

WOOD

The World's Leading Woodworking Resource

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Plus 5 Free Shop Plans
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- Motor: 2HP, 240V, single-phase, 3450 RPM
- Motor amp draw: 9 Amps
- Air suction capacity: 1550 CFM
- Static pressure: 11"
- 6" inlet has removable "Y" fitting with two 4" openings
- Impeller: 12 3/4" balanced cast aluminum
- Bag capacity: 5.7 cubic feet
- Standard bag filtration: 2.5 micron
- Portable base size: 21 1/4" x 33 1/2"
- Bag size (dia. x depth): 19 1/2" x 33"
- Powder-coated finish
- Height with bags inflated: 78"
- Approx. shipping weight: 122 lbs.



G1029Z2P ONLY **\$350⁰⁰**



2 HP PORTABLE DUST COLLECTOR

- Motor: 2 HP, 240V, single-phase, 9A
- Air suction capacity: 1360 CFM
- Static pressure: 11.3"
- Filter rating: 2.5 micron
- 6" Inlet and "Y" fitting with two 4" openings
- Impeller: 12 3/4" cast aluminum
- Portable base size: 27 1/2" x 47 1/2"
- Upper bag size (dia. x depth): 19 1/2" x 47 1/2"
- Lower bag size (dia. x depth): 19 1/2" x 33"
- Lower bag capacity: 5.7 cubic feet
- Powder-coated finish
- Height with bags inflated: 94 1/2"
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CAST IRON WHEELS

- Motor: 1 HP, 110V/220V, single-phase, TEFC, 11A/5.5A
- Precision-ground cast iron table size: 14" sq.
- Table tilt: 45° R, 10° L
- Cutting capacity/throat: 13 1/2"
- Max. cutting height: 6"
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- Blade speeds: 1800 & 3100 FPM
- Approx. shipping weight: 247 lbs.



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- Motor: 1 HP, 110V/220V, single-phase, 14A/7A
- Rewired voltage: 110V
- Table size: 6 1/2" x 47 1/2"
- Number of knives: 3
- Cutterhead speed: 5000 RPM
- Cutterhead diameter: 2 1/2"
- Maximum depth of cut: 1/8"
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- Precision-ground cast iron table w/ wings: 40 1/2" W x 27" D
- Table height: 35 3/8" • Footprint: 21" L x 19 1/2" W
- Arbor: 5/8" • Arbor speed: 3450 RPM



- Max. depth of cut: @ 90° – 3 1/4", @ 45° – 2 1/4"
- Rip cap.: 30" R, 15" L
- Overall size: 57 1/4" W x 35 3/8" H x 37 1/2" D
- Approx. shipping weight: 348 lbs.

G0771 ~~\$795⁰⁰~~ SALE **\$695⁰⁰**



14" 1 3/4 HP DELUXE 110V BANDSAW

- Motor: 1 3/4 HP, 110V/220V, rewired 110V, single-phase, TEFC, 15A/7.5A
- Precision-ground cast iron table size: 19 1/4" x 14 1/8" x 1 1/2" thick
- Table tilt: 45° R, 8° L
- Cutting capacity/throat: 13 3/8"
- Max. cutting height: 10"
- Blade length: 106"
- Blade speed: 3000 FPM
- Approx. shipping weight: 284 lbs.



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T26902 14 Drawer, 40 1/2" W ONLY **\$595⁰⁰**

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The \$150 Shop

A little more than a year ago, a bunch of us were beerstorming at the brewpub near the office when the discussion turned to how we could get more young people involved in woodworking. Even if they have an interest, they may not know how to begin, much less have deep enough pockets to just stop, drop, and equip a shop.

As the ideas (and beverages) flowed, I could see the wheels quietly turning in the head of Lucas Peters, our digital content manager, until he offered up this gem: "Why not build a shop the way you buy a car or a house—on the installment plan?"

And with that, Idea Shop 6 was born.

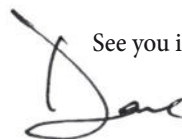
The concept? If you can set aside \$150 per paycheck, you can have a complete woodworking shop—and be building projects in it—inside a year. That's assuming you have an empty space, no previous woodworking knowledge, and nary a power tool. We'll tell you what to buy and when, and show you how to build stuff with the tools you've acquired!

