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WOOD

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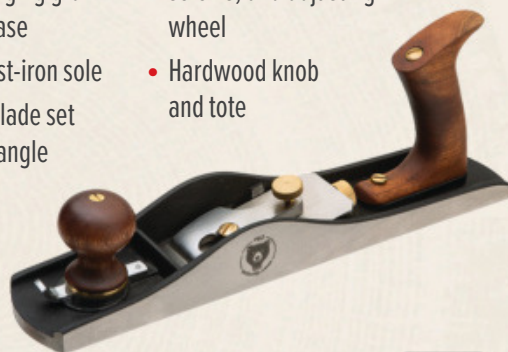
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GO, GO, GADGET

ARE YOU A GIZMO GEEK, CONTRAPTION CONNOISSEUR, OR DEVICE DEVOTEE? THEN YOU'RE MY KIND OF PEOPLE.

I am an absolute sucker for a good DIY shop gadget. The more novel, the better, in my opinion. If cooler heads didn't regularly prevail in our project design pitch meetings, every shop project in the magazine would include multi-angle capability, foldaway surfaces, variable capacity, articulated motion, and all-in-one functionality.

So any levelheaded credibility I pretend to possess goes right out the window when I geek out over marvels like our cover project. Design Editor John Olson put a lot of careful engineering into making the tilting sheet-goods cart on *page 38* a sturdy, compact, and incredibly useful shop aid. Slide a sheet of plywood from your vehicle onto the cart's platform, flip it upright to maneuver through your shop, then lock the platform back in the horizontal position to feed the sheet through the tablesaw or break it down with your circular saw—all without throwing out your back. What's more, you can build this always-ready helper from a single sheet of plywood and short lengths of maple.

Rather than risk multiplying the rolled eyes and "here-he-goes-again" sighs common when I bring the subject up with my long-suffering staff, I'll truncate my gushing and simply offer a link, *below*, to some of my favorite gadget-y project offerings from the past several years.

But I would consider it a personal favor if you would send in your own cool shop inventions and hacks for our *Shop Tips* column (*page 18*) to shoptips@woodmagazine.com. We'd love to share them. Or maybe you have an entire workshop full of homegrown gadgets. Submit your shop to our *Your Shop* column (*page 12*) by sending photos of your space to woodmail@woodmagazine.com.

And as always, get out to the shop and make something. We'll help. 🌲

Lucas

LUCAS PETERS

✉ lucas.peters@woodmagazine.com

📷 @peters.lucas



A triple-cyclone dust collector, a briefcase router table, and a stowaway miter saw stand are among my favorite shop gadgets at woodstore.net/gadgets

WOOD

Issue No. 297 | September 2024
Vol. 41, No. 4

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WOOD®

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PLANS

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In a world where dull screens rule the wall, one storage-packed surround takes a bold stand for style.
- 34 DRESSED-UP MAILBOX POST**
Build a faux frame-and-panel mailbox post sleeve that delivers first-class curb appeal.
- 38 PIVOTING PLYWOOD CART**
Slide sheets aboard this teeter-totter scooter, then tilt it up to fit through doorways and flat again for tablesaw infeed.
- 50 KING OF THE ROAD BOXCAR**
No need to be a man of means when you build this beauty of a boxcar from old scrapwood you have found.
- 62 SITTING-ROOM SWING**
Mount this handsome swinger indoors and you'll have all the neighbors talking and rocking.



ON THE COVER

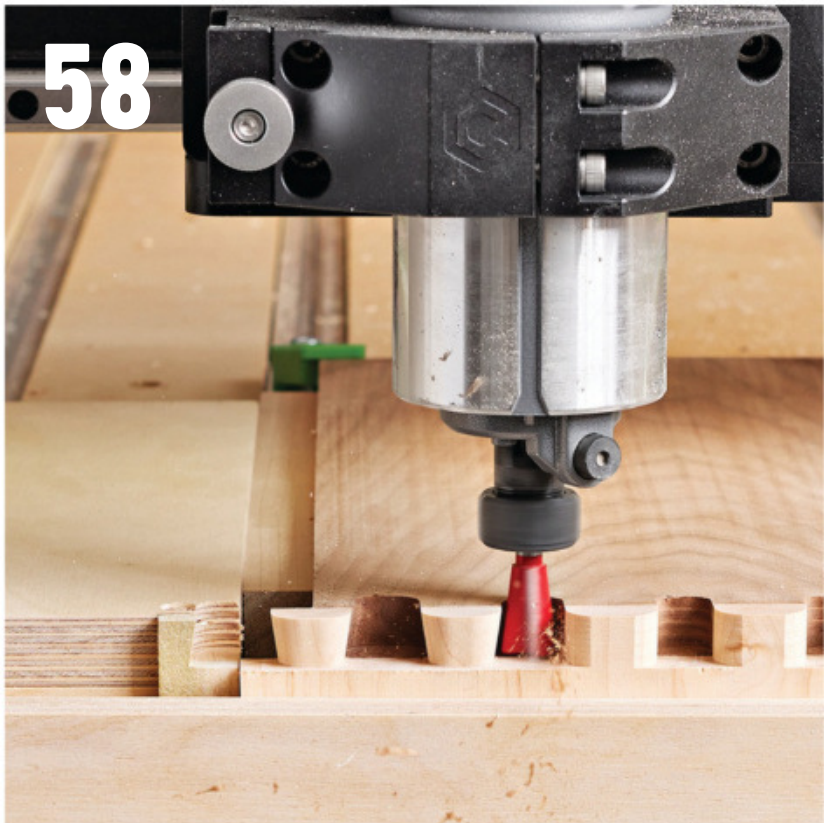


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This spine-saving, sheet-goods-schlepping super cart delivers full sheets of plywood or MDF from your driveway to your tablesaw, where it tilts into place for right-height infeed support.

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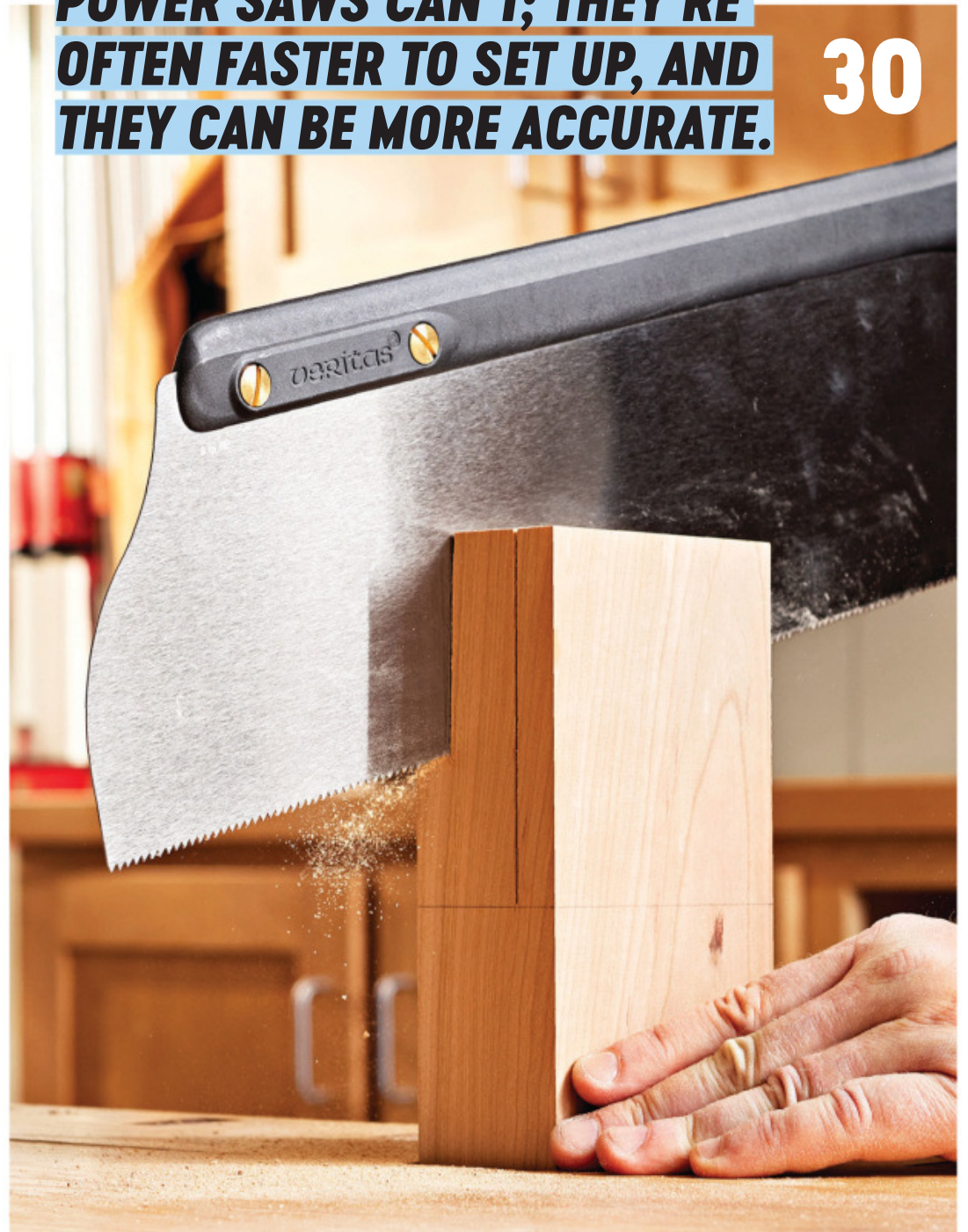
At-the-ready mini router table, air nailer hangers, and more

75 WHAT'S AHEAD

A sneak peek at the October 2024 issue of *WOOD*® magazine

**HANDSAWS CUT IN WAYS
POWER SAWS CAN'T; THEY'RE
OFTEN FASTER TO SET UP, AND
THEY CAN BE MORE ACCURATE.**

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APT APPS

I just read the article about woodworking phone apps in issue 292 (November 2023). I also use the *Fraction Calculator Plus* app. It takes all the stress away from working with fractions.

Another useful app is *Kerfmaker*. After entering the dimensions for each board I need to cut, the sizes of the material I have, it gives me a cut pattern for each board.

Jim Canterbury

via email

Thanks for letting us know about Kerfmaker, Jim. Most cutlist calculators are designed for sheet goods, so it's good to see one that works with boards.

Dave Stone

Managing Editor

The only app I use is the one between my ears—the one God gave me. It works well, its battery doesn't run down, it doesn't get misplaced, and is always there.

Kevin Krall

via email



I use a couple of apps: *Cutlist Optimizer* and *Material Estimator* (by Calculated Industries). I paid for the ad-free versions.

David Bruly

via email

I saw that *Feet Inch Calculator* wasn't one of the apps listed. It combines a construction calculator with a fraction calculator, but it does so much more.

Wes Spurgeon

via email

An app I like is *ConvertPad* for Android which handily converts from one system to another. For example, centimeters to inches. It's also handy for converting temperature, weights, and a host of other units.

Richard Sheridan

via email

Thanks Richard. I didn't find ConvertPad in the Apple App Store, but multiple unit converters are available there, too.

Dave Stone

Managing Editor

NEVER ENOUGH CLAMPS

I recently subscribed to *WOOD* and have certainly enjoyed my first couple issues. I liked the article "A Few of our Favorite Clamps" (September 2023) and will give the Merle Corner Clamp a try. A couple clamps that I'd add to the list are pipe clamps, F-style clamps, and good old-fashioned C-clamps. All are very economical and hold up well. Pipe clamps offer the advantage of flexibility by adding couplers and extensions for larger projects. We all know: You can never have too many clamps!

Mike Desch

Dayton, Ohio

PROGRESS AT WHAT PRICE?

The recent Innovation Awards article in Issue 294 (March 2024) had me shaking my head. The tools were impressive but the prices? Seriously? \$500 for a miter gauge? I think I'll stick with the Incra 1000HD miter gauge for \$220, which you recommended in issue 280 (March 2022). I can buy a lot of Boeshield for the \$400 ArmorGlide upcharge on a \$4000 jointer.

I do regularly invest in tools and equipment, often with the help of your reviews and recommendations. But I'm retired and on a semi-fixed income so I try to buy responsibly. I think this time, I'll steer clear of most of these products.

Biff C.

via email

We understand that some of the items carry a hefty price tag. Innovative products often do. But innovations that catch on generally come down in price, meaning more of us can afford to put them to work in our shops. We present our awards every year to show readers clever new ideas and to encourage manufacturers to keep pushing the envelope.

Dave Stone

Managing Editor

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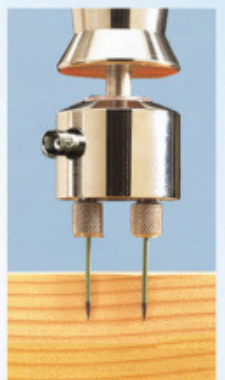


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TABLE TEACHING MOMENTS

The accent table in issue 290 (September 2023) caught my eye. You mentioned new skills that could be acquired in this project, and even though I'm almost 69, I decided that this old dog could learn a few new tricks. Thank you for encouraging me to give it a shot because, after 30 years, I finally attempted mortise-and-tenon joinery and used a tapering jig for the first time.

Jeff Danco

Bridgewater, New Jersey

Beautiful job on the table, Jeff, and kudos to you for tackling new skills! We purposely created this article to be as much about the process as the project so people could experiment with new techniques on a project that doesn't demand huge investments of time or money.

Lucas Peters

Editor-in-Chief

TOOL CHEST BY REQUEST

I made the Tool Chest from issue 283 (September 2022), as a Christmas present for my daughter. It was her special request. I used Walnut and figured maple like the article, but changed the box joints to dovetails. 🌲

Scott Matthews

Newport News, Virginia



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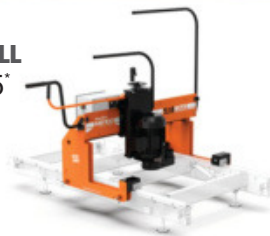
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• **DAN HUMPHREY**, of Mt. Vernon, Ohio, used air-dried cherry grown on his property to make this display case for his grandson's Eagle Scout commemorative rifle and a flag flown over the U.S. Capitol. The case features remote-controlled, dimmable LED lights and hangs on a French cleat.



• **CHRISTOPHER LESLIE BOWERMAN** of Cypress, California, built this color-changing chessboard in honor of his late father. It's made from walnut, birds-eye maple, and cherry. He used his CNC router to cut the walnut squares. Epoxy resin creates the white squares that glow with the light of color-changing LEDs mounted underneath.



• After a tornado destroyed his daughter's home, **JOE THOMPSON** of Oak City, Oklahoma, built this dining room table for their new home. Joe used reclaimed Douglas fir from an old storage building that sat on a friend's farm.



• The Bombardier B12 was a 1940s, 7-passenger, wooden "ice bus" originally used for transportation across the ice in Canada. **JIM KUEHNS** from Stillwater, Minnesota, first rode a vintage Bombardier at the Lake of the Woods. Inspired by the wood toys in *WOOD* magazine, he built two scale models of his own, complete with functioning doors.



SEND US A PHOTO OF YOUR WORK

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

● Harry Volker's grandson, **COLIN MARTIN** of Tunkhannock, Pennsylvania, has been hanging out in Grandpa's workshop since he was 5 years old. He made this wall mirror as his first woodshop project. The mirror was a Christmas gift for Harry and his wife, Jane, who are very proud of Colin.



● **ANDREW KOTLARSIC** of Chardon, Ohio, made this wedding bench for his granddaughter. She wanted the guests to sign it, extending their love and best wishes. Andrew made the bench from cherry and ash, staining the legs black while leaving the rest natural. He finished the bench with polyurethane.



● Inspired by a design of a female face he saw on a hotel window in Dubai, **RAYMOND PROSS** of Gardnerville, Nevada, made a jewelry box from walnut, ebony, and cherry. 🌳



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LOWER LEVEL, HIGHER FUNCTION

A little forethought in home design and architecture creates a basement space free of the normal obstructions, leaving it wide open for a workshop.

WRITER: RANDY MAXEY



This bright, quiet, and roomy workshop located under the garage required a lot of engineering and coordination. Bob has no regrets about the planning, construction work, or cost.



▲ Bob has always had a passion for creating things with his hands. Early on, he enjoyed automotive collision repair before turning his attention to woodworking. He retired from an automotive finish manufacturer as a business solutions manager.



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Creating a woodworking shop in a basement presents a number of challenges. In older homes, the ceilings are often below 8'. Factor in ductwork or plumbing, and moving around requires ducking your head to avoid a headache. Throw in obstacles like structural support posts and mechanical equipment, and the loss of navigable floor space becomes frustrating.

These were issues Bob Medved had faced in his prior shops. So when he had the opportunity to build a new home, he worked with the builder to eliminate these shortcomings. His solution—to locate the basement shop beneath the garage—became the source of an all-new set of challenges (See *Overcoming Construction Challenges* on page 14).

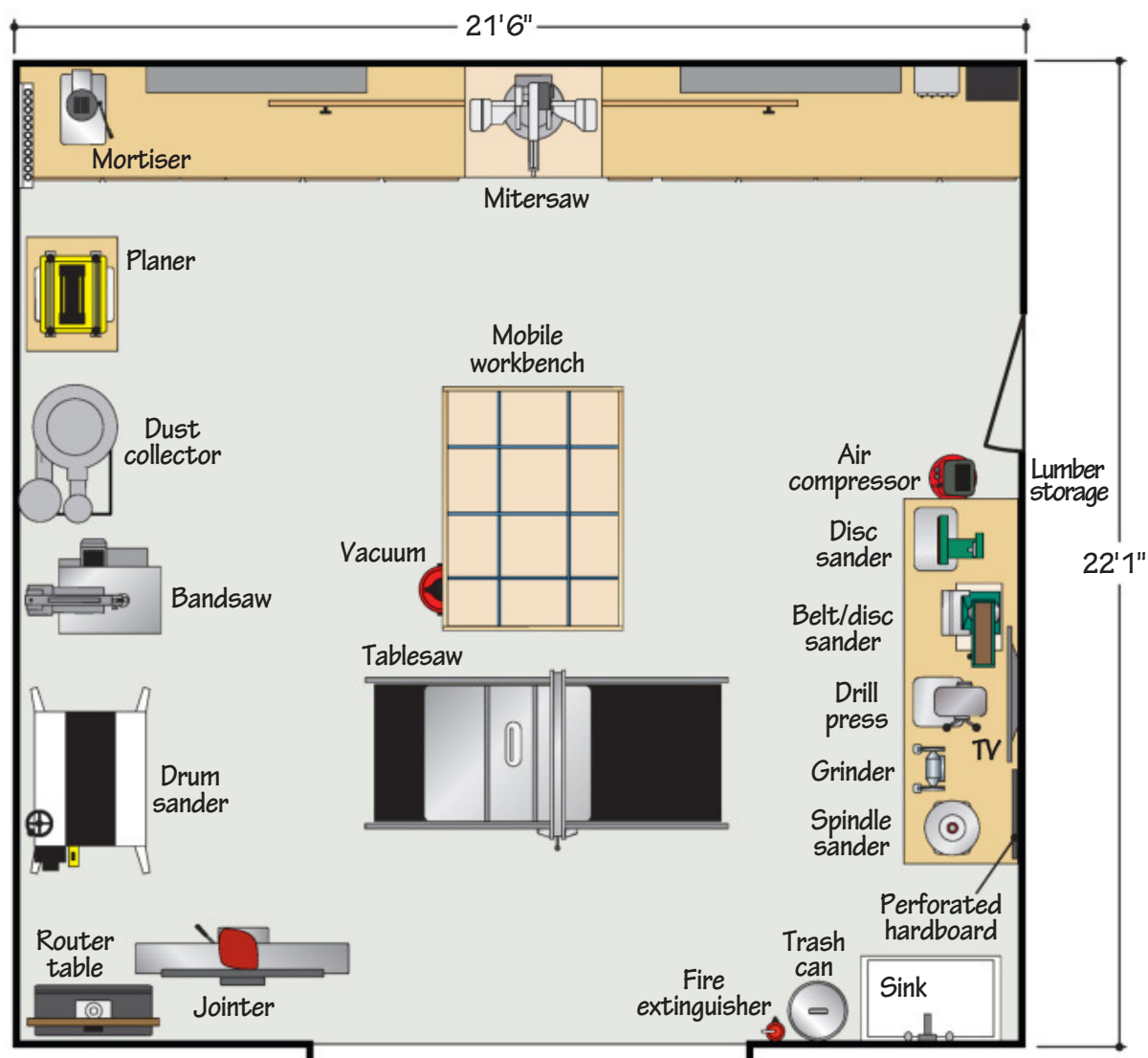
To create open space for the shop below, steel framing supports the

concrete garage floor above, eliminating the need for support posts. Ductwork and plumbing tuck between the wide beams. The furnace and water heater reside in another area of the basement. The result is 500 sq. ft. of wide-open floor space, making shop layout flexible and obstruction-free.

On the ceiling, spray-foam insulation prevents shop sounds from migrating upstairs. On the walls, white-painted drywall over 2×4 framing creates a clean look while brightening the workspace—another one of Bob's goals. Because of their weatherstripping, Bob installed exterior-quality doors between the basement and the shop space to help with dust and sound mitigation.

When designing the shop, Bob had the electrician place a subpanel in the shop that runs everything but the lights,

PHOTOGRAPHER: ROBERT MEDVED
ILLUSTRATORS: ROXANNE LEMOINE, LORNA JOHNSON



woodmagazine.com

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which he left on the main house panel. "In my old shop, when I threw a breaker, all the lights would go out, leaving me in the dark," he says. Bob sent the electrician all the amperage specifications for each machine so he could accurately assess panel requirements.

A wall-mounted dust collector with 4" ductwork captures sawdust effectively from the machines while a ceiling-mounted air filter takes care of any remaining airborne dust.

Dust accumulation was one of Bob's pet peeves in his prior shops. His shop walls are free of all but a few open shelves where dust can gather. Instead, cabinet doors became a priority for the new space. He installed prefab base cabinets for storage with beefy butcherblock tops. "I like a clean, uncluttered shop. I clean up every evening after my work is ended. I don't let dust or clutter build up to the point where it would take me a week to clean it later."

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All of Bob's benchtops feature embedded T-track, including a heavy-duty bench he made from 4×4 legs with 2×4 rails. This bench houses benchtop tools like sanders, a drill press, and a grinder. The fences flanking the saw in Bob's mitersaw station also fasten to embedded T-track, allowing for adjustment as needed.

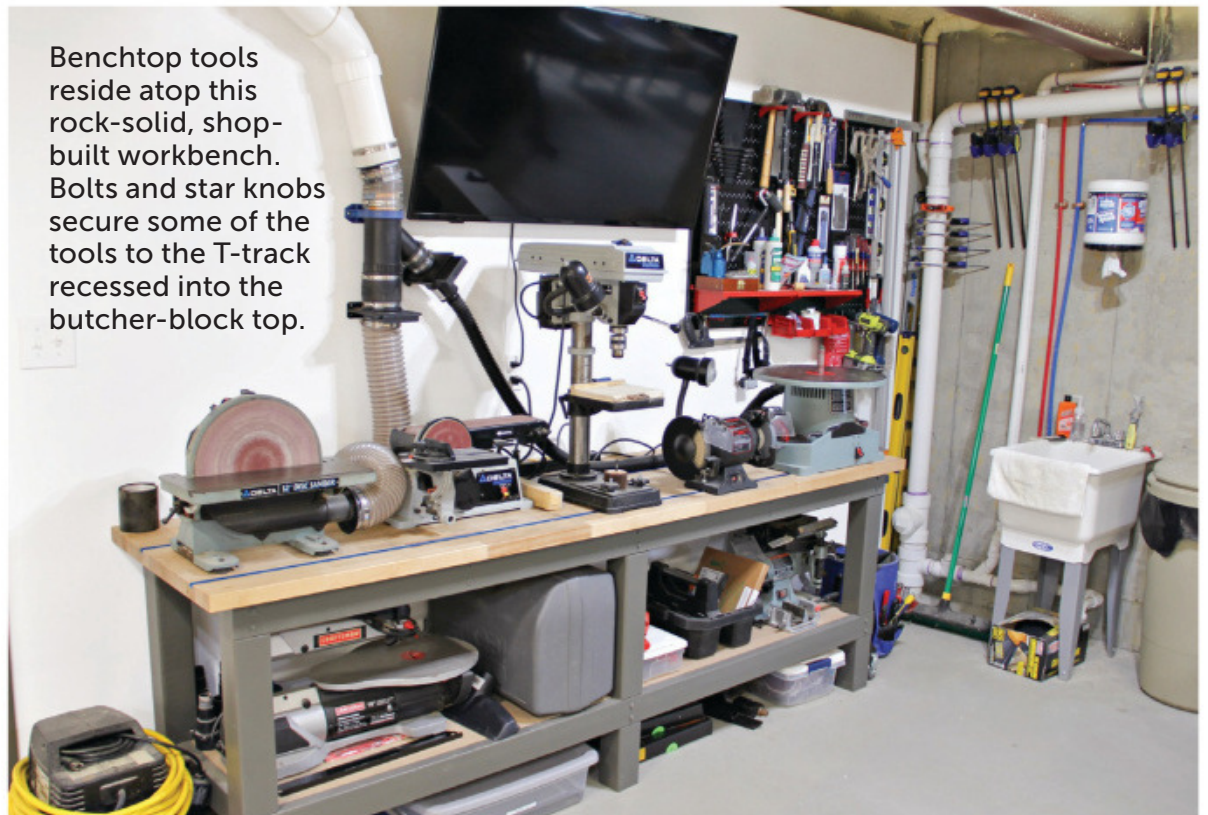
Perhaps the most useful and unique item in Bob's shop is the mobile, adjustable-height workbench. The base is an old, pedal-operated, hydraulic motorcycle lift table he purchased from a friend. Bob added a two-layer 4×8' plywood top edged with hardwood and a frame underneath that slips over the lift table's top. It, too, features an array of embedded T-track. Bob uses this bench for project assembly, carting around project parts, and as an outfeed table for his tablesaw.

Throughout his career, Bob has been an advocate for SkillsUSA, a workforce development organization that encourages students to become skilled professionals, leaders, and responsible community members. Bob says, "I love to see young people excited about skilled trades." 🌱

OVERCOMING CONSTRUCTION CHALLENGES

Bob worked with his architect to design a basement shop under the garage when he built his new home. This required some unique construction techniques:

- Massive steel beams and steel decking support the concrete for the garage floor.
- The garage floor was poured in two separate layers with a waterproof membrane in between to prevent leakage to the shop below.
- Spray foam on the ceiling insulates the space and prevents condensation between the air-conditioned shop and the unconditioned garage above.



Benchtop tools reside atop this rock-solid, shop-built workbench. Bolts and star knobs secure some of the tools to the T-track recessed into the butcher-block top.



Bob takes great care to store lumber neatly in stickered stacks for proper air circulation and drying. A mobile cart stores cutoffs and sheet goods for convenient access.



Cabinets line one wall and prevent the dust accumulation that occurs on open shelving. The only two open shelves in the shop house battery chargers and memorabilia.

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CREATING A DURABLE PAINT FINISH

I've always used stains or clear finishes on my projects but I've been asked to build a project that will be painted. What can I do to make sure the paint resists scratches and doesn't peel or crack?

Dave Laughrin
Saginaw, Michigan

A: Just as it is with a stain or clear finish, preparing the surface properly is the groundwork for success. Any scratches or imperfections in the raw wood will telegraph through the paint, not only spoiling the appearance but also providing a weak point in the finish which can lead to failure down the road.

For the best paint finish, start by carefully selecting the wood species. Close-grained woods, such as poplar, pine, and alder will yield a smoother surface than open-grained woods like oak or ash. For sheet goods, consider birch plywood or MDF as both take paint well.

To prepare the wood for paint, sand the surface up to 180-grit. You want it to be smooth, but still have a bit of tooth to hold the paint. Ease all the edges and corners with sandpaper, as paint won't stick to a sharp edge. Fill any cracks or knotholes, as well as the edges of plywood or MDF, with vinyl putty or drywall spackle. Sand the filler smooth after it dries.

Raw wood will absorb paint like a sponge, so use a primer first. If you're planning to use a water-based paint, use a water-based primer. For projects made from pine or other resinous woods, use a pigmented shellac (such as Zinsser B-I-N) or a stain-blocking primer to prevent bleed-through of knots and sap. Let the primer dry according to the directions (generally overnight), then sand the surface lightly with 320- or 400-grit sandpaper.

When it comes to choosing the paint, skip the wall paint and instead go with an acrylic trim or furniture enamel for better durability. Apply the first coat and allow it to dry completely, then sand it lightly with 320-grit sandpaper to knock down any dust nibs before applying the next coat. Two coats are usually sufficient to create a durable finish.

For most projects, you can stop here and have a perfectly fine, long-lasting paint finish. But for projects that will get scrubbed and wiped down frequently (such as kitchen cabinets or tabletops) you can add another layer of protection by applying polyurethane over the paint. To do this, allow the paint to cure for at least a week, then smooth the surface with 320-grit sandpaper. Brush on a coat of polyurethane. After it dries thoroughly, sand it lightly before applying a second coat. Two coats will offer adequate protection for years of use. 🌳

TIP!

Use a water-based polyurethane to topcoat a painted finish. Oil-based polyurethanes may create a yellow tint.

TIP!

Use a tack cloth or shop vacuum to remove any sanding dust after each sanding step.

TIP!

Gloss or semi-gloss enamels will wear longer than flat- or satin-finish paints.



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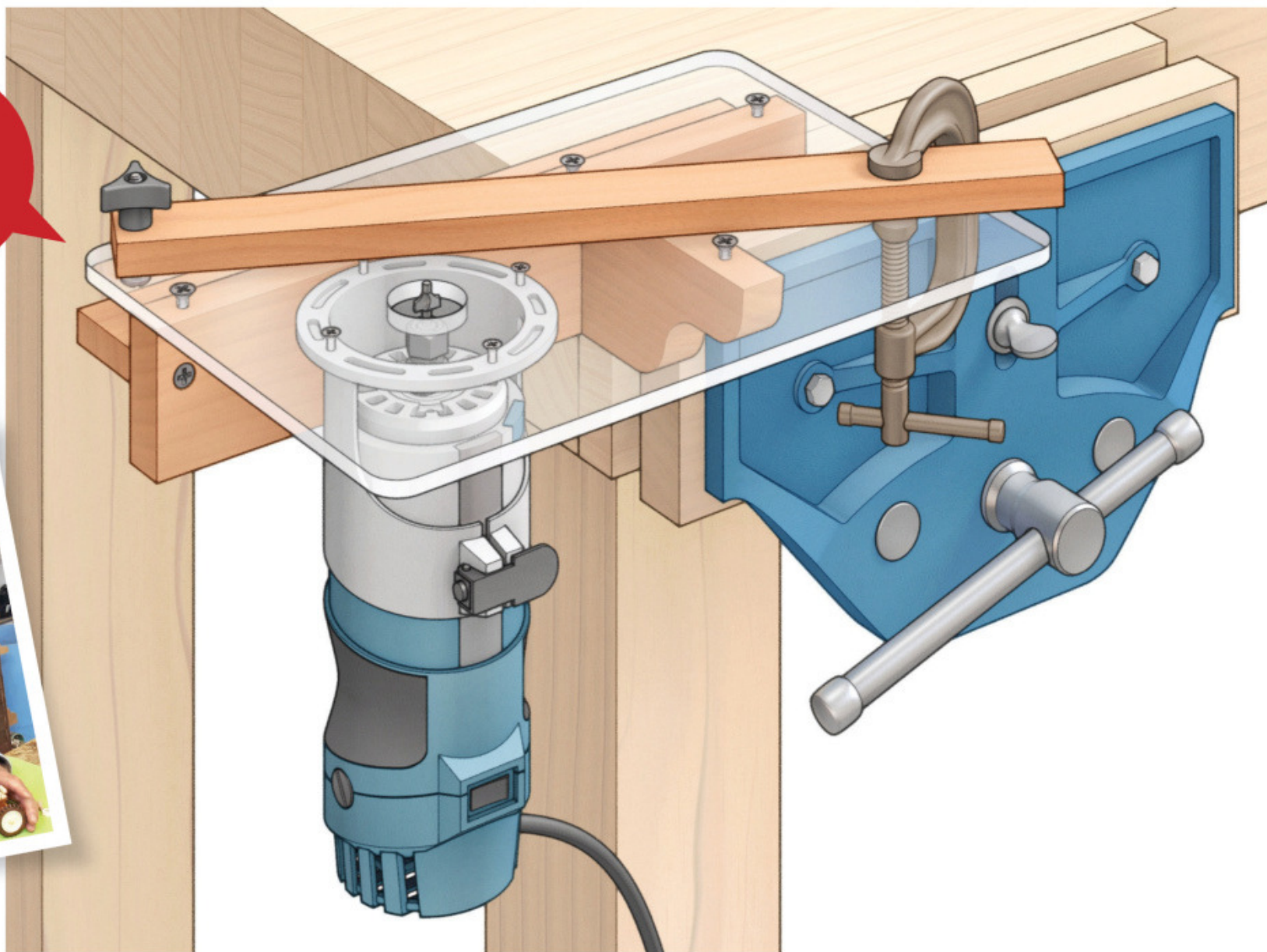
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**TOP
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READY ROUTER

I build a lot of small projects, particularly scale models, making my full-size router table overkill. Also, standing at the router table is a challenge due to health issues. So I made a small, portable table for my compact router that I can position at a comfortable height to rout small parts safely while seated.

Starting with a piece of $\frac{3}{8}$ "-thick polycarbonate (Lexan), I drilled mounting holes for the router and a clearance hole for the bit using the router's plunge base as a template for locating the holes. The cleat allows me to clamp the table in the face vise or to the edge of my workbench. A support arm extends from the cleat to prevent the polycarbonate top from flexing.

I use a bolt with a star knob to secure a pivoting fence made from a piece of scrap. As an added convenience, I use a foot switch to power the router on and off.

Charles Thompson
Washington, Iowa

For his tip, Charles wins a Track Saw Guide plus four hardware-installation jigs from Milescraft worth \$380 (saw not included).



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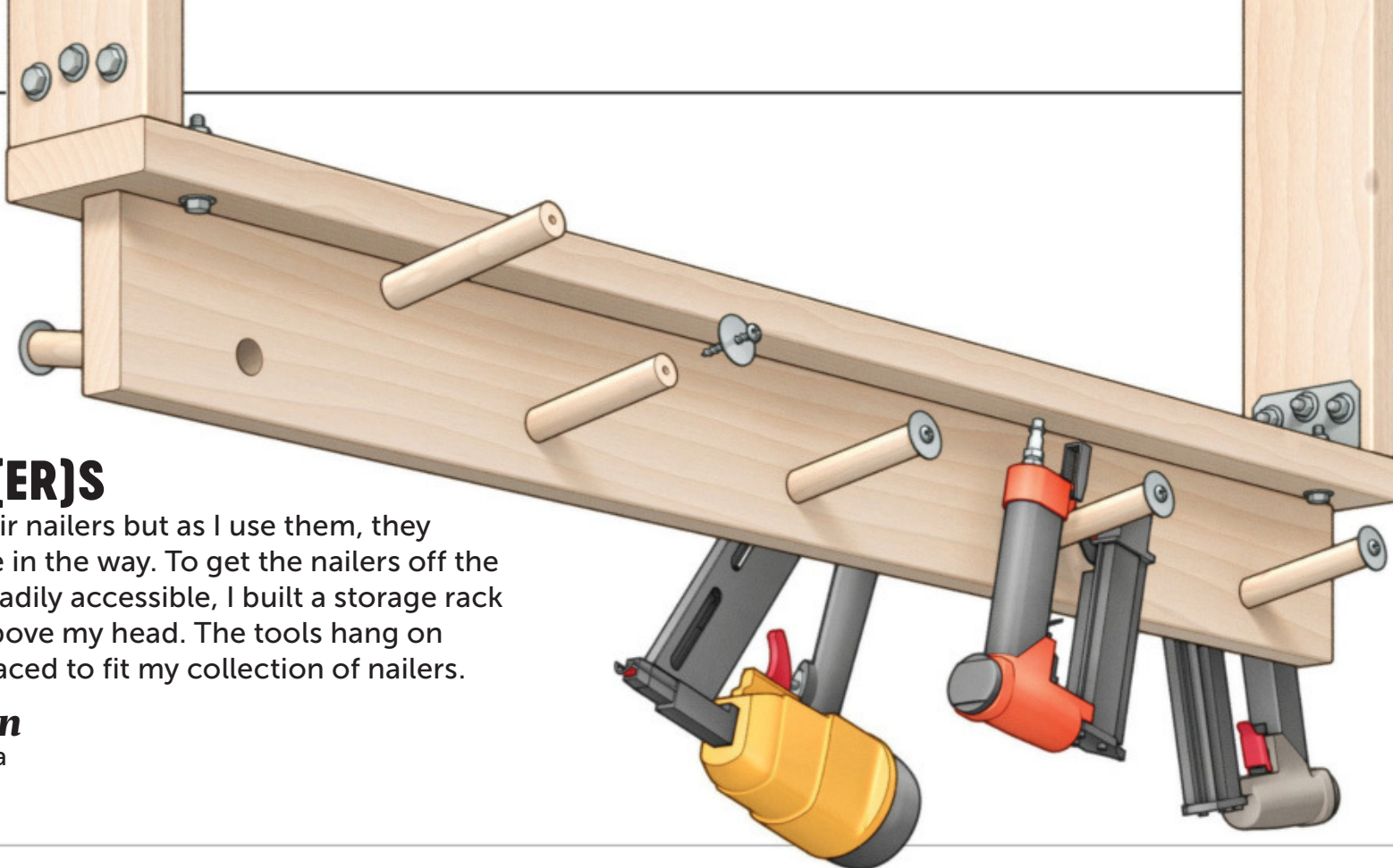
Because we try to publish original tips, please send yours only to **WOOD**® magazine.

ILLUSTRATOR: CHRISTOPHER MILLS

HANG NAIL(ER)S

I use a variety of air nailers but as I use them, they always seem to be in the way. To get the nailers off the workbench but readily accessible, I built a storage rack an arm's length above my head. The tools hang on angled dowels spaced to fit my collection of nailers.

