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Own Inlay  
Banding**  
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# WOOD®

The World's Most Trusted Woodworking Resource

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Easy-to-Customize

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## We got game



Our family has always been gamers. Not so much the video variety (our newest game system is a PlayStation 2, for cryin' out loud), but card games, dice games, and board games. When the kids were little, we played the classics: *Sorry!*, *The Game of Life*, *Trouble*... As they got older, we leveled up to *Phase 10*, *Dutch Blitz*, *Farkle*, and eventually into *Sequence*, *Catch Phrase*, and a newer favorite, *Forty Below*.

Family game nights were frequent and fun, and often included friends and neighbors. I'm not saying our game sessions were competitive, but we've been known to draw curious onlookers from all around the campground during a fast (and loud) afternoon of *Dutch Blitz*.

Now that we're empty nesters, game-night gatherings happen mostly during the increasingly rare times when we can all be together, such as summer vacations and the holidays. In fact, every Christmas-shopping season, Annette and I try to find a new game for the family to enjoy on a snowy holiday evening. Most of the newer games we've found seem to fall short of our expectations—they're either needlessly complicated or they have ill-defined objectives. As a result, we usually fall back on the time-tested favorites.

That's why I'm excited about the Skill-ball game (*above*, and on *page 32*), Design Editor John Olson's tabletop version of the classic carnival game that has been an arcade staple for more than 100 years. It took multiple prototypes (and many misplaced marbles), but John got all the curves and angles just right, and this game plays like a champ. And check out the genius behind-the-scenes routing of game balls to channel them for scorekeeping! Once again, he nailed it.

If you're looking for something a little different, we have more than a dozen other plans for great games for the whole family, from Pegs and Jokers to cribbage, from backgammon to bowling. Just search at [woodstore.net](http://woodstore.net) for "game," or point your smartphone at the code, *below*.

This Christmas, make it a game night with a game you made.

Happy holidays, and I'll see you in the shop!



*Dave*

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# HollyWOOD

At *WOOD*® magazine, we're huge fans of classic cinema. (Except for John, who exclusively watches 90s-era rom-coms.) There's just nothing like the golden age of Hollywood, with its sweeping storylines, attention to artistry, and focus on woodworking.

## *The Wizard of Oz*

A tin woodsman meets a young woman who claims to hold the secrets of his heart. Torn from his beloved hobby in the blessed seclusion of the woods, he must help her complete a honey-do list of tasks, including shoe-shopping, dog-sitting, and recovering a broom from a rival, before he can escape back to his true love: milling lumber.

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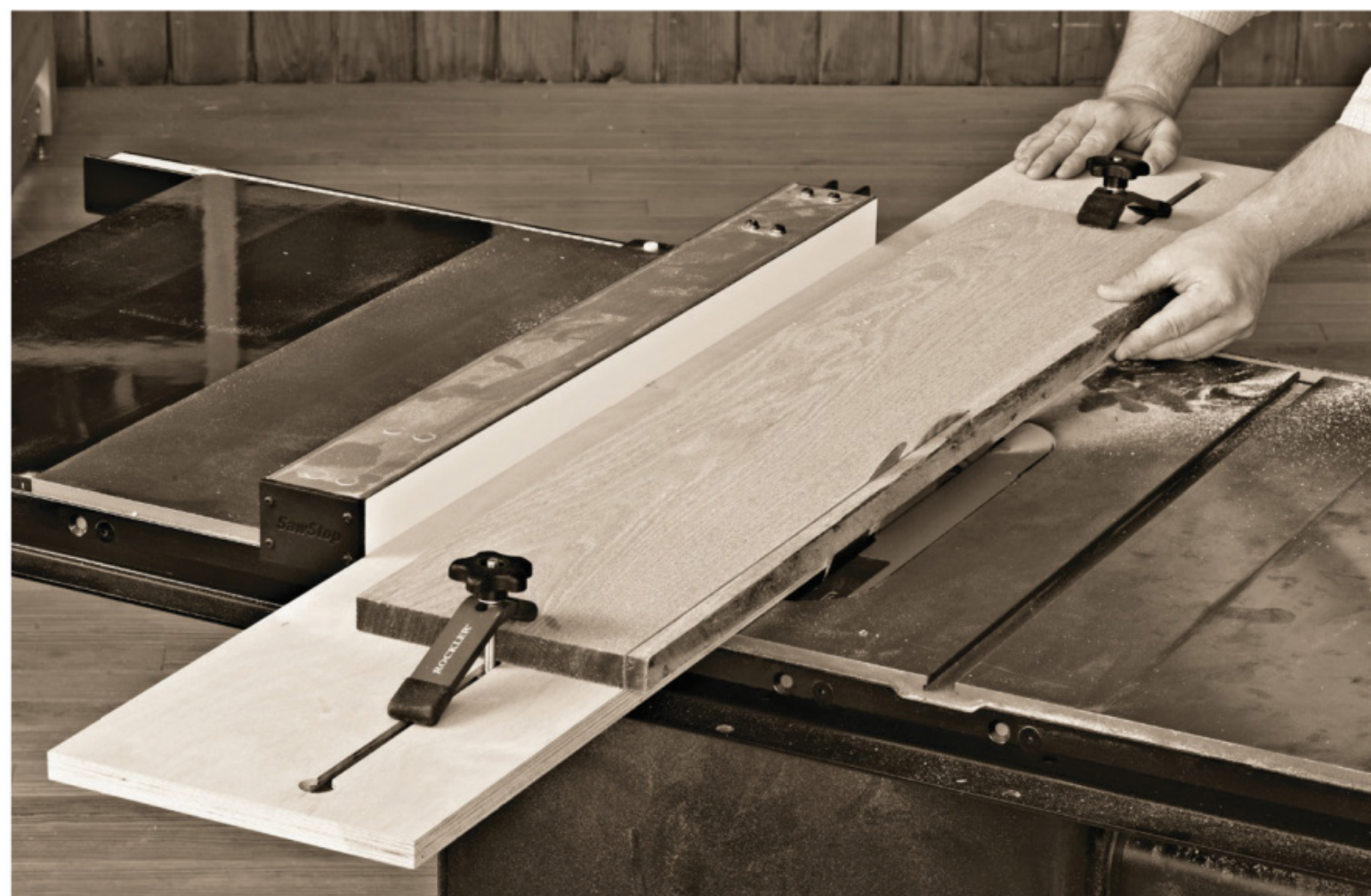
## *Citizen Kane*

In an iconic but familiar tragedy, young Charles Foster Kane follows a dark path into a career in print journalism. Through a life of poverty, wealth, obsession, and scandal, we learn that true happiness could have been his, had he only stuck with his first love (spoiler alert!): sleds.

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## *The Maltese Falcon*

John Huston's directorial debut features a hard-boiled detective, his femme-fatale client, and the titular Holy Grail of all MacGuffins. What's a MacGuffin? In fiction, it's an object or device used to motivate the characters but is ultimately irrelevant to the plot. Much like this column's premise is to these links:

True Lumber with No Jointer: [woodmagazine.com/truelumber](http://woodmagazine.com/truelumber)

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Email a list of your favorite Hugh Grant movies to John Olson at [woodmail@woodmagazine.com](mailto:woodmail@woodmagazine.com)





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## SOUNDING BOARD

### YOUR VOICE

#### Pining for the good ol' days

With high lumber prices high, I decided to build this hall table from pine, as it's much cheaper than hardwoods. Pine also suited the project well because my wife, Katie, wanted a distressed look instead of the typical stain and clear coat. To create the "character," we first painted the table a grayish color, then applied a slurry of grayish grout on the surface. For the top, we adhered cracked bathroom tiles, then grouted between them, as if they were whole tiles.

This project represents my first attempt at template routing. With curves on every piece, I needed smooth lines to make it beautiful and, thanks to hardboard templates, these turned out better than expected. I also used this project to introduce my 10-year-old son, Ryan, to woodworking. Hopefully, he'll be a future WOOD® magazine subscriber.

—**Michael Bonomo**  
Streetsboro, Ohio



*"...if you cannot design and build something this simple, you cannot call yourself a woodworker."*

#### Asked and answered

Regarding Craig Henry's letter in issue 277 ("Sounding Board," October 2021), I appreciate the plans for "simple" projects, such as a workbench or shelf. Many readers of WOOD® magazine are probably gifted woodworkers, like Mr. Henry, but some may be just beginning to learn. Plans like these fulfill what I believe is our obligation: to pass on our skill and knowledge to the next generation.

I learned an old saying long ago: "If you work with your hands, you are a laborer; if you work with your hands and brain, you are a craftsman; but if you work with your hands, brain, and heart, you are an artist." Sharing your love of woodworking makes you an artist.

—**Phil Saroyan**  
Vallejo, Calif.

My story may help explain the value of simple projects to Mr. Henry: I came to woodworking in my late 50s, and fear and intimidation dogged me in the beginning. For days after setting up my tablesaw, I turned it on and stepped back, learning to be calm in the presence of terrifying power.

After watching a few YouTube videos, I was overwhelmed by advanced woodworkers' skill with tools and precision in measurement. And their shops! All those tools, and a seemingly end-

less supply of clamps. They even had stashes of high-quality wood pieces I wished I had, which they called "scrap." It was in a woodworking magazine where I saw the plans for my workbench. Along with completing that first piece came the courage to call myself a woodworker, and the sense that I belonged to the community of folks I'd seen in magazines and on YouTube.

I've made a lot of pieces since then and acquired more tools and clamps. Now, when I see plans in a magazine for the simple pieces I've made, I'm reminded of how this journey began; a simple plan inviting my first steps.

—**Mike Rush**  
Conway, Ark.

Mr. Henry doesn't understand the tightrope the editors of a hobby magazine must walk to appeal to advanced readers without discouraging beginners. Shop teachers and editors understand that the project is not the product. A proper plan is designed so that certain operations must be performed, and skills developed.

The editor can assume that a rookie interested enough to buy the magazine already owns a few rudimentary tools and knows which end of the screwdriver to pound on. That reader needs a set of simple, yet complete, plans for an appealing project. Hence, shelves and workbenches.

From this point, it must be the mission of the magazine staff to teach fundamental and advanced skills, elements of design, and in general provide a foundation that advances the beginner while not boring the advanced reader. Hence nightstands, display tables, and games requiring more precision and skill.

Mr. Henry, I suggest you read the simple articles. I do, and nearly always learn something or have something I already knew reinforced. Issue 277 also had a big article about CNC machining, which does not interest me, but I read it without complaint because there are many readers who are interested. It is part of the editorial tightrope.

—**David Hykes**  
Trafford, Pa.

We are all beginners at our craft sometime in our lives. WOOD is one of the few magazines that writes for all skill levels, and I applaud you for "wasting pages" with articles to assist the beginning woodworker.

If you're a master woodworker, great. Keep up the good work, but don't denigrate those of us who haven't reached some standard you have set. To the beginner and intermediate woodworkers in the world, keep creating and building. Someone out there loves what we do and admires our work, no matter our skill level. 🌲

—**Steven Burns**  
Bend, Ore.



# SOUNDING BOARD

## YOUR VOICE

### It's real, and it's spectacular

*I just finished reading page 1 of issue 277 ("Taking Measure," October 2021) and this has already become my favorite issue of WOOD® magazine ever. See, I am a mechanical designer by vocation, and a luthier by avocation who uses CNC.*

*Some folks think that if a guitar was made using CNC then it is not handmade. I beg to differ. A CNC router can't build a guitar, but it can cut out guitar-shaped parts. CNC or not, it takes a skilled craftsman to produce a guitar.*

*Anti-CNC people—and I admit, I was one of them for a long time—don't understand how much it takes to produce parts on a machine. As Randy Johnson details in his "Getting Started with*

*CNC" article in the same issue, it's way more than just pushing a button and out pops a part.*

*I can build a top-quality guitar using CNC; with power tools utilizing jigs and fixtures; or the way the masters did a hundred years ago, using only hand tools. Let a professional musician play each one, and I guarantee they won't be able to tell the difference.*

*So thank you for supporting CNC as "real woodworking." Please continue to educate your readers on the benefits of a CNC and help defeat the stigma that comes along with it.*

—**Michael Grigg**  
Springdale, Ark.

*Dave, I couldn't agree more with your column about CNC! I've recently learned to use myriad hand tools while building two cedar-strip canoes. However, I love my CNC work and consider that as fulfilling and as much woodworking as building a canoe, or anything else in my shop. My family enjoys my CNC work, and designing on the computer allows me a break from the usual and provides a great challenge for my brain. Thank you for your perspective!*

—**Jeff Lemons**  
Greeley, Colo.

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continued on page 8

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# SOUNDING BOARD

## YOUR PROJECTS



**Craig Yapple**, of Lynnwood, Wash., designed and built this amazing toolbox for his model-making supplies from sapele and poplar. Bypass doors at the top of the case hold three layers of miniature tools, and six swivel drawers at the bottom store even more stuff.



Using rough-sawn oak from a defunct mill and hard maple repurposed from an old gym floor, **Tom Meyer**, of Bettendorf, Iowa, made this 20'-long shuffleboard table. The legs remove to make it at least a little more transportable.

Working from only a photo, **Greg Randall**, of Woodland Hills, Calif., made this rocking motorcycle for a nephew out of oak, maple, walnut, and poplar from a home center. His shop tools consist of "basically a bandsaw, scrollsaw, and belt sander," and it took him 6 months to complete.



More than 1,000 pieces of oak make up the mosaic doors of this pantry made by **Sonny Tice**, of Oswego, N.Y. Sonny has crafted cabinets for 17 kitchens, including one for his son that incorporates this mosaic technique in all of its doors and drawers.





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## A Top Tool of 2020

Popular Woodworking - Nov. 2020

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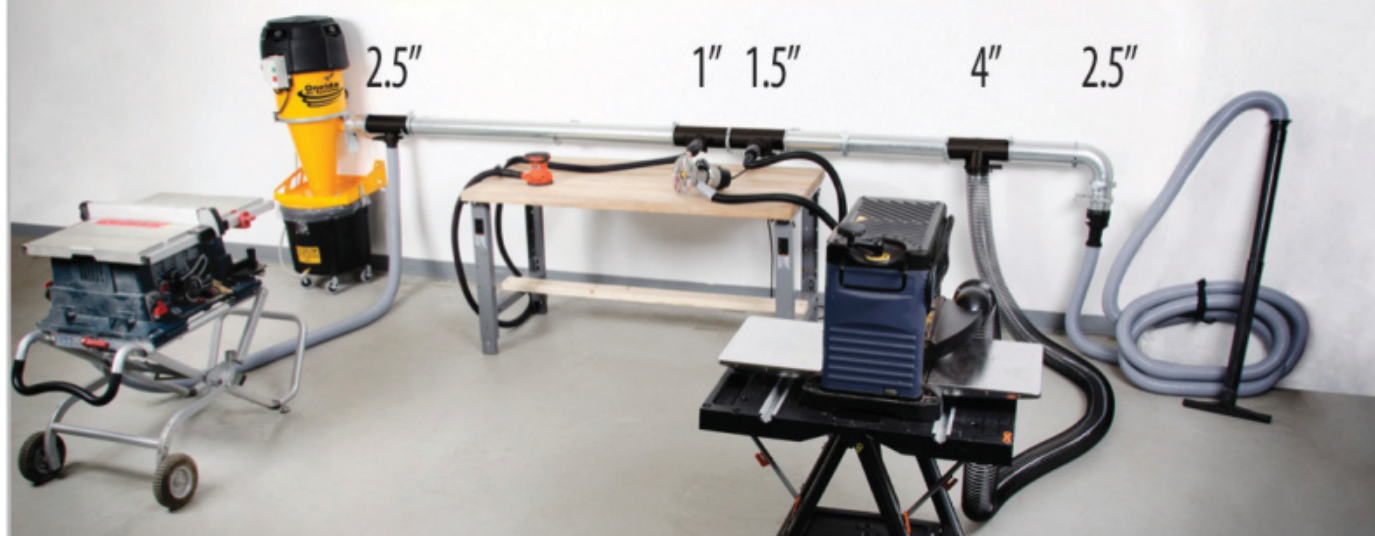
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# SOUNDING BOARD

YOUR PROJECTS



Open at the back and with a hinged roof on the front, this dollhouse, built for his granddaughters by **John Schneider**, of House Springs, Mo., is a simplified 12:1 model of his own log home, complete with fireplace, exposed beams, and hardwood floors. John saddle-notched and stacked the "log" walls, just as on the real McCoy. The cabinet beneath—also built by John—stores doll furniture and accessories and rotates on a lazy-Susan bearing.



Starting with two pieces of lilac harvested from the same branch from her backyard, **Rachel Cozzens**, of Upton, Mass., turned these matching pens as a gift for her friends, a newly engaged couple.



Self-proclaimed "fly-tying nut" **Daniel Briley**, of Mesa, Ariz., built this fly-tying desk in eight separate pieces to enable moving it into his "Dan Cave." Nearly 50 labeled drawers organize his supplies; the roasted oak he used required no stain to attain its rich color, only a clear topcoat. 🌲

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# Religious Conversion



Bud Bieker's workshop, once a church, now sports a cupola rather than a steeple.



The 8×8' multipurpose workbench that wraps Bud's table saw serves as his router table, outfeed support, and project assembly area. Underneath, Bud stores portable power tools, an air compressor, and supplies.

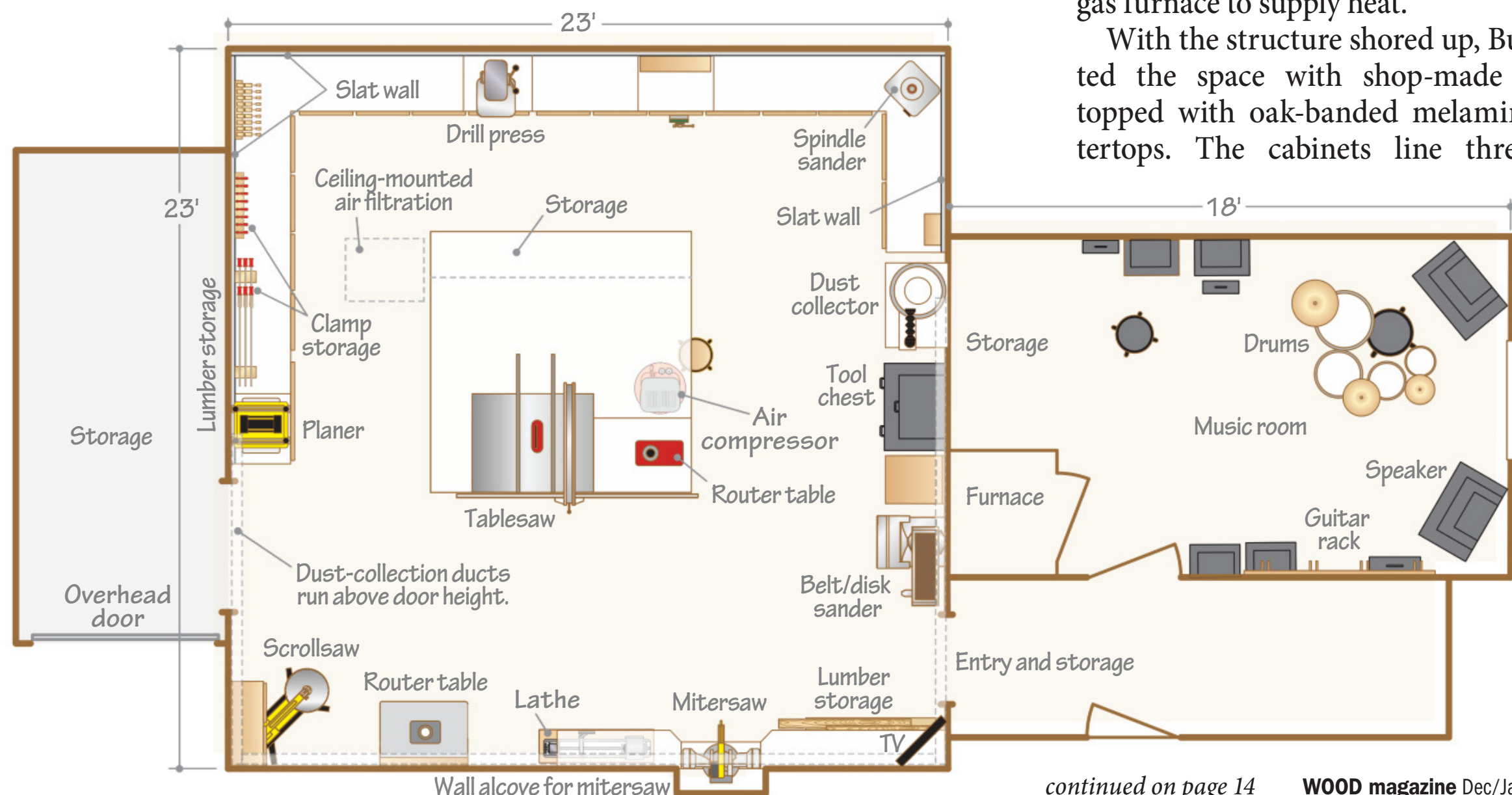
When the property next to their rural Iowa home came up for sale, Bud Bieker's wife, Joan, knew she had to act fast to purchase it. An 1880-era church, converted to a house in the 1920s, it

offered plenty of room for Bud's woodshop, which was overrunning their garage.

Bud's decade-long woodworking hobby now had a new home, but it required a lot of work. First, he gutted the interior of the

structure, opening up the former sanctuary to its original dimensions, and refinished the original oak floors. Then he rewired the building, dedicating individual circuits to each large power tool. He also added a small gas furnace to supply heat.

With the structure shored up, Bud outfitted the space with shop-made cabinets topped with oak-banded melamine countertops. The cabinets line three walls,





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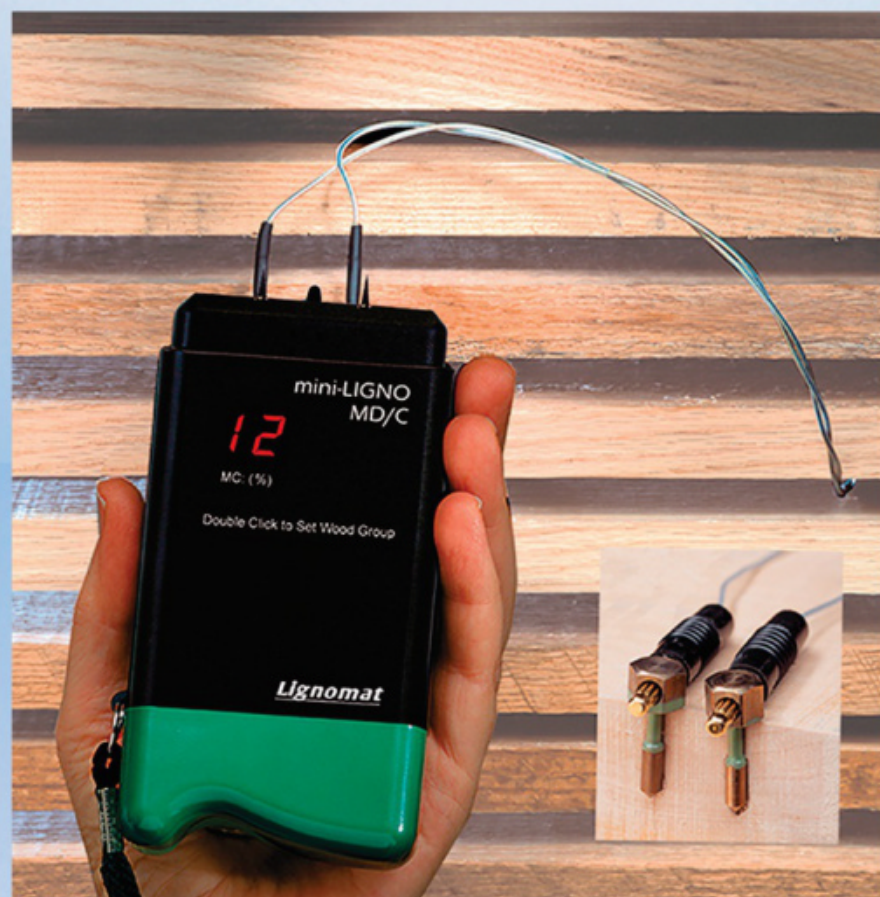


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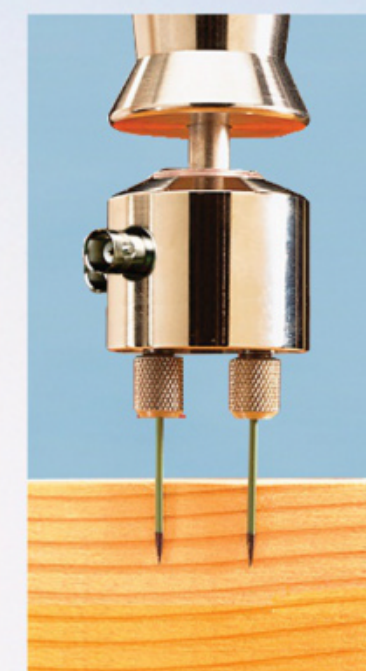
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## SOUNDING BOARD

YOUR SHOP



**Walls lined with cabinets and slat walls** provide loads of flexible storage options. Bud displays his antique tool collection above.



**To squeeze in more floorspace**, Bud bumped out an exterior wall to create an alcove that accommodates the slide mechanism on his miter saw while keeping the fence flush with the wall.

roughly half the shop's perimeter. The drill press and planer reside on shorter cabinets. To use the adjacent cabinet as an outfeed table, the planer's bed sits flush with the countertop.

Above the cabinets, slat walls make storage for tools, clamps, and blades easy to customize and rearrange as needed. When Bud builds projects, most of the activity takes place center stage on the main workbench surrounding the tablesaw.

PVC ductwork for dust collection runs high along three shop walls, with the duct for the tablesaw and router table running through the crawlspace beneath the floor.

Bud converted the enclosed porch into a lumber-storage area and installed a 6'-wide overhead door for easy access. He confesses that he planned to eventually convert the former kitchen into a finishing room. However, his other passion—music—trumped that notion, and the space became a practice room for the cover band in which he plays drums.

Bud says the transformation of the old church building to a spacious workshop was





With this dedicated room in the shop building, Bud's drumming pursuits are out of earshot of the main residence.

certainly worth the effort. He now has a comfortable, fully functional shop space for building furniture for friends and family. He has made pieces such as console tables, entertainment centers, bookshelves, and dining-room tables. He also works on home-renovation projects ranging from decks to bathroom remodels. 🌳

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Antique telephones and equipment line one wall of the storage room that used to be a porch. The collection was built over the 40 years Bud has been working as a telephone engineer and plant manager.



**Bud Bieker's wife, Joan,** strongly encouraged Bud to move his workshop out of their overcrowded detached garage.

15

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**Apply glue sparingly** when assembling pocket-hole joints. Excess glue creates squeeze-out on the face of the joint, or in the pocket holes, where it's difficult to remove.

## Q To glue, or not to glue, with the pocket screw?

I have a bet with a buddy about glue and pocket-hole joints: He says just drive the screws and be done. I apply glue to the joint for added strength. Which way is right?

—David Roders, Lewiston, Idaho

**A** Technically speaking, David, pocket screws possess plenty of strength to hold a joint together without glue. So your joints likely won't fail from using pocket screws alone. But comparative tests show that pocket-hole joints with glue withstand greater forces before failing than joints without. In the case of end-grain-to-edge-grain joints (such as between a rail and stile of a face frame) the added strength may not be huge, but it provides an extra bit of insurance.

Gluing pocket-hole joints prevents the joints from opening or becoming misaligned down the road due to wood movement. Glue resists this movement and anchors the pieces in place, even if the screws relax their grip slightly over time.

But that doesn't mean you win the bet completely, David. In some instances, such as projects that may need to be disassembled later, you should skip the glue. Or you may want to forgo the glue when installing the center stile of a cabinet face frame. This allows you to remove the stile if you ever require unobstructed access to the cabinet interior. But, aside from instances such as these, the few seconds it takes to apply glue provide some extra peace of mind. 🌲

**Tip!** Improve the strength of end-grain glue joints by applying a thin coat of glue to the end grain and letting it sit for a couple of minutes. Then apply more glue and assemble the pieces as usual.

Have a question?  
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1/8"-deep pocket sized to fit sharpening stone

Finger-hole

1 1/2"-thick hardwood tray

1/2"-thick tray pull/stop

Leather hone

## Secret, sliding sharpening station

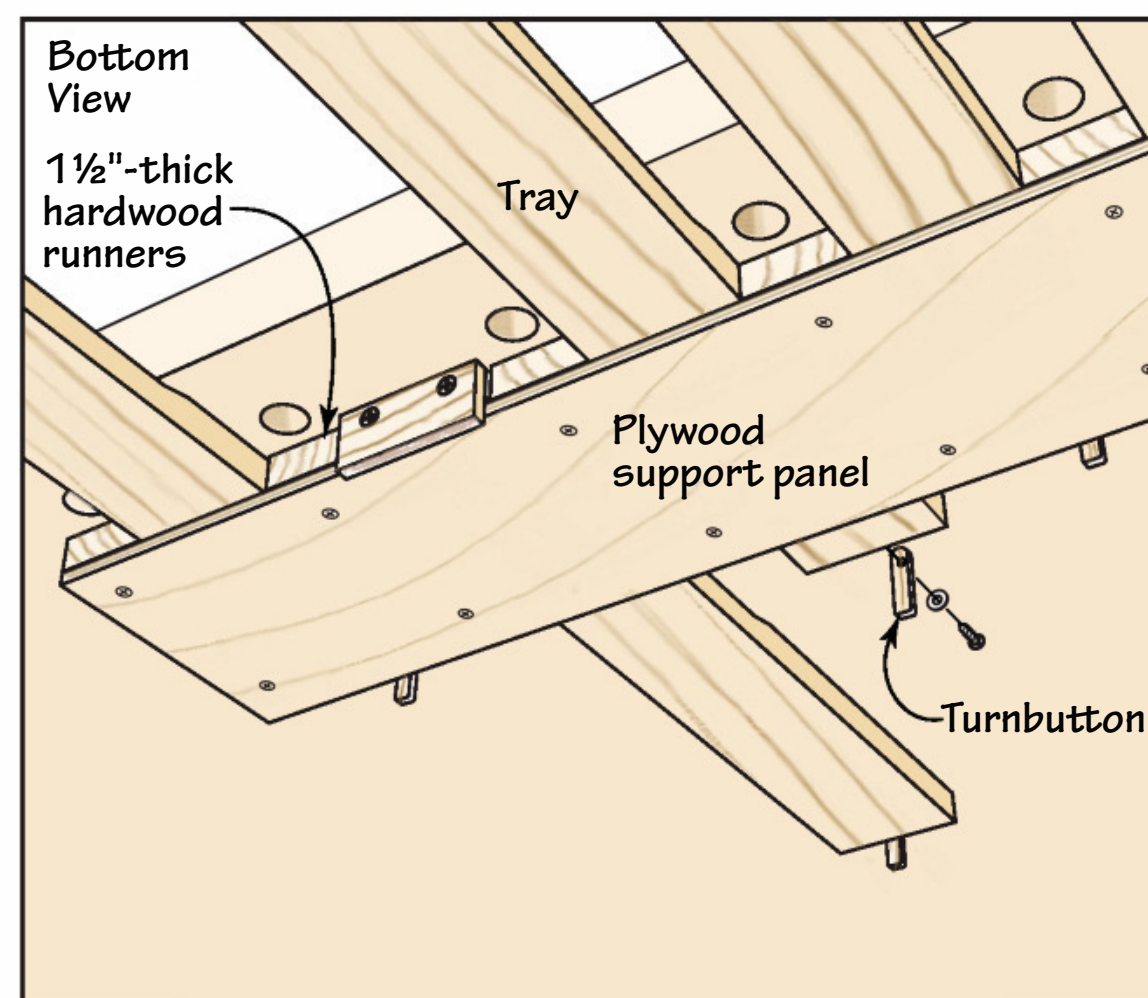
In my small shop, having a dedicated sharpening station was out of the question. So I installed beneath my benchtop sliding trays for rough, fine, and ultra-fine diamond sharpening stones and a leather hone. The trays fit between the dogholes along the front of the bench.

The trays that hold the diamond stones start out as 1 1/2"-thick hardwood about 1/2" wider than the stone. (Make sure the width of the tray fits between dogholes.) To keep the bench edge clear for clamping, I made the trays short enough to slide well under the bench, as shown in the *inset*, without sticking out the other side.

In each tray, form a pocket to fit the sharpening stone. The depth of the pocket should match the thickness of the stone so that it sits flush with the top of the tray. Remove some material from the top face of each tray with a few partial passes over the jointer or by using a bandsaw. The resulting pocket depth should be 1/8". Drill a finger-hole in the pocket to make removing the stones easier.

For the honing tray, glue a strip of leather directly to the top of the tray. As with the other trays, reduce the thickness at the front end of the tray so the leather sits flush with the back end of the tray.

The tray front doubles as both a handle and a stop. To keep the trays from being pulled all the way out, fasten a turnbutton to the back end. Apply a waterproof finish, such as polyurethane, to protect the trays from moisture.



To create the structure that holds the trays under the benchtop, glue hardwood runners the same thickness as the trays to a support panel made of 1/2" plywood. Position the runners so the trays fit snugly between them yet slide easily. Size the length of the runners and width of the plywood so when the full length of the stone is exposed, the turnbutton hits the back of the plywood. Screw this assembly under the benchtop.

—Keith Stadler, Paris, France

## Tips earn up to \$150.

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Send your tip, photos or drawings, and contact info to [shoptips@woodmagazine.com](mailto:shoptips@woodmagazine.com)

Because we try to publish original tips, please send yours only to **WOOD** magazine.

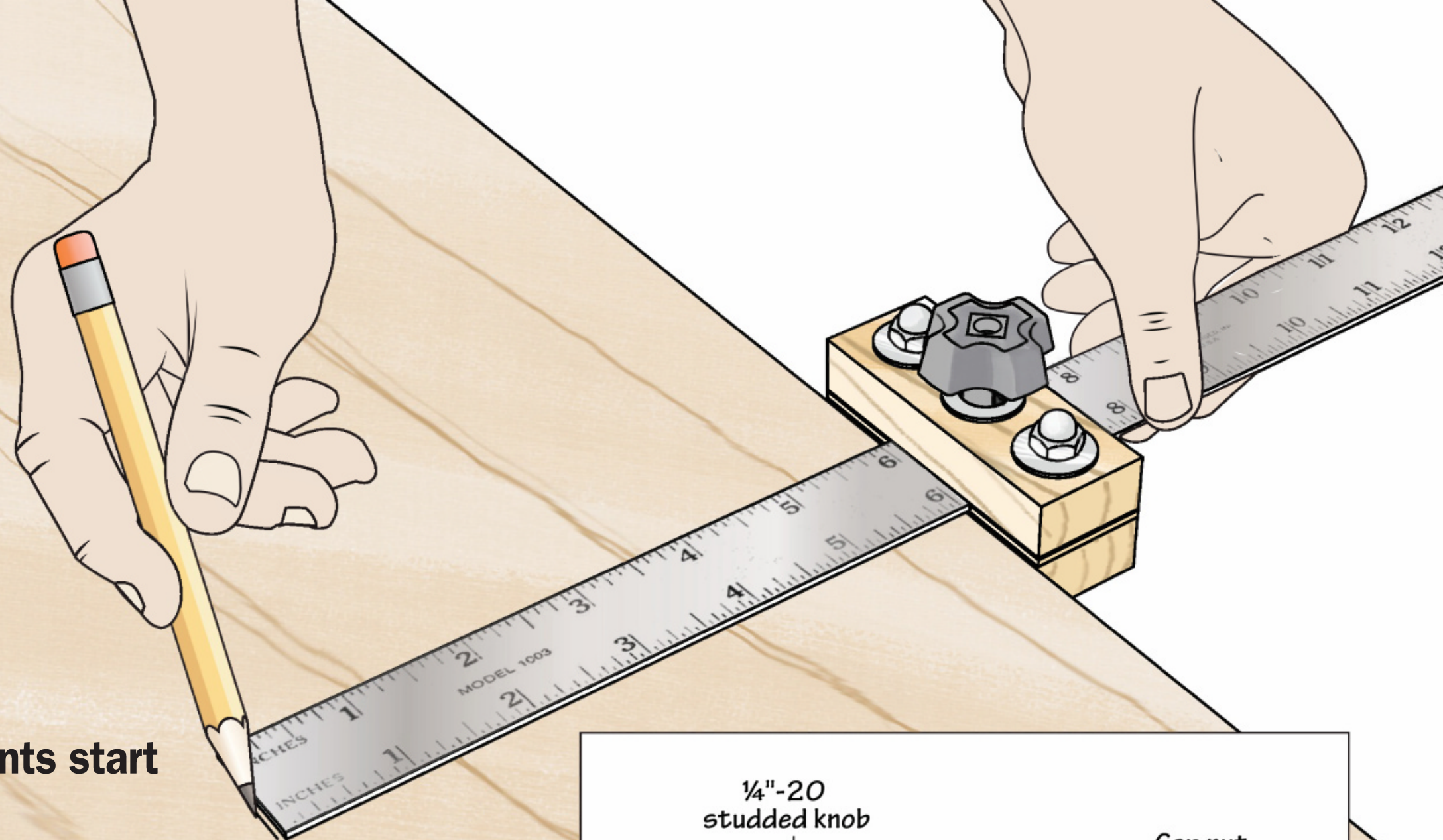


For sending this issue's *Top Shop Tip*, Keith receives a Ridgid 12" sliding mitersaw worth \$330.





# SHOP TIPS



## Repeatable measurements start with a simple stop

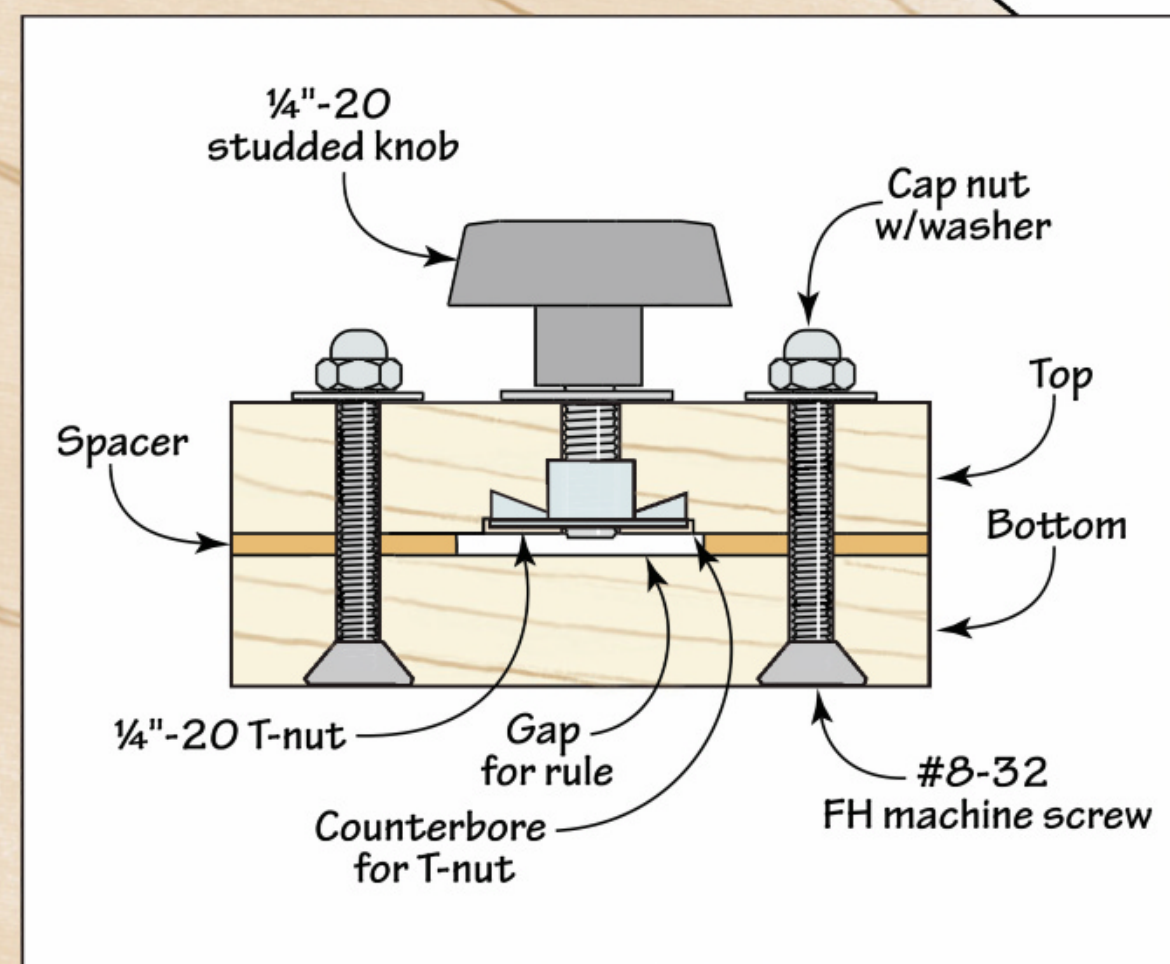
Like the head of a combination square, a ruler stop helps you make consistent layout marks from the edge of a workpiece. I made a ruler stop for nearly every steel rule in my shop, using scraps and a few pieces of hardware.

Start by cutting the top and bottom to rough size, making the top thick enough to house a T-nut. Counterbore for the head of the T-nut and install it.

Next, sand or plane stock to just a hair thicker than the rule. Cut spacers from this stock and glue them between the top and bottom, with the T-nut on the inside, as shown, using the width of the ruler as a guide for placement and spacing. I added machine screws with cap nuts to reinforce the joint. Frankly, they're overkill, but I like the way they look.

Once the assembly dries, sand it to final size, smoothing all the edges. File and sand the end of the stud on the knob smooth so it doesn't scratch the ruler. It only takes light pressure when tightening the stop to secure it.

—William Hertwig, Plymouth, Mass.

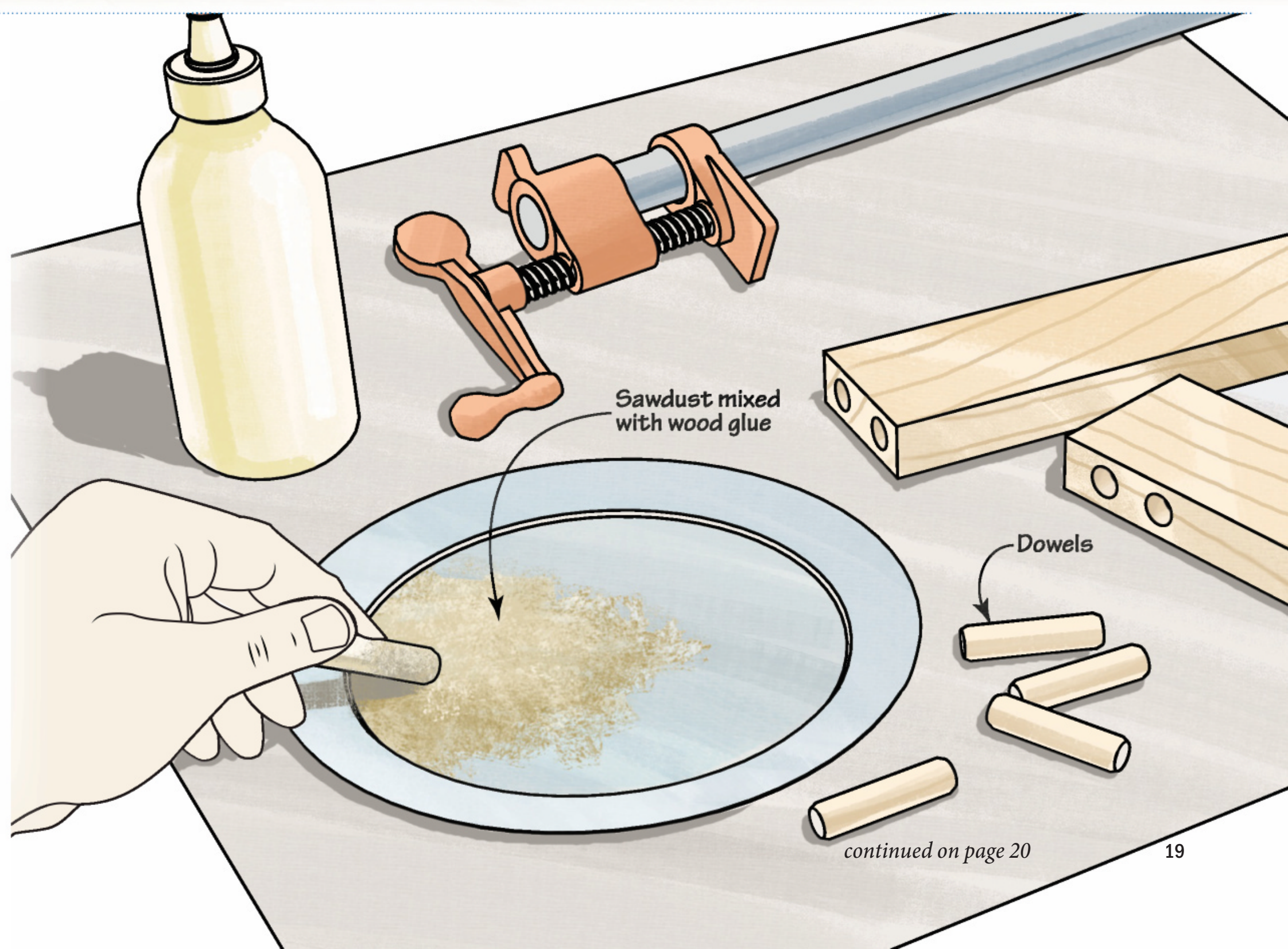


## Chip dip for dowels solves sloppiness

When using dowel joinery, it's not uncommon that one of the holes fits the dowel a little loosely. The hole might be too large or misshapen for a proper fit.