Lucas, Deputy Editor Craig Ruegsegger, and Tools Editor Bob Hunter painstakingly organized each installment of Idea Shop 6 in a

practical, skill-building way. Then we proved it in the barren garage of wannabe woodworker Alejandro Muñoz, who, at the end of the year, ended up with the fully functional woodworking shop you see on *page 42*. Building his shop also gave him the confidence to build his first piece of furniture—a blanket chest, shown *below*.

A project of this scope requires more detail than we can possibly fit into a few pages in each magazine, so every two weeks look for specific tool recommendations, plans, videos, and more support online at woodmagazine.com/ideashop6.

If your shop is already fully outfitted, good for you! How about sharing these articles with your daughter or son, or that nice young couple next door? Give them a chance to enjoy the hobby we love so much.



See you in the shop!

Dave Campbell
dave.campbell@meredith.com



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WOOD®

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EDITORIAL CONTENT CHIEF **DAVE CAMPBELL**

DEPUTY EDITOR **CRAIG RUEGSEGGER**

ART DIRECTOR **KARL EHLERS**

DIGITAL CONTENT MANAGER **LUCAS PETERS**

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TOOLS EDITOR **BOB HUNTER**

GENERAL-INTEREST EDITOR **NATE GRANZOW**

ADMINISTRATIVE ASSISTANT **SHERYL MUNYON**

CONTRIBUTING CRAFTSMEN **JIM HEAVEY, MARK LANE, MATT SEILER, BRIAN SIMMONS**

PHOTOGRAPHERS **CARSON DOWNING, JASON DONNELLY**

CONTRIBUTING EDITOR **LARRY JOHNSTON**

CONTRIBUTING ILLUSTRATORS **TIM CAHILL, LORNA JOHNSON, ROXANNE LEMOINE, KURT SCHULTZ**

CONTRIBUTING DESIGNER **ANNA FLICKINGER**

PROOFREADERS **SAM CADY, BABS KLEIN, BILL KRIER, IRA LACHER**

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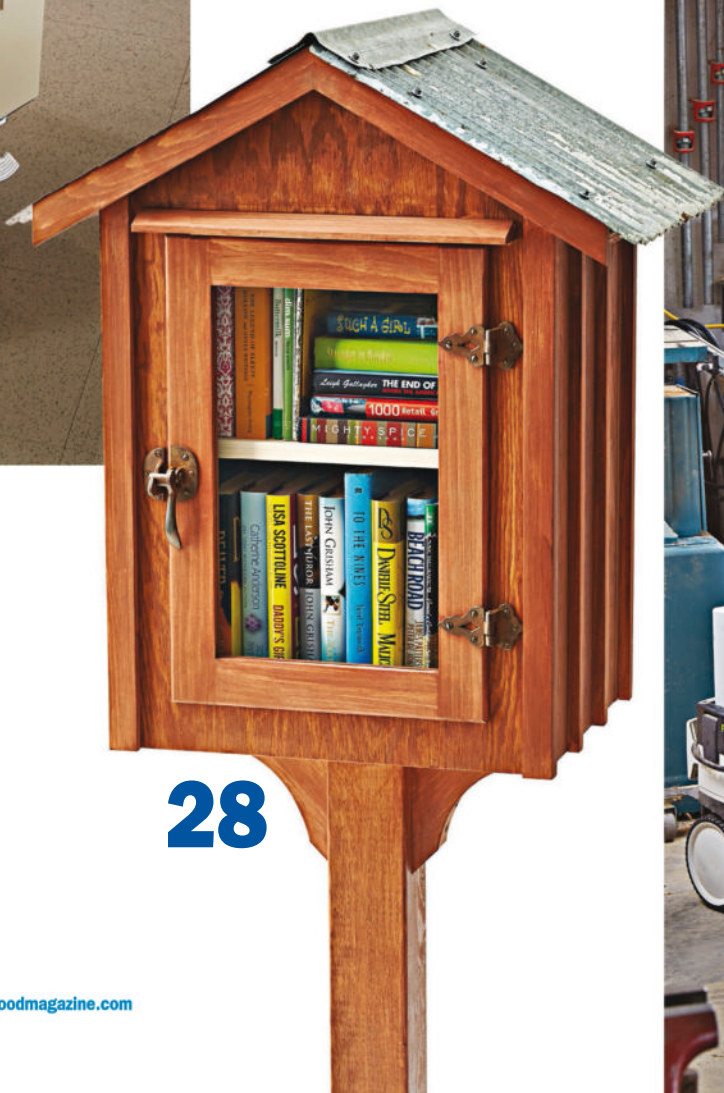
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SHOPAHOLICS

