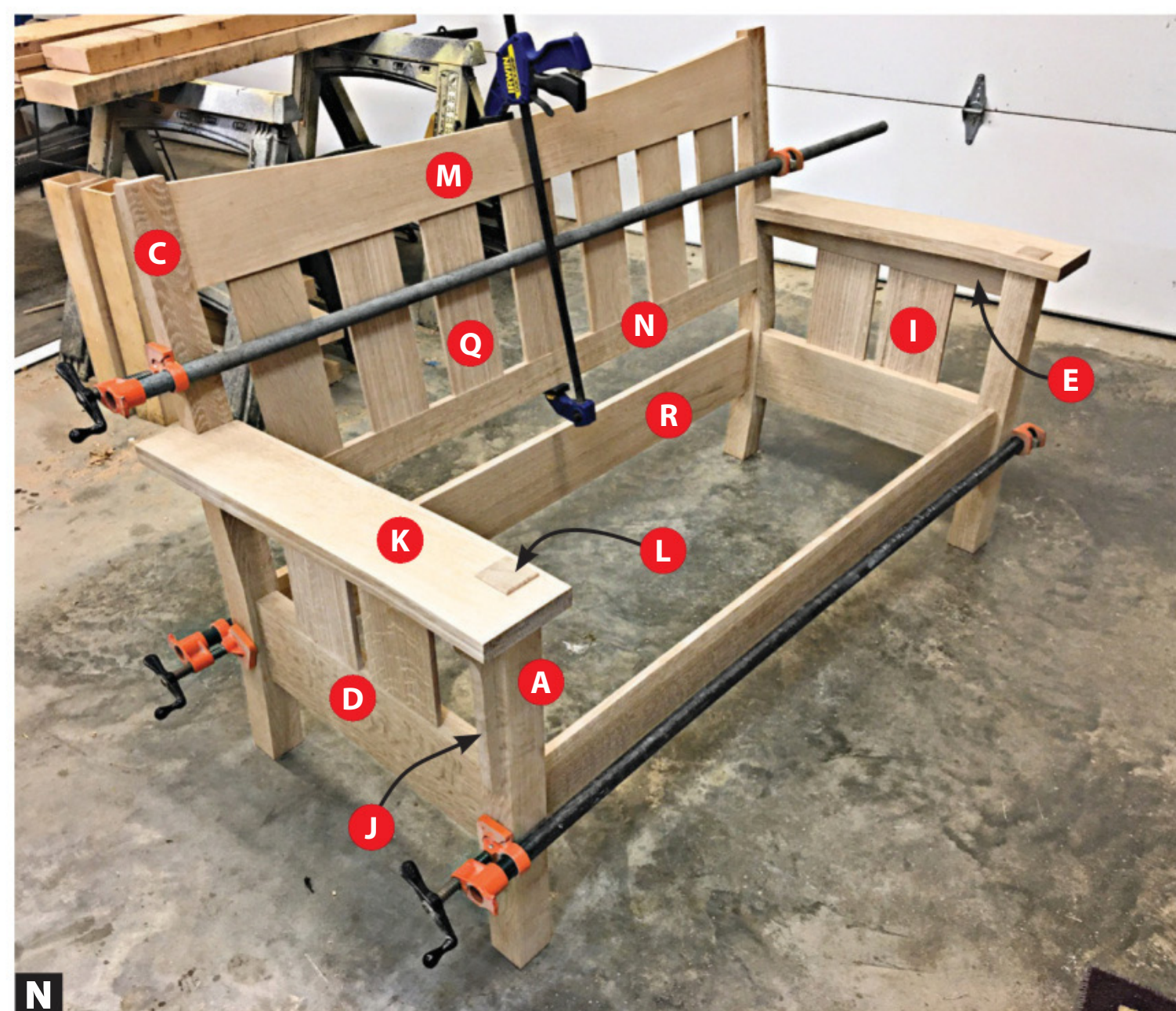
2 Cut the back slats (Q) [Drawing 11] and notch the corners. Finish-sand the slats. Dry-assemble (without glue) the top (M) and bottom (N) stretchers and slats. To ensure fit and ease of assembly, mark the slats for position and set the parts aside.

3 Retrieve the leg stretchers (R) and chamfer the top edge of the front one [Drawing 7]. Finish-sand both parts and dry-assemble them with the sides (A–L) to test their fit.

4 Touch up the sanding where necessary, and organize the parts for final assembly. Spread a moving blanket on your floor and lay one side assembly on it, mortises facing up.

5 Apply glue to the slats (Q) and insert them into the top and bottom stretchers (M, N). Apply glue to the tenons on the stretchers that fit into the side assembly on the floor and insert them into the mortises. Similarly, glue the tenons on the leg stretchers and join them to the side mortises.

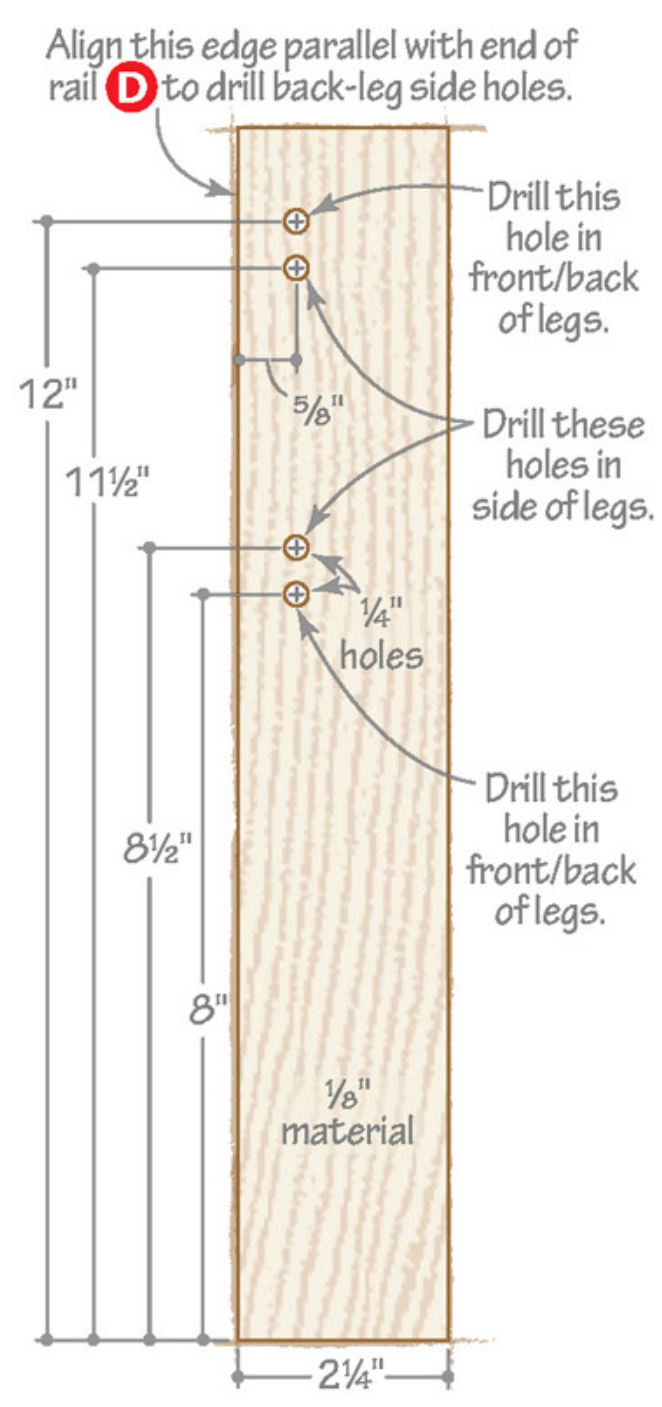
Note: Apply glue only to the middle of the slat tongues to allow the solid-wood slats to move with humidity.



N Clamp the stretcher/leg joints and the middle of the back. Make sure the settee sits evenly, and clean off any glue squeeze-out.

6 Glue the other stretcher tenons and add the remaining side assembly. Carefully place the settee on its legs, and clamp [Photo N].

12 DRILLING GUIDE

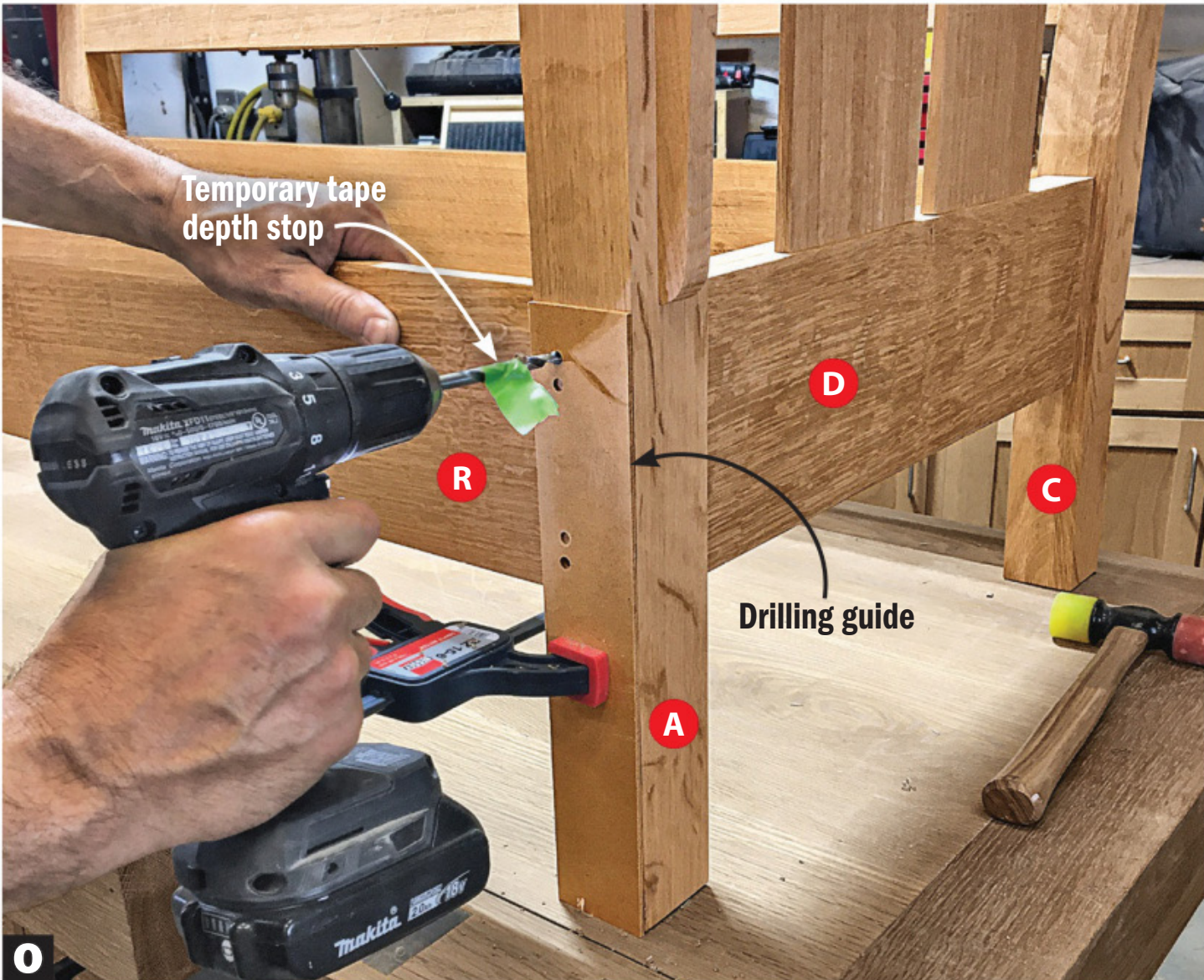


7 Make the drilling guide [Drawing 12]. Drill 1"-deep dowel holes [Exploded View, Photo 0], glue in the dowels, and trim them flush.

8 Finish the settee. (We applied Lockwood Early American Maple golden amber dye #144 followed by Varathane Gunstock stain and a dull lacquer topcoat.)

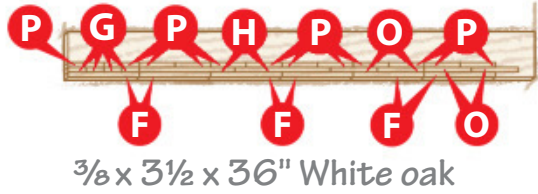
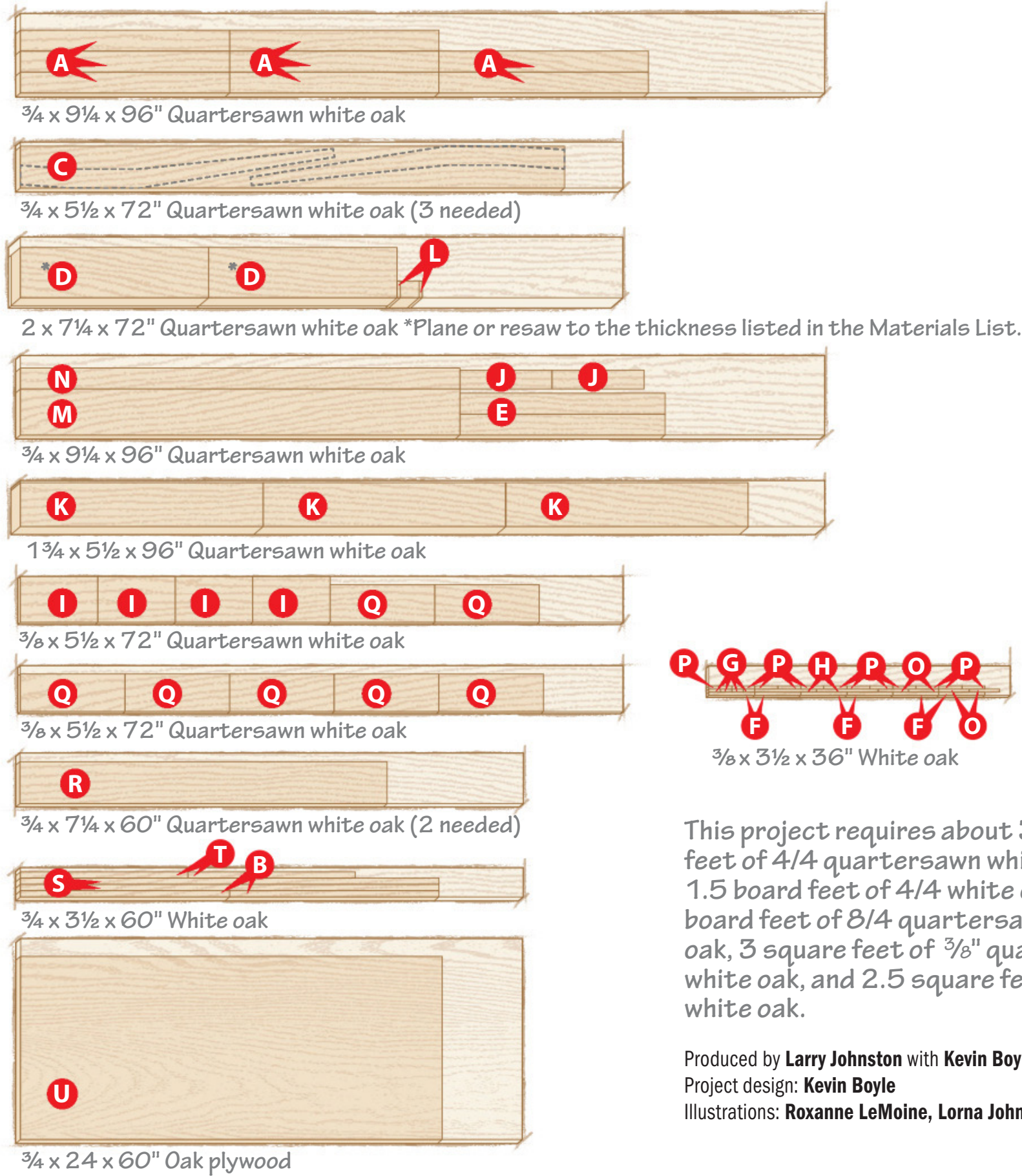
9 Cut the cleats (S, T) and seat (U) to size. Notch the seat corners [Exploded View]. Screw the cleats to the bottom rails (D) and leg stretchers (R) [Exploded View] and drop the seat into place. Then, buy or make a cushion, plop it in place, and sit yourself down for a rest. 🌳

► Upholster the settee seat yourself.
woodmagazine.com/setteeseat



0 Drill holes for reinforcing dowels in the wide mortise-and-tenon joints. Lay out the hole locations on the backs of legs C where the guide won't work. A tape flag on the drill bit serves as a depth stop.

Cutting Diagram



This project requires about 30 board feet of 4/4 quartersawn white oak, 1.5 board feet of 4/4 white oak, 15 board feet of 8/4 quartersawn white oak, 3 square feet of 3/8" quartersawn white oak, and 2.5 square feet of 3/8" white oak.

Produced by Larry Johnston with Kevin Boyle
Project design: Kevin Boyle
Illustrations: Roxanne LeMoine, Lorna Johnson

Materials List

Part	FINISHED SIZE			Matl.	Qty.
	T	W	L		
Sides					
A* front leg staves	¾"	2¼"	24"	QWO	8
B* front leg cores	¾"	¾"	24"	WO	2
C* back legs	2¼"	4⅝"	37"	LQWO	2
D bottom rails	1½"	6"	22½"	QWO	2
E* top rails	¾"	2½"	23⅞"	QWO	2
F front end spacers	⅜"	⅜"	5⅜"	WO	6
G middle spacers	⅜"	⅜"	1¼"	WO	4
H rear end spacers	⅜"	⅜"	7¼"	WO	2
I slats	⅜"	5½"	9¼"	QWO	4
J corbels	¾"	2¼"	11"	QWO	2
K* arms	1⅛"	5"	27¼"	LQWO	2
L arm buttons	2"	2"	⅜"	QWO	2
Backrest, stretchers, and seat					
M top stretcher	¾"	5½"	52½"	QWO	1
N bottom stretcher	¾"	2½"	52½"	QWO	1
O long spacers	⅜"	⅜"	3½"	WO	4
P short spacers	⅜"	⅜"	2⅝"	WO	12
Q slats	⅜"	4½"	12½"	QWO	7
R leg stretchers	¾"	6"	52½"	QWO	2
S front/back cleats	¾"	¾"	50"	WO	2
T side cleats	¾"	¾"	20"	WO	2
U seat	¾"	21⅞"	50⅝"	OP	1

*Parts initially cut oversize. See the instructions.
Materials key: QWO-quartersawn white oak, LQWO-laminated quartersawn white oak, WO-white oak, OP-oak plywood.
Supplies: 1/4x24" white oak dowel, #8x1 1/4" and #8x1 1/2" flathead wood screws, 4x21 7/8x50" upholstered cushion.
Blade and bits: Dado set; 3/8" spiral upcut, top-bearing pattern, and 45° chamfer router bits.

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888-636-4478



Sinuous Serving Tray

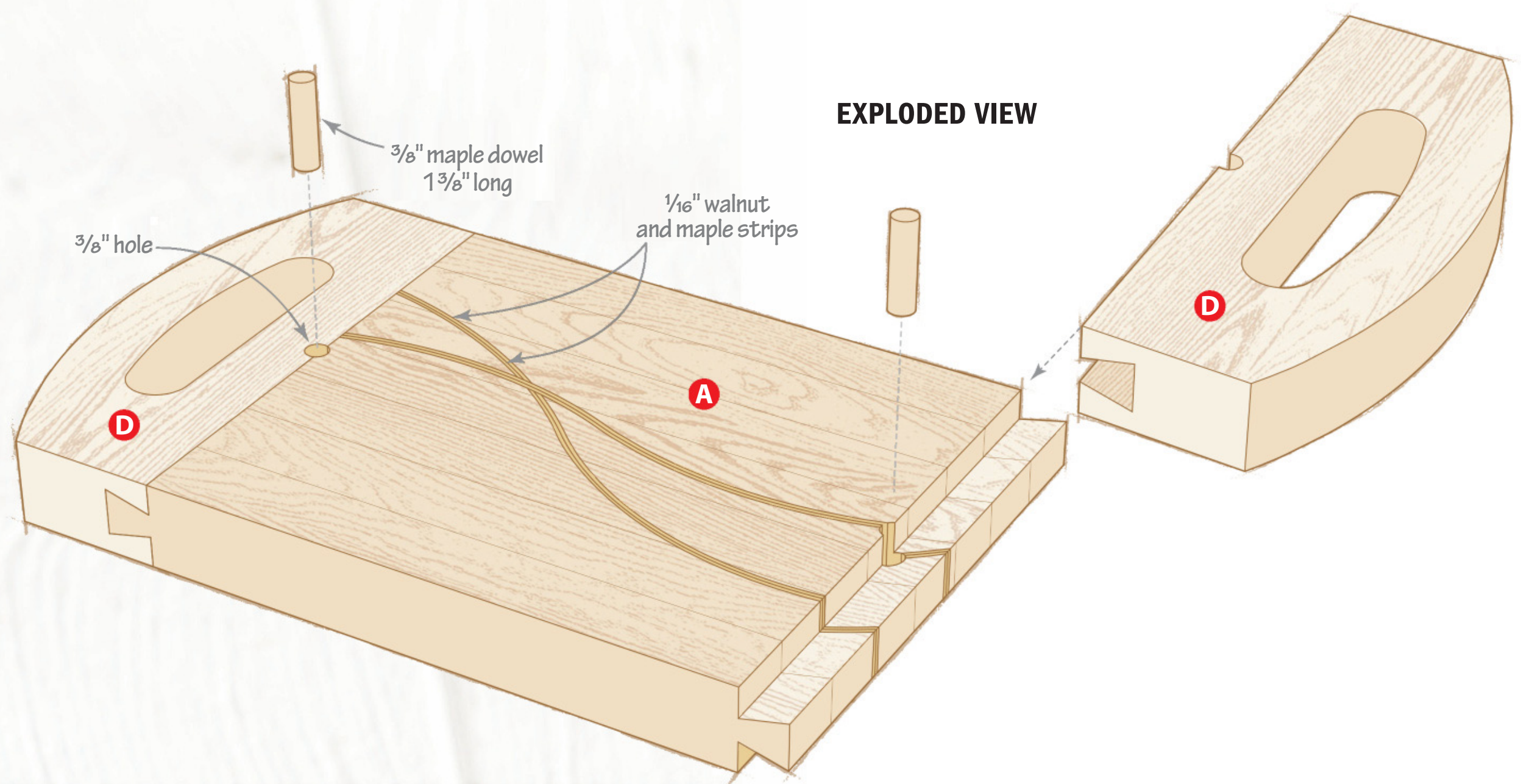
Add your own custom flourishes to serve up style.