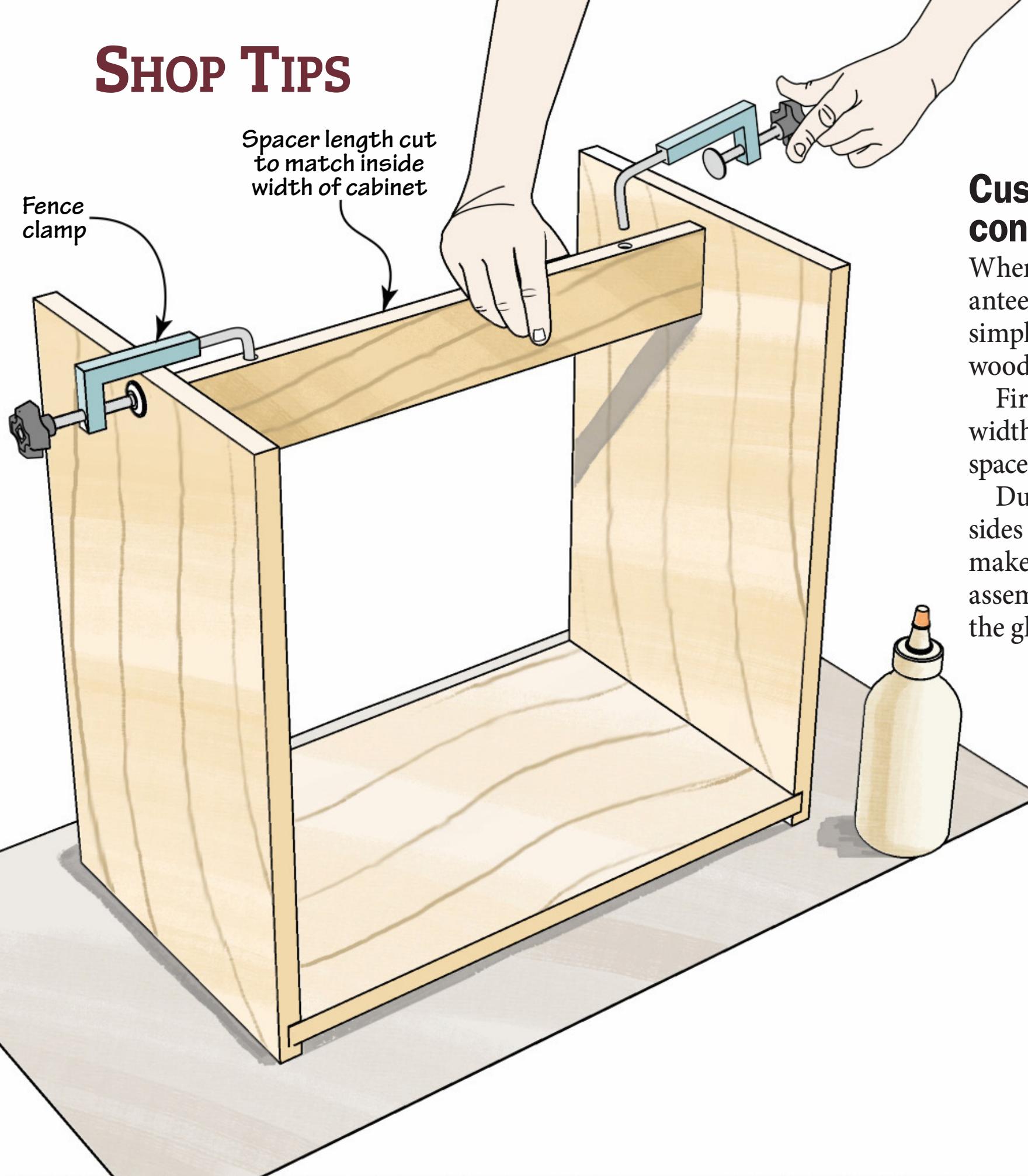
Here's an easy fix: Mix some fine wood chips and sawdust with wood glue to make a paste. Roll the dowel in the mixture and insert it into the hole. The sawdust acts as a filler for any gaps around the dowel.

—Johnny Mitchusson, Newhebron, Miss.





## SHOP TIPS



### Custom clamping spacers for consistent cabinet construction

When building cabinets, I found an easy way to guarantee parallel sides that sit square to the bottom. The simple solution utilizes a pair of fence clamps and a wood spacer during cabinet assembly.

First, cut a spacer to length that equals the inside width of the cabinet. Drill a  $\frac{3}{8}$ " hole in the edge of the spacer near each end to fit the rod of the fence clamp.

During glue-up, clamp the spacer between the sides at the open end of the cabinet. The fence clamps make it easy to clamp one end at a time. This clamp assembly holds the sides in the correct position while the glue dries.

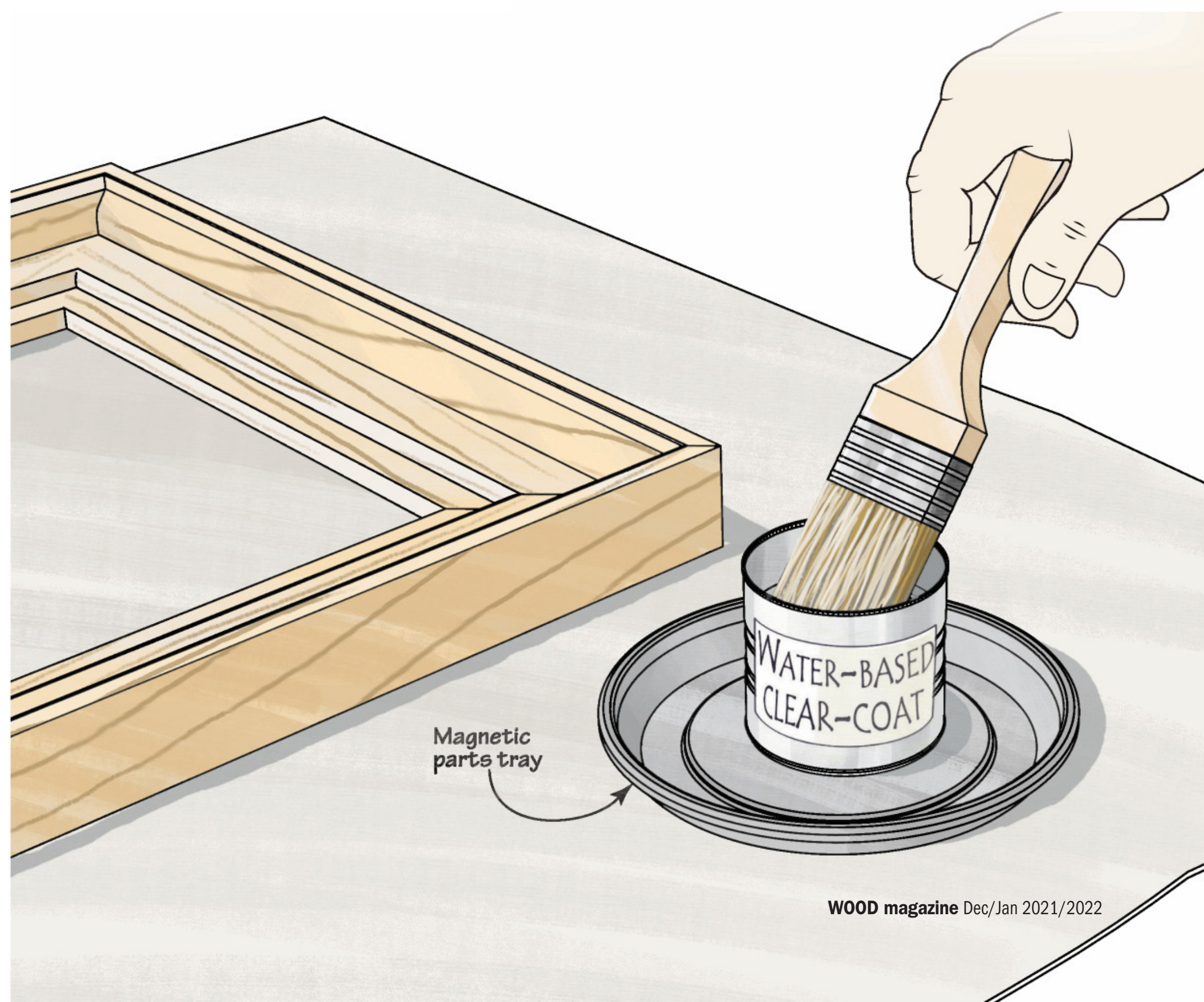
—Steve Pietrowicz, Cresco, Penn.

► Buy fence clamps.  
[woodmagazine.com/fenceclamps](http://woodmagazine.com/fenceclamps)

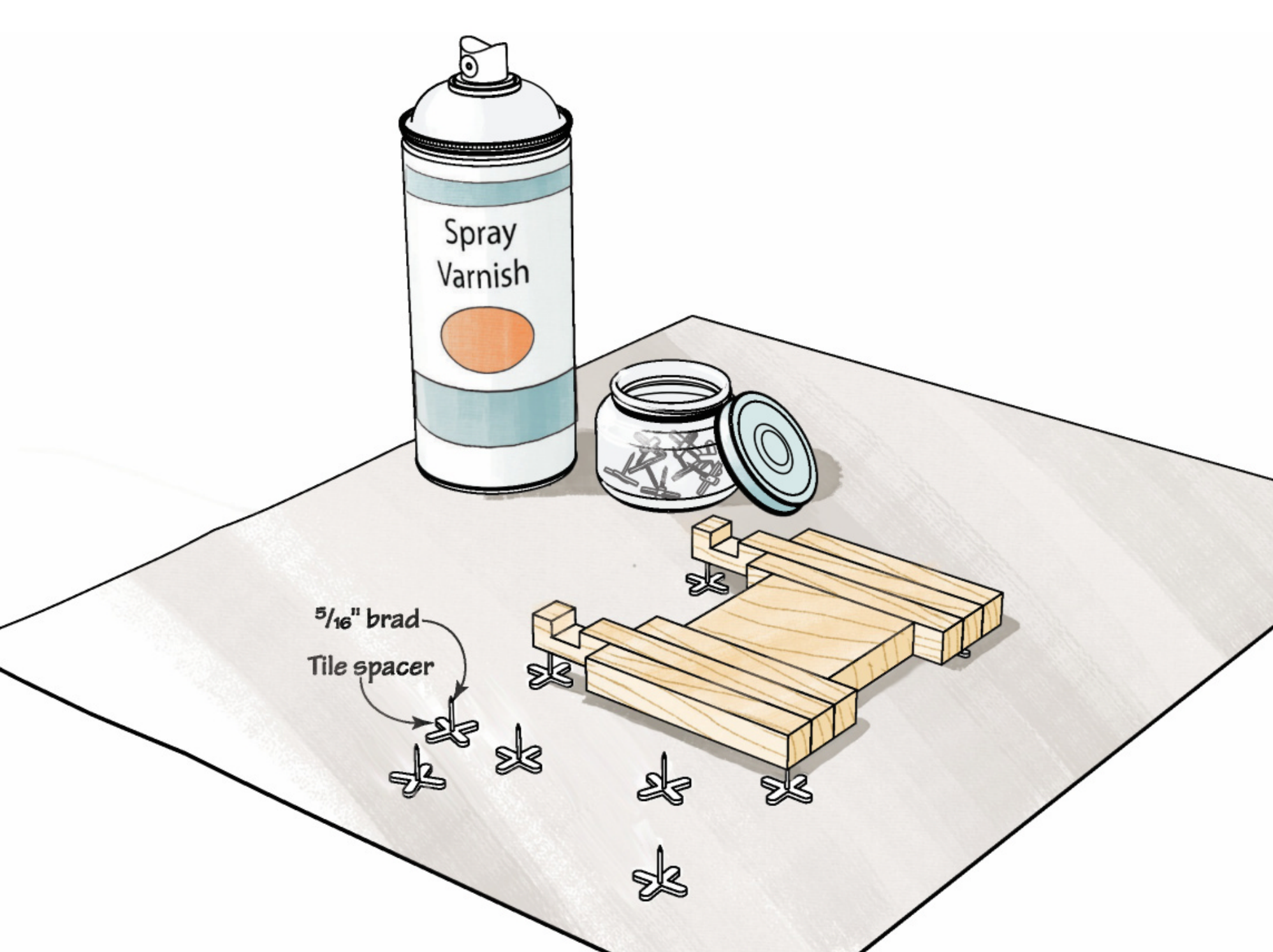
### A magnetic attraction to spill-proof finishing

When using small cans of finish or stain, I place the can inside a 6" magnetic parts tray, less than \$10 at an auto-parts store. The magnet holds the can with enough force to prevent tipping when wiping a brush of excess material. As an added bonus, the parts tray keeps any drips off my bench.

—Robert Schwab, New Berlin, N.Y.







## Up your finishing game with simple spacers

Instead of pricey pyramids, I support small parts and projects for finishing on brad points. Not the drill bits, but actual brads drilled through readily available cross-shaped tile spacers. When I'm done, I just gather them up and store the points in a jar.

—Randy Wade, Grandville, Mich.

[woodmagazine.com](http://woodmagazine.com)

## SHOP TIPS



## A cheesy container for hardware storage

Don't throw out those empty grated-cheese containers. They make perfect jars for storing hardware such as screws, nuts, and small nails. The dual-sided lid, with small and large openings, makes dispensing as many pieces as you need easy with just a shake or two.

—John Wozniak, Willoughby, Ohio

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# CASTLE TSM-12 Pocket Cutter



## Professional pockets with pilot holes... in seconds.

The TSM-12 benchtop pocket cutter machine routs the 6 degree, low-angle Castle Pocket with the pilot hole in less than 2 seconds. Pockets are clean with no tear out. The superior low screw angle minimizes joint shift while providing strong, stable joints. Features include:

- Bosch 1617 Router with a 3/8" three-flute solid carbide router bit
- Bosch Colt Router with a 9/64" premium drill bit
- Low-angle pockets minimize clamping needs for assembly
- Material thickness range from 1/2" to 1-1/2"
- Pockets with pilot holes are created with one simple clamp/pocket lever motion.

[www.CastleUSA.com](http://www.CastleUSA.com)





# The Little Bench That Could

*Don't be fooled by the diminutive size of this workbench.  
For a pint-size project, it packs a powerful punch.*

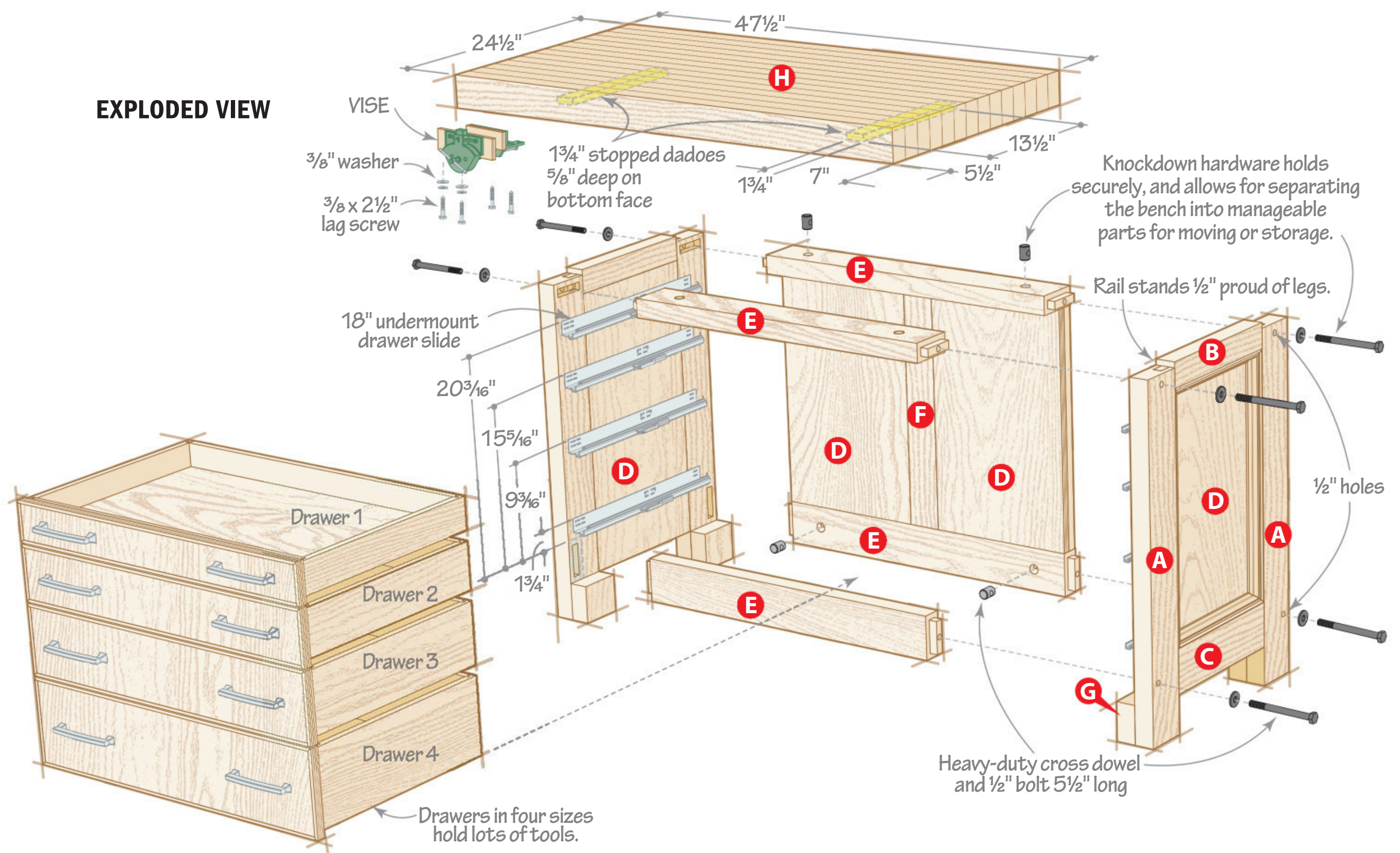
D I M E N S I O N S :  
47½" W × 24½" D × 34½" H

Approximate  
materials cost:  
**\$1600**  
Including vise  
and hardware

**4.5**  
cubic feet of  
drawer  
storage



## EXPLODED VIEW

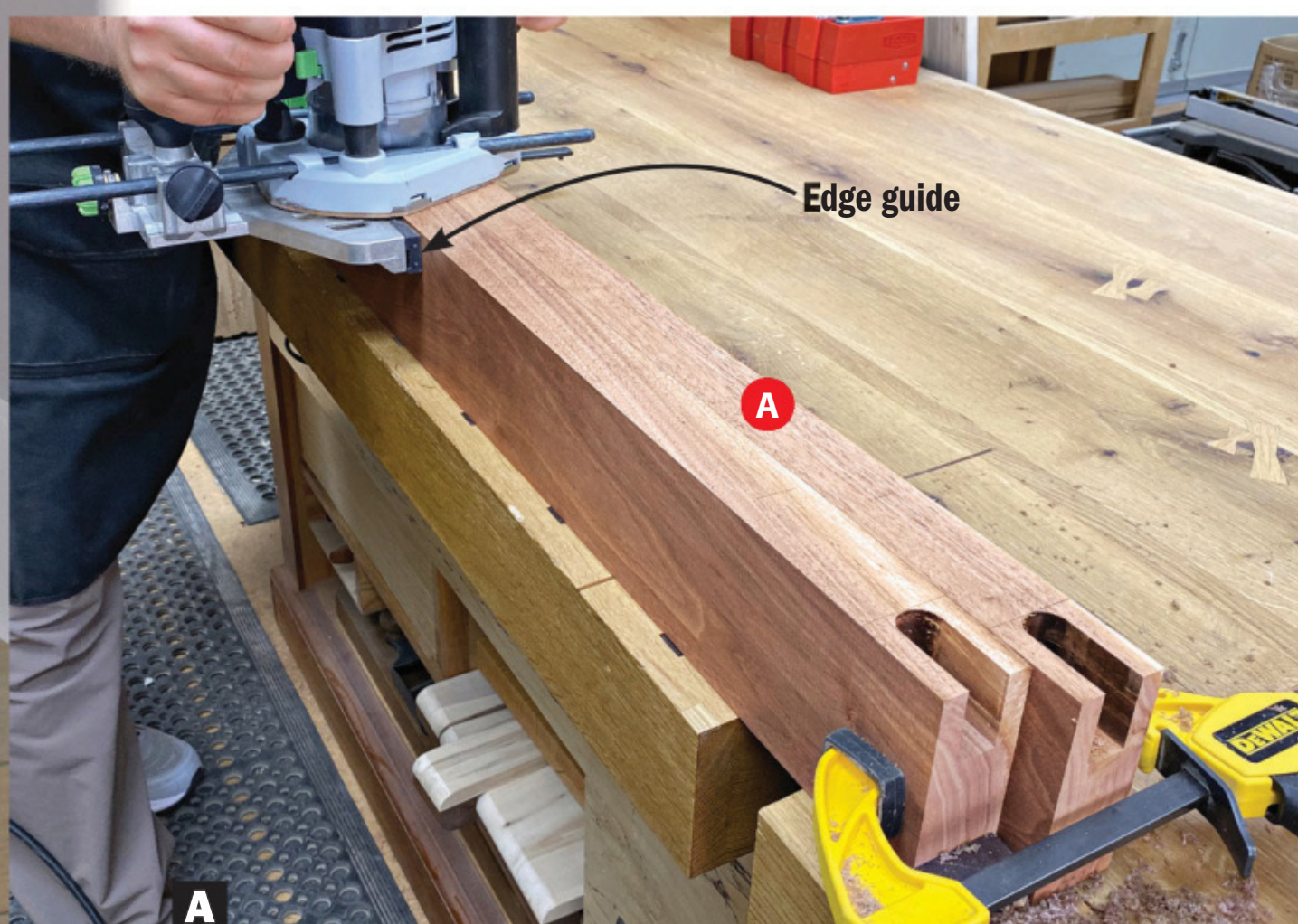


Whether you're just starting out in an apartment, downsizing to smaller living quarters, or simply looking for a secondary work area, this scaled-down bench contains all the required features to do some serious woodworking. A stout base and thick top stand up to just about anything you can throw at them, while a bank of graduated drawers provides plenty of storage for tools and supplies. And it all fits in a compact, 2×4' footprint.

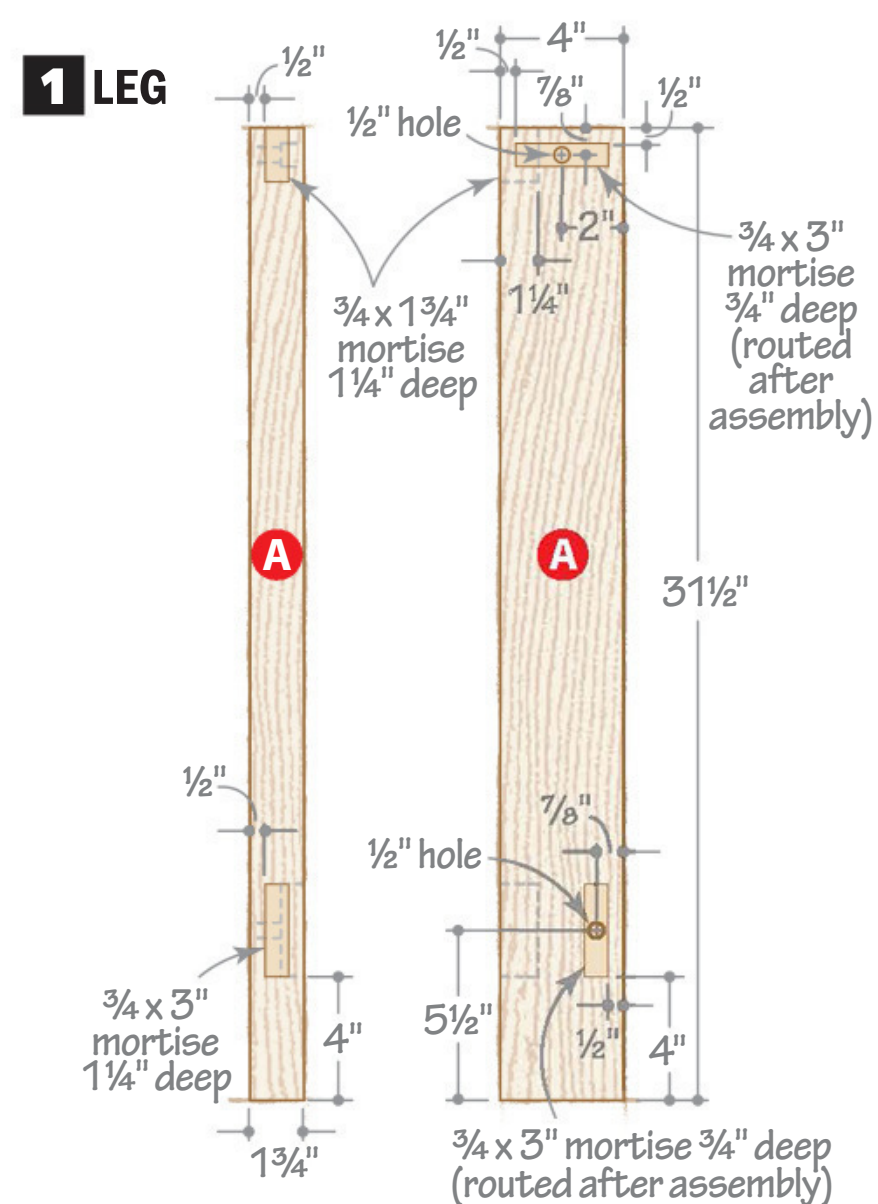
## Start with a small but mighty base

**1** Cut the legs (A) and upper (B) and lower (C) side rails to size [Materials List, Drawings 1, 2]. Label the workpieces so the best faces and edges face out.

**2** Lay out and rout the mortises on the edges of the legs [Drawing 1, Photo A]. Square the ends of the mortises with a chisel. Cut tenons



**A** Clamp two of the legs (A) together to support the router. Then, using a 3/4" spiral upcut bit and an edge guide, rout the mortises.



(Left rear and right front shown; right rear and left front are mirror image.)





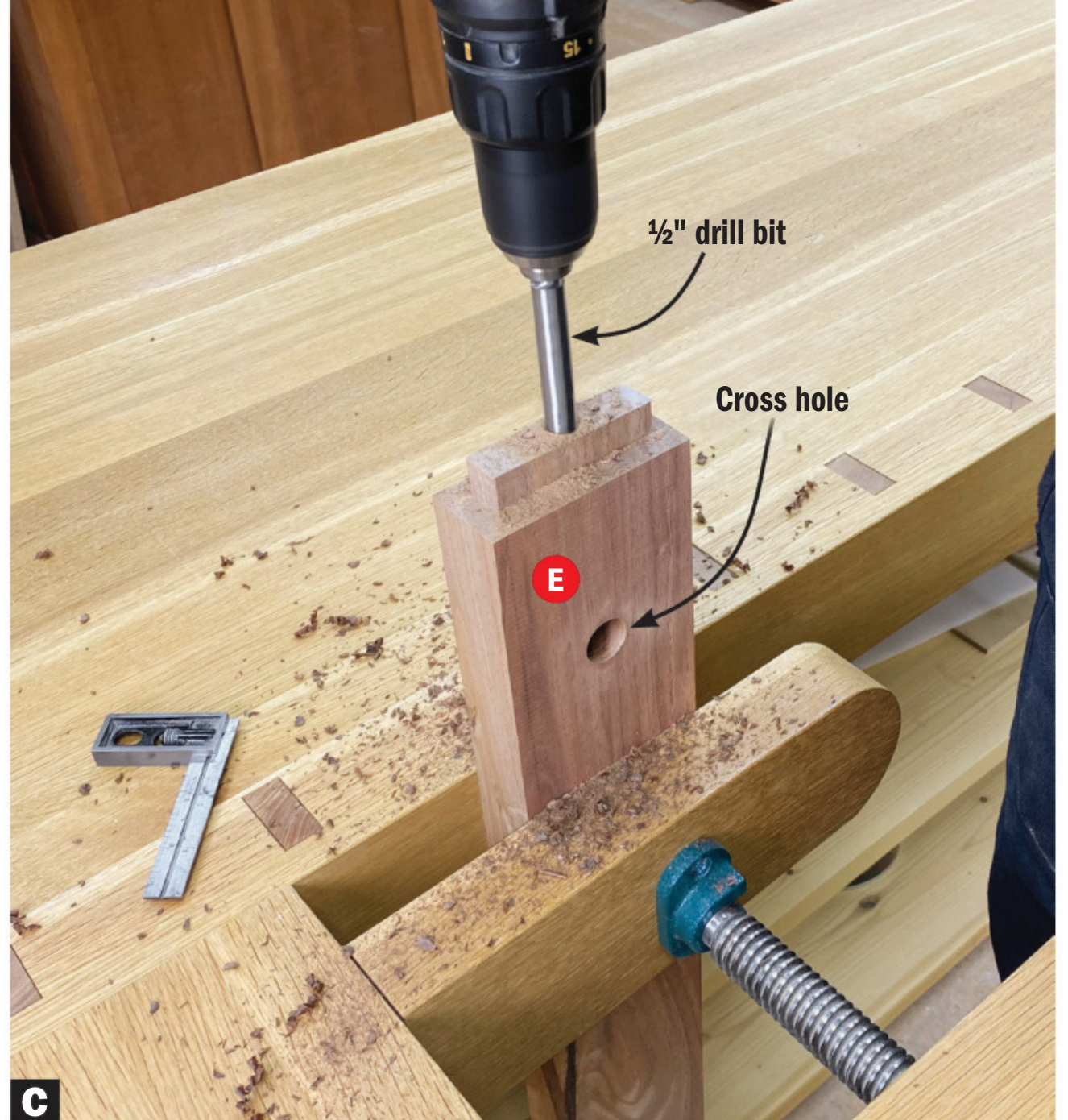
Use the rip fence as a stop when cutting the tenons on the side rails (B, C).

on the ends of the side rails (B, C) [Drawing 2a, Photo B].

**3** Cut the panels (D) to size. Cut biscuit slots in two panels so the panels will sit flush with the inside faces of the rails [Drawing 2]. Then, glue these panels between the upper and lower side rails. Retain the other two panels for the back assembly.

**4** Glue the rail/panel assemblies between the legs (A). With the glue dry, lay out and rout the mortises in the inside faces of the legs [Drawing 2].

**5** Cut the case rails (E) and the center stile (F) to size [Drawing 3]. Mortise the two

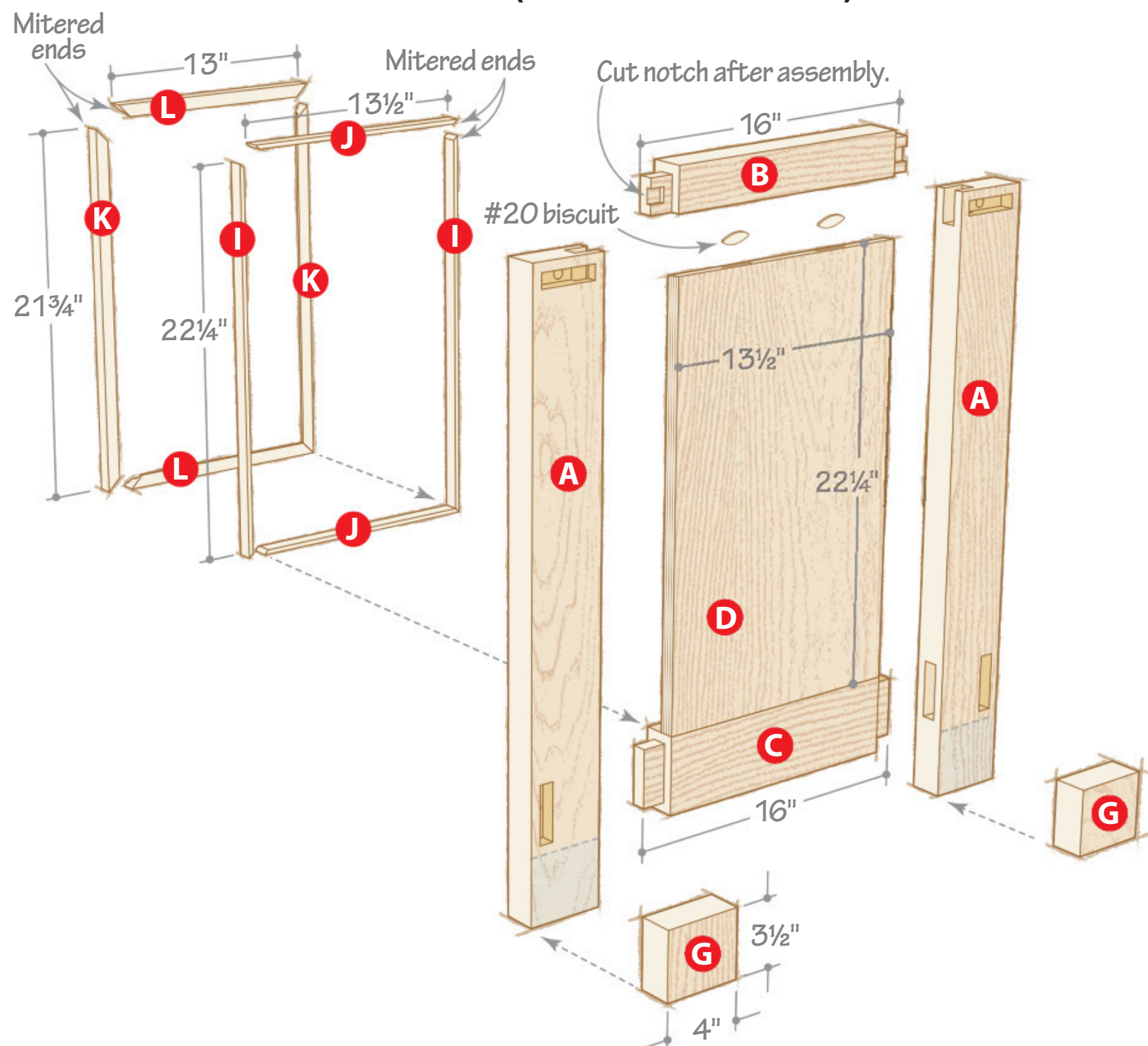


**Drill the bolt holes** in the ends of the rails as deep as you can with a brad-point bit. Then switch to a spade bit to complete the holes.

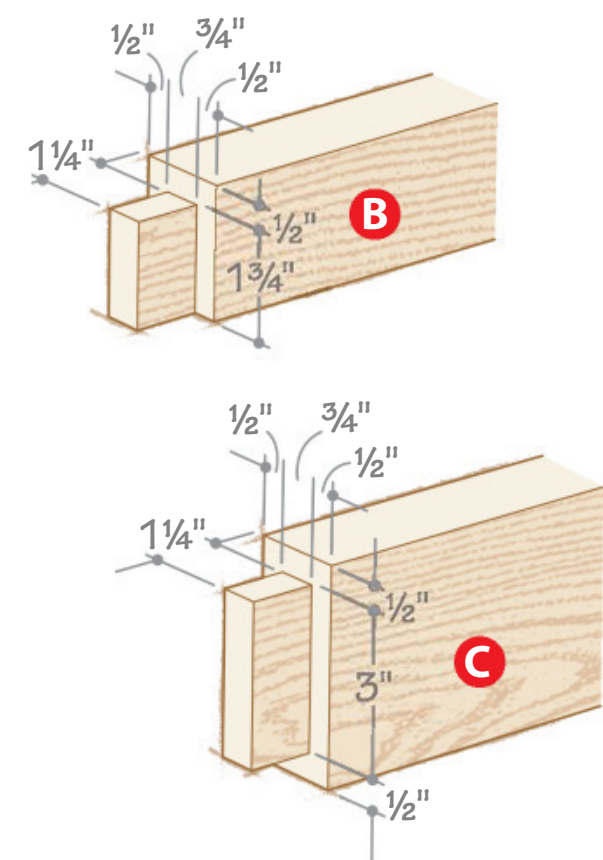
back case rails to accept the stile. Cut tenons on the ends of the stile and all four case rails [Drawing 3a].

**6** Lay out and drill the holes for the cross dowels in the case rails (E) [Exploded View, Drawing 3a]. Lay out the holes for the bolts in

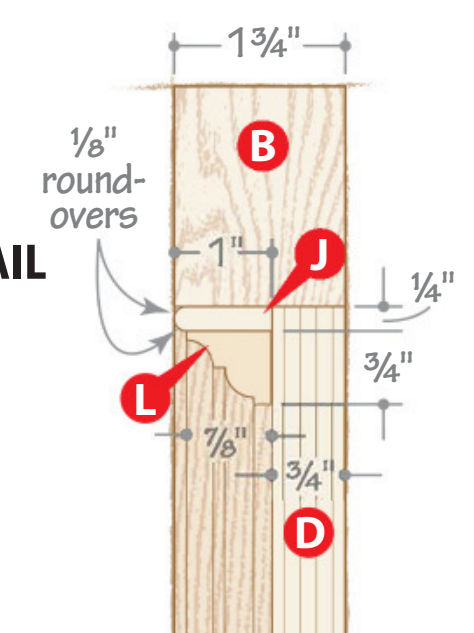
## 2 SIDE ASSEMBLY (Left inside face shown)



## 2a TENON DETAILS



## 2b TRIM DETAIL





**D**  $\frac{1}{8}$ " round-over bit

**D**  **To make the bead trim,** rout  $\frac{1}{8}$ " round-overs along one edge of a wide blank. Rip the molding to width at the tablesaw, then repeat.

glue them to the panels (D), rails (B, C, E), and center stile (F) [**Drawings 2, 3**].

**2** To make the vertical and horizontal molding (K, L), rout a cove and bead profile on a blank [**Drawing 2b**]. Rip the molding to width and bevel the ends to length. Glue the molding to the bead trim and panels.

## Dress it up with trim

**1** From ¼"-thick blanks, make enough bead trim for the panels and drawers [**Drawing 2b, Photo D**]. Miter-cut to length the vertical and horizontal bead trim (I, J) and

**3 BACK ASSEMBLY**  
(Outside face shown)

Diagram illustrating the back assembly of a cabinet door, showing the internal frame and panel construction with dimensions and labels.

**Labels:** E, F, J, K, L, D, I.

**Dimensions:**

- Top rail:  $\frac{3}{4} \times 2$ " mortise  $\frac{3}{4}$ " deep, centered on rail
- Top rail hole:  $\frac{7}{8}$ " hole  $1\frac{1}{2}$ " deep
- Top rail width:  $2$ "
- Top rail length:  $31\frac{1}{2}$ "
- Top rail hole:  $\frac{1}{2}$ " hole  $5$ " deep, centered
- Panel height:  $22\frac{1}{4}$ "
- Panel width:  $13\frac{1}{2}$ "
- Panel depth:  $23\frac{3}{4}$ "
- Bottom rail:  $\frac{3}{4} \times 2$ " mortise  $\frac{3}{4}$ " deep, centered
- Bottom rail hole:  $\frac{1}{2}$ " hole  $5$ " deep, centered
- Bottom rail length:  $31\frac{1}{2}$ "
- Bottom rail hole:  $\frac{7}{8}$ " hole  $1\frac{1}{2}$ " deep
- Bottom rail width:  $3\frac{1}{4}$ "

**Assembly Notes:**

- #20 biscuit

Technical drawing of a wooden box with dimensions and labels E and F.

**Label E:** Dimensions include 4" (length), 3 1/4" (width), 1/2" (height), 3" (depth), 1/2" (hole diameter), 7/8" hole 1 1/2" deep, 1/2" (hole diameter), 3/4" (hole diameter), and 1/2" hole 5" deep, centered.

**Label F:** Dimensions include 2" (length), 1/2" (width), 3/4" (height), 1/2" (hole diameter), 3/4" (hole diameter), 1/2" (hole diameter), and 3" (depth).



**1** Cut to size the drawer fronts/back (M-P) and and sides (Q-T) [**Materials List, Drawing 4**].

**2** Using a ¼" dado blade, groove the inside face of the drawer fronts, backs, and sides for the drawer bottoms. Cut a dado near each end of the drawer sides [**Drawing 4a**]. Rabbit the ends of the drawer fronts/backs.

**3** Cut the drawer bottoms (U) to size and finish-sand the inside faces of all drawer parts. Then, glue the drawer boxes together. With the glue dry, finish-sand the outside of the boxes and notch the drawer backs for the slides [Drawing 4b].

**4** Screw the slide mounting clips to the drawer fronts. Mount the drawer slides to the inner faces of the base side assemblies [**Exploded View**] and install the drawers, making any adjustments for smooth operation.

**5** Cut the false fronts (V-Y) to size. Miter-cut to length the vertical (Z-CC) and horizontal (DD) drawer bead trim and glue them to the edges of the false fronts, flush with the rear face [Drawing 4].

**Tip!** To quickly notch the drawers for the slides, flip the drawer over and cut two kerfs along the edge of the drawer back to define the ends of each notch. Then knock out the waste with a chisel.

**6** Finish-sand the false fronts and attach them to the drawers with double-faced tape, ensuring an even gap all the way around each drawer front. Drive screws through the drawer boxes into the false fronts to secure them.

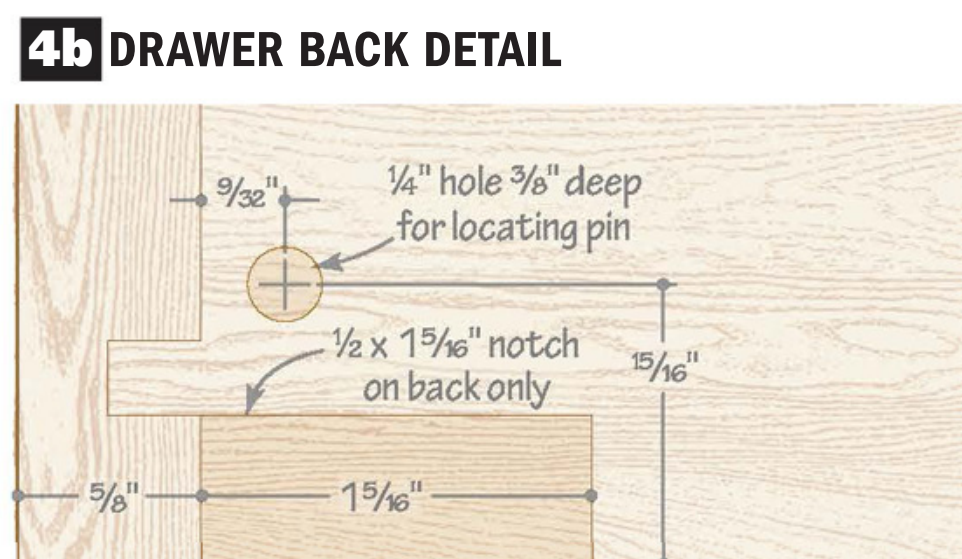
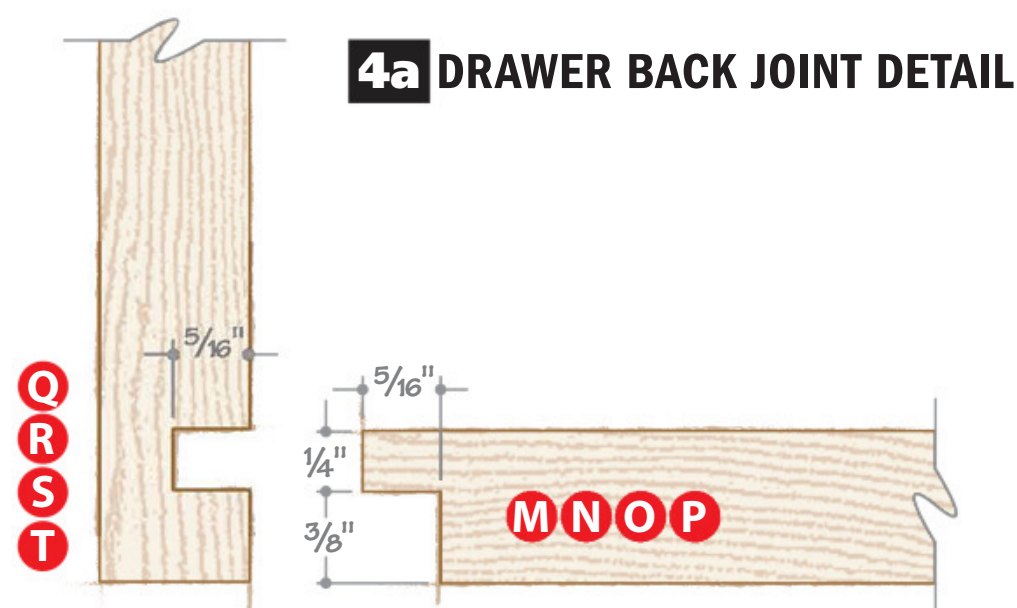
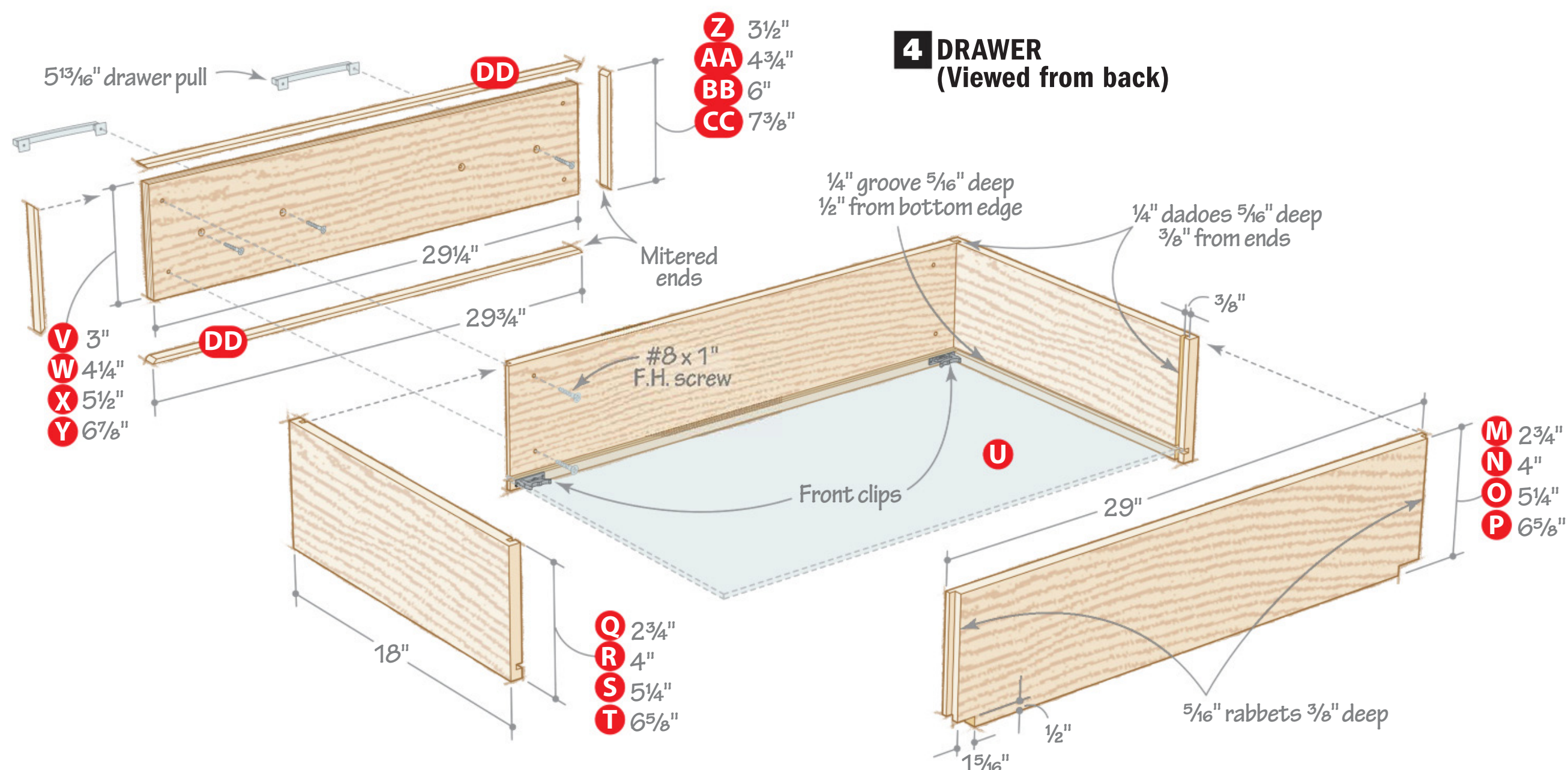
## Finishing touches

**1** Apply a boiled linseed oil finish to the top. To finish the rest of the bench, remove the drawers and disassemble the base. We sprayed on a lacquer finish, but water-based polyurethane also works well.