WOOD magazine's Idea Shop™ is back (page 42)! And since we know your love of a good shop borders on the obsessive, revisit some of our favorites:



A helicopter crash left U.S. Army Flight Engineer Chuck Isaacson paralyzed from the chest down but didn't slow down his shop build.
woodmagazine.com/shoponwheels



When Dale Heisinger gave up his garage to the family car, he traded up to an inexpensive backyard shed with a well-planned layout.
woodmagazine.com/backyardshop



Your shop is a retreat; Mike Walker's is a resort. Overlooking a forest lake, his 1,670-square-foot shop is the epitome of organization.
woodmagazine.com/resortshop

PLAN YOUR SHOP

Download a workshop grid and tool templates to begin planning your shop. Cut out the tool templates and lay them out on the grid to determine possible layouts. woodmagazine.com/shoplayout



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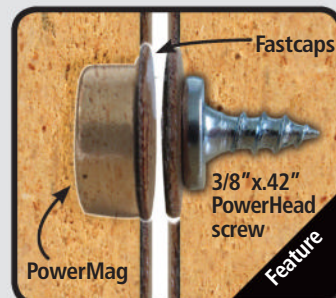
3.5 lbs.
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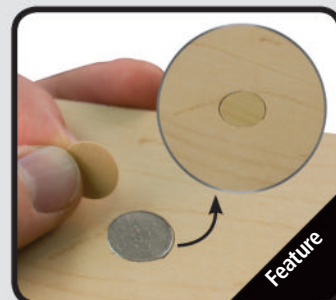
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Plane awesome

I was elated to see the plans for the AC-130 in issue 236 (November 2015). As a retired Marine and Vietnam veteran, I've had the privilege of flying aboard several C-130s, which we lovingly referred to as "gooney birds." My most memorable flight was the one that took me home from Vietnam after completing my combat tour. The morning was foggy, but as I walked across the tarmac, I began to see the shadow of that big bird—first the tail section, then the hulk of the fuselage. Nothing ever looked so beautiful to me! I held my

breath as we rumbled down the runway and didn't let it go until I felt the wheels come up. We were safe and heading home. Now my grandson, an active-duty Marine, is a C-130 mechanic. Needless to say, that aircraft is dear to both of us.

—Michael Schofield,
Gunnery sergeant, USMC (ret.)
Escondido, Calif.

Limbert laments

While laying out an oval using the shop tip in issue 234 (September 2015), I found that it should read, "...cut a narrow scrap as long as half the long axis of the finished oval."

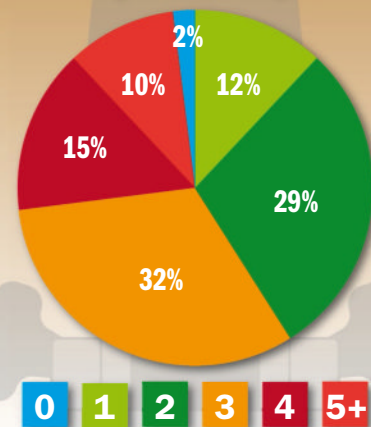
—Marcel Gregg, Houston

The cutting diagram for the Limbert-style end table in issue 236 (November 2015) should call for 1½"-thick stock for part E.

—Cynthia Ramsey, Long Lake, Mich.



How many routers do you own?



Source: September 2015 WOODPulse Survey

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YOUR PROJECTS



Using the plans in issue 231 (March 2015), **James Schrott** of Montello, Wisconsin, built this rolling tool chest using ambrosia maple.



Inspired by the design of the tapered hall bench in issue 227 (September 2014), **David Moerman** of Glendale, Arizona, built this stool using bubinga and wenge.



Ben Hackney, a carpenter from Ashford, Kent, England, built this curved oak chest.

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.



Dick Johnston of Simsbury, Connecticut, modified plans from issue 226 (July 2014) to craft this arching arbor.



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YOUR SHOP



► To add a splash of color to the shop while adding some cushion to the hard concrete floor, Dave positioned multicolored interlocking rubber gym tiles around his bench and tablesaw.