D I M E N S I O N S :
16 1/2" W x 8 1/2" D x 1 3/8" H

Approximate materials cost:

\$50

Even less when you put your scrapwood to work.



EXPLODED VIEW



We designed this tray with two pairs of contrasting ribbons running through the lamination. Adjust the dimensions and add more accent strips of your own design for a one-of-a-kind server or cutting board.

Get the tray under way

1 Laminate seven pieces of $1\frac{1}{2} \times 1\frac{1}{4} \times 11\frac{1}{2}$ " cherry for a uniform tray blank (A). (Leave the blank oversize for now.)

2 Lay out the first accent curve [Drawing 1] and bandsaw on the line [Photo A]. Then use a spindle sander with a light touch to remove any rough spots. Press the two halves together to check for gaps, then sand until they make contact all along the length.

Tip! The exact shapes of the curves aren't critical. Plot start and end points where you like and draw a fluid curve between them.



A Feed the blank smoothly through the bandsaw to reduce tooth marks that will need to be sanded away.



B Center the accent strips (B, C) on the length of the tray blank before clamping the halves together. Waxed paper below the blank prevents gluing the assembly to the bench.



C Rout centered dovetail slots in the handles. To make the job easier, remove the bulk of the material from the center of the slot using a tablesaw before routing.

3 Rip $\frac{1}{16} \times 1\frac{1}{2} \times 16$ " maple and walnut accent strips (B, C). Glue one pair of contrasting strips between the tray halves [Photo B]. After the glue dries, trim the ends of the strips flush and scrape away any squeeze-out.

4 Sand or plane the accent strips flush with the blank on both faces, then repeat the two previous steps to add a second pair of accent strips (B, C). Cut the tray to length.

You can handle this

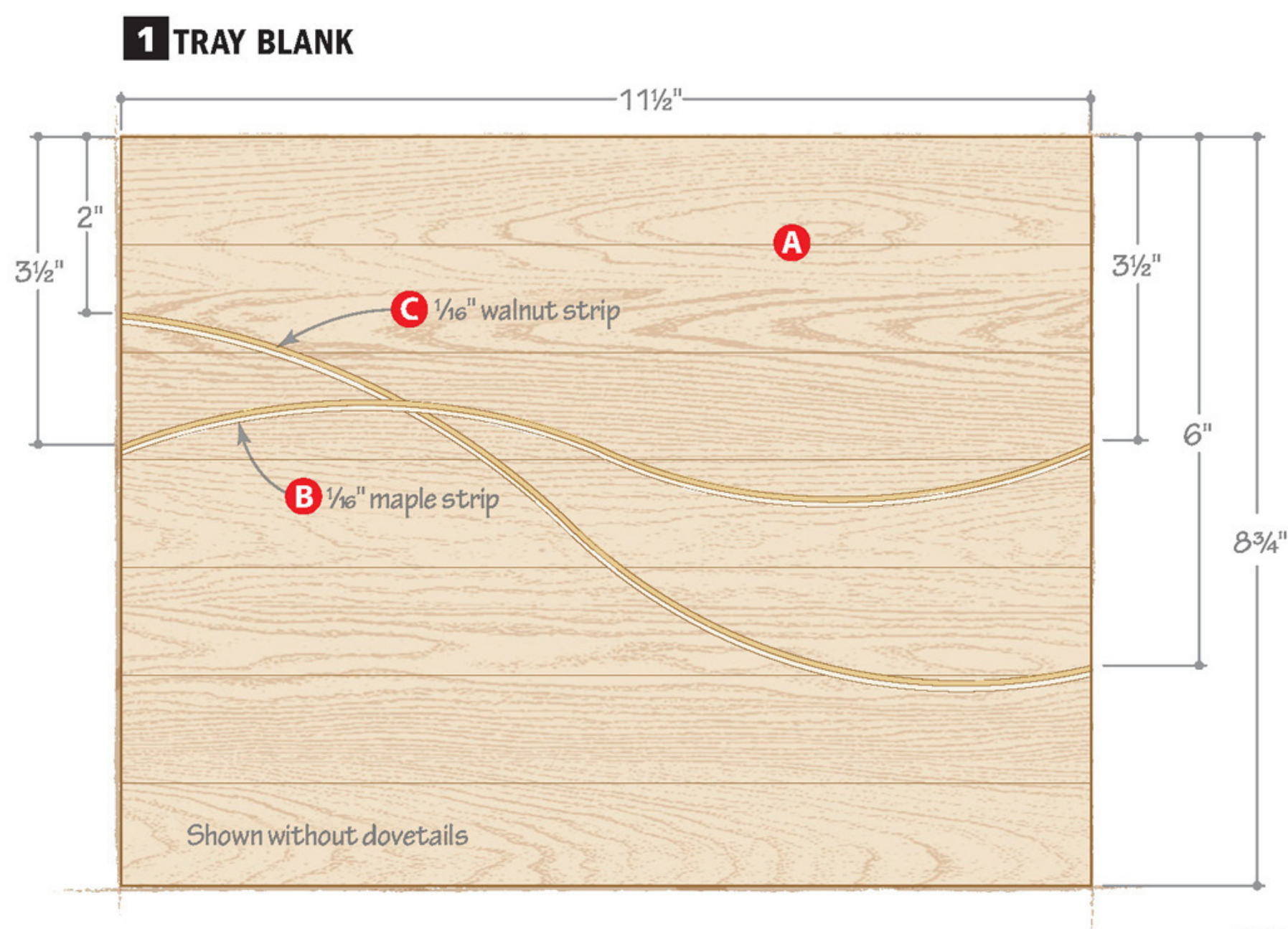
1 Plane a $3\frac{1}{2} \times 17\frac{1}{2}$ " walnut blank for the handles (D) and a scrapwood test piece to $1\frac{1}{2}$ " thick. Then trim the handles to length.

2 Set a 14° dovetail bit to $\frac{3}{4}$ " high and test the cut on the scrap for height and that it's centered. Then rout a dovetail slot in both handle (D) blanks [Photo C].

3 Without changing the bit height, cut dovetails on the tray (A) ends using multiple passes [Photo D]. Then trim the tray width to match the length of the handles [Materials List].

4 Slide the handle blanks on the tray and mark the dowel locations [Drawing 2]. Drill holes [Photo E], then cut and glue maple dowels in place [Exploded View].

Tip! Test-fit the handle (D) dovetails on the tray until you achieve a friction fit.





Sneak up on the tray (A) dovetail width by making several shallow passes. Rout both faces equally to center the handles.



Drill dowel holes centered on the width of the tray. This prevents seasonal wood movement from splitting the tray or handles.

5 Lay out the handle (D) cutouts [Drawing 2] and drill 1" holes to define the ends of the cutouts. Jigsaw out the waste from the openings. Lay out and cut the end curves on the handles and sand smooth. Ease the edges and finish-sand the tray to 220 grit.

6 Apply three coats of a food-safe finish. (We used General Finishes butcher block oil.) Then clear a spot on the table at your next meal for this super server. 🌿

Materials List

Part	FINISHED SIZE			Matl.	Qty.
	T	W	L		
A* tray	1⅜"	8½"	11"	C	1
B* light accent strips	⅛"	1½"	16"	M	2†
C* dark accent strips	⅛"	1½"	16"	W	2†
D* handles	1⅜"	3½"	8½"	W	2

*Parts initially cut oversize. See the instructions.

†Enough for the two accent strips shown. Cut more for additional strips.

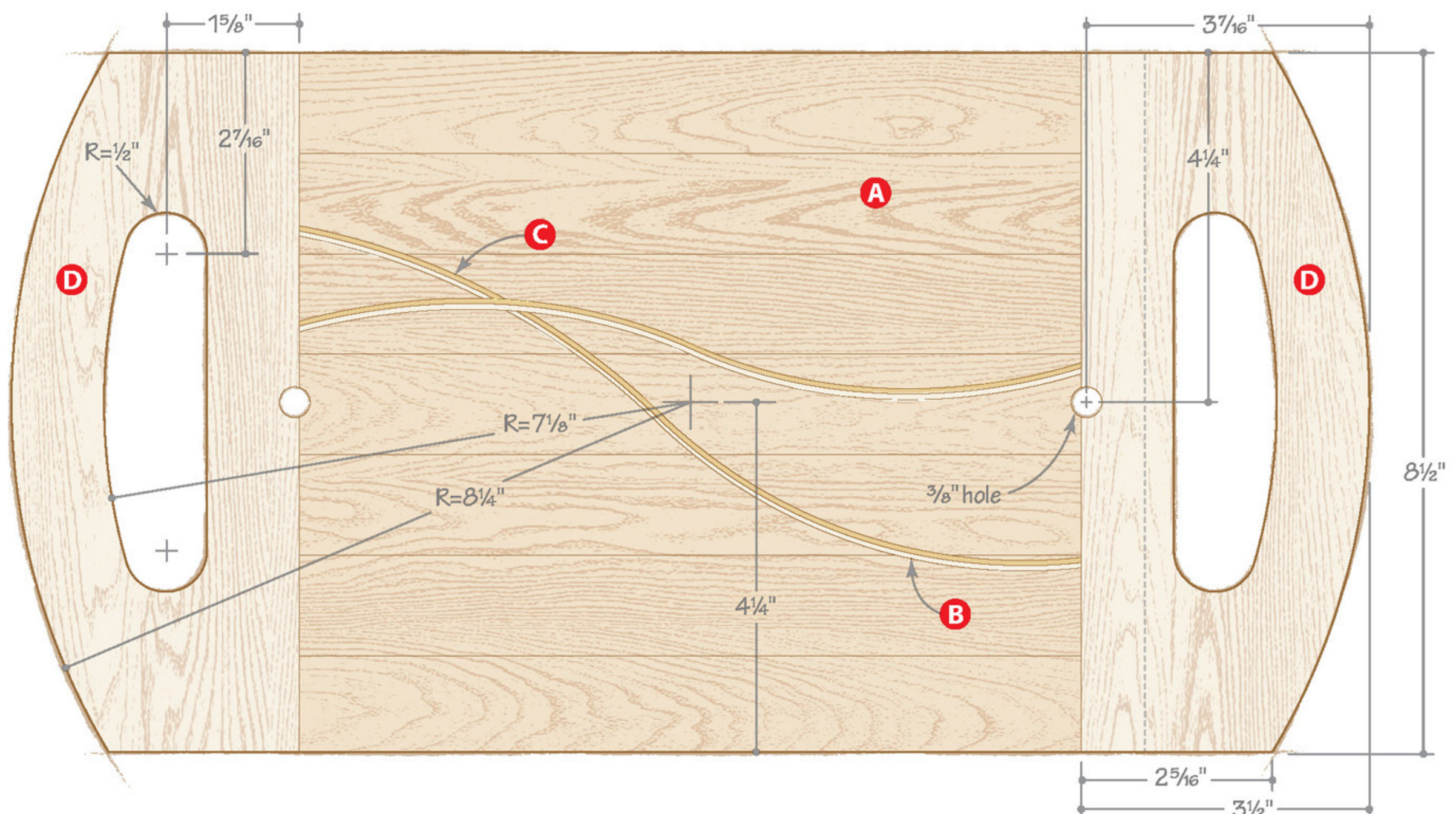
Materials key: C-cherry, M-maple, W-walnut.

Supplies: ⅜" maple dowel.

Bit: ¾" 14° dovetail router bit.

Produced by **Robert Wilson** with **John Olson**
Project design: **John Olson**
Illustrations: **Roxanne LeMoine**, **Lorna Johnson**

2 TRAY TOP VIEW



C-Shell



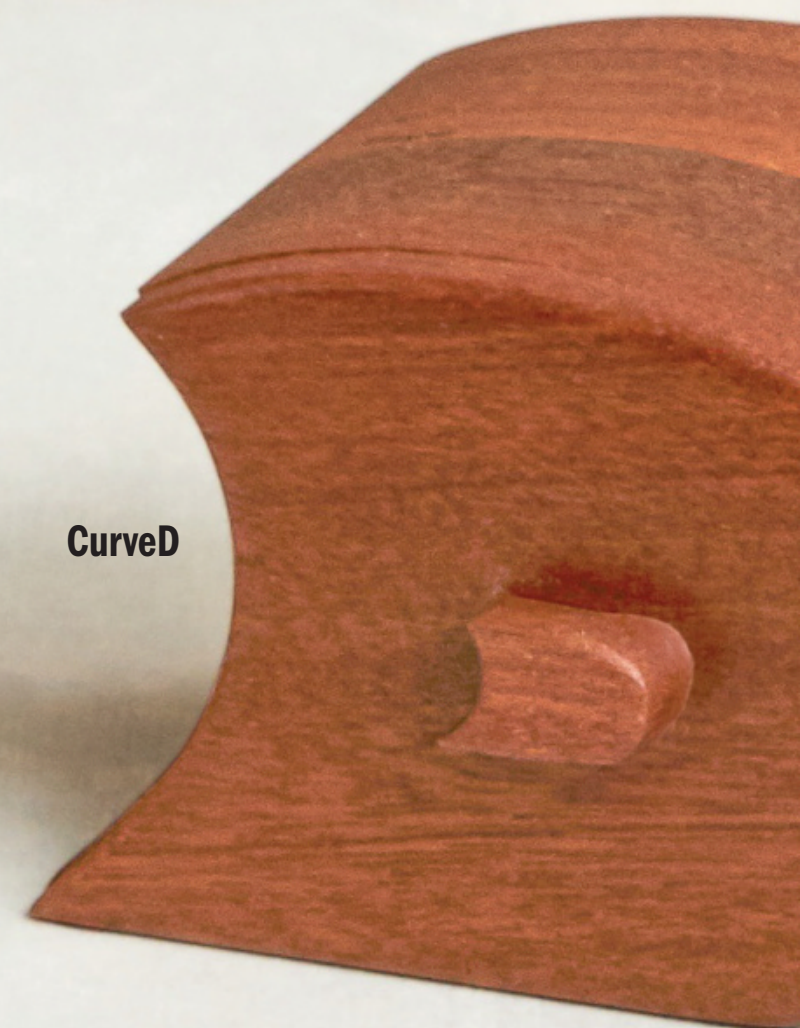
Cube



Omega



Curved



Oval



Bandsaw Beautiful Boxes

We'll show you how to build a basic box and provide a few variations to stimulate your creativity. Your imagination can take it from there.

Bandsaw boxes provide infinite design variations, and that's part of what makes them so addictive. Complete the simplest box in an evening, or challenge yourself with your own design ideas. The common thread is that most of the cutting and shaping happens on the bandsaw.

And let's be honest right up front: Bandsaw boxes require a lot of sanding to get rid of saw-blade marks. But we have tips to reduce sanding time—and the effort will be worth it when you see people's eyes light up as they admire the beauty of a finished box.

First, set up the saw

A $\frac{1}{4}$ "-6tpi blade serves for cutting most boxes as you start out. If your pattern has radii tighter than $\frac{5}{8}$ ", use a $\frac{3}{16}$ "-10tpi blade. As your curve-cutting skill improves, you can switch to a higher tpi blade for a smoother cut surface that requires less sanding.

Ensure your bandsaw table rests square to the blade [Photos A and B]. This eliminates

drawers that taper from front to back, making their fit sloppy or even impossible.

When sawing, strive for continuous cuts. Each stop and start causes a small jag or divot that requires sanding out later. A slow, steady feed results in a smoother cut surface, and allows you to make small corrections, before they become big corrections.

Build a blank, pick a pattern

You risk almost nothing in materials if you practice by laminating short lengths of 2×6, or gluing together scraps from your stash. For most boxes, $3\frac{1}{2}$ –4" of thickness provides enough depth to provide useful drawers, while not exceeding the capacity of a sanding drum, which you'll use to smooth the box interior. Square the edges of the blank to the faces.

Download patterns for the boxes shown in this article at woodmagazine.com/bsbox, sketch your own designs, or search online for line art to use as patterns.

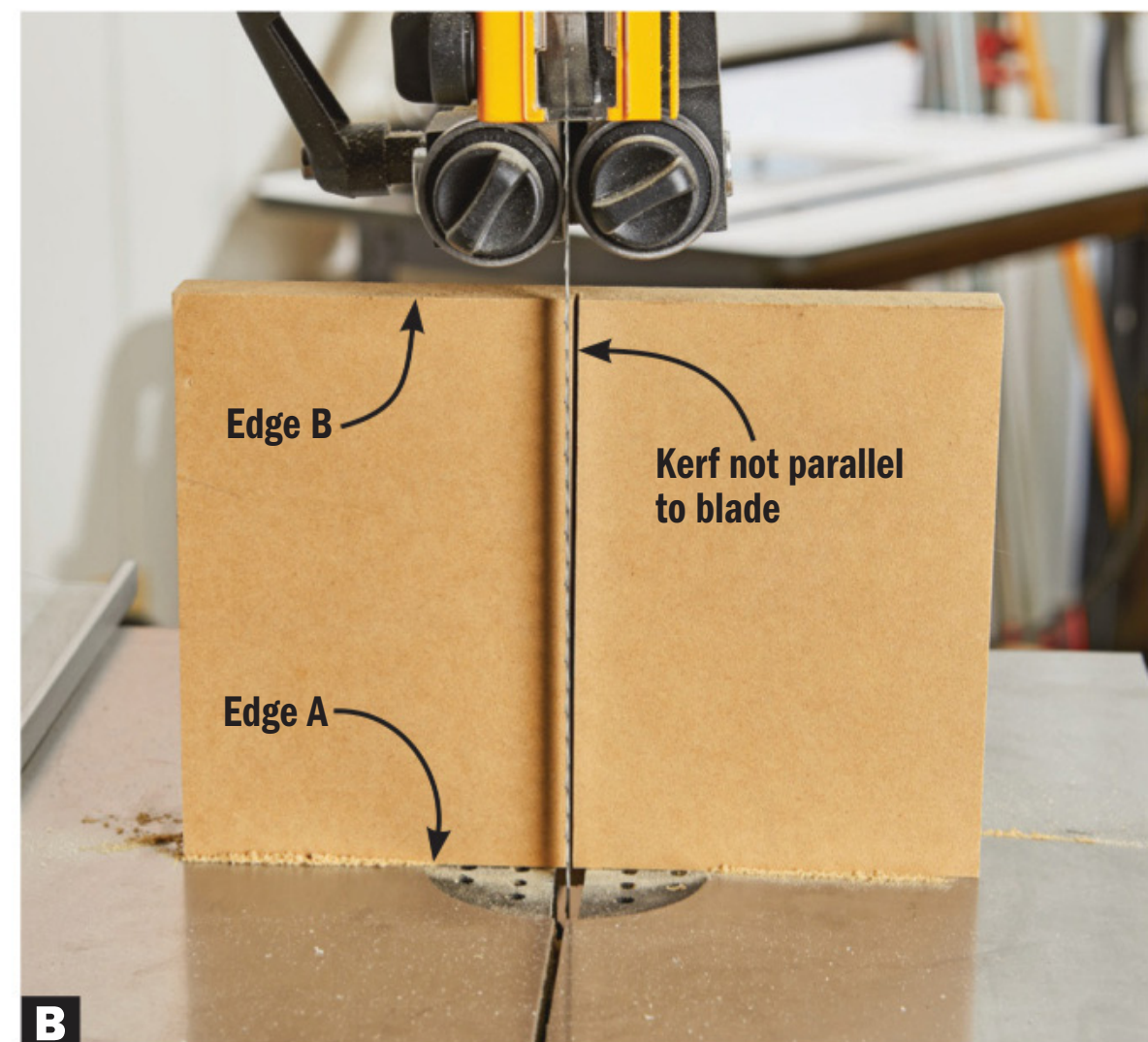
Tip! Buy sandpaper in bulk so you're not tempted to overuse worn-out sheets.

Tip! Avoid patterns with tight inside crevices—they're tough to reach when sanding.

Two steps to guaranteed square cuts



A To square the table to the blade, start with a scrap with parallel edges, and at least 6" wide. Stand it on edge, saw a kerf about $\frac{1}{8}$ " deep into one face, and turn off the saw.



B Flip the piece to the opposite edge and place it behind the blade. If the kerf and blade don't align perfectly, adjust the table tilt and repeat the test.

► Learn to tune up your bandsaw. Point your smartphone's camera at this code, or visit woodmagazine.com/bandsawtune.





Let's make a basic box

Tip! Reduce or enlarge patterns with a photocopier.

Adhere your pattern to the face of the blank with spray adhesive or a glue stick, head to the bandsaw, and follow the steps in **Photos C-L**. When it comes to sanding, don't be afraid to sand cross-grain until you remove the bandsaw marks. Further sanding with finer grits in the grain direction removes the cross-grain marks.



C

Guide the blank along a fence to separate a $\frac{1}{4}$ "- to $\frac{5}{16}$ "-thick back. Mark both pieces to help you orient the back when gluing it on later.



D

Cut out the drawer block. Enter from an end so the kerf blends into the grain when glued shut. When you complete the cut, turn off the saw and allow the blade to stop before removing the blank from the saw.



E

Glue the entry kerf closed by applying glue to a business card and sliding it into the kerf. Clamp and allow the glue to dry.



Tip! Files make quick work of removing bandsaw marks and flattening uneven areas, and are less likely to round edges.

F

Sand the case interior smooth. A spindle sander or sanding drum in a drill press speeds this process, but you also may need files and shop-made sanding blocks to reach into corners. Don't oversand—that creates a loose fit for the drawer.



G

Apply self-adhesive sandpaper (or sheet sandpaper with spray adhesive) to a flat surface and sand smooth the sawn faces of the back and the case. Glue the back to the case in its original orientation.



Note: To prevent the blade jerking down a rounded shape, roll the block as you cut to prevent a gap between the blank and the table where the blade exits.

Marks for later reassembly

H

Cut a ¼"- to ⅝"-thick slice from the front and back of the drawer block. Mark the bottom of all three pieces to help with reassembly later, and set aside the front and back.