**2** With the finish dry, remove the false fronts from the drawers and attach the drawer pulls [**Drawing 4**]. Then, remount the false fronts on the drawers. Reassemble the base and install the drawers.

**3** Mount a face vise [**Sources**] to the top. Then call in a favor from the neighbor across the hall in 4B to help lift the top and set it on the workbench base. But be prepared for her to ask to borrow your tools and use your new bench. 🌳

► Learn about different types of bench vises at [woodmagazine.com/vises](http://woodmagazine.com/vises)



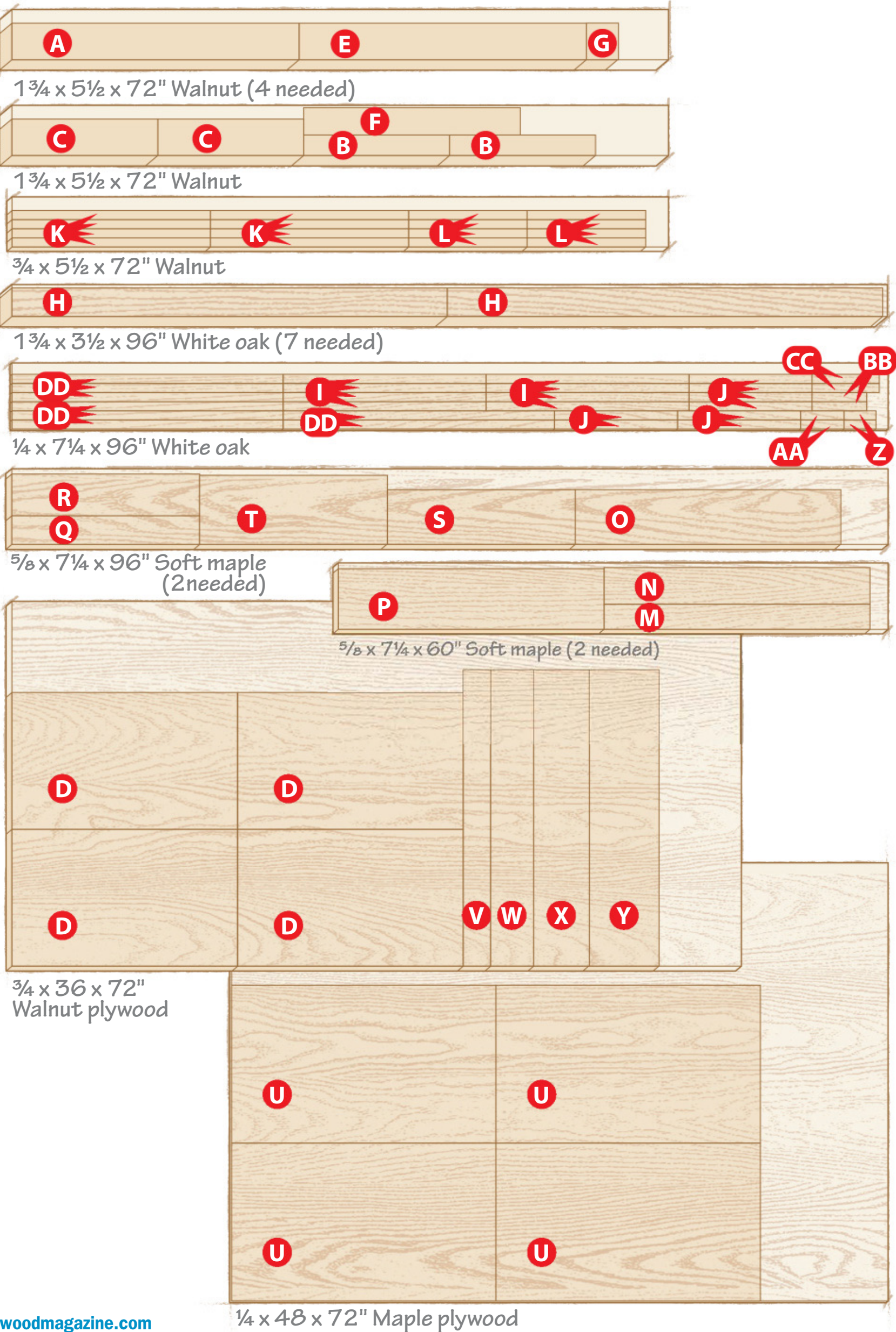


Don't need a workbench?  
Build this project as a  
kitchen island. The heavy,  
thick top provides an  
ideal surface for meal  
preparation or serving.



## Cutting Diagram

This project requires 3 board feet of 4/4 walnut, 30 board feet of 8/4 walnut, 5 square feet of 1/4" white oak, 35 board feet of 8/4 white oak, and 14 square feet of 5/8" soft maple.



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## Materials List

| Part    | Base                   | FINISHED SIZE |         |         | Matl. | Qty. |
|---------|------------------------|---------------|---------|---------|-------|------|
|         |                        | T             | W       | L       |       |      |
| A       | legs                   | 1 3/4"        | 4"      | 31 1/2" | W     | 4    |
| B       | upper side rails       | 1 3/4"        | 2 1/4"  | 16"     | W     | 2    |
| C       | lower side rails       | 1 3/4"        | 4"      | 16"     | W     | 2    |
| D       | panels                 | 3/4"          | 13 1/2" | 22 1/4" | WP    | 4    |
| E       | case rails             | 1 3/4"        | 4"      | 31 1/2" | W     | 4    |
| F       | center stile           | 1 3/4"        | 3"      | 23 3/4" | W     | 1    |
| G       | feet                   | 1 3/4"        | 4"      | 3 1/2"  | W     | 4    |
| H*      | top                    | 3"            | 24 1/2" | 47 1/2" | WO    | 1    |
| Trim    |                        |               |         |         |       |      |
| I       | vertical bead trim     | 1/4"          | 1"      | 22 1/4" | WO    | 8    |
| J       | horizontal bead trim   | 1/4"          | 1"      | 13 1/2" | WO    | 8    |
| K       | vertical molding       | 3/4"          | 7/8"    | 21 3/4" | W     | 8    |
| L       | horizontal molding     | 3/4"          | 7/8"    | 13"     | W     | 8    |
| Drawers |                        |               |         |         |       |      |
| M       | drawer 1 front/back    | 5/8"          | 2 3/4"  | 29"     | SM    | 2    |
| N       | drawer 2 front/back    | 5/8"          | 4"      | 29"     | SM    | 2    |
| O       | drawer 3 front/back    | 5/8"          | 5 1/4"  | 29"     | SM    | 2    |
| P       | drawer 4 front/back    | 5/8"          | 6 5/8"  | 29"     | SM    | 2    |
| Q       | drawer 1 sides         | 5/8"          | 2 3/4"  | 18"     | SM    | 2    |
| R       | drawer 2 sides         | 5/8"          | 4"      | 18"     | SM    | 2    |
| S       | drawer 3 sides         | 5/8"          | 5 1/4"  | 18"     | SM    | 2    |
| T       | drawer 4 sides         | 5/8"          | 6 5/8"  | 18"     | SM    | 2    |
| U       | drawer bottoms         | 1/4"          | 17 3/8" | 29"     | MP    | 4    |
| V       | drawer 1 false front   | 3/4"          | 29 1/4" | 3"      | WP    | 1    |
| W       | drawer 2 false front   | 3/4"          | 29 1/4" | 4 1/4"  | WP    | 1    |
| X       | drawer 3 false front   | 3/4"          | 29 1/4" | 5 1/2"  | WP    | 1    |
| Y       | drawer 4 false front   | 3/4"          | 29 1/4" | 6 7/8"  | WP    | 1    |
| Z       | drawer 1 vertical bead | 1/4"          | 1"      | 3 1/2"  | WO    | 2    |
| AA      | drawer 2 vertical bead | 1/4"          | 1"      | 4 3/4"  | WO    | 2    |
| BB      | drawer 3 vertical bead | 1/4"          | 1"      | 6"      | WO    | 2    |
| CC      | drawer 4 vertical bead | 1/4"          | 1"      | 7 3/8"  | WO    | 2    |
| DD      | drawer horizontal bead | 1/4"          | 1"      | 29 3/4" | WO    | 8    |

\*Parts initially cut oversize. See the instructions.

**Materials key:** W-walnut, WP-walnut plywood, WO-white oak, SM-soft maple, MP-maple plywood.

**Supplies:** #20 biscuits, #8 x 1" flathead screws.

**Blade and bits:** Dado set; 1/8" round-over, 1 1/16" cove and bead, 3/4" spiral upcut router bits.

**Sources:** Heavy-duty cross dowels and bolts (pack of 8) no. 36073, \$27; oil-rubbed bronze 5 13/16" drawer pulls (8) no. 1008108, \$9, Rockler, 800-279-4441, rockler.com.

Wilton 78A woodworker's vise no. B00062NEKK, \$200, amazon.com. 18" undermount drawer slides (4 pr.) no. HT9134339, \$20; front clips (4 pr.) no HT9140413, \$2.05, Woodworker's Hardware, 800-383-0130, wwhardware.com.

Produced by **Vince Ancona** with **John Olson** and **Brian Bergstrom**  
Project design: **John Olson**  
Illustrations: **Roxanne LeMoine**, **Lorna Johnson**



# Clamp Beyond Your

Every bit as frustrating as not having enough clamps is not having clamps that reach where needed. Whether you need to span a cabinet or wide panel, or apply clamping force beyond the reach of a clamp's jaws, these tips help you stretch your clamp's potential. And you won't have to store all those long bars or pipes.

**1. Add a shop-made auxiliary jaw** using scraps of  $\frac{3}{4}$ " plywood or solid stock. Drill a hole at one end to accept the clamp's fixed jaw and square up the near end to provide a flat surface for the clamp jaw to grab. Glue a short scrap to the end (below) to hook over the opposite end of the workpiece. Drive screws into the hook for additional strength, if needed.



**2. For even more clamping force**, drill a hole at both ends of a scrap and use it to bridge between two clamps.

**Note:** Methods that raise the clamp bar out of parallel with the workpiece tend to lift pieces out of alignment. Keep a close eye on pieces as you work.

**3. Instead of buying pipe couplers**, use a fixed jaw as a coupler. We used this method to combine three short pipe clamps into one long one.

Fixed jaw

**4. Join two one-hand bar clamps** by removing the fixed jaw from each clamp. (You may need to drill or knock out the drift pin at the end of the bar.) Then bolt in a length of metal bar. We pressed an old shelf standard into service. Drill holes through the extension and clamp bar so you can insert two bolts in each end to keep the bars and extension aligned.

Fixed jaw

Hook



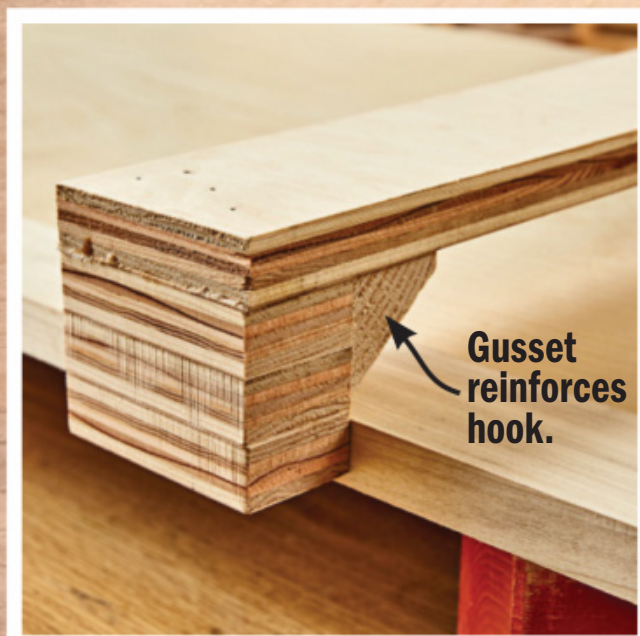
# Clamp Capacity

**5.** For jobs needing a parallel-jaw clamp, add a hook to both ends of a plywood scrap. We glued two layers of  $\frac{3}{4}$ " plywood to reach over the clamp jaw, and three layers with a gusset on the opposite end to grab the edge of the workpiece (below).

Hook

**6.** Hook together two parallel-jaw clamps jaw to jaw. This method allows you to use heavy clamping force.

**Note:** Extensions with wood cleats hooked over a workpiece edge may not withstand the full force a clamp can generate, but should work for most jobs with closely mating surfaces.



**7.** If you need the full depth of the parallel jaws, reverse the fixed jaws, and hold them together using a third clamp. Even clamped together, the fixed jaws will begin to separate as you snug up the clamps, so use this where heavy clamp force isn't needed.

HOOK





**Instead of trying to extend clamps**, bring clamping surfaces closer together. Securing a scrap block to the bottom provides an anchor point for a 6" F-style clamp to draw the bottom panel into the dado in the side.

## Reach deeper

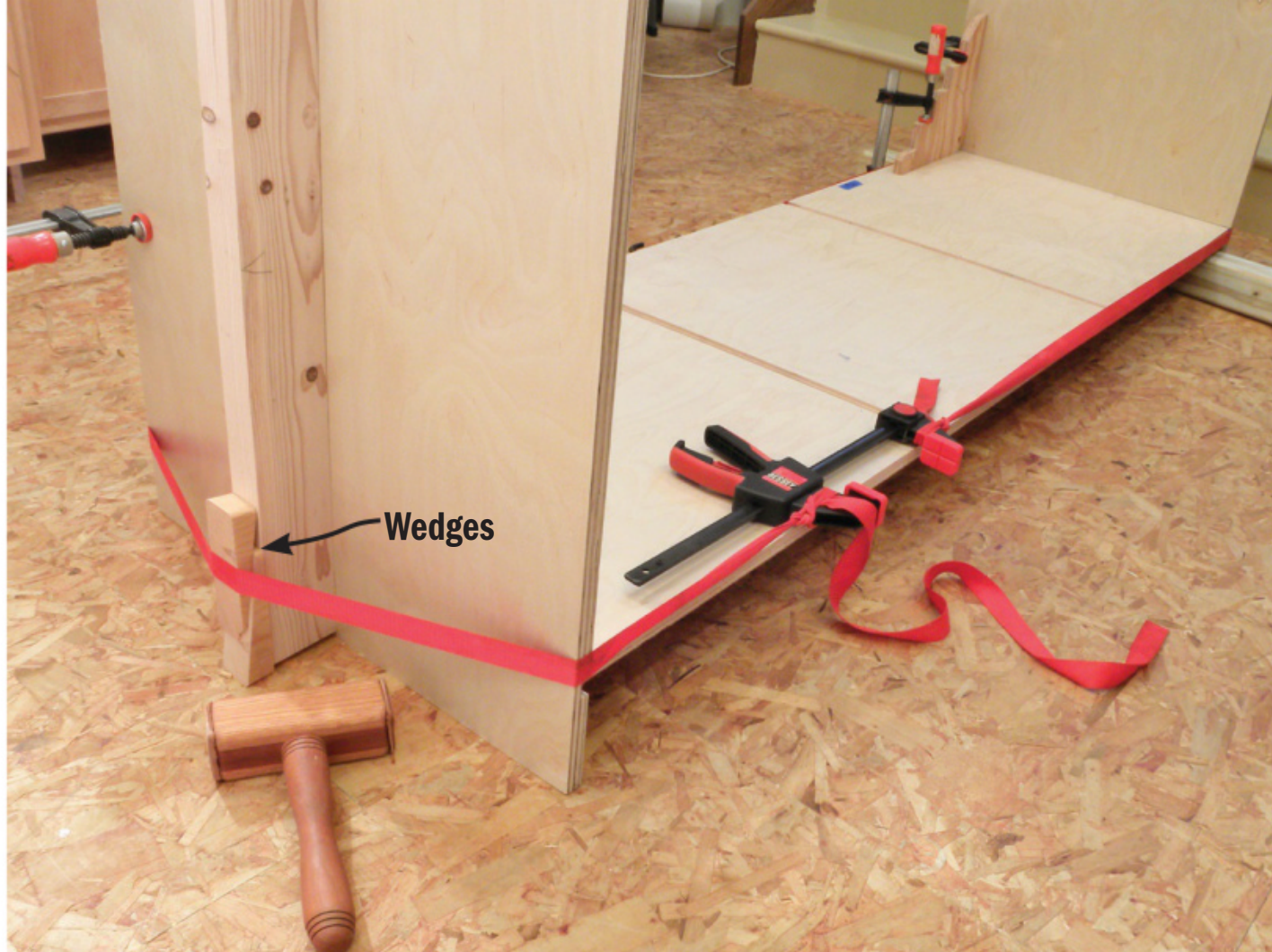
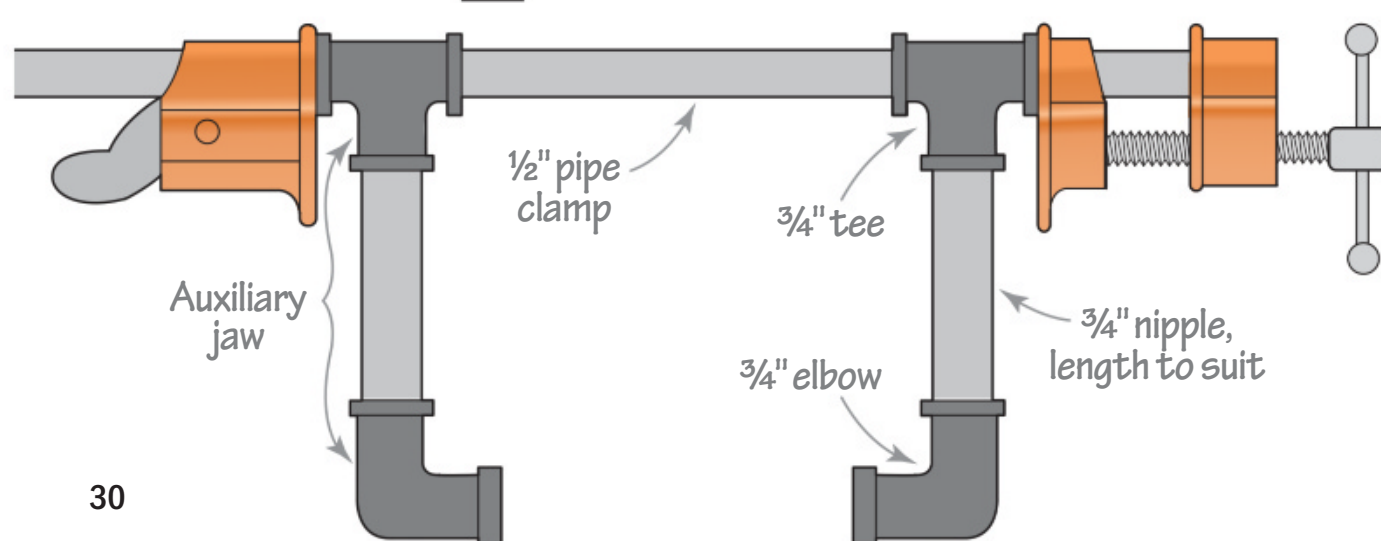
Sometimes you need to clamp a good ways from the edge of a workpiece. When your jaw clamps prove too shallow, try these techniques. 🌳

**To apply clamping force across the full width of an assembly**, use a caul with a slight crown. The 30"-long cauls shown have a crown of about  $\frac{1}{16}$ " from the center to each end. Place the crowned edge against the workpiece; clamping the caul flattens it, applying pressure from the center of the workpiece to each edge.



**If you have  $\frac{1}{2}$ " pipe clamps**, make extensions from  $\frac{3}{4}$ " pipe fittings to slip between the jaws [Drawing 2]. Make sure the faces of the elbows rest flat on the workpiece surface as you tighten the clamp jaws.

## 2 PIPE CLAMP EXTENSIONS

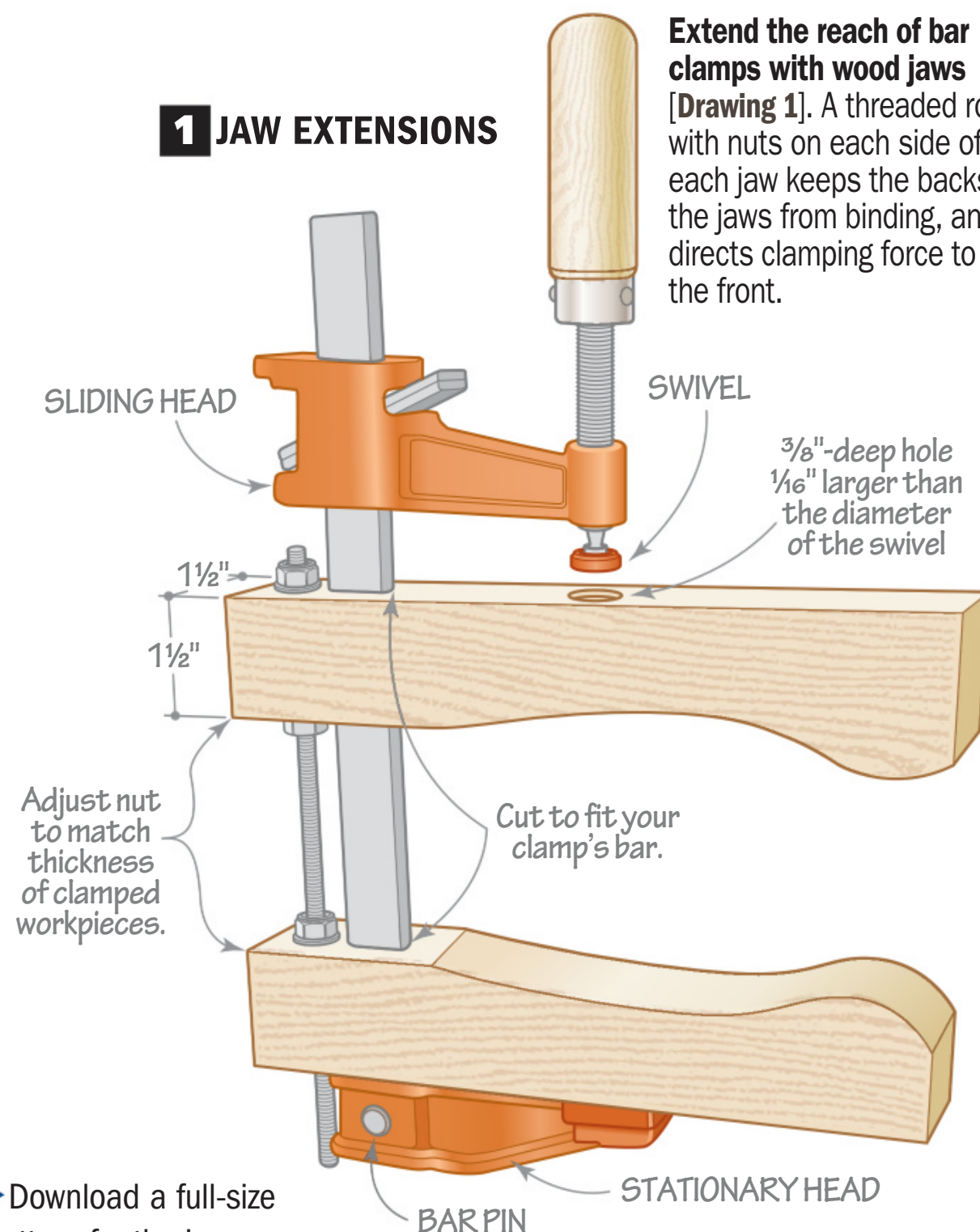


**Wrap a web strap around a cabinet**, tie each end around the jaw of a fully opened one-hand clamp, and tighten the clamp to cinch up the strap. Spacers and opposing wedges distribute pressure into the middle of the assembly.



## 1 JAW EXTENSIONS

**Extend the reach of bar clamps with wood jaws** [Drawing 1]. A threaded rod with nuts on each side of each jaw keeps the backs of the jaws from binding, and directs clamping force to the front.



► Download a full-size pattern for the jaws.  
[woodmagazine.com/279patterns](http://woodmagazine.com/279patterns)

Produced by **Craig Ruegsegger**  
Illustrations: **Roxanne LeMoine, Lorna Johnson**





# WORK

No job is too big when you use these thirteen Construction-Grade woodworking plans. Excavate, grade, and build your playroom into a world-class jobsite complete with a Bulldozer, End Loader, Mobile Crane, and more.

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# Skill-ball

*Get your game on at home with this tabletop-sized version of an arcade classic.*

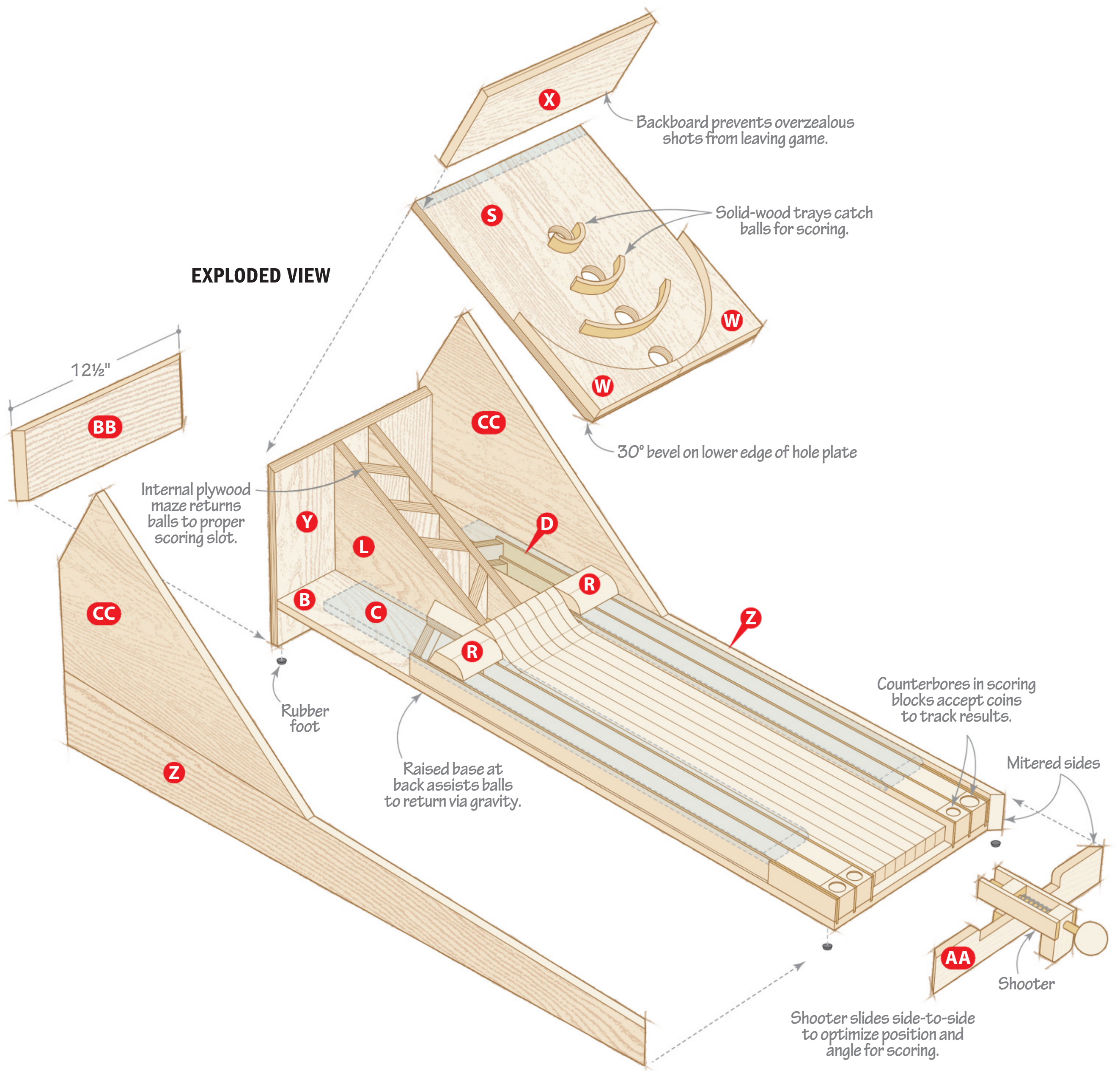
**A**rcade games have wide appeal and get the competitive juices flowing with the very first roll. Although you won't find prizewinning tickets spitting out the front, the highest score still provides bragging rights among your family and friends.

**D I M E N S I O N S :**  
12½" W x 45¼" D x 17⅞" H

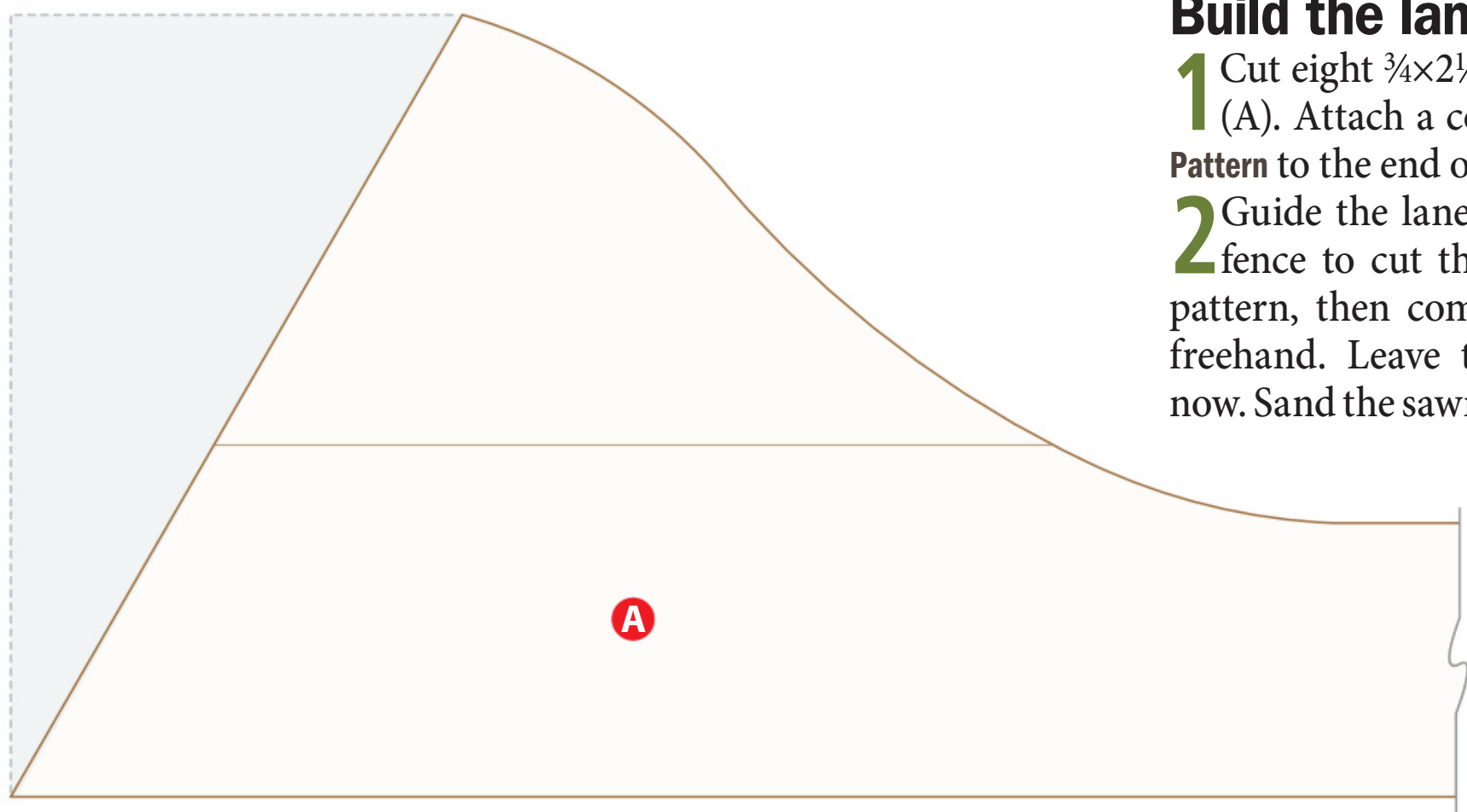
Approximate materials cost:  
**\$150**  
Lumber and kit

**175**  
Max score if you have the skills





FULL-SIZE LANE-END PATTERN



### Build the lane first

- 1 Cut eight  $\frac{3}{4} \times 2\frac{1}{2} \times 28\frac{1}{4}$ " strips for the lane (A). Attach a copy of the **Full-Size Lane-End Pattern** to the end of one strip.
- 2 Guide the lane strip along the bandsaw fence to cut the straight portion of the pattern, then complete the curved section freehand. Leave the wide end square for now. Sand the sawn edge of the strip smooth.

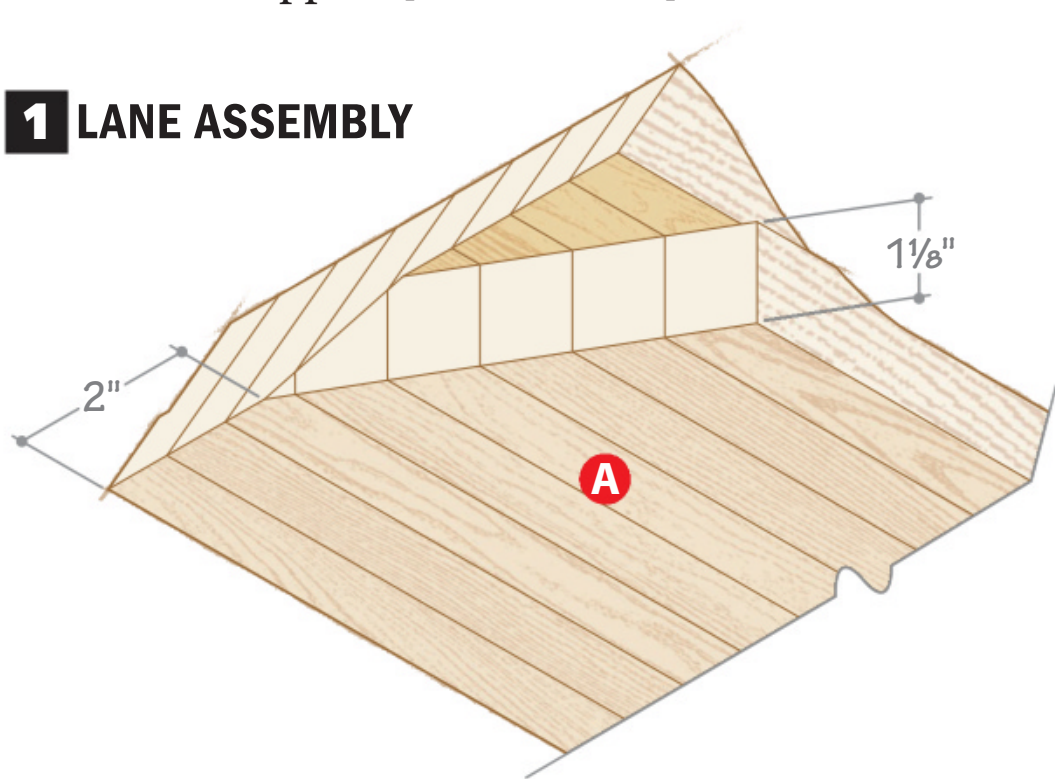


► Learn to pattern-rout identical parts.  
[woodmagazine.com/template](http://woodmagazine.com/template)

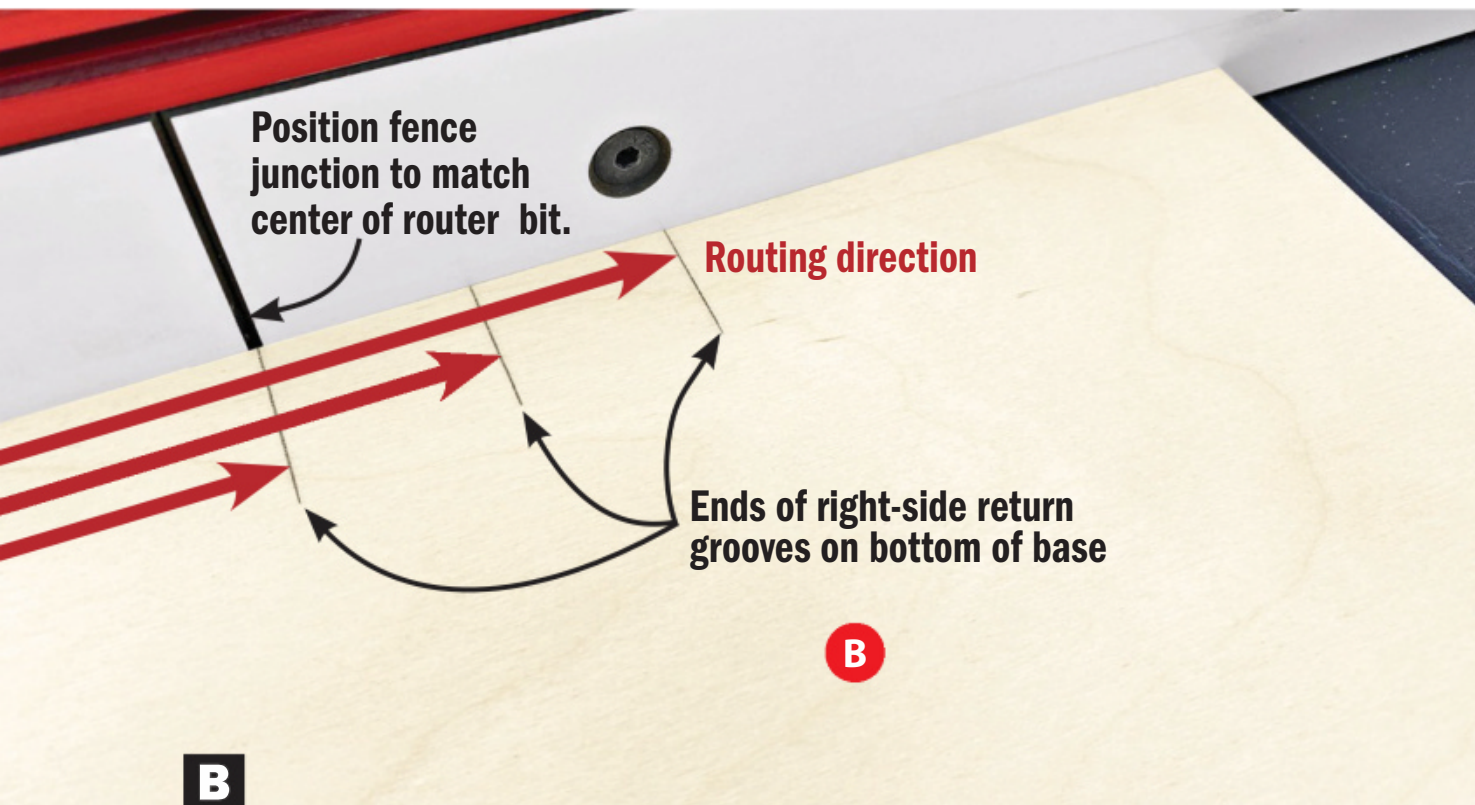
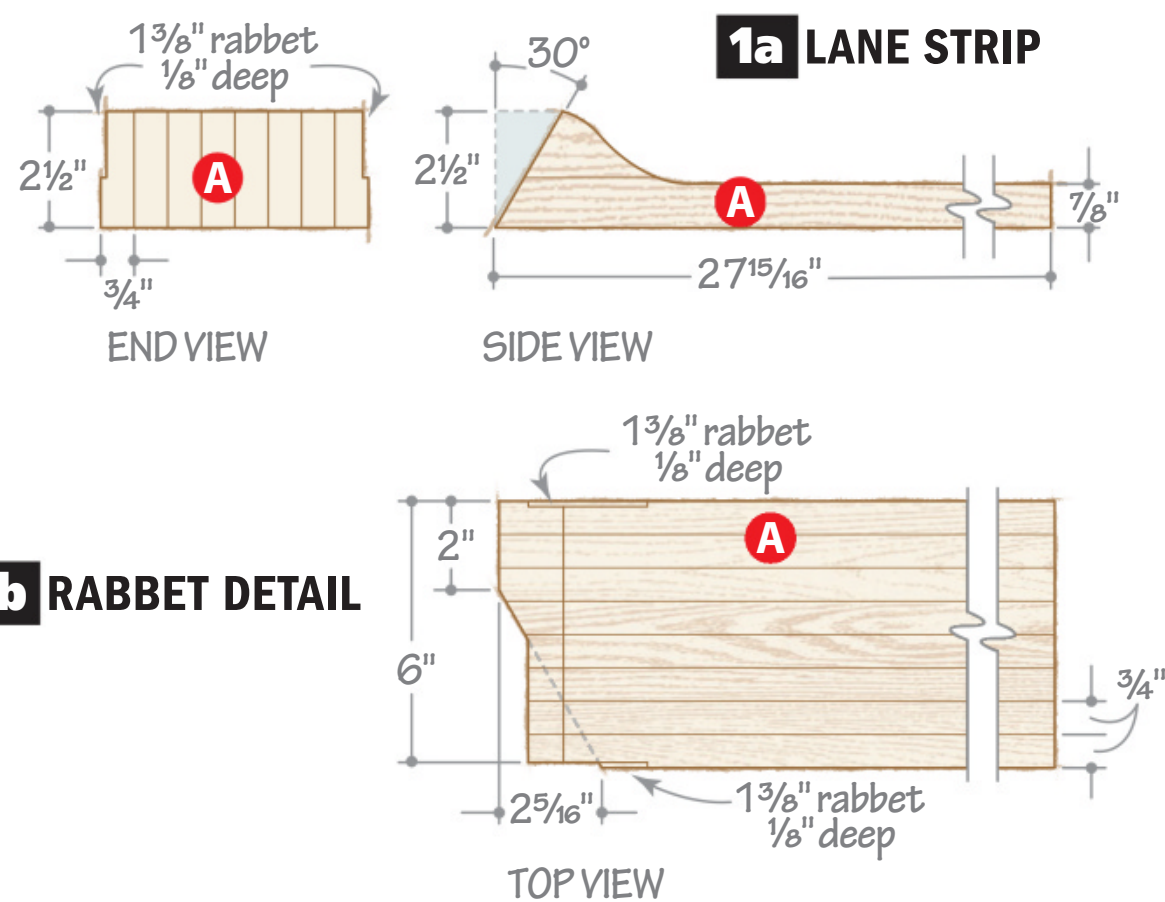
**Tip!** Use a bevel gauge to transfer the rabbet angle to your miter gauge.

- 3** Lay out the remaining strips. Bandsaw and pattern-rout them to shape.
- 4** Glue and clamp the strips together to form the lane. Once the glue dries, sand the lane surface smooth.
- 5** Trim the lane to final length, squaring the front end and beveling the back edge [Drawing 1a].
- 6** Lay out and cut the angled rabbet in the bottom of the lane using a dado blade [Drawing 1, Photo A]. With the dado blade still installed, cut a shallow rabbet on the top outside edges of the lane, running the bottom of the lane against the rip fence for support [Drawings 1a, 1b].