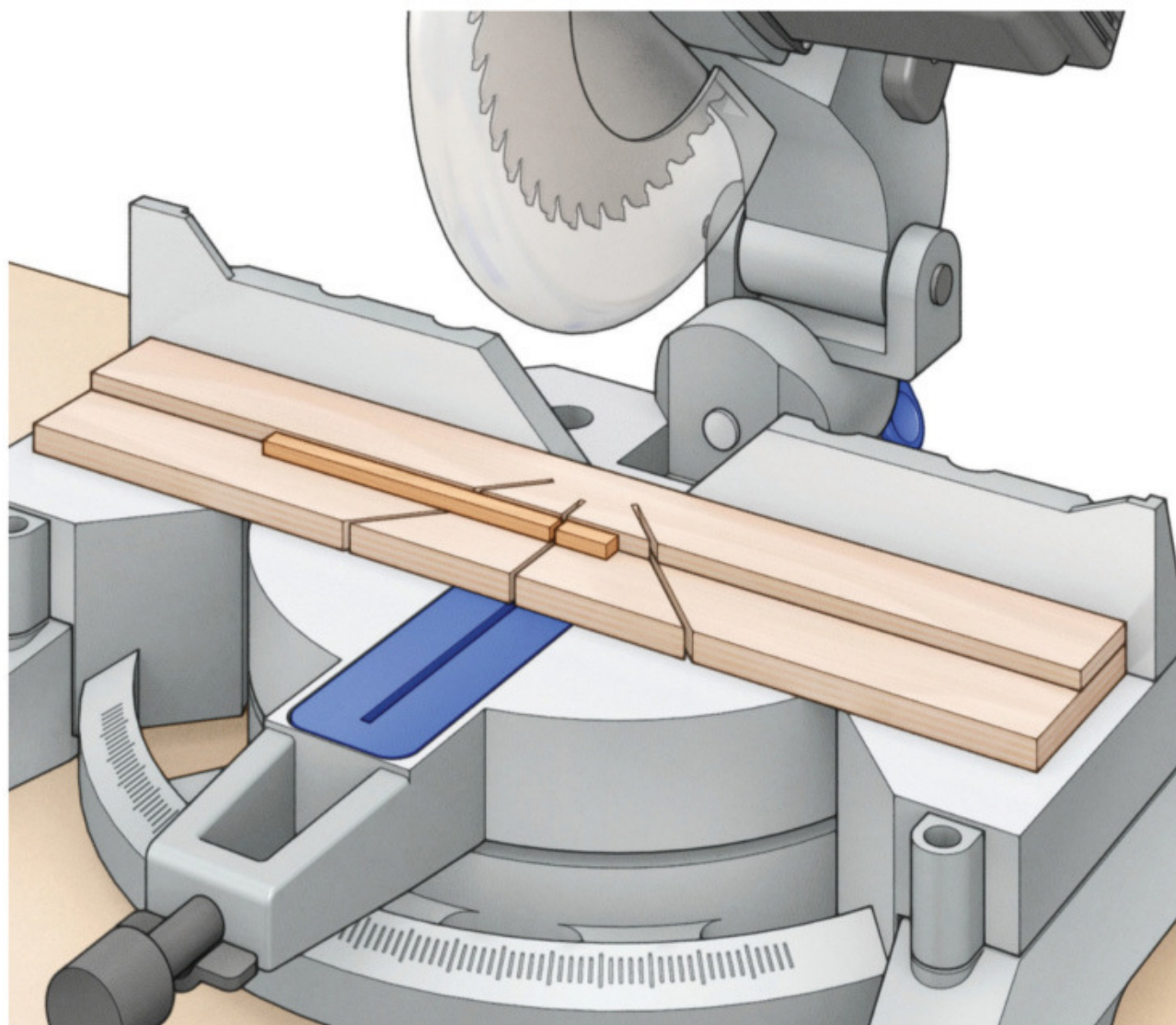
Mike Bozeman
Wetumpka, Alabama



CRYING FOR HELP

While working in the shop one day, I needed help moving some large boards but had no way to call for assistance. That incident reminded me that we had an old baby monitor in the closet. I set up the transmitter in my shop with the receiver in the house. Now, anyone in the house can respond to my pleas for help.

Scott Hunter
Chicago, Illinois



SAFE & SIMPLE SAWING

Cutting thin, short pieces at the miter saw can be a bit intimidating. This simple fence clamps to my saw to make cutting the small parts easier and safer. The base is made of 1/2" Baltic birch plywood. On top of that, I attached a hardwood fence. The fence creates a zero-clearance opening around the blade and brings the workpiece closer to the front of the saw table. I set my saw's depth stop when using the fence to prevent cutting completely through the fence base.

Jeff Baenen
Kenosha, Wisconsin

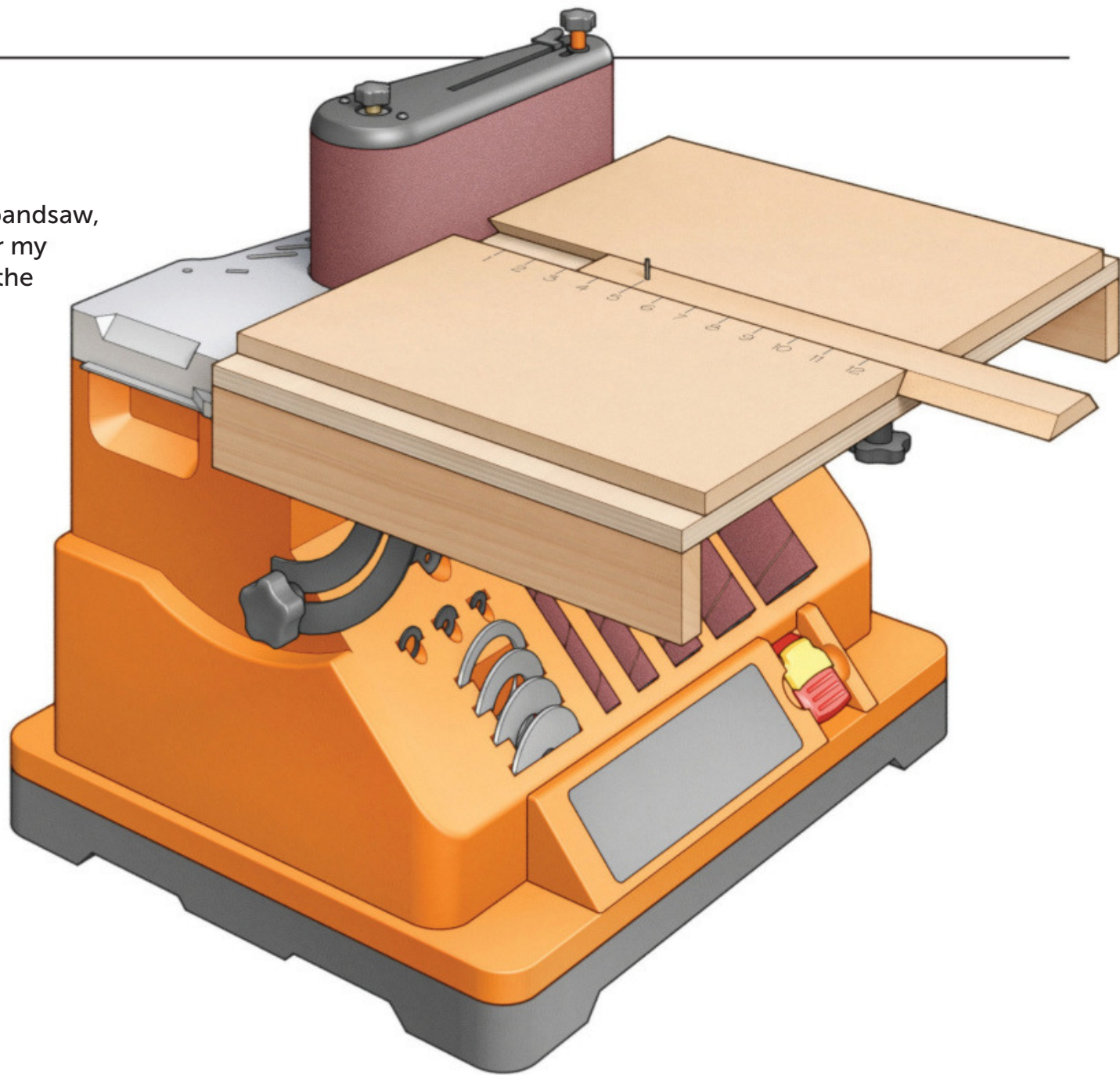
CIRCULAR MOTION

I often use a jig to cut circles on my bandsaw, but it leaves a rough edge. This jig for my oscillating belt/disk sander smooths the edge quickly and easily.

I started with a base of 1/2" Baltic birch plywood sized to fit the sander's table plus a few inches in length to accommodate cleats. Cleats mounted underneath fit snug to the table ends to lock the base in place side to side. A strip of hardwood mounted to the underside slips into the miter slot to eliminate front-to-back movement.

The upper layer, also made of Baltic birch, features a sliding, dovetailed runner that I cut on the tablesaw. I added a cut-off 5d nail as a center pin for locating the circle workpiece. My setup allows for circles up to 24" in diameter. A T-nut in the base, aligned with the runner, locks it in place using a threaded knob.

Joseph Vano
Clarksville, Tennessee



SMOOTH AND CURVY

After using bending plywood to create a curved surface on a project, I was left scratching my head figuring out how to sand it without creating flat facets. The solution was right in front of me: Make a sanding block from a scrap of the same bending plywood. Screws near each edge fasten dowel handles to the plywood. I use adhesive-backed sandpaper or a spray adhesive to fasten the paper to the plywood with staples to reinforce it where the sandpaper wraps the edges.

Emanuel Ringel
Ambler, Pennsylvania

1920s Style for a 1920s Price

It was a warm summer afternoon and my wife and I were mingling with the best of them. The occasion was a 1920s-themed party, and everyone was dressed to the nines. Parked on the manse's circular driveway was a beautiful classic convertible. It was here that I got the idea for our new 1920s Retrograde Watch.

Never ones to miss an opportunity, we carefully steadied our glasses of bubbly and climbed into the car's long front seat. Among the many opulent features on display was a series of dashboard dials that accentuated the car's lavish aura. One of those dials inspired our 1920s Retrograde Watch, a genuinely unique timepiece that marries timeless style with modern technology.

With its remarkable retrograde hour and minute indicators, sunburst guilloche face and precision movement, this design is truly one of a kind. What does retrograde mean? Instead of displaying the hands rotating on an axis like most watches, the hands sweep in a semicircle, then return to their starting point and begin all over again.

Retrograde watches by the big brands can set you back thousands; one recent offering from a big French fashion house is selling for more than \$150,000! But because we've designed the 1920s Retrograde Watch in-house, we can offer it to you for just \$99!

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SHOP TIPS

HANDY CAN HOLSTER

The extension tubes that come with many spray cans kept disappearing in my shop until I came up with a simple solution using a plastic drinking straw. Just heat one end of the straw and pinch it shut with pliers to seal it. Then cut the other end to length. Tape the holster to the can, then simply slide the tube in to secure it.

Chuck Sanborn

West Allis, Wisconsin

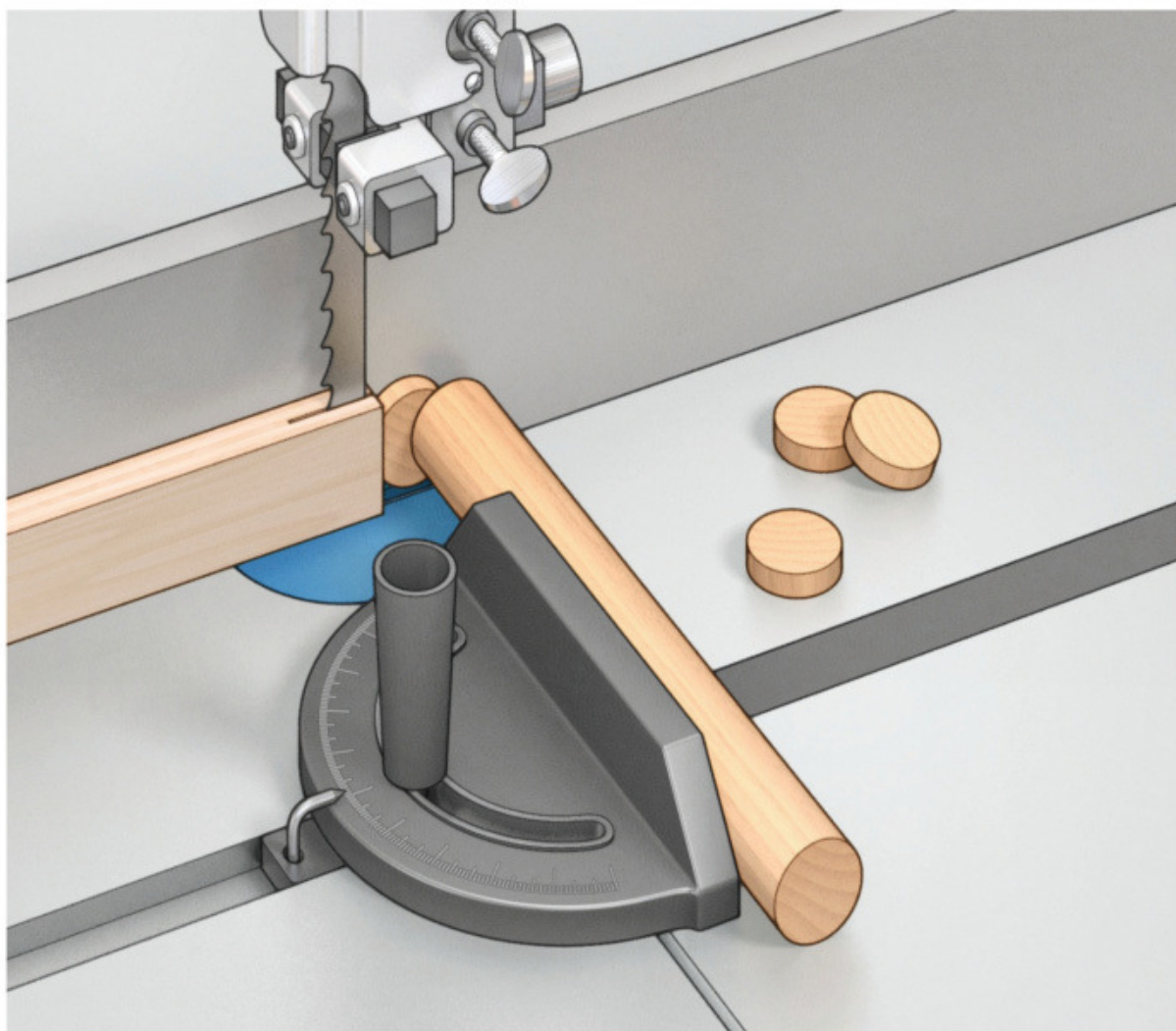


STOP SLIPPED DISKS

A recent board-game project required cutting a lot of thin disks from dowels. To make them consistently, I use the bandsaw fence as a stop to set the disk thickness, my miter gauge to guide the dowel, and a slotted pushstick to push the cut disks free. The depth of the slot on the pushstick equals the diameter of the dowel plus the blade width to ensure the disk clears the blade.

John Baker

Normal, Illinois



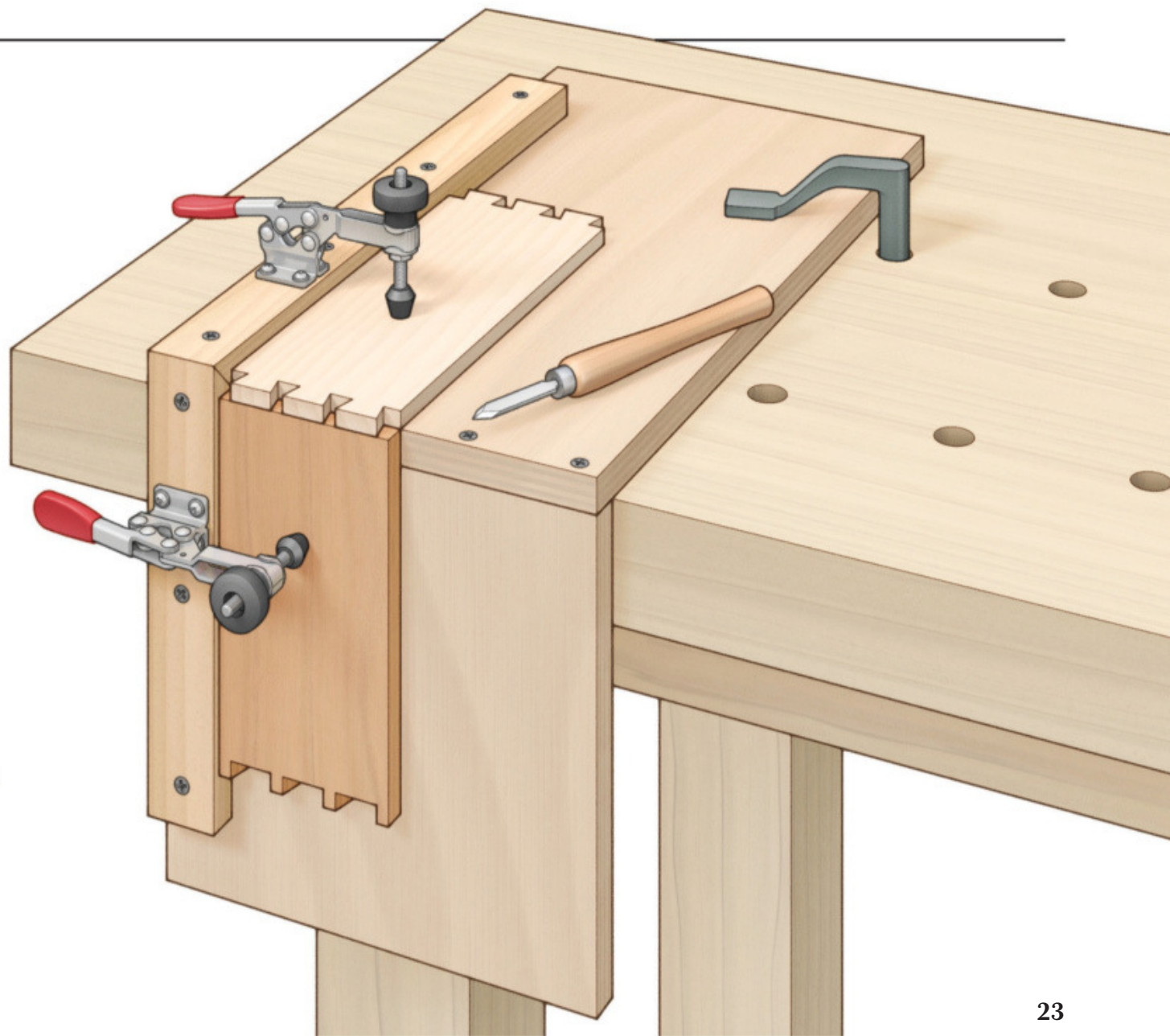
TAIL MARKINGS

This jig really simplifies transferring the tail locations to the pin board when laying out handcut dovetails. I made the base pieces from $\frac{3}{4}$ " Baltic birch plywood fastened at 90° with glue and screws. A pair of hardwood fences along one edge have toggle clamps to align and register the boards for marking.

To use the jig, clamp the pin board vertically with the edge against the fence and the end flush with the horizontal base. Position the tail board so it overlaps and clamp it in place. After marking one end, flip both boards end-for-end and repeat. 🌲

Douglas Carlson

St. Paul, Minnesota



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WALL-MOUNTED TV SURROUND

Warm up a cold, blank flat-screen with this cherry TV surround. It houses a sound bar while also providing display and storage space.

WRITER: KERRY GIBSON
DESIGNER/BUILDER: KEVIN BOYLE

PHOTOGRAPHER: JASON DONNELLY; ILLUSTRATORS: ROXANNE LEMOINE, LORNA JOHNSON



Using the rip fence as a stop, cut the $\frac{3}{4} \times \frac{3}{8}$ " dados in the sides (A, I, R) and base top/bottom (J). An auxiliary miter gauge fence helps support long workpieces.

Install an auxiliary fence on your rip fence, then butt the fence against the dado blade and cut the rabbets in the top end of the case sides using the miter gauge to guide the pieces.

It used to be that hulking console televisions were as much furniture as they were viewing devices. These days, TV screens have shrunk in thickness, but expanded in size to dominate an entire wall. This TV surround dresses up that expanse of black with a furniture touch. The modular design features upright shelving units on the sides with a sound-bar shelf and storage unit bridging the space above and below the TV.

We designed this project to fit a 65" screen, but you can easily expand or shrink the cases to fit your television.

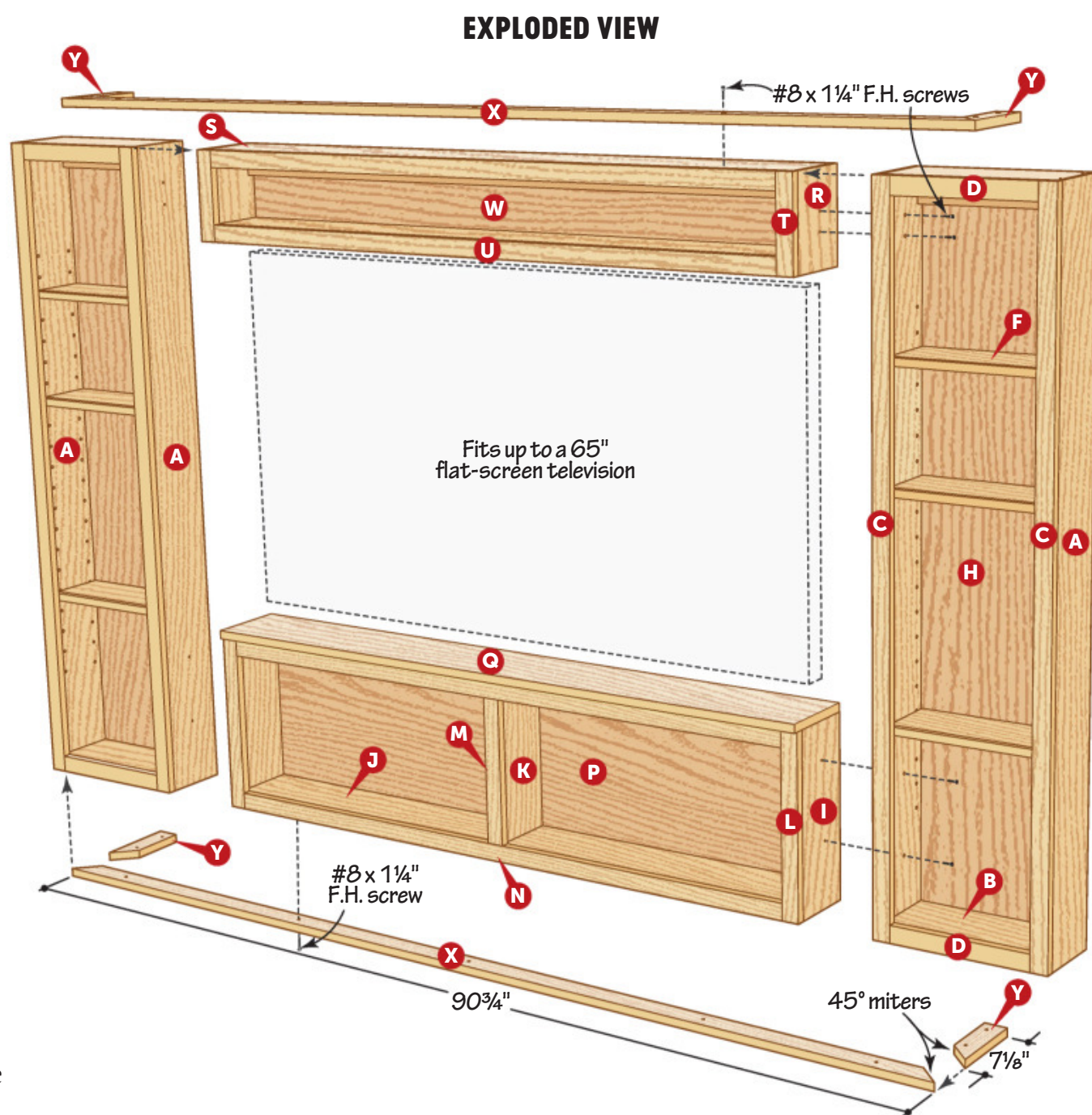
CUE THE CASES

All of the cases are made up of $\frac{3}{4}$ " plywood, with rabbets and dados in the sides to receive the tops and bottoms. Cutting all those plywood pieces first reduces setups.

1 From $\frac{3}{4}$ " cherry plywood, cut the upright sides, tops, and bottoms (A, B), base sides, top, bottom, and divider (I, J, K), as well as the bridge sides, top, and bottom (R, S) to size [\[Exploded View, Materials List\]](#).

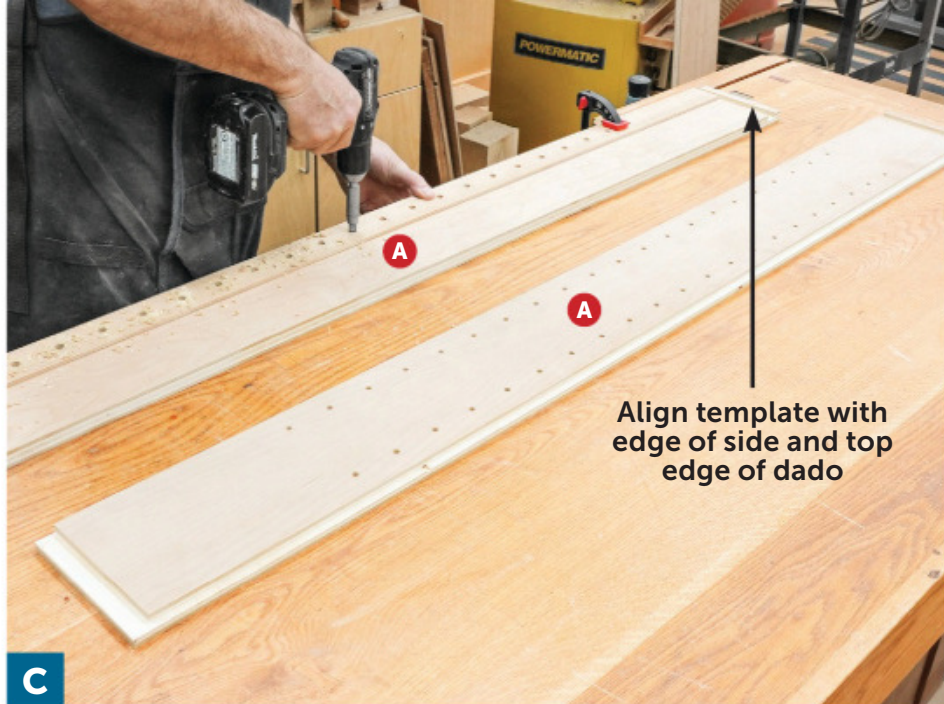
2 Set up your dado stack to match the plywood thickness and, using the fence as a stop, cut the dados in all the case sides (A, I, R) to accept the bottoms [\[Drawings 1-4\]](#). Reset the fence and cut a centered dado in the base top and bottom (J) to accept the divider (K) [\[Photo A\]](#).

3 Cut the rabbets in the top ends of all the case sides (A, I, R) to accept the tops [\[Drawings 1-4, Photo B\]](#).



4 Bury all but $\frac{1}{4}$ " of the dado stack in the auxiliary fence and cut the $\frac{1}{4}$ " rabbets in the back edge of all the case sides [\[Drawings 1-3\]](#). Note that the pairs of case sides mirror each other.

OVERALL DIMENSIONS
90 $\frac{3}{4}$ "W x 7 $\frac{1}{8}$ "D x 61 $\frac{1}{2}$ "H

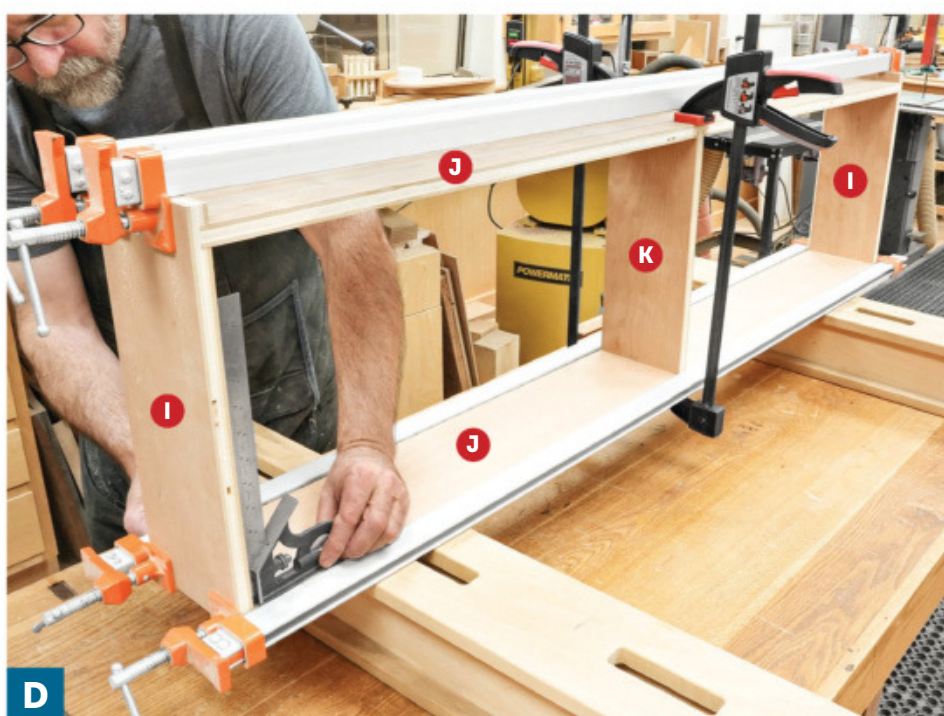


Align template with edge of side and top edge of dado

5 To drill the shelf-pin holes in the upright sides (A), make a drilling template from $\frac{1}{4} \times 2 \times 48$ " plywood. Starting $8\frac{1}{2}$ " from one end, drill holes centered on the template's width every 2" on center [Drawing 2]. We drilled $\frac{3}{8}$ " holes to fit our $\frac{1}{4}$ " self-centering bit. After making the template, drill shelf-pin holes in both upright sides [Photo C]. Finish-sand the inside face of all the case pieces.

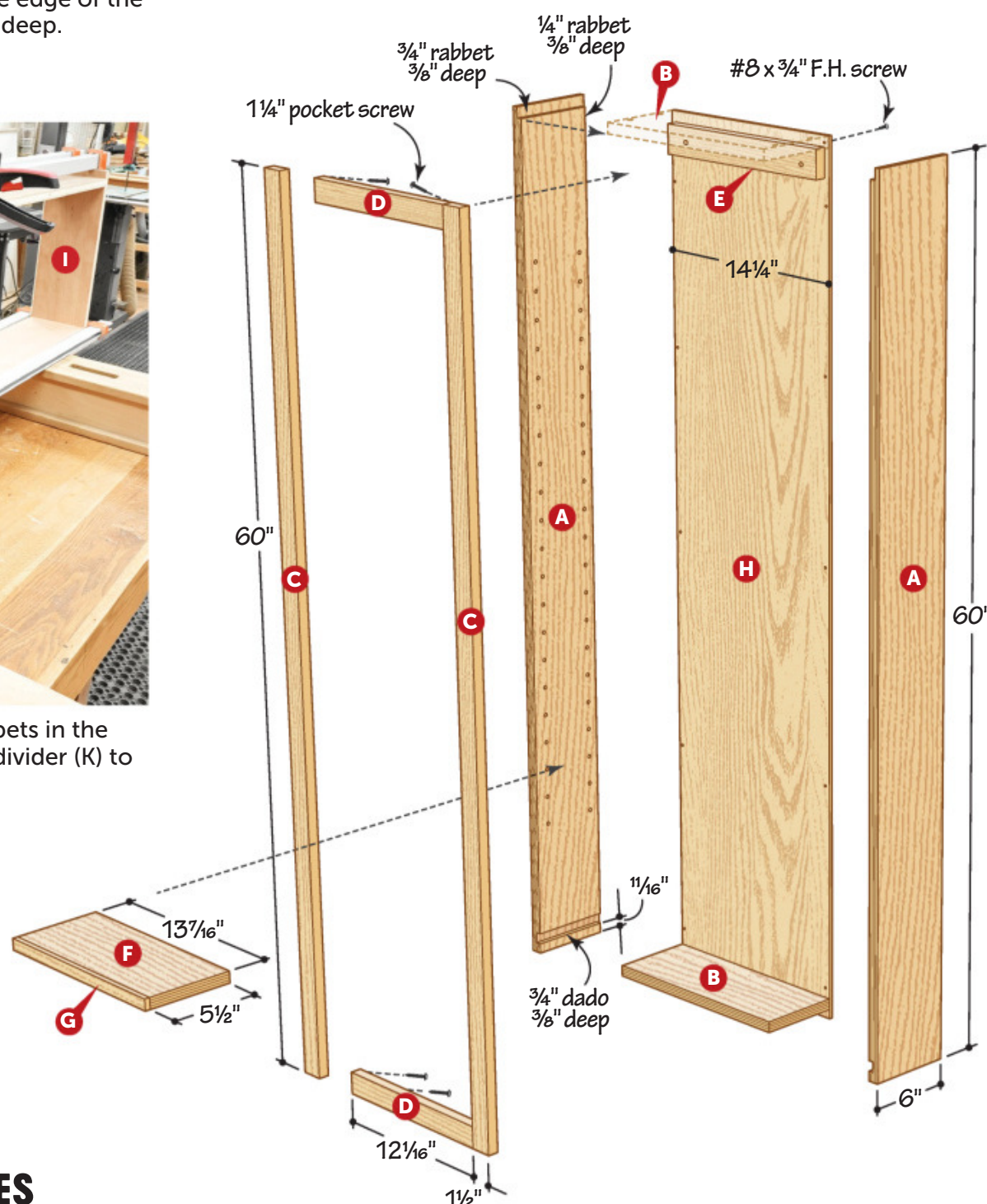
6 Assemble the cases by gluing the tops and bottoms (B, J, S) into the dadoes and rabbets in the sides (A, I, R). On the base, add the divider (K) [Photo D].

Align the template with the dado and the front edge to drill the first row of shelf-pin holes. Then realign the template with the edge of the rear rabbet and drill another row. Be sure to drill only $\frac{3}{8}$ " deep.



To assemble the cases, apply glue to the dadoes and rabbets in the sides and clamp them to the tops and bottoms. Add the divider (K) to the base assembly. Check all of the cases for square.

1 UPRIGHT



FOCUS ON THE FRAMES

A good face frame can conceal slight misalignments. In this design, you'll build frames with rails that are slightly overlength, pushing the stiles just beyond the case sides, then you'll rout the stiles flush after installation. The top edge of the lower rails will stand slightly proud of the bottoms, ensuring no plywood edges show.

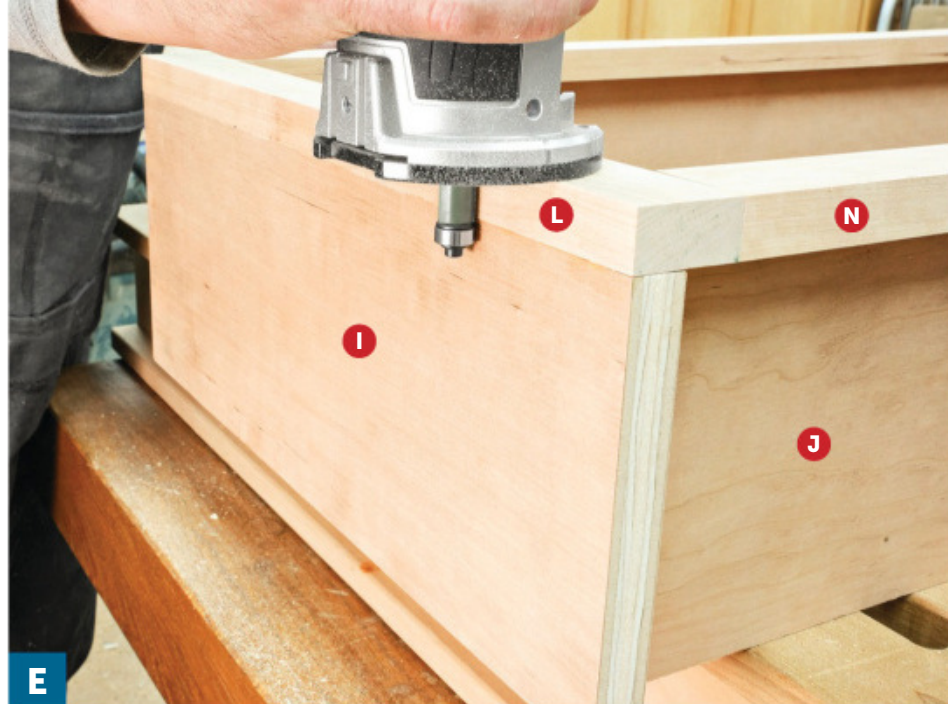
1 From $\frac{3}{4}$ " stock, cut the stiles and rails (C, D, L, M, N, T, U) for the upright, base, and bridge face frames to size [Exploded View, Materials List]. Drill pocket holes in the ends of each rail (D, N, U) and the divider stile (M). Glue and screw each of the face frames together, checking them for square.

Technical drawing of a wooden cabinet door. The overall dimensions are 60" in height and 6" in width. The door features a 3/4" rabbet 3/8" deep at the top and a 1/4" rabbet 3/8" deep at the bottom. A 1/4" shelf-pin hole 3/8" deep is located 1" from the right edge. The door is 2" wide at the bottom and 8 1/2" high. A 3/4" dado 3/8" deep is shown at the bottom edge, with a 1 1/16" gap between the door and the cabinet frame. A red circle with the letter 'A' is placed on the door.

3 Glue and clamp the face frames to the cases, making the upper rail flush with the case top, and overhanging the stiles beyond each case side evenly.

4 After the glues dries, use a flush-trim bit to rout the stiles flush with the sides of the cases **[Photo E]**.

5 From 3/4" stock, cut the mounting cleats (E, O, V) to fit **[Materials List, Drawings 1, 3, and 4]**, then glue and clamp them to the case tops, flush with the back edge of each.



Using a flush-trim bit, rout the stiles flush with the sides on each of the cases. This provides a clean look and ensures that the cases will fit together tightly when mounted on the wall.

3 BRIDGE

Diagram illustrating the assembly of the bridge structure. The components and dimensions are as follows:

- Top Rail (S):** A long wooden rail, 59 1/4" long, with a 1/4" rabbet 3/8" deep on its top edge. It is secured with #8 x 3/4" F.H. screws (V).
- Bottom Rail (U):** A long wooden rail, 57 1/16" long, with a 3/4" dado 3/8" deep on its top edge. It is secured with 1 1/4" pocket screws (T).
- End Rail (R):** A vertical wooden rail, 8" high, with a 1/4" rabbet 3/8" deep on its top edge. It is secured with 1 1/4" pocket screws (T).
- Bridge Deck (W):** A wooden board, 5 3/4" wide, placed between the top and bottom rails. It is secured with #8 x 3/4" F.H. screws (V).
- Dimensions:**
 - Top Rail (S): 59 1/4"
 - Bottom Rail (U): 57 1/16"
 - End Rail (R): 8"
 - Bridge Deck (W): 5 3/4"

4 BASE

7 1/4"

60"

1/4" rabbet 3/8" deep

3/4" rabbet 3/8" deep

16"

1 1/16"

3/4" dado 3/8" deep

1 1/4" pocket screw

13"

27 25/32"

57 1/16"

16"

29 1/4"

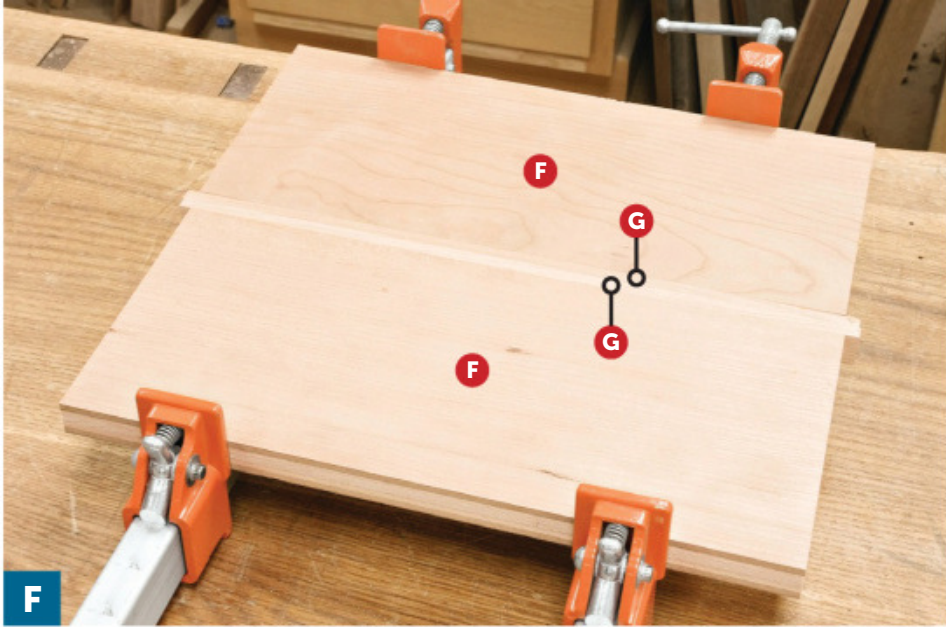
3/4" dado 3/8" deep

Elongated holes

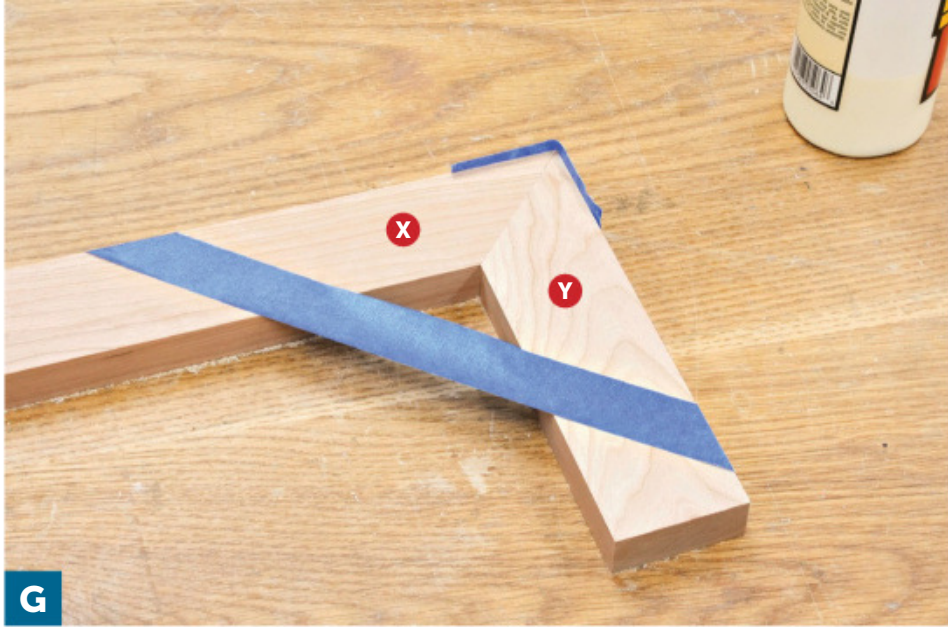
#8 x 3/4" F.H. screw

#8 x 1 1/4" R.H. screws

16"



Save time and use fewer clamps by applying the shelf trim (G) to two shelves at once. Clamping them this way also keeps even pressure across the width of the thinner edging.