I

Lay out the drawer sides and bottom on the drawer block, making them at least ¼" thick and with curved corners. Then cut away the waste.



J

As with the case, sand the drawer interior and the front and back glue surfaces. Then, glue the front and back to the drawer.



K

Cut the case exterior to shape, staying just outside the line. Sand the outside of the case and drawer smooth.



L

Rout ⅛" round-overs around the drawer opening and the front face of the drawer. If desired, round over the outside edges of the case. Experiment with larger round-overs, chamfers, or other profiles on the case exterior, if you like.

Cut a drawer pull from scrap (or purchase one), and secure it to the drawer. For this box (*photo previous page, top left*), we cut the legs and a pull using a plug cutter. After gluing the legs in place and allowing the glue to dry, sand the leg bottoms flat by rubbing them across sandpaper adhered to a flat surface. Then, apply a finish—we used satin spray lacquer or Danish oil for the boxes in this article.

For the final touches, apply self-adhesive felt pads to the drawer bottom for smooth, quiet sliding and to lift the drawer slightly, creating an even reveal all around. You also can place a pad or pads on the back of the drawer to bring it flush with the front face of the case.

Dress up the drawers, and more ideas

Tip! Tight corners in a drawer? Drill the corners at the drill press to make smooth radii, then saw to the holes.

■ **Hide the drawer with a full-overlay front.** To do this, cut a ¼"-thick slice off the back *and* front of the box blank. (Because you cut away the pattern with the front, you may want to cut the box to rough shape first so you know where to lay out the drawer.) When making the drawer, cut off only the drawer back, then bandsaw the drawer interior. Glue the back to the drawer. After the

glue dries, glue the front slice to the drawer [Photo M]. Secure the drawer front to the case with small strips of double-faced tape before shaping the outside of the case [Photo N].



Put a thin spacer behind the drawer so it stands just proud of the case. Glue on the front slice, positioning it to align with the case blank.



Cut and sand the case exterior with the drawer front and drawer in place. With perfectly matched grain and profiles, the drawer front blends into the box.

■ **Make a square pass-through drawer.** You don't need a pattern for this one. Just mark layout lines for the drawer on the face of the blank the same distance from the edges and ends. Then, rather than cut off the back of the blank, slice off the top.

Next, make two stopped cuts to define the sides of the drawer [Photo O]. Glue the top

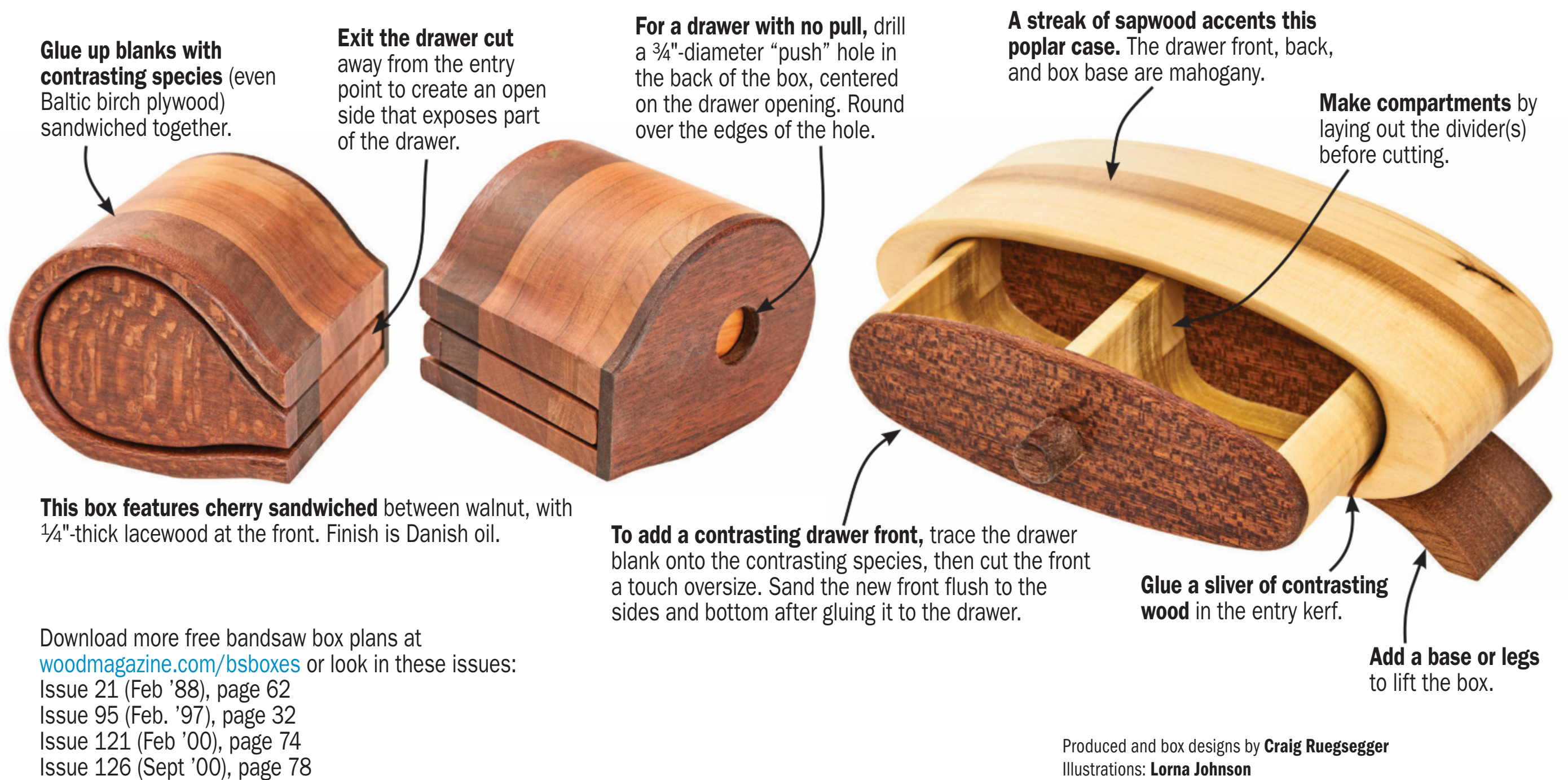
back on, applying glue only to the outside edges, not the drawer block. After the glue dries, cut off the bottom to free the drawer block. Sand the case interior and glue the bottom back on. Shape the drawer as with other boxes.



This box has equal thicknesses of mahogany and maple. Epoxy fills the cavity on the maple drawer front.



For straight, parallel cuts, guide the box against a fence. Mark the bottom line on the back face, too, so you can see it when you flip the blank over to make the cut for the remaining drawer side.



SKILL BUILDER

Get the flock in there

Flocking adds a splash of color and provides an attractive, soft-to-the-touch surface to drawer or case interiors. It also covers minor flaws, allowing you to reduce or even skip sanding areas to be flocked. Flocking consists of fine nylon fibers, available in a wide variety of colors, blown onto a color-matched adhesive painted on a surface [Source].

Tip! Wear a respirator when flocking to avoid inhaling stray fibers.

► Avoid using a plastic tub, as static electricity sticks the fibers to the tub, making clean-up difficult.

You'll need a box to contain the excess flocking and prevent fibers from flying around your shop. It also allows you to reclaim excess fibers for reuse. Cover the box seams and any openings with tape and you're ready to flock. 🌳

Source: Suede-Tex flocking supplies, flockit.com, 815-986-1097.



Load the tube with loose flocking. Slide the perforated half of the tube slowly over the filled half to avoid blowing fibers out.



Mask off adjacent areas, then brush on the adhesive liberally, but avoid drips. A foam brush works well to reach drawer corners.



Place the still-wet adhesive-painted drawer in the box and "puff" on flocking, working from all sides to cover all surfaces thoroughly. You can't overdo it, so use far more than you think you need. After the adhesive partially dries (about 30 minutes), gently shake off excess flocking into the box and pour it back into the bag for reuse.

WOOD[®] Magazine innovate AWARDS 2021

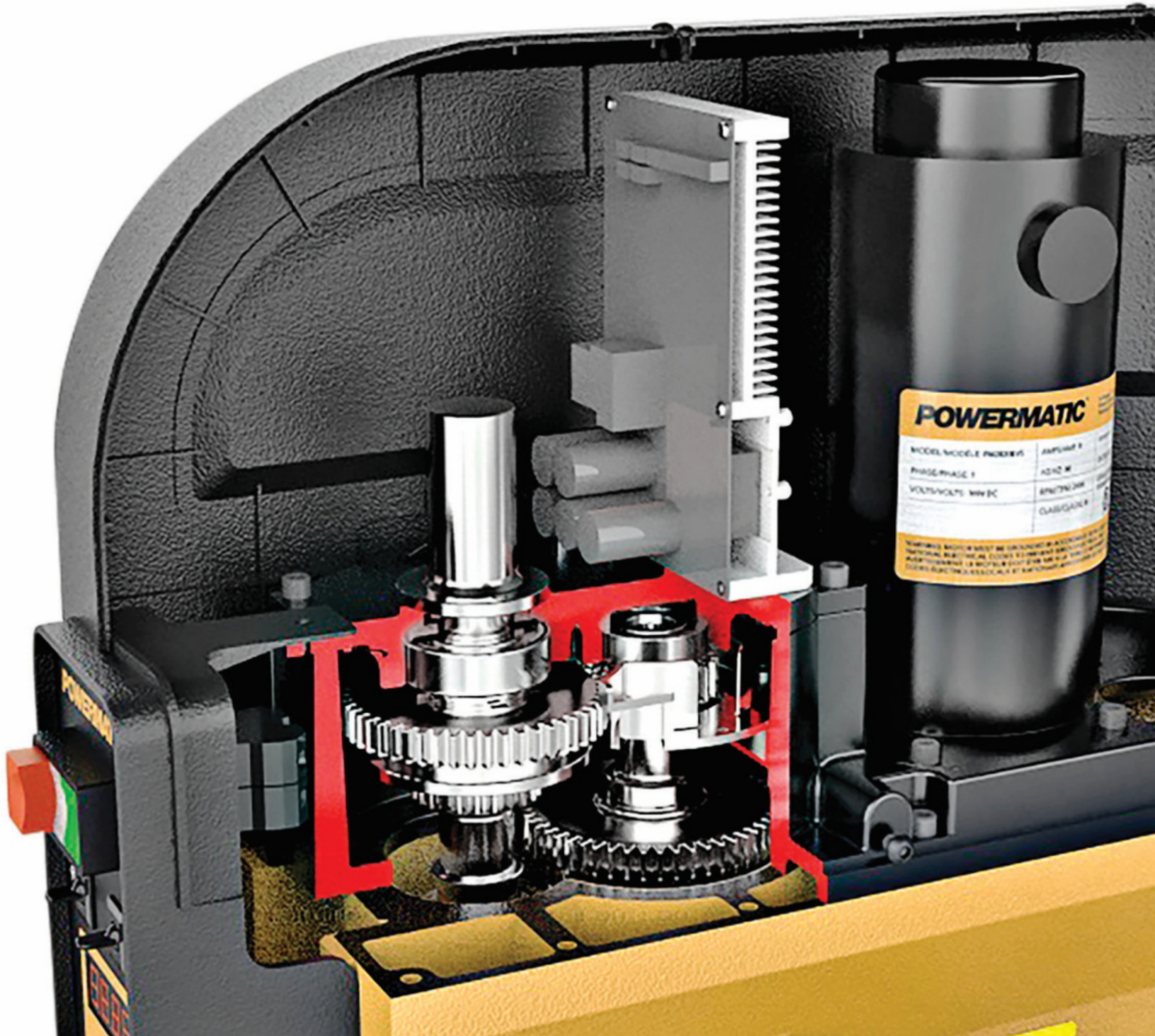
WOOD[®] magazine editors name their picks for the best new woodworking tools and accessories.

Gear up for drilling

Powermatic's new drill press uses gears to transfer rotation and torque from the motor to the spindle, so there are no belts to slip when the boring gets tough. This 110-volt heavyweight (336 pounds) provides infinitely variable speed in two ranges (150–870 and 600–3,600 rpm) set by a front-mounted dial. The large center section of the 15¼×20½" cast-iron table can be swapped out for optional downdraft- or gridded-dovetail-slot accessory tables.

Gear-driven 20" drill press

Powermatic
no. PM2820EVS, \$1,999
800-274-6848, powermatic.com





Need more capacity? Slide it on over

This lathe outperforms its footprint, but only when needed. To double the between-centers capacity, from 20" to 40", the motorized tailstock bed extends with the push of a button. That also opens up the area below the headstock spindle to increase the swing from 23⁷/₃₂" to 31¹/₄". An included tool-rest extension lets you use the banjo on the lower bed, or you can buy an optional bed insert to fill the gap and skip the tool-rest extension.

30×40" wood lathe

Rikon
no. 70-3040, \$3,800
877-884-5167, rikontools.com



Who needs pneumatics?

Although battery-powered nailers are so common now they threaten the existence of pneumatic models, most tend to be much larger than their pneumatic equivalent. This Milwaukee 23-gauge pin nailer, however, is about the same size as a pneumatic pinner. Powered by a rechargeable 12-volt lithium-ion battery, this compact nailer fires 1/2–1 3/8" pins. Milwaukee says it will shoot up to 750 pins per charge.

M12 23-gauge pin nailer

Milwaukee
no. 2540-20 (nailer only) \$199; no. 2540-21 (with one battery and charger) \$249
(available early 2021)
800-729-3878, milwaukeetool.com



This air filter is a real self-starter

You've probably never done this, but we sometimes forget to turn on the air scrubber until we see a fog of dust. General's new line of air-filtration systems constantly monitors air quality, turning the machine on when needed, and shutting down when the air is sufficiently clean. The ceiling-hung units (models 10-1000 and 10-2000) also help light the shop with a bottom-mounted LED panel. The floor-standing cylinder unit (model 10-1440) rolls on casters.

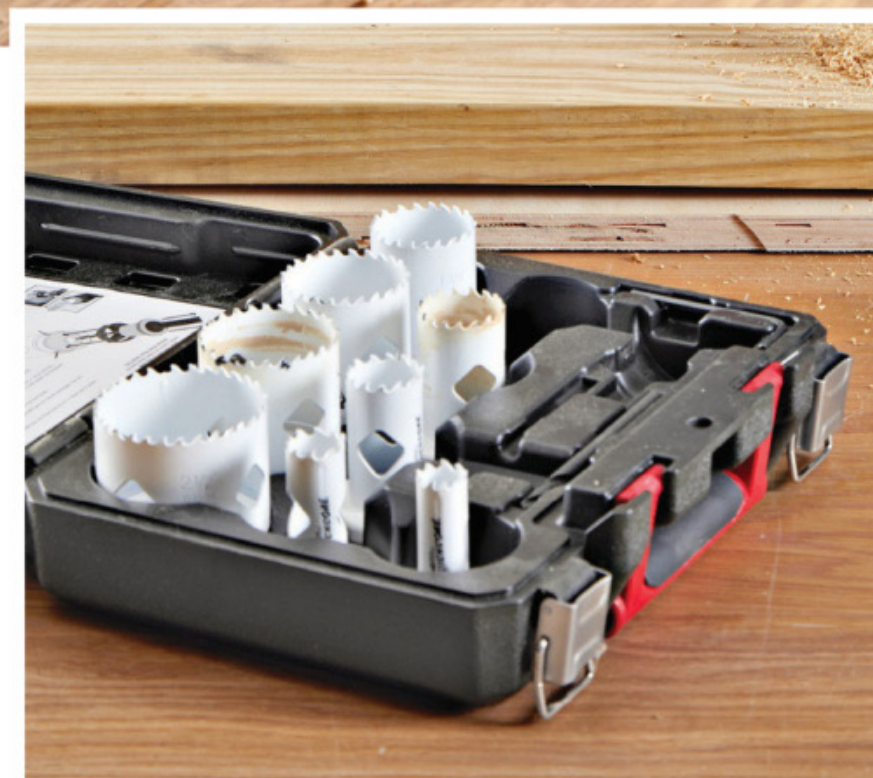
Air-filtration systems

General
no. 10-1000, \$400
no. 10-2000, \$800
no. 10-1440, \$600
(all available late 2020/early 2021)
888-664-0449, general.ca



Easy on/off hole saws

The unique quick-connect system of the Extreme Quickcore hole saws lets you change saws on the mandrel in a flash. Simply pull back on the mandrel sleeve, and the three pins retract to release the hole saw. To remove a cutaway plug from the hole saw, disconnect the saw from the mandrel and use the pilot drill bit to push the plug out. This set includes the mandrel, two pilot bits, a hex wrench, and hole saws in 3/4", 7/8", 1 1/8", 1 3/8", 1 1/2", 1 3/4", 2", 2 1/8", and 2 1/2" diameters.



Blue Mol Extreme Quickcore hole saws

Disston
no. 231, \$100
800-446-8890, disstontools.com

Speedy clamps work on- and off-track

Tracksaw makers might claim you don't need to clamp the track to a workpiece, but we feel better when we do. And most tracksaw manufacturers sell their proprietary clamps as optional accessories. Bessey's EZR clamps fit into the clamping slot on most tracks to hold them in place from below, but the tail jaw reverses to work as regular one-hand bar clamps for day-to-day use. The EZR clamps also come with a removable 2" jaw extension that helps reach and clamp over something that might otherwise be in the way.

6" EZR one-hand table clamps

Bessey Tools
pack of 2 clamps, no. EZR-SET, \$30
800-828-1004, besseytools.com



No straightedge needed for lots of slots

To create perfectly parallel shelf dados, rout the first dado using this jig's fence as the guide. Then, fit the fence into that dado to rout another one parallel to it. The jig lets you space slots from 1/8" to 6 1/16" apart, using bits 1/8"-3/4" in diameter. Its plastic base comes predrilled to mount several popular routers.

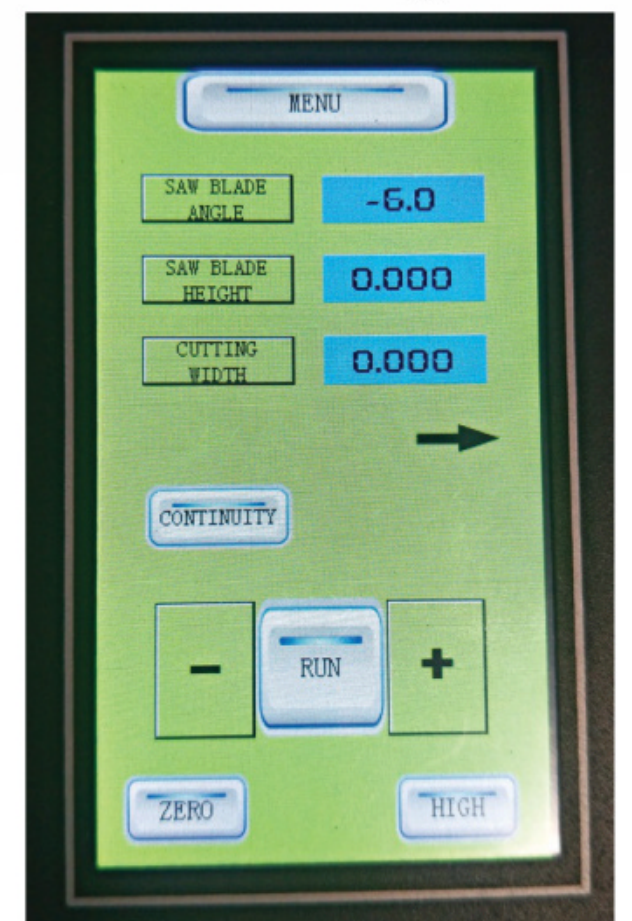
Indexing dado jig

Rockler Woodworking & Hardware
no. 59237, \$70
800-279-4441, rockler.com



Look ma, no handwheels!