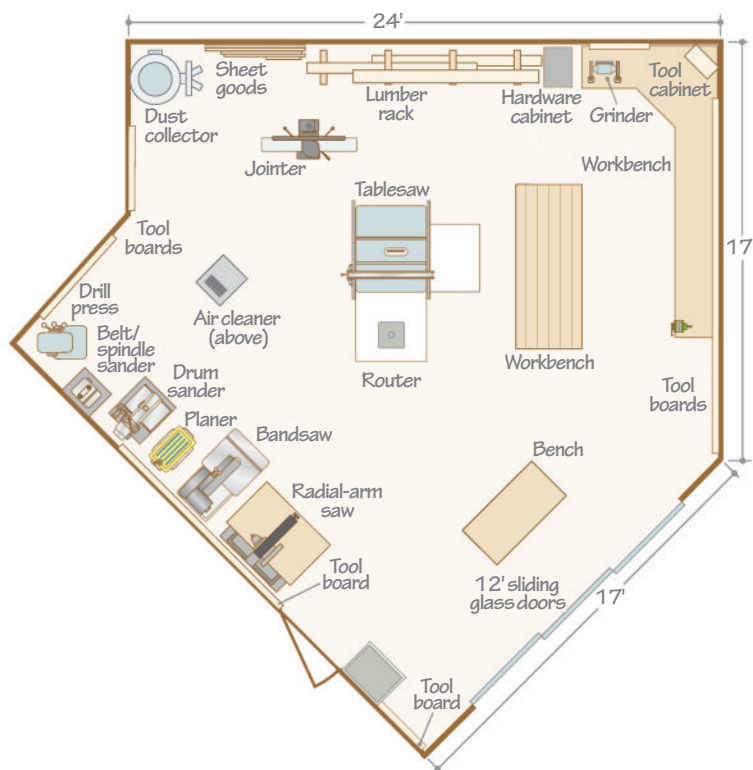
Originally, Dave Owen's shop was going to be a three-stall garage and two-story apartment overlooking a lake. He kept the views but gave up on the apartment—instead building an enviable woodworking shop.

Dave ensured excellent workflow through the spacious six-sided shop by meticulously planning out the locations for all his major tools. Mounting many of them on casters or mobile bases further improved efficiency. Dave says, "I can cut 4×8' sheets of plywood, joint 8' lengths of lumber, and crosscut pieces to whatever size I need—all with ample space to move around." 🌲





An extension of his double carport, Dave's shop features sliding door panels perfect for letting in plenty of Florida's sunshine and fresh air.



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Q What is a “Regulator” clock?
I’ve seen lots of clocks with the word “Regulator” printed or etched on the glass of the door covering the pendulum. What’s the history of this name—is it a brand of clock or a type?

—Phil Hughes, Washington, D.C.

A We turned your question over to one of the world’s leading clock experts, Phil. Gregg Perry operates a studio in Pennsylvania (perrysclocks.com) specializing in the conservation and restoration of antique clocks and watches. He’s also a certified appraiser of these timekeepers. Here’s what we learned from Gregg:

Regulators were first developed in England around 1720. Typical clocks of the day were only accurate to within about 5 minutes per week. But regulators, such as the one shown at *right*, powered by a weighted and geared mechanism, could be accurate to within 10 seconds per month when properly adjusted. These clocks were initially used in observatories and clock and watch shops as the standard of accuracy during repairs, synchronization, and manufacturing.

By the mid-19th century, regulators were being mass-produced with high accuracy in Vienna, Austria. And near the end of that century, the American version of these clocks began to be produced in mass quantity with equal accuracy. The majority of these clocks kept time only, however, without any bells or chimes.

Regulators gained prominence in America in the late 1800s as the time standard in railroad stations of every town. Railroad employees would synchronize their pocket watches to these regulator clocks several times a day. This helped to reduce the number of train collisions.