To assemble the top and bottom trim, wrap masking tape around the outside corner, apply glue to the mitered surfaces, then hold the joint closed with another piece of tape.

THAT'S A WRAP

- From $\frac{3}{4}$ " plywood, cut the upright shelves (F) to size [Drawing 1, Materials List]. From $\frac{3}{4}$ " stock, cut $\frac{1}{4}$ " strips for the shelf trim (G) about 1" overlength. Glue and clamp them to the edge of the shelves [Photo F]. After the glue dries, cut the shelf trim flush with the ends of the shelves.
- From $\frac{3}{4}$ " stock, cut the base cap (Q) to size. Cut the front and side trim pieces for the top and bottom (X, Y) slightly overlength, then miter-cut the ends to finished length [Exploded View]. Glue the mitered ends together [Photo G].
- From $\frac{1}{4}$ " plywood, cut the case backs (H, P, W) to size [Materials List]. Finish-sand all the cases, shelves, base cap, case backs, and trim assemblies. Apply a finish of your choice. We used Minwax clear brushing lacquer.
- Form elongated screw holes in the base top (J) in order to install the base cap (Q). These allow the solid-wood cap to expand and contract seasonally. Install the backs on the upright, bridge, and base cases.
- To install the surround, mount the bridge, centered and level, above your wall-mounted TV, driving #10×3" cabinet screws through the mounting cleat and into wall studs.
Clamp the uprights to the bridge, clamp the base in place between the uprights and drive screws to mount it. Then screw the uprights to the bridge and anchor them to wall studs.
Add the upper and lower trim assemblies (X/Y). Install the sound bar, stock the display shelves, and fill in the lower storage area. Then grab some popcorn, flick on the big game, and enjoy the show and your handiwork. 🌿

MATERIALS LIST

PART		FINISHED SIZE			Matl.	Qty.
		T	W	L		
UPRIGHTS						
A	UPRIGHT SIDES	¾"	6"	60"	CP	4
B	UPRIGHT TOPS/BOTTOMS	¾"	5¾"	14¼"	CP	4
C	UPRIGHT FRAME STILES	¾"	1½"	60"	C	4
D	UPRIGHT FRAME RAILS	¾"	1½"	12½ ¹⁶ "	C	4
E	UPRIGHT CLEATS	¾"	2"	13½"	C	2
F	UPRIGHT SHELVES	¾"	5½"	13 ⁷ ₁₆ "	CP	6
G*	UPRIGHT SHELF TRIM	¾"	¼"	13 ⁷ ₁₆ "	C	6
H	UPRIGHT BACKS	¼"	14¼"	60"	CP	2
BASE						
I	BASE SIDES	¾"	6"	16"	CP	2
J	BASE TOP/BOTTOM	¾"	5¾"	59¼"	CP	2
K	BASE DIVIDER	¾"	5¾"	14 ⁹ ₁₆ "	CP	1
L	BASE FRAME STILES	¾"	1½"	16"	C	2
M	BASE DIVIDER STILE	¾"	1½"	13"	C	1
N	BASE FRAME RAILS	¾"	1½"	57½ ¹⁶ "	C	2
O	BASE CLEAT	¾"	2"	28 ⁷ ₈ "	C	2
P	BASE BACK	¼"	16"	59¼"	CP	1
Q	BASE CAP	¾"	7¼"	60"	C	1
BRIDGE						
R	BRIDGE SIDES	¾"	6"	8"	CP	2
S	BRIDGE TOP/BOTTOM	¾"	5¾"	59¼"	CP	2
T	BRIDGE FRAME STILES	¾"	1½"	8"	C	2
U	BRIDGE FRAME RAILS	¾"	1½"	57½ ¹⁶ "	C	2
V	BRIDGE CLEAT	¾"	2"	58½"	C	1
W	BRIDGE BACK	¼"	8"	59¼"	CP	1
X*	FRONT TRIM	¾"	2"	90¾"	C	2
Y*	SIDE TRIM	¾"	2"	7½ ⁸ "	C	4

*Parts initially cut oversize. See the instructions.

MATERIALS KEY: CP—Cherry plywood, C—Cherry.

SUPPLIES: $\frac{1}{4}$ " and #8× $\frac{3}{4}$ " flathead wood screws, #8× $\frac{1}{4}$ " roundhead screws, $\frac{1}{4}$ " fine-thread pocket screws, #10×3" cabinet mounting screws, $\frac{1}{4}$ " shelf pins.

BLADE AND BITS: Dado set, $\frac{1}{4}$ " self-centering drill bit, flush-trim router bit.

PROJECT COST: It cost us about \$375 to build this project. Your cost will vary by region and source.

CUTTING DIAGRAM

This project requires 19 board feet of 4/4 cherry based on example boards shown.



3/4 x 7 1/4 x 96" Cherry



3/4 x 3 1/2 x 84" Cherry



3/4 x 5 1/2 x 60" Cherry



3/4 x 5 1/2 x 96" Cherry



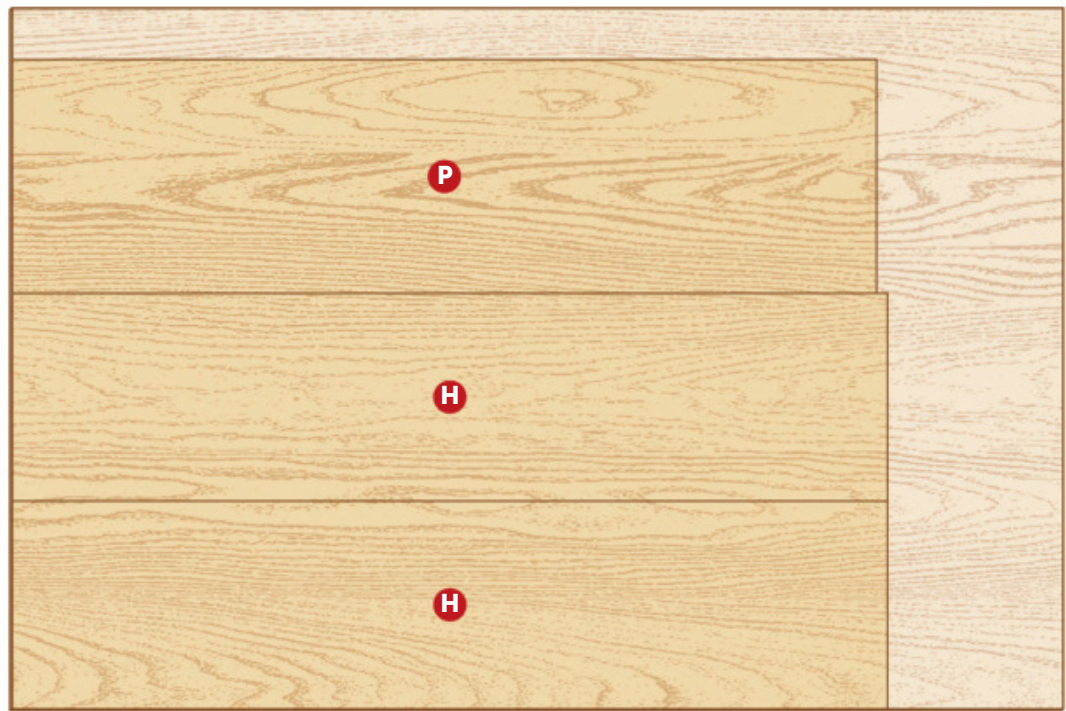
3/4 x 7 1/4 x 96" Cherry



3/4 x 48 x 96" Cherry plywood



1/4 x 12 x 60" Cherry plywood



1/4 x 48 x 72" Cherry plywood

“
YOU WON'T BELIEVE HOW MUCH THIS DRESSES UP A FLAT-SCREEN TV. AND WHO CAN'T USE MORE SHELF SPACE?
”

-KEVIN BOYLE, DESIGN EDITOR

9 HANDSAWS YOU SHOULD HAVE

Even in a shop full of power tools, these “cordless” saws offer unique capabilities, features, and value that make them must-have additions to your tool arsenal.

WRITER: RANDY MAXEY

No matter how many power saws you own, handsaws will always be useful in the shop. They cut in ways power saws can't, they're often faster or simpler to set up, and they can be more accurate. Plus, many of them are very economical. Here are nine handsaws we think every woodworker should have.



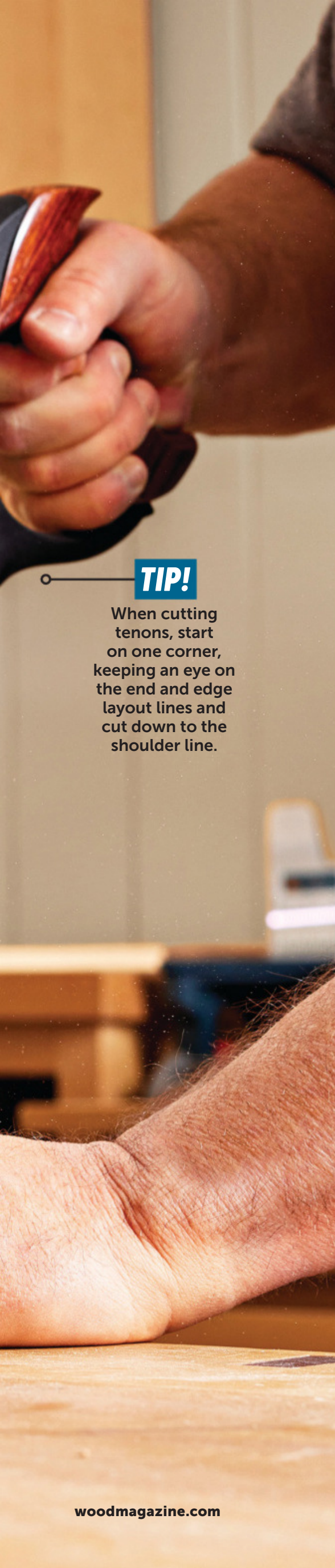
PHOTOGRAPHER: CARSON DOWNING

1

TENON SAW

With a stiff back and beefy blade, a tenon saw stays on track when hand-cutting joinery. Available in several sizes and configurations, this western-style saw cuts on the push stroke. Use a rip-cutting tenon saw to form the cheeks of a tenon. A crosscut saw defines the shoulders. Tenon saws also excel at cutting open mortises for bridle joints.

Veritas Crosscut Tenon Saw, no. 05T1405, \$149



TIP!

When cutting tenons, start on one corner, keeping an eye on the end and edge layout lines and cut down to the shoulder line.

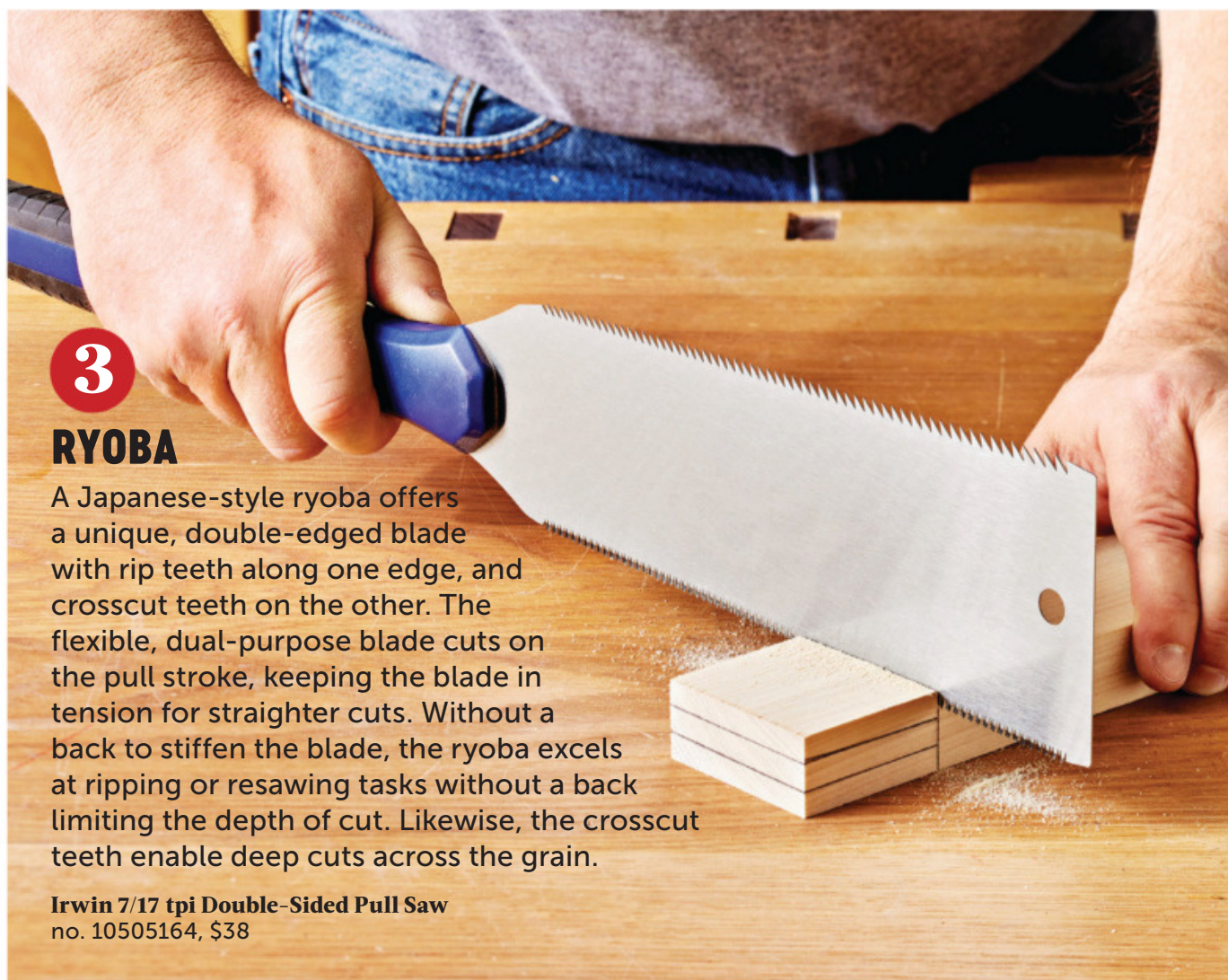


2

VENEER SAW

Fine veneers demand more than a haphazard utility knife. A veneer saw, with a narrow kerf and zero set to its teeth, cuts cleanly while allowing you to maintain straight lines. The curved, double-edged blade features small, triangular teeth for cutting on the push or pull stroke with little or no tear-out. The curve enables you to start the cut anywhere along the cutline, working toward the edges to prevent cracking the veneer. An offset handle provides clearance for fingers when cutting against a straightedge.

Kunz Veneer Saw
no. 703810, \$24



3

RYOBA

A Japanese-style ryoba offers a unique, double-edged blade with rip teeth along one edge, and crosscut teeth on the other. The flexible, dual-purpose blade cuts on the pull stroke, keeping the blade in tension for straighter cuts. Without a back to stiffen the blade, the ryoba excels at ripping or resawing tasks without a back limiting the depth of cut. Likewise, the crosscut teeth enable deep cuts across the grain.

Irwin 7/17 tpi Double-Sided Pull Saw
no. 10505164, \$38

FLUSH-CUT SAW

A thin, flexible blade with no tooth set on one side lets you trim flush without marring the surface. Typically used for flush-cutting dowels or plugs, the fine, Japanese-style tooth pattern cuts aggressively and cleanly on the pull stroke, requiring only a little sanding to bring the cut piece smooth with the surrounding surface.

**Veritas Double-Edge
Flush-Cutting Saw**
no. 05K3601, \$33



4

5

GENT'S SAW

With a stiff back and fine teeth, this western-style counterpart to the dozuki makes the fine, accurate cuts needed for precise joinery work. The back reinforces the thin blade for accurate cuts on the push stroke without kinking or bending the blade.

Blue Spruce 8" Gent's Saw, \$129



32



6

DOZUKI

A dozuki works like a gent's saw, but cuts on the pull stroke with a very thin blade. Available in varying sizes and teeth per inch (tpi), a dozuki makes razor-thin, laser-straight cuts cleanly and quickly, making this saw ideal for creating intricate joinery.

Z-Saw 5.9" (150mm) Dozuki
no. 7105, \$28

COPING SAW

Originally designed for creating seamless joints on architectural trim, a coping saw proves useful for many shop tasks. It excels at removing waste from hand-cut dovetails and multiple tenons on wider workpieces. Its thin blade slides effortlessly into a saw kerf made by a joinery saw and easily maneuvers and makes tight turns while cutting.

Olson Deluxe Coping Saw
no. SF63510, \$16



HACKSAW

When you need to cut continuous hinges, threaded rod, brass, steel, or aluminum, you'll want a hacksaw. Easy-to-change blades are available in a variety of tpi to match the material being cut and the smoothness of cut required.

Lenox 12" High-Tension Hacksaw
no. 12132HT50, \$22

8-IN-1 HANDSAW

This saw may not be needed often, but its ability to hold off-the-shelf jigsaw, hacksaw, reciprocating saw, and flush-trim blades makes it super handy to have around. It's a great utility saw for your on-the-go tool box. 🌲

Toolan 8-in-1 Handsaw
no. SW2204N, \$19





MAILBOX POST

This hollow sleeve slips over a 4x4 post, dressing it up with details to write home about, such as faux frames and panels and curved braces.

WRITER: CRAIG RUEGSEGG

DESIGNER: JOHN OLSON

BUILDER: BRIAN BERGSTROM

OVERALL DIMENSIONS

6½"W x 37"D x 59½"H

PHOTOGRAPHER: JASON DONNELLY; ILLUSTRATORS: ROXANNE LEMOINE, LORNA JOHNSON



Glue up 3¾"-wide material so you can trim the edges flush as you rip the inner-brace (A) blank to finished width.



You need not cut fully through the inner-brace (A) blank. The cut from the opposite face will intersect the first, creating the end profile.

Make your mailbox a local landmark and earn a stamp of approval from the neighbors. Hidden pocket screws and deck screws hold everything together, and cedar lumber ensures this sleeve will endure snow, rain, heat, and the gloom of night.

STAMP OUT A POST SLEEVE

1 Laminate two 24" lengths of 2-by stock to make a blank for the inner braces (A) **[Photo A, Materials List]**. Trim the blank to 3½" wide. Cut intersecting miters on each end **[Drawing 1a, Photo B]**, then lay out the arc on each **[Photo C]**. Bandsaw and sand the arcs to shape.

2 From $\frac{3}{4}$ " cedar, cut the sleeve front/back (B) and sides (C) to size [\[Materials List\]](#). Notch the edges of each side (C) [\[Drawing 1b\]](#).

3 Edge-glue material for the outer braces (D), then cut them to size. Make a template to lay out the curve on each, then bandsaw and sand them to shape **[Drawing 1c]**. Glue and pocket-screw the braces to the sides **[Photo D]** and set the assemblies aside.

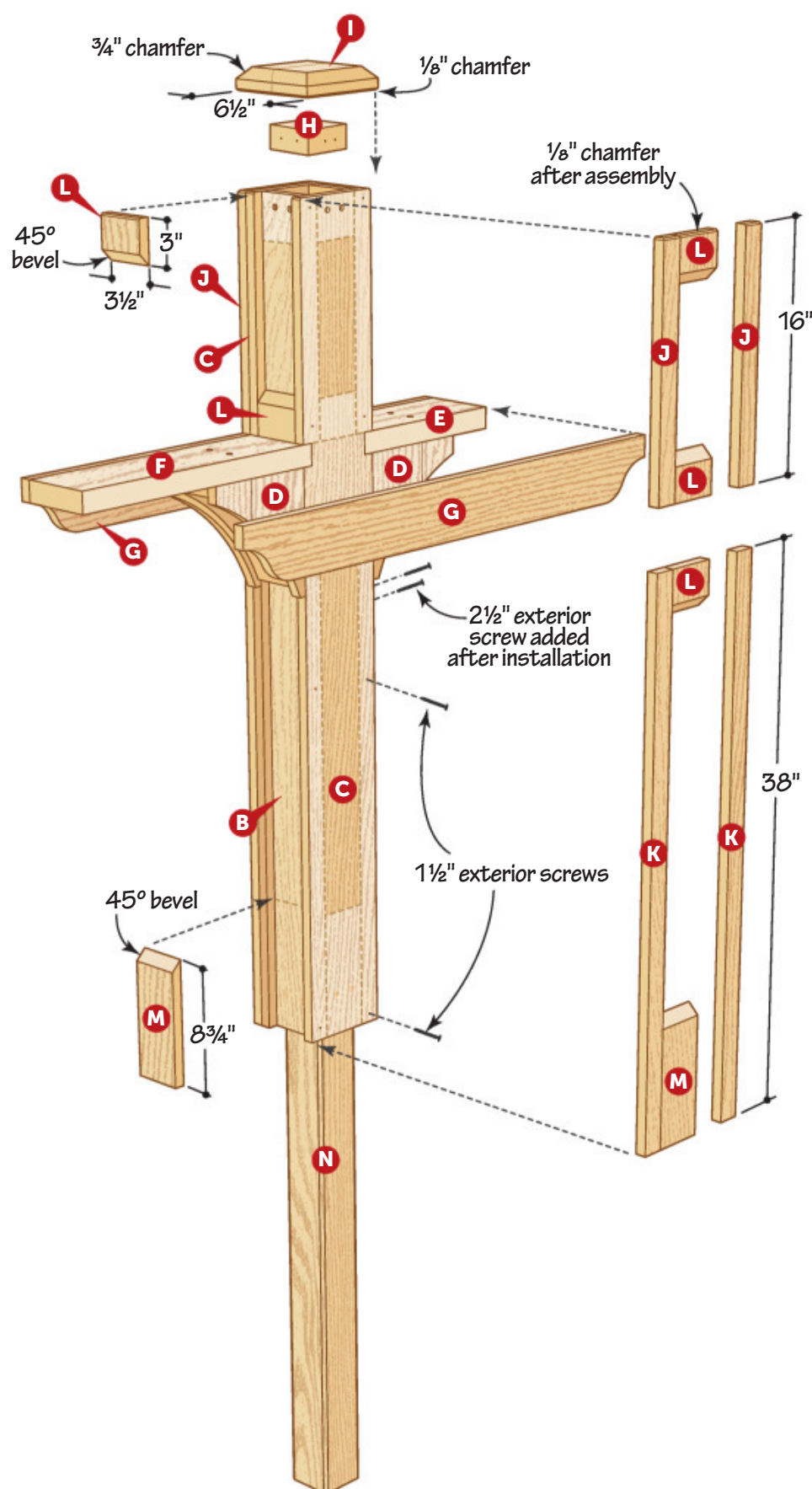
TIP!

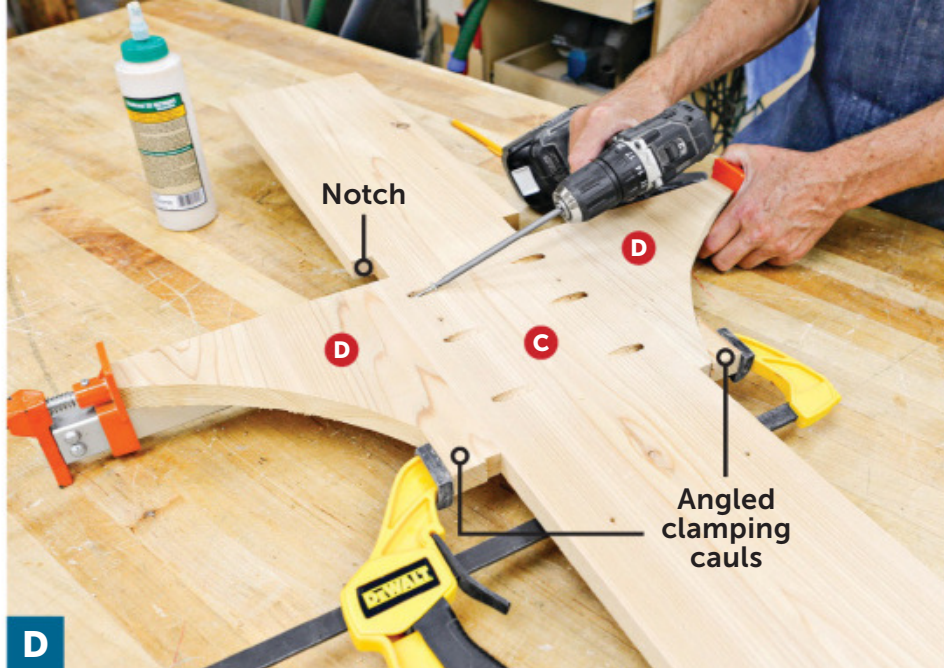
If your cedar has one rough face, sand it smooth for a better appearance and to reduce splinters.



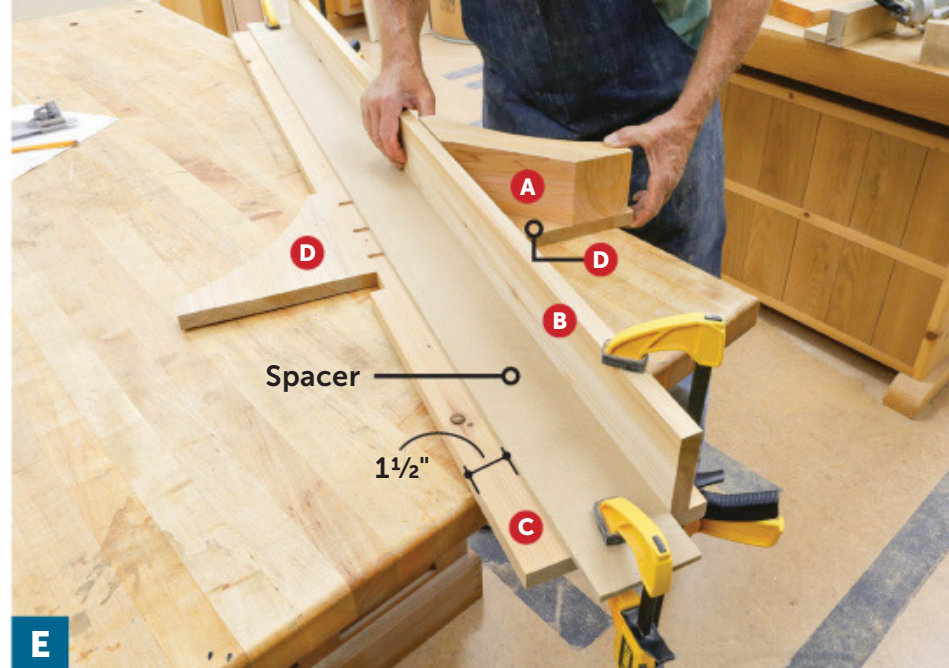
Make a template to lay out identical arcs on the inner braces (A). Align the template with the points of the miter cuts.

EXPLODED VIEW





D Align the top edge of the braces (D) with the bottom of the notches. Clamp them in place and drive coarse-thread pocket screws.



E Center the spacer on the sleeve side (C). Clamp the sleeve front (B) against the spacer. Align the tops of the inner and outer braces (A, D).

4 Cut a $3\frac{1}{2}$ "-wide spacer at least 55" long from scrap. Use it to position the sleeve front (B) on a side assembly (C/D) as you determine the placement of the inner braces (A) [Photo E]. Mark one outer brace's position on the sleeve front, then repeat for the other brace and the sleeve back.

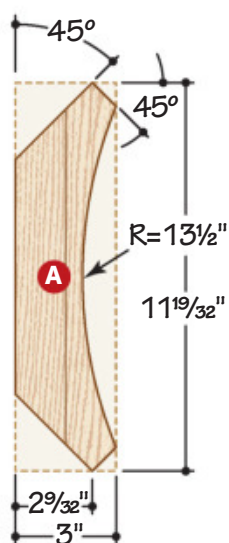
5 Glue and screw the inner braces (A) to the sleeve front and back (B) where you marked them [Drawing 1]. Glue these assemblies to a side assembly (C/D/D), allow the glue to dry, then add the remaining side assembly. Reinforce the joints by screwing the sides to the front and back [Exploded View].

DELIVER A PLATFORM

1 Cut the rear and front platforms (E, F) to size [Drawing 1]. Glue them in place in the notches of the sides (C) and secure them with screws into the inner braces (A).

2 Cut the arms (G) to size. Join them face to face with double-sided tape, aligning their ends and edges. Then lay out and shape the curves on each end [Drawing 2]. Glue an arm to each side of the sleeve assembly, flush with the top faces of the platforms (E, F).

1a INNER BRACE



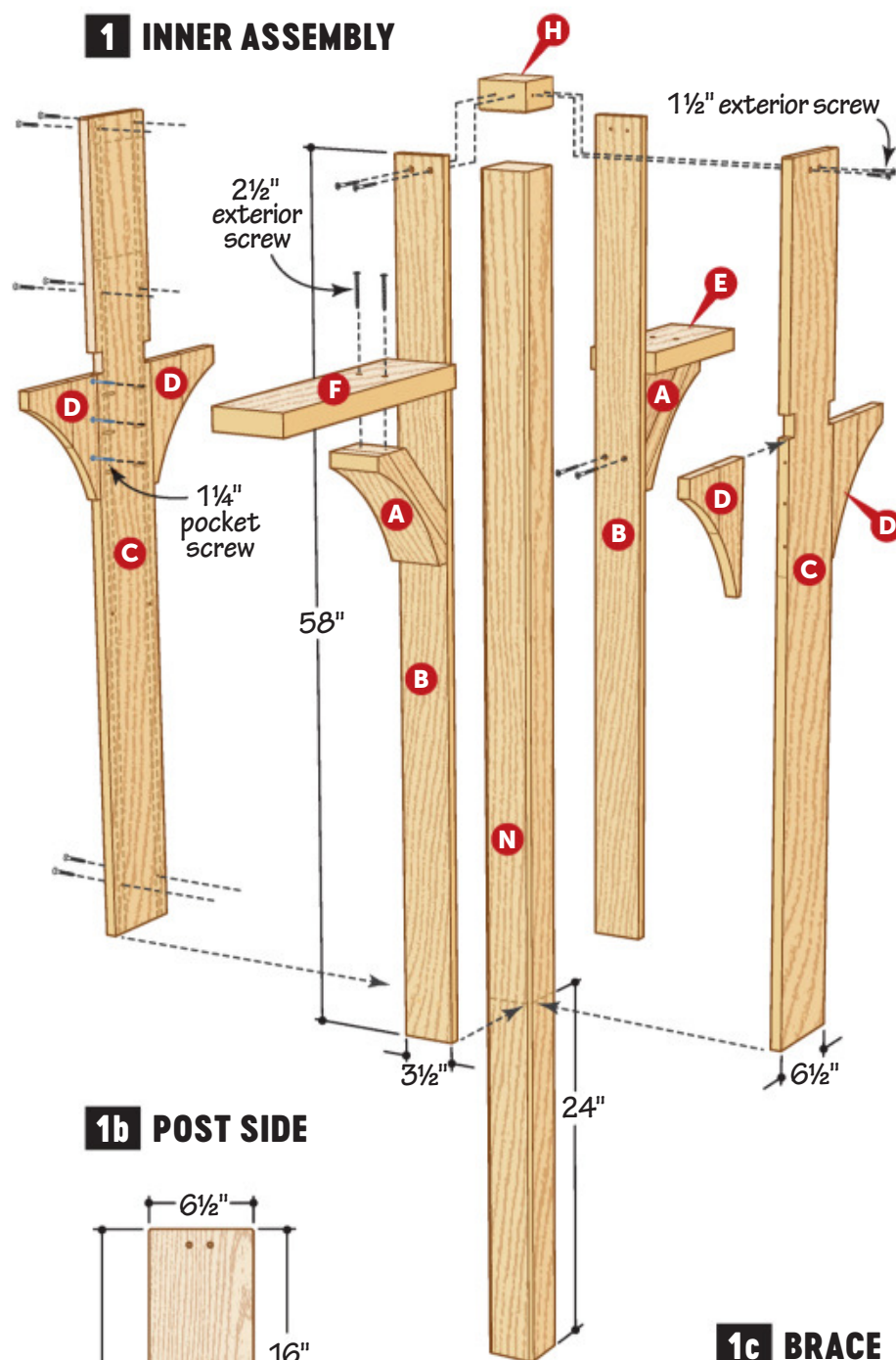
ENVELOP THE SLEEVE IN TRIM

Trim and filler pieces cover the screwheads securing the sleeve sides and create the faux frame-and-panel appearance.

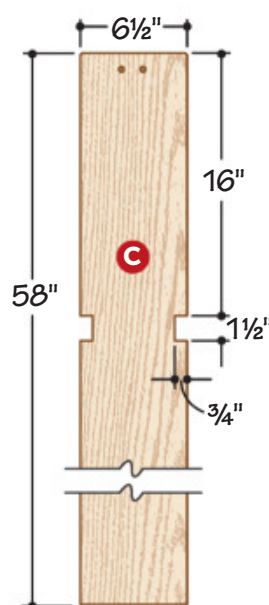
1 Cut the plug (H) to size. Edge-glue material for the cap (I) and cut it to size. Tilt your tablesaw blade to 45°, then chamfer the top and bottom faces of the cap [Exploded View]. Glue the plug to the bottom of the cap, centered.

2 Cut the upper and lower trim (J, K) to size [Exploded View]. Glue these pieces to the sleeve sides [Photo F].

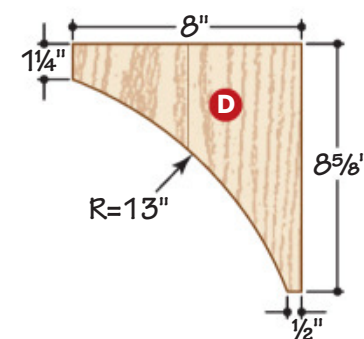
1 INNER ASSEMBLY



1b POST SIDE



1c BRACE





Clamp the trim (J, K) flush with the edges of the sleeve sides (C) and against the arms (G).

MATERIALS LIST

PART		FINISHED SIZE			Matl.	Qty.
		T	W	L		
A*	INNER BRACES	3"	3½"	11 ¹⁹ / ₃₂ "	LC	2
B	SLEEVE FRONT/BACK	¾"	3½"	58"	C	2
C	SLEEVE SIDES	¾"	6½"	58"	C	2
D	OUTER BRACES	¾"	8"	8 ⁵ / ₈ "	EC	4
E	REAR PLATFORM	1½"	5"	12"	C	1
F	FRONT PLATFORM	1½"	5"	20"	C	1
G	ARMS	¾"	4"	37"	C	2
H	PLUG	1½"	3½"	3½"	C	1
I	CAP	1½"	6½"	6½"	EC	1
J	UPPER TRIM	¾"	1½"	16"	C	4
K	LOWER TRIM	¾"	1½"	38"	C	4
L	SHORT FILLERS	¾"	3½"	3"	C	10
M	LONG FILLERS	¾"	3½"	8¾"	C	4
N	POST	3½"	3½"	80½"†	PTP	1

*Parts initially cut oversize. See the instructions.

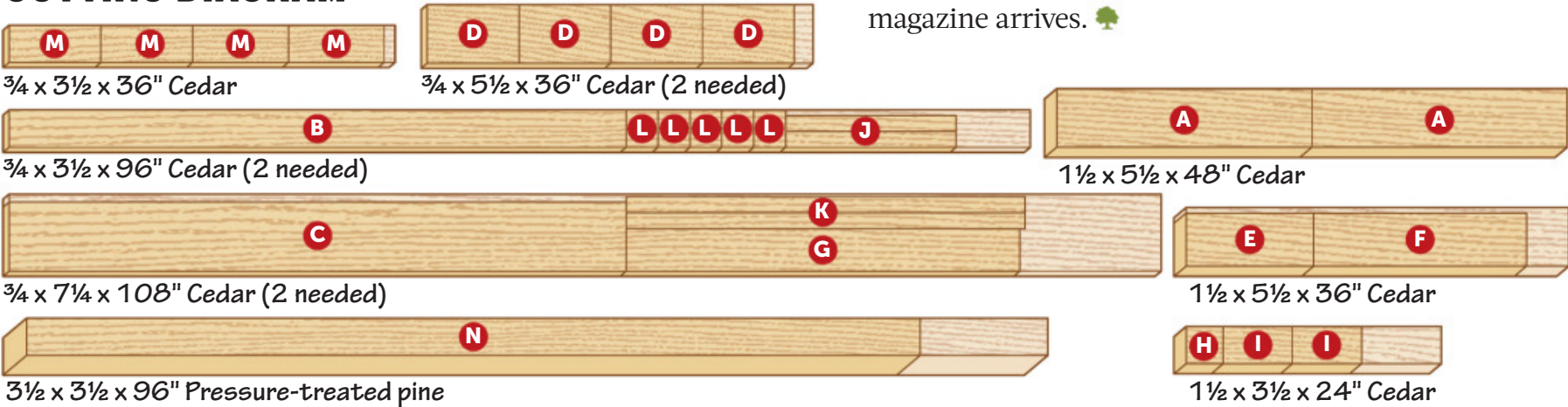
†Allows for 24" of post below ground.

MATERIALS KEY: C—cedar, EC—edge-glued cedar, LC—laminated cedar, PTP—pressure-treated pine.

SUPPLIES: 1 1/4" coarse-thread pocket screws, 1 1/2" and 2 1/2" exterior screws.