CNC-inspired automation comes to the home woodworking shop with General's new 3-hp cabinet saw, which features a fully digital, motorized rip fence and similarly operated blade-height and -tilt controls. A touchscreen on the fence helps you program in some repeatable functions and settings, and provides the ability to add any software updates in the future. General also plans to sell the rip fence as a retrofit accessory for existing tablesaws; pricing has not been set yet. 🌲



Digital 10" tablesaw

no. NC tablesaw, 36"-rip \$3,800; 52"-rip \$4,000
(available late 2020/early 2021)
888-664-0449, general.ca

Jig Plan Super Bundle



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Adjustable circle jig



Tapering jig



Fluting jig



Miter-shooting jig

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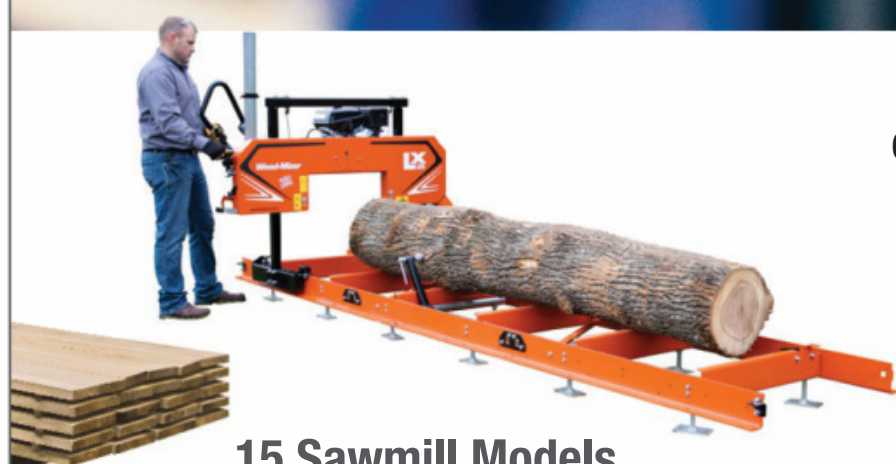
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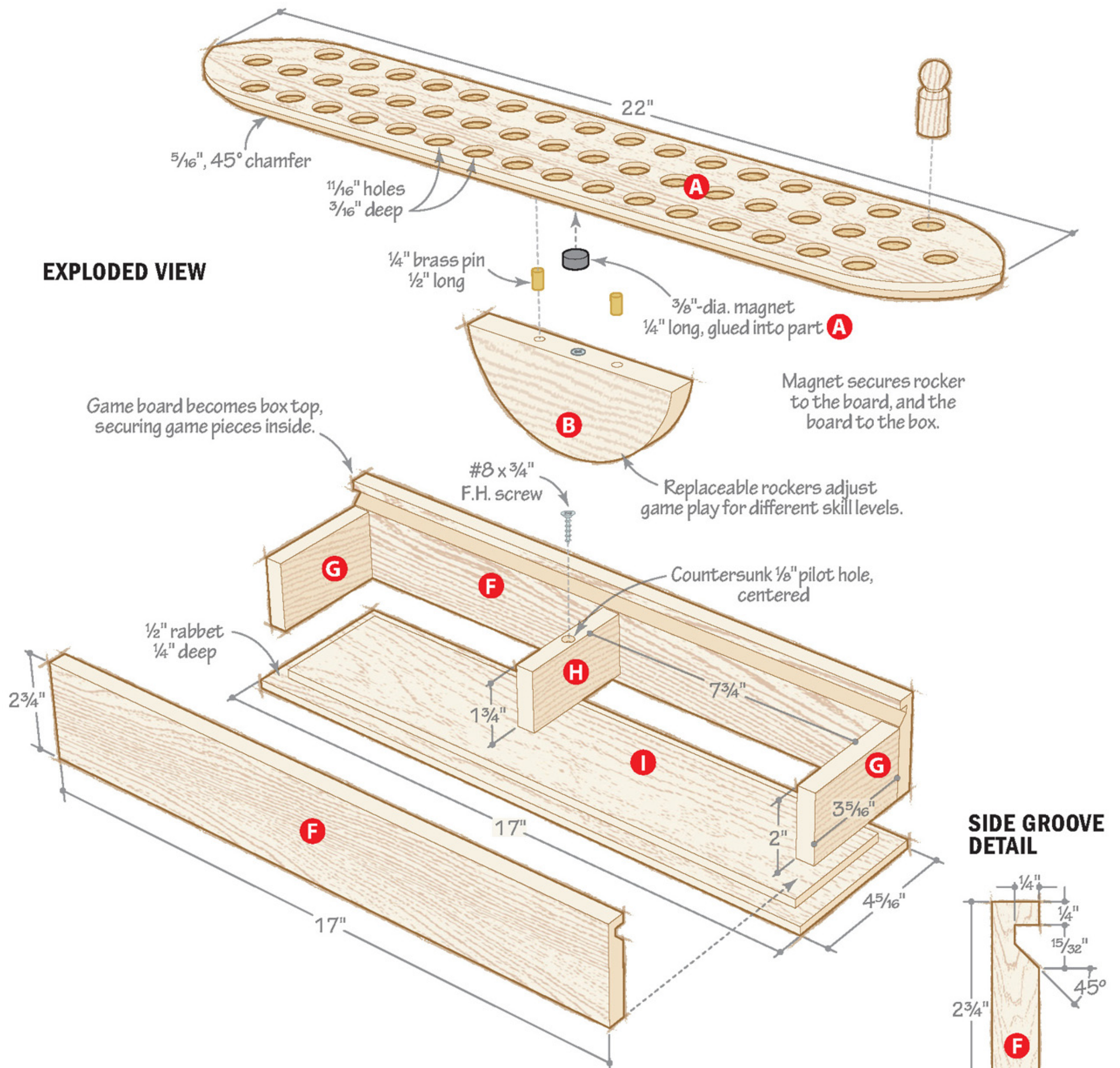
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LiVE *the wood life*

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► Download the rules of play.
woodmagazine.com/yachtrock

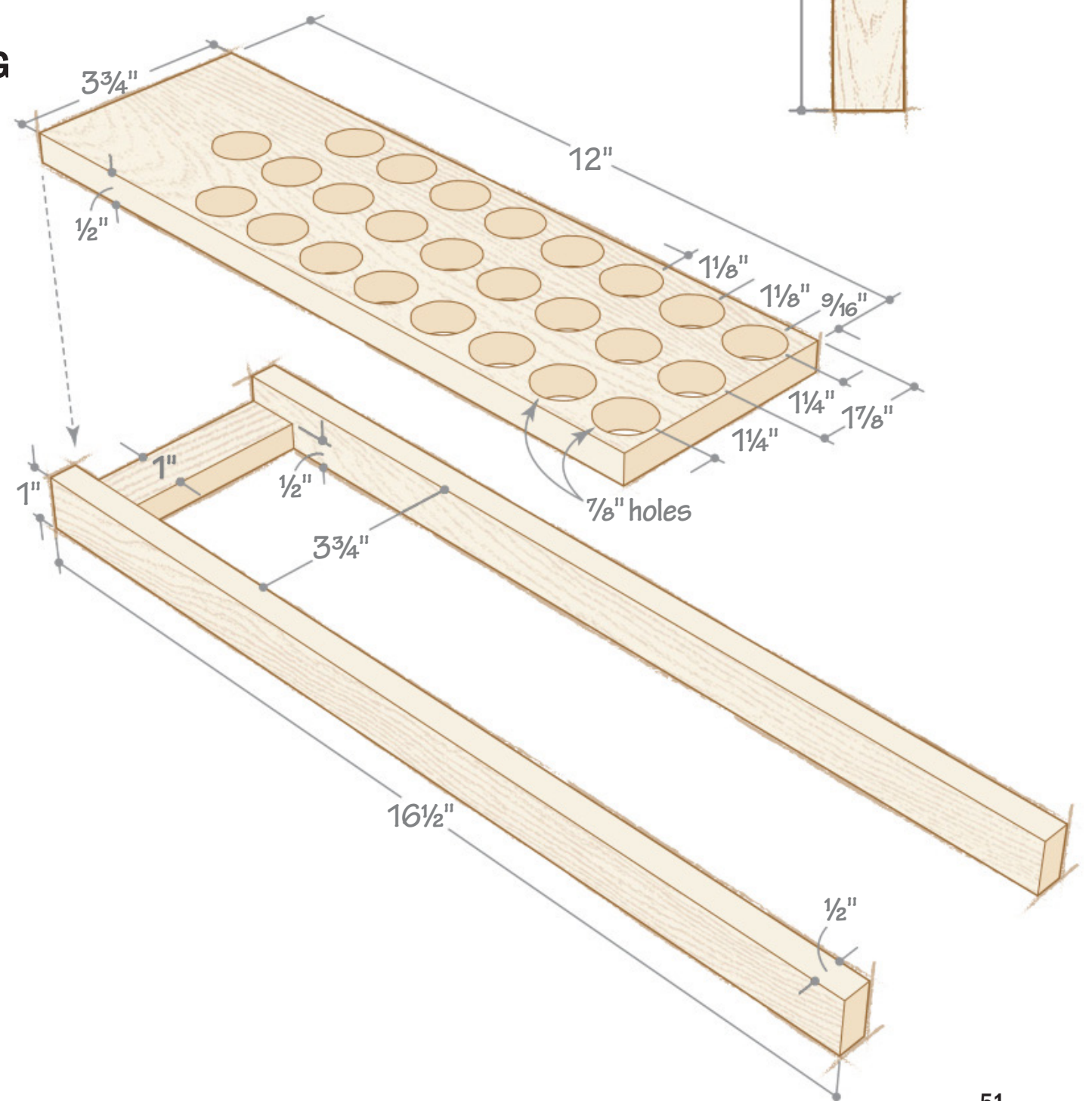


DIMENSIONS:
22" W x 4 5/16" D x 3" H

Approximate materials cost:
\$55

Including lumber, game pieces, and hardware

1 HOLE-ROUTING JIG

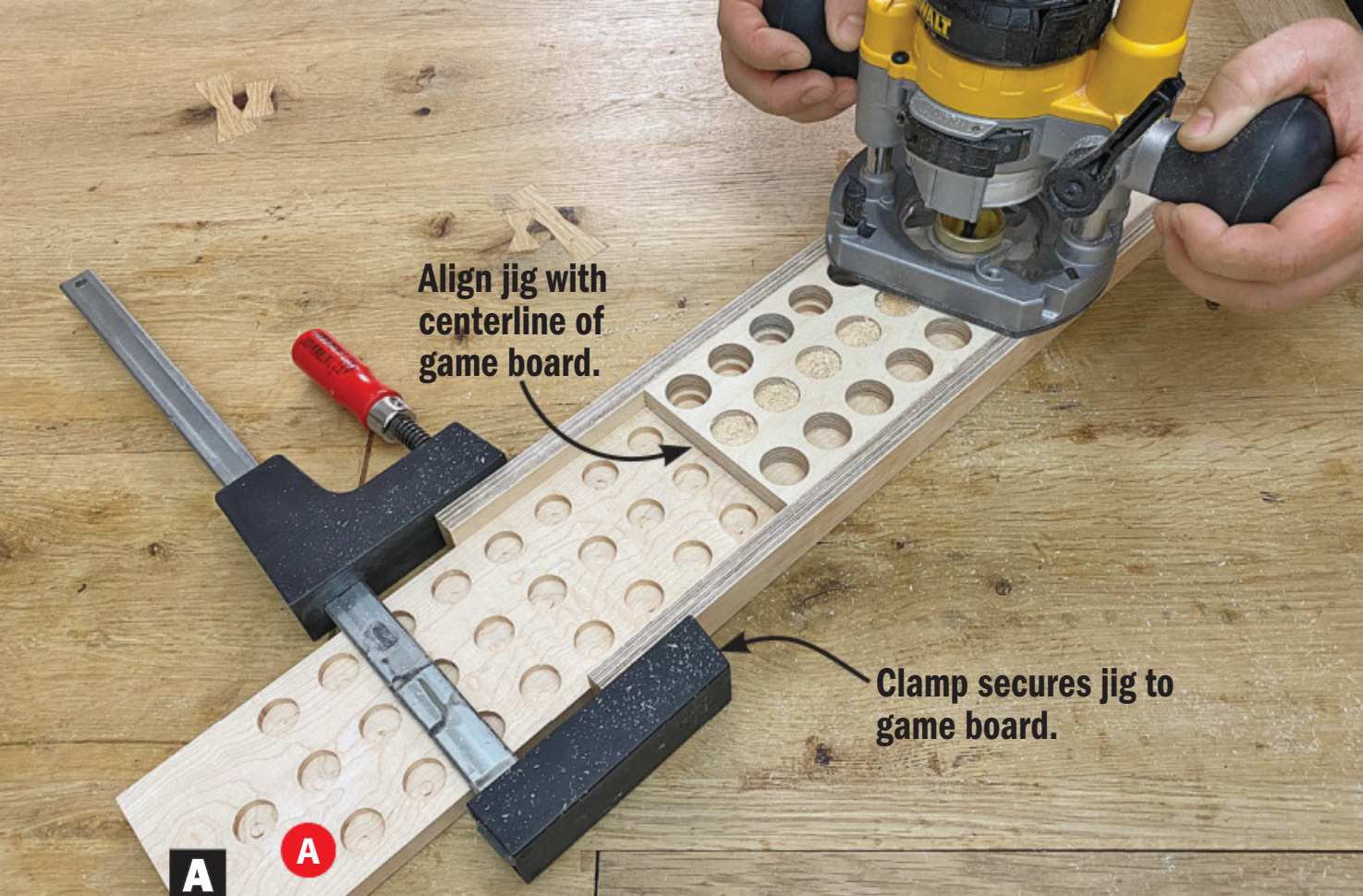


This tabletop balance game promises fun for all ages as players try to keep on an even keel, moving passengers safely from the deck to their cabin. Interchangeable rockers of differing sizes vary game play—large rockers provide more stability, and smaller ones demand more finesse.

Built-in storage makes the game easy to stow away or take on the go, and we've assembled some of the supplies that you will need into one convenient kit [Source].

All a board!

1 Cut the game board (A) to size [Materials List]. Build the hole-routing jig using 1/2 inch material of your choice [Drawing 1]. Clamp

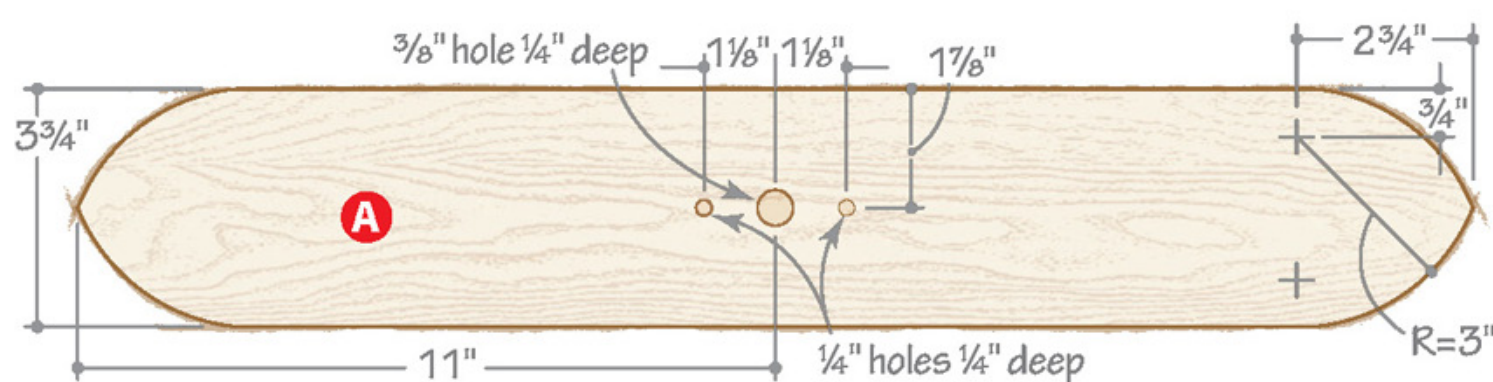


A Mount a $\frac{7}{16}$ " guide bushing in your plunge-router base and cut the pockets using a $\frac{1}{4}$ " spiral downcut bit. Make one pass to remove the bulk of material, then vacuum out the sawdust and make a second pass to the final $\frac{3}{16}$ " depth.



B Glue 150-, 180-, and 220-grit sandpaper to the ends of three dowels. Chuck each dowel in a drill in turn and sand the bottoms of the pockets.

2 GAME BOARD (Bottom face)



the jig to the game board and rout the people pockets [Photo A, Exploded View].

2 Sand the bottoms of the pockets to remove any router marks [Photo B].

3 Bandsaw the game board to shape [Drawing 2], sand the edges and faces smooth, and then rout a chamfer around the bottom edges of the game board [Exploded View].

4 On the underside of the game board, drill a hole for the magnet, then the holes for the locator pins [Drawing 2]. Glue the magnet in place with a dab of CA glue.

Steady the ship

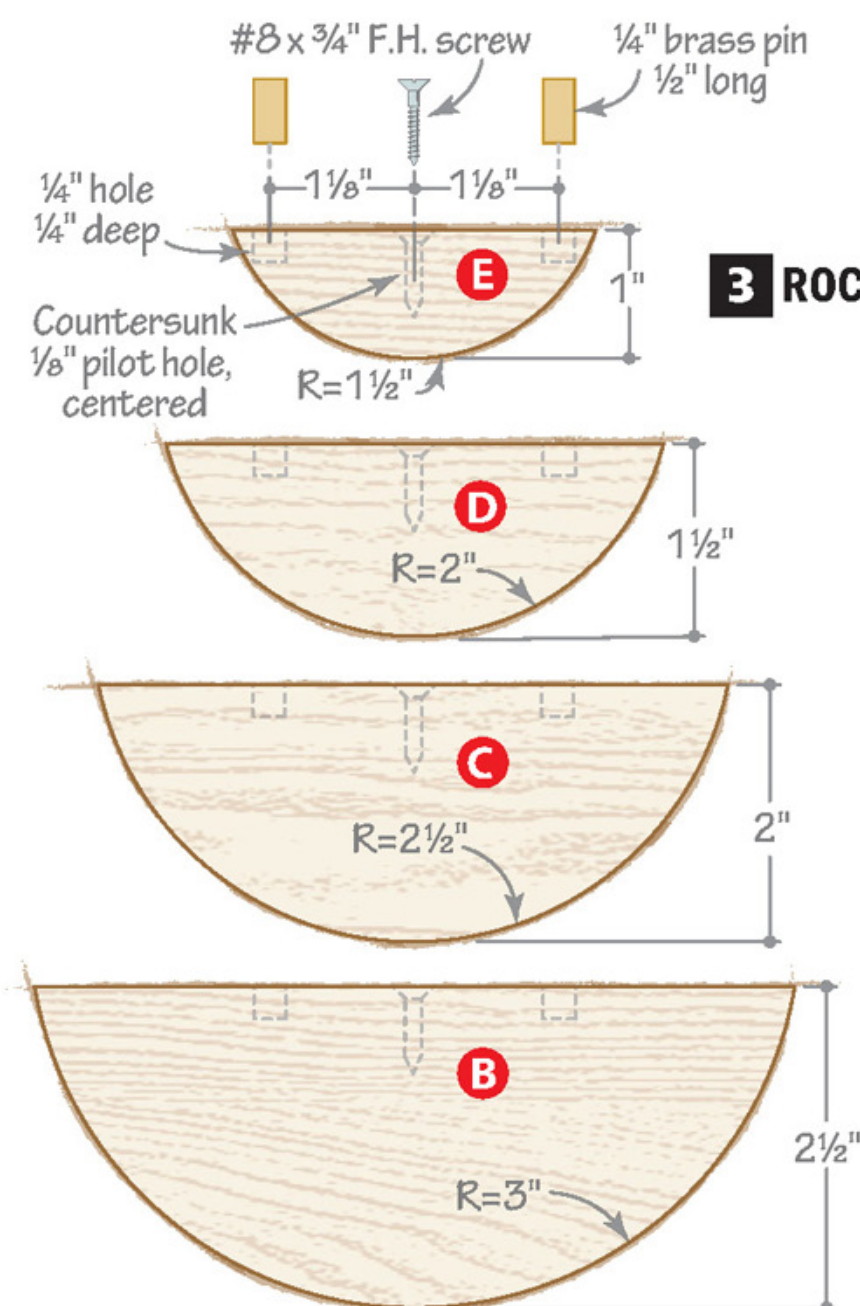
1 Cut to size a blank for each rocker (B–E), and lay out the radius on each workpiece [Materials List, Drawing 3]. Drill the holes in the top edges of all four rockers. Drive a screw in each center hole and glue in the brass locator pins, cut from $\frac{1}{4}$ " brass rod.

2 Cut the rockers (B–E) to shape and sand each curve smooth. Take your time on these curves so the game rocks smoothly in use. Test each one with the board to make sure the board sits level with no game pieces in place.

3 Cut the box sides (F), ends (G), divider (H), and bottom (I) to size [Materials List]. Rabbet the bottom [Exploded View] and dry-fit the pieces.

4 To cut the grooves in the box sides (F) to fit the game board [Exploded View], first cut $\frac{1}{4}$ "-deep grooves slightly wider than the flat edge of the game board (our edge was $\frac{3}{16}$ ").

► For a more finished look, and to help the pins register in their holes, file a small chamfer on the end of each pin.



3 ROCKERS

► Create circles using a variety of tools.
woodmagazine.com/circlejigs

Next, tilt your tablesaw blade to 45° and set the fence to cut away the lower edge of the groove [Photo C].

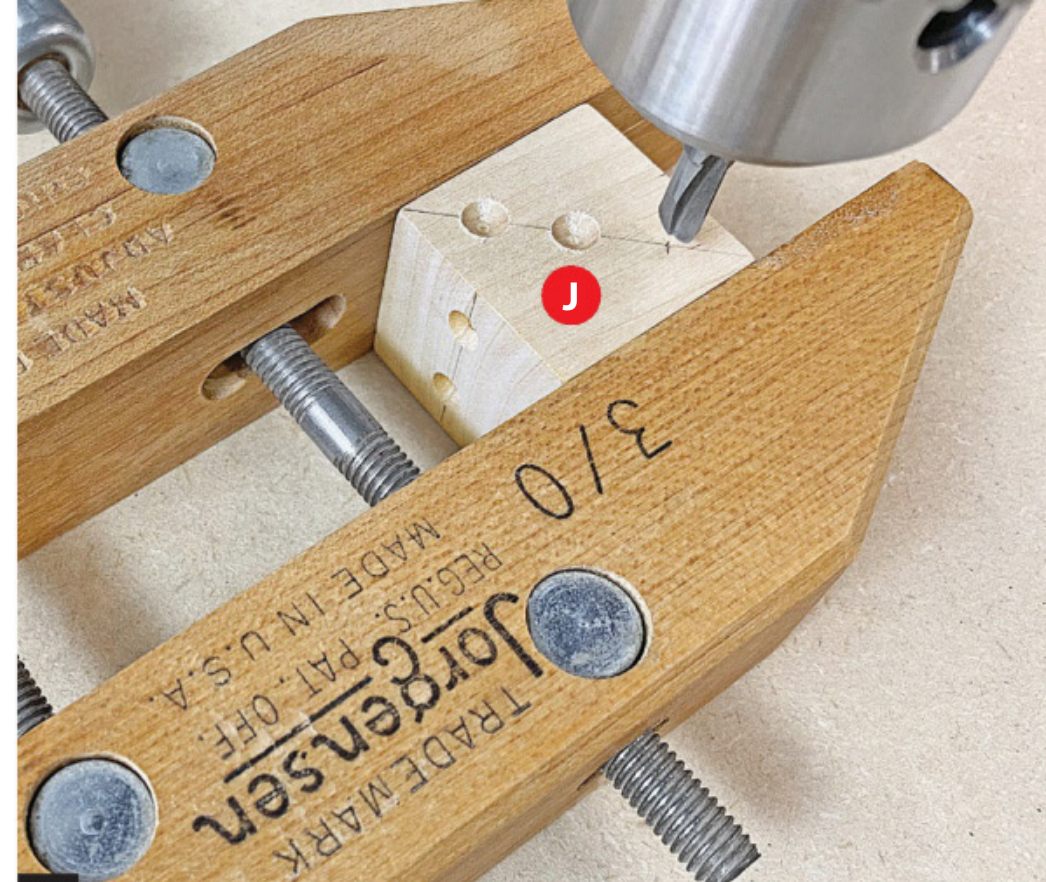
5 Glue and clamp the box ends (G) and divider (H) to the sides (F), then glue that assembly to the box bottom (I) [Exploded View]. Drill a centered $\frac{1}{8}$ " hole with countersink for a wood screw in the divider. Once the glue dries, sand the box assembly smooth, and drive a screw into the divider.