By the 1920s, American manufacturers were displaying the word “Regulator” on the clocks’ glass-front door as a testament to their heritage. But the name has always been a generic term to describe the type of clock, not a particular brand. And most modern clocks, such as the one shown at *right*, contain a quartz movement, with the pendulum simply for show. 🌲



ANTIQUE
REGULATOR



REGULATOR-
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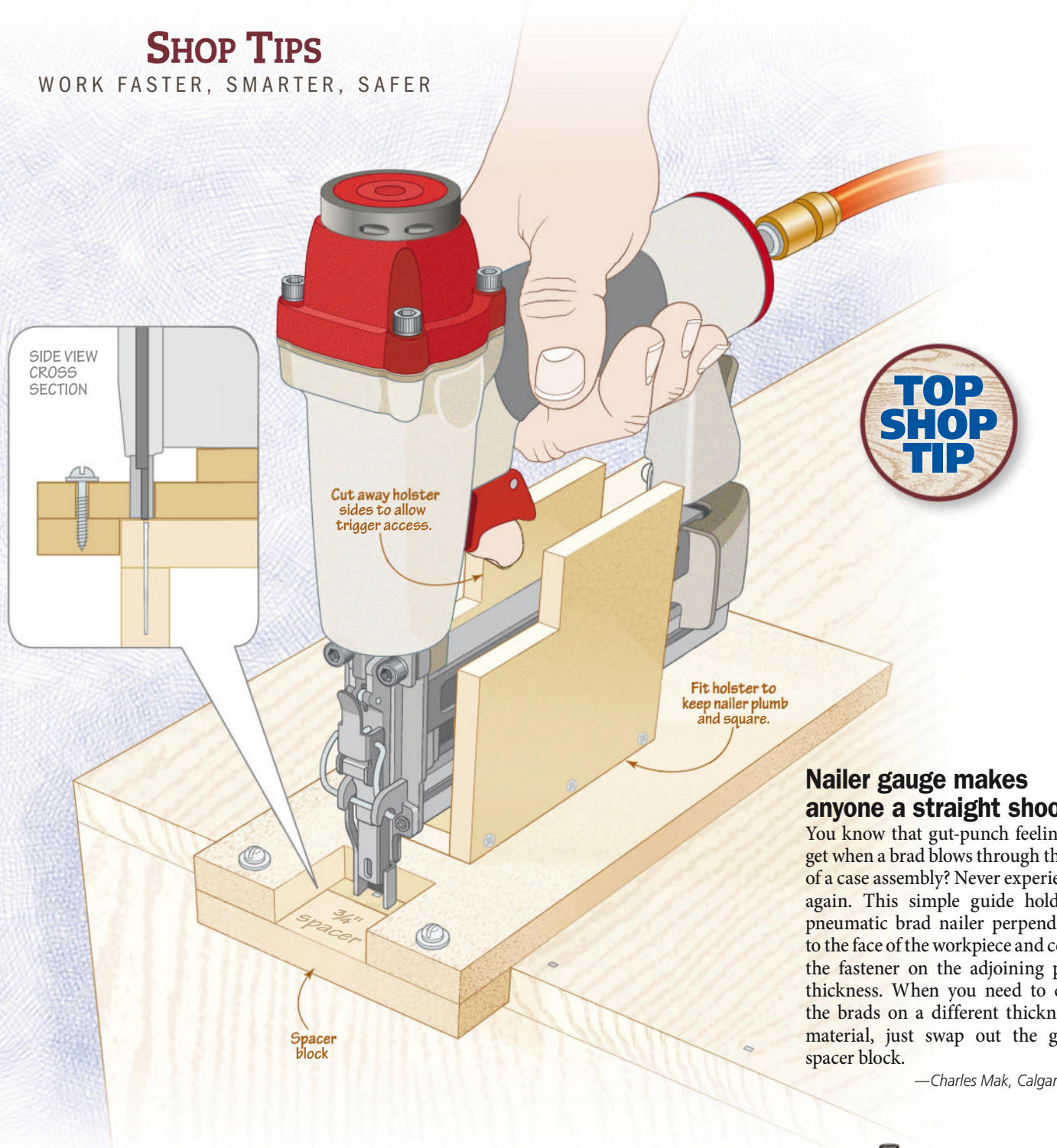
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—Charles Mak, Calgary, Alta.

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Send your tip, photos or drawings, and contact info to shoptips@woodmagazine.com