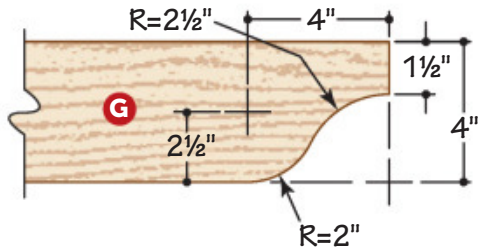
PROJECT COST: It cost us about \$125 to build this project. Your cost will vary by region and source.

CUTTING DIAGRAM



3 Cut the short and long fillers (L, M) to size and bevel-cut one end of each at 45°. Glue short fillers against both edges of the arms (G) and the top faces of the platforms (E, F) **[Photo G, Exploded View]**. Glue and screw the plug/cap assembly (H/I) in the top of the sleeve, then glue the remaining short and long fillers flush with the ends of the sleeve. After the glue dries, sand a slight chamfer around the upper end of the sleeve assembly where it meets the underside of the cap.

2 ARM



Glue short fillers (L) on all four faces on the upper portion of the sleeve, and only on the side faces on the lower portion.

GIVE IT A SEND-OFF

1 Sand the assembly to 180 grit, easing any sharp edges. Apply an outdoor finish. We used spar varnish.

2 Dig a posthole and install a pressure-treated 4x4 post (N) to accept the sleeve. Slide the sleeve onto the post, secure it with screws through the back, and mount your mailbox. Then smile with pride every time you get the mail—especially when your issue of WOOD® magazine arrives. 🌲



Make sure your post installation meets Postal Service rules.
woodmagazine.com/mailrules

SHEET GOODS SCOOTER

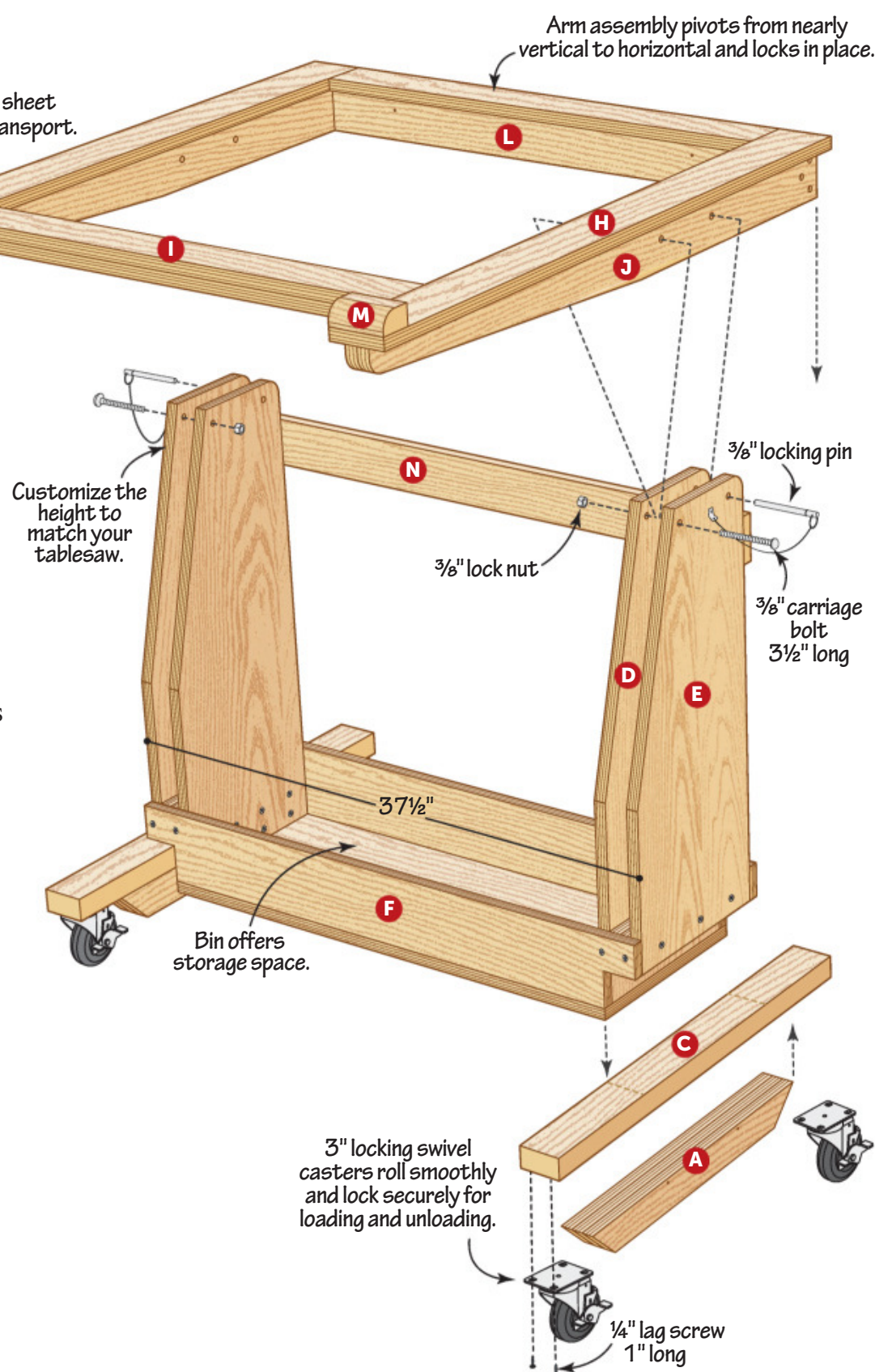
Easily roll full sheets of plywood across the shop then swing them into position for controlled feeding across the tablesaw.

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

EXPLODED VIEW

Handling 4×8' sheet goods can be a back-straining, energy-zapping task. Reserve more energy for the project ahead with this versatile cart. Use it to unload sheet goods from your truck, then move them to the tablesaw or storage. With the arms in a vertical position, the cart fits through most doorways. At the tablesaw, rotate the pivoting arm assembly into a horizontal position, perfect for infeed support.

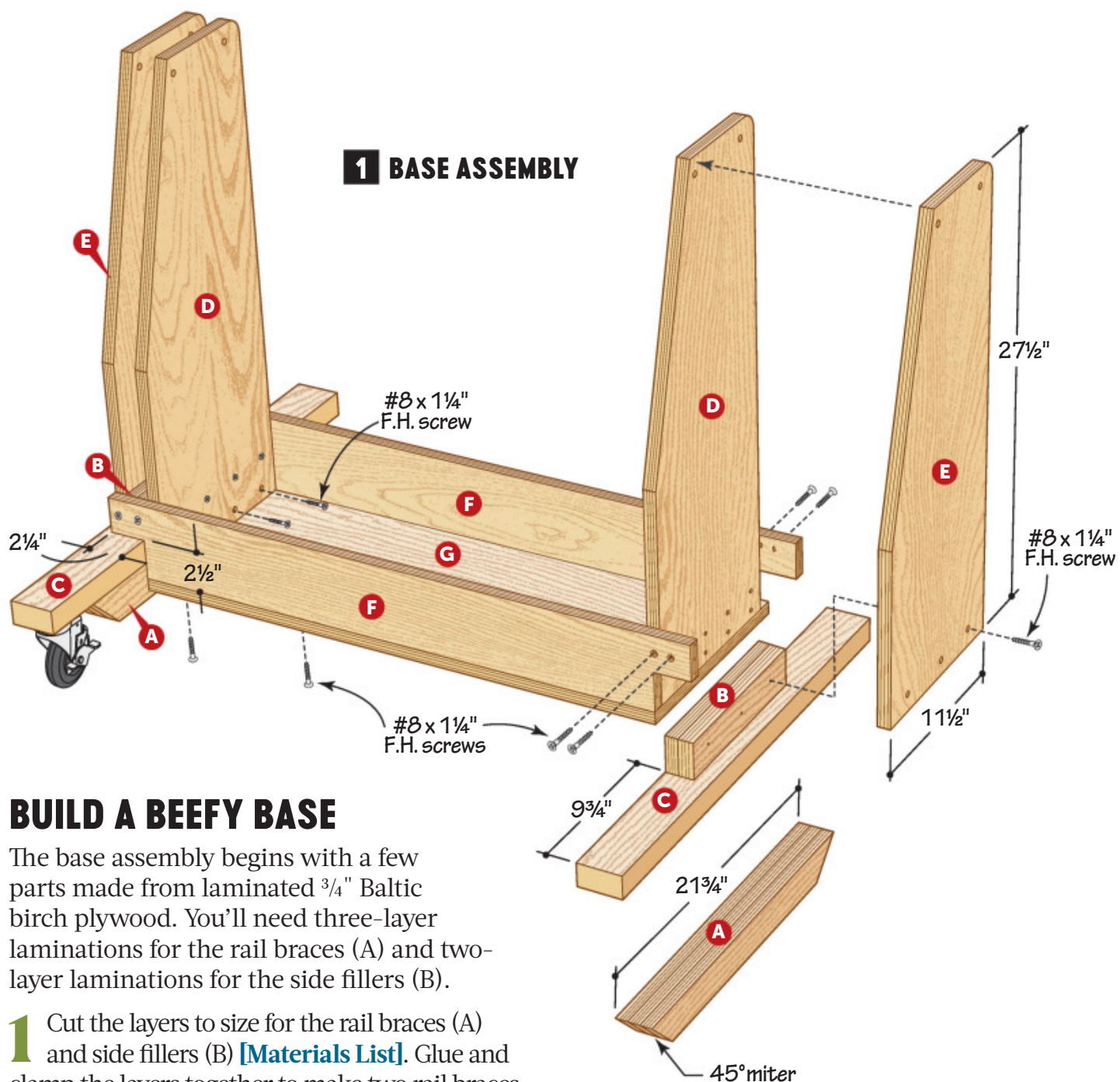
OVERALL DIMENSIONS
38½"W × 42"D × 35½"H





Customize the height of the uprights to position sheet goods for easy tablesaw infeed support.

PHOTOGRAPHER: JASON DONNELLY
ILLUSTRATORS: ROXANNE LEMOINE, LORNA JOHNSON



1 BASE ASSEMBLY

BUILD A BEEFY BASE

The base assembly begins with a few parts made from laminated $\frac{3}{4}$ " Baltic birch plywood. You'll need three-layer laminations for the rail braces (A) and two-layer laminations for the side fillers (B).

1 Cut the layers to size for the rail braces (A) and side fillers (B) [Materials List]. Glue and clamp the layers together to make two rail braces and two side fillers. Once the glue dries, miter-cut the ends of the rail braces [Drawing 1].

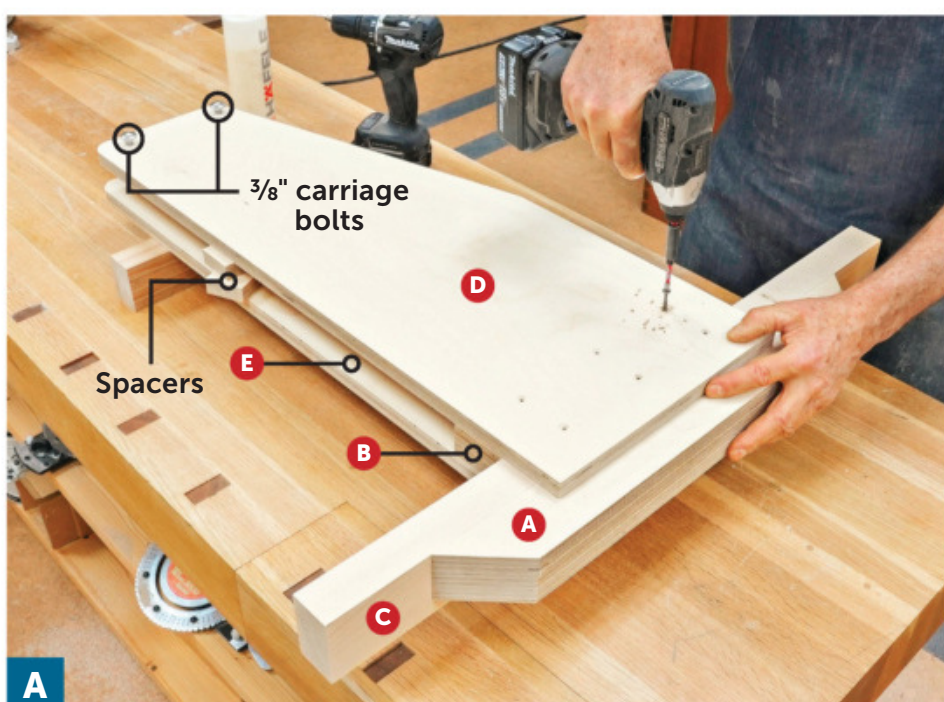
2 Cut the side rails (C) to size. Glue a rail brace to the lower face of a side rail, flush with the inside edge and centered along its length. Then glue a side filler (B) to the

upper face of the side rail $9\frac{3}{4}$ " from the front end and flush with the inside edge. Repeat for the other side, making sure to position the side filler to create a mirrored pair.

ADD THE UPRIGHTS

Uprights (D, E) mount to the base and support the pivoting arm. The height of your table saw and the casters you purchase dictates the length of the uprights. Our base assembly with $4\frac{1}{4}$ " casters places the arms, when horizontal, at $34\frac{1}{4}$ " high—great for our 34" saw table. Measure your saw table and casters, and adjust both uprights, if needed.

1 Cut the inner and outer uprights (D, E) to size and shape [Drawing 2]. Stack them in pairs with their edges and top ends flush and drill the $\frac{3}{8}$ " pivot and locking-pin holes. Glue and screw the outer uprights (E) to the side fillers (B), positioning the bottom edge against the side rails (C) [Drawing 1], then flip over the assemblies and attach the inner uprights (D) [Photo A].



A Use $\frac{3}{8}$ " carriage bolts to align the holes in the uprights, then glue and screw the inner upright (D) to the side rail (C) and filler (B).



Watch our video for an easy way to measure casters
woodmagazine.com/
measurecasters

2 Cut the notched rails (F) to size and form the notches in the lower corners [Drawing 1]. Glue and screw the rails between the upright assemblies. Flip the assembly upside down, measure for the bottom (G), and cut it to fit. Glue and screw the bottom to the inner uprights (D) and notched rails.

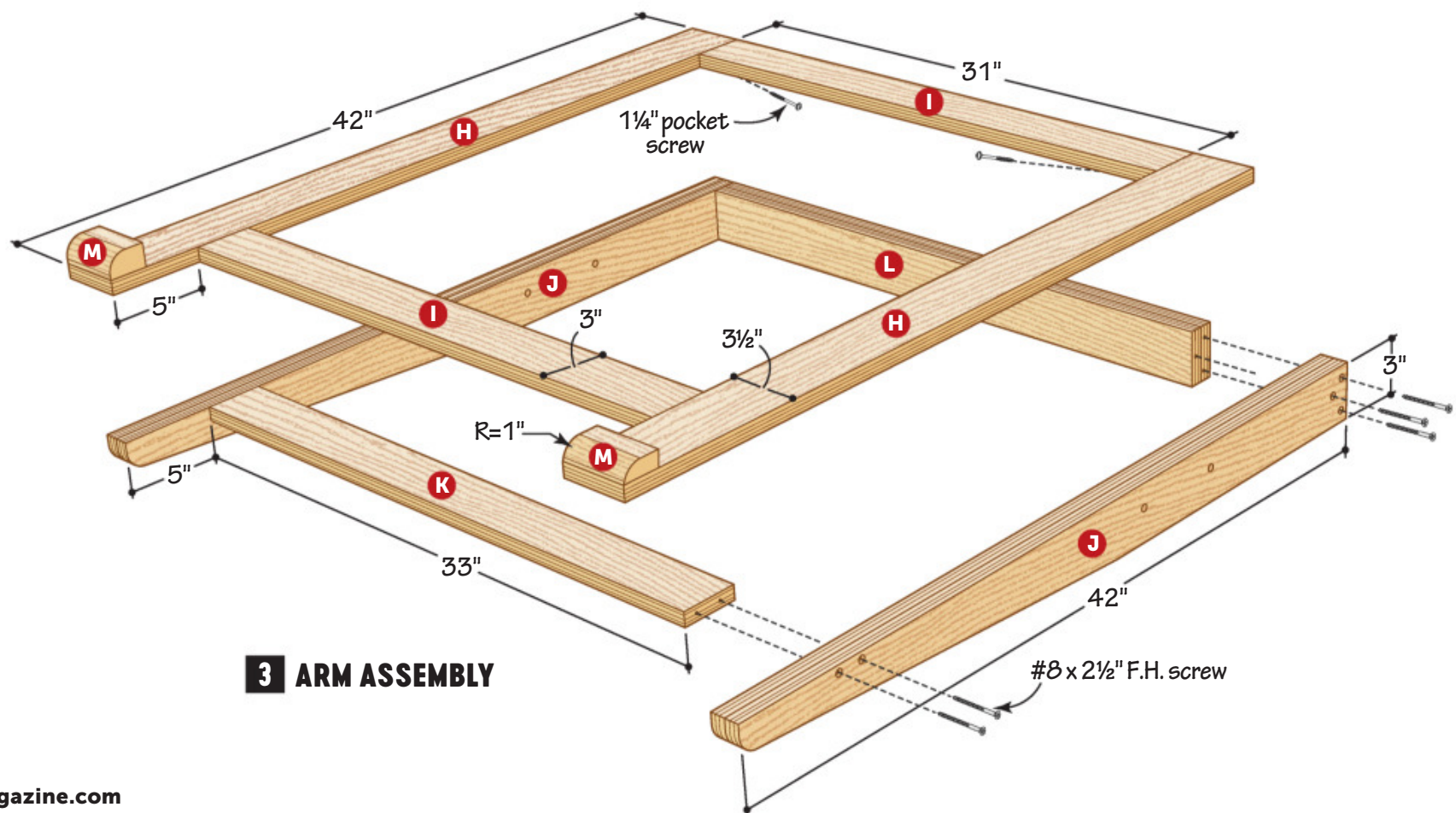
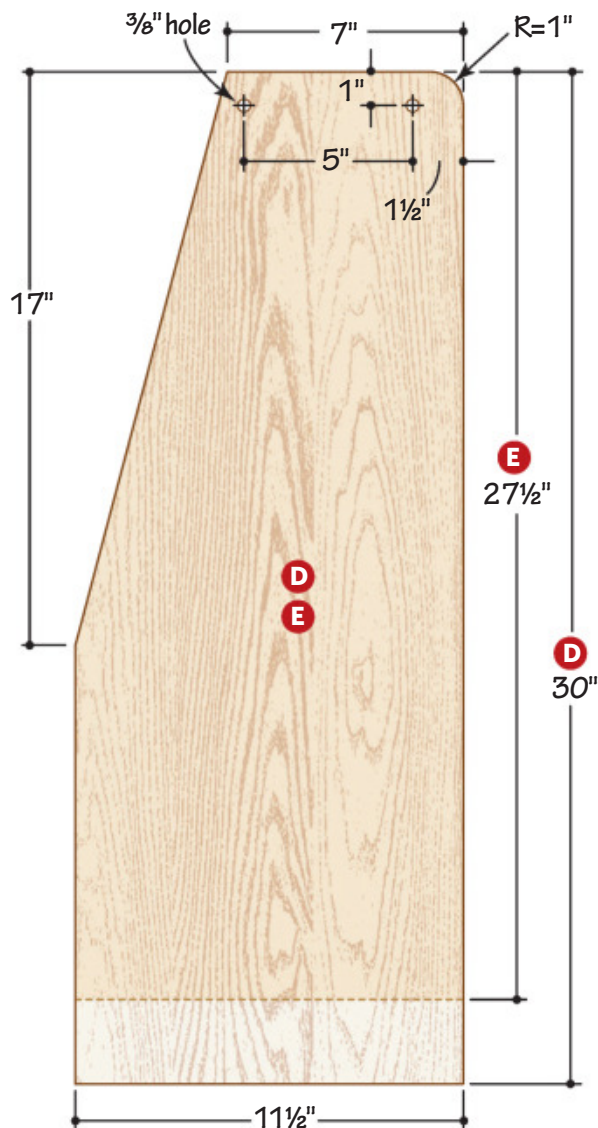


B Make the length of the support spacers (K, L) equal to the distance between the outside faces of the inner uprights (E).

PIVOT TO THE ARMS

- 1** Cut the arms (H) and arm spacers (I) to size. Use glue and pocket screws to assemble the frame [Drawing 3].
- 2** Laminate and cut the arm supports (J) to size and shape [Drawing 4]. Drill the $\frac{3}{8}$ " holes and check the hole alignment between the uprights.
- 3** Measure to verify the length of the front and rear support spacers (K, L) [Photo B]. Cut the spacers to size, forming a lamination for the rear spacer (L) [Drawing 3]. Glue and screw the support spacers between the arm supports (J).

2 UPRIGHTS



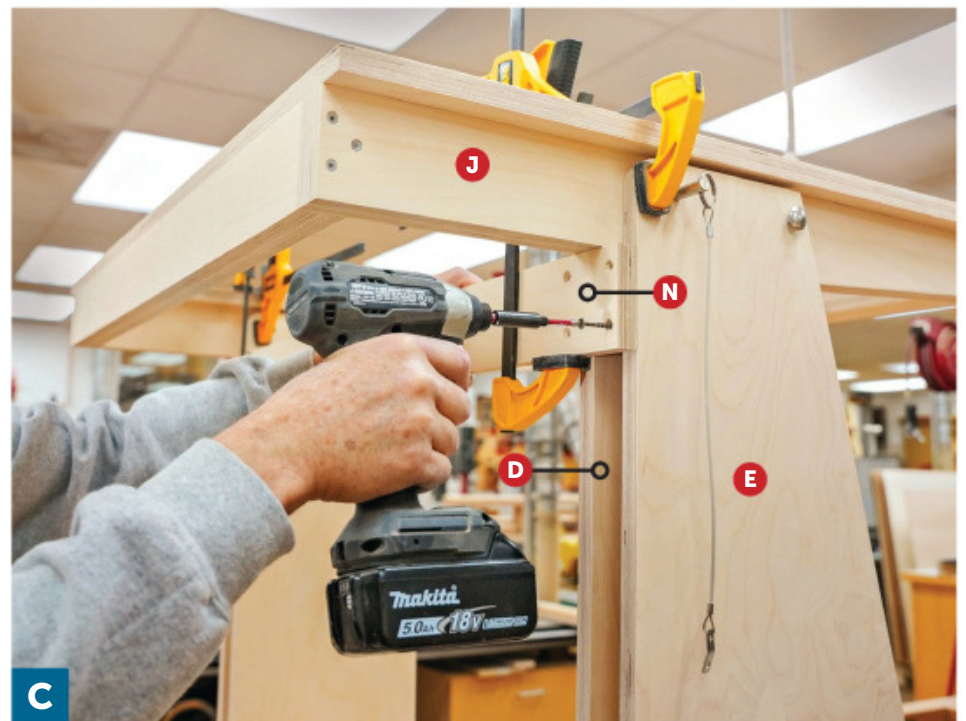
3 ARM ASSEMBLY

4 Glue and clamp the support assembly (J–L), centered, on the underside of the arm assembly (H, I) [Drawing 3]. Cut the pads (M) to size, round over the front corners, and glue them to the arms (H).

5 Place the arm assembly on the base assembly and insert the carriage bolts and pins, locking the arms in the horizontal position [Exploded View]. Cut and install the back rail stop (N) [Photo C].

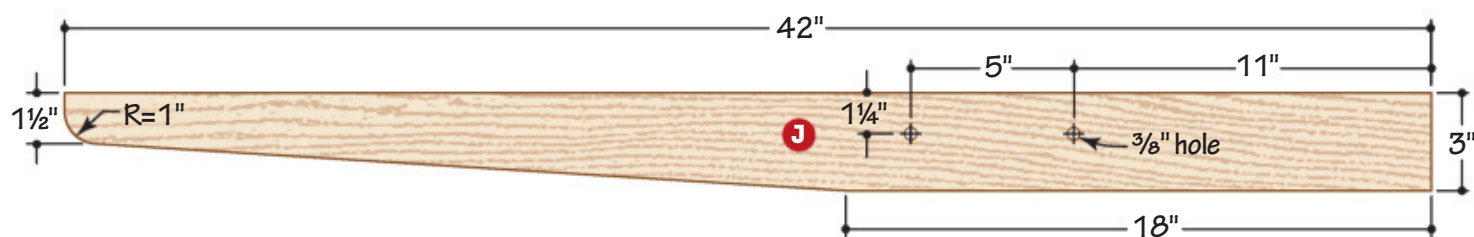
6 Separate the arm and base assemblies, finish-sand, and apply a finish if you choose. We sprayed on two coats of matte lacquer. Once the finish dries, attach the casters to the bottoms of the side rails using $\frac{1}{4}$ " lag screws [Exploded View].

7 Attach the arm assembly using a carriage bolt and lock nut on each side, and fasten the pin lanyards to the outer uprights (E). Load your cart with a sheet of plywood and roll it over to the tablesaw to start cutting parts with newfound ease for your next project. 🌲



C Clamp the uprights (D, E) tight to the arm supports (J), measure the length of the back rail stop (N), and cut it to fit. Add glue to the uprights, then clamp the stop to the underside of the arm supports before screwing it to the uprights.

4 ARM SUPPORTS



“

THIS CART ALSO WORKS WELL WITH A TRACKSAW. PAIR YOUR PLYWOOD WITH A 1" SHEET OF FOAM INSULATION TO PROTECT THE CART, AND SAW AWAY.

-JOHN OLSON, DESIGN EDITOR

”



MATERIALS LIST

PART		FINISHED SIZE			Matl.	Qty.
		T	W	L		
A	RAIL BRACES	2¼"	2¼"	21¾"	LBB	2
B	SIDE FILLERS	1½"	2¼"	11½"	LBB	2
C	SIDE RAILS	1½"	2¾"	29½"	M	2
D	INNER UPRIGHTS	¾"	11½"	30"	BB	2
E	OUTER UPRIGHTS	¾"	11½"	27½"	BB	2
F	NOTCHED RAILS	¾"	4¾"	37½"	BB	2
G	BOTTOM	¾"	13"	33"	BB	1
H	ARMS	¾"	3½"	42"	BB	2
I	ARM SPACERS	¾"	3"	31"	BB	2
J	ARM SUPPORTS	1½"	3"	42"	LBB	2
K	FRONT SUPPORT SPACER	¾"	3"	33"	BB	1

PART		FINISHED SIZE			Matl.	Qty.
		T	W	L		
L	REAR SUPPORT SPACER	1½"	3"	33"	LBB	1
M	PADS	1¼"	2"	3½"	M	2
N	BACK RAIL STOP	¾"	3"	37½"	BB	1

MATERIALS KEY: LBB–laminated Baltic birch plywood, M–maple, BB–Baltic birch plywood.

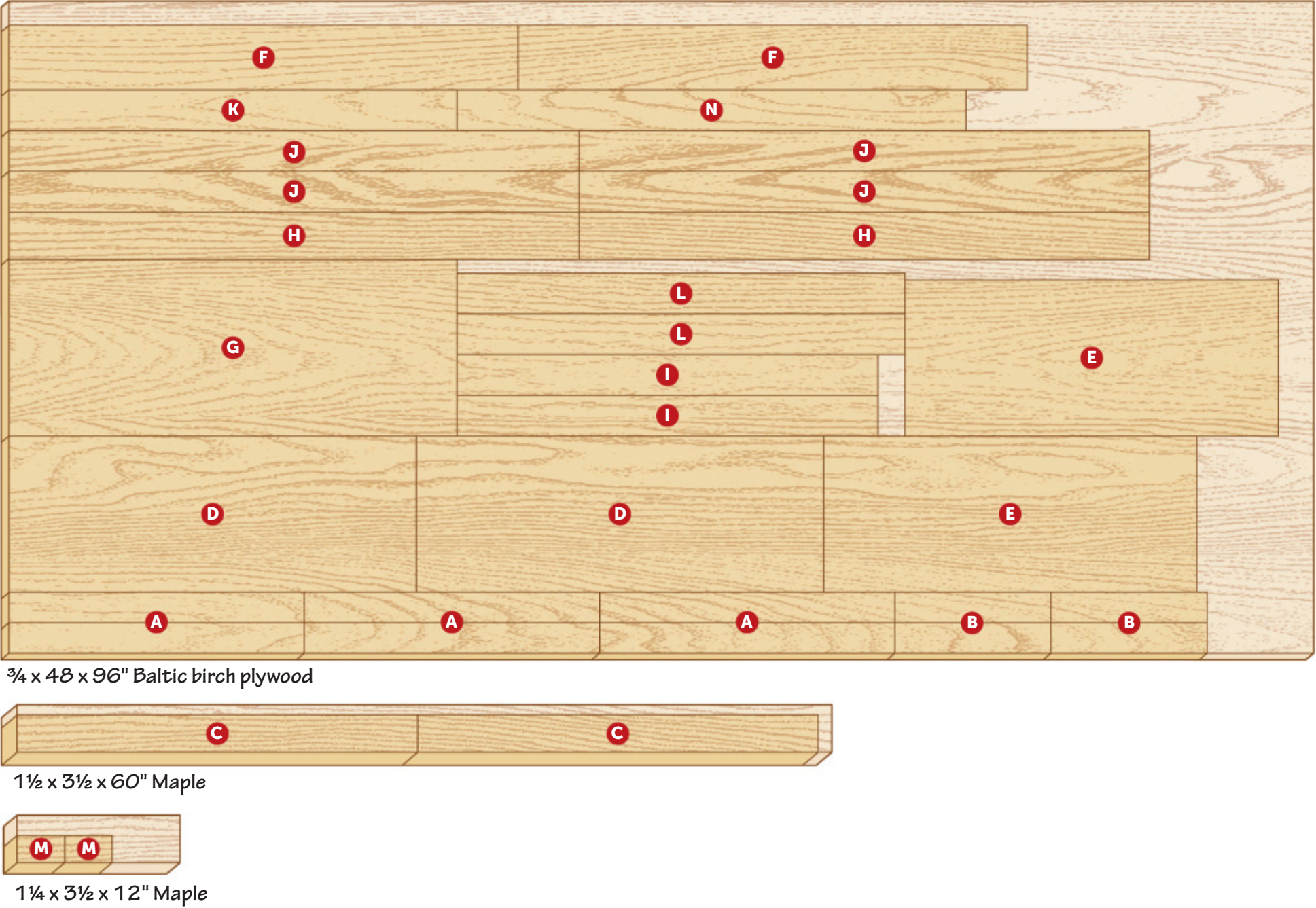
SUPPLIES: #8×1¼" flathead screws, #8×2½" flathead screws, 1¼" pocket screws, ¼×1" lag screws (16), ¾×3½" carriage bolts (2), ¾" lock nuts (2).

SOURCES: 3" rubber locking swivel casters, no. 2835T14 (4), \$16 each; ¾×3" ring-grip pin with lanyard, no. 94975A253 (2), \$8 each, mcmaster.com.

PROJECT COST: It cost us about \$250 to build this project. Your cost will vary by region and source.

CUTTING DIAGRAM

This project requires 4 board feet of 8/4 maple and 1 sheet of Baltic birch plywood based on example boards shown.



FROM

THICK

TO

THIN

Turn an ordinary bandsaw into a mini sawmill capable of cranking out all the thin stock you need.

WRITER: VINCE ANCONA

PHOTOGRAPHER: CARSON DOWNING; ILLUSTRATOR: CHRISTOPHER MILLS

When you need thin lumber, you have three choices: purchase milled and dressed thin stock (which tends to be expensive), plane the stock down from thicker boards (which wastes wood), or resaw the thin stock from thicker material, thereby minimizing the amount of wood that ends up as sawdust or chips. This last option not only stretches your wood-buying dollars, but it also often results in more pleasing projects because you create thin wood with matching color and grain.

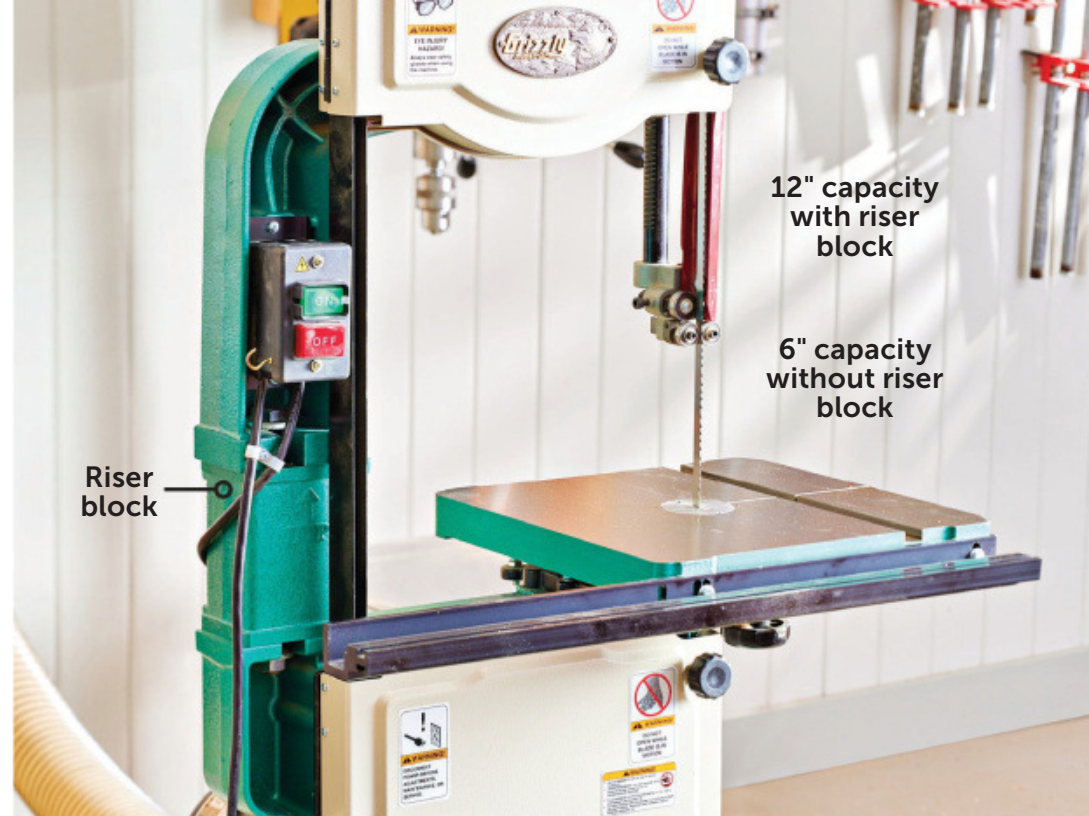
You might think resawing requires a heavy-duty, 18" or larger bandsaw. But for the occasional resawing job, you can get by just fine with a common 12" or 14" model. The key is to choose the right equipment and tune up your saw for the best results. Read on to learn how.

LIMITING FACTORS

Before you start to envision peeling off 12"-wide sheets of veneer on your bandsaw, let's take a reality check. The width of boards you'll be able to resaw is limited by the maximum distance between the upper saw guides and the bandsaw table. On most 14" bandsaws, this distance is around 6", which may be adequate for most needs.

But if your project requires thin stock wider than this, all is not lost. Check whether your bandsaw manufacturer offers a riser block kit for your model. A riser kit is like a booster seat for your bandsaw. A cast iron extension bolts between the lower casting and upper arm of the saw to increase the cutting capacity. (You'll also have to purchase a longer blade.) On our bandsaw, the addition of a riser block ramps up the cutting capacity from 6" to 12" (*top*).

Resawing wide boards requires a lot of power. We recommend a bandsaw with a motor of at least 1 hp if you resaw on a regular basis. You can still resaw if your bandsaw motor is under 1 hp, but you may have to limit the width of the pieces or slow the feed rate to avoid overloading the motor.



A riser block kit extends the height of your bandsaw, doubling the cutting capacity of the saw. Kits include the riser block, a longer post for the upper guide assembly, and a longer blade guard.

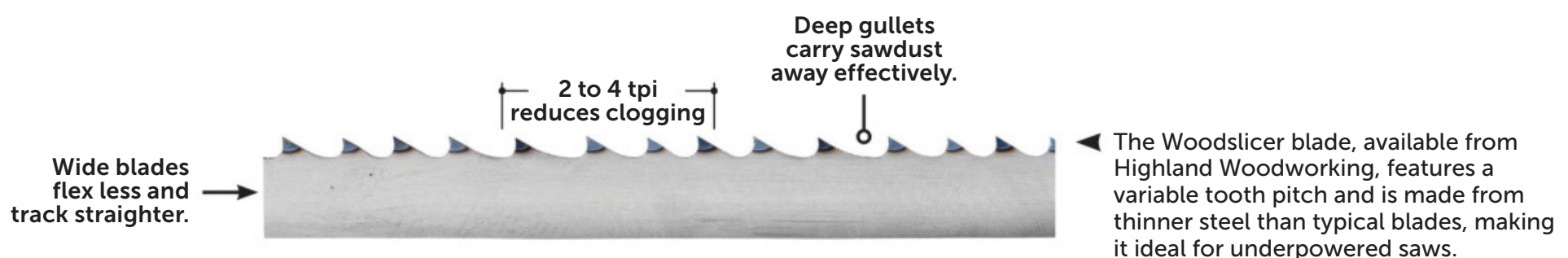
CHOOSE THE RIGHT BLADE

Selecting the proper bandsaw blade for resawing boils down to two equally important factors: blade width and tooth count. Let's start with the width.

Wider blades have greater beam strength, which is a fancy way of saying they're rigid enough to resist flex, resulting in a straighter cut. Even though some manufacturers claim their 14" bandsaws will accept $\frac{3}{4}$ " blades, few saws in this class can adequately tension a blade this wide. Instead, go with a $\frac{1}{2}$ "-wide blade, which will offer the needed rigidity.

Next, focus on tooth count. Resawing creates lots of sawdust. A blade with fewer teeth and large gullets between them clears away sawdust much more effectively than one with closely spaced teeth. Choose a blade in the 2- to 4-teeth-per-inch (tpi) range (*below*).

Carbide-tipped blades are excellent for resawing, but they work best on saws with motors of 2 hp or more. Though they last longer, carbide-tipped blades cost several times more than conventional steel blades. For occasional resawing, you're better off sticking with a steel blade.



In addition to a proper blade, you'll need a couple of accessories for your bandsaw. A fence holds the workpiece vertically and guides it through the cut, making your cutline easier to follow (*opening photo, page 44*). If your bandsaw didn't come with a fence, you can make your own or purchase an aftermarket version. Some aftermarket fences are designed specifically for resawing, with a tall profile to support wide boards.

A featherboard helps by holding the workpiece against the fence. A tall featherboard (*right*), or stackable models, offer extra support.