C Sneak up on this cut in both blade height and fence position. Check the fit of the game board (A) in the groove. To enlarge the groove, simply bump the fence toward the blade.



D Mark the center for the first person, then clamp a vise to the drill-press table. By keeping the bottom of the person flush with the vise jaws you can repeatedly drill each one out quickly. Use a handscrew if you don't have a drill-press vise.



E Set your drill press to high speed, and use the sharp point of the flute grind to line up the bit just as you would the tip of a twist drill.

Ready the crew

1 The wooden people don't weigh enough on their own to rock the boat, so you have to add a little mass to each. For that, cut to length 24 pieces of $\frac{1}{4}$ " brass rod $\frac{1}{2}$ " long.

2 Drill a $\frac{1}{4}$ " hole $\frac{1}{2}$ " deep in the bottom of each person [Photo D], then glue in a section of brass rod with a dab of CA glue. Sand the bottom of each piece smooth.

3 To make the die (J), lay out the location of the dots on a $1\frac{1}{4}$ "-square maple blank or photocopy and apply the full-size patterns [Drawing 4]. Drill out the holes using a $\frac{1}{4}$ " round-nose router bit at the drill press [Photo E]. Sand the edges to round them.

► Get plans for this drill-press vise. woodmagazine.com/drillpressvise

Finish, ho!

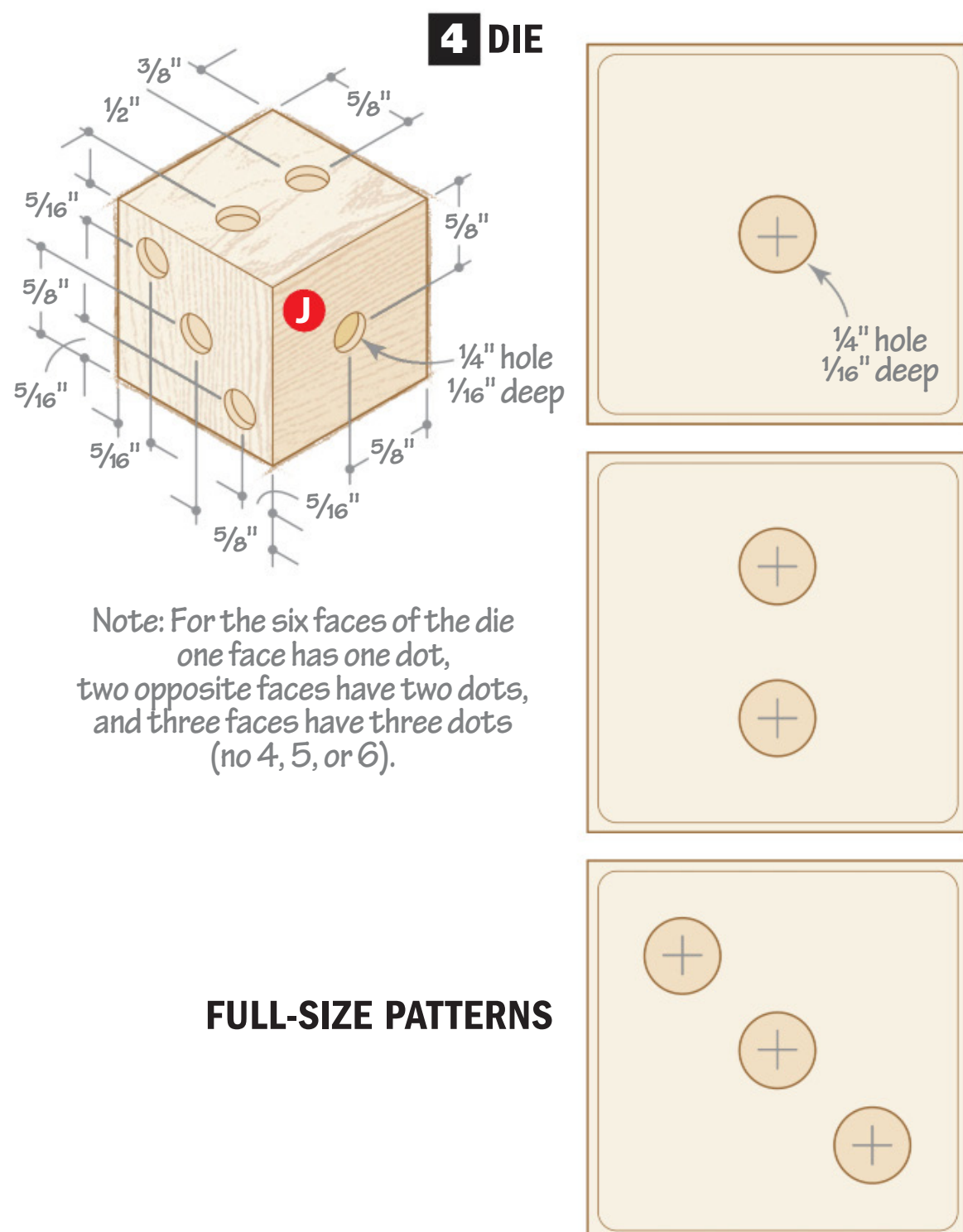
1 Paint the people, 12 one color and 12 another color. We used blue and red artists' acrylic.

2 Once the paint has dried, apply two coats of lacquer on everything: the board, box, rockers, die, and people. We used a satin sheen spray lacquer.

3 Stain the dots of the die, and on the game board the center six holes, and end seven holes [opening photo]. We used Rust-Oleum quick-dry Kona stain.

4 Once the stain dries, apply two more coats of finish to all the workpieces and let dry overnight. Then it's time to step aboard, and rock and roll. 🌳

► Applying a base coat of lacquer before staining prevents the stain from soaking into the end grain, and helps if your brush slips and you get stain on an area by mistake. After the stain dries, wipe or sand it off.



FULL-SIZE PATTERNS

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

Materials List

Part	FINISHED SIZE			Matl.	Qty.
	T	W	L		
A game board	$\frac{1}{2}$ "	$3\frac{3}{4}$ "	22"	M	1
B 6" rocker	$\frac{3}{4}$ "	$2\frac{1}{2}$ "	$5\frac{7}{8}$ "	C	1
C 5" rocker	$\frac{3}{4}$ "	2"	$4\frac{7}{8}$ "	C	1
D 4" rocker	$\frac{3}{4}$ "	$1\frac{1}{2}$ "	$3\frac{7}{8}$ "	C	1
E 3" rocker	$\frac{3}{4}$ "	1"	$2\frac{7}{8}$ "	C	1
F box sides	$\frac{1}{2}$ "	$2\frac{3}{4}$ "	17"	C	2
G box ends	$\frac{1}{2}$ "	2"	$3\frac{5}{16}$ "	C	2
H center divider	$\frac{1}{2}$ "	$1\frac{3}{4}$ "	$3\frac{5}{16}$ "	C	1
I box bottom	$\frac{1}{2}$ "	$4\frac{5}{16}$ "	17"	C	1
J die	$1\frac{1}{4}$ "	$1\frac{1}{4}$ "	$1\frac{1}{4}$ "	M	1

Materials key: M-maple, C-cherry.

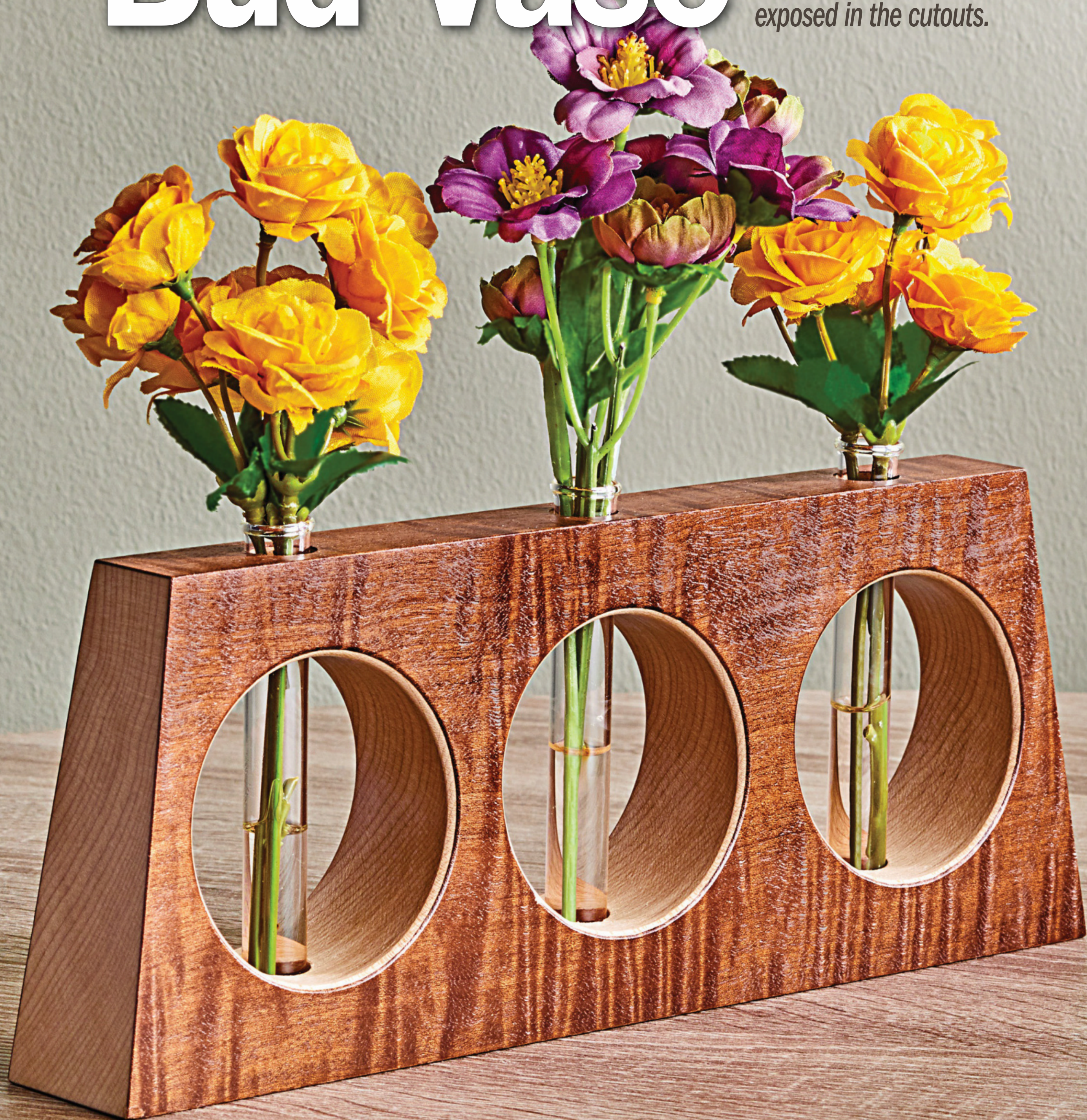
Supplies: #8 $\times \frac{3}{4}$ " flathead screws (5), $\frac{1}{4}$ " brass rod, $\frac{3}{8}$ " dia. $\times \frac{1}{4}$ " long rare-earth magnet.

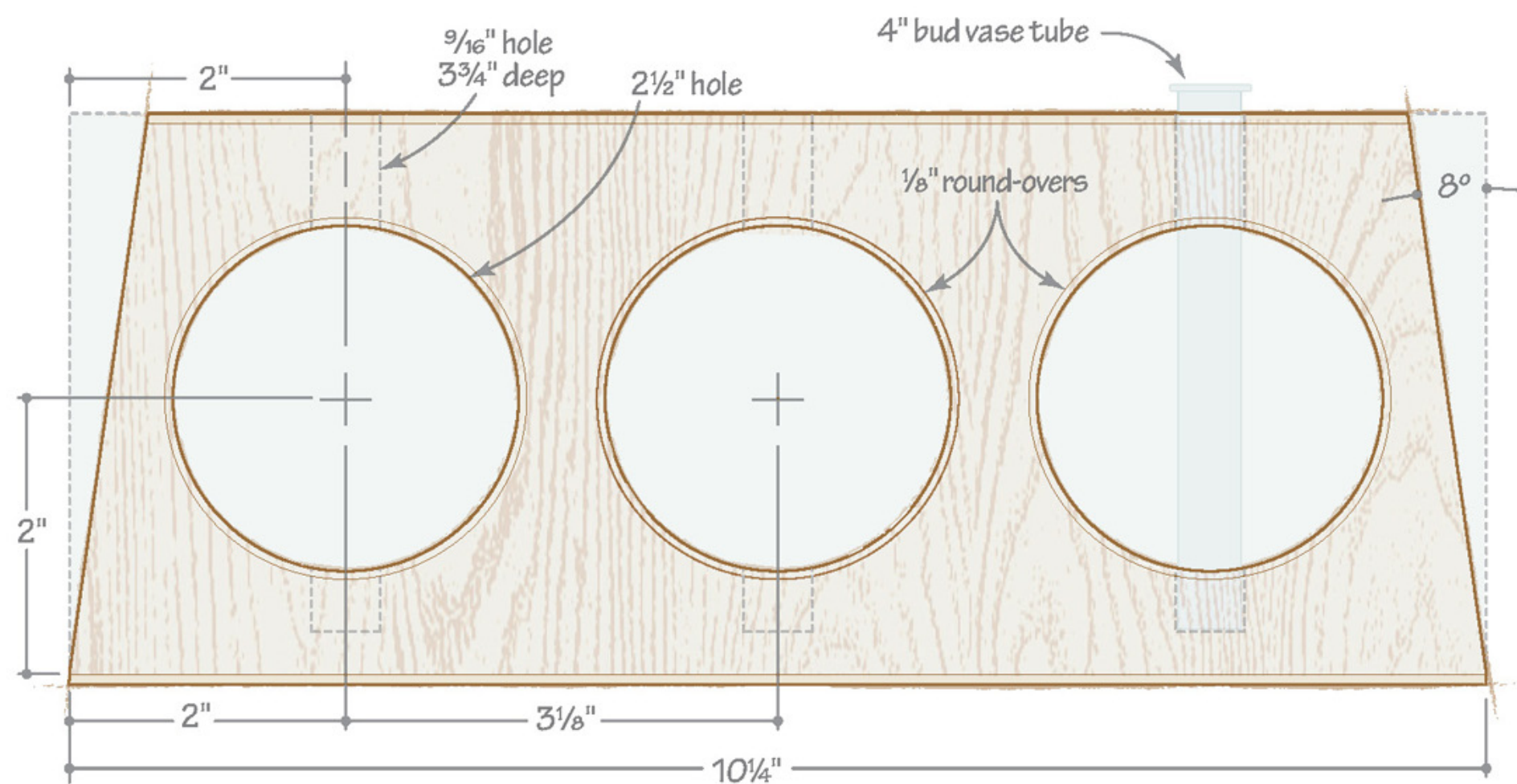
Bits: $\frac{1}{4}$ " spiral downcut router bit, $\frac{1}{4}$ " roundnose router bit.

Source: Small wood people (12), large wood people (12), $1\frac{1}{4} \times 1\frac{1}{4}$ " maple blank, kit no. RS-01283, \$16.95 plus shipping, 888-636-4478, woodstore.net/yachtrock.

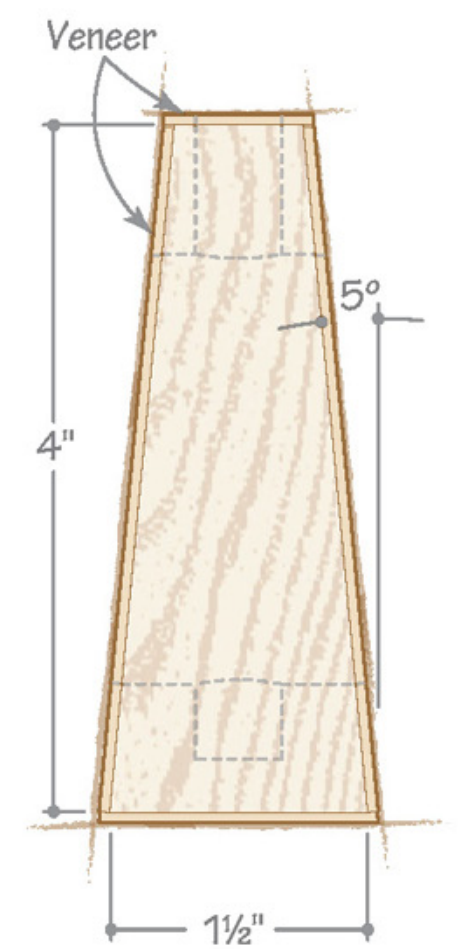
Tapered Triplet Bud Vase

*Veneered faces highlight
the contrasting wood
exposed in the cutouts.*





FRONT VIEW



END VIEW

1 Cut a 2×4×12" blank for the base. (We used maple.) Lay out the 5° face bevels on each end and connect the lines along the top edge [End View Drawing].

2 Tilt your bandsaw table 5° and cut the bevels just outside the lines. Smooth the bevels with a pass over the jointer, or with a hand plane.

3 Make two 4×12" clamping cauls from 3/4" MDF, beveling one face on each at 5°.

4 Cut two 4 1/4×12 1/4" pieces of a contrasting veneer. (We used quilted makore, an African wood similar to sapele.) Apply glue to each face of the base, press the veneer against it, and clamp with the cauls [Photo A].

5 After the glue dries, remove the cauls and trim the veneer flush using a sharp knife. Cut veneer to cover the top and bottom of the base, and glue it in place [Photo B]. Trim the veneer flush after the glue dries.

Tip! Make several shallow passes to cut through the veneer.



A

The beveled cauls provide parallel clamping surfaces. Make sure the veneer overhangs slightly on all sides and doesn't slide around as you clamp.



B

Two more scraps of MDF serve as cauls when gluing and clamping veneer to the top and bottom faces.



C The cauls hold the base perpendicular to the bit and prevent tear-out on both faces. Register the top of the assembly against the drill-press fence so the holes align perfectly. Clamp the assembly to the fence as you drill.

6 Retrieve the beveled cauls and secure them to the base using a short piece of double-faced tape at each corner, with the ends and edges flush. Lay out the centers of the large holes on one caul [Front View Drawing], and transfer the marks to the top of the base. Drill the large holes [Photo C].

7 Drill the small holes through the top and into the bottom edge in two steps: First, drill into each large opening with a $\frac{1}{16}$ " Forstner bit, working slowly to avoid tear-out. Then, set the base aside and chuck a $\frac{1}{16}$ " twist bit into the drill press, registering the shoulder of the bit against the jaws. Set the drill-press depth gauge so the bit stops $\frac{1}{4}$ " above the table. Because the base won't fit under the bit, remove the bit, place it into one of the holes in the base, then remount the bit [Photo D]. Drill the holes into the bottom edge, then carefully remove the unmarked caul and the tape.

8 Working from the center mark of the center circle, lay out each end of the base $5\frac{1}{8}$ " from the mark [Front View Drawing]. Transfer the lines to the exposed veneered face. Set your miter gauge to 8° and cut each end of the base [Photo E].

9 Round over the large holes [Front View Drawing], finish-sand to 220 grit, then apply a finish. (We used satin aerosol polyurethane.) Insert the bud tubes [Source] and some fresh-cut flowers to brighten up any table or shelf. 🌳

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



D Slide the base and bit under the chuck, and remount the bit with its shoulder against the chuck jaws. Drill the hole, loosen the bit, and repeat the process to drill the remaining holes.



E With the caul resting on the table, cut an end of the base. Reset the miter gauge for the opposite 8° setting and miter-cut the other end.

Bits: $2\frac{1}{2}$ " Forstner bit, $\frac{1}{16}$ " Forstner bit, $\frac{1}{16}$ " twist bit.
Source: 4" bud vase tubes (3) no. 152108-2, \$1.75/2 pk., Packard Woodworks, 800-683-8876, packardwoodworks.com.

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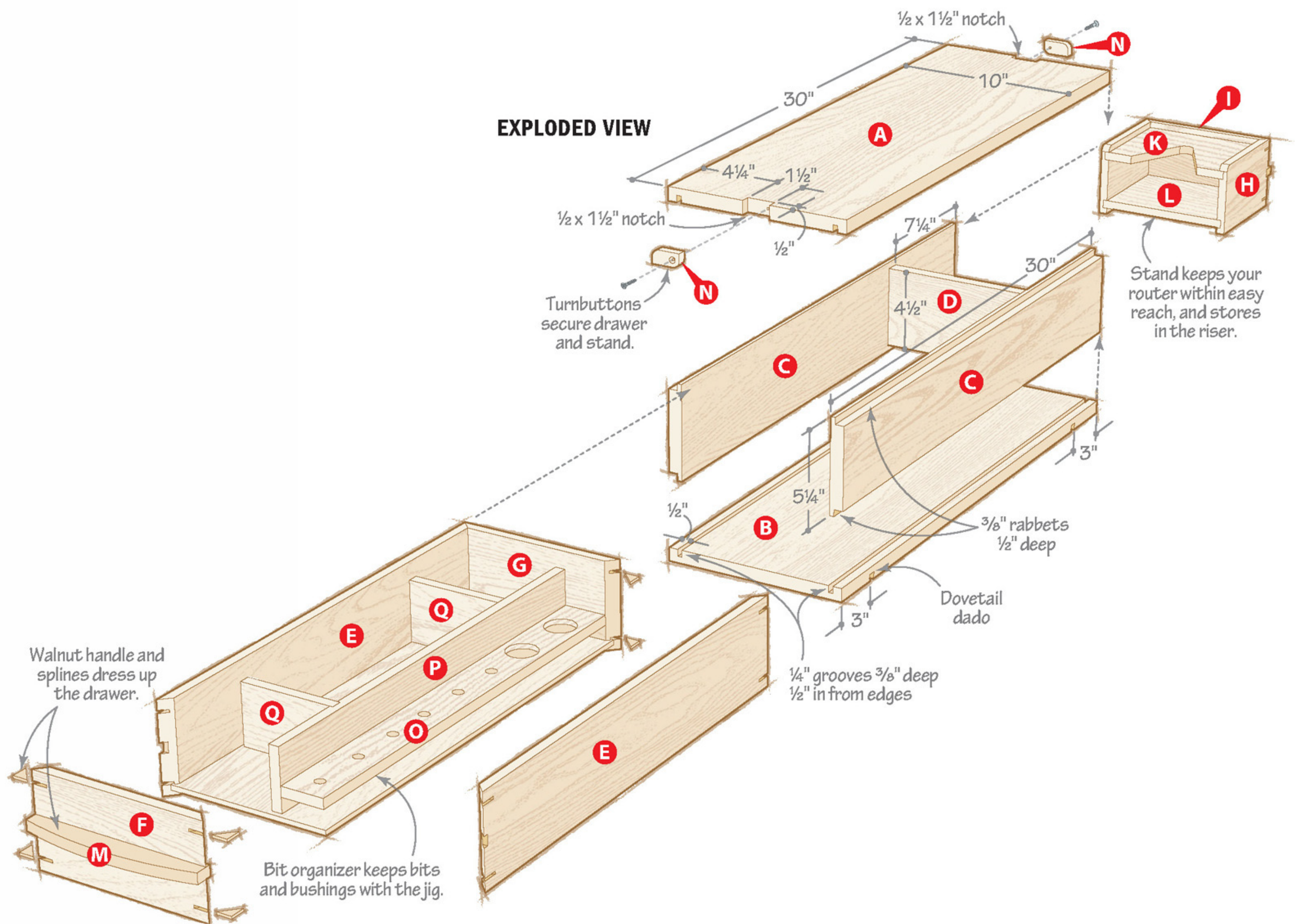
3-in-1 Dovetail Workstation

Raise your work to new heights.