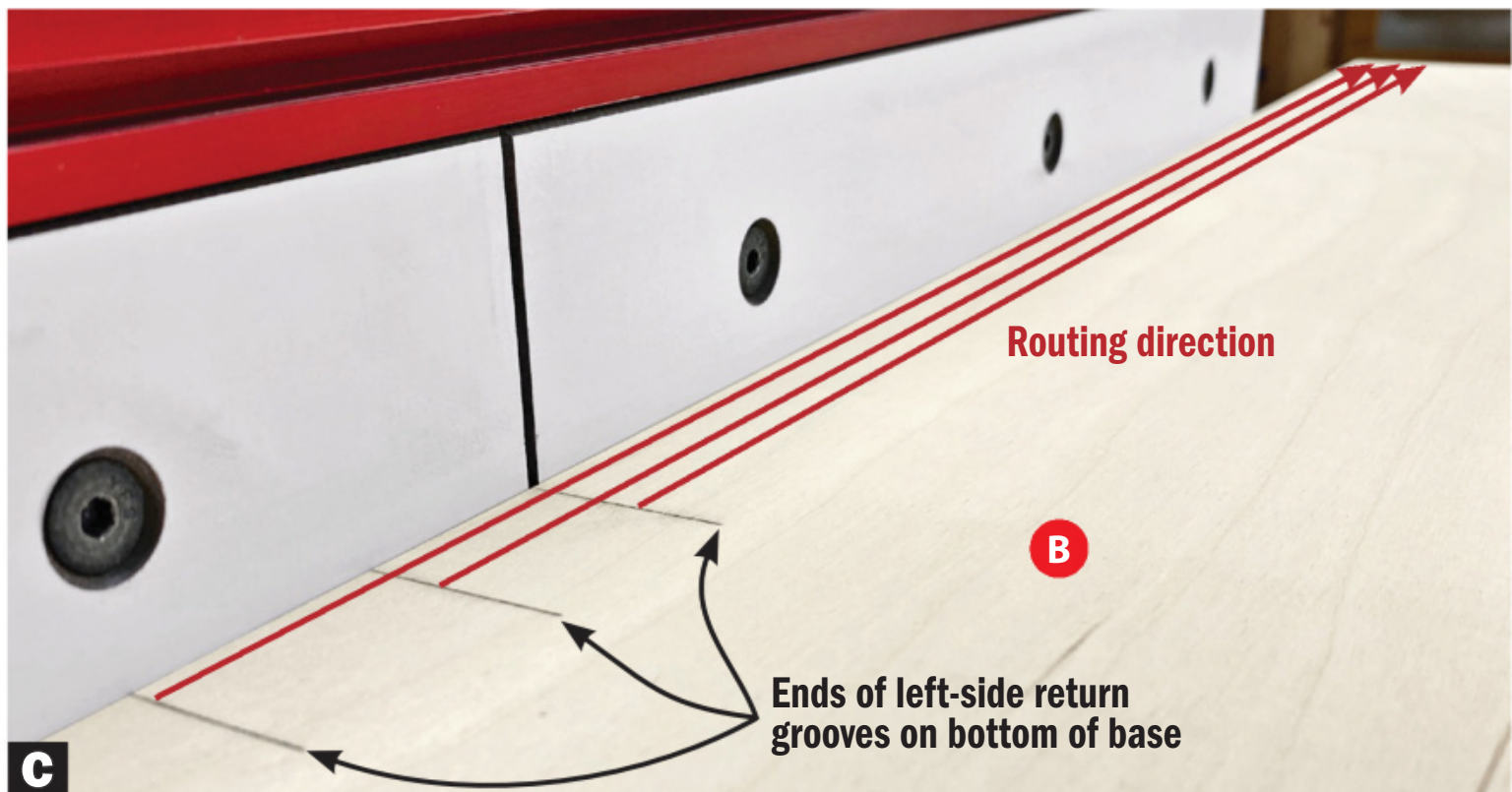
## 1 LANE ASSEMBLY



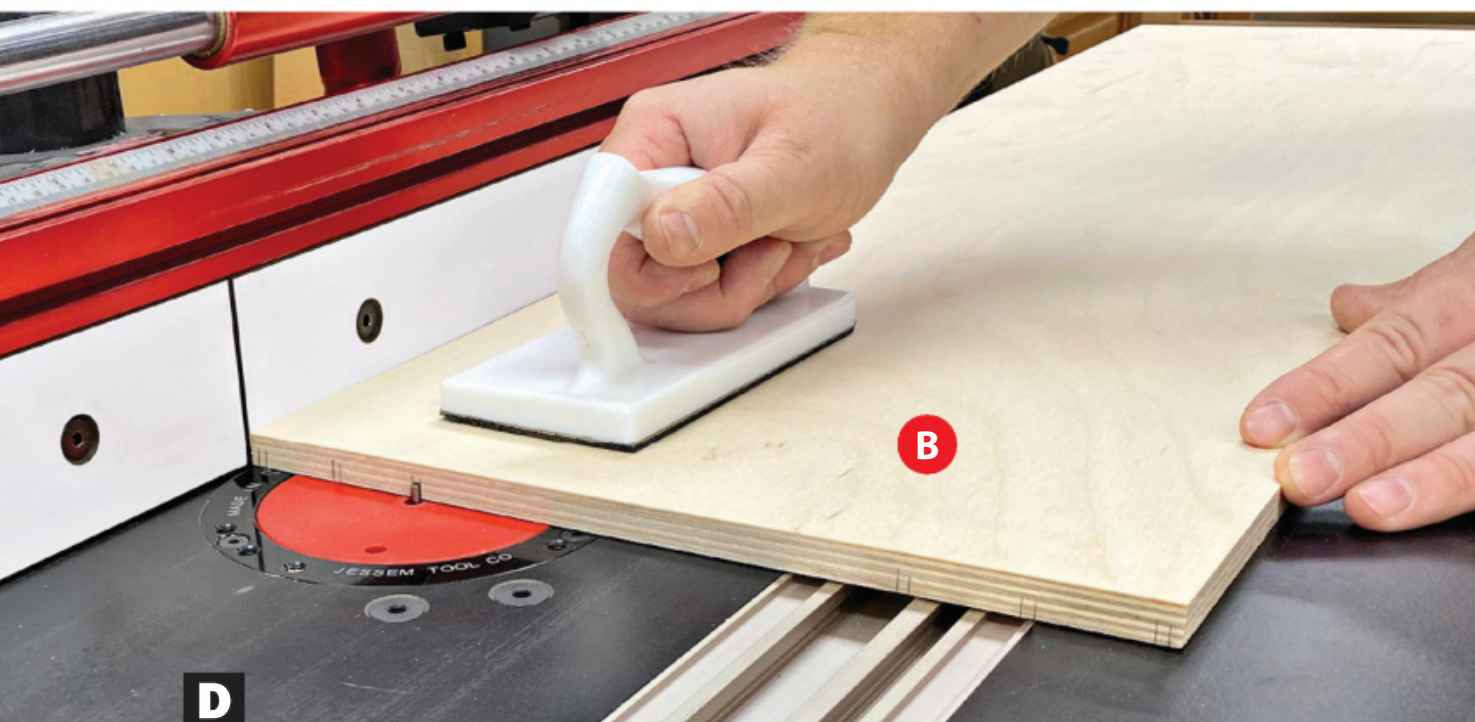
**A** A deep relief cut on the lane bottom directs balls falling into the lowest hole of the game to the proper ball return.



**B** Align the junction of the router-table fences with the center of the bit to act as a reference for starting and stopping cuts. On the right side of the base (B) you'll rout to the layout marks (end of cut shown).



**C** On the left side of the base (B), lower the base onto the bit and then rout to the end (start of cut shown).



**D** Rout the grooves in the base (B) and return tops (C), alternating between the base and corresponding return-top groove to ensure perfect alignment. After routing the grooves in the return tops (C), mark them as left and right along with the outside edges to make it easy to match them up with the base during assembly.



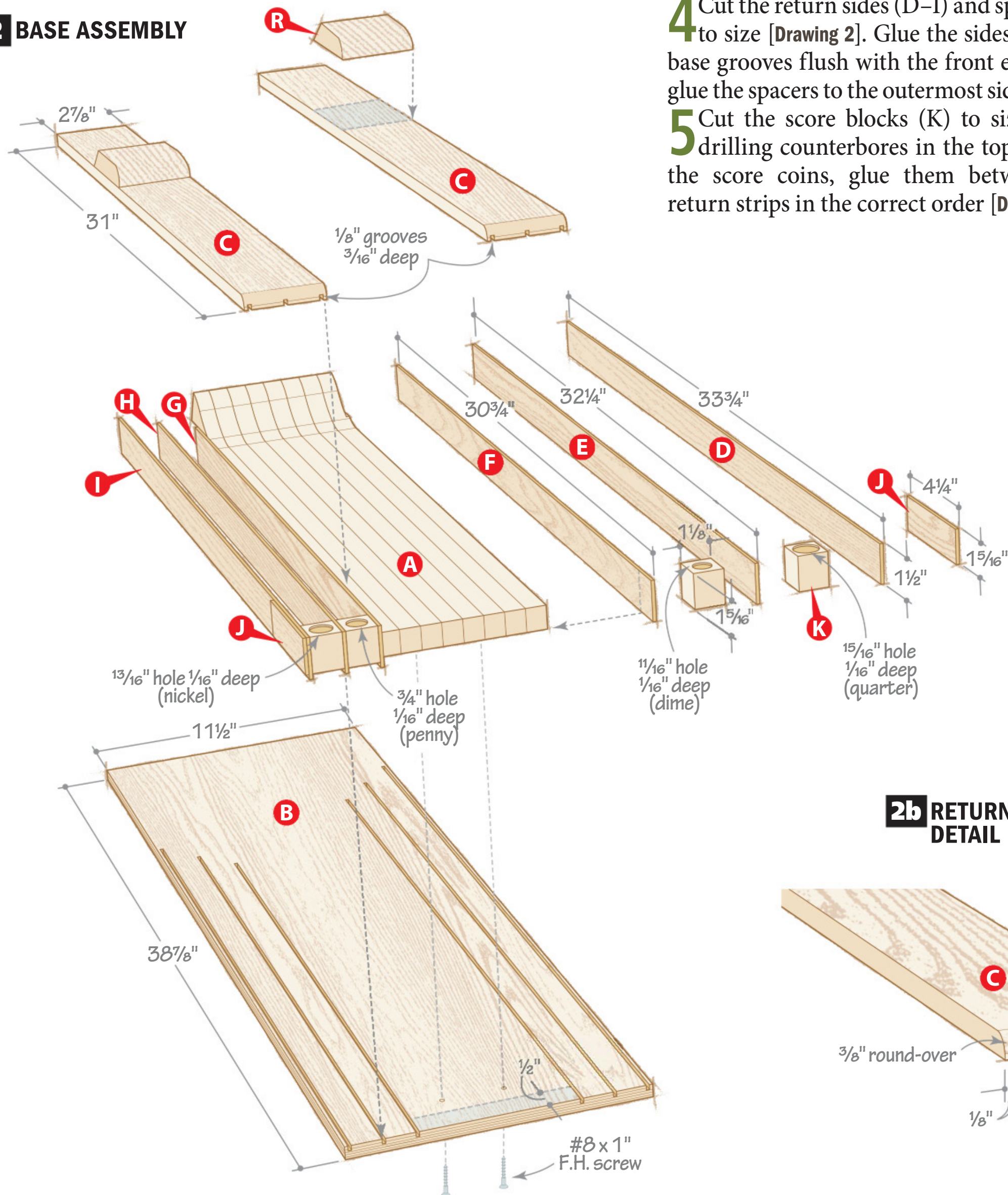
## Add the ball returns

- 1 Cut the base (B) and return tops (C) to size [Drawing 2].
- 2 Lay out the locations of the stopped grooves on the front end of the base, and the ends of the grooves on the bottom face of the base [Drawing 2a].

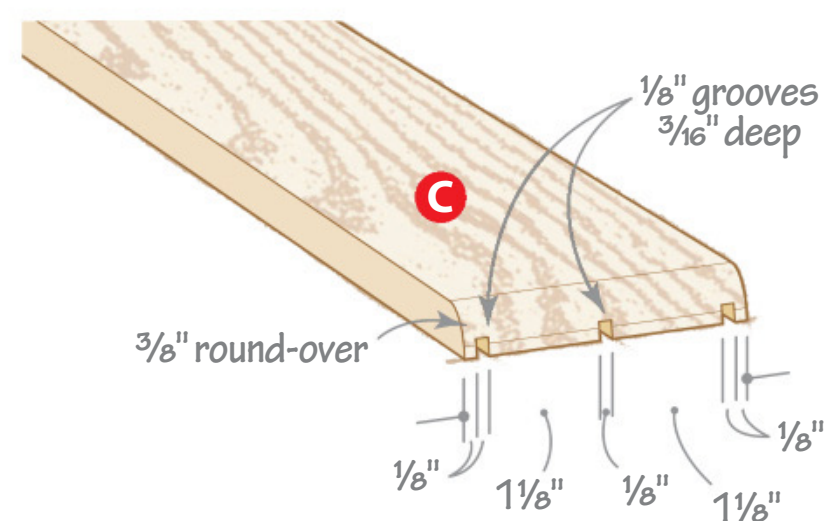
3 Install a  $\frac{1}{8}$ " spiral upcut bit in your table-mounted router, and rout the innermost grooves in the base and return tops [Drawings 2 and 2b, Photos B-E]. Adjust the router-table fence and repeat the process to rout the middle grooves, and then the outermost grooves. Square up the groove ends with a chisel.

- 4 Cut the return sides (D-I) and spacers (J) to size [Drawing 2]. Glue the sides into the base grooves flush with the front edge, and glue the spacers to the outermost sides (D, I).
- 5 Cut the score blocks (K) to size. After drilling counterbores in the top face for the score coins, glue them between the return strips in the correct order [Drawing 2].

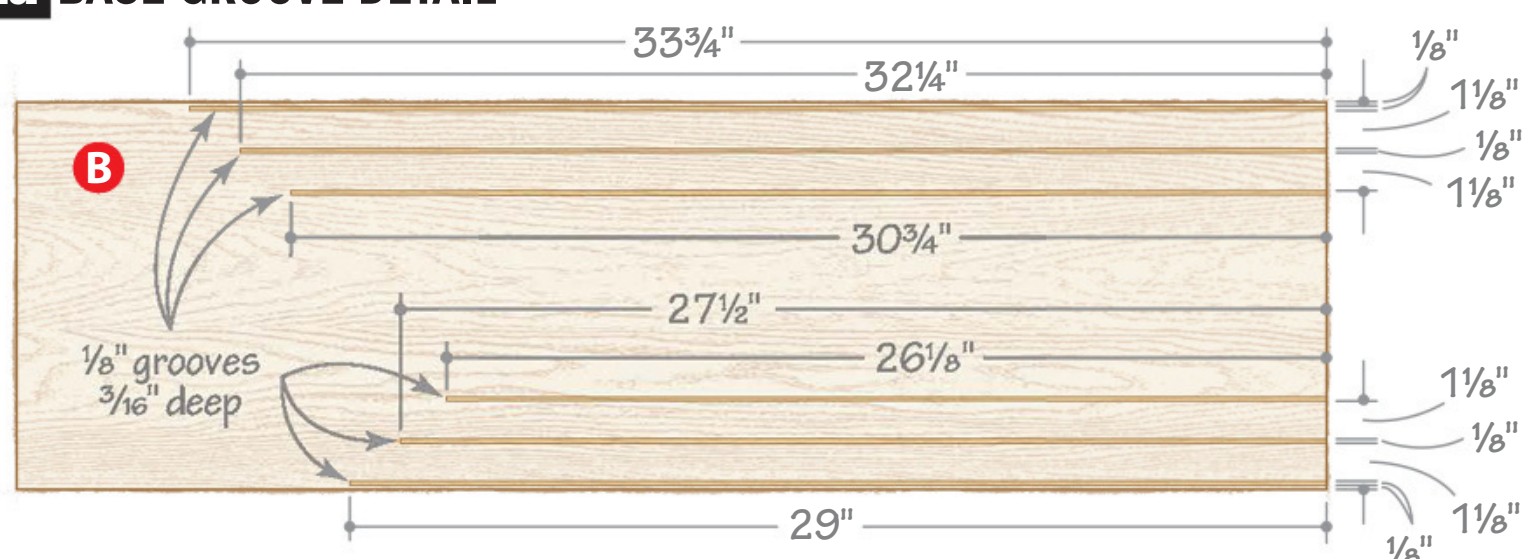
### 2 BASE ASSEMBLY



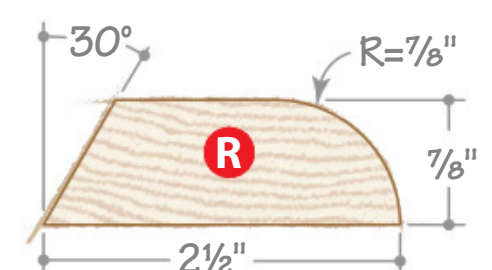
### 2b RETURN-TOP DETAIL



### 2a BASE GROOVE DETAIL



### 2c RETURN-TOP FILLER







**F** Adjust the miter gauge to 30° and set the blade for a 1 1/8"-deep cut. A miter-gauge extension minimizes tear-out as you complete the cut.



**G** Rotate the miter gauge to the opposite 30° setting to cut the notches for the right ball-drop side.

## Create an a-maze-ing ball sorter

Returning the scoring balls and keeping accurate score requires a hidden maze of plywood parts.

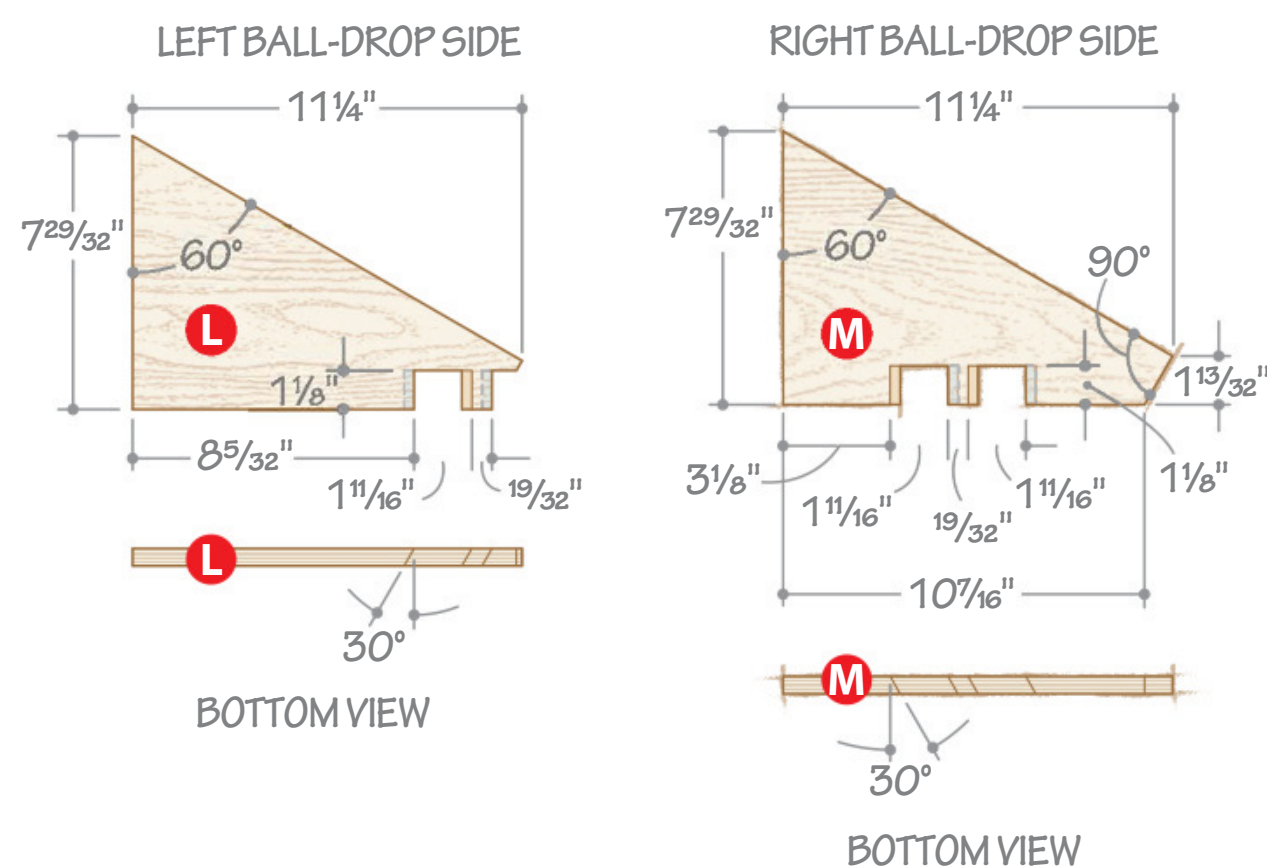
**1** Cut the ball-drop sides (L, M) to length and width [Drawing 3], then lay out the angle at the top and lower right corner on the right ball-drop side (M). Join the two sides (L, M) with double-faced tape and bandsaw them to shape.

**2** Lay out the locations for the angled return notches in the ball-drop sides [Drawing 3]. To help align the cuts, transfer the layout lines across the bottom edge and up the opposite face, matching the angle of the notch. Cut the notches with a dado set [Photos F, G].

**3** A series of dividers (N) connect the ball-drop sides (L, M), and guide the balls to the correct scoring return via gates (O) [Drawing 4]. Cut a 2 5/8×28" strip of 1/2" Baltic birch plywood with the edges ripped at parallel 30° bevels.

**4** Crosscut the four dividers (N) extra-long (3 1/2", 5 1/4", 6 1/2", 8") and glue them to the ball-drop sides [Drawing 4a, Photo H].

### 3 BALL-DROP SIDES

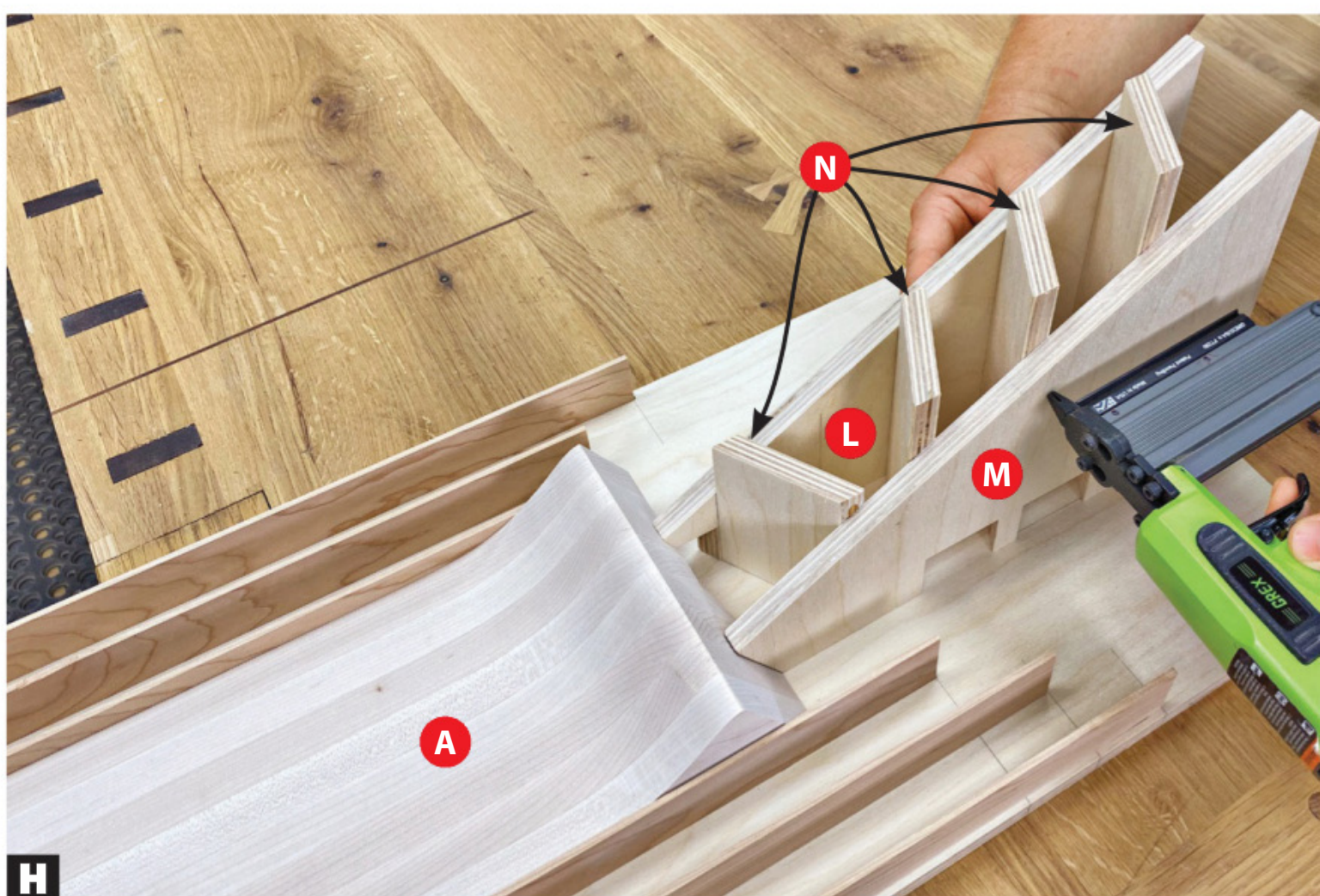


**5** After the assembly dries, trim the dividers [Photo I] and sand the cut edges smooth. Glue and screw the assembly to the base (B) flush at the back edge [Drawing 4a, Exploded View].

**6** Starting with a 1 1/8×20" strip of 1/2" plywood, cut and install the gates (O), beveling the ends at 30°. Size each gate to fit between the ball-drop sides and its matching return side [Photo J, Drawing 4a].

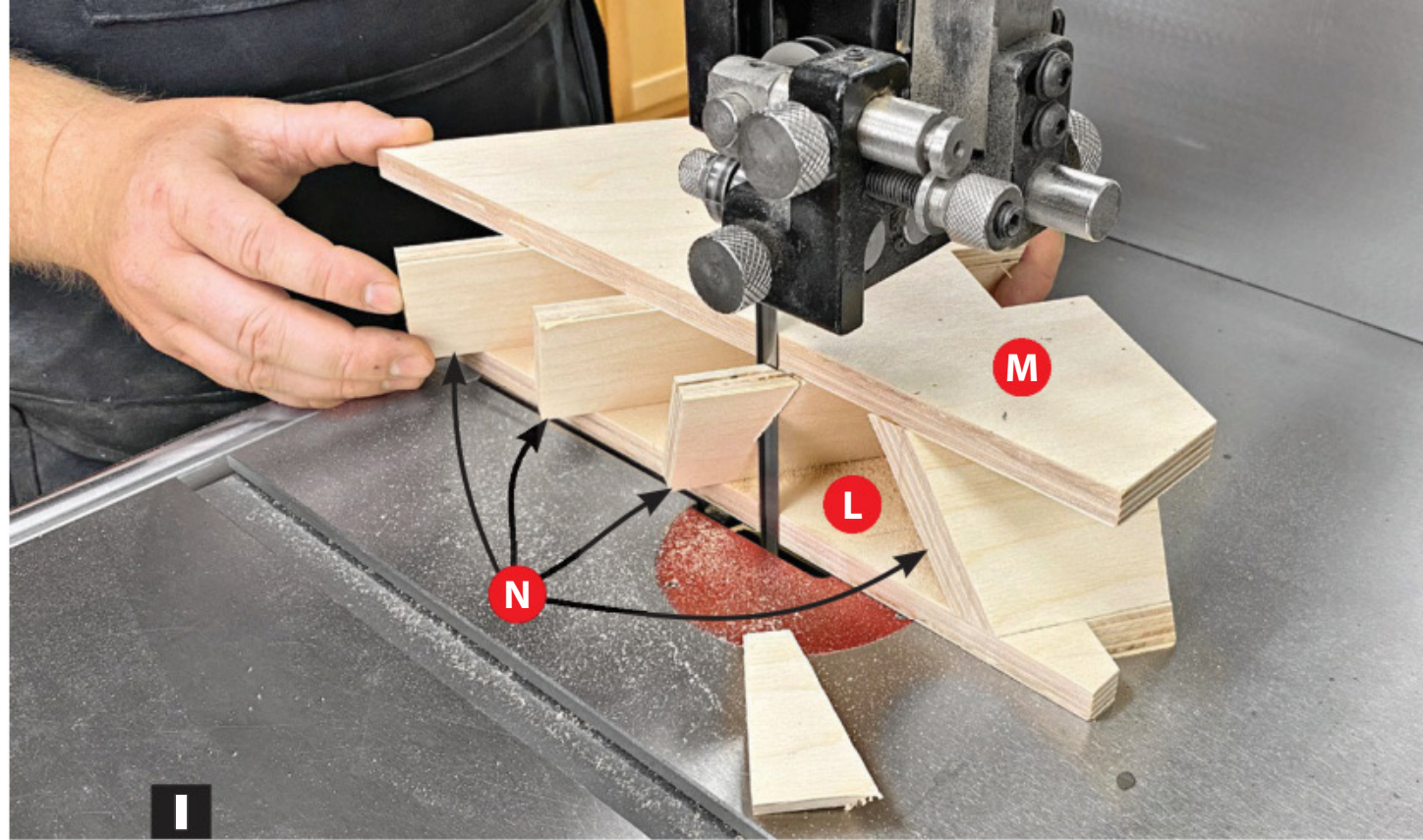
**7** Screw the lane (A) to the base and against the ball-drop sides (L, M) [Exploded View, Drawing 2]. Round over the front ends of the return tops (C), then glue them to the return sides (D–I) and gates (O).

**8** Miter-cut the return tops (P, Q) to length, then bevel-cut the front end to nest against the lane. Glue them to the top edges of the gates [Drawing 4a]. Finally, round over the ends of a 12"-long blank for the return-top fillers (R) [Drawing 2c]. Bevel-cut them to length and glue them to the return tops (C), flush with the end of the lane (A).

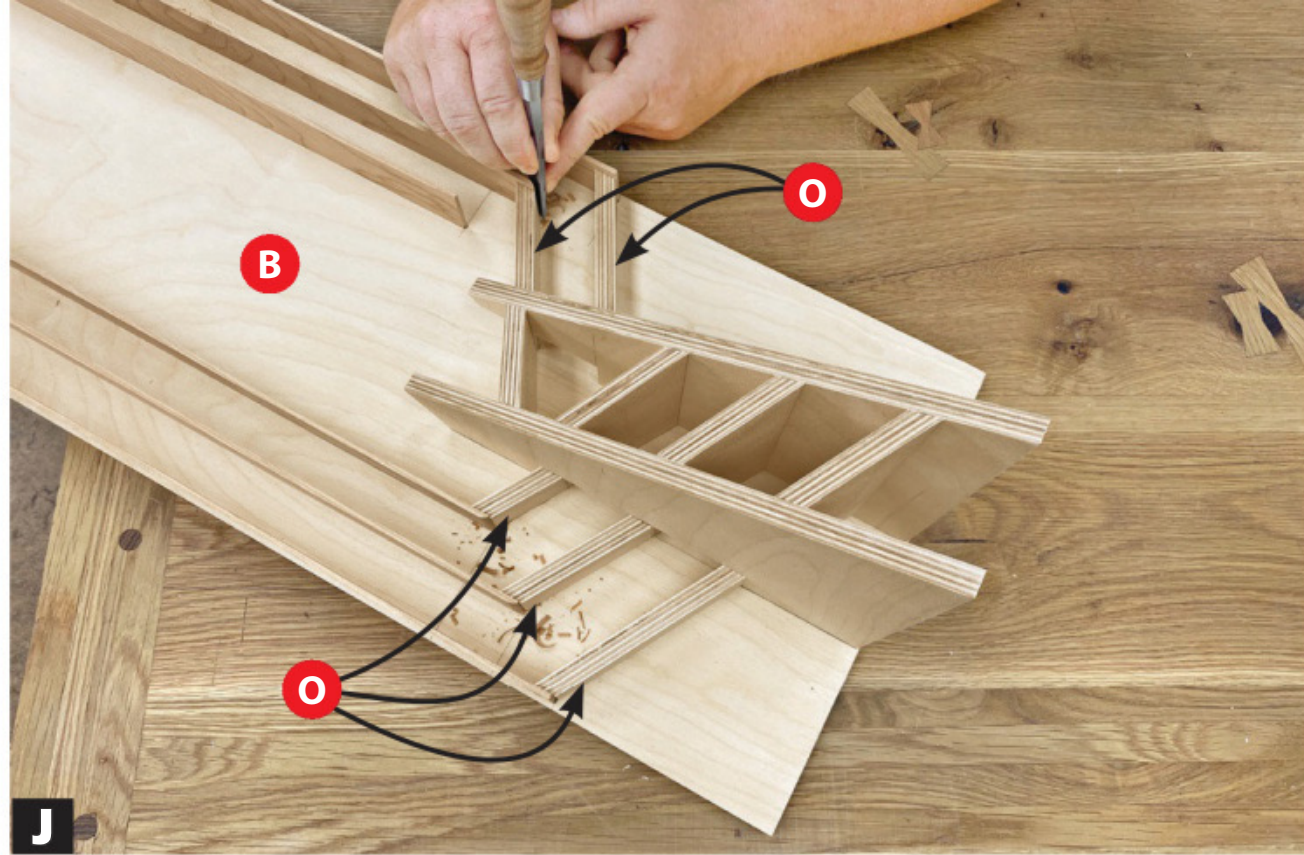


**H** Sandwich the dividers (N) between the sides (L, M), lining them up with the notches in the sides. Use the back of the lane (A) to square up the assembly while securing the dividers with 1" brad nails.





**I** **No muss, no fuss!** Trimming the tops of the dividers (N) flush with the ball-drop sides avoids the hassle of measuring, marking, and cutting compound miters.



**J** **After installing the gates (O),** round the corners of the return sides with a chisel to prevent balls from hanging up.

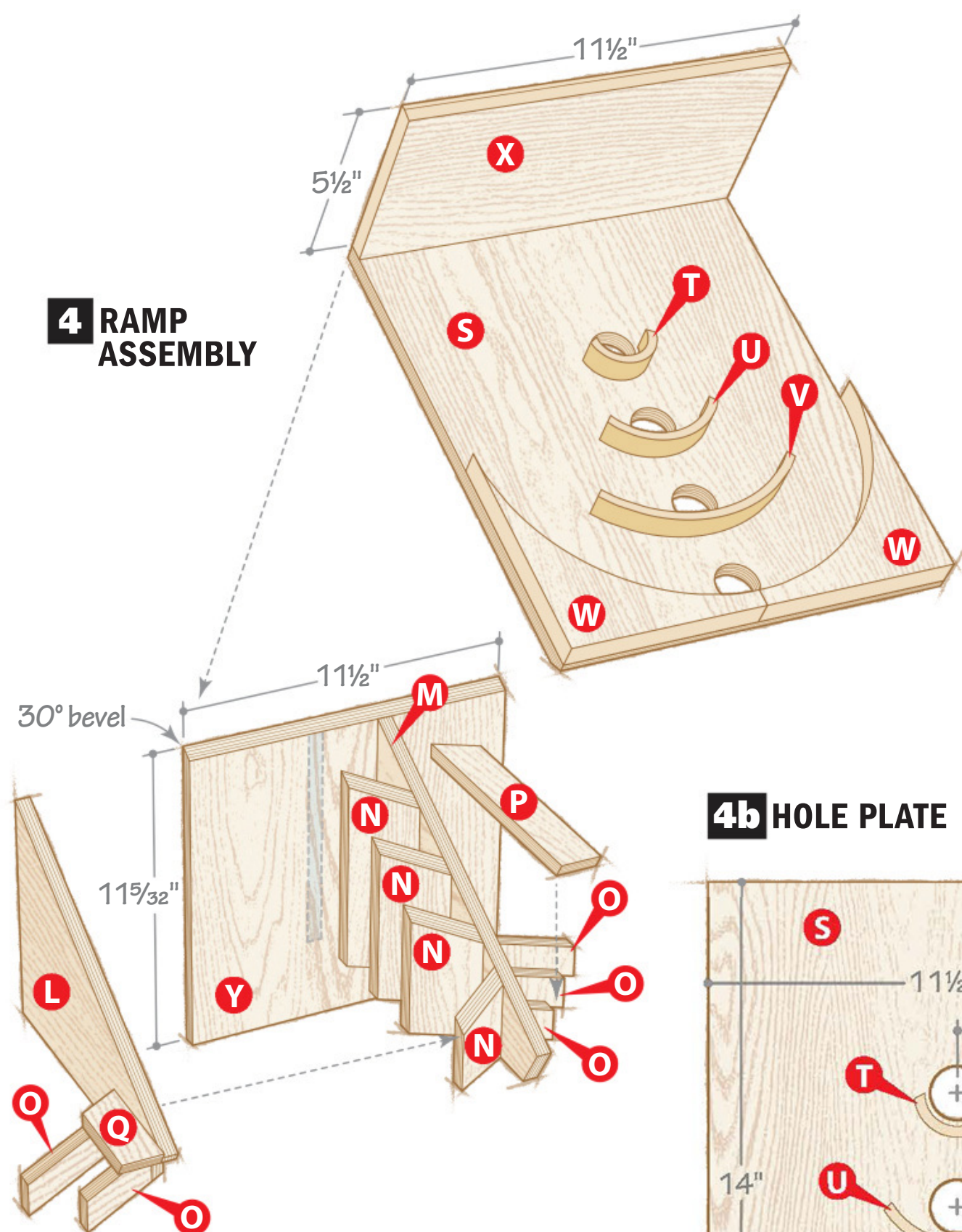
## Setting up for scoring

- 1** Cut the hole plate (S) to size [Drawing 4b], then drill the holes.
- 2** Cut and shape the trays (T-W) [Drawing 4c] and glue them to the plate [Drawing 4b].
- 3** Test-fit the plate (S) to the lane and ball-drop assembly. Bevel the bottom edge of the plate [Exploded View] to rest flat on the return tops (C).

**4** Cut the backboard (X) to size and glue it to the top of the hole plate flush with the back edge [Drawing 4].

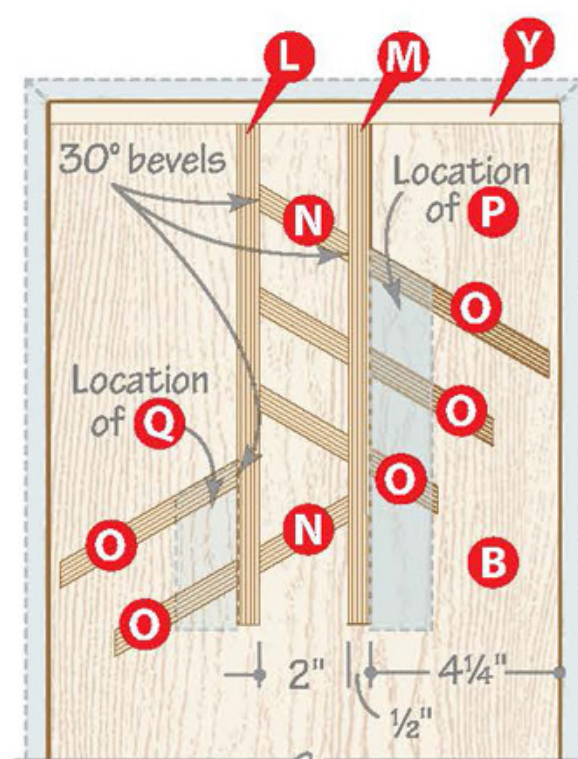
**5** Glue the hole-plate assembly (S-X) to the ball-drop assembly [Drawing 4].

**6** Cut the back (Y) to size, beveling the top edge at 30°, and glue it to the back of the ball-drop sides (L, M) [Drawing 4, Exploded View].

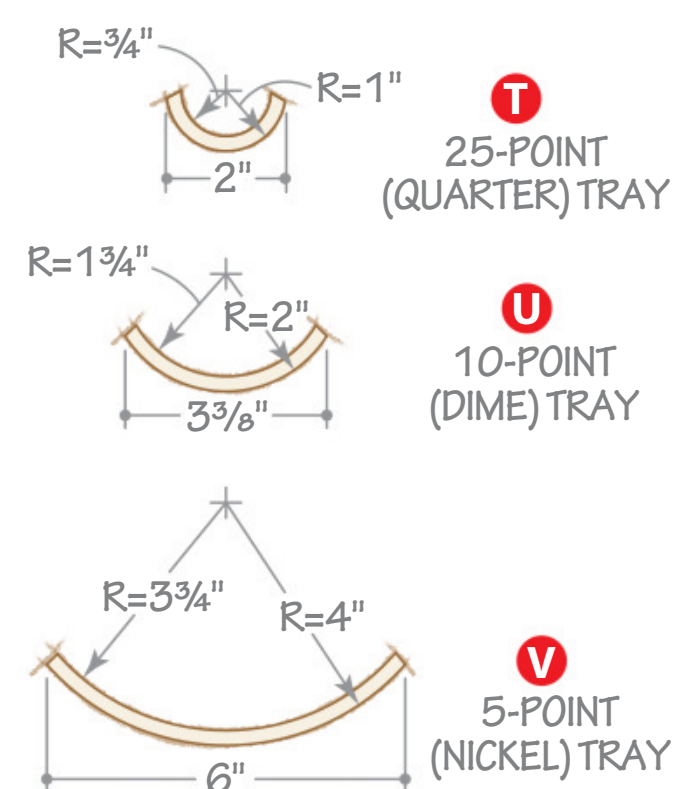


### 4 RAMP ASSEMBLY

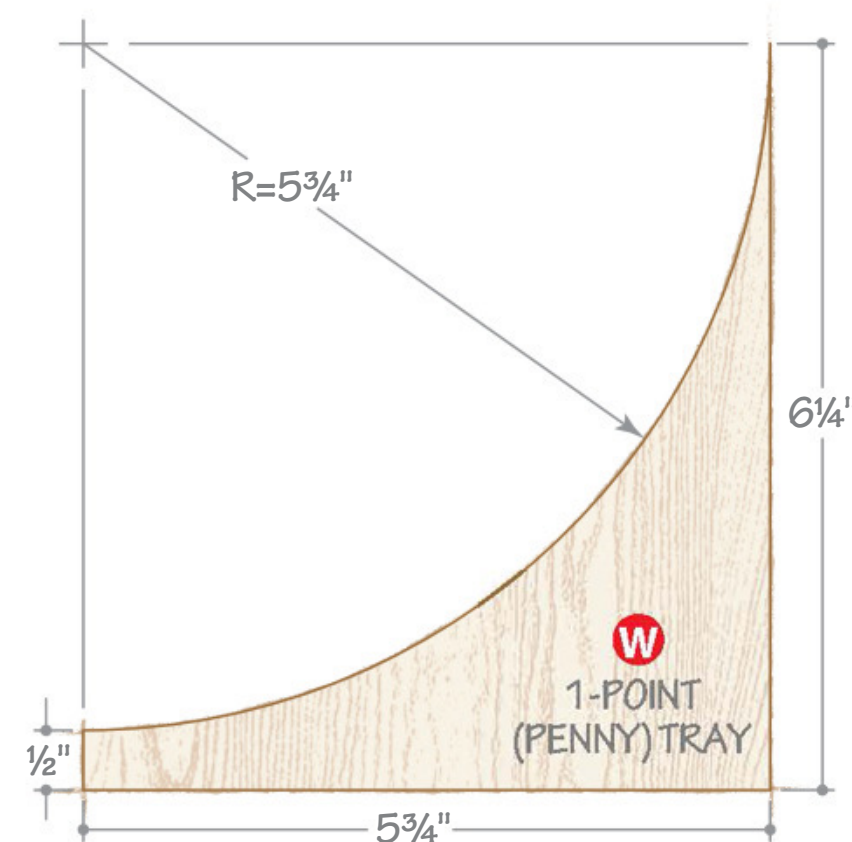
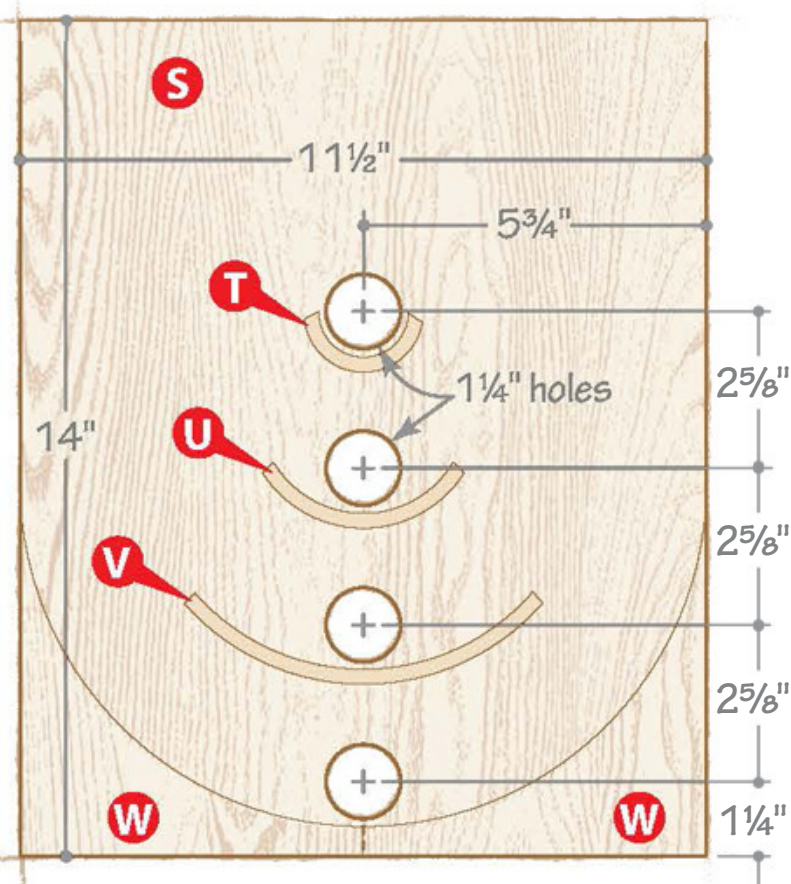
### 4a BALL-DROP DETAIL



### 4c TRAY DETAILS



### 4b HOLE PLATE





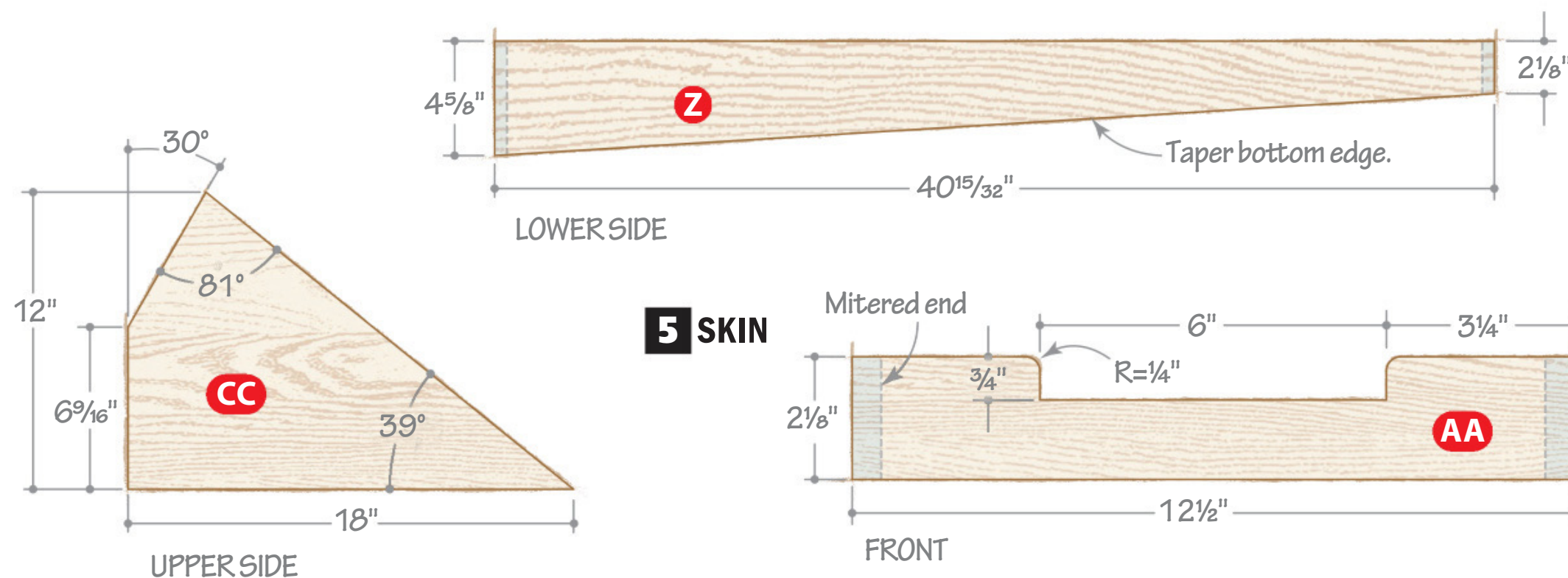
**Tip!** Raise the front of the base, temporarily leveling the lane, while mitering the lower sides, front, and back.