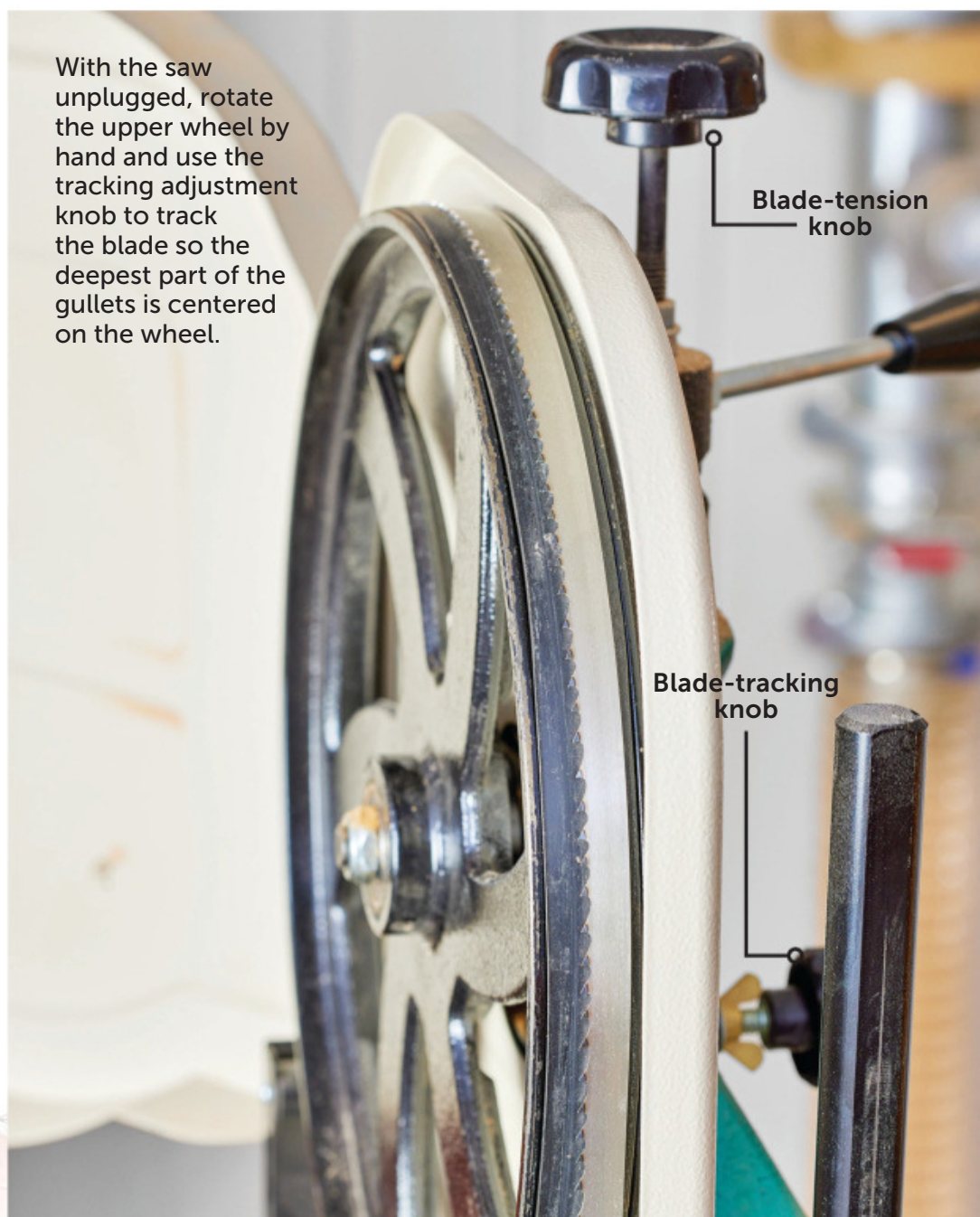
This tall featherboard by Bow Products is designed specifically for resawing at the bandsaw. A 6" flexible silicone feather provides pressure across the entire face of the board.

ADJUST YOUR SAW

Once you have your equipment squared away, it's time to tune up the bandsaw for resawing. Start by unplugging the saw, backing off the upper and lower guides, and installing the resaw blade. Apply just enough tension to prevent the blade from slipping off the wheels, but don't tension it fully yet.

To track the blade, rotate the upper wheel by hand and adjust the blade tracking so the bottoms of the gullets are centered on the width of the upper wheel (*right*). Once the blade tracks where you want it to, increase the tension. The blade tension indicator on most bandsaws lacks accuracy,

◀ With the upper guide assembly raised to its highest position, press against the blade, midway between the table and guide. A properly tensioned blade should flex about 1/4" under moderate finger pressure.



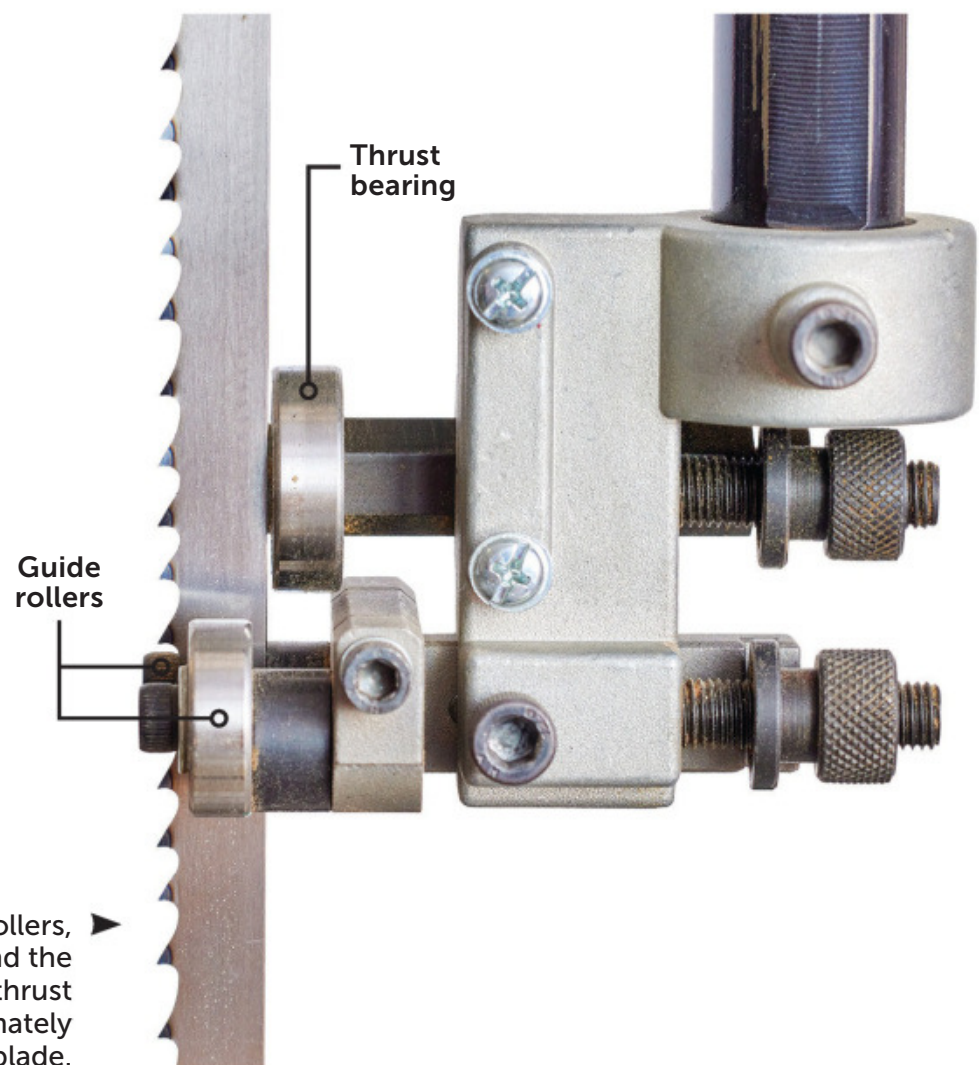
With the saw unplugged, rotate the upper wheel by hand and use the tracking adjustment knob to track the blade so the deepest part of the gullets is centered on the wheel.

Blade-tension knob

Blade-tracking knob

so don't rely on it. Instead, raise the upper blade guide to its maximum position, then tension the blade so it deflects about $\frac{1}{4}$ " under moderate finger pressure (*previous page*). After tensioning the blade, double-check the tracking to make sure it hasn't caused the blade to shift position.

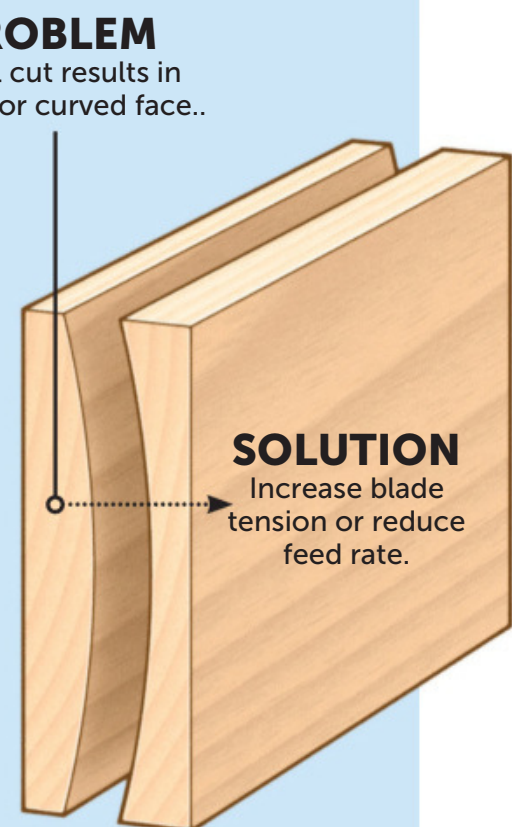
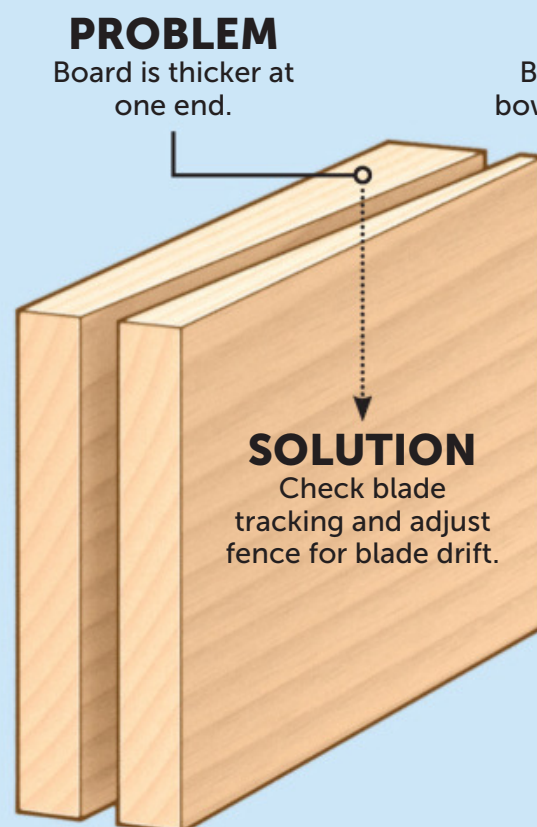
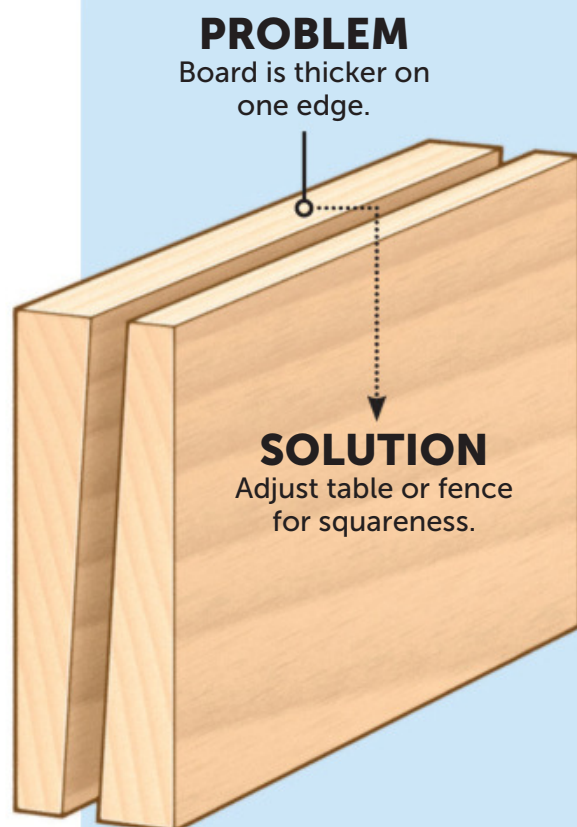
Now you're ready to adjust the guides. Position the upper guide assembly so the guide blocks (or rollers) are just behind the gullets (*right*). Set the upper thrust bearing so it's just behind the blade but not touching it.



Position the guide blocks (or rollers, in our case) about $\frac{1}{16}$ " behind the deepest part of the gullets. The thrust bearing should also sit approximately $\frac{1}{16}$ " behind the blade.

RESAW REVIEW

If everything goes right, your resawing efforts will yield thin boards that are a consistent thickness throughout their length and width. But life is not always perfect. Take a look below at common resawing headaches and their prescribed cures.



TIP!

A business card makes a handy feeler gauge for setting the guide blocks.

Loosen the guides and slide them in or out so they are $\frac{1}{64}$ " to $\frac{1}{32}$ " away from the sides of the blade (*right*). Don't get too hung up on the exact distance—you want the guides close to the blade but not touching it. Repeat with the lower guides and thrust bearing, then rotate the upper wheel by hand to make sure the blade travels freely without rubbing on the guides or thrust bearings.

Using a square, adjust the table square to the blade (*below, right*).

The final step before turning on the saw is to position your fence and featherboard. Set the fence about $\frac{1}{16}$ " farther from the blade than your desired stock thickness. This will leave extra material for planing or sanding to final thickness. Position the featherboard ahead of the blade and adjust it to apply moderate pressure against the workpiece.

Power up the saw and start feeding your workpiece (*below*). Avoid feeding too quickly or aggressively, which can cause blade deflection or burning from

Adjust the guides on each side of the blade as close to the blade as possible without touching. Rotate the blade by hand to make sure that it doesn't rub against the guides.

An engineer's square is ideal for determining whether the blade is square with the table. If it isn't, loosen the knobs below the table and adjust the tilt angle.

Engineer's square

insufficient chip clearing. Let the saw do the work and concentrate on maintaining a smooth and steady feed rate. Use a push block to finish the cut.

With a properly tuned saw, you will end up with a uniformly thick board requiring just a couple of passes through a planer or thickness sander to smooth the surface. If your first attempt is less than perfect, don't get discouraged. For inconsistent thickness, see *Resaw Review* (*previous page*). If the blade wanders off your cutline, see *Dodging the Drift* (*next page*). With a little practice, you'll be a resaw master in no time. 🌲

If it helps, draw a cut line on the top edge of your board. Then, after positioning your rip fence and featherboard, guide the workpiece past the blade, letting the saw do the work.



To determine the drift angle, draw a line on a piece of scrap, parallel with the edges. Cut halfway through the board, pivoting as needed to stay on the line. Then shut off the saw without moving the scrap.



Place a bevel gauge against the front edge of the saw table and the edge of the board to register the degree of blade drift. Tighten the blade on the bevel gauge.



Loosen the bolts on your rip fence and adjust the fence to match the angle of blade drift, then retighten the bolts. (Note that not all bandsaw fences allow you to do this.)

DODGING THE DRIFT

Blade drift is the tendency for a blade to cut along a path that is not parallel with the fence. Depending on the drift direction, the blade will pull the workpiece away from or into the fence, making it difficult to follow the cutline.

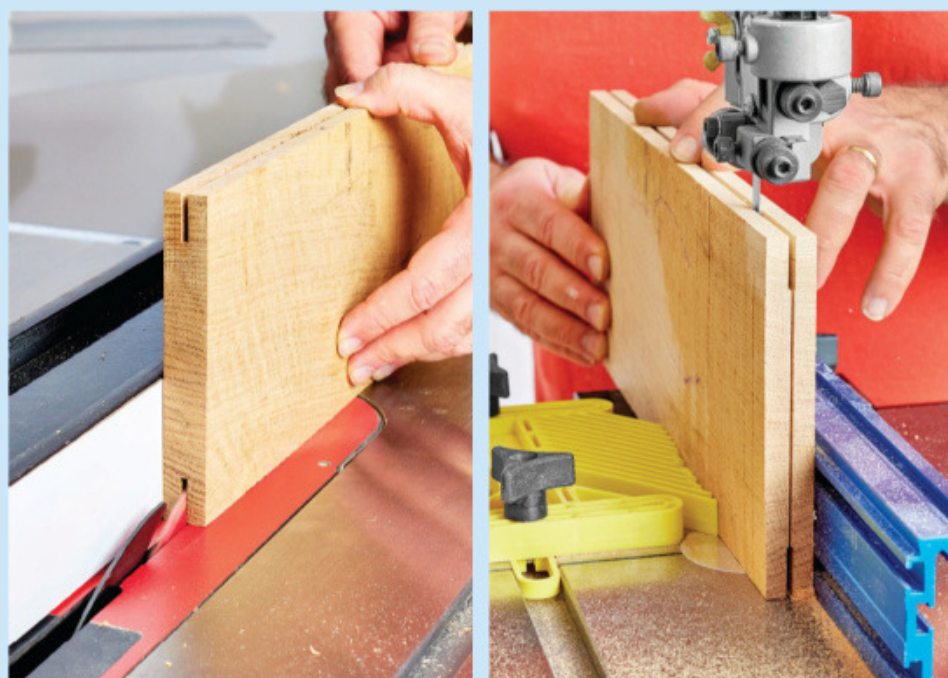
One way to deal with drift is by slightly adjusting the position of the blade on the wheels via the tracking knob. Through trial and error, you may be able to find a sweet spot where the blade doesn't drift. (Readjust your guides after you're done, as well.)

Another method is to shift your fence out of parallel with the blade to match the drift angle. Many commercial fences are designed to allow this.

To determine the angle of blade drift on your saw, mark a centered, straight line on the face of a scrap of plywood or MDF as long as the depth of your bandsaw table. Cut halfway through it, angling the piece as necessary to stay on the cutting line (*top left*). Use a bevel gauge to transfer the blade drift angle to your bandsaw rip fence (*left and below left*).

A third way to deal with blade drift is to use a fence with a drift bar or resaw guide with a rounded face to provide a single point of contact against the board. This allows you to pivot the board on the fly as you resaw to account for drift. These single-point fences require more attention to use because you have to steer the board through the cut.

If your bandsaw continues to give you trouble in cutting a straight line, try this trick. Cut kerfs on both edges of the board at the tablesaw (*below*), then complete the cut at the bandsaw. The bandsaw blade will take the path of least resistance and follow the kerfs for an accurate cut.



Using a thin-kerf blade at the tablesaw, cut a 1"-deep kerf along the cutline on both edges of the workpiece. Finish resawing the board at the bandsaw. The blade tracks in the kerfs with less strain on the saw.



ALL-WEATHER BOXCAR

Protect your valuable freight from the elements
with this enclosed boxcar — the latest in our
WOOD® Timber Line Express train series.

WRITER: VINCE ANCONA
DESIGNER/BUILDER: JOHN OLSON



PHOTOGRAPHER: JASON DONNELLY;
ILLUSTRATORS: ROXANNE LEMOINE, LORNA JOHNSON

No freight train would be complete without a complement of boxcars. Named for their boxy shape, these cars carry all kinds of goods, from large rolls of paper to sacks of grain to appliances. Our version is based on a standard steel-frame car with sliding doors on each side for loading and unloading.

Just as with our previous cars, we've assembled a kit that includes the specialty items like the wheels and pegs to get you started [\[Source\]](#).

KEEP ON TRUCKIN'

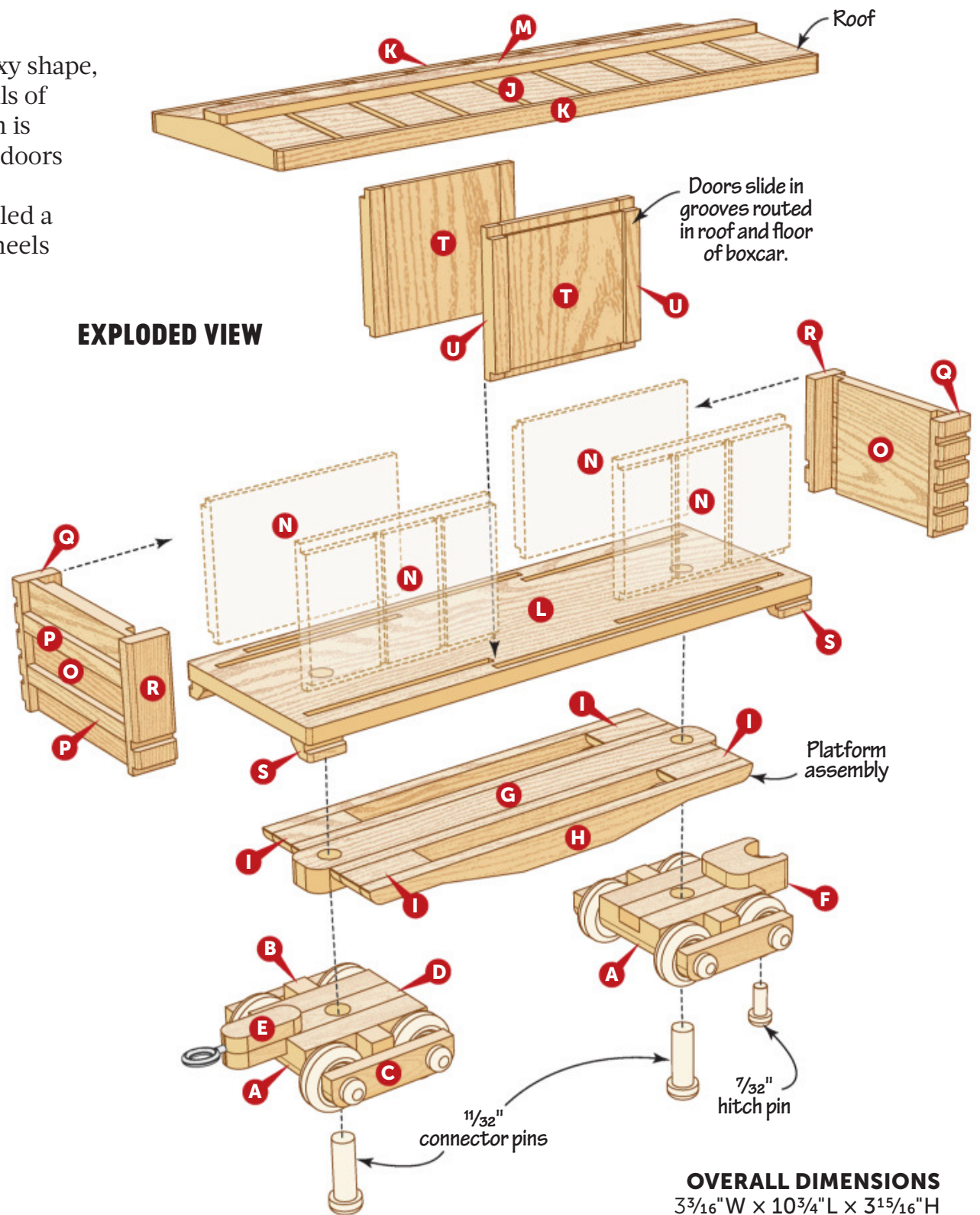
Front and rear truck assemblies keep the boxcar on track as it rides along the rails. These assemblies are identical to those used on the log car in issue 293 (December 2023/January 2024) and the container car in issue 295 (May 2024). If you've already built those cars, the next steps will be a case of déjà vu.

1 Cut the truck frames and spring groups (A, B) to size [\[Materials List, Drawing 1\]](#). Form the centered groove on the top of each frame, then drill holes in the edges for the axle pegs [\[Photo A\]](#).

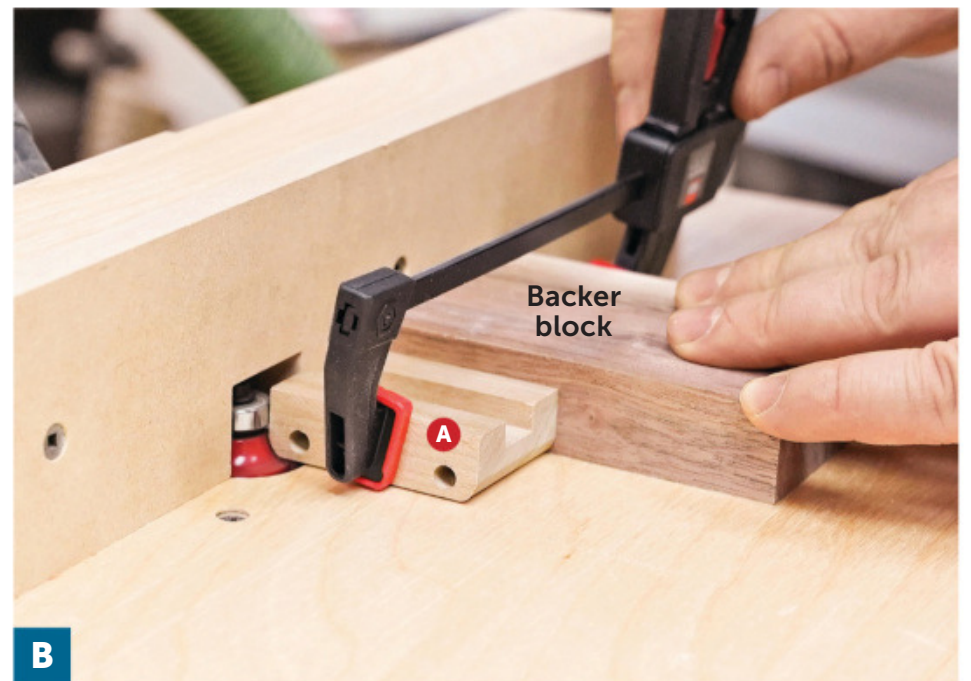
2 Round over the lower ends of the frames [\[Drawing 1, Photo B\]](#), then glue and clamp the spring groups (B) to the frames, centered front-to-back [\[Drawing 2\]](#).

3 Cut the side frames, tongues, and tongue extension (C-E) to size [\[Drawing 2\]](#). Drill holes in the side frames and round over the lower corners [\[Drawing 1\]](#).

4 Round off the corners on one end of the tongue extension (E) [\[Drawing 2\]](#), leaving the other end square for now. Glue and clamp the tongue extension to the top of one of the tongues (D), keeping the square ends flush.

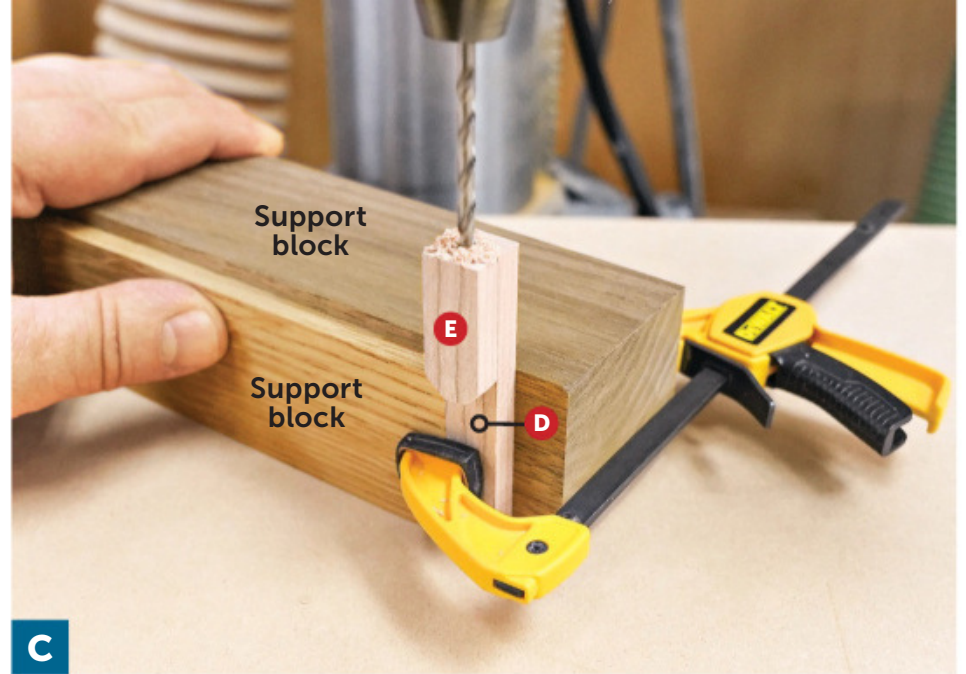


To ensure straight holes for the axle pegs, clamp the truck frames (A) against a support block on your drill-press table, then drill $\frac{1}{2}$ "-deep holes using a $\frac{7}{32}$ " brad-point bit.



Install a $\frac{1}{4}$ " round-over bit in the router table and clamp a truck frame to a backer block to keep your fingers away from the bit and prevent tear-out as you route across the grain.

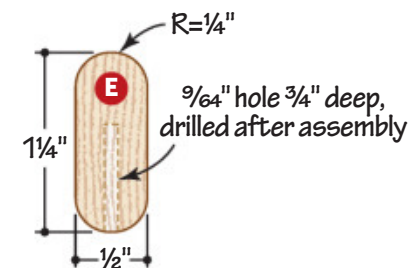
5 Once the glue dries, drill the $\frac{9}{64}$ " hole in the front end of the tongue assembly [Drawing 2, Photo C]. Round off the corners of the drilled end, then glue the tongue assembly into the groove on the front truck frame (A), flush at the back end. Drill the $\frac{7}{32}$ " hole in the remaining tongue (D), round off the corners next to the hole, and glue the piece into the groove on the rear truck frame, flush with the front end.



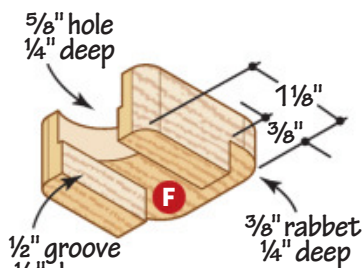
C

Use a pair of support blocks to hold the tongue in a plumb and square vertical position at the drill press. A $\frac{9}{64}$ " brad-point bit makes a clean hole in the end grain.

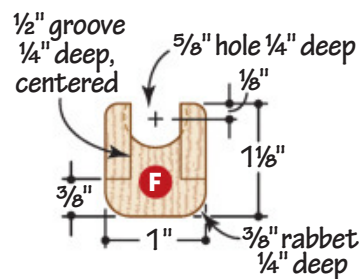
1 TRUCK PARTS



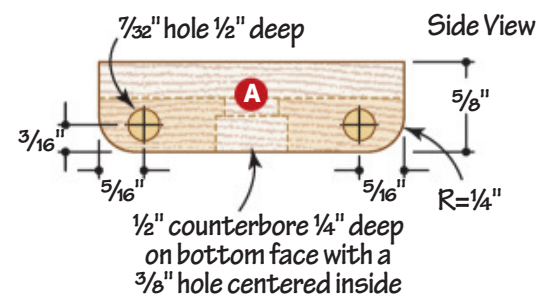
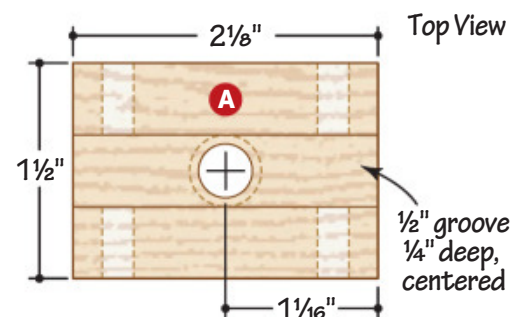
Truck Tongue Extension



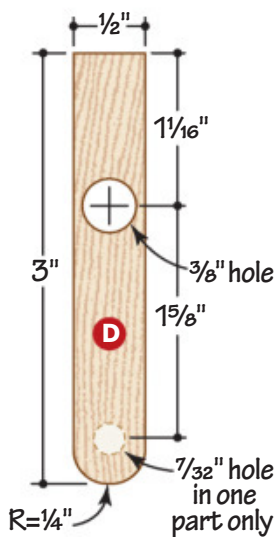
Tongue Hitch Shroud



Truck Side Frame

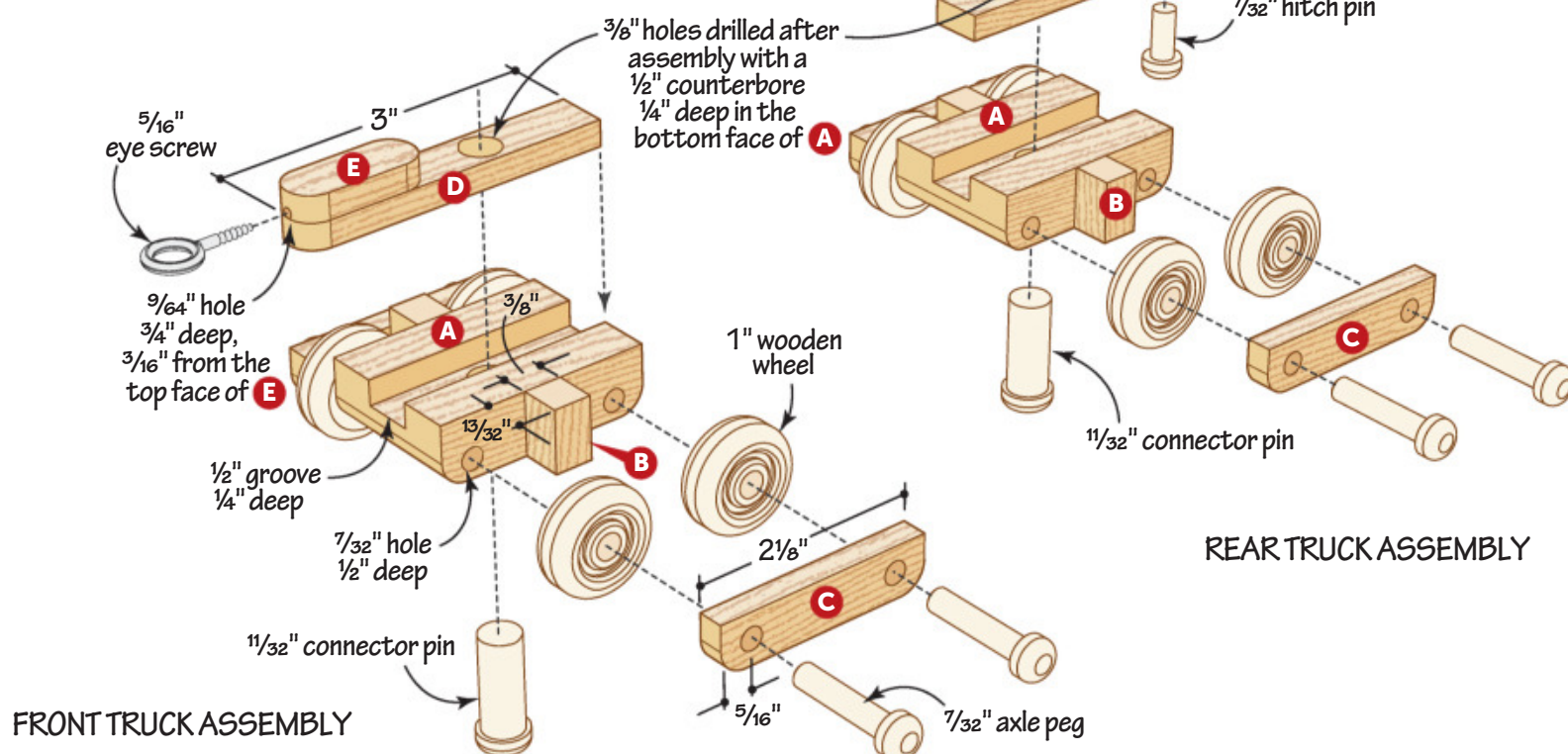


Truck Frame



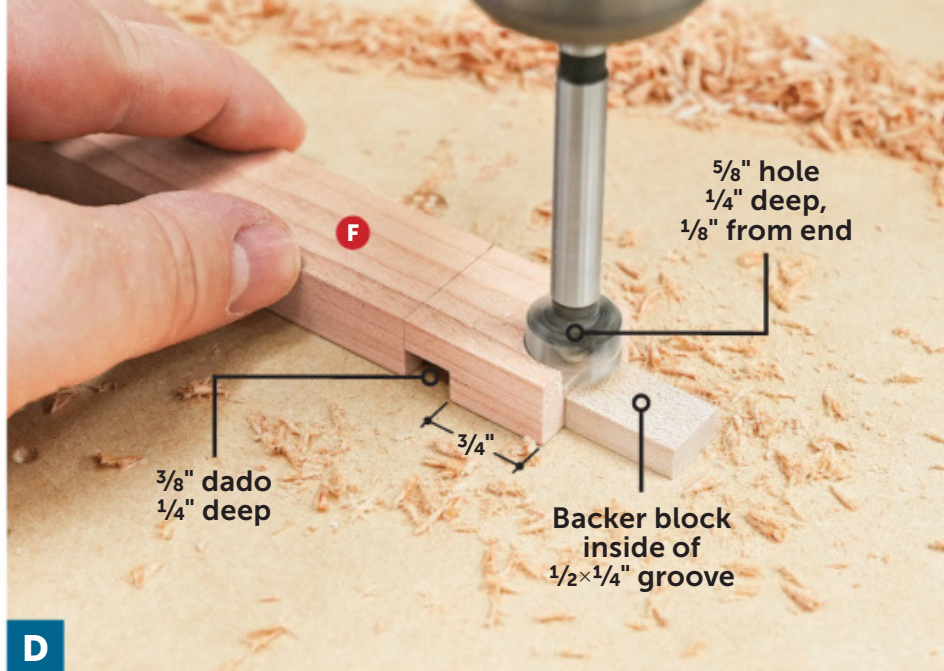
Truck Tongue

2 TRUCK ASSEMBLIES

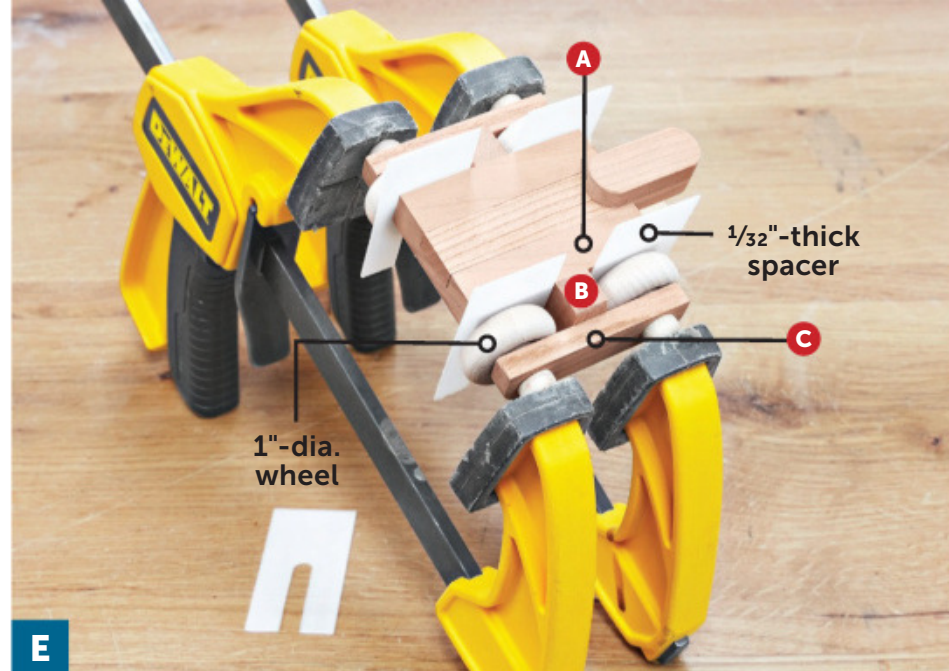


FRONT TRUCK ASSEMBLY

REAR TRUCK ASSEMBLY



Install a $\frac{5}{8}$ " Forstner bit in the drill press and drill a $\frac{1}{4}$ "-deep hole, centered $\frac{1}{8}$ " from the end of the workpiece. A backer block prevents tear-out as the bit passes into the groove.



Slot the $\frac{1}{32}$ " spacers from the project kit to fit around the axle pegs between the wheels and the truck frame (A) before clamping the wheel assemblies into place. Once the glue dries, remove the spacers.

6 Cut a 6"-long blank to thickness and width for the tongue hitch shroud (F) [Materials List]. Form a centered groove along one face to fit the rear truck tongue (D) [Drawing 1], then cut the $\frac{3}{8}$ " dado $\frac{3}{4}$ " from one end. Drill the hole on the top face [Photo D] and round over the corners on the same end. Crosscut the hitch shroud to length just beyond the edge of the dado to form a $\frac{3}{8}$ " rabbet. Round over the front corners and glue the hitch shroud to the rear truck tongue [Drawing 2].