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Approximate materials cost:
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storage for
6
router bits
and
2
bushings



This project lets you kiss off all those chiropractic kinks that come from stooping over to monitor your routing progress. Clamp this workstation to your bench and raise your dovetail jig to a more comfortable working height.

But it serves as more than just a booster seat for your dovetail jig. It also houses a drawer to store router bits and accessories, as well as a stand that holds your router while you're clamping workpieces in the jig.

Build the basic riser

We sized this project to accommodate most dovetail jigs. But before cutting any parts to size, compare the width and depth of your dovetail jig to the overall project dimensions and make any necessary adjustments.



A With a dado blade in the saw, position the rip fence to cut 1/4"-wide grooves 1/2" from the edges of the riser top (A) and bottom (B).

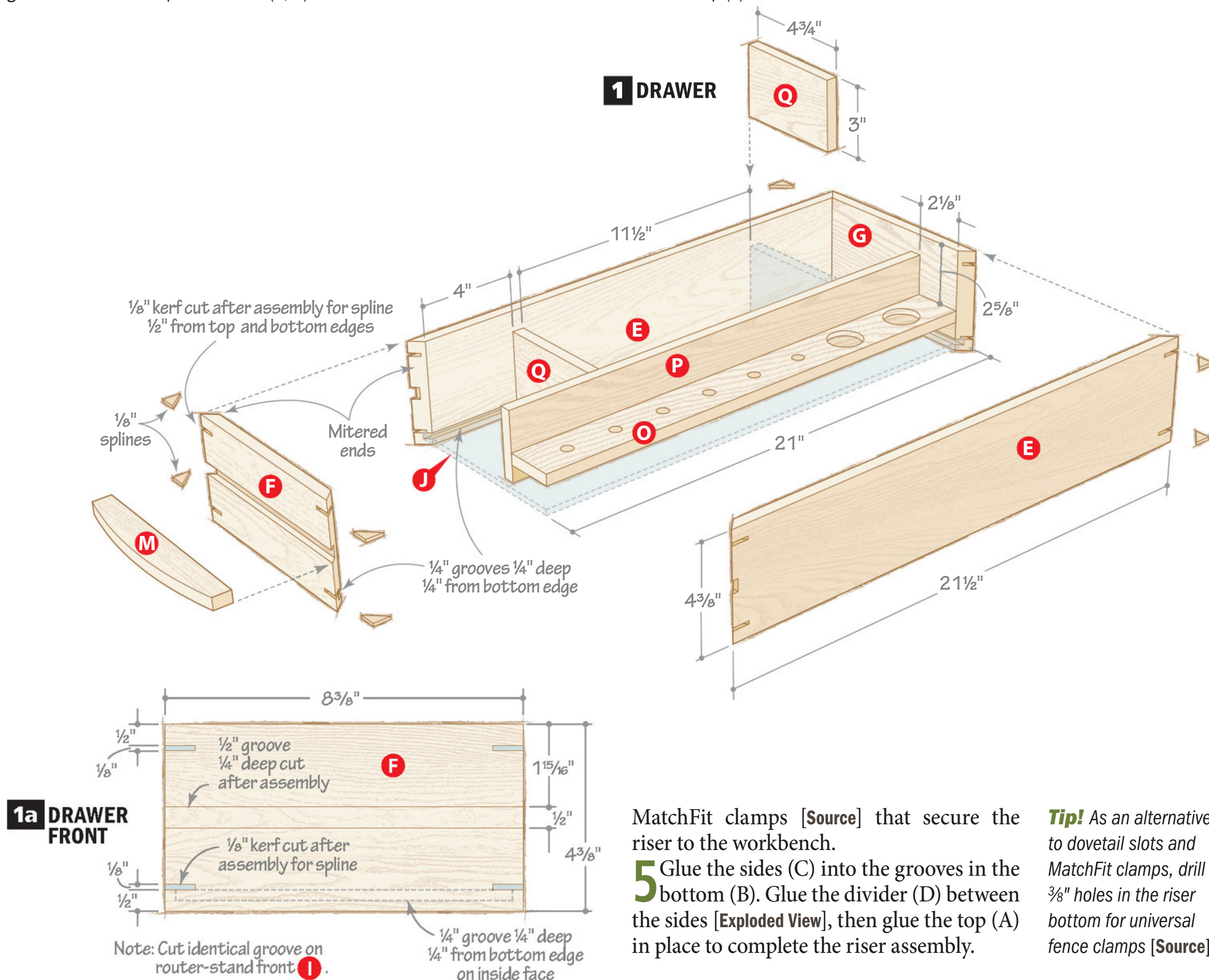
1 From 3/4" Baltic birch plywood, cut the riser top (A), bottom (B), sides (C), and divider (D) to size [Exploded View, Materials List]. Groove the riser top and bottom (A, B) [Exploded View, Photo A].



B Cut rabbets along the edges of the riser sides (C) to create tongues that fit the grooves in the riser top and bottom (A, B).



C Make overlapping cuts with a dado blade to cut a centered notch on each end of the riser top (A).



2 Add chippers to the dado stack and attach an auxiliary fence to the rip fence. Rabbet the edges of the riser sides (C) [Exploded View, Photo B].

3 Attach a tall auxiliary fence to your miter gauge and cut a centered notch on both ends of the riser top [Exploded View, Photo C].

4 Rout two dovetail slots in the riser bottom [Exploded View] for a pair of MicroJig

MatchFit clamps [Source] that secure the riser to the workbench.

5 Glue the sides (C) into the grooves in the bottom (B). Glue the divider (D) between the sides [Exploded View], then glue the top (A) in place to complete the riser assembly.

Tip! As an alternative to dovetail slots and MatchFit clamps, drill 3/8" holes in the riser bottom for universal fence clamps [Source].

Add the drawer and stand

1 From 1/2" Baltic birch plywood, cut two 4 3/8 x 31" blanks for the drawer and one 4 3/8 x 23" blank for the router stand.

2 Cut a 1/4" groove in both drawer blanks for the drawer bottom [Drawings 1 and 1a]. Cut two 1/2" grooves in the router-stand blank [Drawing 2].

3 Miter-cut to length the drawer sides (E), front (F), and back (G) from the drawer

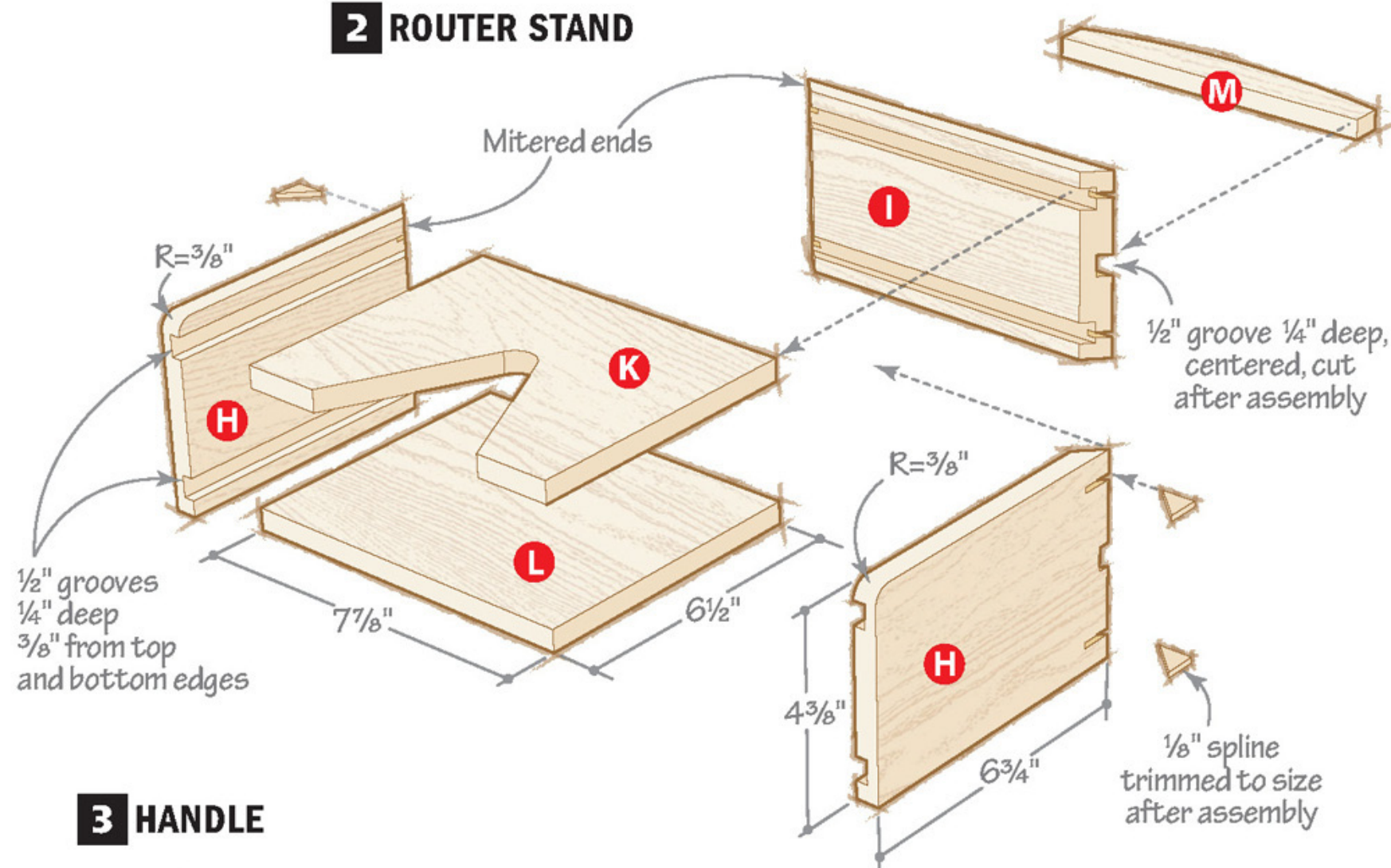


D Tilt your saw blade 45° and miter-cut the drawer and router-stand parts to length.

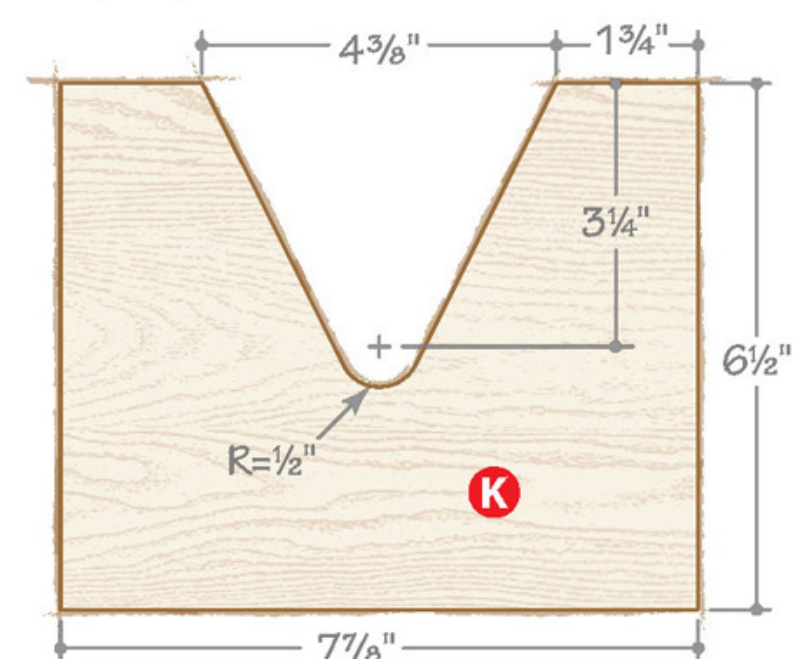


E Using a dado blade, position the rip fence to cut a centered, 1/2"-wide groove on the front of the drawer and router stand for a handle.

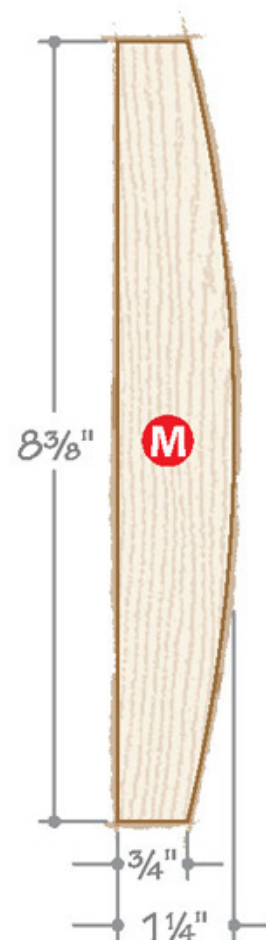
2 ROUTER STAND



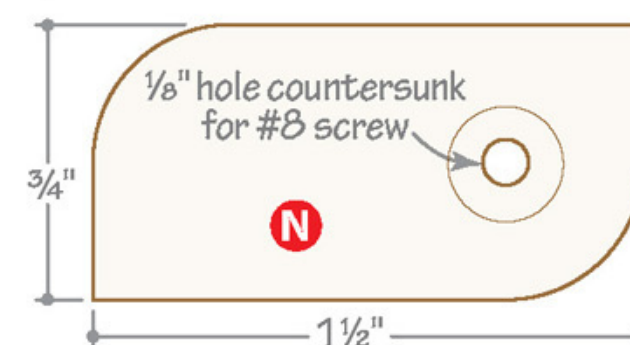
2a ROUTER STAND PLATE



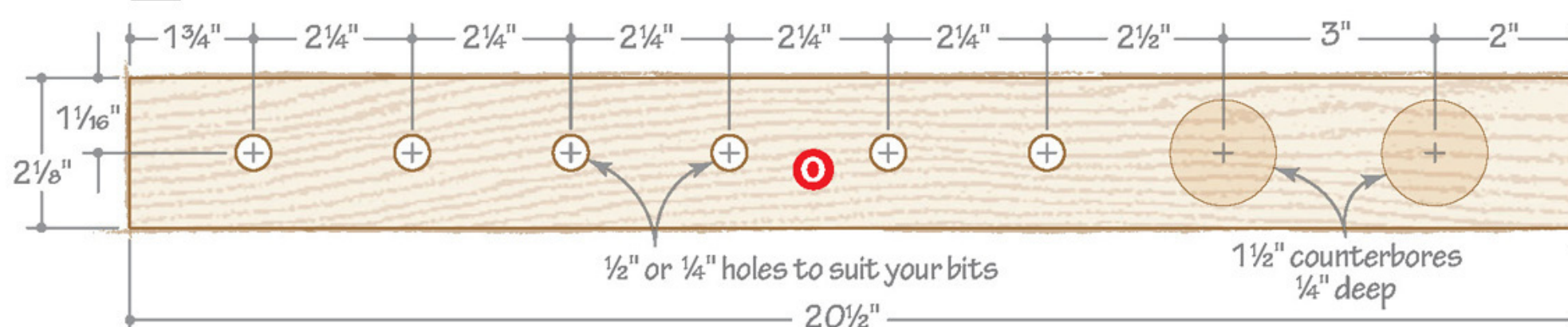
3 HANDLE



4 TURNBUTTON FULL-SIZE PATTERN



5 ROUTER BIT HOLDER



blanks [Drawing 1]. Likewise, miter to length the sides (H) and front (I) from the router-stand blank [Drawing 2, Photo D].

4 Dry-assemble both the drawer and router stand with painter's tape and test the fit of these assemblies in the riser openings. From 1/4" Baltic birch plywood, cut the drawer bottom (J) [Drawing 1]; then glue and clamp the drawer.

5 From 1/2" Baltic birch, cut the router-stand plate and bottom (K, L) [Drawing 2]. Cut the V-shaped opening in the plate [Drawing 2a]. Glue and clamp the router stand.

6 With the glue dry, groove the front of both the drawer and the router stand

[Drawing 1a, Photo E]. Radius the top corners of the router stand [Drawing 2].

7 Add splines to the mitered corners of the drawer and router stand [Skill Builder]. Cut the handles (M) and turnbuttons (N), fit them, then shape them [Drawings 3 and 4]. Glue the handles into the grooves in the drawer and router stand. Drill a countersunk screw hole in each turnbutton and set them aside.

8 Cut to size the bit holder (O) and drawer dividers (P, Q) [Drawing 1, Materials List]. Drill the holes and counterbores in the bit holder [Drawing 5]. Glue up the bit holder/divider assembly.

SKILL BUILDER

Reinforce miter joints with decorative splines

Mitered end grain doesn't make strong joints for building drawers or boxes. But you can beef up mitered corners by adding splines. A contrasting wood gives your project a decorative touch, while reinforcing the joint.

To add the splines, make a simple five-piece tablesaw jig that straddles your rip fence and cradles the drawer or box 45° to the table. Place the workpiece in the jig and set the blade height [Photo F]. Then adjust your rip fence for the desired spline location.

Cut a kerf on all four corners of the drawer and the two mitered corners of the router stand. Then flip the assemblies around to cut a second set of kerfs on the opposite side [Photo G].

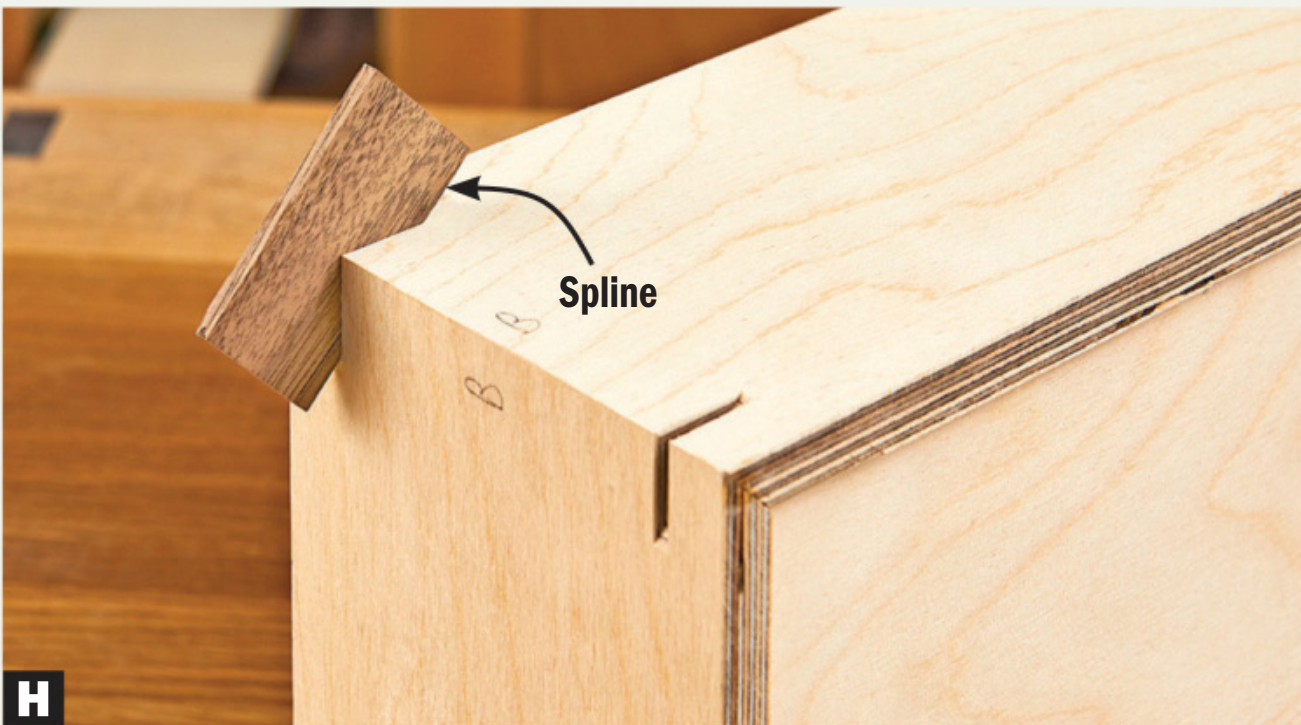
To make the splines, select a contrasting wood and plane the stock to match the width of the kerfs. Cut and glue oversize splines into the kerfs [Photo H]. After the glue dries, trim the splines flush using a handsaw and sand as needed.



F With the drawer resting in the jig, set the height of the blade to cut halfway through the corner joint.



G Clamp the workpiece to the jig before pushing both through the blade to cut the kerfs for the splines.



H Plane contrasting spline stock for a smooth, easy fit in the kerfs, to allow for any slight swelling when you apply the glue.