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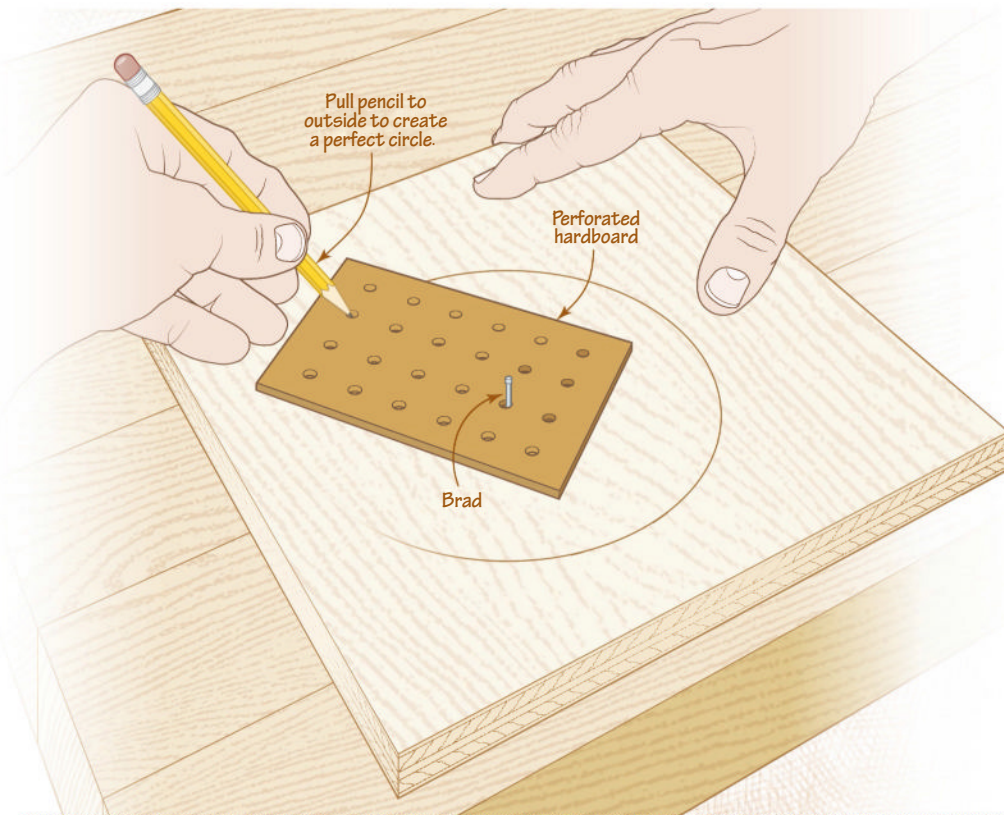


Antique Brass



Antique Pewter

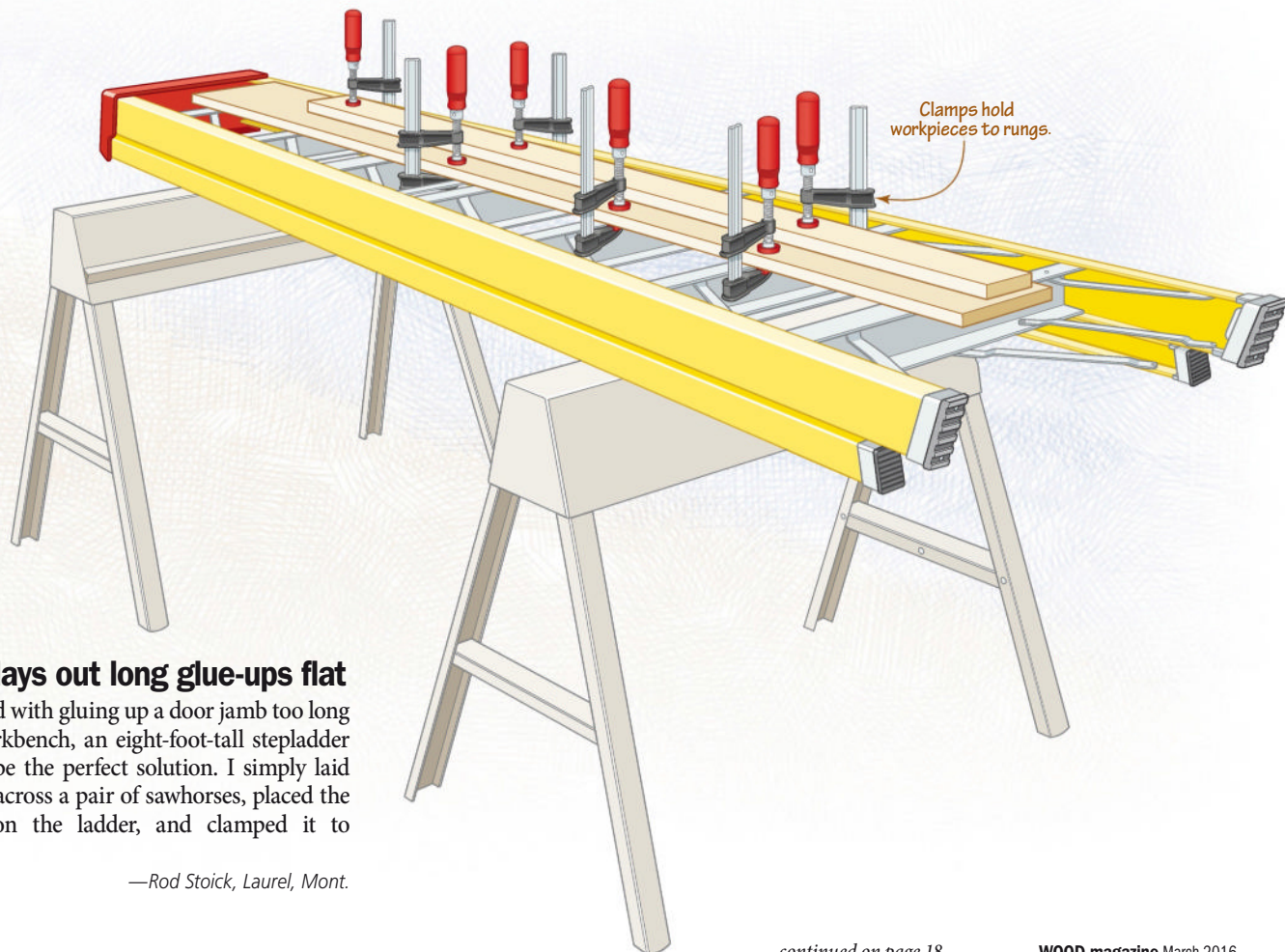
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Down and dirty circle-maker