7 Begin the truck assembly by gluing an axle peg into each hole in the truck side frames (C) [Drawing 2] using a few drops of cyanoacrylate glue on the underside of the peg heads. Once the glue cures, slip the wheels and spacers (included in the kit) onto the axle pegs. Then, switching back to wood glue, glue the ends of the pegs into the holes in the truck frames (A), and the side frame (C) to the spring group (B) [Photo E].

8 Form a recess for the truck connector pins by drilling a $\frac{1}{2}$ " counterbore $\frac{1}{4}$ " deep, centered on the bottom face of each truck frame (A) [Drawing 1]. Then drill a $\frac{3}{8}$ " hole through the truck assemblies, centered in the counterbores. Add the eye screw to the front truck and glue the hitch pin into the hole in the rear truck tongue (D), trimming it flush with the top of the hitch shroud (F).

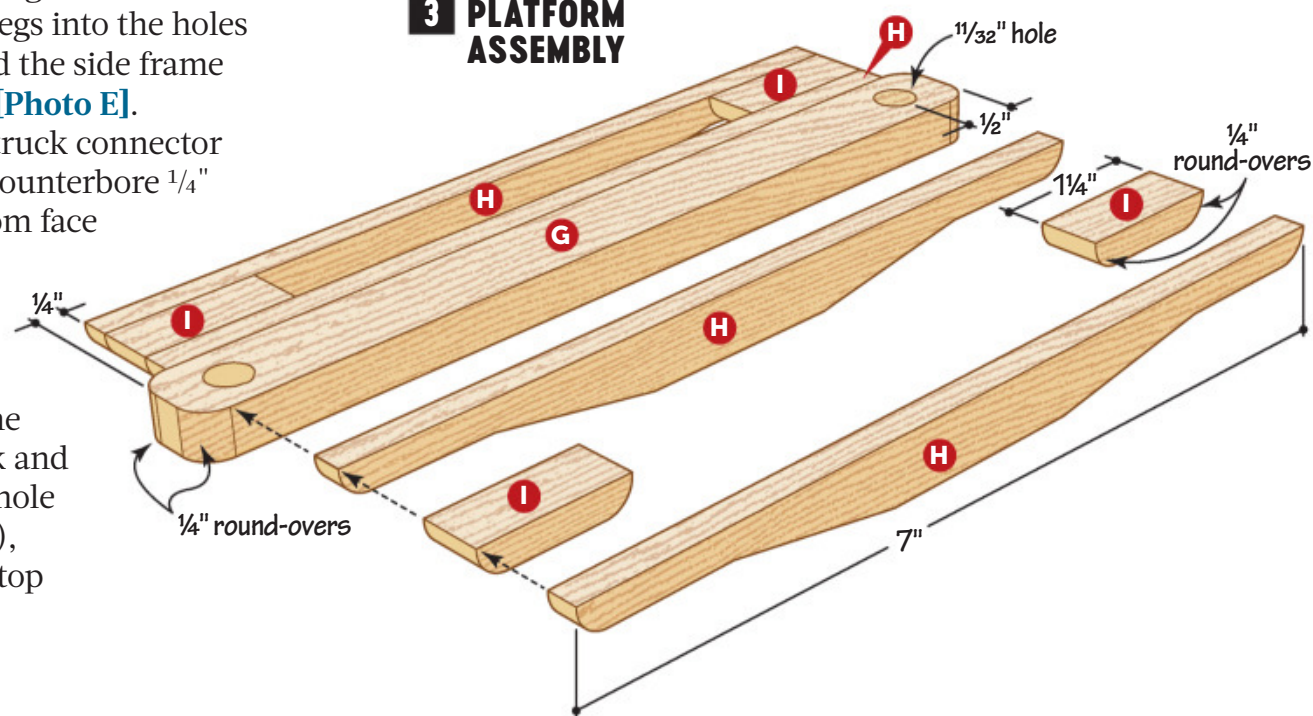
ADD A STURDY PLATFORM

1 Cut the frame rail (G), platform rails (H), and fillers (I) to size [Materials List, Drawing 3]. Rout $\frac{1}{4}$ " round-overs on the corners of the frame rail and the lower ends of the platform fillers.

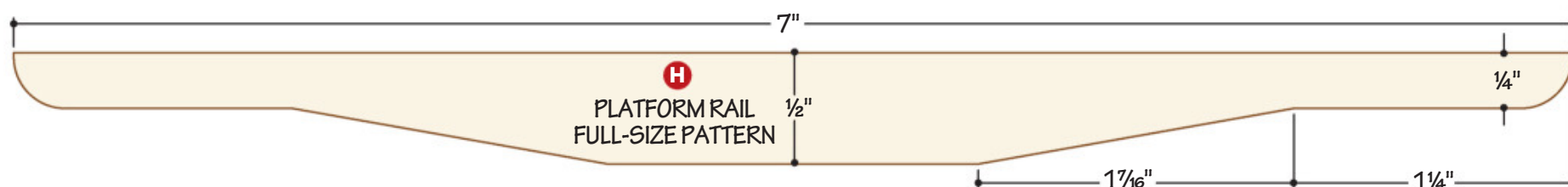
2 Use the full-size pattern [Drawing 4] to cut the platform rails to size and shape. Then glue and clamp the fillers between the pairs of platform rails, flush with the ends [Drawing 3].

3 Drill the two holes in the frame rail, then glue the platform assemblies to each side, centered along its length and flush with the top.

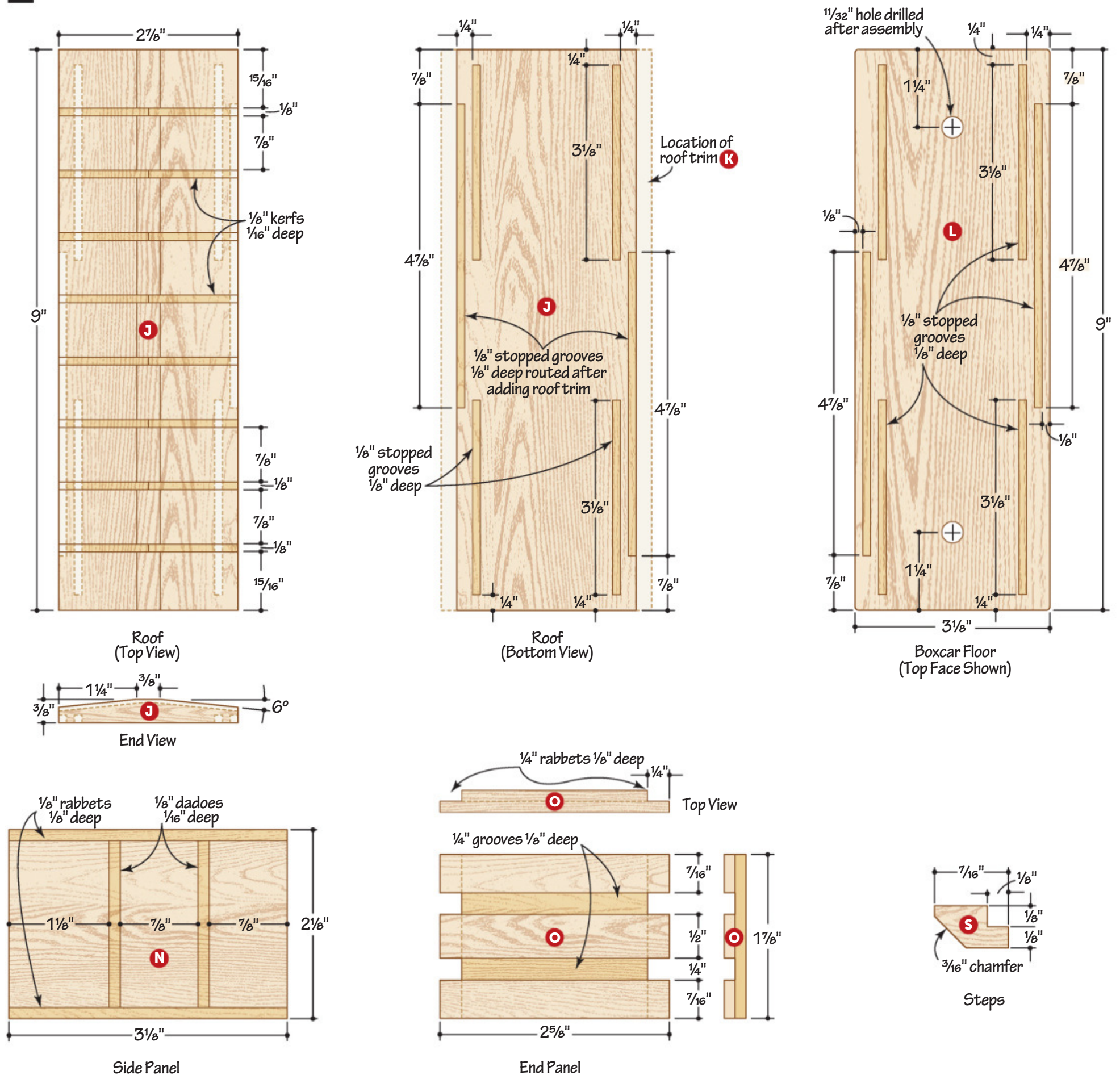
3 PLATFORM ASSEMBLY



4 FULL-SIZE PATTERN



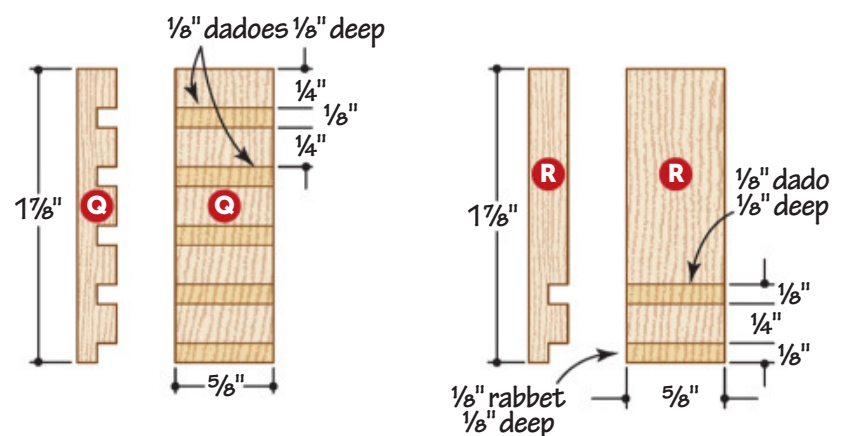
5 BOXCAR PARTS



CATWALK ON A HOT TIN ROOF

Fun Fact: Boxcars were originally made out of wood (like ours). But due to their fire hazard, wooden boxcars were phased out in the late 1960s in favor of steel boxcars.

- 1 Cut the roof (J) to size [Materials List, Drawing 5]. Bevel the roof to shape at the bandsaw by tilting the table to 6°. Sand the sawn faces smooth. Mark the locations for the 1/8" kerfs on top of the roof and cut these at the tablesaw [Drawing 5, Photo B].
- 2 Cut two pieces for the roof trim (K) to size [Drawing 6]. Glue the trim to the edges of the roof, flush with the ends and bottom face. Cut the boxcar floor (L) to size to match the roof/trim assembly (J/K).



End Panel Corners



F Hold the beveled faces of the roof (H) flat on the tablesaw to cut the kerfs on the top. Use a stop to position the kerfs, flipping the roof end for end between cuts and then repositioning the stop.

G Using a pair of stopblocks clamped to the fence, carefully lower the workpiece onto the spinning $\frac{1}{8}$ " spiral bit and rout stopped grooves in opposite corners of the floor (L) and roof (J).

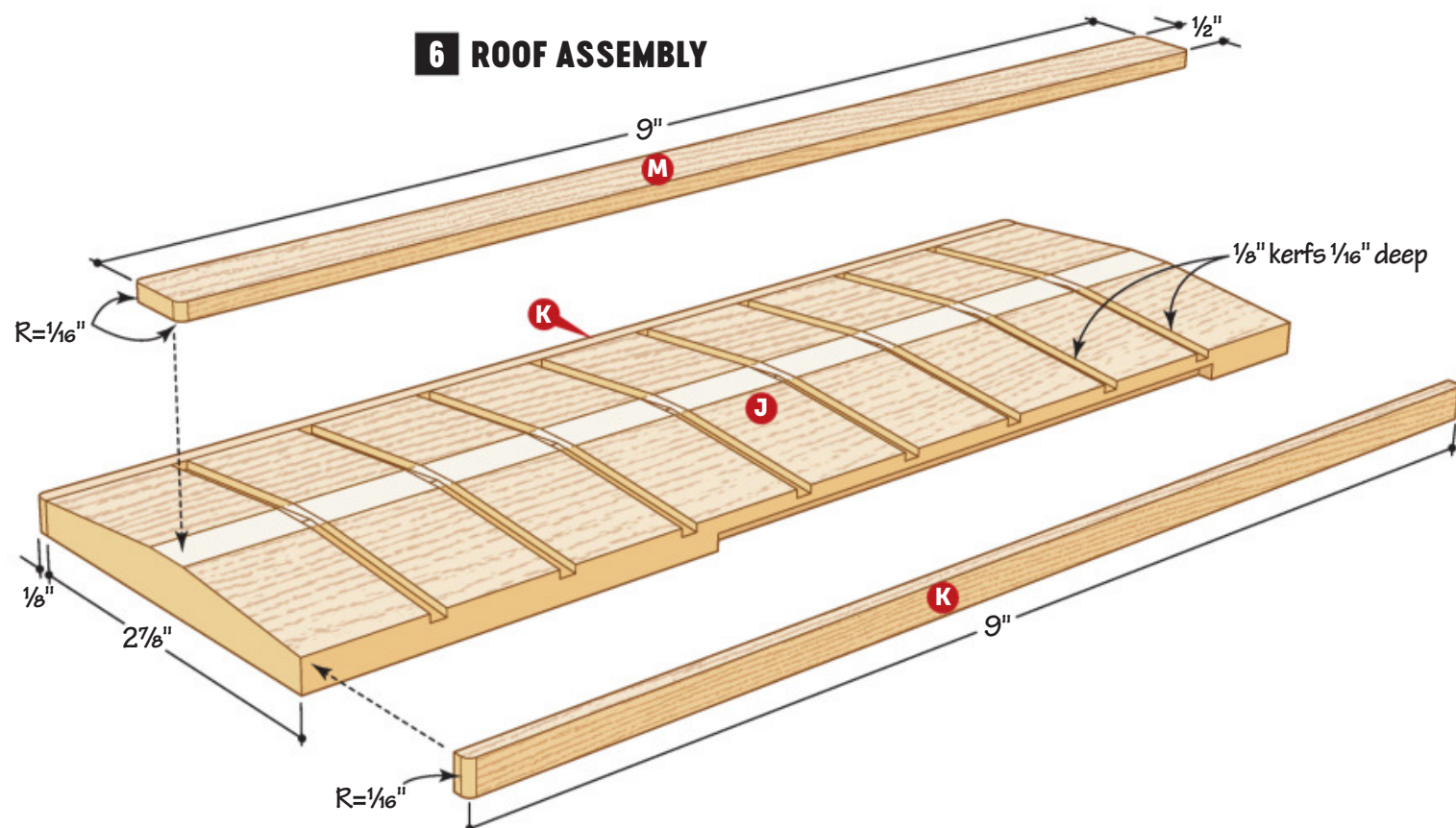
TIP!

If you don't own a $\frac{1}{8}$ " chisel, round the ends of the tongues on the sides and doors when you make them later on.

- 3** At the router table, mill the stopped grooves for the car sides and doors in the roof and floor [Photos G and H, Drawing 5]. Square the ends of the grooves with a chisel.
- 4** Cut the roof catwalk (M) to size and glue it to the roof assembly [Drawing 6].
- 5** Glue the platform assembly (G-I) to the bottom of the floor (L), centered side-to-side and front-to-back [Exploded View]. After the glue dries, extend the holes in the ends of the frame rail (G) through the floor.
- 6** Dry-assemble the front and rear truck assemblies to the platform using the connector pins [Exploded View]. Mark the connector pins for length and cut them flush with the top of the floor. Don't glue the pins in place just yet.

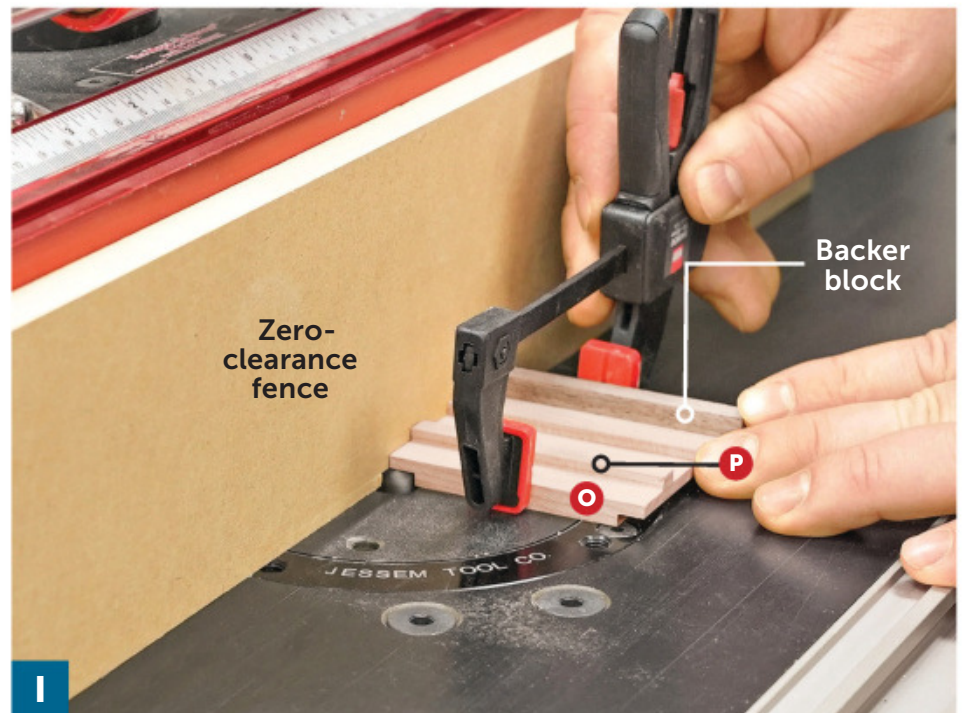


H Reposition the stopblocks to rout the grooves on the opposing corners. To rout the grooves for the doors, reposition the fence and stopblocks.



BOX IT ALL IN

- 1** Cut the side panels (N) to size and cut dados across their faces [Drawing 5]. Rabbet both edges of each panel to fit in the stopped grooves in the floor and roof. Glue the side panels into the grooves of the floor, checking for square. Add the roof (without any glue) as a clamping caul to hold the side panels in place while the glue dries.
- 2** From $\frac{1}{4}$ " stock, cut a $1\frac{7}{8} \times 6$ " blank for the end panels (O) and two $\frac{1}{4} \times 6$ " blanks for the end ribs (P). Rout two $\frac{1}{4}$ " grooves on one face of the end panel blank [Drawing 5], then glue the two end rib blanks into the grooves. After the glue dries, cut the two car ends (O/P) to length.
- 3** Rout rabbets on the ends of the end panel assemblies (O/P) [Photo I]. Glue the end panels to the floor and sides.
- 4** Cut the end panel corners (Q, R) to size [Drawing 7]. Rout a rabbet across one end of each corner, then rout the dados. Glue the corners to the boxcar assembly [Exploded View].
- 5** Cut a 6"-long blank to thickness and width for the steps (S) [Materials List]. Rabbet one edge, then chamfer the opposite edge [Drawing 5]. Cut the individual steps to length and glue them to the bottom face of the floor, flush with the ends and edges.
- 6** Using a sanding block, gently round over the corners of the steps, floor, panel corners, and roof trim. Sand the inside corner of each step and panel corner to match the exposed corners.

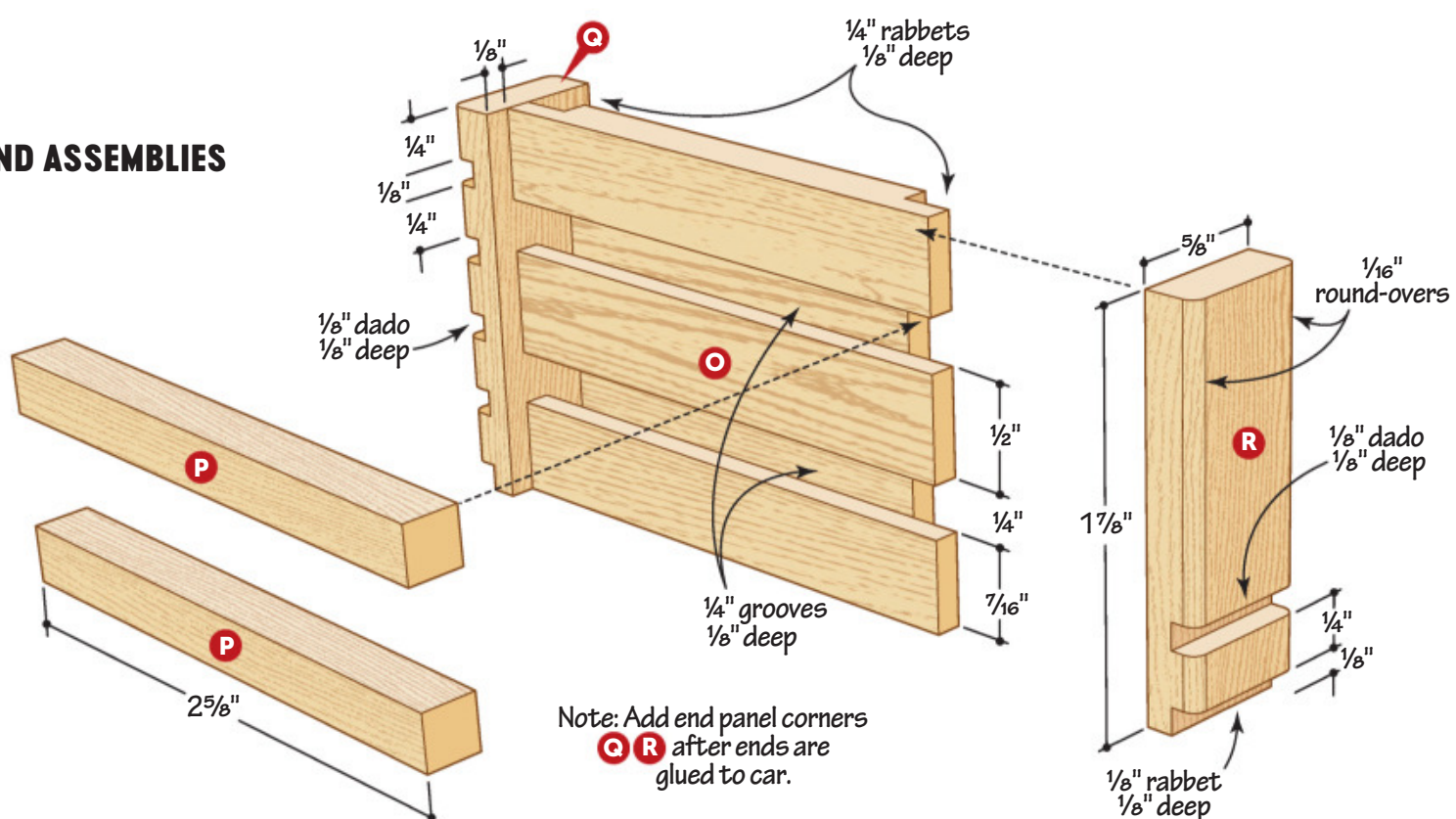


With a zero-clearance auxiliary fence mounted to the router table, clamp each end panel assembly (O/P) to a backer block to prevent tear-out when routing the $\frac{1}{4}$ "-wide rabbets across the ends.

SLIDE THE DOORS CLOSED

- 1** Cut the door panels (T) and edging (U) to size [Materials List, Drawing 8]. Glue each panel between pairs of edging, flush at the ends and back (inner) face.
- 2** Rabbet the top and bottom edges of the door assemblies to create tongues that fit in the grooves of the car floor and roof. Dry-fit the doors and roof to the car to check that the doors slide smoothly.

7 END ASSEMBLIES





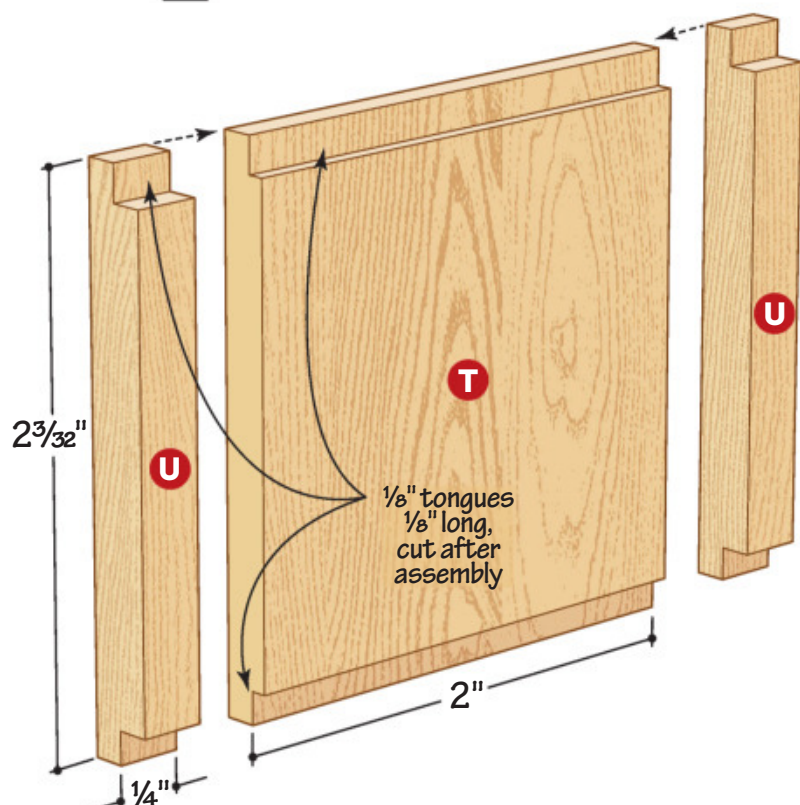
3 Finish-sand the subassemblies, mask the glue surfaces, and apply a clear finish. We sprayed three coats of matte aerosol lacquer, buffing between coats.

Note: To allow the pins to rotate freely within the trucks, don't apply glue to the holes in the truck assemblies when adding the connector pins.

4 Insert a connector pin through each wheel truck and glue the end to the frame rail and platform assembly. Wipe off any glue squeeze-out.

5 Install the sliding doors and glue the roof to the car, taking care not to get glue in the door tracks. Then hitch your boxcar to the train so you can load it up with cargo. 🌲

8 DOOR (Outside face shown)



MATERIALS LIST

PART		FINISHED SIZE			Matl.	Qty.
		T	W	L		
A	TRUCK FRAMES	5/8"	1 1/2"	2 1/8"	C	2
B	SPRING GROUPS	3/8"	13/32"	5/8"	C	4
C	TRUCK SIDE FRAMES	1/4"	1/2"	2 1/8"	C	4
D	TRUCK TONGUES	1/4"	1/2"	3"	C	2
E	TONGUE EXTENSION	1/4"	1/2"	1 1/4"	C	1
F*	HITCH SHROUD	1/2"	1"	1 1/8"	C	1
G	FRAME RAIL	3/8"	3/4"	7 1/2"	C	1
H	PLATFORM RAILS	1/4"	1/2"	7"	M	4
I	PLATFORM FILLERS	1/4"	1/2"	1 1/4"	M	4
J	ROOF	3/8"	2 7/8"	9"	C	1
K	ROOF TRIM	1/8"	1/4"	9"	M	2
L	FLOOR	1/4"	3 1/8"	9"	C	1
M	ROOF CATWALK	1/8"	1/2"	9"	M	1
N	SIDE PANELS	1/4"	2 1/8"	3 1/8"	C	4
O*	END PANELS	1/4"	1 7/8"	2 5/8"	C	2
P*	END RIBS	1/4"	1/4"	2 5/8"	C	4
Q	END PANEL CORNERS	1/4"	5/8"	1 7/8"	M	2
R	END PANEL CORNERS	1/4"	5/8"	1 7/8"	M	2
S*	STEPS	1/4"	7/16"	5/8"	C	4
T	DOOR PANELS	3/16"	2"	2 3/32"	C	2
U	DOOR EDGING	1/4"	1/4"	2 3/32"	C	4

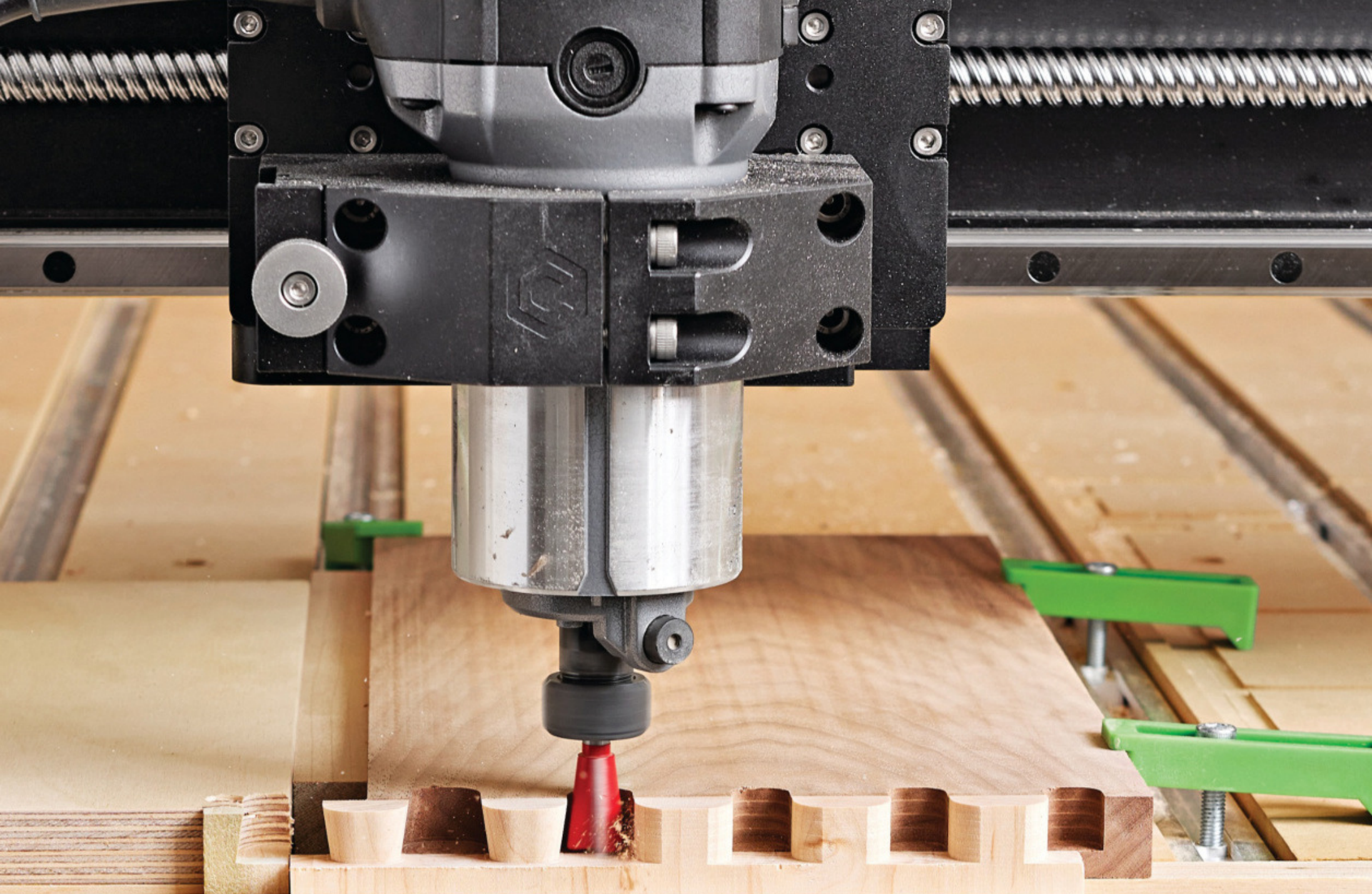
*Parts initially cut oversize. See the instructions.

MATERIALS KEY: C—cherry, M—maple.

BITS: 9/64", 7/32", 11/32", 3/8" brad-point bits, 1/2" and 5/8" Forstner bits, 1/8" and 1/4" spiral router bits, and 1/4" round-over router bit.

SOURCES: Train Boxcar Kit no. RS-01380E \$10 each (\$40 5-pack), woodstore.net/boxcar kit.

PROJECT COST: It cost us about \$30 to build this project. Your cost will vary by region and source.



THE CNC END GAME

Sometimes cutting on the flat with a CNC just doesn't cut it. Here's how to turn machining on its edge for precision joinery.

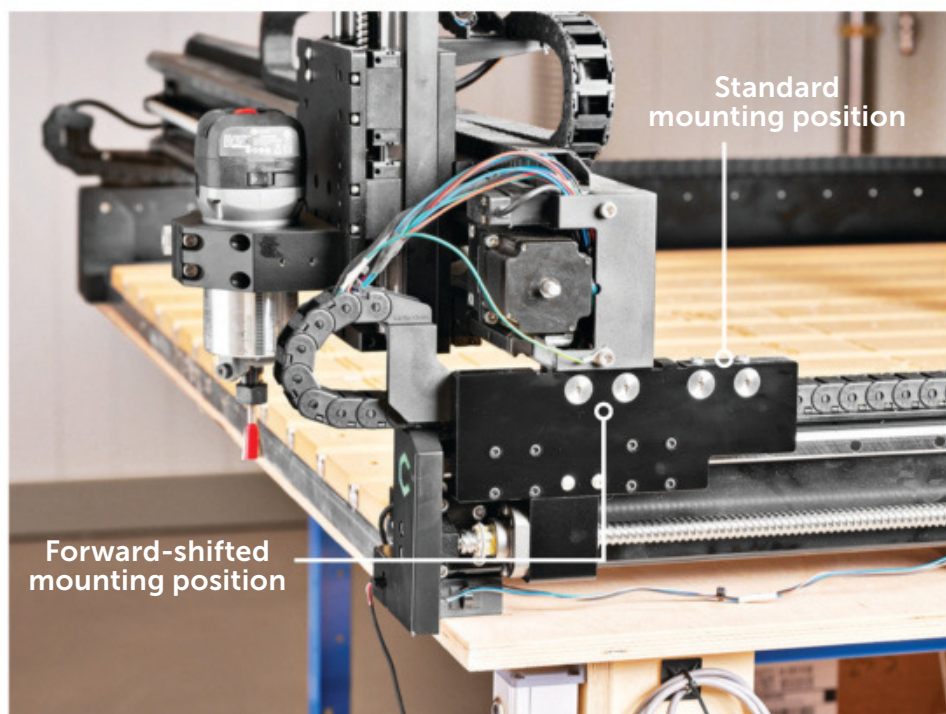
WRITER: LUCAS PETERS

PHOTOGRAPHER: CARSON DOWNING

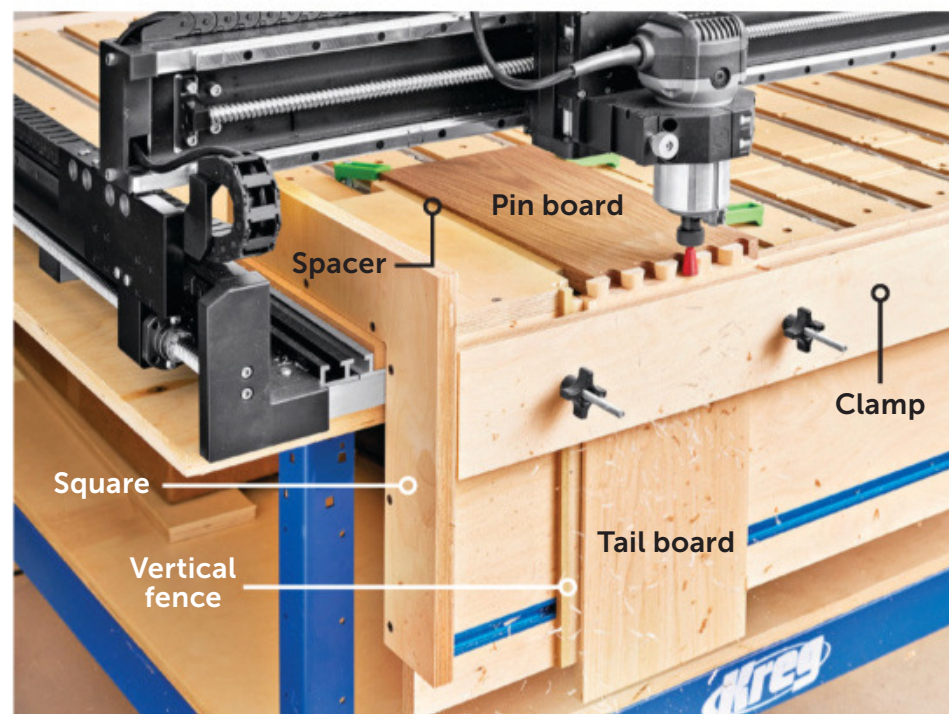
One of the final frontiers for hobbyist computer-numerical control (CNC) routers remains the ends and edges of workpieces where gantry-style machines struggle to create the crisp lines of traditional woodworking joinery, such as dovetails or box joints. This is because, by its nature, a spinning bit oriented perpendicular to the horizontal workspace of a CNC bed cuts a rounded profile on interior corners of workpieces. Workarounds that compensate often prove unsatisfactory (*right*).

This is not a problem for router tables or handheld routers. With both, you can reorient either the workpiece or tool so that the crisp-cornered profile of a bit, such as a straight bit or dovetail bit, intersects the workpiece face instead.

Several CNC manufacturers offer solutions that eliminate or circumvent the gantry-style CNC's flat bed, bringing repeatable numerical control to that final frontier of CNC routing.



Carbide3D's latest Shapeoko Pro models offer an alternate gantry mounting point that places the cutter about 3" forward of the standard position, allowing it to travel past the front edge of the bed.



This shop-made jig secures to the bed's T-track channels. A CNC-cut square holds a vertical backing board with T-track clamping points, allowing workpieces to be secured at 90° to the bed.

OFFBED TRAVEL

Machine modification is a celebrated tradition in hobbyist CNC circles. One common home-brewed solution alters the machine by shifting the spindle forward or alters the bed by shifting it rearward or trimming it. Either approach allows the bit to travel beyond the front edge of the bed, where workpieces can be positioned vertically using a jig for cutting on end or edge.

Some manufacturers, such as Carbide3D, have taken cues from those customer mods and built overtravel capability into their machines (*above left*).