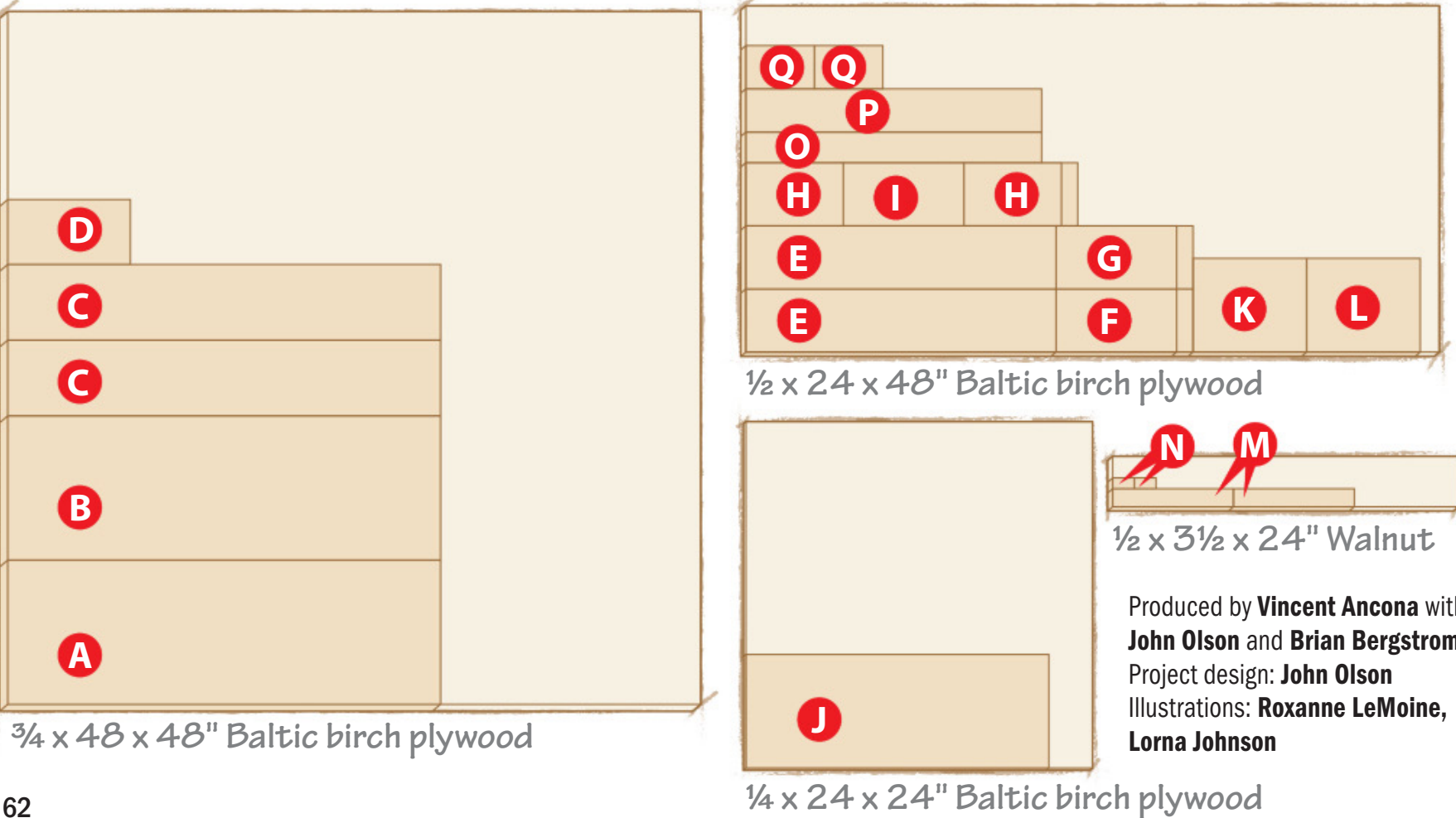
Finish and put the riser to use

- 1 Apply a clear finish to all the assemblies. We used a satin spray lacquer.
- 2 To attach the turnbuttons, drill a pilot hole in each notch of the riser top (A) for a wood screw. Screw the turnbuttons in place, tightening the screws just enough so the turnbuttons still rotate.
- 3 Screw your dovetail jig to the top of the riser. Place the bit organizer in the drawer.

Slide the drawer and router stand in the riser and rotate the turnbuttons to hold them in place. Now, the next time you need to rout dovetails, your back will thank you. 🌳

Tip! To locate the pilot holes for the screws, place a turnbutton in the notches in the riser top and use it as a template while drilling the holes.

Cutting Diagram



Materials List

Part	FINISHED SIZE			Matl.	Qty.
	T	W	L		
A riser top	3/4"	10"	30"	BP	1
B riser bottom	3/4"	10"	30"	BP	1
C riser sides	3/4"	5 1/4"	30"	BP	2
D riser divider	3/4"	4 1/2"	8 1/2"	BP	1
E* drawer sides	1/2"	4 3/8"	21 1/2"	BP	2
F* drawer front	1/2"	4 3/8"	8 3/8"	BP	1
G* drawer back	1/2"	4 3/8"	8 3/8"	BP	1
H* router-stand sides	1/2"	4 3/8"	6 3/4"	BP	2
I* router-stand front	1/2"	4 3/8"	8 3/8"	BP	1
J drawer bottom	1/4"	7 7/8"	21"	BP	1
K router-stand plate	1/2"	6 1/2"	7 7/8"	BP	1
L router-stand bottom	1/2"	6 1/2"	7 7/8"	BP	1
M handles	1/2"	1 1/4"	8 3/8"	W	2
N turnbuttons	1/2"	3/4"	1 1/2"	W	2
O router-bit holder	1/2"	2 1/8"	20 1/2"	BP	1
P long drawer divider	1/2"	3"	20 1/2"	BP	1
Q short drawer dividers	1/2"	3"	4 3/4"	BP	2

*Parts initially cut oversize. See the instructions.
Materials key: BP-Baltic birch plywood, W-walnut.
Supplies: #8×1 1/4" flathead screws.
Blade and bits: Dado set, 1/2" drill bit, 1 1/2" Forstner bit, 14° 1/2"-dovetail bit.
Source: MicroJig MatchFit dovetail clamps (1 pr.), no. 61047, \$45; or Rockler universal fence clamps (1 pr.), no. 31373, \$19.99; Rockler, 800-279-4441, rockler.com.

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SHOP TEST

Cordless



How we chose the field

In order to be included in our test group, each circular saw had to meet the following criteria:

- powered by a single 18- or 20-volt rechargeable lithium-ion battery (included or optional);
- uses either a 6½" or 7¼" blade—the most widely available sizes.

► We tested each saw using identical Irwin Marathon blades, to fairly compare each saw's performance.

Just as a mobile phone frees you from being tethered to the wall during a call, a cordless circular saw liberates you from the length limitations of a power cord. Because many of today's battery-powered circular saws have enough power and runtime to perform capably on construction sites, handling all your cutting needs in a workshop will be a piece of cake.

Although you can find cordless saws with smaller blades, the vast majority of them use either 6½" or 7¼" blades. So we gathered up 16 models in these two sizes and tested them head-to-head. (Because these saws use model numbers that can get confusing, for clarity in this article we refer to brands with multiple models by their blade size whenever possible.) Here's what we found.

How you'll buy them at retail

Almost every cordless drill comes in a kit with one or two battery packs, a charger, and often a storage case or bag. But that's not always the case with these saws: Only nine of the saws we tested sell in a kit with at least one battery and charger, and that's how we list them in this article. However, you can buy all the test models as "bare" tools (with-

► Despite marketing claims, 20-volt lithium-ion battery packs essentially equal 18-volt packs in terms of power. But some manufacturers claim a brief output of 20 volts with a fully charged pack. That's why those packs say "20 volts max," or something similar.

Circ Saws

If you haven't already switched to one of these, try it. You'll wonder how you ever tolerated a corded saw.



► Watch a video overview of all 16 saws.
woodmagazine.com/cordlesscircsaws

out battery or charger). If you already own tools that use the same batteries, buying a bare tool saves you money. And a bare tool allows you to pair the saw with your choice of battery packs and charger.

For the saws sold only as bare tools, we used battery packs rated at 4.0, 5.0, or 6.0 amp-hours (Ah), depending on which each manufacturer offers. (Unfortunately, not all brands offer packs with the same amp-hour rating.) Two 6½" kits, the compact Makita XSH04RB and Worx Exactrack WX530L, come with 2.0-Ah batteries.

Cordless doesn't mean gutless

To see what these saws are capable of, we tasked each one with the challenge of cutting through three layers of ¾" oriented-strand board (OSB) without stalling. We timed the

48"-long cuts, and then averaged the results to arrive at a "power" rating for each saw.

All of the saws proved capable of making this cut, but five outperformed the pack: the 6½" Makita XSH03T and the 7¼" Bosch, Craftsman, DeWalt, and Ridgid. (See the chart on *page 68* for ratings on all models.) We also made repeated test cuts in red oak and pine lumber, and the power performance tracked similarly.

Although the compact Makita XSH04RB lacked the power of most other saws in the test when using the supplied 2-Ah battery pack, it had no difficulty cutting ¾" lumber and plywood. Then, when we tested it with its optional 5-Ah pack, we found this saw cut with notably more power. Likewise, the Worx saw also performed better with an optional 6-Ah pack.

► A battery pack's amp-hour rating equates to the size of a car's fuel tank: The more amp-hours, the longer the runtime, and the larger the pack.

Runtime shouldn't be an issue

To evaluate each saw's runtime per battery charge, we made cuts from the same stacked-OSB setup until the battery was exhausted. As you can see in the chart at *right*, all but two cut at least 29', with the test-best Bosch cutting more than 2½ times that length. So if you're cutting ¾" stock, you should be able to cut 3–4 times as much before the battery gives out.

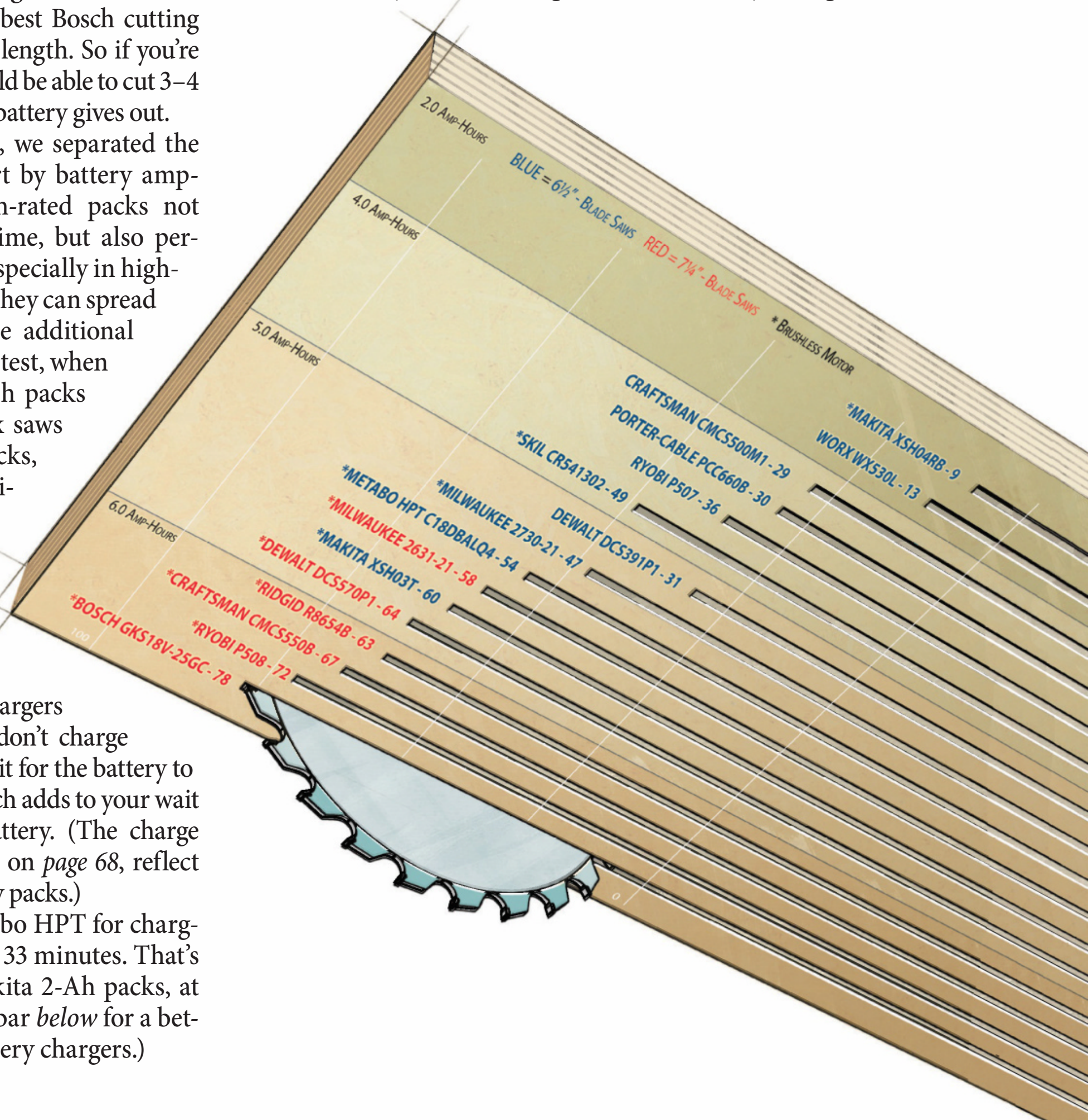
For a fair comparison, we separated the saws' output in the chart by battery amp-hour rating. Higher Ah-rated packs not only provide more runtime, but also perform more efficiently—especially in high-demand tasks—because they can spread the workload among the additional cells. Just as in the power test, when we swapped out the 2-Ah packs in the Makita and Worx saws with their high-Ah packs, run time increased significantly. And we noted that brushless-motor saws outperformed their brushed-motor counterparts in nearly every case.

Today's high-tech chargers know that hot batteries don't charge efficiently, so they will wait for the battery to cool before charging, which adds to your wait if you have only one battery. (The charge times shown in the chart on *page 68*, reflect room-temperature battery packs.)

We give credit to Metabo HPT for charging its 5-Ah packs in just 33 minutes. That's nearly as fast as the Makita 2-Ah packs, at 24 minutes. (See the sidebar *below* for a better understanding of battery chargers.)

Cordless cutting: bigger battery, brushless motor matter

We made 4' crosscuts in a 3-layer stack of ¾" oriented-strand board (OSB), resting after every five cuts, until the battery could no longer power the saw. The numbers below represent the average total linear feet cut per charge.



► Learn more about battery-powered tools for woodworking. woodmagazine.com/cordlesstools

Get amped up to recharge your batteries faster

A battery charger can all too often become the forgotten or taken-for-granted accessory when it comes to battery-powered tools. Smaller amp-hour (Ah) packs charge faster than larger ones on the same charger because they have fewer cells. But not all chargers perform equally, even within the same brand. A charger's output is expressed in amps: The higher the output, the faster it typically charges. For example, Ryobi's 2-amp compact charger took just under two hours to charge a 4.0-Ah pack. When we switched to a 3-amp stand charger, it shaved 30 minutes off the charge time.

But a lot of cordless-tool kits come with a low-output (read: inexpensive) charger to make kit prices more attractive. (See the chart on *page 68* for charge times and charger output ratings for each tested saw.)



The Worx compact charger slides onto the battery pack, rather than being a "stand" model. This charger needed nearly six hours to charge this 2-Ah pack.

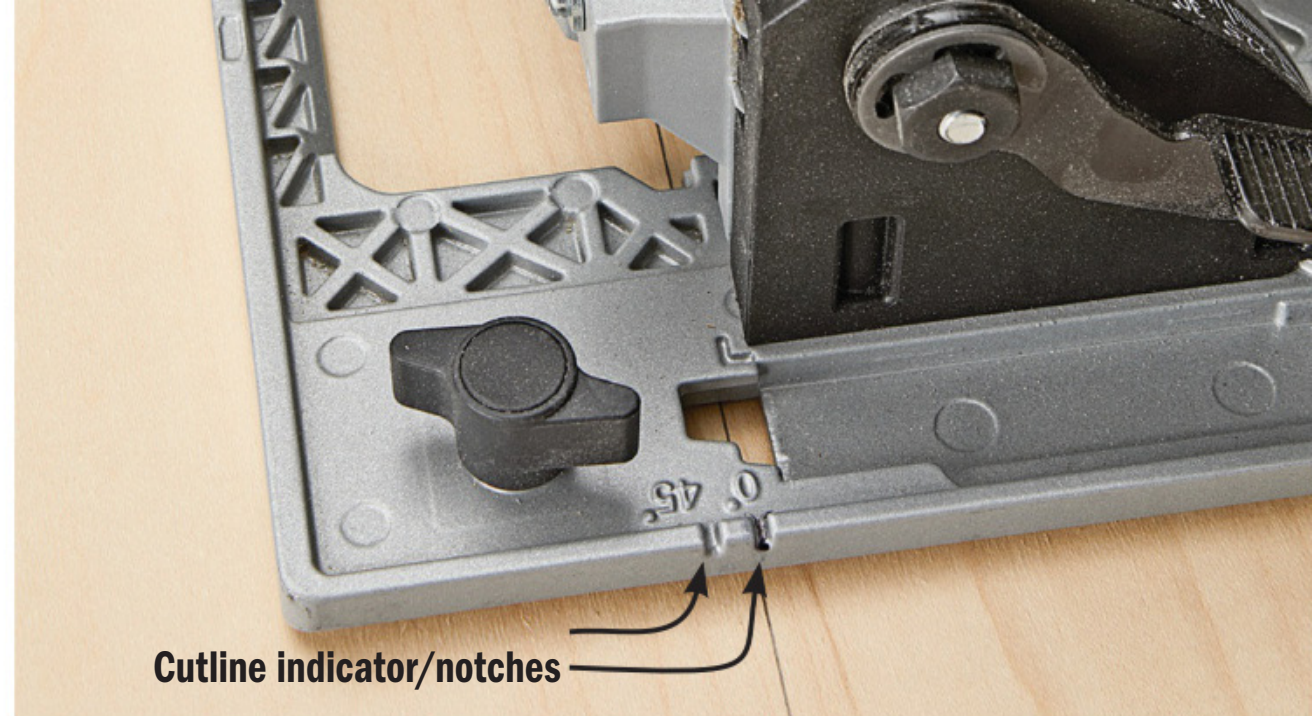


Makita's 9-amp dual charger charges two packs simultaneously. (Many multiport chargers charge batteries in sequence.) This model also has a USB port for charging smartphones and similar devices.



Cutline indicator/notches

The cutline notches on DeWalt's 7 1/4" saw extend from the front of the shoe to the blade cutout, providing two reference points for tracking a cutline.

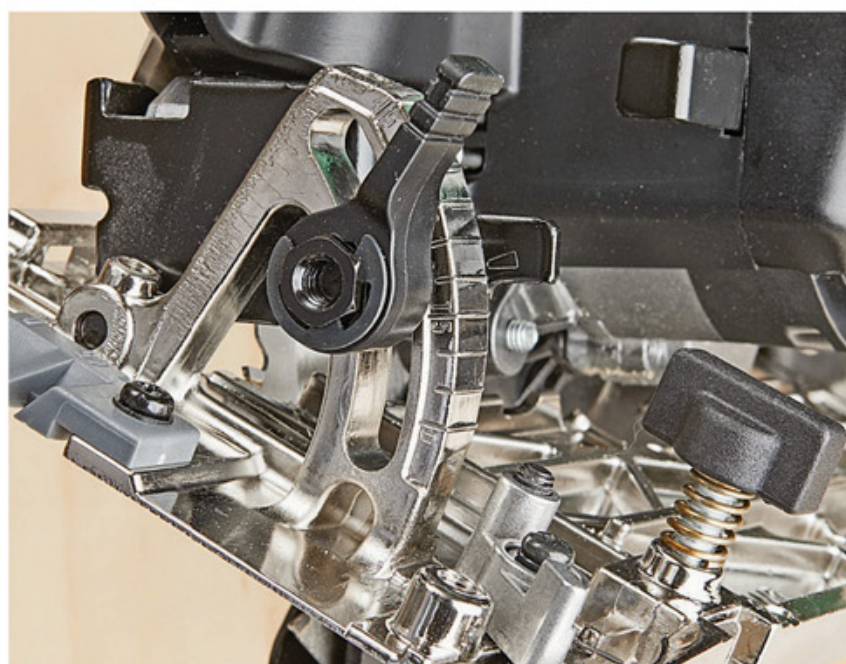


Cutline indicator/notches

Bosch's tiny cutline notches prove more difficult to see and track along a cutline. They're also slightly out of alignment with the blade, rendering them ineffective.



Ridgid's saw has easy-to-see angle markings and stops at five common angles when tilting the blade for beveled cuts.



The Metabo HPT's shiny chrome-like shoe and low-contrast angle markings make it difficult to accurately set the blade to a specific angle.



Ryobi's 6 1/2" saw has the easiest blade-depth setting system, with a twist-lock knob and clearly marked increments.

Let the shoe be your guide

If you're cutting along a marked line—without a straightedge guide—it's best to use the cutline notch on the shoe to track the blade along that line, rather than trying to eyeball the line at the point of cut.

Each test saw has indicators or notches similar for cutting with the blade perpendicular to the workpiece (0°) and when tilted to 45°. Most notches were reliably accurate, but on four of the tested saws, the 0° notch—the most commonly used—was out of alignment with the blade by as much as 1/16", with no adjustment to correct it. These saws were: Craftsman and Porter-Cable in 6 1/2" and Bosch and Ridgid in 7 1/4".

You set cutting depth by raising or lowering the shoe. Each of the saws in the test cuts at least 2" deep, with the Ridgid cutting deepest at 2 5/8". The Metabo HPT—with a 6 1/2" blade—cut a second-best 2 1/16", bettering five 7 1/4" saws.

The shoe on the Worx Exactrack saw, shown *below*, has a hinged portion that lifts out of the way to make a zero-offset cut. We found it clumsy to use, and after repeated cuts using the same wood straightedge, we discovered that the blade had shaved away part of the straightedge, rendering it useless. Overall, it's not a feature worth targeting.

► Get better cuts from any circular saw. woodmagazine.com/circsawtips



To set blade depth on the Bosch, you must depress a thumb lock and then push forward on the slide lock. It's a tricky maneuver that requires a strong thumb.



Raise the Exactrack shoe to ride on a straightedge, and then butt the saw's fixed shoe against the straightedge to make a cut along that edge.

Right blade or left?