## Let's wrap up this game

- 1 Cut the lower sides (Z), front (AA), and back (BB) to size, mitering the ends to wrap around the base [Exploded View].
- 2 Notch the top edge of the front (AA), then sand round-overs on the two inside corners [Drawing 5].
- 3 Taper the bottom edge of the sides (Z) and sand the edges smooth [Drawing 5].

4 Glue the lower sides, front, and back to the assembly with the top edge of the sides flush with the top face of the return tops (C).

5 Cut the upper sides (CC) to shape [Drawing 5] and glue them to the lower sides (Z) and the edges of the hole plate (S) and ball-drop back (Y) [Exploded View].



## Shape the shooter

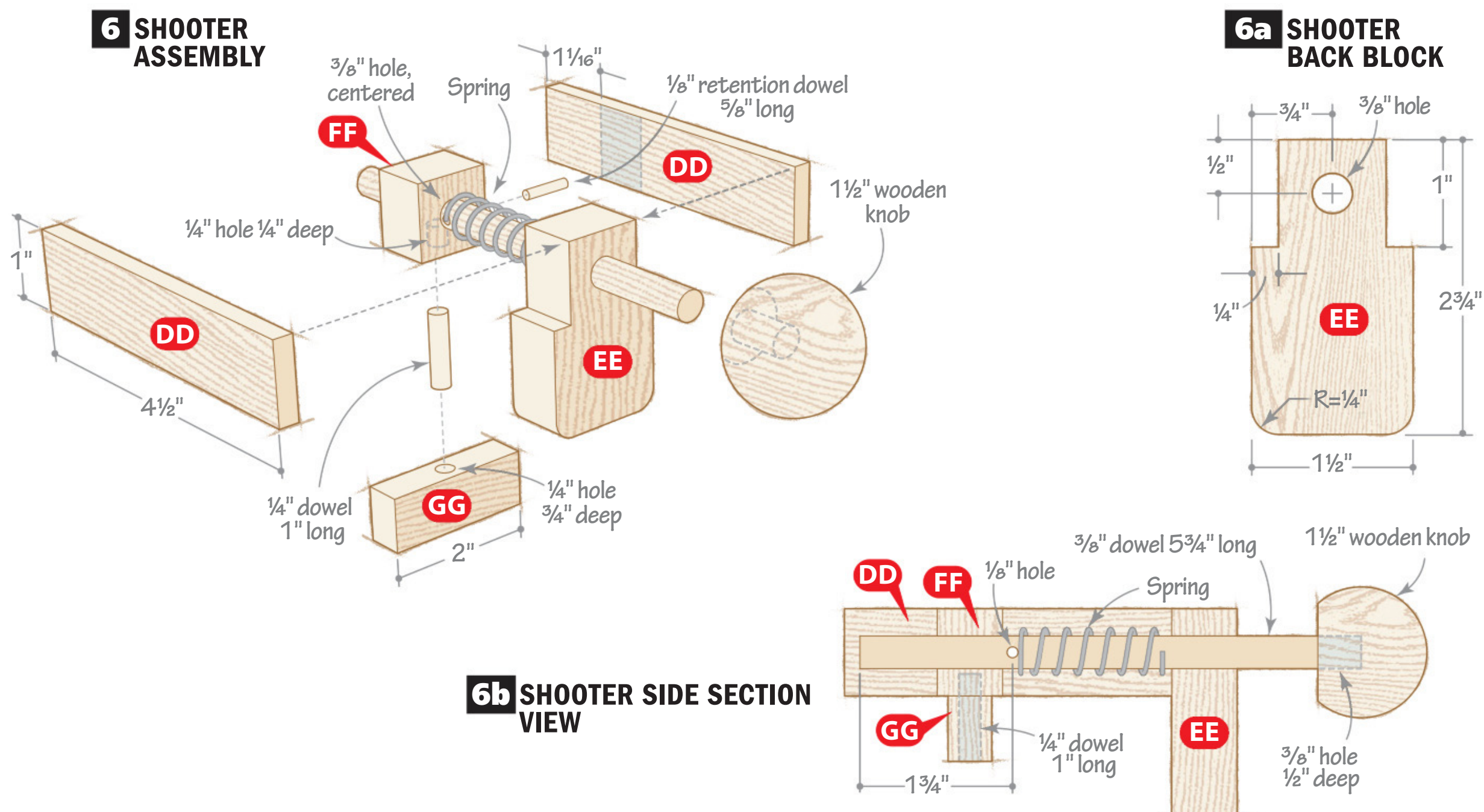
► Safely cut and shape small parts.  
[woodmagazine.com/smallparts](http://woodmagazine.com/smallparts)

- 1 Cut the shooter parts (DD–GG) to size [Drawing 6].
- 2 Rabbet both edges of the back block (EE) [Drawing 6a].
- 3 Drill the holes in the back and front blocks (EE, FF), knob, pivot block (GG), and a 1/8" hole through the 3/8" dowel [Drawings 6, 6b].
- 4 Glue the shooter sides (DD) to the back and front blocks (EE, FF), then glue the 3/8" striker dowel into the knob and the 1/4"

pivot dowel into the bottom of the front block [Drawings 6, 6b].

5 Hold the spring between the back and front blocks (EE, FF) and slide the striker dowel through both holes. Compress the spring slightly with your fingers and slide the 1/8" retention dowel through the striker [Drawing 6]. Place the pivot block (GG) between the end of the lane (A) and front (AA) and then set the shooter assembly into place [Exploded View].

**Note:** Depending on the thickness of your rubber feet, adjust the length of the back block (EE) so it just rests on your tabletop when the shooter is assembled and resting in place.









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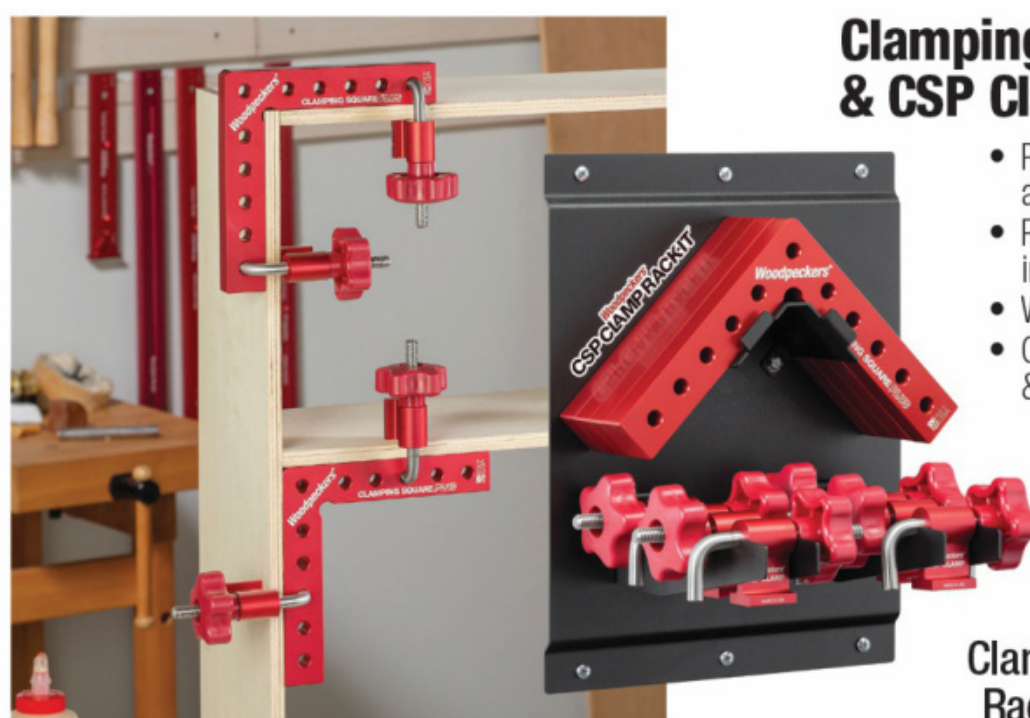
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- 3 radius profiles &  $45^\circ$  chamfer available.
- Hardened blades are easy to re-hone.
- Profile perfectly centered on your stock.

### EZ Edge Corner Plane

Includes a wall-mountable Rack-It™

$1/8$ ",  $3/16$ ",  $1/4$ " Radius

-or-  $45^\circ$  Chamfer....\$159.99

Deluxe Set....\$569.99



Dust Port fits either end!



Drill Press & Hose not included.

## DP-PRO Drill Press Table System

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- Micro-adjustable DP-PRO Flip Stops.
- DP-PRO Drawer Base simplifies installation on any drill press.
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- Fence fits on all 4 sides & works 4 different ways.
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- Works with nearly all 1/2" & smaller drills.
- 1" capacity inside frame & 2" capacity outboard.
- Optional extensions & stops available.

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Drill Guide....\$259.99

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## Multi-Function Router Base

- Micrometer adjustment positions cutter perfectly.
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- Works with most routers that have guide rod holes.

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Router not included.

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- Patent pending miter bar adjusts to any 3/4" miter slot.
- Graduated fence with micro-adjustable flip stop & 45" extension.
- Extra-long miter bar increases cross-cut capacity of most saws to 24".
- Miter Bar available separately to build jigs & cut-off tables.
- Flop Stop keeps wide panels level with table for perfect squaring cuts.

**Exact-90**  
Miter Gauge....\$329.99

25.5" Miter Bar....\$69.99



Table Saw not included.



Table Saw not included.



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- Bring your rip fence back to the same spot each & every time you need it.
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50" Capacity - Powermatic/Biesemeyer\*....\$229.99

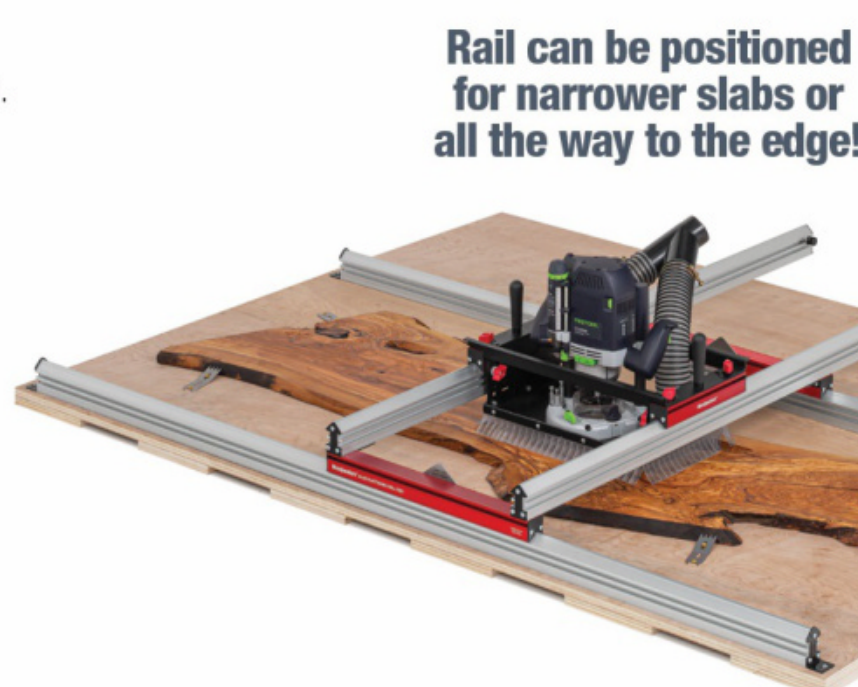
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- Router carriage now has adjustable height & built-in dust ports.
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## SHOP TEST

# Benchtop Planers

*These machines reduce boards to final thickness quickly and accurately.*



► Delta and Ryobi launched new benchtop planers too late to be included in our tests.

**W**hen we last reviewed benchtop planers (issue 246, May 2017), only one machine featured an insert cutter-head rather than the traditional straight knives. Fast-forward to today, and at least a half-dozen benchtop planers cut with an insert head. We wanted to see how these machines fare against models equipped with straight knives, so we rounded up 15 planers to test head-to-head in the *WOOD*® magazine shop. Here's what we found.

### Cut quality: Straight makes great

In a perfect world, a planer would leave a board so smooth that you wouldn't have to sand it to a final finish. But that's never the case, so the best you can hope for is to minimize sanding. To grade each planer's quality of cut (see the chart on *page 46*), we planed walnut boards and gently rubbed them with a flat piece of white chalk: The chalk sticks to high spots and leaves low spots bare. On





**A** White chalk reveals minimal milling marks from the DeWalt DW735X when planing at its slowest feed speed.

the smoothest surfaces [Photo A], left by the DeWalt DW734 and DW735X—each with a three-knife cutterhead—we could start sanding with 150-grit abrasive. At the opposite end of the spectrum [Photo B], we had to start with 80-grit sandpaper or a scraper to smooth the more pronounced milling marks left by the Grizzly G0940, Laguna PX12, Oliver 10044, and Ridgid R4850.



**B** Though more obvious on this board planed by the Oliver machine, insert cutterheads typically create ridges and grooves along the length of the planed board.





► Watch a video demonstration of the differences between straight knives and insert cutters. [woodmagazine.com/planercutters](http://woodmagazine.com/planercutters)

Three models—DeWalt DW735X, Jet JWP-13BT, and Rikon 25-135H—provide two feed speeds. Use the faster speed to remove material quickly, then switch to the slow speed for the final passes to achieve the best quality of cut. (The quality-of-cut grades in our chart on *page 46* reflect the slow speed for these machines.)

### (Insert advantages here)

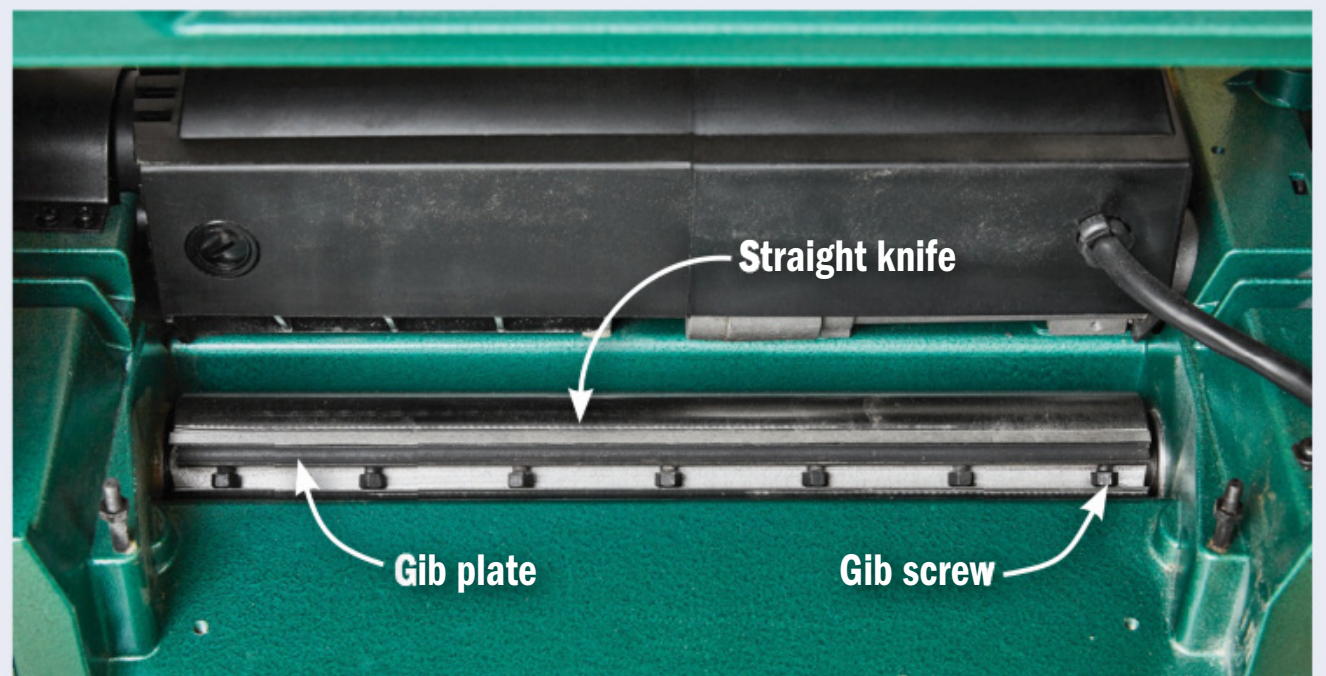
Although none of the insert-cutterhead planers (*below right*) produced an “A” cut, you may find their advantages worth a little extra cleanup time. For example, the carbide cutters found on four test models should dull slower than steel inserts or straight knives. And, the ½"-wide insert cutters create smaller chips than do straight knives, lessening the load on your dust collector. These smaller bites also reduce the cutting noise on planers and jointers with induction motors, but the universal motors on these benchtop machines negate that benefit: at 90–104 decibels, you’ll still need full-time hearing protection.

Should a knot or piece of grit nick your straight knives, you’re in for flipping, replacing, or sharpening the knives (held in place by lots of screws). But with insert cutters, you simply rotate or replace only the nicked cutters—a one-screw-per-cutter job. Replacing a full set of insert cutters takes longer than replacing or flipping the disposable self-indexing straight knives, but you’ll rarely replace or rotate all the cutters at once.

We downgraded the Laguna when it comes to changing cutters for two reasons: First, the motor housing interfered with the included T-wrench. And second, the screws holding the insert cutters were so tight from the factory that we were unable to loosen them. Laguna’s Benjamin Helshoj said he had no difficulty loosening screws on multiple planers at his location, so ours might be an isolated problem.

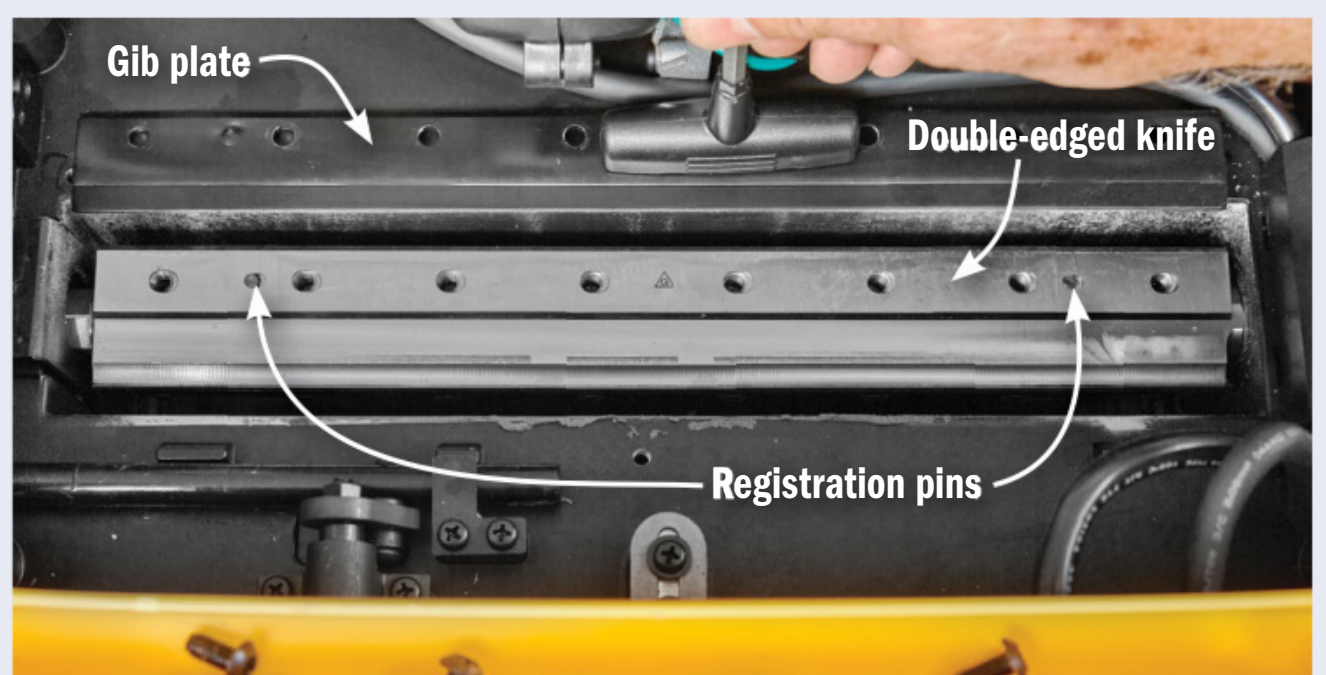
The Grizzly G0505 uses traditional resharpenable knives that rest on springs within the cutterhead and require using a spanner tool (included) to set accurately, a fussy and time-consuming process.

## Comparing the cutters head-to-head-to-head-to-head



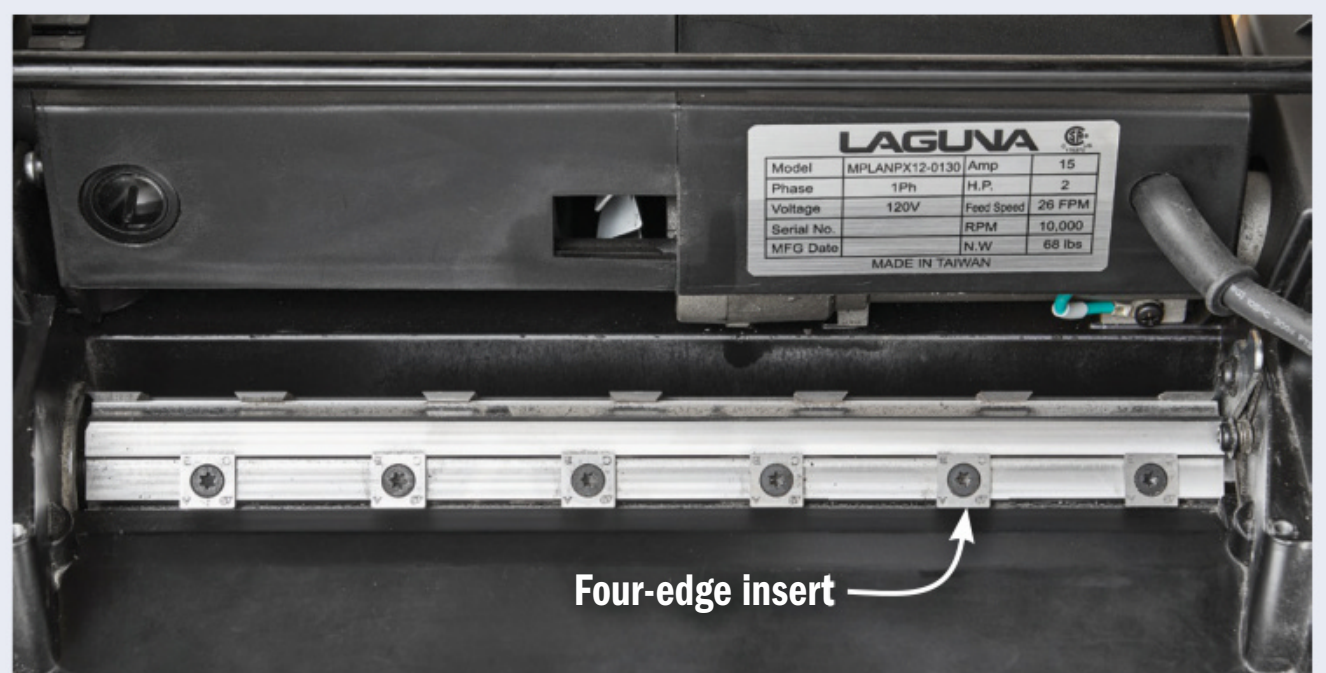
### TRADITIONAL STRAIGHT KNIVES

Resharpenable knives rest on spring-supported jackscrews (not visible), and secure to the cutterhead with a multiscrew gib plate.



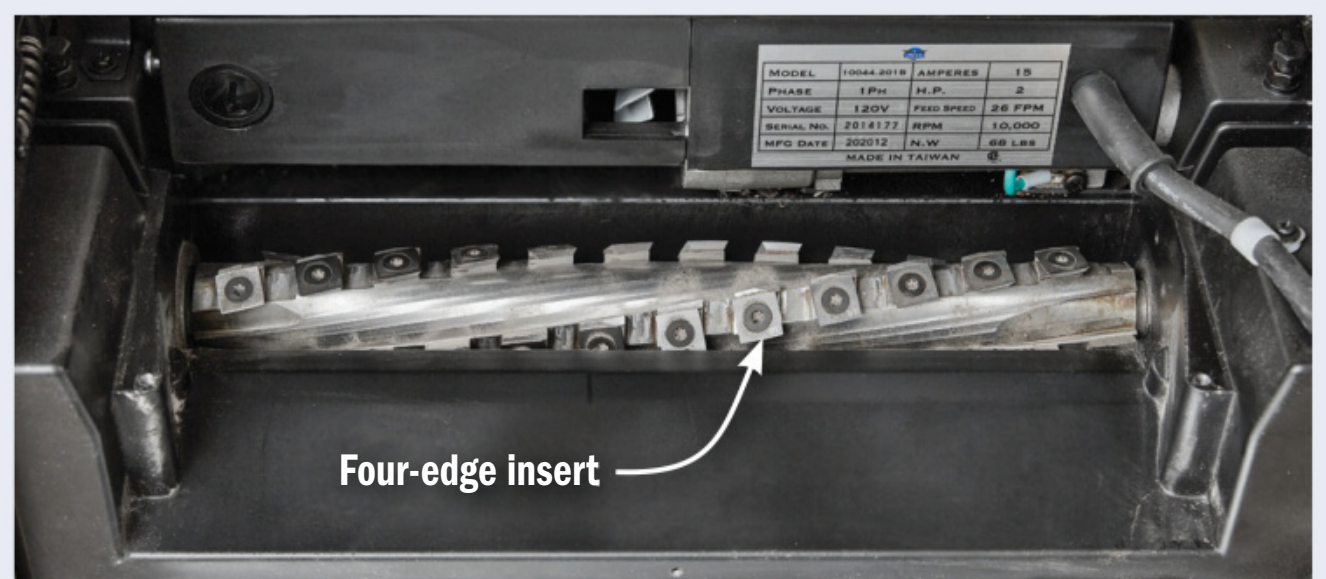
### SELF-INDEXING STRAIGHT KNIVES

Disposable knives register on pins on the cutterhead, and secure with a gib plate and screws. When one edge dulls, flip the knives to their fresh edge.



### STRAIGHT INSERT CUTTERHEAD

Instead of full-width knives, these use short, replaceable insert cutters. Staggered cutters progressively cut the full width of the head. Jet’s model uses a similar style, but with cutters twice as wide.



### HELICAL INSERT CUTTERHEAD

Square insert cutters wrap helically around the cutterhead shaft.

**Tip!** Keep an extra set of knives or 10–20 inserts on hand to avoid downtime waiting for new or resharpened ones to arrive.



► Learn tips for reducing snipe. [woodmagazine.com/snipevid](http://woodmagazine.com/snipevid)

## Shoot down problem snipe

Snipe often proves more frustrating to deal with than a less-than-stellar cut quality. If you can't remove snipe (shown at *right*) by sanding, scraping, hand-planing, or cutting it off entirely, it inevitably shows up in your finished project. Adjusting the planer's infeed and outfeed tables usually lessens the severity of snipe—a trial-and-error process that's ultimately worth the effort.

From the factory, each planer sniped, and in general, planers with beds shorter than 30" sniped deeper. But we dialed in five machines (both DeWalts, Jet, Laguna, and Ridgid) so they gouged no more than .0015", an amount we quickly sanded away. Snipe from the other planers required varying amounts of greater effort to remove. Although seven planers provide a manual carriage lock intended to minimize snipe, we found mixed results: some helped, but don't expect a carriage lock to eliminate snipe.

## Power forward

All of the planers demonstrated sufficient power to plane  $\frac{1}{32}$ " from full-width red oak boards, a very reasonable performance expectation. When we challenged the machines to cut as deep as  $\frac{1}{16}$ " from those same boards, we stalled the Laguna and both Grizzly machines. The DeWalt DW735X, Rikon, and Triton models exhibited the most muscle.



**Snipe is a slightly deeper cut** about 2–3" from each end of a board, resulting when only one feed roller engages the board, allowing the cutterhead to gouge.

## Chip collection a big must

All but two tested machines come with a chip-collection hood and port for either 2½" or 4" hose. Of the seven machines that earned top marks for chip collection, all but the Grizzly G0940 have 4" ports; that model has a 2½" port with a 4" adapter. Built-in blowers in the DeWalt DW735X and Oliver evacuated chips so effectively you almost won't need to turn on the connected dust collector.

The Grizzly G0505 and Makita 2012NB do not include a chip-collection hood and port. Instead, they spew chips out the back. Both sell optional chip-collection hoods.

► Tune up your benchtop planer for better performance. [woodmagazine.com/planertips](http://woodmagazine.com/planertips)



**Short infeed and outfeed tables**, shown here on the Craftsman CMEW320, lack the support needed to decrease snipe.

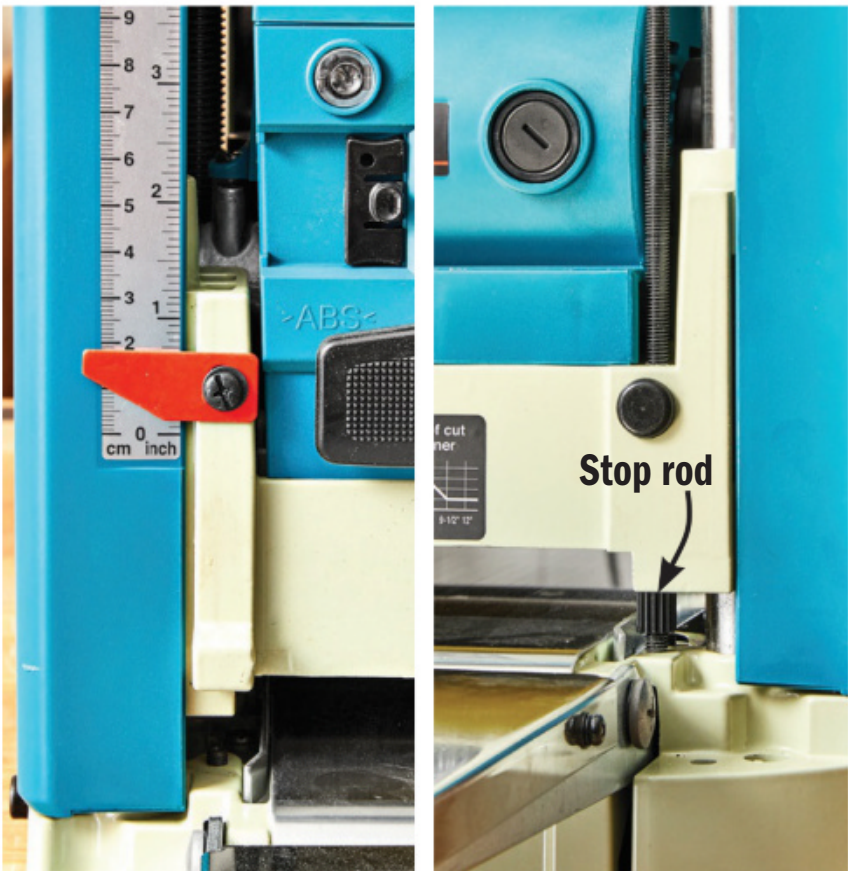


**Longer tables**, shown on the DeWalt DW734, provide greater support and subtle elevation at the ends to decrease snipe.





Ridgid provides 10 preset thickness stops from 1/8" to 1 1/4", with markings in 1/32" increments, and a manual lock for ultrafine thickness control.



Makita's stop rod works well enough, but you must reset it for each thickness. To do so, lower the carriage to the desired thickness on the depth scale, then drop the stop rod fully and lock it in place.

### Shortcuts to accurate planing

■ **Thickness stops.** Six machines lack pre-set stops for common thicknesses. These stops help to prevent you from planing a board thinner than intended. We like Ridgid's, shown at *top*, best.

■ **Depth-of-cut gauge.** When you insert the end of the board beneath it, this mechanism tells you how much material the planer will remove. We find it most helpful when making the first pass or two, especially with rough lumber. The gauges on the DeWalt DW735X and Ridgid worked best.

■ **Thickness scale.** Each planer comes with a scale and adjustable indicator, but not all prove easy to use. We like the systems on the DeWalt DW735X, Grizzly G0940, Laguna, Oliver, Ridgid, Rikon, and Shop Fox W1877 best. Delta's scale was applied too high (vertically), making it impossible to calibrate the cursor accurately. Curiously, Craftsman's scale measures in confusing 1/10" increments.

## Benchtop planers: Ideally suited for home workshops

| MODEL             | PERFORMANCE RATINGS (1) |                  |                |                     |                                 |                               |                                  |                               | TYPE OF CUTTERS (NUMBER OF INSERTS) (3) | FEED RATE, FPM |
|-------------------|-------------------------|------------------|----------------|---------------------|---------------------------------|-------------------------------|----------------------------------|-------------------------------|-----------------------------------------|----------------|
|                   | PRIMARY                 |                  |                |                     | SECONDARY                       |                               |                                  |                               |                                         |                |
|                   | CUT QUALITY             | ABSENCE OF SNIPE | OBSERVED POWER | CHIP COLLECTION (2) | EASE OF CHANGING KNIVES/CUTTERS | EASE OF USING THICKNESS STOPS | EASE OF USING DEPTH-OF-CUT GAUGE | EASE OF USING THICKNESS SCALE |                                         |                |
| CRAFTSMAN CMEW320 | B                       | C                | B+             | B                   | A                               | N/A                           | N/A                              | D                             | 2D                                      | 32             |
| DELTA 22-555      | B                       | C                | B              | B                   | A                               | N/A                           | N/A                              | C-                            | 2D                                      | 32             |
| DEWALT DW734      | A                       | A                | A-             | A                   | A-                              | B-                            | B                                | B+                            | 3                                       | 26             |
| DEWALT DW735X     | A                       | A                | A              | A                   | A-                              | A-                            | A                                | A                             | 3                                       | 14/21          |
| GRIZZLY G0505     | B-                      | D                | B-             | D                   | C-                              | N/A                           | N/A                              | B-                            | 2R                                      | 32             |
| GRIZZLY G0940     | C                       | C                | B-             | A                   | B-                              | B                             | B                                | A-                            | C4 (30)                                 | 27             |
| JET JWP-13BT      | B                       | A                | B+             | B                   | C+                              | B                             | B                                | B-                            | H2 (24)                                 | 18/29          |
| LAGUNA PX12       | C-                      | A                | B-             | A                   | D                               | B-                            | B                                | A-                            | C4 (26)                                 | 28             |
| MAKITA 2012NB     | B+                      | B                | B              | D                   | A-                              | N/A                           | C                                | B                             | 2D                                      | 28             |
| OLIVER 10044      | C-                      | B+               | B              | A                   | C                               | B-                            | B                                | A-                            | C4 (36)                                 | 28             |
| RIDGID R4850      | C+                      | A                | A-             | B                   | A-                              | A                             | A                                | A-                            | 3                                       | 33             |
| RIKON 25-135H     | B-                      | B-               | A              | A                   | B                               | B                             | B                                | A                             | H2 (26)                                 | 18/28          |
| SHOP FOX W1877    | B+                      | B+               | B+             | A                   | B                               | A-                            | B                                | A-                            | C2 (26)                                 | 27             |
| TRITON TPT125     | A-                      | C                | A              | B                   | C-                              | N/A                           | N/A                              | B-                            | 2D                                      | 31             |
| WEN 6552T         | A-                      | C                | A-             | B                   | C-                              | N/A                           | B                                | B                             | 3                                       | 26             |



The digital gauge on the Oliver planer accurately displays the thickness setting, readable in fractions and decimals. It runs on two AAA alkaline batteries.

### An inside straight wins the pot

Since its launch in 2003, the DeWalt DW735 (no "X" version until recently) has consistently outperformed the portable planer pack, but at a premium price. Now priced in the middle of the range, and facing competition from insert cutterheads, it's once again our Top Tool. It scored among the highest grades in every test category, and when you factor in the blower-assisted chip collection, two feed speeds, and the extra set of knives (a \$55 value), it's a better value than ever. If you prefer an insert cutterhead, we recommend the Jet JWP-13BT and Rikon 25-135H.

Our Top Value award goes to the Wen 6552T. It offers few frills, but but offers more power and better cut quality than many higher priced machines in the test. 🌳



| CAPACITIES,<br>INCHES |                          |                          |   |    | OVERALL DIMENSIONS                       | ACCESSORIES (4) |          |     |    |      |   |   |       |               |                                    |
|-----------------------|--------------------------|--------------------------|---|----|------------------------------------------|-----------------|----------|-----|----|------|---|---|-------|---------------|------------------------------------|
| MAX. WIDTH OF CUT     | MAX. WORKPIECE THICKNESS | MIN. WORKPIECE THICKNESS |   |    | L × W × H, INCHES (WITH TABLES EXTENDED) | STANDARD        | OPTIONAL |     |    |      |   |   |       |               |                                    |
| 12½                   | 6⅞                       | ⅛                        | N | 2⅛ | 23⅝×21½×17                               | D               |          | 93  | 56 | 6'2" | 2 | T | \$350 | \$37          | 888-331-4569, craftsman.com        |
| 13                    | 6⅞                       | ⅝                        | N | 2⅜ | 23⅝×21½×20¼                              | C, D            | S        | 91  | 60 | 7'8" | 5 | T | \$400 | \$49          | 800-223-7278, deltamachinery.com   |
| 12½                   | 6⅞                       | ⅛                        | Y | 4  | 33⅞×21¾×20                               | D               | S        | 93  | 76 | 7'   | 3 | T | \$500 | \$55          | 800-433-9258, dewalt.com           |
| 13                    | 6⅞                       | ⅛                        | Y | 4  | 37¾×27×14¼                               | D, K            | S        | 93  | 91 | 7'6" | 3 | T | \$680 | \$55          | 800-433-9258, dewalt.com           |
| 12½                   | 6⅜                       | 1⅜                       | N |    | 27⅞×15¼×18¾                              | C               | D, S     | 94  | 68 | 8'3" | 1 | C | \$425 | \$79          | 800-523-4777, grizzly.com          |
| 13                    | 6                        | ¼                        | Y | 2⅛ | 28×23¼×18¾                               | D               | S        | 96  | 75 | 6'5" | 1 | C | \$895 | \$79/10-pack  | 800-523-4777, grizzly.com          |
| 13                    | 6⅜                       | ⅜                        | Y | 4  | 28¼×20⅞×20                               | D               | R, S     | 94  | 75 | 6'7" | 5 | T | \$940 | \$75/10-pack  | 800-274-6848, jettools.com         |
| 12½                   | 6¼                       | ⅝                        | Y | 4  | 33⅞×20×20¼                               | D               |          | 94  | 70 | 7'   | 2 | T | \$700 | \$70/10-pack  | 800-234-1976, lagunatools.com      |
| 12                    | 6⅜                       | ⅝                        | N |    | 30⅞×19×15⅝                               |                 | D, S     | 96  | 63 | 7'4" | 1 | C | \$750 | \$40          | 800-462-5482, makitatools.com      |
| 12½                   | 6⅜                       | ⅝                        | Y | 4  | 33⅞×20×20¼                               | D               |          | 94  | 68 | 7'   | 2 | T | \$900 | \$60/10-pack  | 800-559-5065, olivermachinery.net  |
| 13                    | 6⅜                       | ⅛                        | Y | 4  | 35⅞×18½×19⅞                              | D               |          | 95  | 72 | 6'5" | 5 | T | \$500 | \$39          | 866-539-1710, ridgidpowertools.com |
| 13                    | 6⅜                       | ⅜                        | Y | 4  | 34⅞×22¼×19½                              | D               | R        | 95  | 68 | 6'   | 5 | T | \$750 | \$60/10-pack  | 877-884-5167, rikontools.com       |
| 13                    | 6⅜                       | ⅛                        | Y | 4  | 34×19×19¼                                | D               |          | 94  | 79 | 6'   | 2 | T | \$860 | \$100/10-pack | 800-840-8420, woodstockint.com     |
| 12½                   | 6⅞                       | ⅛                        | N | 2⅜ | 23⅞×15⅞×19⅞                              | D               |          | 104 | 60 | 7'6" | 3 | C | \$425 | \$40          | 855-227-3478, tritontools.com      |
| 13                    | 6⅞                       | ⅝                        | N | 2⅛ | 24⅞×16×18¾                               | D               | S        | 90  | 63 | 6'4" | 2 | C | \$360 | \$25          | 847-429-9263, wenproducts.com      |

1.

A

B

C

D

N/A

Excellent

Good

Fair

Poor

Not applicable

2. All units tested with a chip-collection hood, if included, connected to a dust collector.

3.

(2D) Two disposable double-edged steel straight knives
(2R) Two resharpenable steel straight knives
(3) Three disposable double-edged steel straight knives
(C2) Carbide inserts with two cutting edges
(C4) Carbide inserts with four cutting edges
(H2) High-speed-steel inserts with two cutting edges

4.

(C) Chip-deflection shield
(D) Chip-collection hood/port
(K) Spare set of knives
(R) Carbide insert cutters
(S) Stand

5.