For laying out circles where the exact radius isn't critical, I like to use a scrap of perforated hardboard. Drive the tip of a brad into the center of your workpiece, then slip the hardboard over the brad. Place your pencil tip in the hole closest to the radius of your desired circle and give it a spin!

—Sheryl Munyon, WOOD® magazine



Ladder lays out long glue-ups flat

When faced with gluing up a door jamb too long for my workbench, an eight-foot-tall stepladder proved to be the perfect solution. I simply laid the ladder across a pair of sawhorses, placed the assembly on the ladder, and clamped it to the rungs.

—Rod Stoick, Laurel, Mont.

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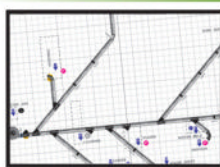
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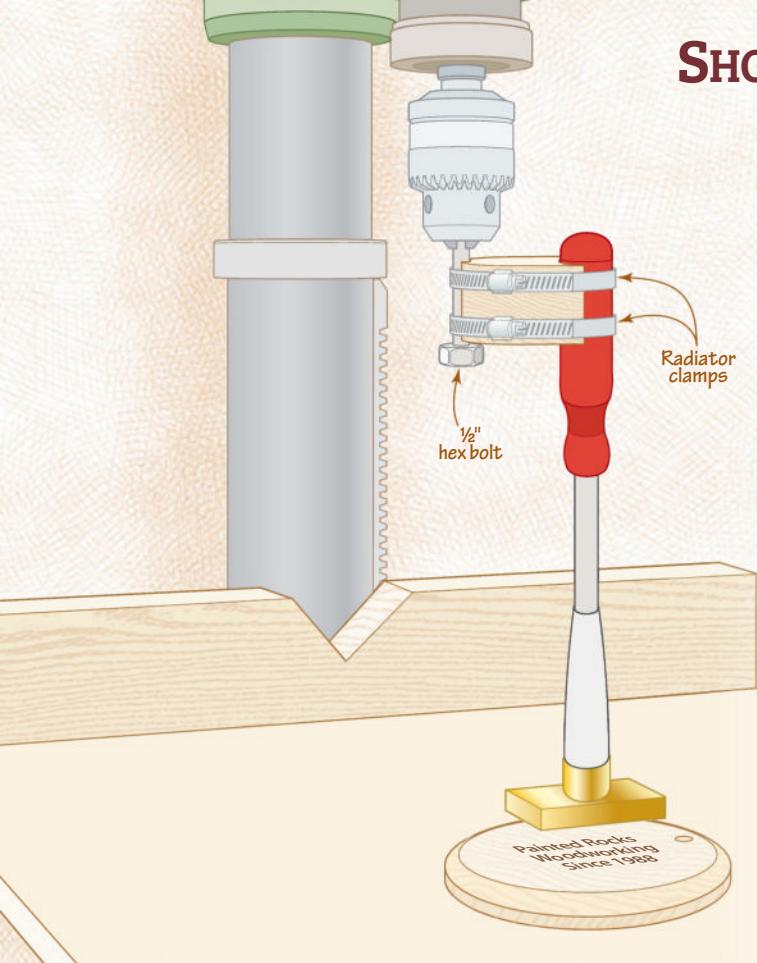
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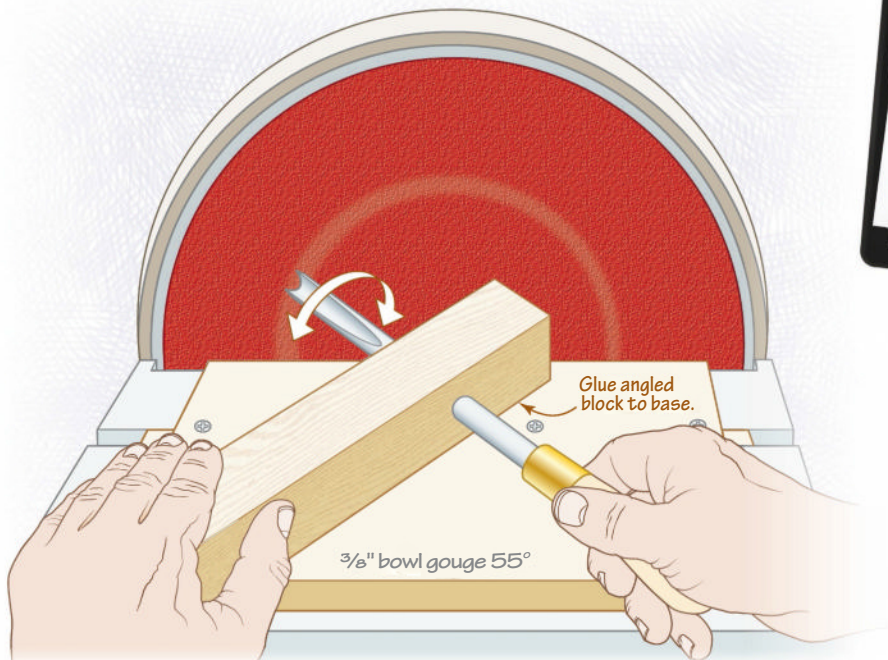


Make your mark with this straight-up stamping solution

I like to mark the projects I build with one of those branding irons you heat with a propane torch. But if you don't hold the iron squarely and with steady pressure, the design won't burn evenly in the wood.

Instead of freehanding the iron, I fasten mine to a 1/2" hex bolt by way of a scrapwood adaptor and two hose clamps. After heating the iron, I chuck the bolt into the drill press and use the quill lever to drive the iron straight down to the workpiece.