Nine of the 16 test saws have their blades located on the right side of the tool, as viewed from the operator position (the rear of the saw); the remainder are on the left. Why the difference? No manufacturer could give us a definitive reason, so it really just comes down to your preference. Although you might prefer to operate the saw with your dominant hand on the trigger, that might mean for some cuts the motor side of the saw—the heaviest—will rest on the off-cut. Inevitably, you'll have to use your less-dominant hand for some cuts.

Circ saw snippets

■ **Blade brake.** All the test models—except the 6½" Ryobi—have a built-in blade brake, an important safety feature. Most of these stop the blade almost instantly. Although Ryobi's 7¼" saw has a brake, it takes nearly three times as long as the other saws to stop the blade.

■ **Ergonomics.** Each saw has a two-trigger power switch, another important safety feature, considering that with a battery installed, the saw is always "hot." The thumb switch on the Worx saw is located only on the left side; easy to activate when using your right hand, but nearly impossible with your left. The other saws have thumb switches on both sides of the trigger.

■ **Light 'em up.** Although 11 of the 16 saws have a built-in LED to illuminate the cutline, we found the benefit negligible once the blade starts kicking dust into its path. The Bosch and Makita saws' LEDs blink when the battery's charge level gets near zero, and some models' do the same to indicate when a cut overloads the saw. We found these notifications easy to miss when cutting outdoors in bright sunlight.

■ **Multiple blade speeds.** The Bosch saw has seven electronically controlled blade speeds, and the Metabo HPT has two; we found no meaningful benefit with either saw.

■ **Dust collection.** Without dust collection, most of the debris blows out the side and up into your face when you're standing on the blade side of the saw. The Bosch, Ridgid, Skil, and Worx saws come with dust ports that connect to a vacuum hose. Others offer one as an optional accessory.

■ **Storage.** Six saws come with either a plastic case or fabric bag for storage; all of these sell as kits with battery packs and charger.

Cutting the cord, and then some													
MODEL	PERFORMANCE RATINGS (1)							BLADE MOUNT (RIGHT, LEFT)	BRUSHLESS MOTOR? (YES, NO)	BATTERY (2)			
	PRIMARY			SECONDARY						AMP-HOUR RATING	CHARGE TIME, MINUTES	CHARGER OUTPUT, AMPS	
	POWER	RUNTIME PER BATTERY CHARGE	RELIABILITY OF CUTLINE NOTCHES	EASE OF ADJUSTING BLADE DEPTH	COMFORT/EASE OF USE OF HANDLE AND TRIGGER	TOOL BALANCE	EASE OF TILTING SHOE						
6½" SAWS													
CRAFTSMAN CMCS500M1	C	C	C-	B	B	B	B	L	N	4	61	4	
DEWALT DCS391P1	B	C	B-	B	B	B	B+	L	N	5	84	4	
MAKITA XSH03T	A	A-	A-	B	A	A	B+	L	Y	5	52	9	
MAKITA XSH04RB	D+	D	A	A	A	A	C	R	Y	2	24	9	
METABO HPT C18DBALQ4	B	B+	A	A	B+	B	C-	R	Y	5*	33	8*	
MILWAUKEE 2730-21	B+	B	B+	B	B	B	A-	L	Y	5	92	3	
PORTER-CABLE PCC660B	C-	B-	C-	B	C-	B	B	L	N	4*	102	2*	
RYOBI P507	B-	B	A-	A	C+	B	B-	L	N	4*	116	2*	
SKIL CR5413-1A	B	B	B+	B	B+	A-	B	R	Y	4	49	6	
WORX WX530L	C	D+	B	B	D	B	C	R	N	2	345	.4	
7¼" SAWS													
BOSCH GKS18V-25GC	A	A	C	C	A	A	A	R	Y	6.3*	53	4*	
CRAFTSMAN CMCS550B	A	A-	A	B	A-	A	B+	R	Y	6*	92	4*	
DEWALT DCS570P1	A	A-	A	B	A	A	A-	R	Y	5	82	4	
MILWAUKEE 2631-21	A-	A-	A-	B	B	A	A	R	Y	5	104	3	
RIDGID R8654B	A	A-	C-	B	B	B-	A	R	Y	6*	73	6*	
RYOBI P508	A-	A	A-	A	C+	B	B	L	Y	6*	174	2*	

► Learn proper body mechanics for using a circular saw. woodmagazine.com/circsawbasics

Best of the battery saws

If you already own a battery-powered tool or two, it makes sense to buy a saw that shares those batteries. We don't think you'll be disappointed in any of these models. But if you're willing to invest in a new battery platform to get a top performer, go with the 7¼" right-blade DeWalt DCS570P1, or the 6½" left-blade Makita XSH03T. These two saws share Top Tool honors. 🌳

Produced by **Bob Hunter** and **Michael Springer**
Illustration: **David Kallemyn**

	MAX. CUTTING DEPTH, INCHES		SHOE						WARRANTY, YEARS (3)				
	BLADE AT 0°	BLADE AT 45°	BEVEL ANGLE RANGE (MIN./MAX.), DEGREES	BEVEL ANGLE STOPS, DEGREES	AUTOMATIC BLADE BRAKE? (YES, NO)	LED? (YES, NO)	STORAGE BAG OR CASE?	WEIGHT, LBS-OZ (WITH BATTERY)	SAW	BATTERY PACKS	COUNTRY OF ASSEMBLY (4)	SELLING PRICE (5)	CONTACT INFORMATION
	2⅜	1⅜	0–50	0	Y	N	NONE	7-6	3	3	C	\$140	888-331-4569, craftsman.com
	2⅞	1⅝	0–50	0	Y	N	CASE	7-9	3	3	M	\$250	800-433-9258, dewalt.com
	2¼	1⅞	0–50	0, 45	Y	Y	BAG	7-10	3	3	R	\$390	800-462-5482, makitatools.com
	2¼	1⅞	0–50	0, 45	Y	Y	BAG	6-12	3	3	U	\$300	800-462-5482, makitatools.com
	2⅞	1⅜	0–45	0	Y	Y	NONE	7-7	L	2*	C	\$200	800-829-4752, metabo-hpt.com
	2⅞	1⅝	0–50	0	Y	Y	BAG	8-8	5	3	C	\$320	800-729-3878, milwaukeetool.com
	2⅞	1¾	0–50	0	Y	N	NONE	7-5	3	3*	C	\$60	888-848-5175, portercable.com
	2	1⅞	0–56	0	N	N	NONE	6-13	3	3*	C	\$69	800-525-2579, ryobitools.com
	2⅜	1⅞	0–50	0	Y	Y	NONE	8-0	5	2	C	\$190	877-754-5999, skil.com
	2⅞	1⅝	0–50	0	Y	N	NONE	4-6	2	1	C	\$120	855-279-0505, worx.com
	2½	1⅞	0–50	0	Y	Y	NONE	11-7	3	2*	H	\$250	877-267-2499, boschtools.com
	2½	2	0–56	0, 22.5, 45	Y	Y	NONE	8-12	3	3*	C	\$130	888-331-4569, craftsman.com
	2½	2	0–57	0, 22.5, 45	Y	Y	BAG	9-11	3	3	C	\$280	800-433-9258, dewalt.com
	2½	1⅞	0–50	0, 50	Y	Y	BAG	9-5	5	3	C	\$280	800-729-3878, milwaukeetool.com
	2⅝	1⅞	0–56	0, 15, 22.5, 30, 45	Y	Y	NONE	10-15	3†	3*†	C	\$170	866-539-1710, ridgidpowertools.com
	2⅜	1⅜	0–56	0, 45	Y	Y	NONE	8-13	3	3*	C	\$119	800-525-2579, ryobitools.com



woodmagazine.com



1.

A

B

C

D

Excellent

Good

Fair

Poor
2.

(*) Batteries not included with saw
3.

(L) Lifetime

(*) Batteries not included with saw

(†) Lifetime service agreement upon registration
4.

(C) China

(H) Hungary

(M) Mexico

(R) Romania

(U) United States
5.

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

Foolproof Finishes

Get professional-looking results with these easy-to-apply choices.



After putting all the time and effort into building a great project, a flawless finish really sets it off. These finishes go on quick without a lot of fuss or expensive spray equipment.

Finish furniture with a wipe

Polyurethane creates a hard, protective finish but can be difficult to apply without brush marks, sags, or drips. The low viscosity of Arm-R-Seal—a blend of mineral oil and urethane resin—creates a thin film, eliminating those problems. Apply it with a natural-bristle brush, foam brush, or lint-free cloth. Then wipe off the excess with a lint-free cloth within a few minutes.

The first coat may not provide a consistent sheen and you may wonder about your

decision to use it. But Arm-R-Seal looks and wears best after three or more coats, allowing each coat to dry overnight. Buff it to a nice sheen with a cloth once it cures.

In the end, Arm-R-Seal imparts a light amber tone to wood and, like most penetrating oil finishes, highlights the grain. Its high durability makes it suitable for furniture, tabletops, and even benchtops. It can be applied over stains and other finishes (follow the manufacturer's recommendations). Find it for around \$20 per quart.

Sources:

generalfinishes.com,
rockler.com, woodcraft.com,
homedepot.com



It takes a few coats before Arm-R-Seal builds to the desired depth and appearance. To avoid transferring contaminants to the can with the brush, pour some finish into a clean container for application.

Rub it in for a fantastic finish

Originally developed for hardwood floors, Odie's Oil contains waxes in addition to resins that provide a nice sheen. Its initial paste-like consistency becomes more liquid as you stir it.

A little Odie's Oil goes a long way. Apply a thin coat with a white, non-woven abrasive polishing pad, working it deep into the wood. Wait about 45 minutes and then buff it with a clean cloth, removing all of the excess finish. The resulting even, satin finish shows off the wood grain.

If you want to apply more coats, allow 24 hours between them. No sanding is required between coats. It takes two weeks to cure for maximum protection against water and other liquids. A 9-ounce jar costs \$45.

Another version of this product, Odie's Super Penetrating Oil, has a thinner consistency, making it easier to apply to larger or more complex projects. The trade-off is a less durable finish than the standard Odie's Oil. The application process is the same. You'll spend about \$100 for a 32-ounce jar of Super Penetrating Oil.

Sources:

odiesoil.com
850-695-2055
rockler.com, infinitytools.com



Odie's Oil finishes contain non-toxic oils and waxes that offer plenty of protection.



Because of the waxes and oils in the finish, Odie's Oil has a stiff consistency until it's mixed thoroughly.

A Note on Safety

Oil-soaked rags can spontaneously combust, presenting a fire hazard. Dispose of applicators and rags in a metal pail with water and secure the lid, or spread them out to dry thoroughly before disposing of them. Thoroughly clean any non-disposable brushes.

Tradition meets convenience

The modified linseed oil in Tried & True Varnish Oil harkens to 18th-century traditional oil finishes. The manufacturer adds a rosin-based derivative from pine trees that improves the durability of the finish. It costs around \$35 per quart.

To apply Tried & True, wipe on a thin coat using a lint-free cloth. The viscosity, a little thicker than boiled linseed oil, requires a bit of effort to work the finish into the surface.

After an hour or so, rub the surface briskly with a cloth until completely dry. The finish fully cures in 24 hours, after which you can buff it using #0000 steel wool or a soft cloth. Additional coats increase the depth of shine and level of protection.

Sources:

triedandtruewoodfinish.com,
leevalley.com, rockler.com,
woodcraft.com



The linseed oil in Tried & True makes it feel “sticky” on application and requires a little more effort to apply than thinner oil finishes.

Beauty and durability in one

Like other oil-based finishes, Waterlox Original Sealer/Finish absorbs into the wood to seal it while adding a protective film. Its water-like consistency helps carry the resins deep into the wood fibers.

Waterlox adds depth to the wood while providing water-resistant protection. It's suitable for any-size project, including hardwood floors and countertops. With its blend of tung oil and linseed oil, the first coat shows off the wood. Additional coats add durability and depth to the finish owing to resins in the blend.

Apply up to four coats for optimum protection, allowing 24 hours between coats. Although this prolongs finish time, the end result is worth the wait. You'll find Waterlox Original Sealer/Finish for \$32 a quart.

Sources:

waterlox.com
800-321-0377
rockler.com, woodcraft.com



This water-thin coating soaks into the wood while leaving a protective film on the surface. Use a natural bristle brush to lay down a smooth finish.

Spray for speed

When it comes to a quick finish for small projects, nothing beats spray lacquer in a rattle can. You can easily apply several thin coats within a few hours. Lacquer works great as a stand-alone finish or as a topcoat for stains and other finishes.

Spray only in a well-ventilated area—if you can spray outdoors, all the better. (The finish dries fast enough to minimize dust nibs, even outdoors.) Always start spraying off to the edge of the project, then move the can in a smooth, even stroke past the opposite edge, keeping the nozzle the recommended distance from the surface. This avoids buildup along the edges of the project that causes runs or sags. Practice on a scrap piece to determine how far away and how fast to move the can for the optimum finish.

Although lacquer dries to the touch rather quickly, it's best to wait at least an hour



A quick-drying, spray-applied lacquer allows you to build multiple coats quickly.

before applying another coat to allow most of the solvents to evaporate. The great thing about lacquer is it doesn't require sanding between coats. The solvent from the freshly sprayed finish reactivates the lacquer of the previous coat to aid adhesion.

A can of lacquer costs around \$10 and is available wherever paint supplies are sold. 🌱

Produced by Randy Maxey

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- (3) Nonrequested Copies Distributed Through the USPS by Other Classes of Mail: 0
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- e.** Total Nonrequested Distribution: 2,499
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- (2) In-County Paid/Requested Subscriptions Stated on PS Form 3541: 0
- (3) Sales Through Dealers and Carriers, Street Vendors, Counter Sales, and Other Paid Distribution Outside USPS: 8,067
- (4) Requested Copies Distributed by Other Mail Classes Through the USPS: 0
- c.** Total Paid and/or Requested Circulation: 282,010
- d.** Nonrequested Distribution (by Mail and Outside the Mail):
- (1) Outside-County Nonrequested Copies Stated on PS Form 3541: 1,701
- (2) In-County Nonrequested Copies included on PS Form 3541: 0
- (3) Nonrequested Copies Distributed Through the USPS by Other Classes of Mail: 0
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18. Signature and title of editor, publisher, business manager, or owner Chris Susil, VP/Planning & Analysis. Date: September 21, 2020. I certify that all information furnished on this form is true and complete. I understand that anyone who furnishes false or misleading information on this form or who omits material or information requested on the form may be subject to criminal sanctions (including fines and imprisonment) and/or civil sanctions (including civil penalties).

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TOOLS & MATERIALS

SHOP-TESTED

Twist and Sharp

Don't throw away dull twist bits—you can sharpen them yourself, and a dedicated drill-bit sharpener makes the job fast, easy, and accurate. We tested several models and it quickly became clear why Drill Doctor dominates this market. Each model shown here uses a 180-grit diamond abrasive to hone the bit tips. (Replacement drums cost \$20.)

Drill Doctor 750X, \$140

Bit sizes: $\frac{3}{32}$ – $\frac{3}{4}$ " diameter

Bevel-angle range: 118°–140° (infinitely variable)

This machine lets you grind a variety of bevel angles on your largest twist bits, and even has a port for applying a microbevel to metal-drilling bits. This jig offers the greatest bevel range and largest bit capacity of all the systems we tested, and is easiest to use, so it's our favorite.

Drill Doctor
800-597-6170, drilldoctor.com



► See how these sharpeners work.

woodmagazine.com/drilldoctor



Drill Doctor 500X, \$100

Bit sizes: $\frac{3}{32}$ – $\frac{1}{2}$ " diameter

Bevel-angle settings: 118°, 135°

This model works similarly to the 750X, but offers only two angle settings and smaller bit capacity. You can buy an optional chuck for \$35 to sharpen bits up to $\frac{3}{4}$ ".



Drill Doctor 350X, \$50

Bit sizes: $\frac{3}{32}$ – $\frac{1}{2}$ " diameter

Bevel-angle setting: 118°

Although a bit fussier to set up and use than the other models shown, this bare-bones machine sharpens perfectly to its only angle—the most common wood-drilling-bit bevel of 118°.

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Model B975



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TOOLS & MATERIALS

SHOP-TESTED

Get ultrafine routing accuracy in multiple dimensions

Trim/compact router plunge base \$399.95; edge guide \$219.95; LED kit \$79.95 (battery-powered kit \$29.95)

Every trim router comes with a base, so why would I even consider replacing it, especially with one that costs more than twice as much as the entire router? Because precision matters, and I've never used a router base—a whole system, really—as well-built and precise as Micro Fence. I replaced the plunge base on my DeWalt 1¼-hp compact router, and thanks to the silky-smooth plunge action and reliable locking knob, I confidently used this base to rout hinge mortises, inlay mortises, and grooves for inlay banding. What I like best is this base's microadjuster for bit depth, accurate to .001".

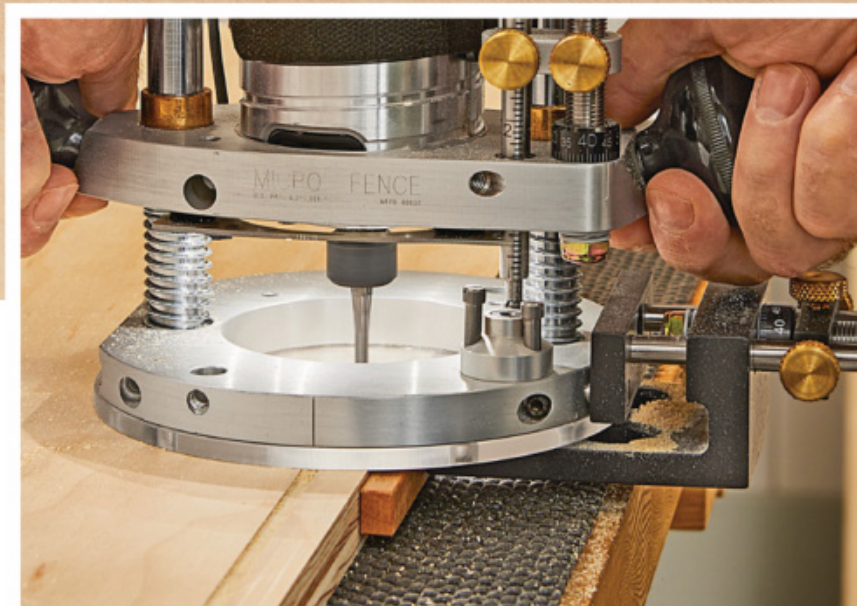
Add in the Micro Fence edge guide—also with a .001" microadjuster—and you have a router capable of routing to width and depth for a spot-on-perfect fit. No more trial-and-error test cuts. And if needed, you can back off the same amounts to repeat a two-step cut with ease and confidence.

These two products call for a big investment that, understandably, will put off some woodworkers. But if you value accuracy, you'll quickly forget the price tag and just enjoy the fuss-free reliability Micro Fence provides.

Micro Fence sells plunge bases to fit 18 trim, compact, and sub-compact routers, including several cordless models. Some models require adapter rings, at an additional cost. I recommend the optional LED ring (*insert photo*), which takes away all shadows and illuminates brilliantly. You also can add other accessories, such as circle and ellipse jigs and attachments for connecting to an aluminum tracksaw track.

—Tested by Bob Hunter, Tools Editor

Micro Fence
818-683-0330, microfence.com



Clamp confidently with these knuckle-savers

Gear Klamp, 6" (no. GK15) \$20; 12" (no. GK30) \$22; 18" (no. GK45) \$25; 24" (no. GK60) \$28

I often find myself clamping in tight spaces with traditional F-style or one-hand bar clamps, and because the handle rests too close to the workpiece, I end up scraping my knuckles. Thankfully, Bessey's Gear Klamp eliminates that problem. With this clamp, the handle wraps around the bar—you simply rotate it with plenty of clearance for knuckles. Gears inside the sliding jaw (cutaway view shown at right) make this possible.

The jaws are made of durable composite material, with a tall pad on the fixed jaw and a round cap on the sliding jaw's screw. A quick-release trigger lets you slide the jaw quickly before tightening. It's light, but not a lightweight. I've used these for numerous tasks clamping workpieces to a workbench and clamping components inside larger case furniture pieces, and they work amazingly well.

—Tested by Kevin Boyle, Senior Design Editor

Bessey Tools
800-828-1004, besseytools.com



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TOOLS & MATERIALS

NEW AND UNTESTED

Reciprocating saw

Right-angle drill

Cutoff saw

Impact driver

Drill/driver

Impact wrench

Ryobi downsizes cordless tools

Powered by Ryobi's 18-volt One+ lithium-ion battery packs, these new tools feature brushless motors and smaller overall sizes, compared with regular Ryobi cordless tools (20–31 percent, depending on the tool). You can buy the ½" drill/driver in a kit with two 1.5-amp-hour batteries, charger, and bag (no. PSBDD01K) for \$129. Get the ¼" impact driver kit (no. PSBID01K) for \$129. Or get the pair in a kit (no. PSBCK01K) for \$179. The other tools sell only as bare tools without battery or charger:

- cutoff saw (no. PSBCS02B), \$99
- one-hand reciprocating saw (no. PSBRS01B), \$99
- ⅜" right-angle drill (no. PSBRA02B), \$99
- ⅜" four-mode impact wrench (no. PSBIW01B), \$119.

Ryobi
800-525-2579, ryobitools.com



Rockler adds one-hand bar clamps

6" no. 83149, \$13; 12" no. 82030, \$17; 18" no. 82252, \$20; 24" no. 89232, \$25

With four sizes to choose from, Rockler's new one-hand clamps feature an I-beam steel bar and protective polypropylene pads on the jaws. The jaws

also reverse to use as a spreader. Rockler says the clamps apply up to 300 pounds of clamping force.

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WHAT'S AHEAD

A GLIMPSE INSIDE THE MARCH ISSUE (ON SALE JANUARY 10)



Tool tower
Heads up: This handy high-rise stacks accessible storage in a small footprint.



Old-school stock prep
For parts too small to safely machine, or to simply sharpen your muscle memory, learn to straighten and square using only hand tools.



Shop test: Floor-standing lathes
Outgrown your mini-lathe? Step up to one of these big boys, capable of 16" or larger bowls and 24"-plus spindles.



Dust-collection hacks
These shop-smart solutions take over where the accessory manufacturers leave off to ensure that your shop—and lungs—stay clean.



Display cabinet
This showcase literally puts your collection in a new light thanks to cord-free LEDs and glass shelves.

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