(C) China
(T) Taiwan

6. Prices current at time of article production and do not include shipping, where applicable.
- 
- Produced by **Bob Hunter** with **Tom Brumback**
- woodmagazine.com
- 47

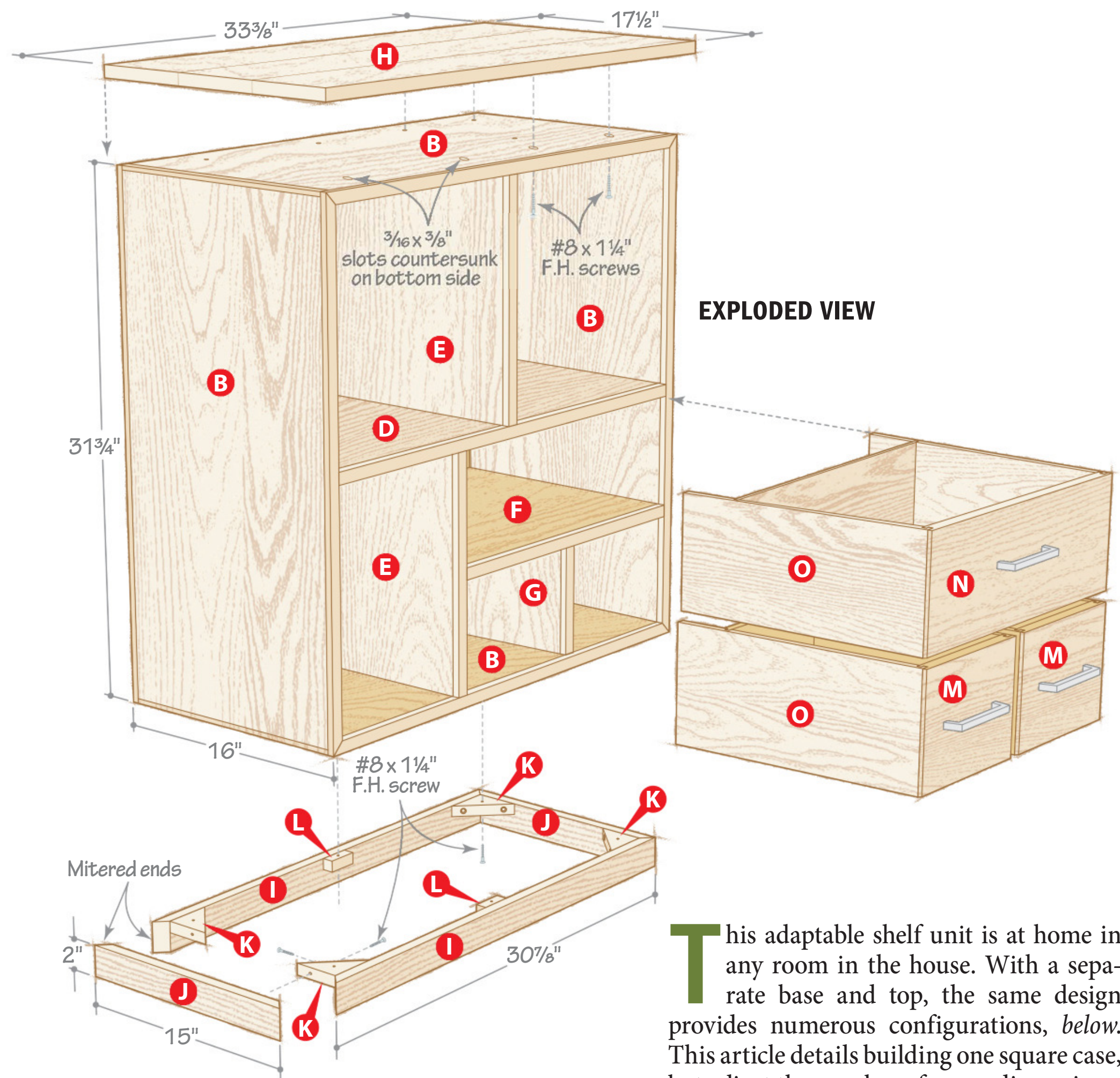


# Modular Shelves

*Build one or build more, and maximize their versatility: Orient any side up, use with or without drawers, stack them, or line them up to suit your space and needs.*





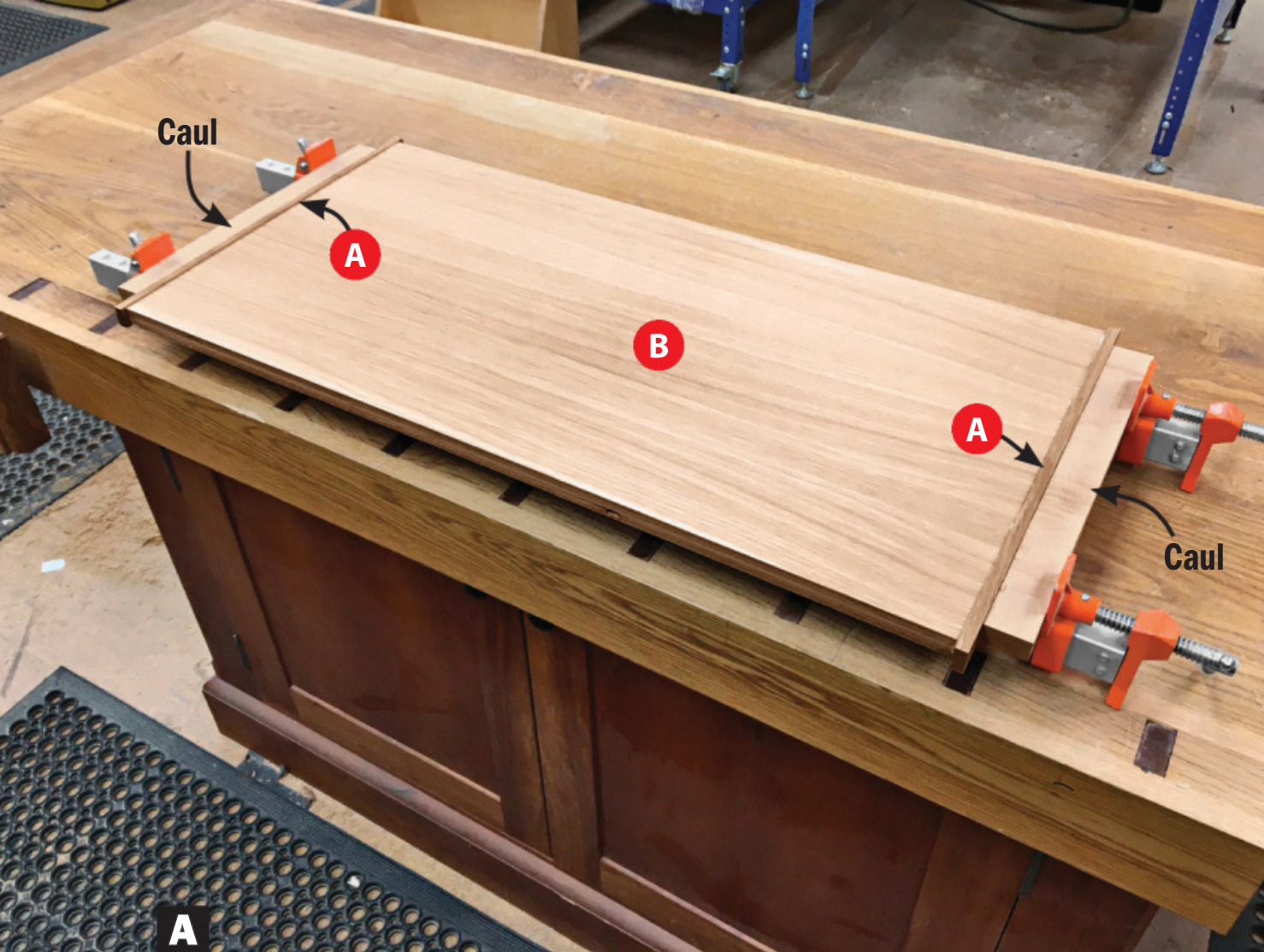


**T**his adaptable shelf unit is at home in any room in the house. With a separate base and top, the same design provides numerous configurations, *below*. This article details building one square case, but adjust the number of cases, dimensions, and drawer placement as desired.

**DIMENSIONS:**  
 $33\frac{3}{8}"$  W  $\times$   $17\frac{1}{2}"$  D  $\times$   $34\frac{1}{2}"$  H  
 Approximate materials cost for single case:  
**\$250**  
**3** looks, same construction techniques







**A** Cauls distribute clamping pressure evenly when gluing the corner trim (A) to the sides, top, and bottom (B).



**B** Rout the trim (A) edges flush to parts B using a rabbeted auxiliary fence and flush-trim bit.

## Start by edging the panels

**1** Cut the corner trim (A) slightly wider and longer than listed [Materials List]. Cut the case sides, top, and bottom (B) to size.

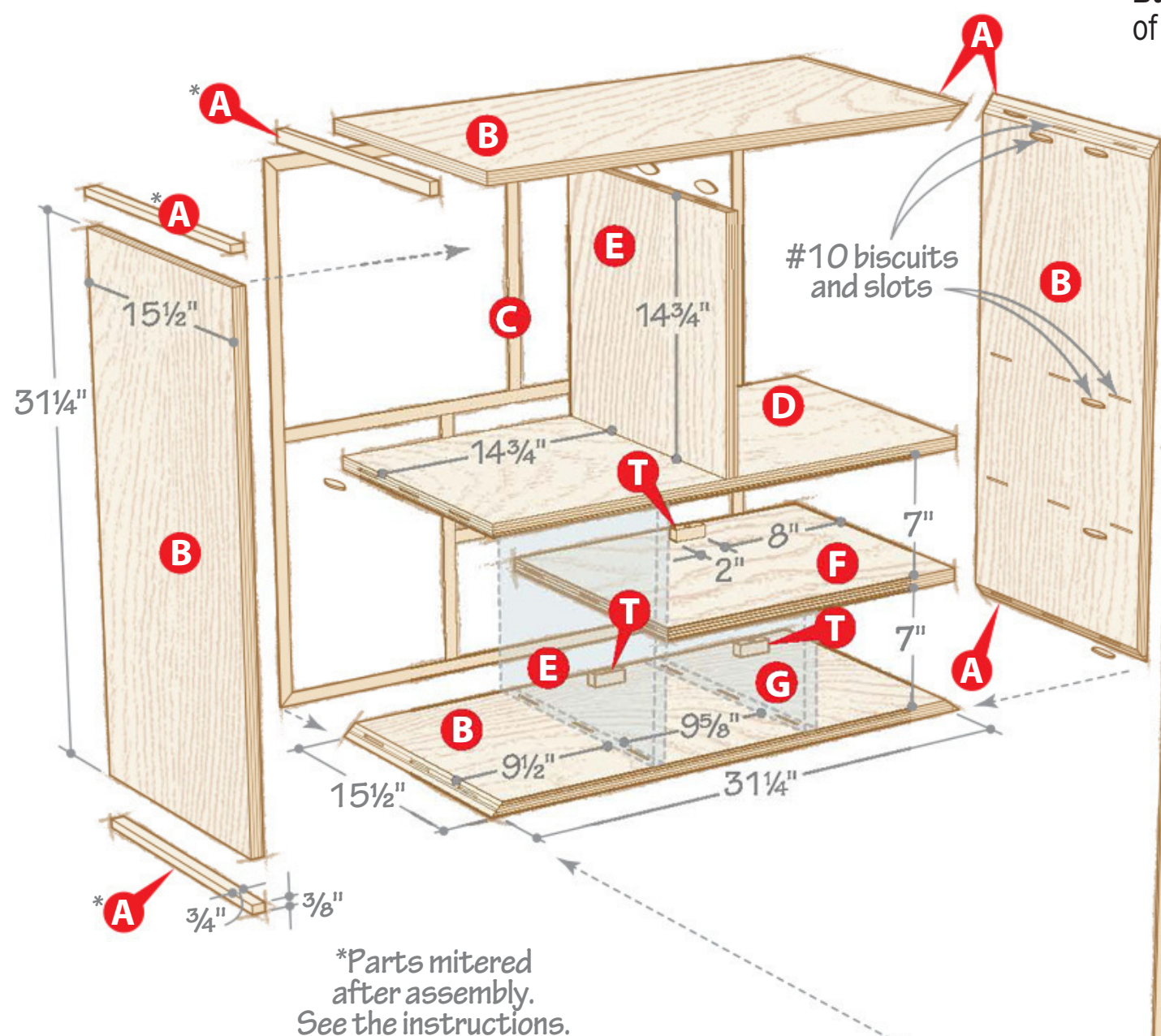
**2** Glue the trim to the ends of parts B [Drawing 1, Photo A] with the trim overhanging all around. With the glue dry, rout the trim flush with the faces [Photo B].

**3** Cut a 3×12" spacer and place it against the tablesaw rip fence. Position the fence to align the left edges of the spacer and blade. Cut the trim (A) ends flush with the edges of the panels [Photo C].

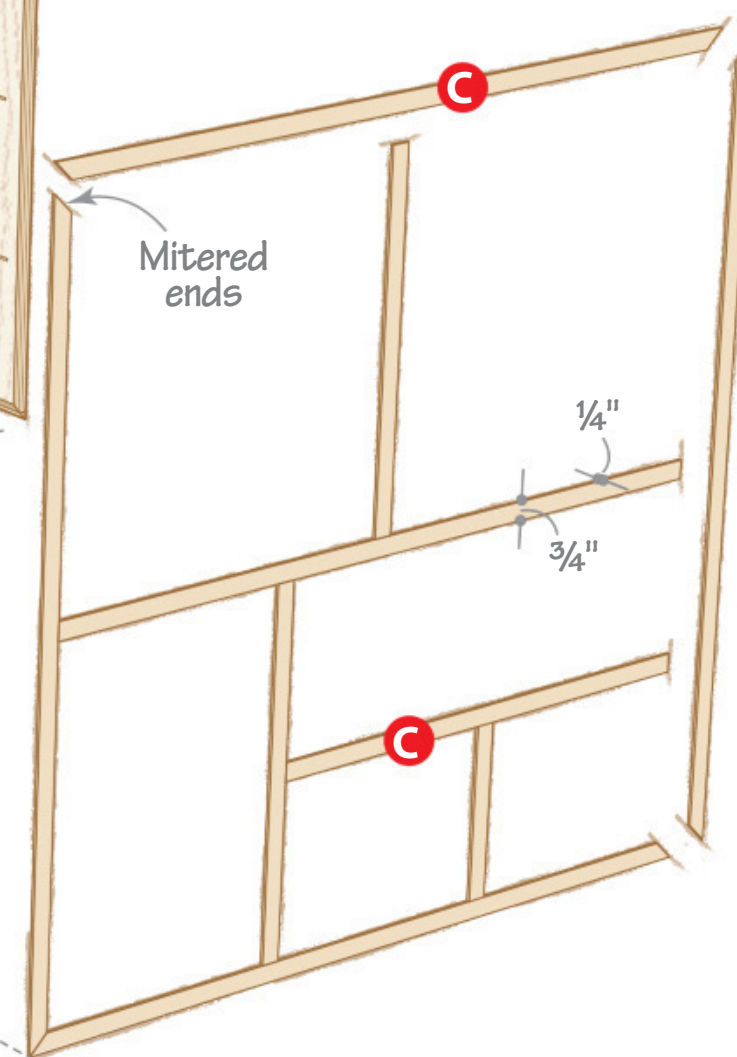
**4** Plane blanks for the edging (C) and rip them to width. From those blanks, cross-cut the following rough lengths: ten 34"



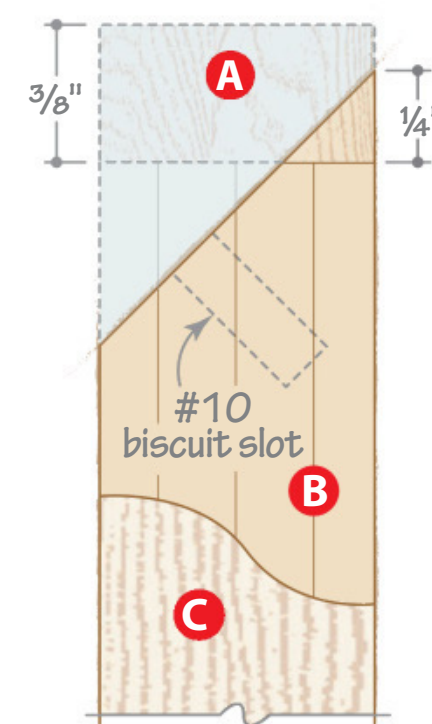
**C** Butt a part B against the spacer and slide both into the saw blade, cutting the end of the corner trim (A) flush.



## 1 CASE



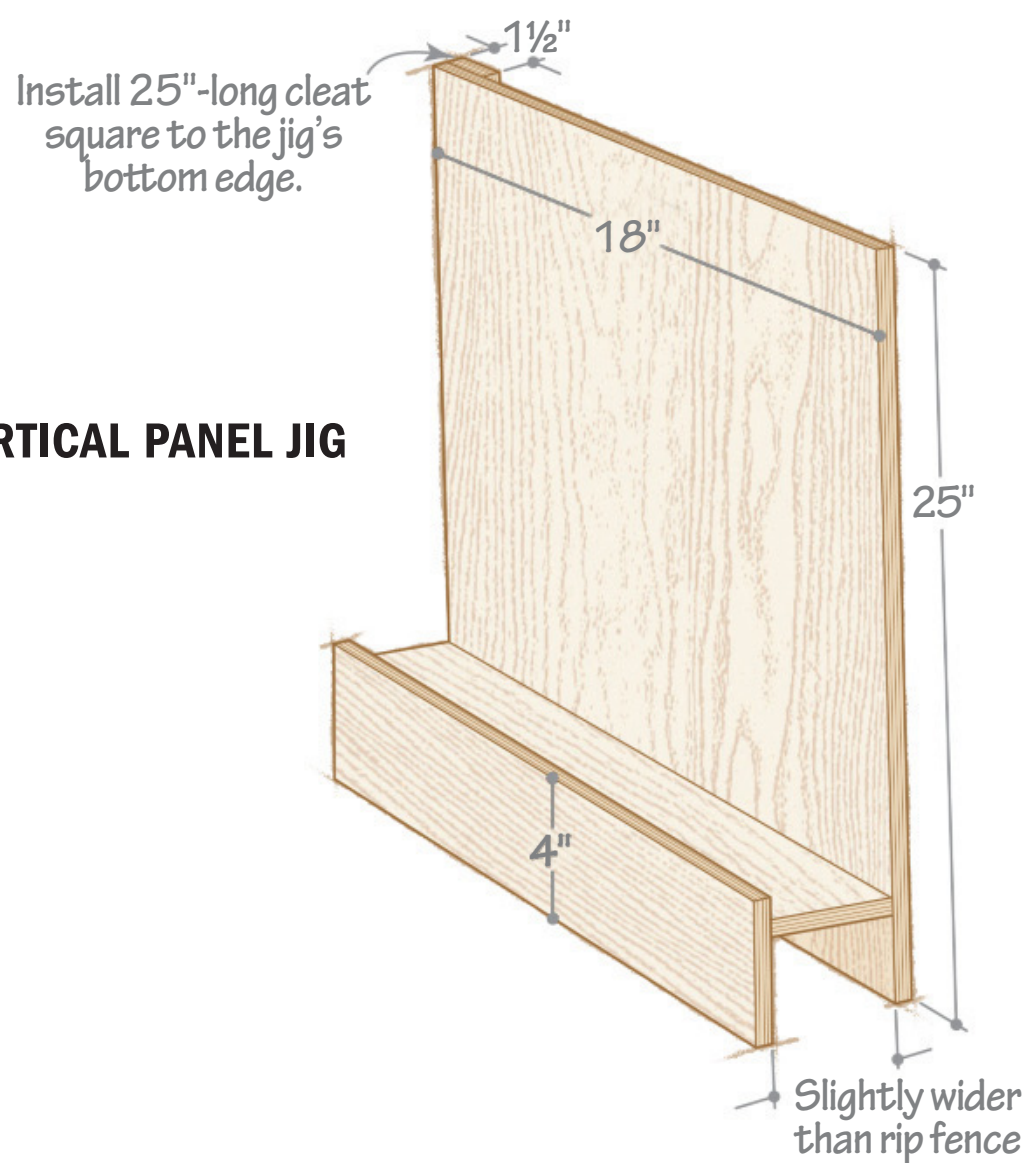
## 1a CASE PANEL END DETAIL







**D** Bevel-cut one end of a panel, then rotate it end for end and clamp the same face against the jig and bevel-cut the opposite end.



## 2 VERTICAL PANEL JIG

pieces, two 21" pieces, four 16" pieces, and two 8" pieces. Cut the shelves and dividers (D–G) to width and 1/2" overlength.

**5** Glue the edging (C) to the case parts (A/B, D–G), with the edging overhanging equally, again using cauls to distribute clamp pressure. Flush-trim the edging on parts A/B as before. Flush-trim only the edges of parts D–G on the router table: You'll trim the ends later when test-fitting parts inside the case.

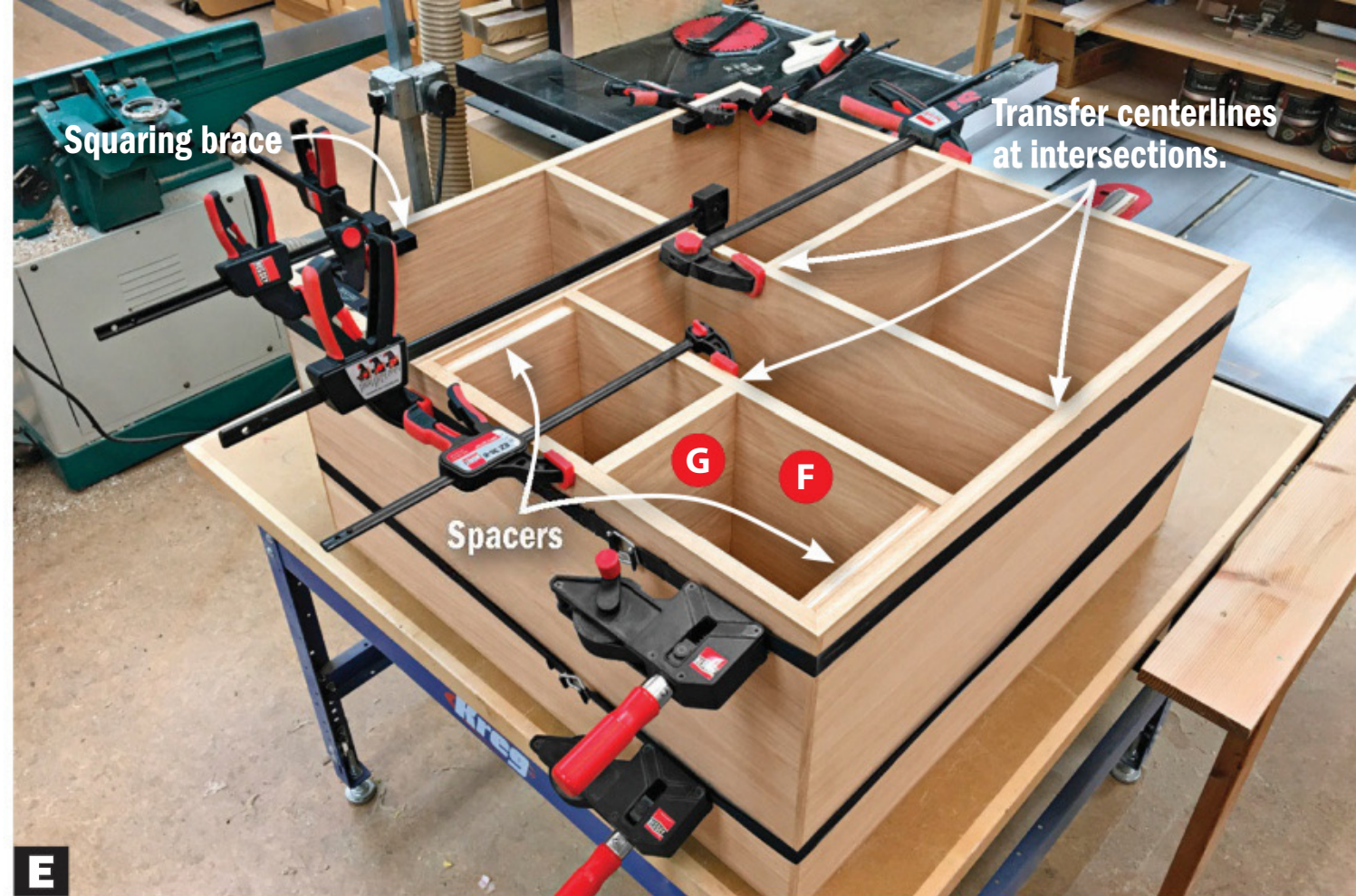
## Make the beveled case

**1** From 3/4" plywood, build a vertical panel jig to slide smoothly on your table saw's rip fence [Drawing 2].

**2** Tilt the blade to 45° and clamp an A–C assembly to the vertical panel jig. Position the jig to bevel the trim (A), leaving a 1/4 x 1/4" triangle [Drawing 1a]. Bevel-cut the ends of all four A–C assemblies [Photo D].

**3** Cut biscuit slots into the bevels [Drawing 1], positioning them closer to the heel of the

**Note:** Cutting the bevels also cuts into the bottom edge of the jig.



**E** Transfer divider (G) and shelf (F) centerlines to mating parts. Squaring braces and spacers keep everything aligned.



**F** Align the biscuit-joiner centerline with the marked centerline, using the mating part as a fence to position the tool.

bevel so you don't cut through the outside face of the case.

**4** Dry-fit the case, clamp it up, and check for gaps. Fine-tune the fit of the joints with a block plane or sandpaper, if needed.

► Make your own squaring braces. [woodmagazine.com/brace](http://woodmagazine.com/brace)

## Fit the interior

**1** With the case still dry-fit, measure the interior of the case, and cut the middle shelf (D) to fit [Drawing 1].

**2** Rest the middle shelf on the bottom, and measure the remaining interior height. Divide this dimension by two and cut the large dividers (E) to this length.

**3** Cut the short shelf (F) to size. Then cut the short divider (G) to length, to center the short shelf in its opening [Drawing 1]. Cut two scrap spacers the same length as the divider to use during assembly.

**4** Clamp the dividers and short shelf (E–G) in the case and mark the biscuit centerlines [Photo E].

**5** Disassemble the case. Extend the centerlines across the faces of the panels and mark biscuit locations along the centerlines. Cut biscuit slots in the part ends and then the faces [Photo F]. Finish-sand all the parts.









**K** Add the right side (B) and case top (B) to complete the assembly.

## Materials List

|         |                         | FINISHED SIZE |      |      |       |      |
|---------|-------------------------|---------------|------|------|-------|------|
| Part    |                         | T             | W    | L    | Matl. | Qty. |
| Case    |                         |               |      |      |       |      |
| A       | *corner trim            | ¾"            | ⅜"   | 15½" | WO    | 8    |
| B       | case sides, top, bottom | ¾"            | 15½" | 31¼" | WOP   | 4    |
| C       | edging                  | ¼"            | ¾"   | **   | WO    | **   |
| D       | *middle shelf           | ¾"            | 15½" | 30¼" | WOP   | 1    |
| E       | *large dividers         | ¾"            | 15½" | 14¾" | WOP   | 2    |
| F       | *short shelf            | ¾"            | 15½" | 20"  | WOP   | 1    |
| G       | *short divider          | ¾"            | 15½" | 7"   | WOP   | 1    |
| H       | *top                    | ¾"            | 17½" | 33⅜" | EWO   | 1    |
| Base    |                         |               |      |      |       |      |
| I       | base front/back         | ¾"            | 2"   | 30⅞" | WO    | 2    |
| J       | base ends               | ¾"            | 2"   | 15"  | WO    | 2    |
| K       | base corner blocks      | ¾"            | 3"   | 3"   | WO    | 4    |
| L       | base mounting blocks    | ¾"            | ¾"   | 3"   | WO    | 2    |
| Drawers |                         |               |      |      |       |      |
| M       | small drawer fronts     | ¾"            | 6⅓"  | 9⅞"  | M     | 2    |
| N       | large drawer front      | ¾"            | 6⅓"  | 19⅓" | M     | 1    |
| O       | drawer sides            | ½"            | 6⅓"  | 15¾" | M     | 6    |
| P       | small drawer backs      | ½"            | 6⅓"  | 9⅞"  | M     | 2    |
| Q       | large drawer back       | ½"            | 6⅓"  | 19⅞" | M     | 1    |
| R       | small drawer bottoms    | ¼"            | 9⅞"  | 12½" | MP    | 2    |
| S       | large drawer bottom     | ¼"            | 19⅞" | 12½" | MP    | 1    |
| T       | drawer stops            | ¾"            | ¾"   | 2"   | WO    | 3    |

\*Parts initially cut oversize. See the instructions.

\*\*Individual parts cut to fit. See the instructions.

**Materials key:** WO-white oak, WOP-white oak plywood, EWO-edge-glued white oak, M-maple, MP-maple plywood.

**Blade and bits:** Dado set; flush-trim router bit.

**Supplies:** #8x1 1/4" flathead screws, #10 biscuits, drawer pulls

## Finishing up

**1** Inspect the assemblies and finish-sand where needed. Apply a finish. (We sprayed on satin polyurethane.)

**2** Turn the case upside down and screw on the base, centered. Return the case upright, drill holes and slots [Exploded View], and attach the top (H), also centered.

**3** Install the drawer pulls, and install the drawer stops (T) so the drawer fronts sit flush with the front of the case [Drawing 1]. Move the shelves into their home and start making the most of their versatility. 🌳

Produced by **Andrew Zoellner** with **Kevin Boyle**

Project design: **Kevin Boyle**

Illustrations: **Roxanne LeMoine**, **Lorna Johnson**

## Cutting Diagram



3/4 x 3 1/2 x 84" White oak \*Plane or resaw to the thickness listed in the Materials List.



3/4 x 3 1/2 x 84" White oak



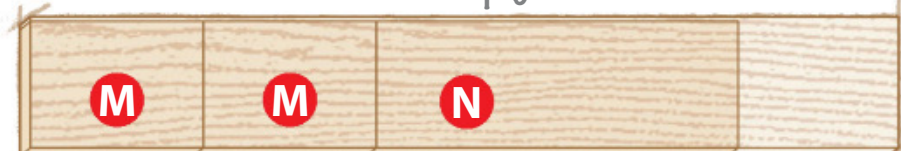
3/4 x 5 1/2 x 72" White oak



3/4 x 7 1/4 x 72" White oak



3/4 x 48 x 96" White oak plywood



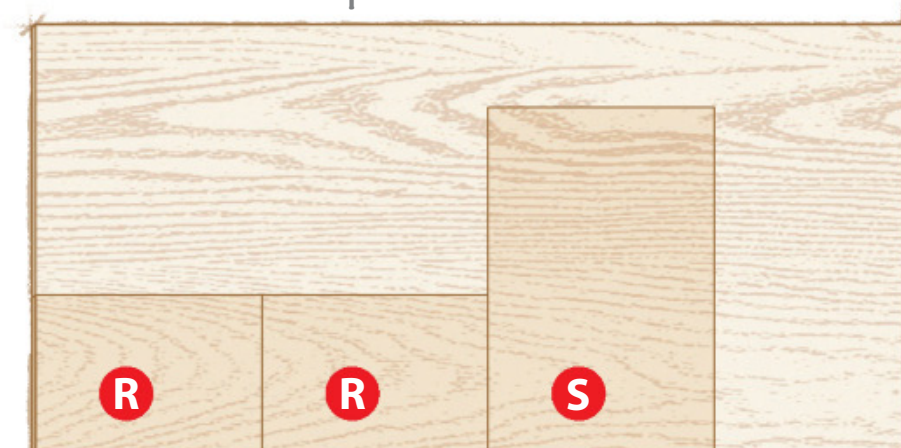
3/4 x 7 1/4 x 48" Maple



1/2 x 7 1/4 x 72" Maple



1/2 x 7 1/4 x 72" Maple



1/4 x 24 x 48" Maple plywood

This project requires 10 1/2 board feet of 4/4 white oak, 2 1/2 board feet of 4/4 maple, and 8 square feet of 1/2" maple.



# WOOD® Magazine innovate

## AWARDS 2022

Even in a global pandemic, manufacturers continue to invent safer, smarter tools and accessories. We selected these as the best of the lot.



Spring-loaded arm

### Blade-stop technology comes to portable circ saws

Festool's new tracksaw quickly stops a spinning blade if a bind causes kickback. Here's how it works: A spring-loaded arm connected to a microswitch rides behind the blade, resting on the track. Should the saw lift from the board and track, as it would do in a kickback situation, the arm drops, triggering the brake and stopping the blade in less than a second without damaging the blade. The saw resets itself automatically. (A bypass switch allows you to override this feature for tasks such as cutting across mortises, recesses, or cutouts.)

#### Antikickback cordless tracksaw

Festool no. TSC 55 5,2 KEBI-F-Plus-FS, \$800  
888-337-8600, festoolusa.com







## One-handed clamps without the cramps

Don't you hate having to repeatedly squeeze a one-handed bar clamp to close up the jaw, especially when you can't take one hand off an assembly? Rockler's new Spring-Loaded Bar Clamps slide closed automatically when you squeeze the trigger, then you only have to pull the trigger a couple of times to achieve clamping force. Rockler says these clamps deliver a maximum of 150 pounds of force, with 2¼" of throat depth and 7/8x1½" nonmarring jaw pads.

### Spring-loaded bar clamps

Rockler 6" no. 69764, \$20; 10" no. 65890, \$23  
800-279-4441, rockler.com



## Taper jig delivers repeatable precision

It's almost impossible to reset most tapering jigs to perfectly repeat the angle after you've changed it for a different taper. With the positive locking scales on Woodpeckers' Precision Taper Jig, you can set the angle from 1 to 7° in ¼° increments, or 1–15° in ½° increments, and precisely return to them at any time. You can also lock in any angle without using the scales. Built-in clamps hold the workpiece securely while also providing handles to guide the jig. You'll likely need to replace the jig's MDF base over time if you cut more than one taper angle. If you buy the shorter jig but later need more length, Woodpeckers offers a 16" extension kit (no. PTJ-EXT, \$140).

### Tablesaw tapering jig

Woodpeckers 32" no. PTJ-32, \$280; 48" no. PTJ-48, \$400  
800-752-0725, woodpeck.com

## Tool batteries shrink more

Rather than bundling traditional cylindrical lithium-ion cells inside its battery packs, DeWalt's Powerstack battery packs layer "pouch cells" similar to the flat cells used in tablets and laptop computers. The result: a 1.7-amp-hour pack that's smaller and lighter than DeWalt's current 2.0-amp-hour pack, that the company says will deliver more power and twice the number of charge cycles. The batteries, which will be sold separately and in kits beginning in December, are compatible with all DeWalt 20-volt tools and chargers.

### 20-volt pouch-cell battery

pricing not yet determined  
DeWalt  
800-433-9258, dewalt.com



Traditional cylindrical cell



Flat pouch cell





## No T-track? No problem for this featherboard

Magswitch's Vertical Featherboard Pro attaches easily to any steel-tube tablesaw rip fence (or any other steel or cast-iron surface) via the built-in MagJig magnet and removes just as easily, thanks to the MagJig's on/off switch. The angled fingers adjust up and down as well as reverse direction. And, you can remove the MagJig from the featherboard base to use with any shop-made jig.

### Vertical featherboard

Magswitch no. 81101302, \$65  
303-468-0662, magswitch.com



## Tagalong separator keeps close contact with your vac

Although cyclonic separators for shop vacuums have been around for a while, Mullet Tools' M5 separator tags along in close tandem with the vac thanks to a rigid-pipe connection that locks the two units together. And the M5's view window (which doubles as its dump port) lets you see when the unit gets full. It comes with ports to attach 2½" vac hose.

### Cyclone dust-collection separator

Mullet Tools no. M5, \$230  
316-200-1630, mullettools.com



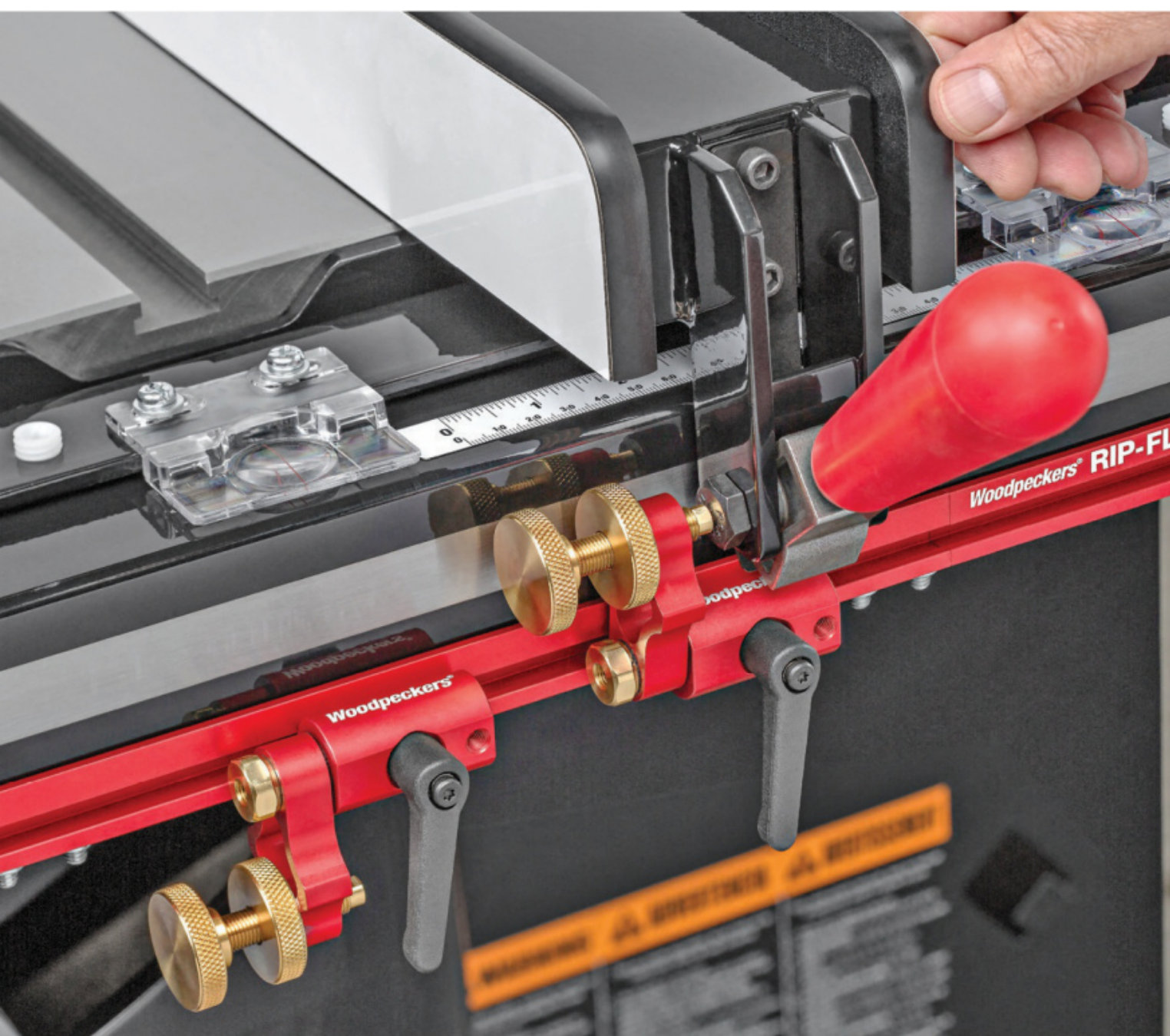


## Lift sheet goods easier with a suction-cup-like helper

The Grabo Pro-Lifter 20 puts a handle almost anywhere one didn't already exist, enabling you to better lift heavy or awkward items, such as a sheet of plywood, MDF, drywall, glass, marble, or just about anything flat. A rechargeable battery in this lightweight unit powers a pump that, when engaged on a flat surface, sucks the air from the sealed bottom face, forming a tight grip. This unit lifts up to 143 pounds of sheet goods in the "parallel hold" (shown at *right*) and up to 220 pounds when lifting perpendicularly. Those figures increase when lifting plastic, glass, or ceramic.

### Battery-powered vacuum lifters

Grabo Pro-Lifter 20, \$300  
844-430-0510, grabo.com



## Add microadjustable stops to your tablesaw rip fence

What flip-stops on a miter-gauge fence do for cutting pieces to identical length, the Rip-Flip Fence Stop System does for workpiece width. Attach the aluminum bar to your saw's front fence rail, and then secure the microadjustable stops wherever you need them to make repeatable, accurate cuts, such as for multipass dados. The system fits most saws that use a T-square-style rip fence.

### Tablesaw fence stop system

Woodpeckers 36" and 50" rip models, \$210-\$230  
800-752-0725, woodpeck.com



## I'll have the spray booth with exhaust on the side

Between airborne dust particles and noxious fumes, spraying finish seems a bit of a gamble. The PaintLine's 80"-cube Portable Jobsite Spray Booth consists of a knockdown aluminum frame wrapped in a replaceable heavy plastic liner (three included), giving you a space to spray most projects. We'd opt for the exhaust-vent attachment (\$87) that provides a filtered portal for a 20" box fan to evacuate fumes and overspray. The optional Pro Bundle (\$1,146, *above*) includes the spray booth, exhaust vent, multiple filters, and 15' of flexible duct. The Blower Bundle (\$2,057) includes all of that, plus a 1,570-cfm blower. 🌳

### Portable spray booth

The PaintLine no. PJSB, \$663  
510-477-9100, thepaintline.com



# Meating Board

*Serve up your favorite cold cuts on this easy-to-make (no baloney) charcuterie board.*







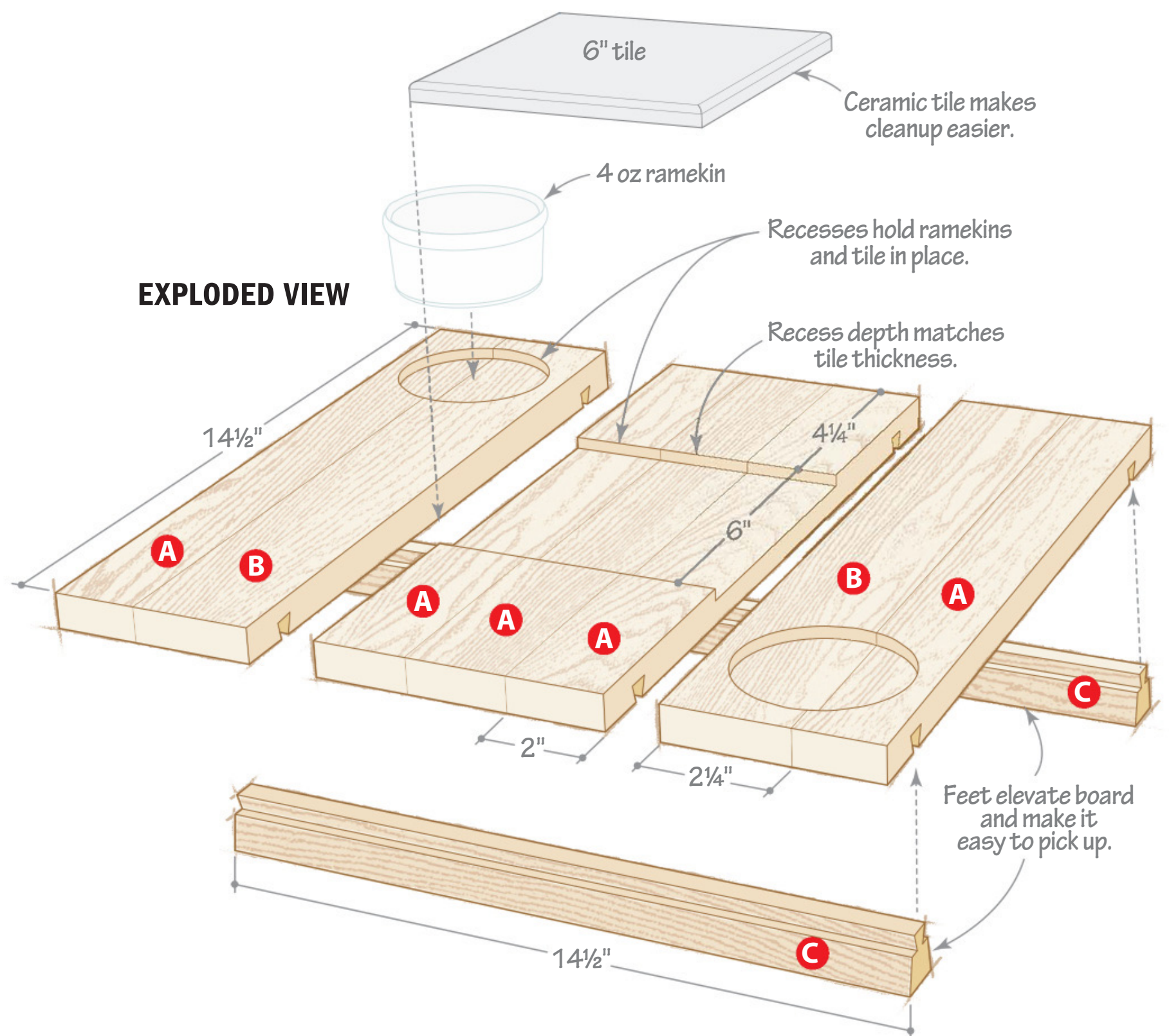
**D I M E N S I O N S :**  
14½" W x 14½" D x 1½" H

Approximate materials cost:

**\$25**

¼ to ⅓ lb

Cold cut serving size per person



## Recess time

► *Charcuterie*, a French term, refers to all types of cured, dried, or preserved meats.

**Tip!** Have your tile and ramekins on hand to use when sizing the recesses.

**1** From 4/4 stock, cut to width, but 2" over-length, five narrow strips (A) and two wide strips (B) [Materials List].

**2** Glue the strips together into three blanks: Two with one narrow (A) and one wide (B) strip, and one with three narrow strips [Exploded View]. With the glue dry, plane the assemblies to a final thickness of ¾".

**3** Install a ¾" dado stack in your tablesaw and cut a wide, centered dado on the center assembly (A/A/A) [Exploded View, Photo A].



**A** Set the dado blade height to match the thickness of your tile, then dado the blank to match the tile's width.





**B** Using the jig and a pattern bit, rout  $\frac{1}{8}$ "-deep recesses for the ramekins in opposite corners of the board.



**C** With backer boards clamped to both edges to prevent tear-out, remove the bulk of the waste from the dovetail slots with a straight bit.

**4** Edge-glue the three blanks, keeping the faces flush. With the glue dry, cut the board to final size, keeping the tile recess centered on the board [Exploded View].

**5** On a  $7 \times 7$ " scrap of  $\frac{3}{4}$ " plywood, lay out a circle  $\frac{1}{16}$ " larger than the diameter of the bottom of the ramekins [Drawing 1]. Drill or cut out the waste and sand the edge smooth with a spindle sander or sanding drum. Add a pair of cleats to adjacent edges of the jig.