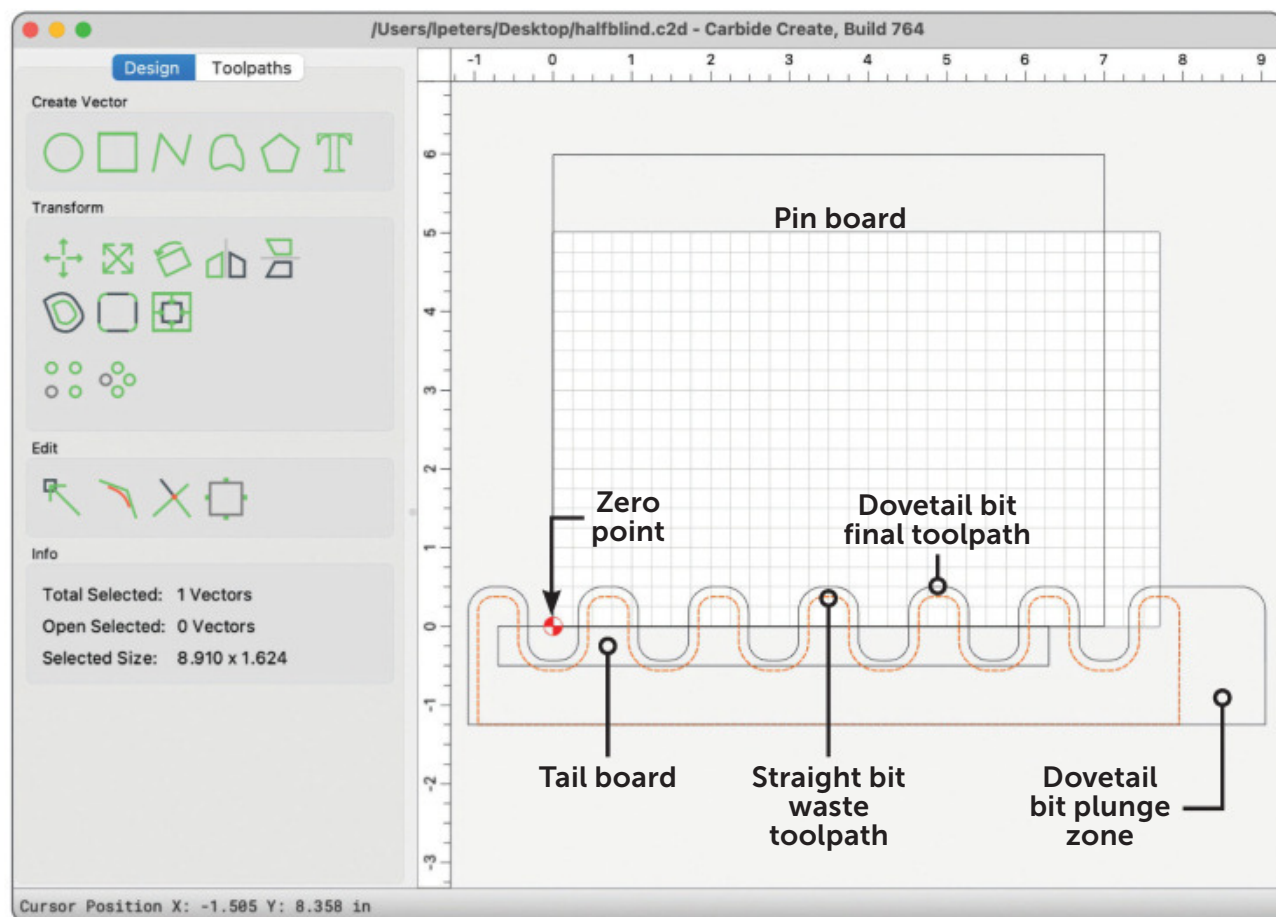
A jig built to secure and square a workpiece vertically to the front edge of the bed (*above right*) lets you take advantage of that overtravel to cut box joints, dovetails, and more.



“
**YOUR FIRST DOVETAILS
 ON A CNC ROUTER CAN
 TAKE JUST AS MUCH
 TWEAKING AS HAND- OR
 JIG-CUT. BUT IT’S JUST
 AS SATISFYING WHEN
 THEY COME TOGETHER.**

-LUCAS PETERS, EDITOR-IN-CHIEF

”



Toolpaths for half-blind dovetail joints mimic the comb-like template of a dovetail jig. The inner pocket toolpath (red) is first hogged away by a straight bit before finishing with a full-depth dovetail toolpath.

However, it can take serious imagination, especially if you’re setting up joinery such as half-blind dovetails in two-dimensional computer-aided design (CAD) software (above). Because dovetail bits are not commonly modeled in hobbyist control software, you may have to “trick” the software by choosing or creating a straight bit representing the diameter of your dovetail bit’s end.

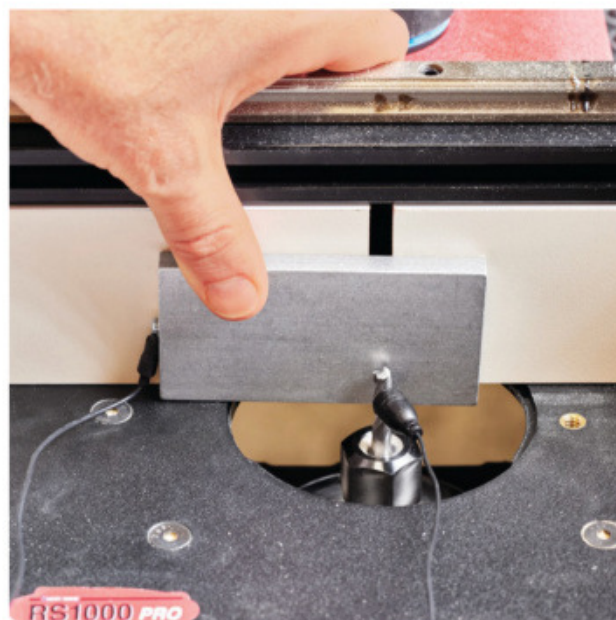
Also, since you can’t plunge or make partial-depth cuts with a dovetail bit and maintain its signature tapered look, the dovetail cut must be full depth. First create a pocket toolpath for a straight bit to hog out most of the waste, making sure to leave a “safe zone” in your design that the dovetail bit can plunge into.

Carbide3D, carbide3d.com
 Shapeoko 5 Pro 4x4’ with Compact Router, \$3,830

COME TO THE TABLE

Next Wave CNC takes a different approach to end and edge work by building computer control into a familiar router-table form factor with their RS1000 Pro. Servo motors control the fence position and a router lift. After determining the bit location with a touch plate (near right), you can use the table-mounted control screen to dial up a precision fence distance and bit height for your routing operation.

The control screen goes further than that, however, with built-in apps for a laundry list of joinery operations (far right). Simply choose your operation, enter details about the bit and work-piece, and let the touchscreen guide you as it automatically positions the fence and bit for each cut (next page, top).



Many CNC machines offer a touch plate accessory. When the plate—a known thickness—touches the bit, it completes a circuit, telling the machine the precise location of the bit.



End and edge operations programmed into the RS1000 Pro include box joints, through and half-blind dovetail joints, biscuit slots, tongue-and-groove joints, dowel joints, and locking miter joints.



While it can't match all of the flexibility of a gantry-style CNC, the RS1000 Pro promises to eliminate the need for a slew of shop-made or store-bought joinery jigs and power tools along with much of their associated learning curves.

Next Wave CNC, carbide3d.com
RS1000 Pro with optional Sliding Miter, \$2,000

Complete a pass on the RS1000 Pro's box-joint application and tap the touchscreen for the next. The fence automatically repositions itself for the next pass. Repeat until you've completed the entire end.

A HELPING HANDHELD

Shaper's Origin builds the computer control directly into a handheld router form factor. An integrated camera first scans and records a field of special QR-code-like tape strips that let Origin continuously orient itself to the workpiece. Load your toolpath directly into the machine where it is overlaid virtually onto the scanned workpiece in the on-board touchscreen monitor. Your job is to roughly trace that toolpath while the offset spindle shifts to compensate for any of your jitters and bobbles.

The portability lets you take the CNC to a workpiece secured on end or edge in a jig. While you can manufacture a shop-made version of such a jig, Shaper offers two accessories for that purpose.

Routing a toolpath with the Origin feels like a coloring-book app. Get close to the line and the spindle shifts to make sure the cut is accurate.

The first, the Plate, (*right*) rests on or clamps to a workpiece and specializes in cutting mortises for a library of downloadable hardware patterns, such as for hinges (*below left*), loose tenons, connector hardware, and bowties.

The second, the Workstation (*below right*), resembles a dovetail jig with clamps and accessories used to secure workpieces flat or on end for cutting box joints, dovetails, tenons, mortises, and more. 🌲

Shaper, shapertools.com
Origin, \$2,899; Plate, \$375; Workstation, \$475



Our shop-made jig attached to one of the Plate's several mounting points holds a workpiece on edge while routing. Shaper sells a similar, optional Edge Mortising Adapter add-on for \$99.



Download a toolpath for a Soss 204 hinge from the ShaperHub website, mark its center on your workpiece to align with the Plate's index mark, place the path, and rout a perfectly fitting mortise.



With a field of permanent Shaper Tape to orient the hand-held CNC, the Workstation features multiple accessories for securing workpieces in its vertical clamping surface.



A SWING FOR ALL SEASONS

You don't need warm weather—or even a porch—to enjoy relaxing in this perch. Hang it indoors and rock out year round.

WRITER: VINCE ANCONA

DESIGNER: KEVIN BOYLE

BUILDER: BRIAN BERGSTROM

OVERALL DIMENSIONS

48½"W x 26"D x 13¾"H



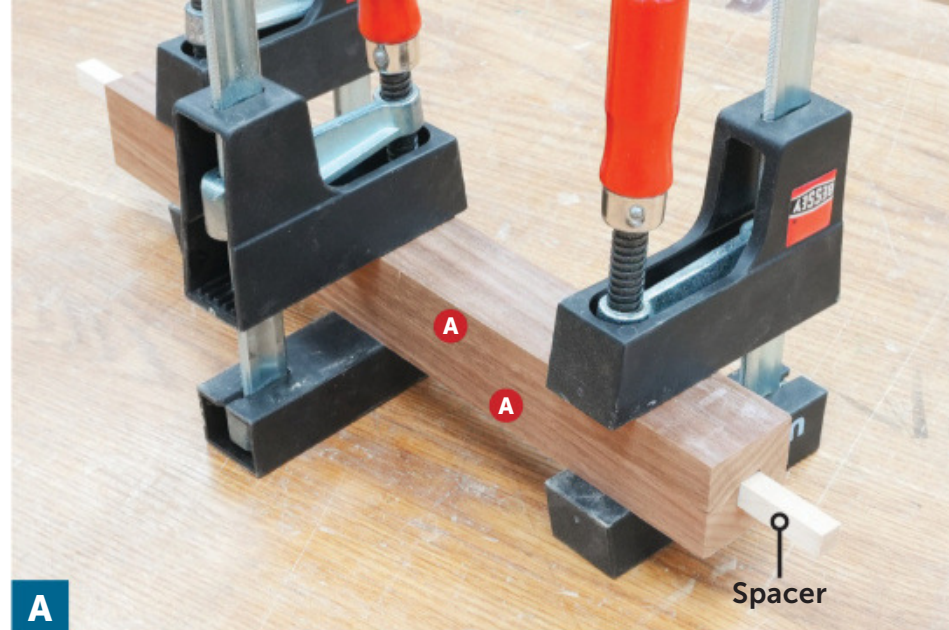
Playgrounds and porches typically come to mind when you think of swings. But that doesn't always have to be the case. Bring the outdoors inside with this scaled-down version of a porch swing suitable for hanging in an all-season room, basement, or rumpus room.

LAMINATE THE POSTS

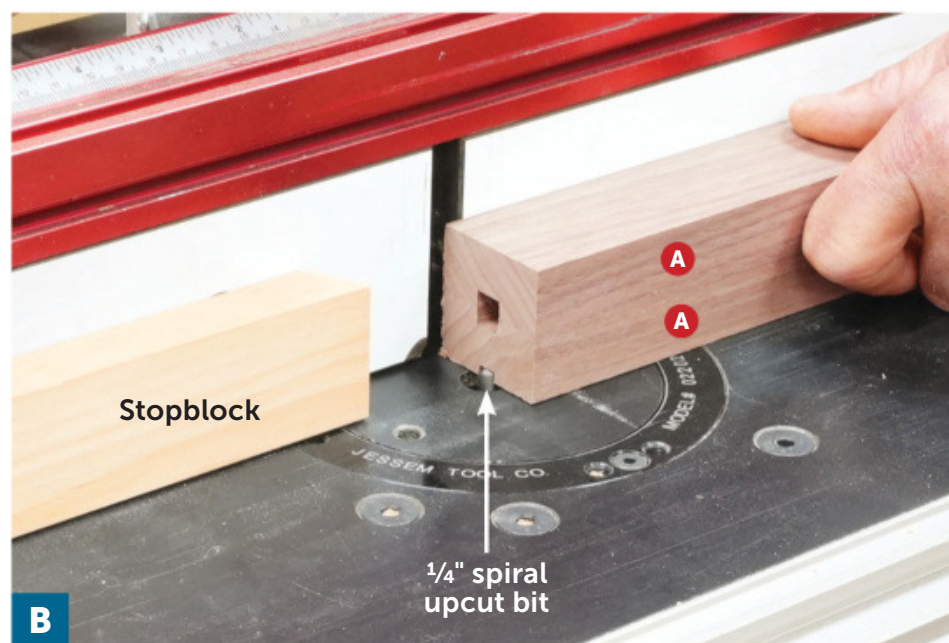
Square posts and stretchers form the side assemblies of the swing. Gluing up the posts from two halves allows you to create a channel through the center of each post for the rope that will suspend the swing.

1 Cut the post halves (A) to size [Materials List, Drawing 1]. Mill a centered groove on one face of each half, then glue the halves together to form four posts [Photo A].

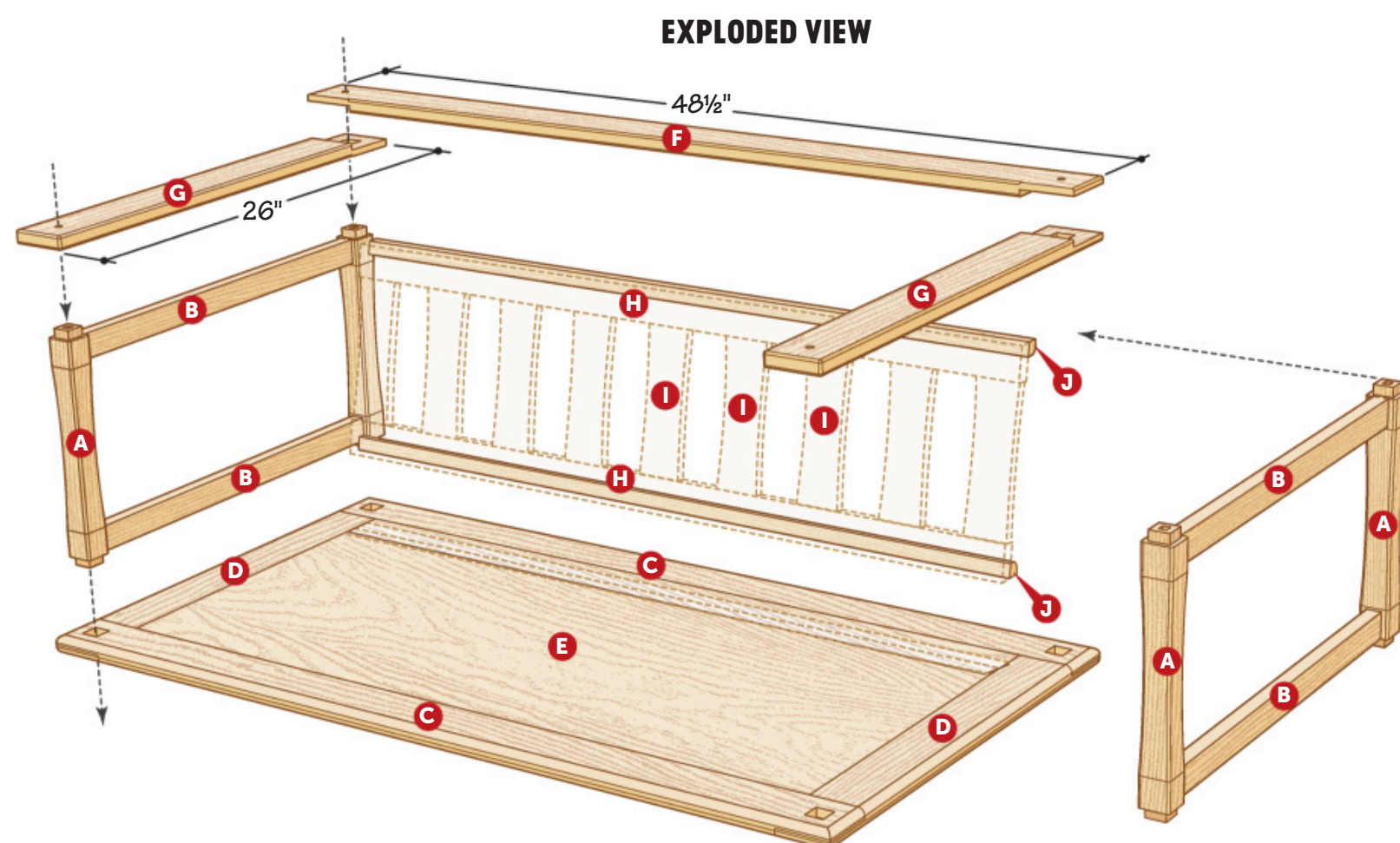
2 Mill stopped grooves in each post for the side stretchers [Photo B]. Square up the ends of the grooves with a chisel.



A To keep both halves of each post aligned during glue-up, cut short, square spacers to fit in the ends of the grooves. Just make sure to remove the spacers before the glue sets up.

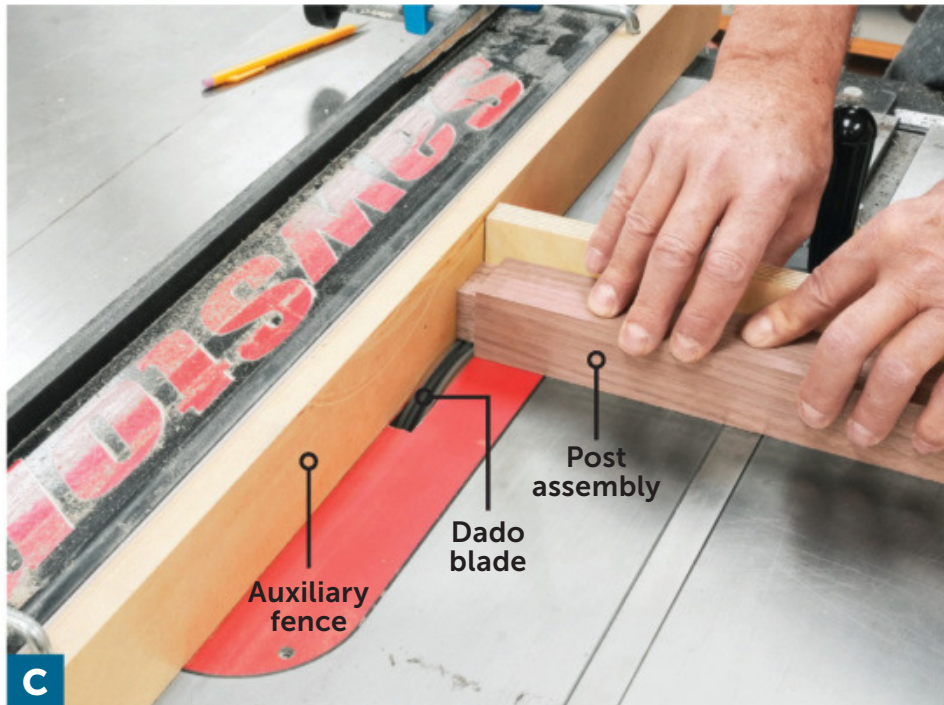


B Using a 1/4" spiral upcut bit and a stopblock to control the length, rout a centered, 1 3/4"-long stopped groove at both ends of each post. These will be the mortises for the side stretchers.

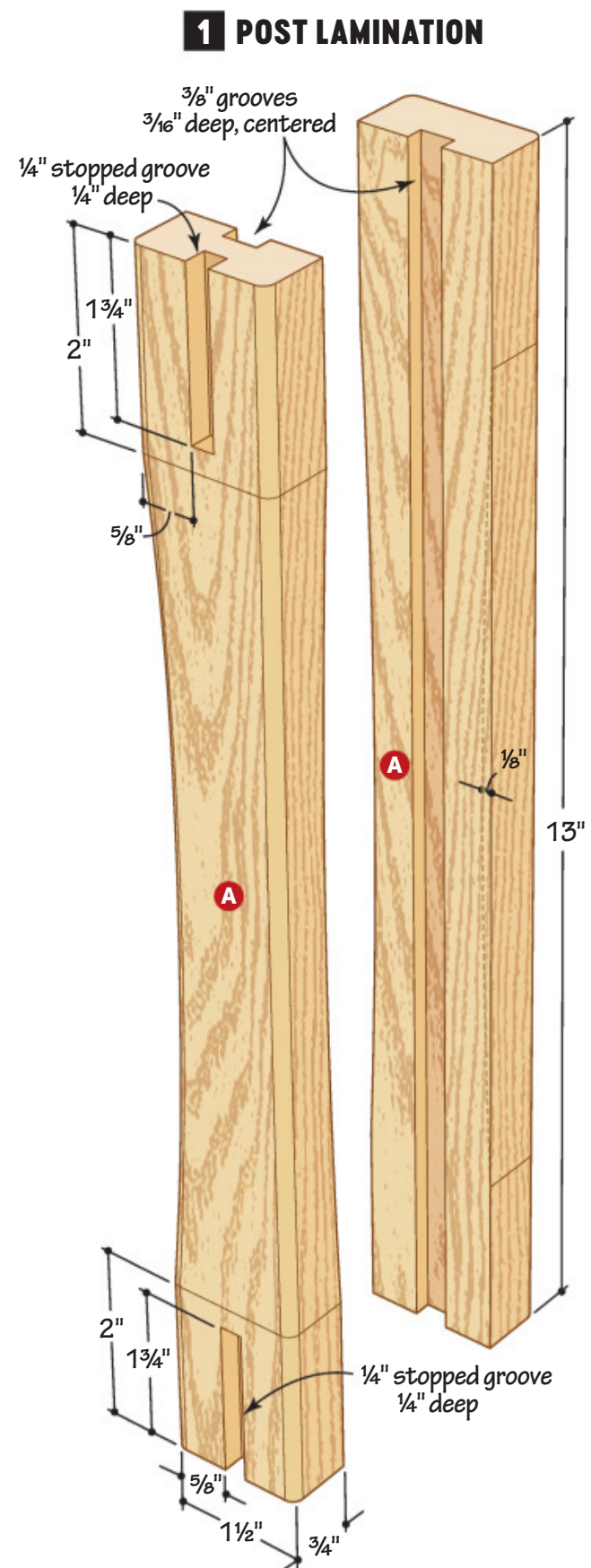


PHOTOGRAPHER: JASON DONNELLY
ILLUSTRATORS: ROXANNE LEMOINE, LORNA JOHNSON

- 3** Cut a tenon on each end of all the posts [Drawing 2, Photo C].
- 4** Build the sled (*Curves Ahead*, below) and use it to rout curves on all four faces of each post [Drawing 1, Photo D]. Round over the edges of the posts.
- 5** Cut the side stretchers (B) to size [Drawing 3] and form stub tenons on the ends to fit the stopped grooves in the posts. Ease the inside edges of the stretchers with sandpaper, then glue and clamp them between the posts to create two side assemblies.

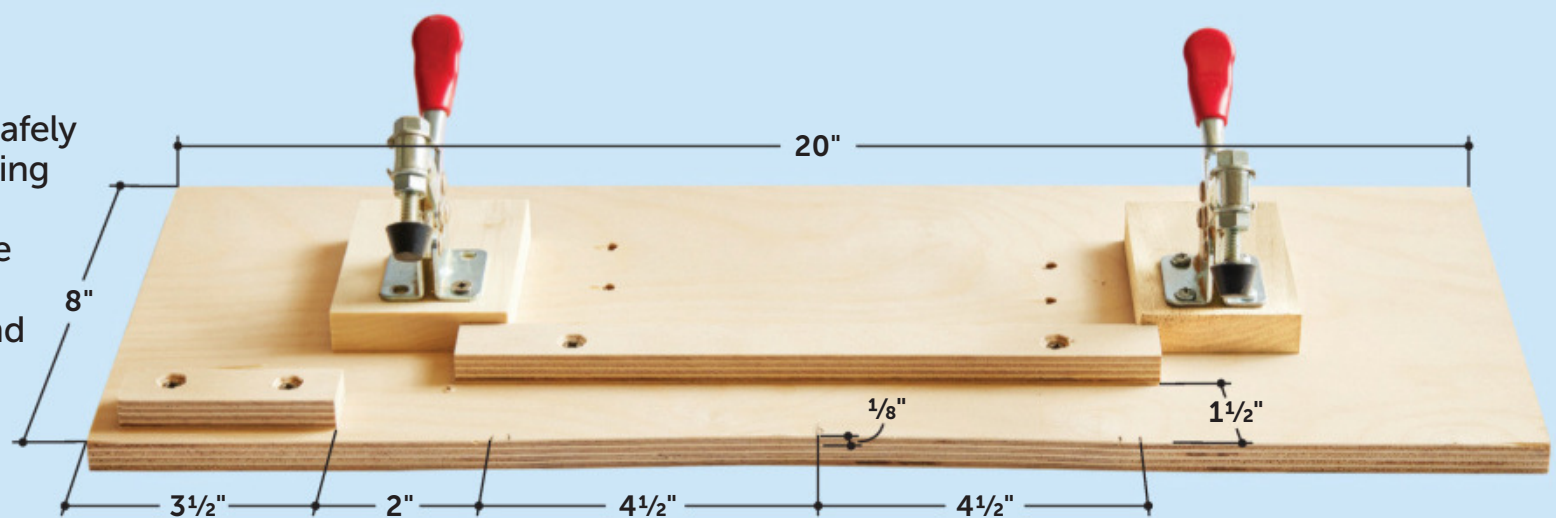


With an auxiliary fence secured to your rip fence, cut the tenons on the ends of the laminated posts with a $\frac{1}{2}$ "-wide dado blade. A long fence attached to the miter gauge backs up the cuts.

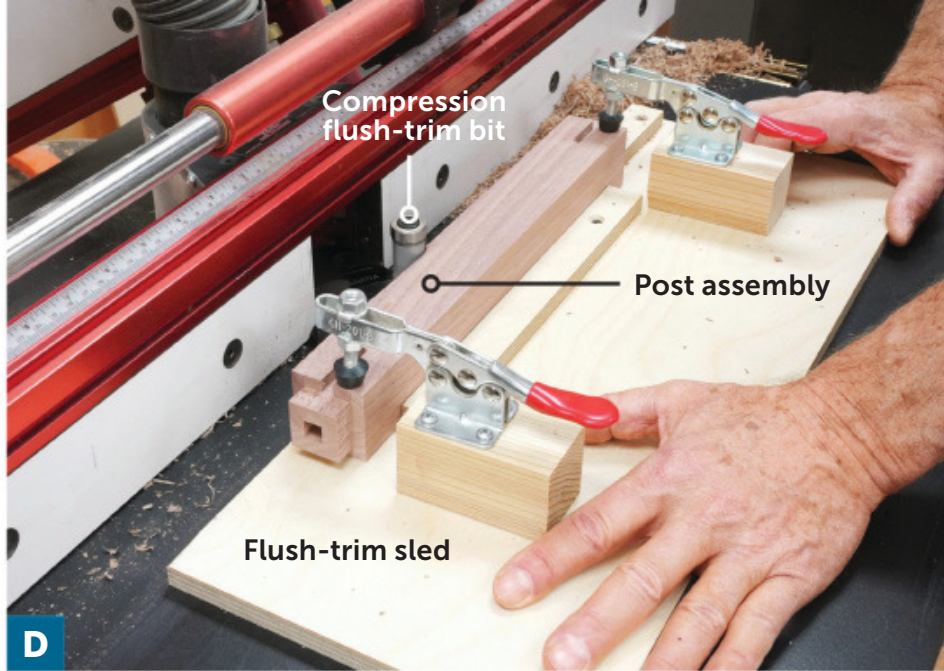


CURVES AHEAD

Build this flush-trim sled to safely hold the posts (A) while routing the curves on the faces. Centered on one edge of the sled base, cut and sand the curve profile. Add a fence and a stop to position each post for routing, and a pair of toggle clamps to hold the post in place. Rout the curves using a $\frac{3}{4} \times 2$ " compression flush-trim bit.



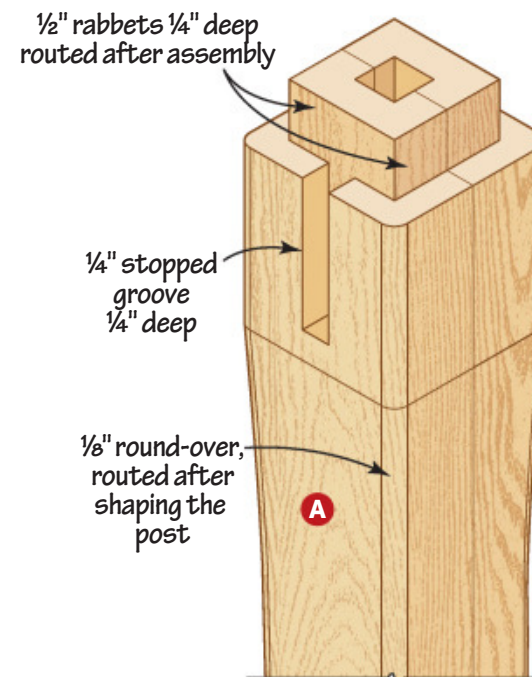
Lay out, cut, and sand a $\frac{1}{8}$ "-wide, 9"-long arc, centered on edge of base.



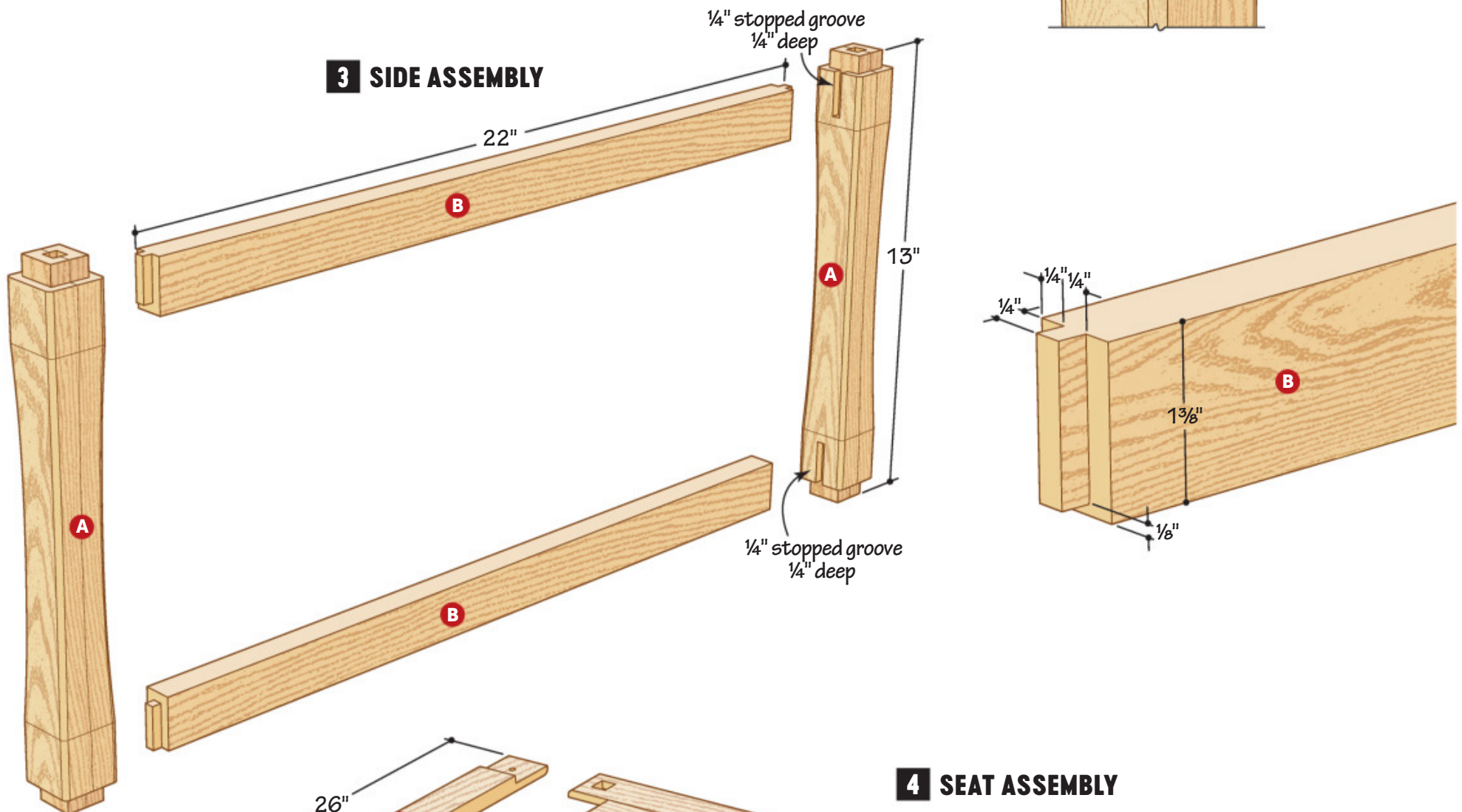
D

A flush-trim sled and a tall compression flush-trim bit make quick work of routing the curves in the posts. The bit has a bearing at both ends and rides against the curved profile in the edge of the sled base.

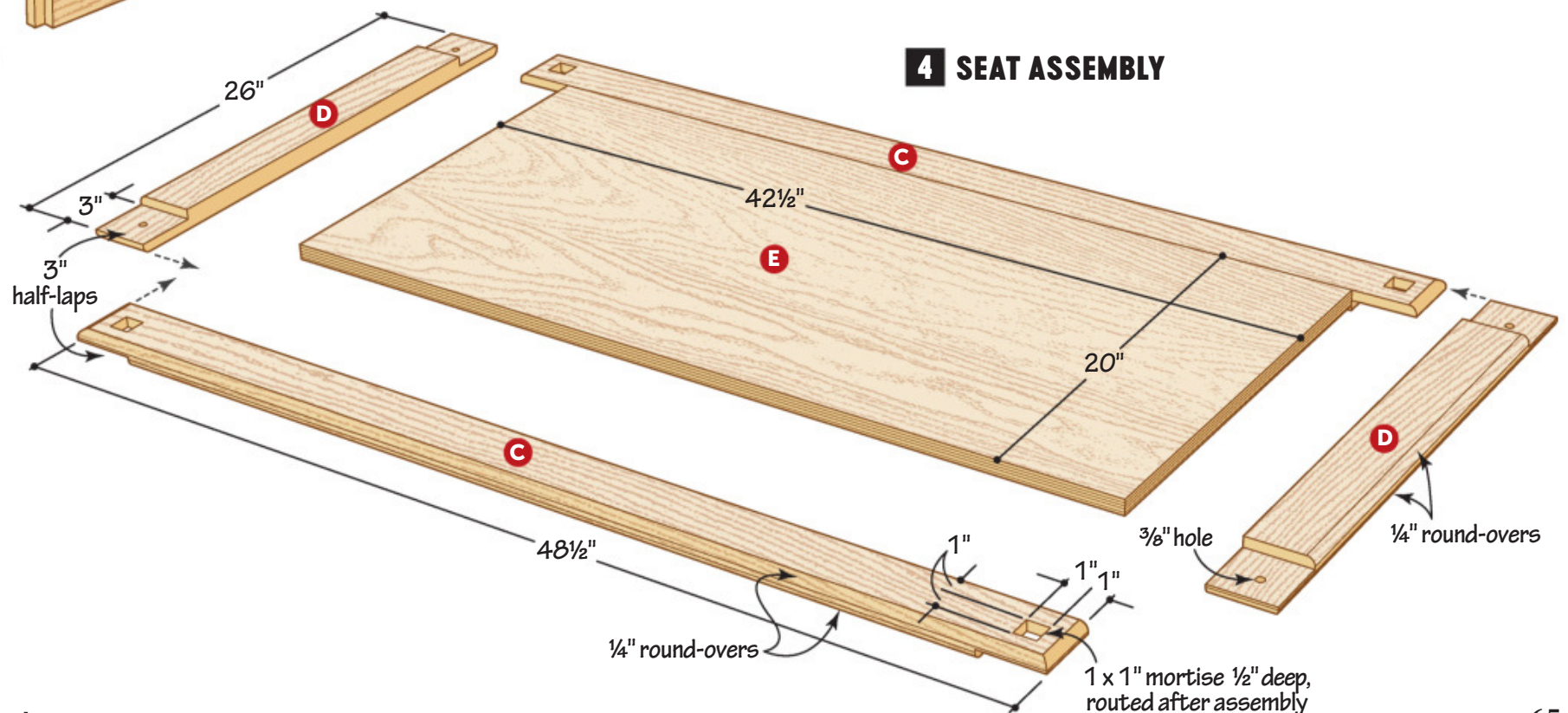
2 POST TENON DETAIL



3 SIDE ASSEMBLY



4 SEAT ASSEMBLY

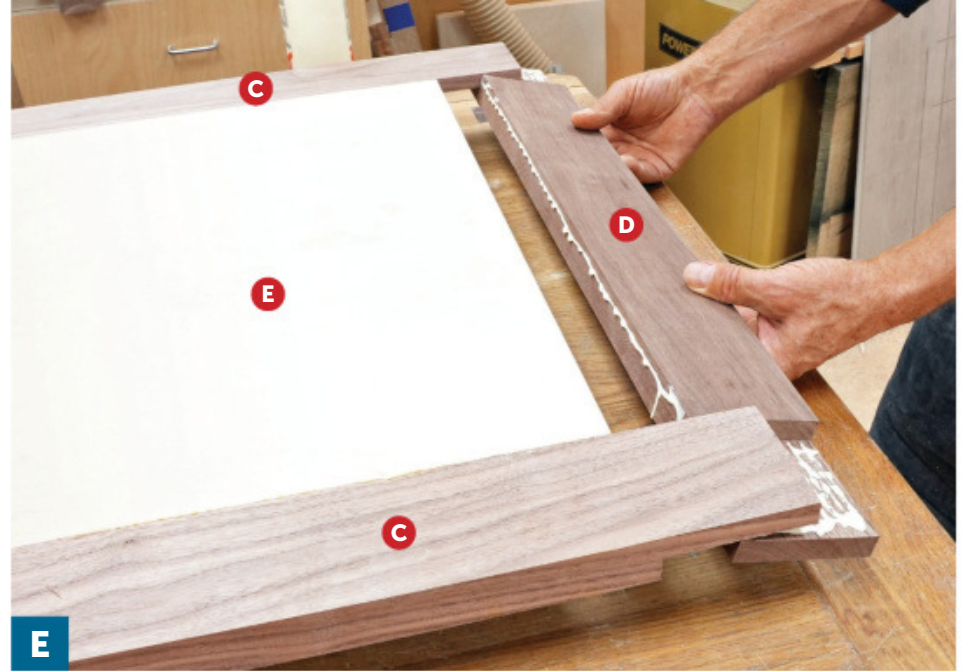


HAVE A SEAT AND A REST

1 Cut the seat front and back rails (C), seat side rails (D), backrest (F), and armrests (G) to size [Drawings 4–6]. Install a $\frac{3}{4}$ " dado blade in your tablesaw and cut 3"-long half-laps on both ends of the rails and backrest (C, D, F) and one end of the armrests (G) (see *Perfect Half-Laps* on the next page).

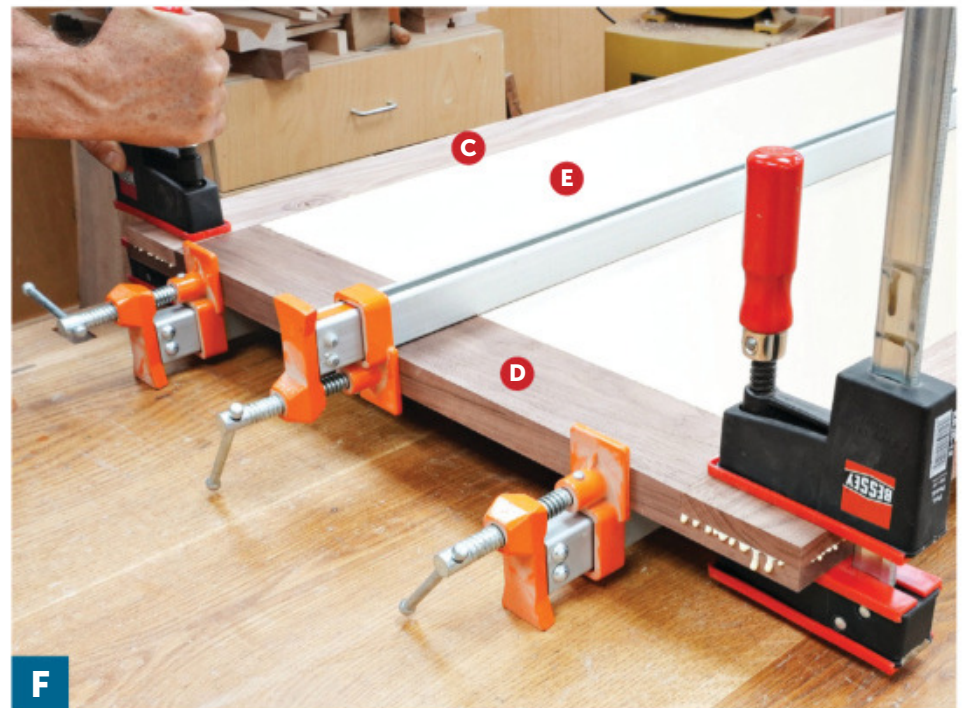
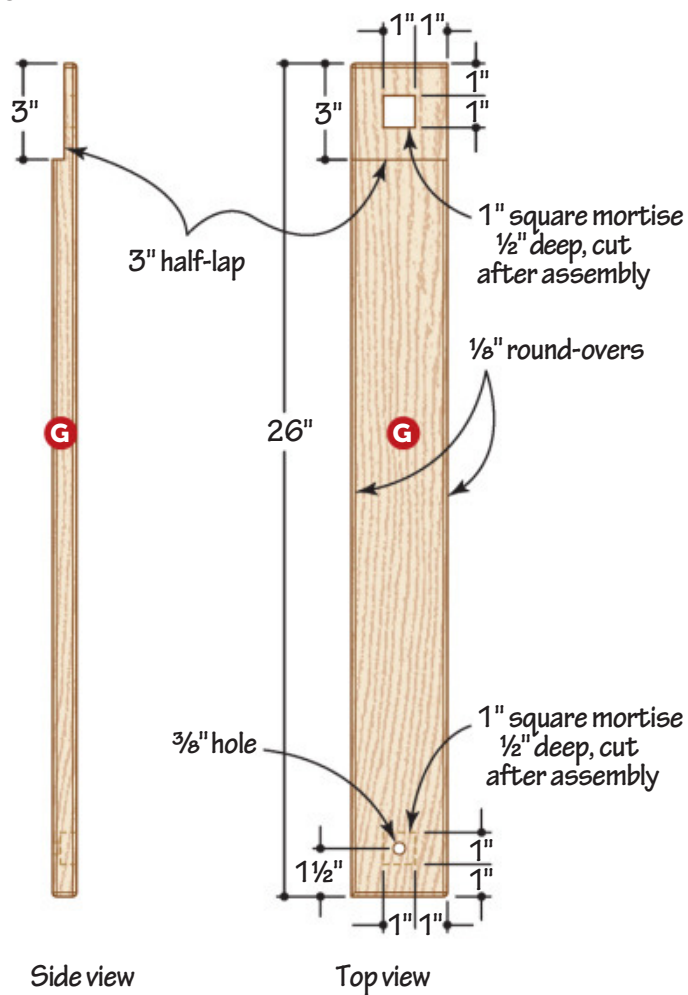
2 Cut the seat panel (E) to size from $\frac{3}{4}$ " plywood [Materials List]. Glue the seat front and back rails (C) to the long edges of the seat panel with the upper faces flush.

3 Glue the seat side rails (D) to the front and back rails and the seat panel [Photos E and F].



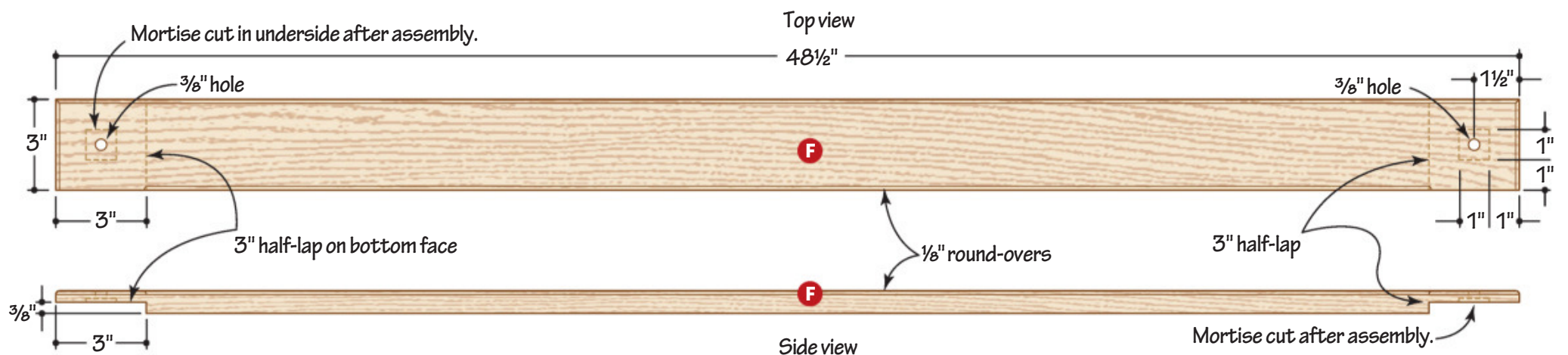
Glue the front and back rails (C) to the edges of the seat panel. After the glue sets, add the seat side rails (D) by spreading glue on the half-laps and the mating edge.

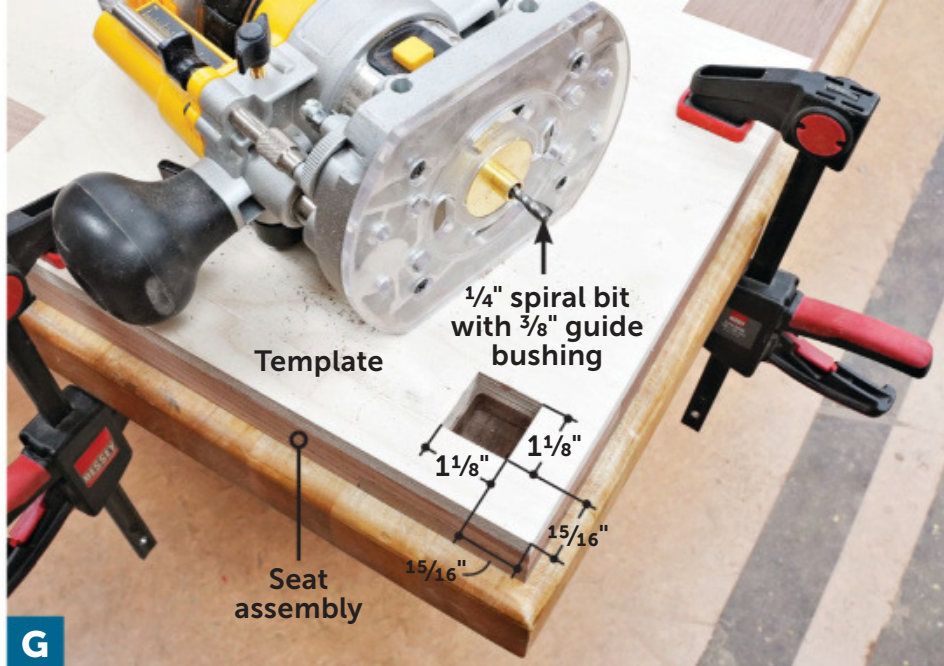
5 ARMREST



Clamp across the assembly first to draw the side rails (D) tight against the seat panel (E). Then add a clamp to the half-lap joint at each corner of the frame.

6 BACKREST





To cut the 1/2"-deep mortises in the top face of the seat, use a simple plywood template along with a 3/8" guide bushing and a 1/4" spiral upcut bit. Square up the corners of the mortise with a chisel.



Sandwich the two side assemblies between the seat and armrest assemblies. Setting the swing on a pair of risers makes it easier to position the clamps at both ends.

TIP!

Back workpieces with scrap when drilling to prevent blowout.

4 Glue the armrests (G) to the backrest (F), checking for square.

5 After the glue dries, rout 1/2"-deep mortises in the corners of the seat and armrest/backrest assemblies for the posts [Photo G, Drawings 4, 5]. Drill a 3/8" hole in the center of each mortise.

6 Round over the top and bottom edges of the seat and armrest/backrest assemblies. Note that the round-overs on each assembly are different sizes.

7 Glue the side assemblies (A/B) to the seat (C/D/E) and armrest (F/G) assemblies [Exploded View, Photo H].

PERFECT HALF-LAPS

The secret to cutting perfect half-laps is using test pieces to dial in the height of the dado blade. Start with your dado blade adjusted to just under half the thickness of your stock and cut a joint on one end of both test pieces. Raise the blade in small increments and make repeat cuts until the test pieces are flush (below left).



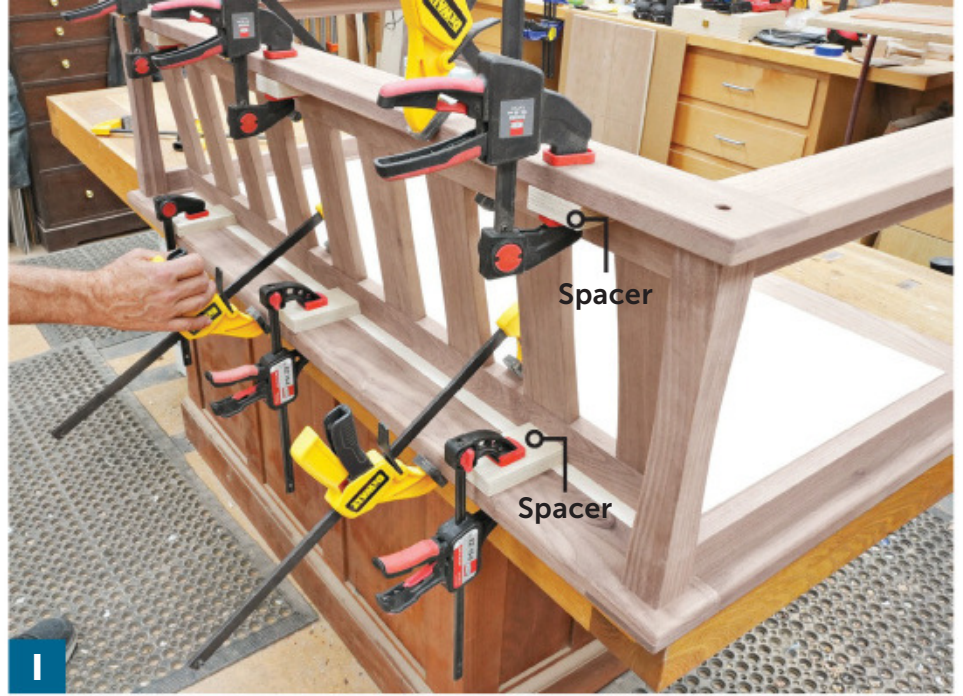
Using scrap stock the same thickness as your seat rails (C, D), cut a test joint to dial in the height of the dado blade. Make any blade height changes in small increments because they will be doubled.



Cut the half-laps in the seat rails using the rip fence as a stop and an auxiliary miter gauge fence to minimize tear-out as the dado blade exits the cut.

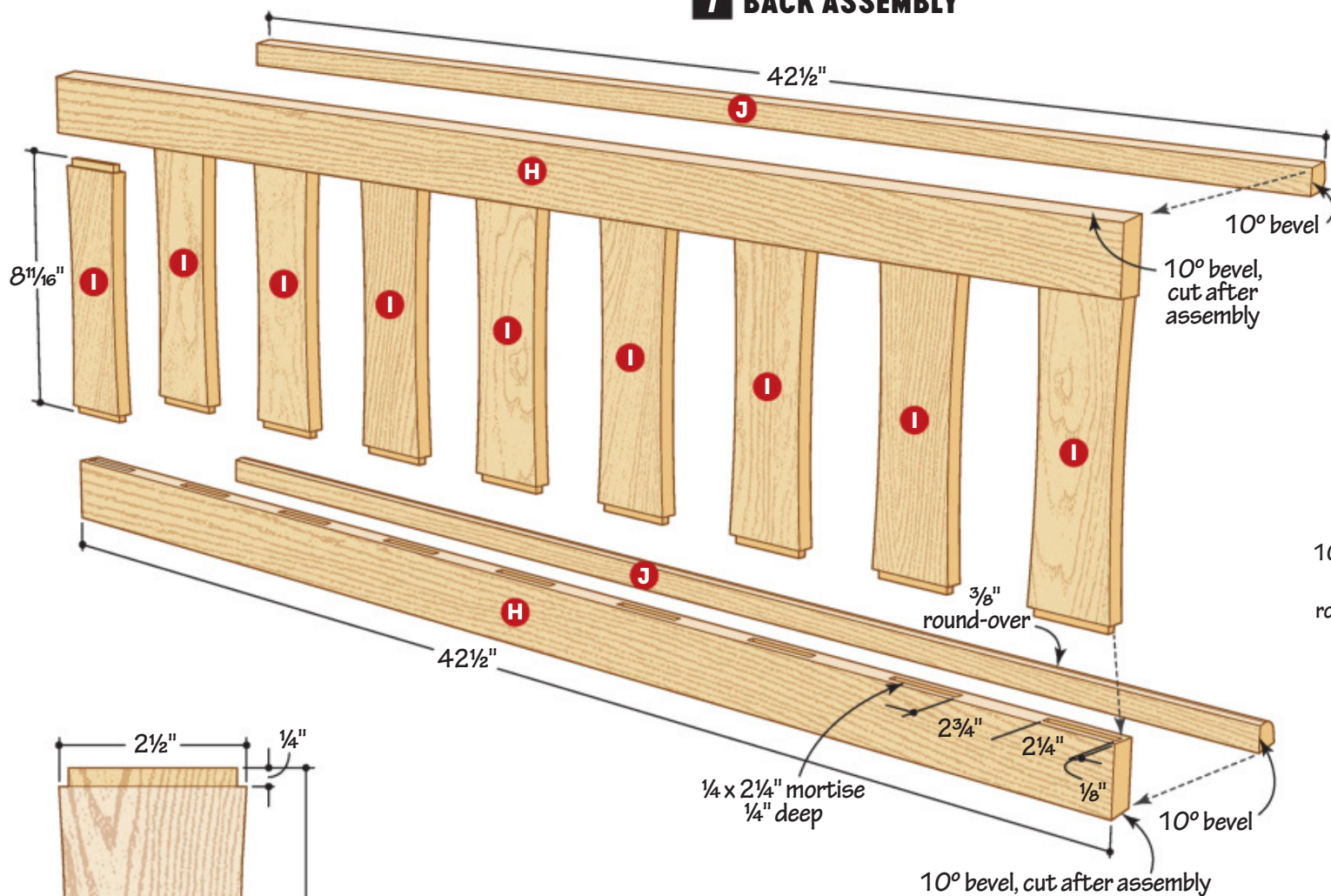
LEAN BACK

- 1 Cut the back rails (H) to size [Materials List, Drawing 7]. Lay out and cut the mortises along one edge of each back rail.
- 2 From $\frac{5}{8}$ " stock, cut the back slats (I) to size. Cut tenons on the ends of the back slats [Drawing 8].
- 3 Lay out and cut the curves on one of the back slats, then sand the edges smooth. Use this slat as a template, affixing it with double-faced tape to each of the other slats and routing the curves with a flush-trim bit. Ease the curved edges with sandpaper.
- 4 Glue the slats into the back rails. Clamp across the assembly, checking for square.

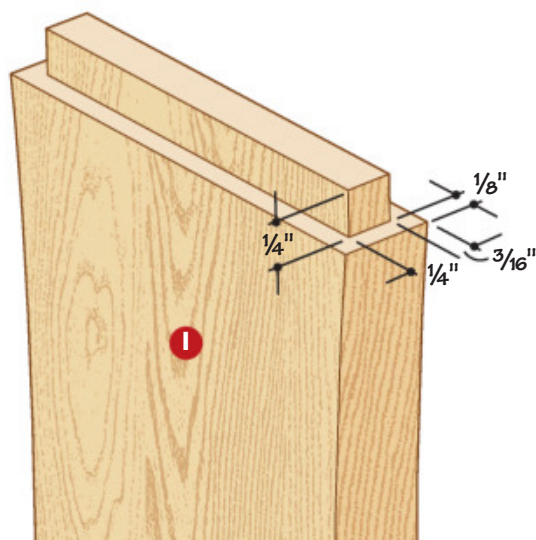
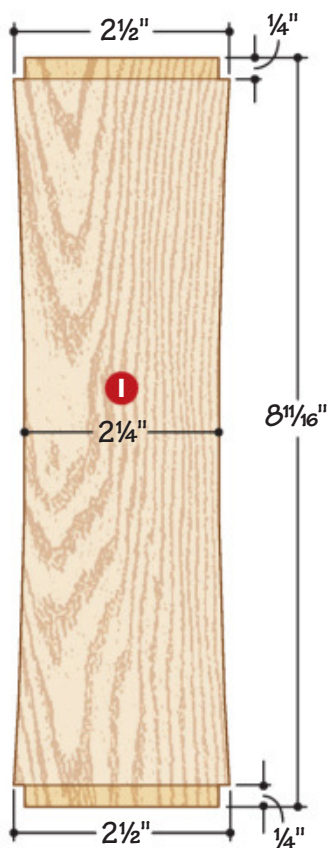


Clamp temporary spacers to the seat frame and backrest to aid in positioning the back assembly for the final glue-up. After the glue dries, glue the trim stops (J) at the top and bottom.

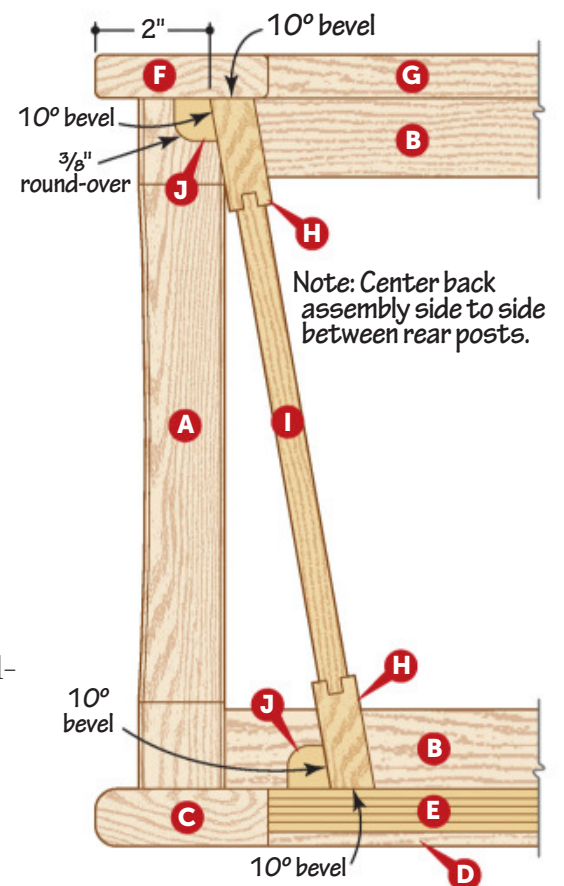
7 BACK ASSEMBLY



8 BACK SLAT



9 SWING SIDE SECTION VIEW



- 5 After the glue dries, bevel-rip the edges of the back rails (H) at the tablesaw [Drawing 9], sneaking up on the final fit between the seat and backrest. Glue the back assembly to the swing [Exploded View, Photo I].

- 6 Cut the trim stops (J) to size, beveling one edge of each piece. Round over the outside edge before gluing each trim stop in place.

HANG HIGH AND SWING ON

- 1

Sand the swing to 220-grit and ease any sharp edges before applying a coat of Danish oil stain. (We used dark walnut.)
- 2

After the oil has cured for several days, apply a topcoat. (We sprayed on two coats of lacquer, rubbing out between coats with an extra-fine sanding sponge.)
- 3

Order a custom seat cushion [Sources] or take the seat measurements to a local upholsterer, as we did. Our seat cushion is 21×44", and we specified 3" foam.
- 4

Thread the ropes [Sources] through the holes and double-knot them below the seat before cutting off the excess. Hang the swing securely from ceiling joists at a comfortable height. If your joists aren't conveniently located where you wish to hang your swing, cut 2×4 anchor cleats long enough to span at least three joists and attach them to the joists with lag screws. Then hang the swing from the cleats. Add the seat cushion and enjoy a lazy afternoon swinging away. 🌳

Note: We paid about \$200 to have the cushion for our swing made locally. We found the cost to be comparable to ordering online.

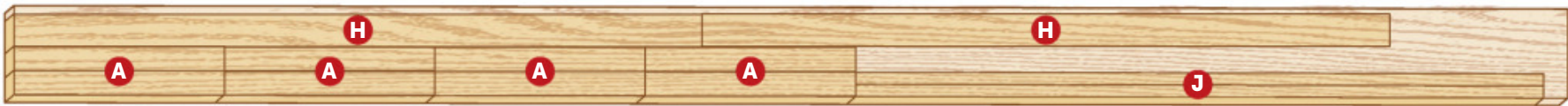
MATERIALS LIST

PART		FINISHED SIZE			Matl.	Qty.
		T	W	L		
A	POST HALVES	3/4"	1 1/2"	13"	W	8
B	SIDE STRETCHERS	3/4"	1 3/8"	22"	W	4
C	SEAT FRONT/BACK RAILS	1"	3"	48 1/2"	W	2
D	SEAT SIDE RAILS	1"	3"	26"	W	2
E	SEAT PANEL	3/4"	20"	42 1/2"	BB	1
F	BACKREST	3/4"	3"	48 1/2"	W	1
G	ARMRESTS	3/4"	3"	26"	W	2
H	BACK RAILS	3/4"	2 1/8"	42 1/2"	W	2
I	BACK SLATS	5/8"	2 1/2"	8 11/16"	W	9
J	TRIM STOPS	3/4"	3/4"	42 1/2"	W	2

MATERIALS KEY: W—walnut, BB—Baltic birch plywood.
BLADE AND BITS: Dado blade, 1/4" spiral upcut bit, 3/4" compression flush-trim bit (2" length), 1/8", 1/4", and 3/8" round-over bits, 3/8" guide bushing.
SOURCES: 3/8" rope no. 0051, \$0.27/foot, knotandrope.com. 1/2×3 1/4" forged screw eye bolts no. B07KNJ494X, \$30 [pack of 5], amazon.com. Cushion, customcushions.com.
PROJECT COST: It cost us about \$500 to build this project. Your cost will vary by region and source.

CUTTING DIAGRAM

This project requires 6 board feet of 5/4 walnut and 12 board feet of 4/4 walnut based on example boards shown.



3/4 x 5 1/2 x 96" Walnut



3/4 x 7 1/4 x 84" Walnut



3/4 x 3 1/2 x 84" Walnut †Plane or resaw to the thickness listed in the Materials List.



1 x 7 1/4 x 84" Walnut



3/4 x 24 x 48" Baltic birch plywood

BIG POWER FOR TINY NAILS

By driving tiny headless nails, 23-gauge pin nailers can hold moldings and other project details in place without leaving telltale holes (see *Size It Up*, next page). This is especially useful as an alternative to clamps for small or tricky glue-ups. These days, you'll find headless pinners everywhere, including big-box stores, with an array of methods for supplying pin-driving power.



Air power still proves a driving force

If you have a compressor, it's still hard to beat the simplicity of a pneumatic gun. The air hose can be cumbersome, but it's a great trade off versus the weight of a battery-powered pinner. Plus, pneumatics fire instantly and forcefully and never require downtime for recharging. The new P635L from Grex drives pins from $\frac{3}{8}$ " to $1\frac{3}{8}$ " long with ease and weighs just 2.4 lbs. An edge guide attaches to ensure consistent nail positioning when needed and stores out of the way onboard when it's not.

Grex, grexusa.com
23-gauge $1\frac{3}{8}$ " headless pin nailer, no. P635L, \$198



Fuel canisters drive fine nails

Grex takes a unique approach to cordless pin-nailer power with the GCP650. It drives pins from $\frac{3}{8}$ " to 2" using the power of a replaceable canister filled with non-odorized propane. A pair of AAA batteries ignites the charge to push the piston and drive in a pin. Each canister fires up to 1,300 pins. Handy features include adjustable drive depth, an edge guide, and a dry-fire lockout.

Grex, grexusa.com

2" 23-gauge headless pin nailer, no. GCP650, \$438; fuel canisters (4 pack), no. GFC01-4, \$25

Big-box bargain-price pinner

The new Airstrike 23-gauge pin nailer joins Ryobi's One+ platform and brings 10% size and weight reduction compared to the company's previous model. Powered by an 18-volt, 2.0 Ah battery, the company claims you can drive up to 4,000 pins per charge. You can also buy it as a bare tool; and use any Ryobi 18-volt battery. An LED illuminates the work area while driving pins from $\frac{1}{2}$ " to $1\frac{3}{8}$ " long.

Ryobi, ryobitools.com

18-volt One+ airstrike 23-gauge pin-nailer kit, no. PCL310K, \$179 with battery and charger



High-voltage pinning companion

In our tests, 40 volts seemed like overkill (and added weight) for driving pins. But if you're already invested in Makita's big-tool battery and charger platform, the GTP01D1 works great to drive pins from $\frac{5}{8}$ " to $1\frac{3}{8}$ ". It features tool-free depth-of-drive adjustment, an LED light, and a lockout to prevent dry firing. At 5.3 lbs. it's hefty, but with a 2.5 amp-hour (Ah) battery, should drive a lot of pins on a single charge.

Makita, makitatools.com

40-volt XGT Brushless 23-gauge pin nailer, no. GTP01D1, \$599 with battery and charger, no. GTP01Z, \$369 (bare tool)

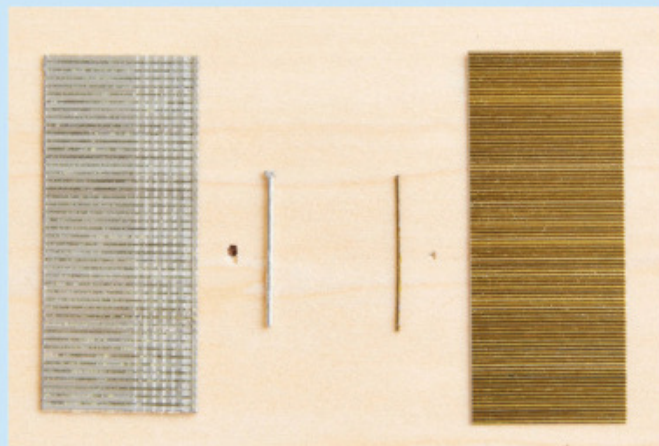


20-volts of clean power

Dewalt's 23-gauge nailer drives up to 2,000 pins from $\frac{5}{8}$ " to $1\frac{1}{2}$ " long on a single charge of it's 2.0 Ah battery very cleanly, with no perceptible indentation around the pin. At 4.1 lbs., it's no lightweight, but is well balanced. An LED light helps with nail placement in hard-to-see areas, and a low-fastener lockout prevents dry firing.

DeWalt, dewalt.com

Atomic 20-volt 23-gauge headless pin nailer, no. DCN623D1, \$299 with battery and charger



SIZE IT UP

Compared to 18-gauge brad nails (left), 23-gauge pin nails (right) are smaller in diameter and, because they lack the head, leave a much smaller hole. (1"-long nails shown.)

SHOP-TESTED GET SMOOTH SHAVINGS WITH COST SAVINGS

Tester: Kevin Boyle

Melbourne Tool Company from Australia is a new name in the hand-plane game. I first saw prototypes of their products at a show in 2022, where I was intrigued by their designs and their pricing goals, but was told their team was still tweaking the manufacturing process to meet their quality standards. Over a year later, I got my hands on a three-plane set, which includes a low-angle jack, block, and smoothing plane, all for \$425.

The plane bodies are well-cast, with flat soles and square sides that are ground to an excellent finish. The hardwood totes on the jack and smoothing plane are slightly smaller than I'm accustomed to, but comfortable and smooth. All three planes have a 12° bed angle, and come with blades ground at 25° made from M2 steel that take and hold a keen edge. The company also offers blades with 38° and 50° bevels, and I like that the same blades fit both the jack and smoothing planes. Norris-style adjusters allow precise adjustment, and the adjustable mouths open wide and close tight to the blade. All of the adjustments operate smoothly and lock in securely with little to no backlash.

After spending time using all three Melbourne planes, I can say they were worth the wait. I am impressed with their quality and performance, especially for the \$425 combo kit price—a couple hundred dollars less than an equivalent set from a competitor I often shop with.

Melbourne Tool Company, melbournetool.com
Low-angle block, smoothing, and jack plane kit, no. MTC-3-KIT, \$425



NEW AND UNTESTED MAGNETS ATTRACT DUST-COLLECTION ACCESSORIES

If you regularly move a dust collection hose from one machine to another, then you've experienced the challenges of trying to clamp, snap, or friction-fit the hose securely into place. Woodcraft hopes to make it easier with its new MagFitt system of magnetic dust hose connectors and machine couplings.

Made from ABS plastic, these new connectors feature rare-earth magnets in the hose connector fitting along with a mating metal ring on the machine coupling. We haven't been able to try them out yet, but the idea seems simple and effective as long as the pieces meet with a good seal.

Machine couplings are available in 2½" and 4" sizes, as well as a 4" to 2½" reducer. Hose connectors come in 2½" and 4" sizes. 🌱

Woodcraft, woodcraft.com
MagFitt dust-collection fitting system, \$9-\$20



Blade Stunner

Beautifully made, magnificent to look at, this knife is a work of art at only \$99

It's not often you happen upon a blade smith who has gem cutting skills. But finding needles in haystacks is what we do best, so when we saw this master craftsman's handiwork, we made certain to procure some of these Southwestern masterpieces to complete our collection.

The stainless steel blade, bolster and pommel are exquisitely etched and would have looked great with a less ambitious handle. But the results of overachieving are stunning here. The turquoise-blue colored handle is ablaze with assorted stones like jasper, marble, sunstone, and coral that have been hand cut and inlaid in a Southwestern motif.

But we don't stop there. While supplies last, we'll include a pair of \$99, 8x21 power compact binoculars and a genuine leather sheath FREE when you purchase the Sedona Knife.

"I AM A KNIFE COLLECTOR AND THE SEDONA LOOKS GREAT IN MY COLLECTION."
— WILLIAM B.

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Sedona Knife ~~\$179*~~

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the Sedona Knife



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Impossible Price
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+FREE
Binoculars

Knife Specifications

5" etched stainless steel blade; 9-1/2" overall length

- Turquoise-colored handle with accent stones including coral, marble, sandstone, tiger's eye, jasper and sunstone

BONUS! Call today and you'll also receive this heavy duty sheath!



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- **Converts to a stake bed** for hauling long loads

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WHAT'S AHEAD

A GLIMPSE INSIDE THE OCTOBER ISSUE (ON SALE AUGUST 16)

LOW-ANGLE JACK PLANE TEST
We pitted 10 bevel-up, low-angle jack planes against one another. See which stood out—and which surprised us.



SUPER STOUT BENCH
Build this uncommonly sturdy workbench from commonly available lumber.



CUP-HINGE JIGS
Concealed hinges require precision drilling. These jigs make it easy using only a hand drill.



MIXED-MEDIA GARDEN BENCH
Pair weather-beating white oak with easily cast concrete for rock-solid outdoor seating that looks stunning.

Woodpeckers®

Precision Woodworking Squares

- One-piece central core.
- Stainless model includes scribing guides.
- Lip keeps the square flat on your work.
- Guaranteed perpendicular to $\pm .0085^\circ$ for life.
- Available in inch or metric.



Precision Woodworking Square

Includes a Woodpeckers wall-mountable wooden case

12"\$129.99

12" Stainless Steel....\$149.99

Other Sizes Available on Woodpeck.com



Precision T-Squares

- Scribing guides on 1/16" centers.
- Beveled edge reduces parallax.
- Tight tolerance laser-engraved scale.
- 600mm metric version available.

Precision T-Square

Includes a wall-mountable Rack-It™

TS-12 12"\$129.99

TS-24 24"\$149.99

TS-32 32"\$179.99



in-DEXABLE

Combination & Double Squares

- Push-button index locks head at any full-inch.
- Laser-cut scribing guides for precision parallel lines.
- Retractable support keeps head aligned to your stock.

in-DEXABLE Squares

Includes a wall-mountable Rack-It™

Double 6"\$129.99

Center Finder 6"\$139.99

Combination 12"\$169.99

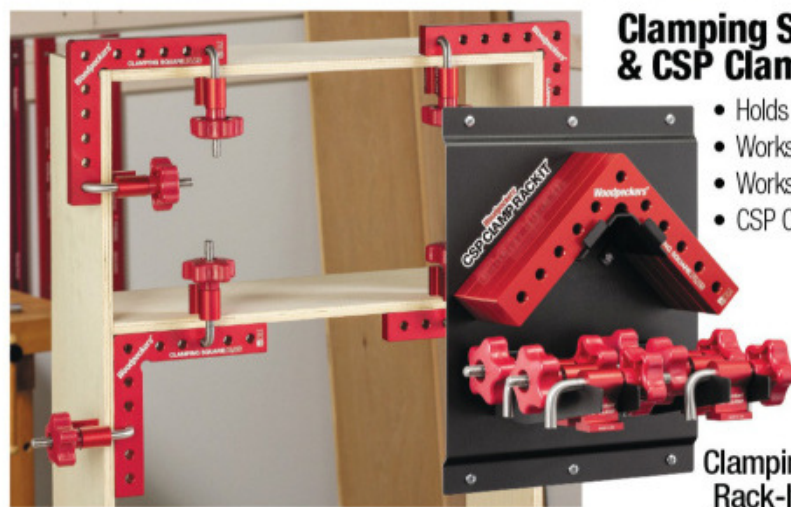
Protractor 18"\$239.99

Other Sizes Available on Woodpeck.com



Clamping Squares PLUS & CSP Clamps

- Holds stock at right angles.
- Works inside or outside.
- Works with any clamp.
- CSP Clamps speed the job.



Clamping Squares PLUS Rack-It™ Kit....\$269.99

CLAMPZILLA™

4-Way Panel Clamp

- Applies pressure both directions.
- Works with material from 5/8" to 4".
- Improved vertical pressure.
- Flatter panels faster.

ClampZILLA

18" Capacity....\$139.99

38" Capacity....\$169.99

50" Capacity....\$199.99



Dado Nut

- Full thread engagement with dado stacks on SawStop table saws.
- Unique 2-piece design.
- Simplifies every blade change; just one thing to juggle.
- Precision machined on state of the art CNC Swiss lathes.



Dado Nut

For SawStop....\$44.99



Rout-N-Plane™ Benchtop Board Mill

- Perfect for end grain cutting boards.
- Adjusts to work with almost any size or style router.
- Two sizes: 15" and 24" wide. Both work from 3/4" to 3" thick.
- When it won't fit your planer, plane it with Rout-N-Plane!

Rout-N-Plane

15" Benchtop Board Mill....\$169.99

24" XL Benchtop Board Mill....\$209.99

SANDSTAND™ Tilting Sander Base

- Turn your palm sander into a stationary sander.
- Works with most palm sanders.
- Angle adjusts from flat to 45°.
- Clamps or bolts to any work surface.

SandStand Tilting

Sander Base....\$109.99

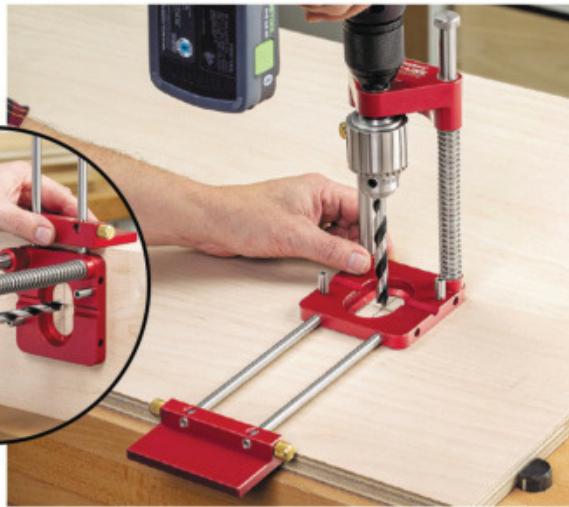


Sander not included.



AUTO-LINE™ DRILL GUIDE

- Perpendicular holes anywhere.
- Fence fits on all 4 sides.
- Works with most drills.
- Deluxe Kit includes extensions.



Drill not included.

Auto-Line Drill Guide
Drill Guide....\$299.99
Deluxe Kit....\$399.99

THIN RIP GUIDE®

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



Table Saw not included.

ThinRip Guide
Includes a wall-mountable Rack-It™
....\$169.99

Iron-Grip™ Small Parts Holder

- Rout small parts safely & accurately.
- Works with bearing guided bits or table-mounted fences.
- Quick-release jaw for fast change over.

Iron-Grip Small Parts Holder
....\$169.99
Extended Capacity
Fence....\$19.99

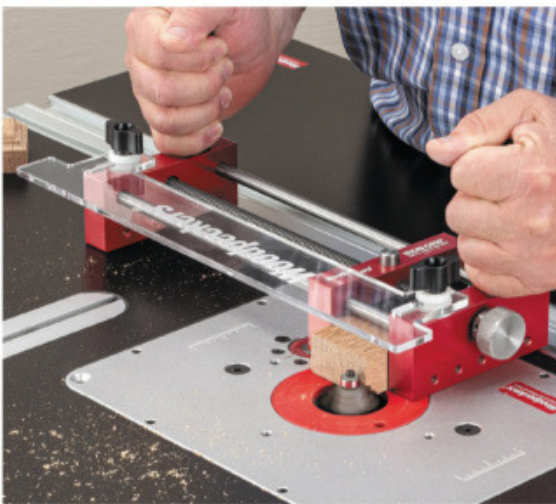


Table Saw not included.

StealthStop™ Miter Gauge

- Fits all 3/8" x 3/4" miter gauge slots.
- Patented leaf springs ensure perfect fit.
- Rear fence extends from 21" to 29".
- Micro-adjustable flip stop.
- Positive stops for standard angles.
- Optional zero-clearance inserts.

StealthStop
w/Fence & Stealth Stop
Miter Gauge....\$119.99



Table Saw not included.

MULTI-ROUTER

The Joinery Machine

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

Multi-Router
The Joinery Machine
w/Dust Cabinet....\$2999.00
w/Mortise & Tenon
Package....\$4199.00

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Spline Jig

- Works with both table saw and router table.
- Spline grooves or dovetail keyways.
- Cut splines in projects up to 36" long.
- Stops included for repeat positioning.

Spline Jig....\$159.99



Hold-down clamps sold separately.

HexScale Rules

- Six rules in one!
- Inch & metric scales in 3 layouts.
- Right-to-left, left-to-right & centering.
- Stop simplifies repeat marking.
- 6", 12", 24" & 36" lengths.

HexScale Rule
Includes a wall-mountable Rack-It™
Set....\$159.99
Individual Sizes Available
on Woodpeck.com



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