**6** Position the jig on the charcuterie board and rout the recesses [Photo B].

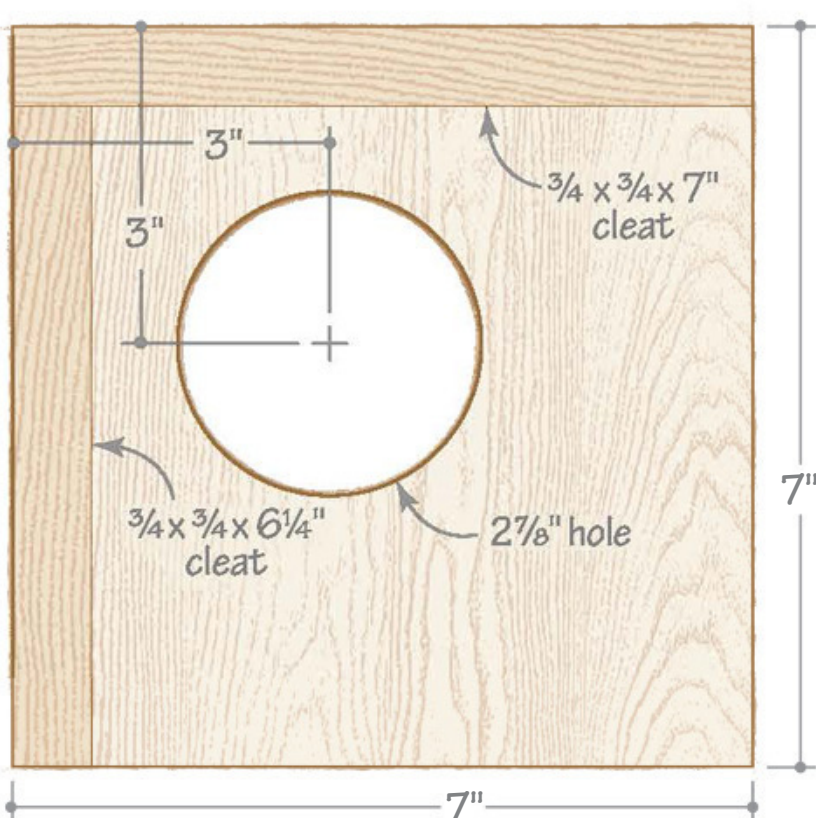
## Add a pair of tails for the feet

**1** Using a  $\frac{1}{4}$ " straight bit, rout a pair of  $\frac{5}{16}$ "-deep dados on the bottom of the board, near each end [Drawing 2, Photo C].

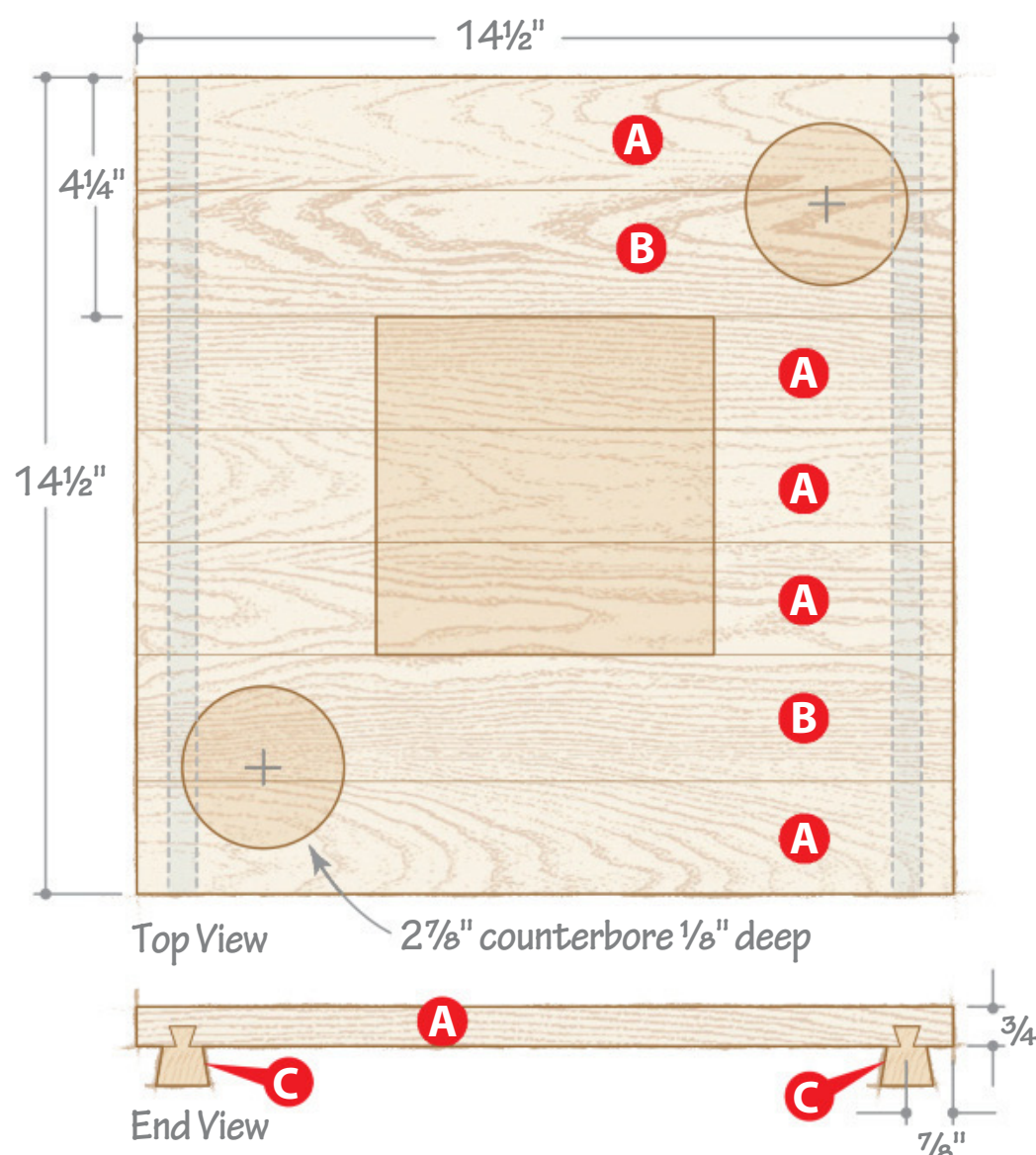
**2** Replace the straight bit with a  $14^\circ$  dovetail bit and rout the length of each dado [Photo D]. Leave the bit at the same height to rout the feet later.

**3** Cut the feet (C) to width and a couple of inches overlength, along with a test piece to use when sizing the dovetails. Rabbet the top edges of the feet and test piece [Photo E].

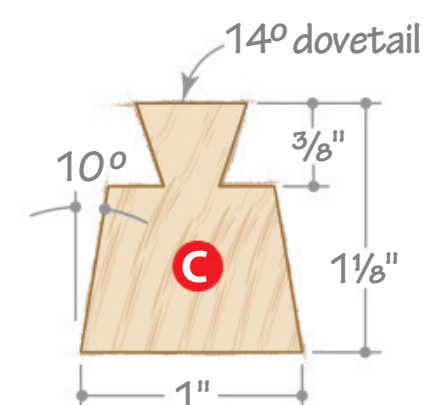
### 1 RECESS JIG



### 2 BOARD ASSEMBLY



### 2a FOOT DETAIL







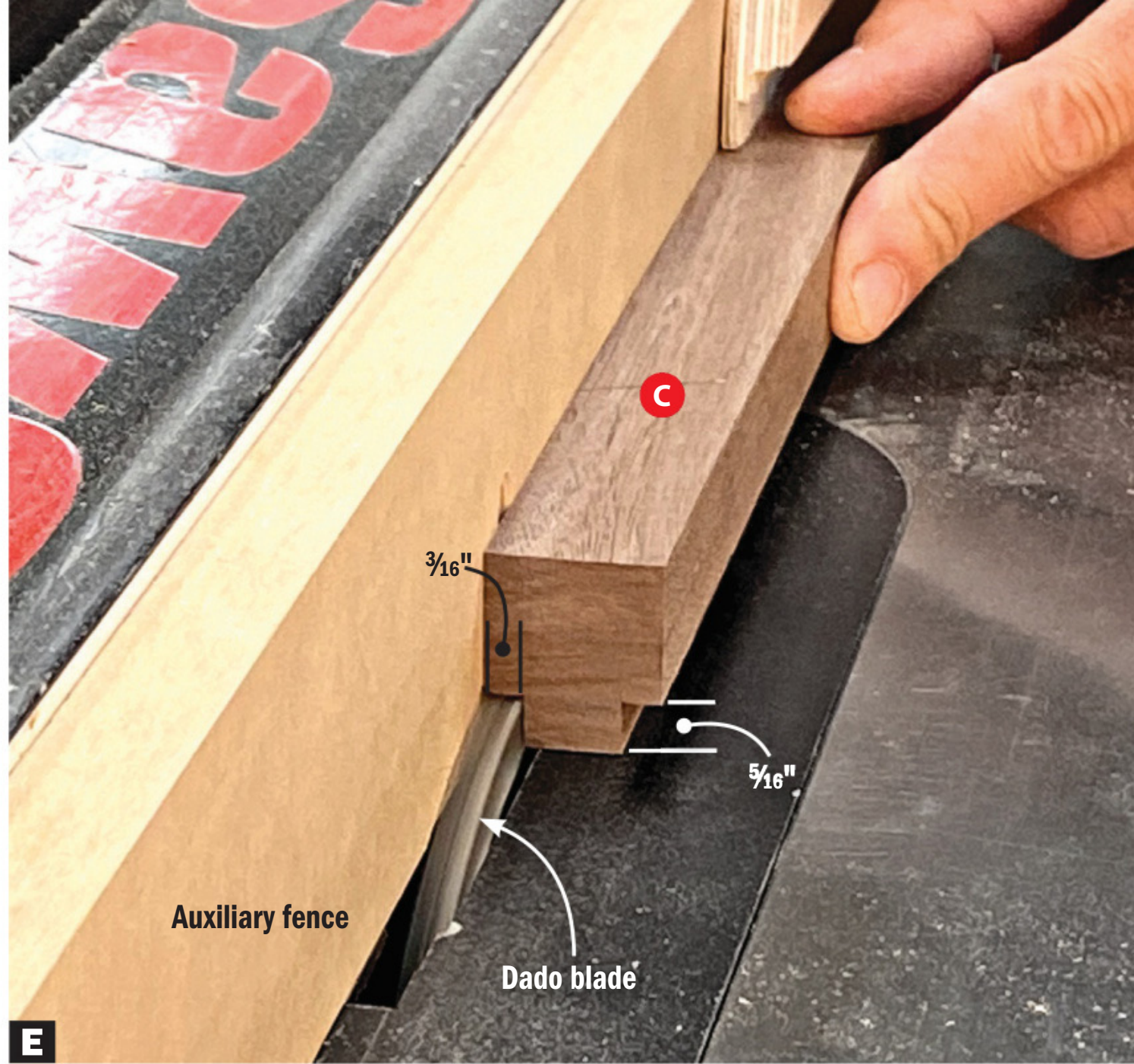
**D** Swap out the straight bit for a dovetail bit, recenter the bit on the dados, and complete the slots.

**4** Adjust the router-table fence to rout a dovetail on the test piece to fit the slot in the board [Photo F]. Aim for a sliding fit that comes together using hand pressure. Then, without moving the fence, rout the dovetails on the feet (C).

**5** Bevel the edges of the feet [Drawing 2a], cut them to final length, and finish-sand the surfaces. Slide the feet two-thirds of the way into the board, then apply glue to the remainder of the dovetail slots before sliding the feet all the way home.

**6** Finish-sand the board and apply a finish. (We used General Finishes Butcher Block Oil.) After giving the board 24 hours to absorb the oil, load it up with your favorite meats and cheeses. 🌿

▼ Using a larger tile creates an easy-clean surface for serving soft cheeses or pâtés.



**E** Bury the dado blade in an auxiliary rip fence to rabbet the edges of the feet (C).



**F** Rout both sides of the dovetail, checking the fit in the slots in the board.

## Materials List

| Part             | FINISHED SIZE |        |         | Matl. | Qty. |
|------------------|---------------|--------|---------|-------|------|
|                  | T             | W      | L       |       |      |
| A* narrow strips | 3/4"          | 2"     | 14 1/2" | C     | 5    |
| B* wide strips   | 3/4"          | 2 1/4" | 14 1/2" | C     | 2    |
| C* feet          | 1"            | 1 1/8" | 14 1/2" | W     | 2    |

\*Parts initially cut oversize. See the instructions.

**Materials key:** C=cherry, W=walnut.

**Supplies:** 6×6" ceramic tile (1).

**Blade and bits:** Dado set, 1/2" dovetail bit, 1/4" straight bit, 1/2" pattern bit.

**Source:** 4 oz ramekins (2) \$13.49 [set of 6], [woodmagazine.com/ramekin](http://woodmagazine.com/ramekin).

Produced by **Vince Ancona** with **Kevin Boyle**

Project design: **Kevin Boyle**

Illustrations: **Roxanne LeMoine, Lorna Johnson**

[woodmagazine.com](http://woodmagazine.com)



# Make Your Own Inlay Banding

By Guy Dunlap

*Turn scrap into beautiful highlights for other projects.*



Guy Dunlap teaches woodworking online and in his home shop, and has been an instructor at Weekend With WOOD. Watch his online videos on YouTube (Guyswoodshop) and at [guyswoodshop.com](http://guyswoodshop.com).

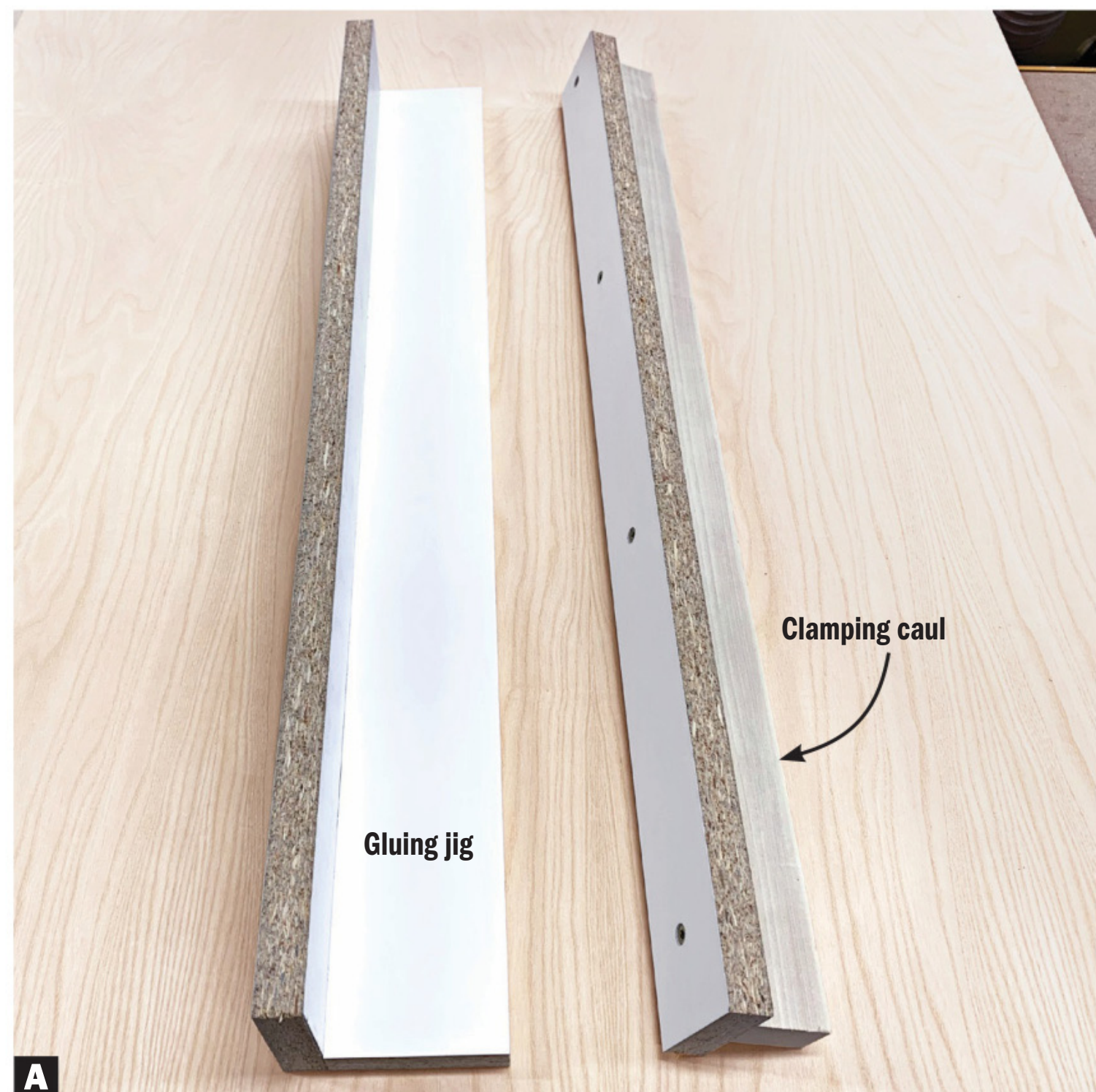


I often incorporate inlay banding in “serious” work, such as reproduction pieces, but I also use it to have some fun and give a project a fancy detail. Following these instructions, you can create your own inlay banding and be on your way to adding unique and striking visual accents to your work.

## Start with a gluing jig

Creating banding involves cutting small strips and pieces, and gluing them into blanks called packets. You then cut thin strips from a packet and combine them with other thin solid woods or veneers to form patterned strips of inlay. A simple shop-made gluing jig and clamping caul help align the packet parts, assuring the symmetry of the pattern. I use  $\frac{3}{4}$ " melamine-coated particleboard for my jig so glue squeeze-out won't adhere the packets to the jig.

To make the jig and caul, cut one  $3 \times 24$ " piece and two  $2\frac{1}{4} \times 24$ " melamine pieces. Screw a narrow piece to the bottom of the wider one, creating an L [Photo A]. Screw a 24" length of scrap lumber to the back of the remaining piece to create a T-shape caul for clamping the packets in the jig.



**A** The melamine faces of the jig and caul resist glue. Countersink the screwheads in the caul so they sit below the caul surface.



## Earn your stripes

This classic design of parallel contrasting bands, *above*, typically uses holly and dyed black veneer [Source]. I substituted less-expensive 8/4 maple for holly. While not quite as light-colored as holly, the maple still contrasts nicely with the black veneer.

**Source:** Black veneer no. 46340, 3 sq. ft., \$23, Rockler, 800-279-4441, rockler.com.

From the maple, rip a  $\frac{3}{16}$ "-wide strip and two  $\frac{1}{32}$ "-wide strips. Then cut four pieces of veneer [Photo B].

Dry-assemble the packet, stacking layers in this order:  $\frac{1}{32}$ " maple, two layers of black veneer,  $\frac{3}{16}$ " maple, two additional layers of black veneer, and finally  $\frac{1}{32}$ " maple [Photo C].

► Learn several methods to rip thin strips safely. [woodmagazine.com/thinstrips](http://woodmagazine.com/thinstrips)



**B** Use the  $\frac{3}{16}$ " piece of maple as a pattern to cut four identically sized pieces of black veneer. A scrap of plywood protects the benchtop from cuts.



**C** These layers of maple and veneer make a packet  $\frac{5}{16}$ " wide. Overall width is not critical, as you can easily rout a recess to fit any size banding.



► I use PVA wood glue, but hide glue provides a longer open time and has no effect on finish—however it needs to sit in clamps for at least 24 hours.

Using a glue roller, apply to the inside face of an outer maple layer an even, edge-to-edge coat of glue [Photo D]. Stack a veneer piece on top, align the edges, and continue adding glue and stacking until you have all the layers in place.

Place the packet in the gluing jig [Photo E]. Then, clamp the caul to the jig with the melamine surface against the packet [Photo F]. Start in the middle and work your way to the ends. Wipe off any squeeze-out, and leave clamped for several hours.

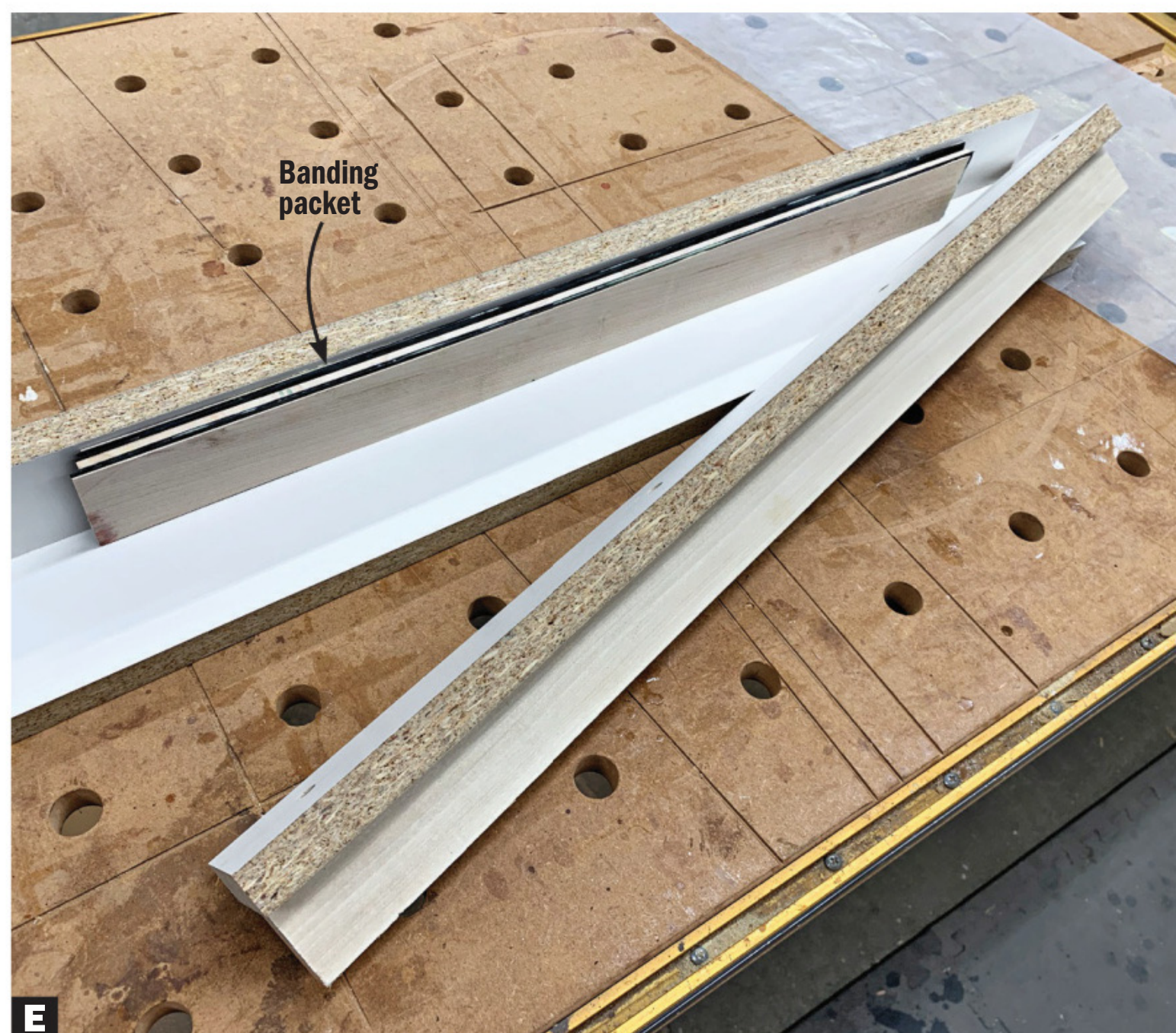
After the glue dries, the packet should easily separate from the caul and jig. If not, help it along with a putty knife.

True up one edge of the packet with a hand plane or at the jointer. If using the jointer, take a very shallow pass of  $\frac{1}{32}$ " or less. It may take several passes.

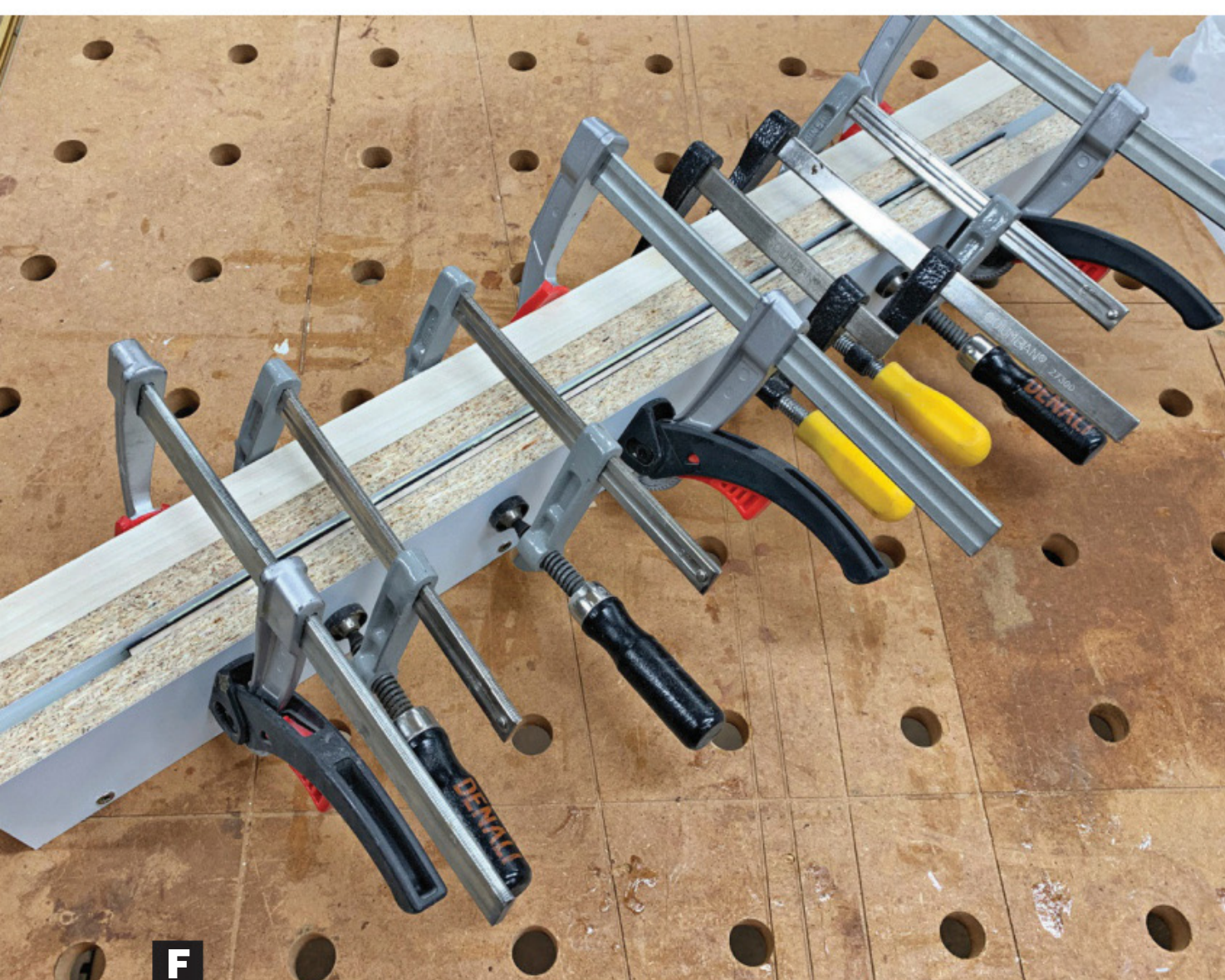
To cut the packet into banding strips, set your bandsaw fence  $\frac{1}{8}$ " from the blade. Place the packet's jointed face against the fence and start ripping strips [Photo G]. The packet should yield about 13–15 inlay strips.



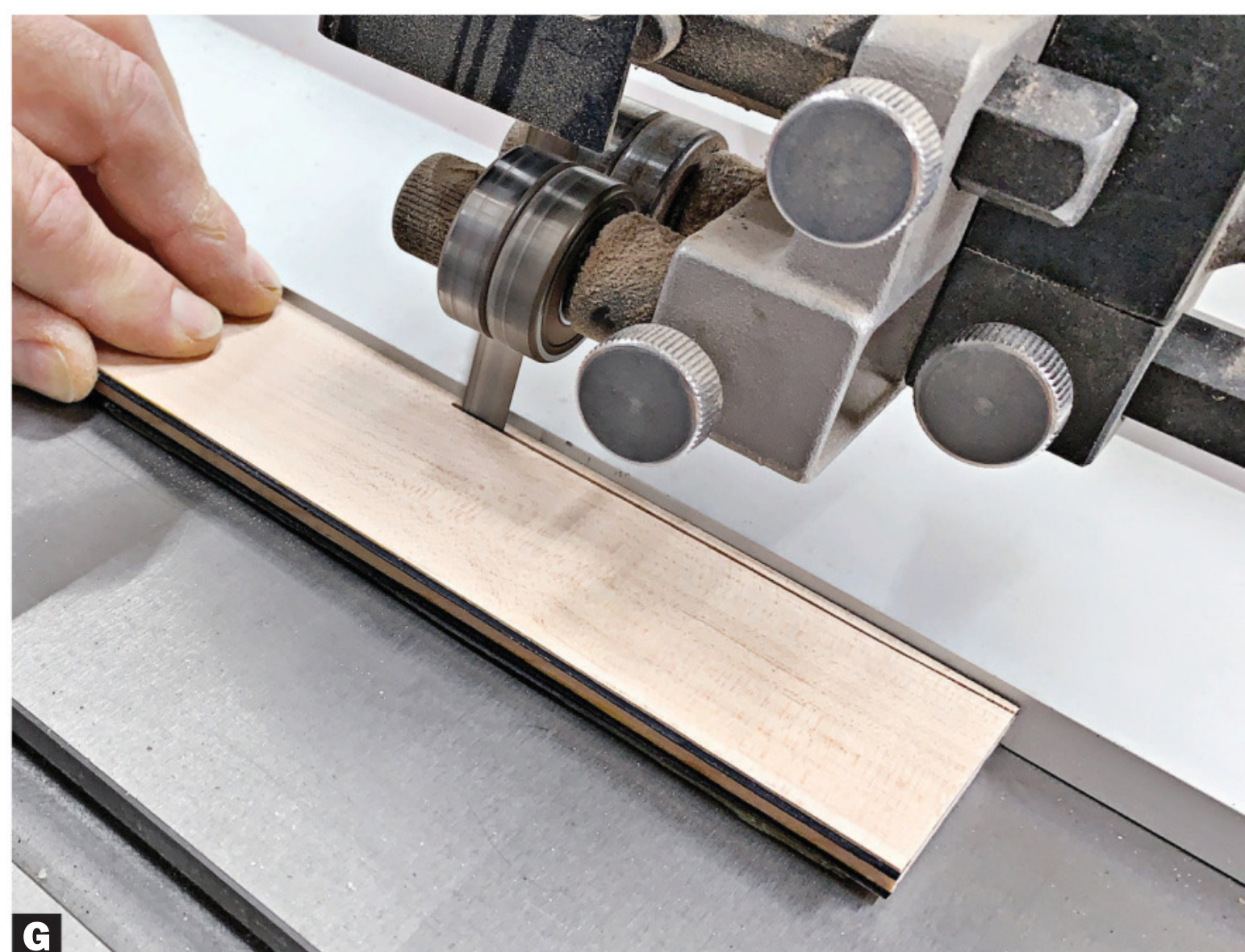
**D** Waxed paper catches any glue drips when applying glue to the packet layers.



**E** Press the edge of the packet against the jig surface to help align the pieces.



**F** Use enough clamps to get even pressure along the full length of the packet. This ensures uniform width and prevents voids in the completed banding.



**G** The bandsaw makes quick work of cutting the banding strips. Keep even pressure toward the fence to maintain consistent thickness.



## It's hip to alternate squares

For this pattern, start with two pieces of black veneer, two pieces of  $\frac{1}{32}$ "-thick maple, and one piece each of  $\frac{1}{4}$ "-thick maple and cherry. All should be about 2" wide.

Start by ripping the  $\frac{1}{4}$ " maple and cherry into strips the same as their thickness ( $\frac{1}{4}$ "). Edge-glue them [Photo H] so you have maple on one edge of the glue-up, and cherry on the other. When applying glue to small assemblies such as this, I always think, "Thin to win." In other words, don't starve the joint, but also don't flood it with glue.

After the glue dries, use a thickness planer to take off just enough from each face to get

them flat and to finished thickness of about  $\frac{3}{16}$ ". A drum sander also works well.

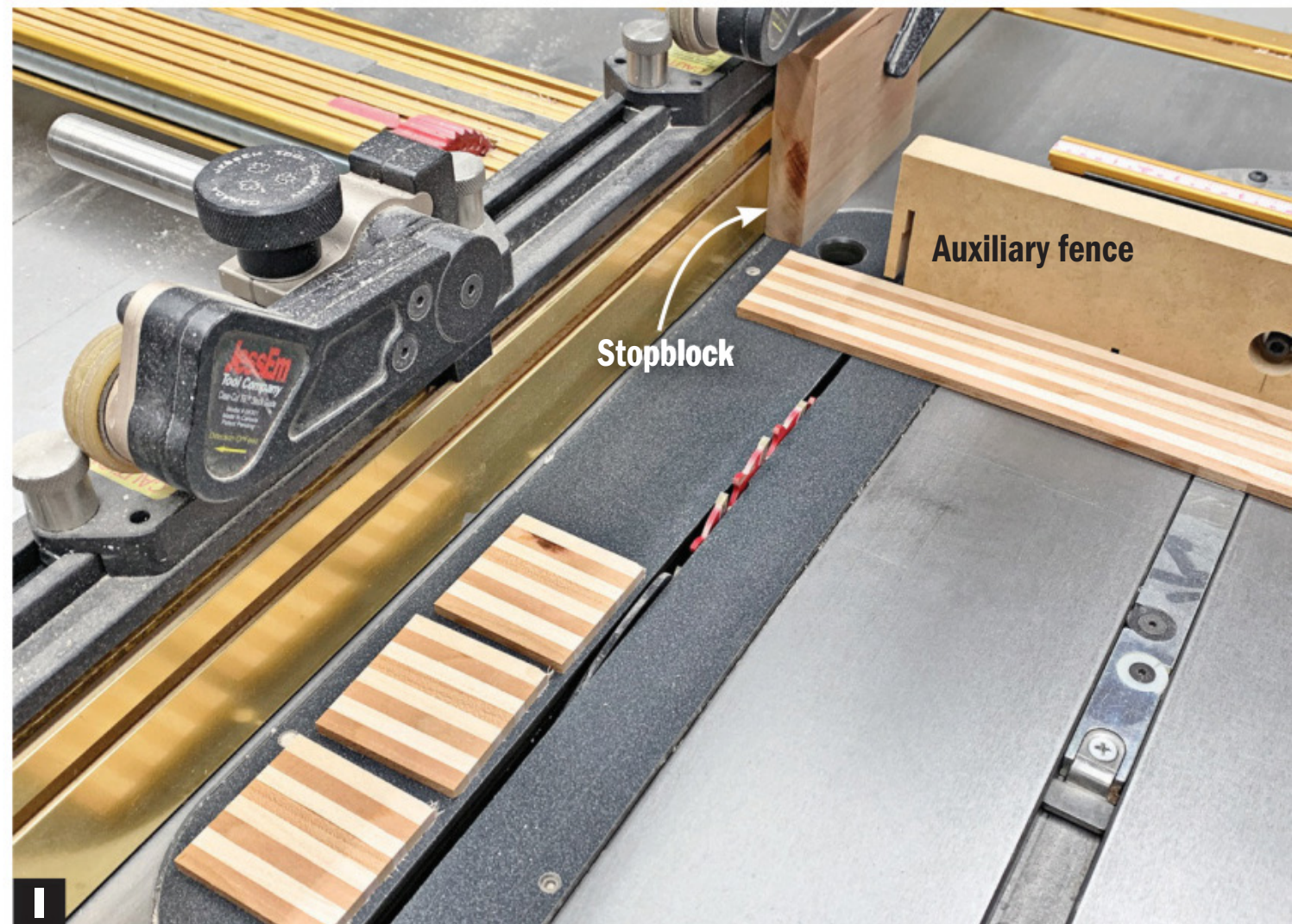
At the tablesaw, crosscut the cherry/maple blank into 2" lengths [Photo I]. Then, begin assembling the packet by gluing one piece of  $\frac{1}{16}$ " maple to a piece of black veneer. Add the maple/cherry blanks edge to edge [Photo J]. Top this with another layer of black veneer and then the last layer of  $\frac{1}{16}$ " maple. Clamp the packet in the gluing jig.

With the glue dry, joint the narrow face, as before. Take a shallow pass, as you will be sending end grain over the jointer. You also can use a hand plane—I recommend a low-angle block plane.

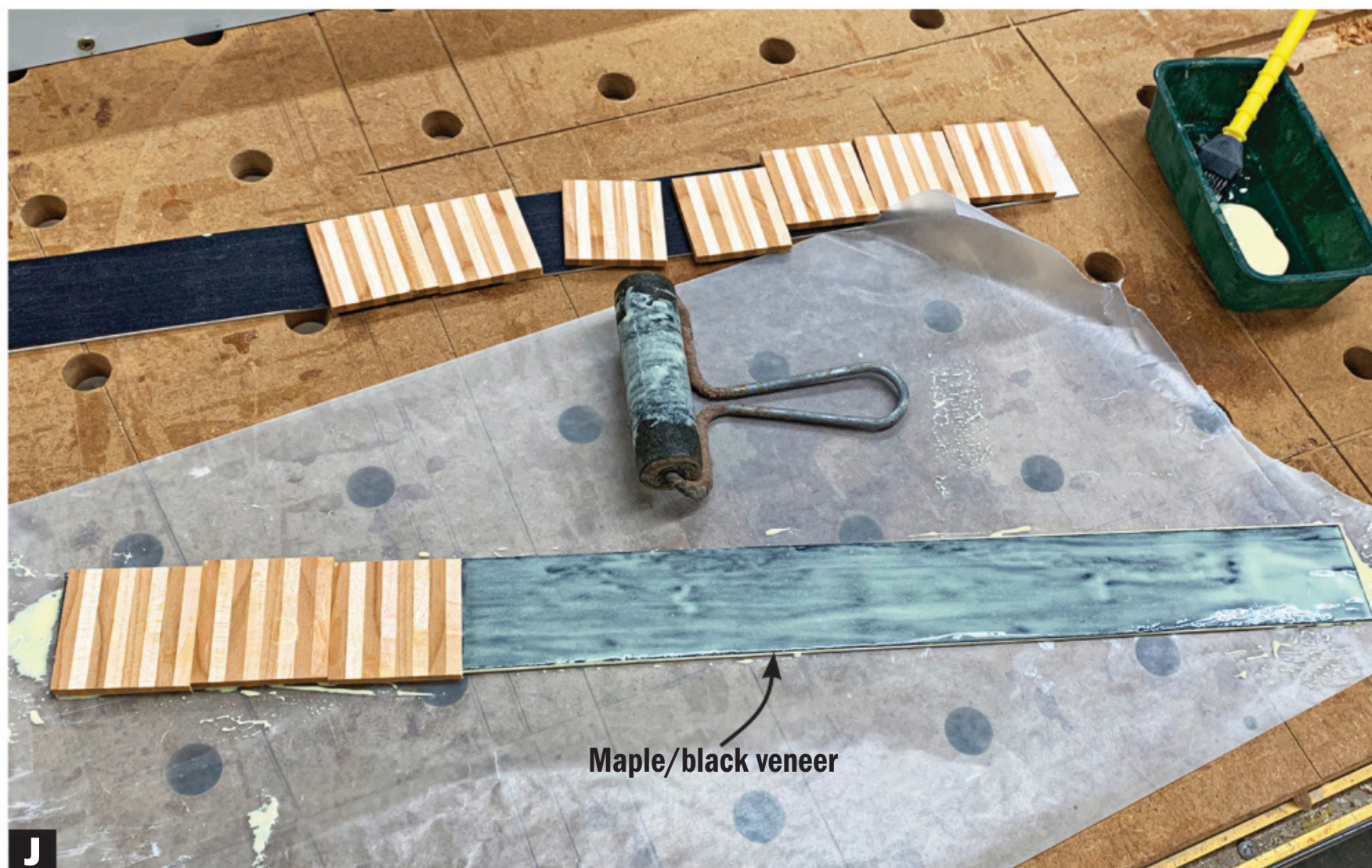
**Tip!** Lightly dampen the end grain to help cut the wood fibers.



**H** Press the strips to a piece of melamine particleboard or waxed paper while applying clamps. Spring clamps easily grip the thin workpieces.



**I** Cut the blocks using a miter gauge with an auxiliary fence and a stopblock clamped to the fence in front of the blade.



**J** When gluing down the maple/cherry blanks, make sure to maintain the alternating pattern.



## Now, saw a sawtooth

For this pattern, cut two blanks each of  $\frac{1}{32}$ "-thick maple and walnut, and one each of  $\frac{1}{4}$ "-thick maple and walnut, all 2" wide.

To cut the 45° angles, make a simple bandsaw sled, as seen in **Photo K**. Start with a 6×10" piece of MDF. Cut a hardwood runner that slides easily in the bandsaw miter slot without any wiggle. Glue the runner to the bottom of the sled square to the back edge of the sled. Then attach a fence 1" from the back of the sled.

Using an accurate triangle, tilt the bandsaw table 45° to the blade and lock it. Turn on the saw and move the sled forward until the sled fence just touches the blade. Turn off the saw.

Using the sled, cut a 1"-long piece from either the  $\frac{1}{4}$ "-thick maple or walnut blank, and glue it to the sled as a stopblock [**Photo L**]. Nest the angled end of one  $\frac{1}{4}$ "-thick blank against the stop, make a cut, flip the piece over, and repeat until you have about 2" or so of the blank left. Repeat with the other blank.

**Tip!** To prevent cutting the sled in two, clamp a stopblock to the top of the saw table.

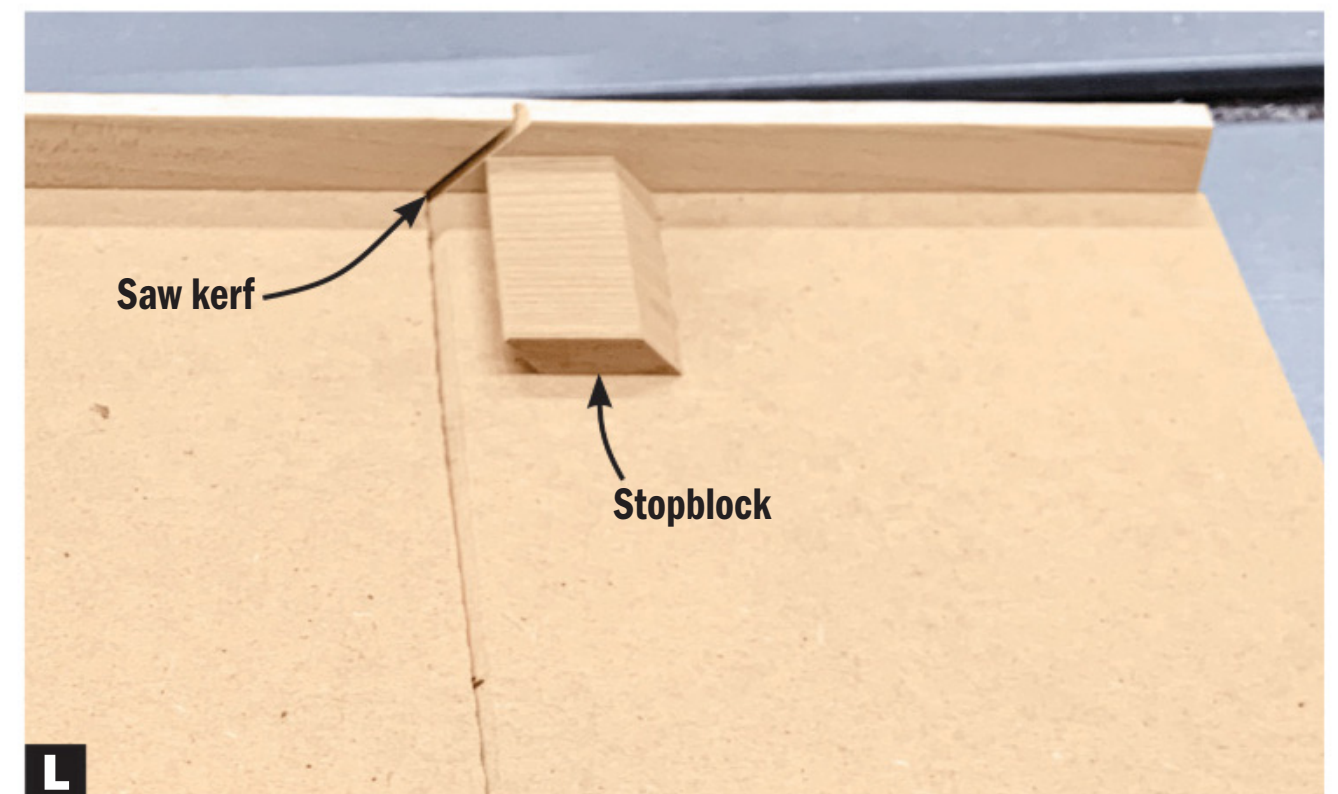
To glue up the packet, screw one of the 2" cutoffs from a triangle blank to the gluing jig as a stop. Apply glue to one edge of a triangle piece and set the unglued edge against the stop. Continue gluing alternating species, working quickly, as the PVA glue sets up fast [**Photo M**]. After getting about 18-20" of triangles glued up, set the caul in place and lightly clamp it. Tap the other offcut against the open end of the assembly to help drive the triangles together and tighten up the glue lines. Remove the caul, screw the second offcut in place, clamp the caul back in place, and set the assembly aside to dry.

After the glue dries, flatten the faces of the triangle packet using a piece of 100-grit sandpaper glued to a scrap of MDF. Complete the packet by gluing on the walnut face a layer of  $\frac{1}{16}$ " maple, then  $\frac{1}{16}$ " walnut [**Photo above**]. On the opposite (maple) face, glue on the walnut layer first, then the maple. After the glue sets, remove, joint, and cut banding as with the other packets.

**Tip!** Wax the mitered end of the stop to prevent gluing the banding assembly to it.



**K** A sled guided by a runner in the miter-gauge slot helps you cut pieces of consistent size and with identical angles.



**L** Position the stopblock so the point on the top edge touches the near edge of the blade kerf.



**Have your triangles sorted and nearby** for quick assembly. Brush glue onto the outer edge of a triangle, and press it against the previous one, alternating maple and walnut.



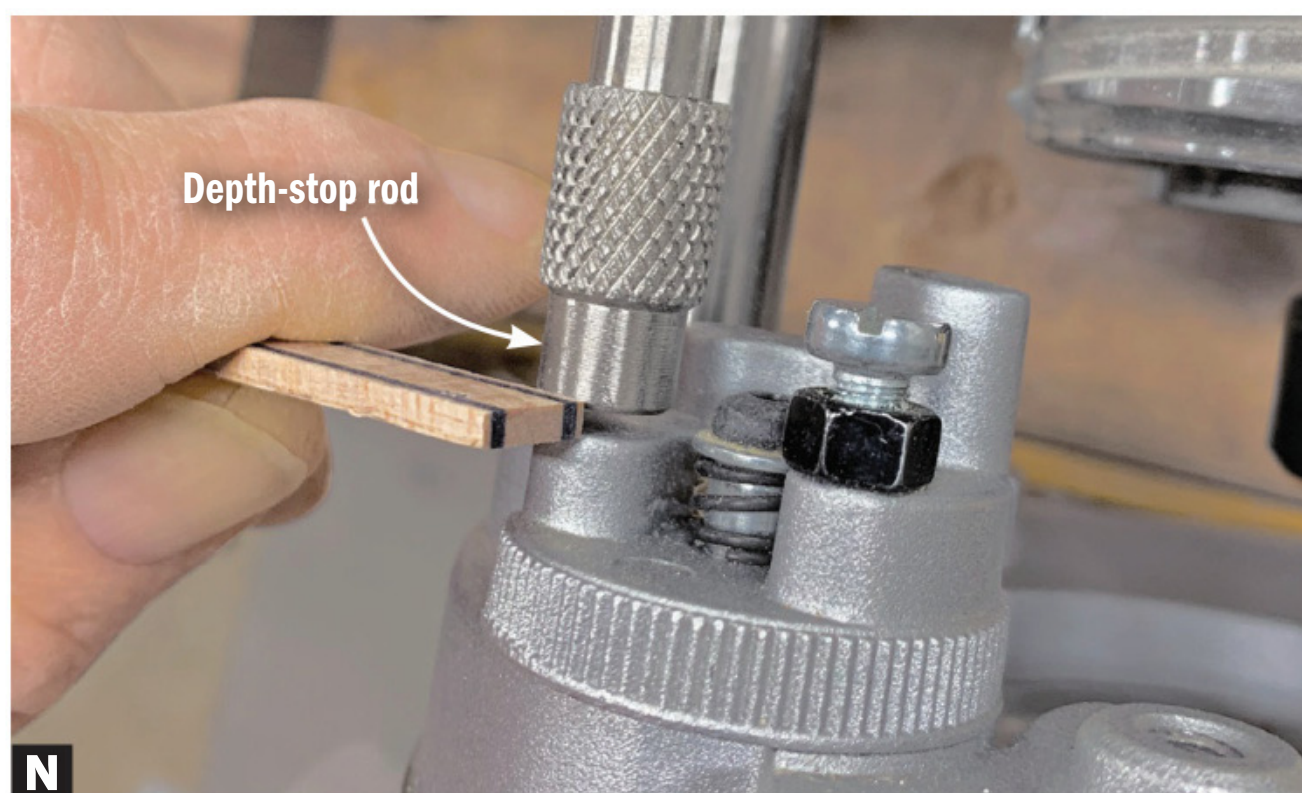
## Strike up the banding

Inlaying banding into a project couldn't be easier, but the square and sawtooth patterns require careful layout (see **Cutting corners**, right). For any inlay pattern, set up your trim router with a 1/4" downcut spiral bit and an edge guide. Then set the depth stop [Photo N] to rout slightly shallower than the thickness of the banding. Set the edge guide to rout a groove the desired distance from the edge of the workpiece. Make a pass in your workpiece and a piece of scrap. Then, to widen the groove to fit the inlay, use the banding as a gauge on your scrap piece [Photo O]. Adjust the edge guide to rout to the line and test your setup on the scrap before you rout your finished piece. Chisel the corners square.

**Tip!** Make your caul from melamine, or use waxed paper to prevent gluing it in place.

Glue the banding in place, clamping a caul over it. After the glue dries, trim the banding flush to the surface using a low-angle block plane or sander [Photo P].

This just barely scratches the surface of the designs you can create. To fire your imagination, use these same techniques with different wood species and see the sidebar at right, or search online for additional patterns. 🌳



**N** Use a piece of the banding to set the router depth of cut. Set the depth-stop rod so the banding won't quite fit into the gap.

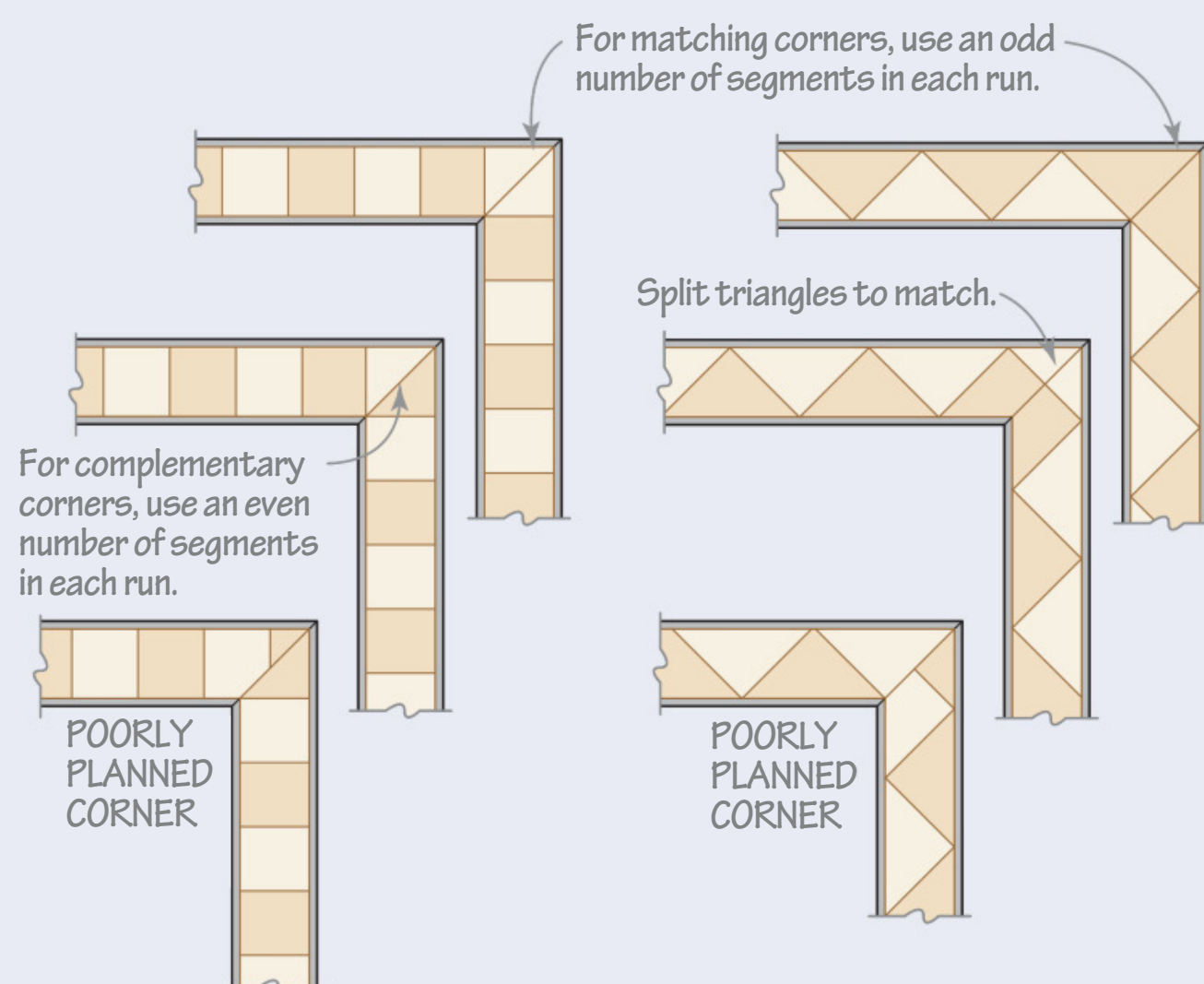


**O** Press one edge of the banding against the outside wall of the routed channel. With a marking knife, mark along the other edge of the banding.

## Cutting corners

Inlay with a linear pattern, such as the stripes inlay, can be mitered to any length, and the pattern continues around corners uninterrupted. Sequential patterns, such as the sawtooth and squares, require specific lengths to provide a full figure at the corners [Drawings, photo right]. Determine those lengths from the inlay itself.

For example, if you have an 8x12" box lid, and you want the inlay 1/2" from each edge, the ideal inlay lengths would be 7" and 11". However, your banding may not provide a full square or triangle at those dimensions. So measure the inlay to find the nearest length that begins and ends with a full figure. Modify the layout on the lid to match these lengths.



**P** A sharp low-angle block plane skewed to the banding quickly brings the inlay flush with the workpiece. Sand with 220-grit sandpaper, if needed.



# Built for Bonding Tower

*Lift up little helpers to counter (or workbench) height to encourage interactivity.*

D I M E N S I O N S :  
16" W x 19½" D x 36" H

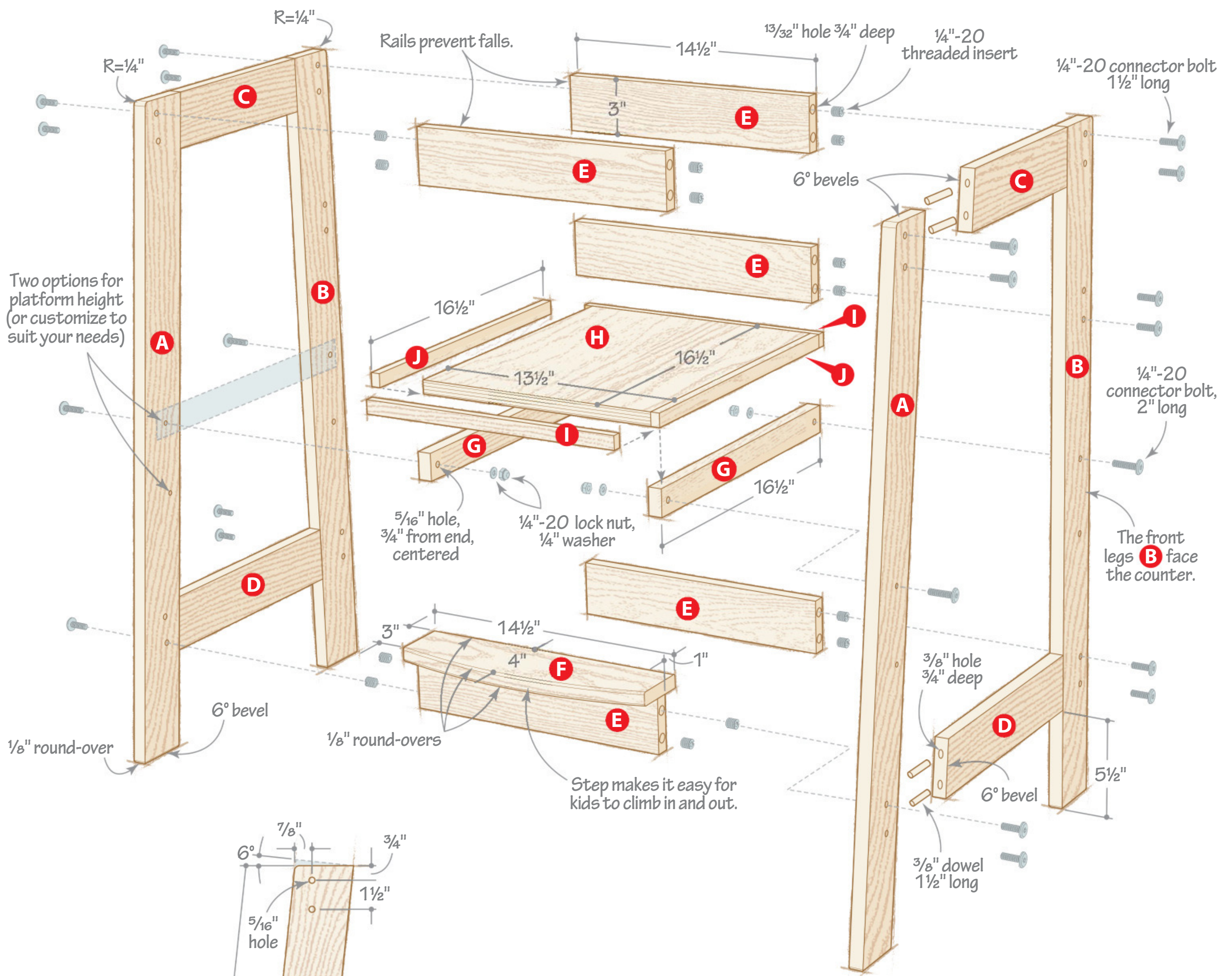
Approximate materials cost:

**\$75**  
Including hardware

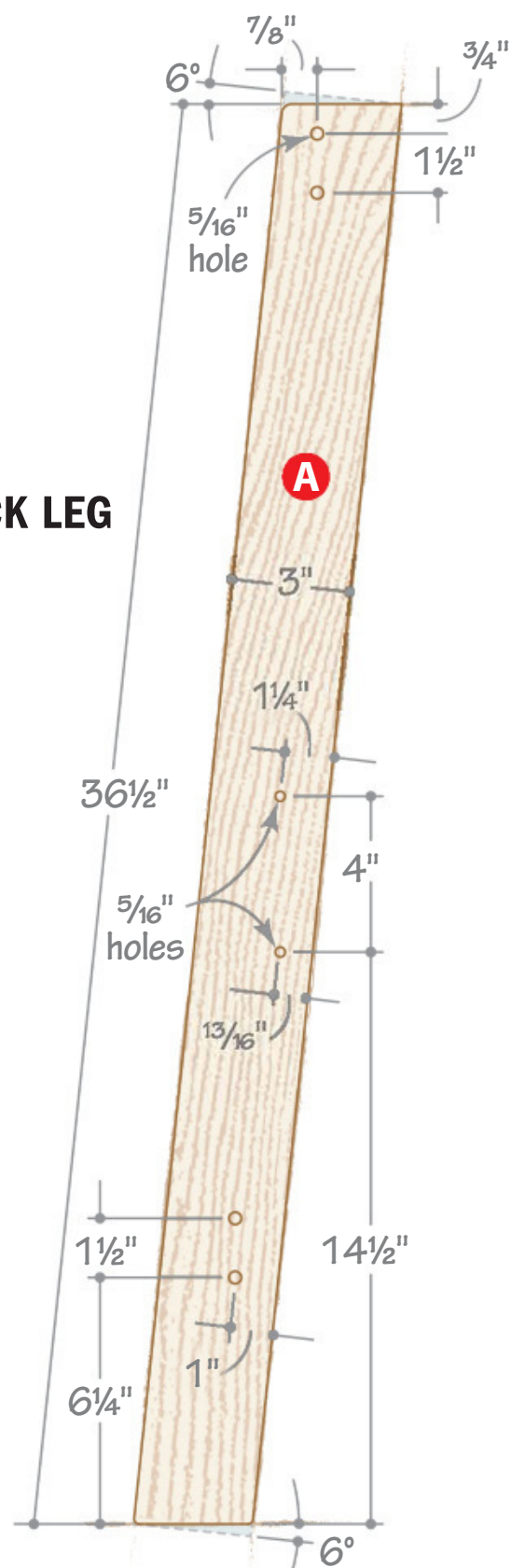
**2**  
eager helping hands



## EXPLODED VIEW



### 1 BACK LEG



Kids possess endless curiosity, and love being a part of what grown-ups do around the house. This platform lets them see what's happening w-a-y up there at counter height, and it's easy to adjust the height of the platform as your helper grows.

The tower assembles with knockdown fasteners so you can knock out this tower in a weekend, and easily store it or pack it up for shipping.

### Side frames made simple

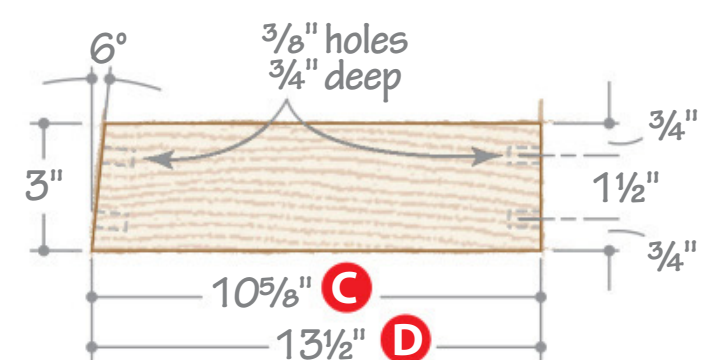
1 Cut to size the legs and side rails (A-D), angling both ends of the back legs (A) and the back ends of the rails (C, D) [Materials List, Drawings 1, 2].

2 Lay out the locations of the dowels in the ends of the side rails [Drawing 2], then

► Read more about the benefits of learning towers.

[woodmagazine.com/helpinghands](http://woodmagazine.com/helpinghands)

### 2 SIDE RAILS





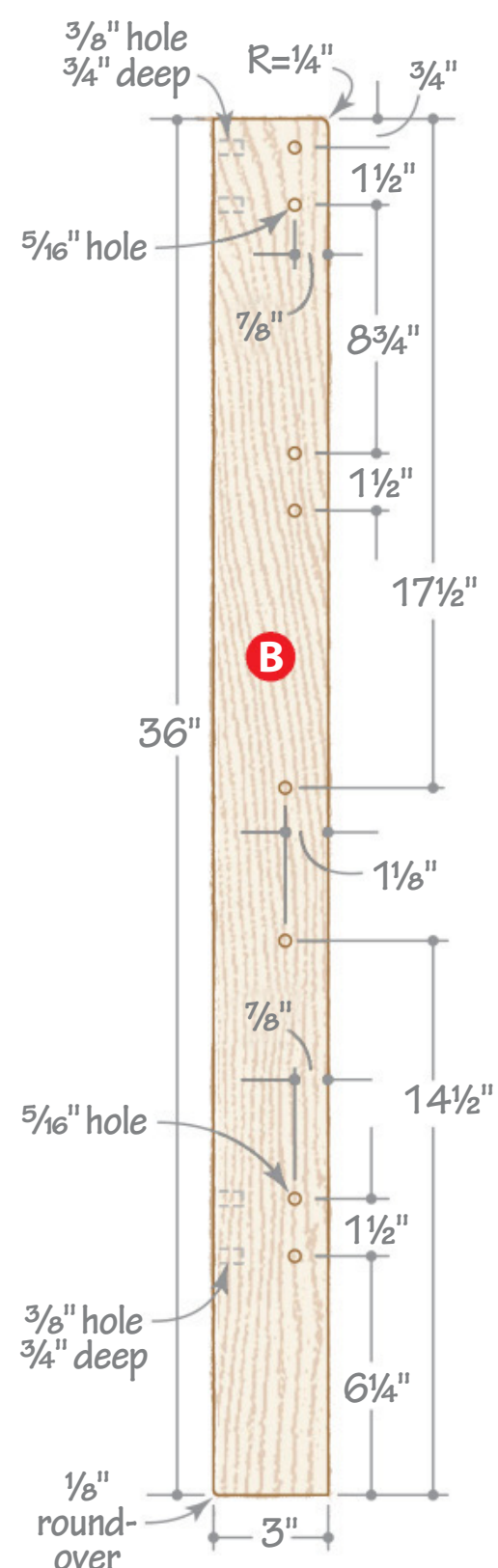


**A** **Place a side rail (C, D) flush** against the end of a leg (A, B) and transfer the layout marks for the dowel holes. Label each joint to make it easy to find mating parts during assembly.



**B** **Clamp a doweling jig to the workpiece** aligned with your layout mark. Reference the jig off the same face on every piece so the faces remain flush during assembly.

### 3 FRONT LEG



transfer the layout to the legs (A, B)  
[Drawing 3, Photo A].

**3** Drill the dowel holes in the edges of the legs and the ends of the side rails [Drawing 3, Photo B]. Lay out and drill the holes in the faces of the legs [Drawings 1, 3].

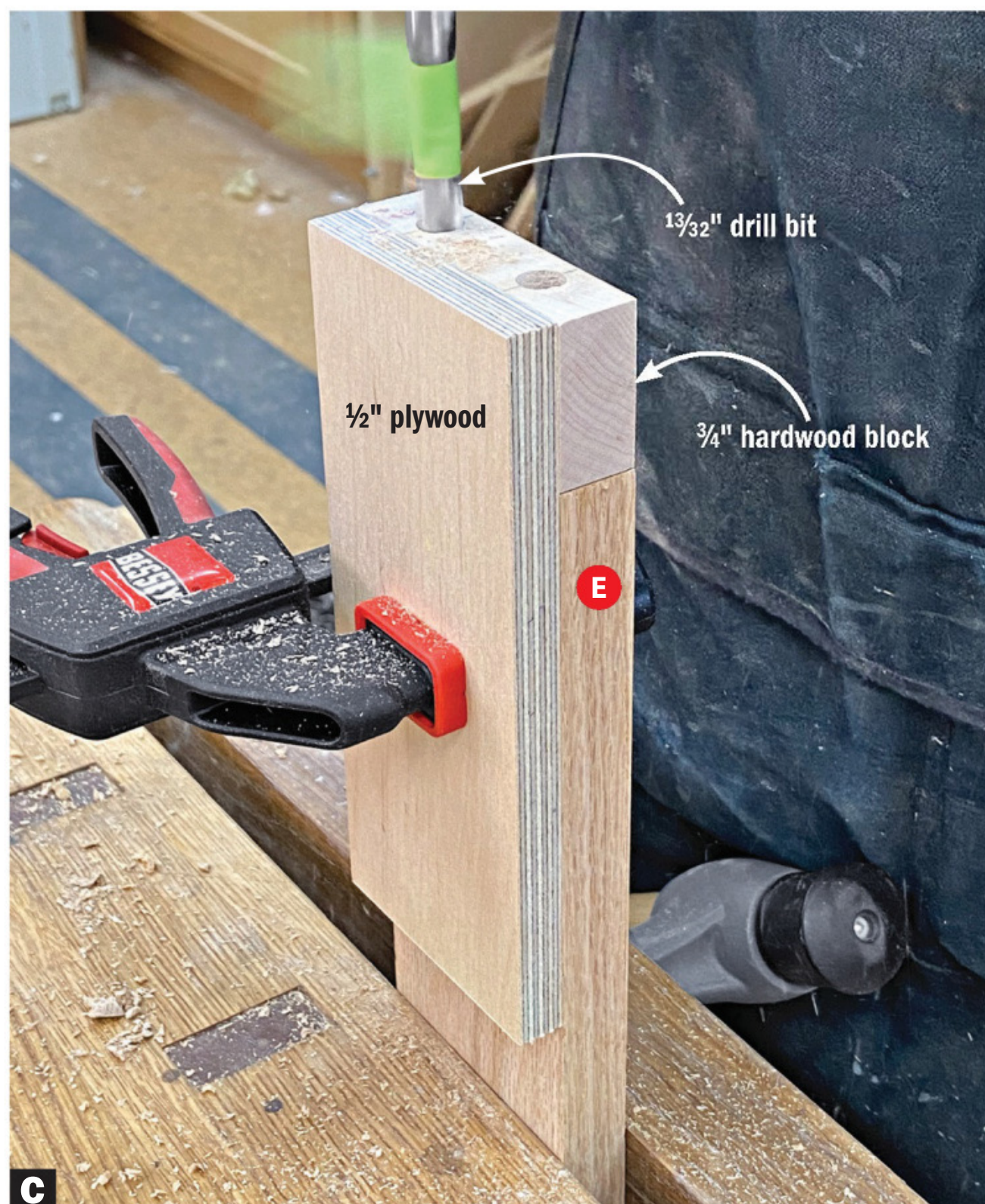
**4** Glue together the side assemblies (A–D), applying glue to each dowel and dowel hole. Once the glue dries, round over the top corners and bottom ends of the legs [**Exploded View, Drawing 3**].

## Step right up

**1** Cut to size the front/back rails (E). Drill the holes in the ends [**Exploded View, Photo C**], then install the threaded inserts [**Photo D**].

**2** Cut to size the step (F) and band-saw the curve on the back edge [**Exploded View**]. Round over the curved edges, then glue and clamp the step to the top of a front/back rail (E).

► Learn how to make your own fairing stick and use it to lay out curves.  
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**C** **Use a shop-made doweling jig** to drill the odd-sized holes for threaded inserts in the ends of the front/back rails (E). Lay out and drill the holes in the block at the drill press to provide good vertical alignment when using the jig.



- 3 Cut to size the platform supports (G), platform (H), and platform trim (I, J). Glue the trim to the edges of the platform [Exploded View].
- 4 Transfer the holes from each side assembly (A-D) to the platform supports (G) and drill the holes in the supports [Exploded View]. Glue the supports to the bottom of the platform, flush with the side trim and centered front to back.
- 5 Finish-sand each part, apply a finish, and assemble the tower [Exploded View]. We used an outdoor water-based polyurethane for easy cleaning.
- 6 Pull up the tower to the countertop or workbench and give your little helper a whole new perspective. 🌳

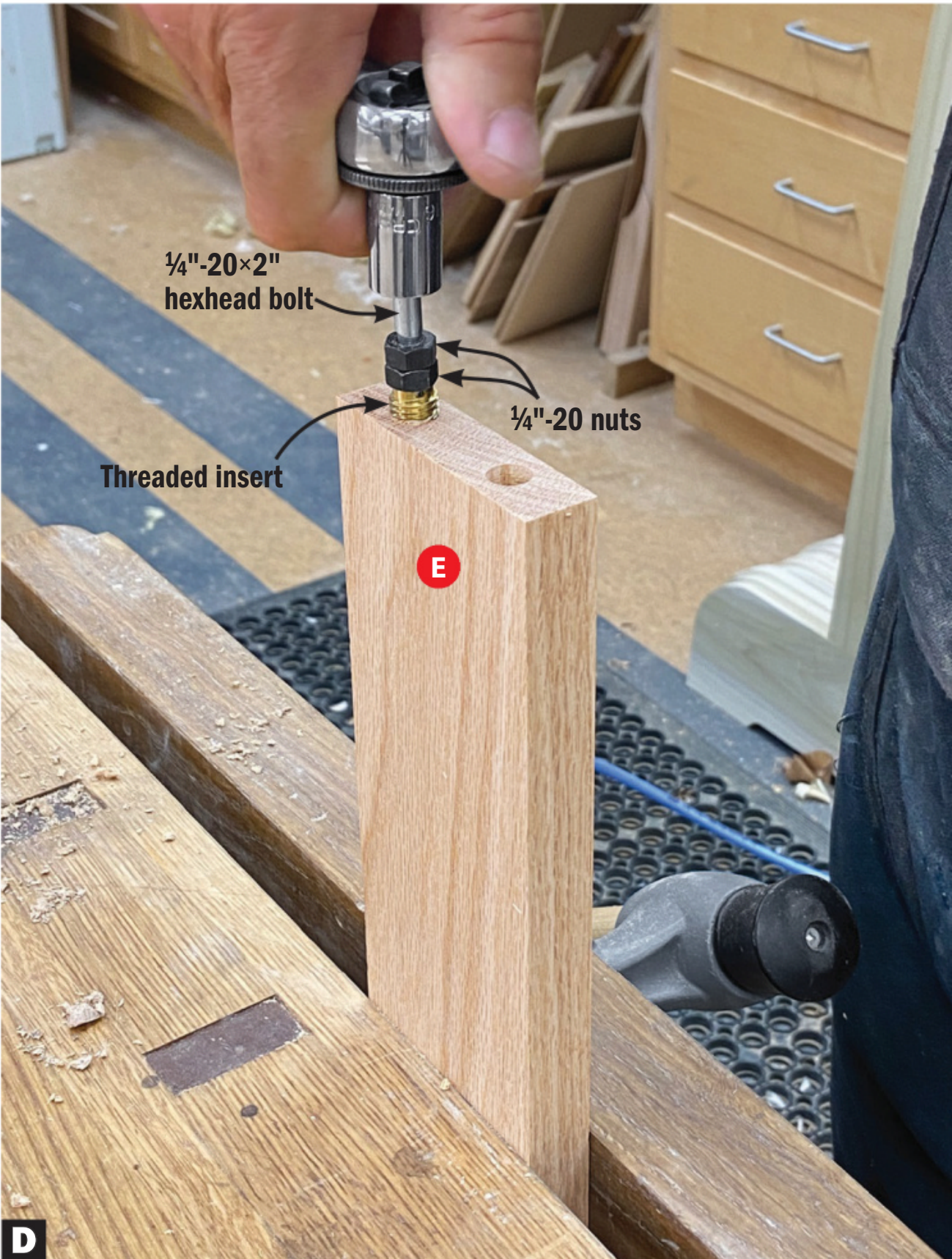
## Materials List

| Part                       | FINISHED SIZE |      |      | Matl. | Qty. |
|----------------------------|---------------|------|------|-------|------|
|                            | T             | W    | L    |       |      |
| A back legs                | ¾"            | 3"   | 36½" | O     | 2    |
| B front legs               | ¾"            | 3"   | 36"  | O     | 2    |
| C side upper rails         | ¾"            | 3"   | 10⅝" | O     | 2    |
| D side lower rails         | ¾"            | 3"   | 13½" | O     | 2    |
| E front/back rails         | ¾"            | 3"   | 14½" | O     | 5    |
| F step                     | ¾"            | 4"   | 14½" | O     | 1    |
| G platform supports        | ¾"            | 1½"  | 16½" | O     | 2    |
| H platform                 | ¾"            | 13½" | 16½" | OP    | 1    |
| I front/back platform trim | ½"            | ¾"   | 14½" | O     | 2    |
| J side platform trim       | ½"            | ¾"   | 16½" | O     | 2    |

**Materials key:** O-oak, OP-oak plywood.

**Supplies:** ⅜" dowels, ¼"-20 threaded insert nuts (20), ¼"-20 × 1½" connector bolts (20), ¼"-20 × 2" connector bolts (4), ¼" washers (4), ¼"-20 lock nuts (4).

**Bit:** 1⅜" drill bit.

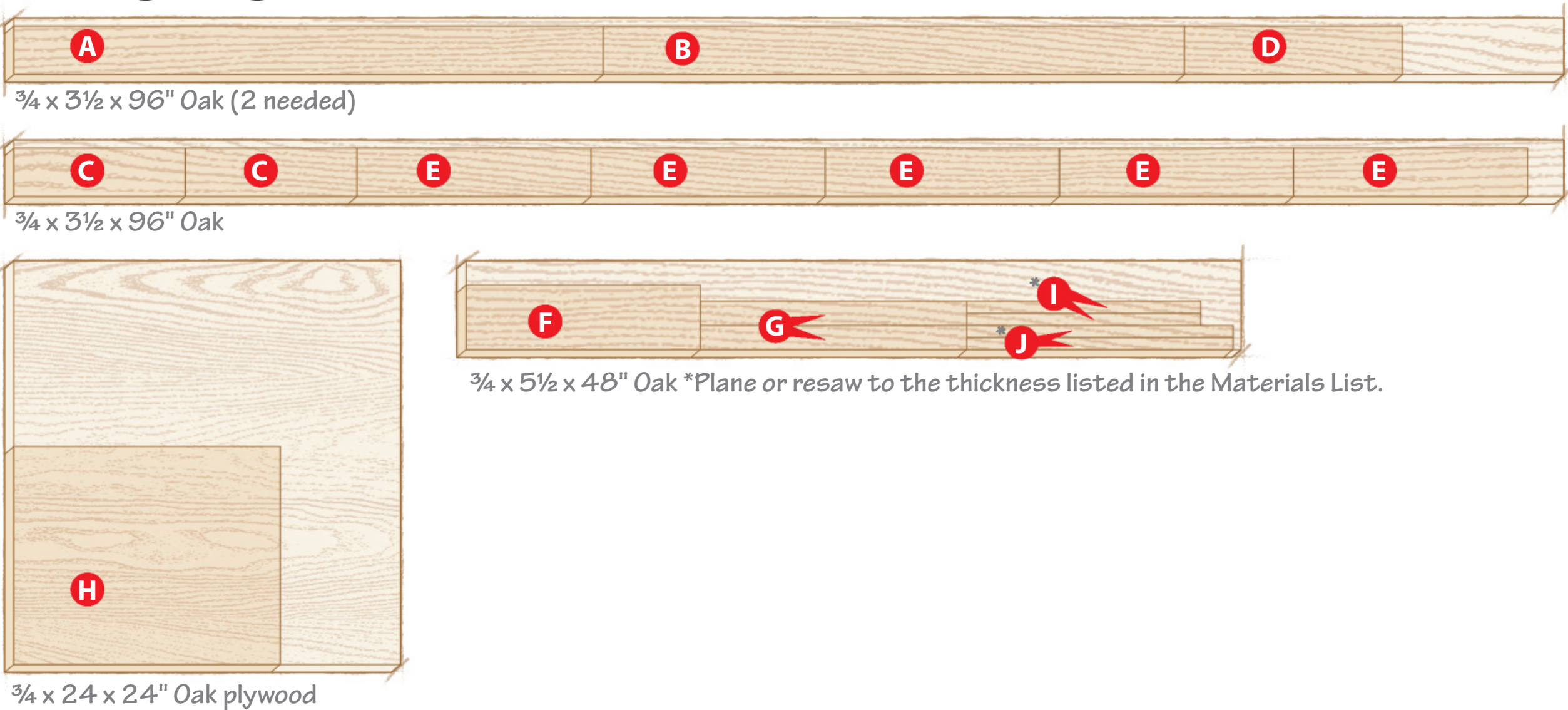


**D** Install a pair of jam nuts on the end of a ¼"-20 bolt to drive a threaded insert into each hole. Make sure the insert threads in straight before driving it home.

Produced by **Zach Brown** with **Kevin Boyle**  
Project design: **Kevin Boyle**  
Illustrations: **Roxanne LeMoine, Lorna Johnson**

## Cutting Diagram

This project requires 8 board feet of 4/4 oak.







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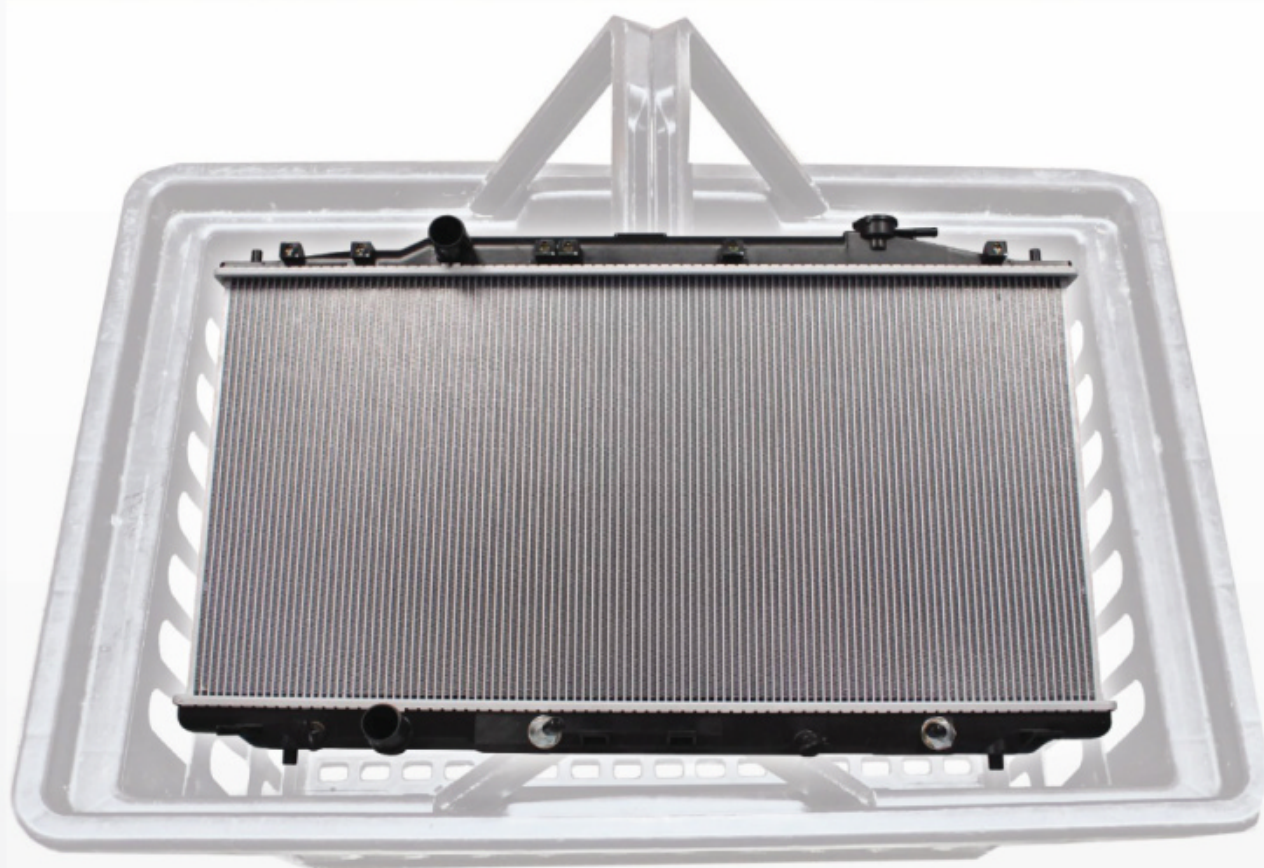
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# Doweling Dandies

If you've ever used a doweling jig to join two boards, you know the need for absolute precision when drilling the mating holes. Like all joinery jigs, a good doweling jig should be intuitive, easy to use, and accurate. We've tried 'em all, and these are the jigs we like best.



## Best overall: JessEm Doweling Jig Master Kit

no. 08350MK, \$200

Precisely machined from metal, this jig (*above*) comes with three sets of interchangeable drill guides (for 1/4", 3/8", and 1/2" dowels) plus bits and stop collars. The self-indexing fence registers positively in 1/8" increments for repeatable precision. For centered holes, you set it based on half the workpiece thickness, which requires a little more mental math than with a self-centering jig. The drill guides are spaced in equal increments so you can drill those you want without moving the jig. After drilling the first workpiece, you align the second by sliding the jig's guide slot over a dowel (*right*), and drill the mating hole.



JessEm  
800-436-6799, jessem.com



## Best self-centering jig: Task Premium Doweling Jig

no. 124315, \$75

The jaws on this jig close simultaneously, perfectly centering the drill guides on workpieces up to 2 3/16". With two guides each in 1/4", 5/16", and 3/8" diameters, you can easily drill two holes without repositioning the jig. Because it lacks alignment marks, you have to rely on another tool, such as a square, to position it accurately along a board's length or width.

Woodcraft  
800-225-1153, woodcraft.com



## Best single-size jig: Rockler Doweling Jig Kit (3 sizes)

1/4" no. 59060, \$20; 3/8" no. 54854, \$20; 1/2" no. 55072, \$20

If you use primarily one size of dowels, one of these jigs couldn't be any easier to use: Align the jig to a layout mark, clamp it, and drill. We found the on-jig alignment marks and bit-depth gauge handy, as well as the drop-down stops for positioning the jig near the end of a workpiece. One caveat, though: Each jig locates holes a fixed distance from an edge or end (the 3/8" jig drills a hole centered 3/8" from an edge).

Rockler  
800-279-4441, rockler.com



## Best-value jig: Milescraft Dowel Jig Kit

no. 1309/1359, \$25

This handy kit comes with three guides—one each in 1/4", 5/16", and 3/8"—as well as bits with stop collars, dowel centers, glue, and an assortment of dowels. Pins extending from the top of the jig self-center holes on a board's thickness. Then you insert a dowel in the drilled hole and use it to align the jig for the mating workpiece.

Milescraft  
224-227-6930, milescraft.com



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## TOOLS & MATERIALS

SHOP-TESTED

### This trimmer shares two battery platforms

18-volt trim router, no. M1808DAQ4, \$150 (tool only);  
charger with two 3-amp-hour battery packs, no. UC18YSL3S, \$200

I love the freedom of using a battery-powered trim router, and Metabo HPT's 18-volt trimmer ranks as one of my favorites. I especially like the rack-and-pinion microadjuster for easily fine-tuning the cutting depth through its 1½" of vertical travel, as well as the two LEDs that light up the bit nicely.

This router uses a two-switch power system for safety. I can easily reach both switches—mounted on opposing sides of the motor—with my thumb and forefinger. But the primary switch times out after 10 seconds of nonuse, a mild irritant when you take longer than that to reposition a workpiece.

It does not come with a battery or charger, so I recommend getting a slim 3.0-amp-hour pack. With this pack, the router balances perfectly while still providing all the power and runtime I need. (You can also use Metabo HPT's 36-volt MultiVolt pack, which about doubles the runtime.) The kit comes with ¼" and ⅜" collets, a flush-trimming guide, edge guide, dust-collection attachment, and a ⅜" proprietary guide bushing, making it a great value, too.

—Tested by Bob Hunter, Tools Editor

Metabo HPT  
800-706-7337, metabo-hpt.com

### 12-volt power drives this compact cordless pinner

12-volt 23-gauge pin nailer, no. 2540-21, \$250;  
nailer without battery or charger, no. 2540-20, \$200

Nothing beats a pinner for tacking delicate moldings and onlays onto a project—the headless pins leave tiny holes that oftentimes don't need to be filled—but bulky battery-powered pinners have tended to handle awkwardly. This nimble cordless Milwaukee pinner, with its compact 1.5-amp-hour battery pack, weighs just over 3 pounds, and performs as well as any pneumatic model I've used.

A sealed volume of nitrogen propels the piston and driver when you pull the double trigger. As a result, I could fire pins in quick succession without having to wait for the tool to cycle. It sank 1⅜" pins into dense white oak without fail. And after firing 300 pins, I gave up and decided it will fire all the pins I'll ever need on a single charge.

Unlike pneumatic models, this pinner provides an LED that shines down the front of the nose. However, more often than not, my sight line was behind the nose, where the LED did little good.

—Tested by Bob Hunter

Milwaukee  
800-729-3878, milwaukeetool.com







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NEW AND UNTESTED

## Apollo launches new HVLP sprayers

Falcon HVLP spray systems, 3-stage, no. FS3, \$785; 4-stage, no. FS4, \$969; 5-stage, no. FS5, \$1,175

Three new Falcon models join the Apollo lineup: a 3-stage turbine that Apollo says generates 7.0 psi, a 4-stage turbine (9.0 psi), and a 5-stage turbine (9.5 psi). These models replace Apollo's ECO systems, with smaller and lighter turbine bodies, and still use U.S.-made motors. The 3- and 4-stage systems each come with a 25' hose, and the 5-stage a 28' hose. Each system also comes with a spray gun, your choice of a pressure-cup bleeder (no. E5011) or nonbleeder (no. E7000), or a gravity-fed gun (no. E7700); prices vary based on which gun you choose.

Apollo HVLP Turbo Spray  
888-900-4857, hvlp.com



## MLCS adds cordless router

Rocky CL 18-volt trim router combo kit, no. 9021, \$250

The Rocky 30 trim router has been around for several years, and this battery-powered version frees you from the cord. With this kit, you get a variable-speed motor (10,000–30,000 rpm) with LED lights, two 4.0-amp-hour battery packs,  $\frac{1}{4}$ " and  $\frac{3}{8}$ " collets, a fixed base with  $1\frac{3}{8}$ " vertical range, a plunge base with the same capacity and a three-stop turret, an edge guide, flush-trimming guide, and dust-collection attachment. (You can buy the fixed-base-only version, no. 9019, for \$230.)

MLCS Woodworking  
800-533-9298, mlcswoodworking.com



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**f.** Total Distribution: 291,095

**g.** Copies not Distributed: 26,633

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**i.** Percent Paid and/or Requested Circulation: 99.2%

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**g.** Copies not Distributed: 24,597

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**17.** Publication of Statement of Ownership for a Requester Publication is required and will be printed in the December 2021/January 2022 issue of this publication.

**18.** Signature and title of editor, publisher, business manager, or owner Chris Susil, VP/Planning & Analysis. Date: September 20, 2021. 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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#### Blanket chest

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Specially formulated with exclusive Freud-made TiCo™ Hi-Density carbide and unique cutting geometries, these solid carbide bits offer an unmatched cutting performance and durability on workshop and small CNC machines.



Featuring the industry's first functional coating, Black I.C.E. (Industrial Cooling Element) protects the solid carbide cutting edge by creating a slick, lubricant like action for less friction, heat and pitch buildup.

Whether you are creating detailed inlays, 3D decorative projects or sign making, Freud's unique, expanded offering of over 100 bits and sets delivers superior cutting performance and quality finish.



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