—Richard Laakaniemi, Cedar Grove, Wis.



Simple jig puts the grind on curved cutters

Many turners use only a bench grinder to sharpen their chisels and gouges. I find that I have to do less honing when I use my disc sander with a 320-grit disc instead. But to grind a perfect edge on a rounded profile, such as a bowl gouge, I needed a jig to hold

the tool steady and at the correct angle.

My design is simple: I made the base from 3/4" plywood with a hardwood runner to fit the sander's miter-gauge slot. After drilling a hole through a hardwood block to snugly hold the shaft of the gouge, I

mounted it to the base at the same angle as the bevel of the tool's blade.

To avoid overheating the blade, slide the jig toward the middle, where the disc turns more slowly.

—Bill Wells, Olympia, Wash.

SHOP TIPS

Foam-backed
carpet remnant

Treat your project like a star: Roll out the red carpet

When reaching the later stages of a project, I protect it from scratches or marring by tossing a carpet remnant—usually available for around a dollar per square foot at home centers—on my workbench. The type with foam backing works especially well, as it tends not to slide around. 🌳

—John Cusimano, Lansdale, Pa.



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Stepping Outside of Your Comfort Zone

by Jimmy DiResta

Even with a growing reputation as a “jack-of-all-trades” maker, I’m often blindsided by a request to work with a material, process, or technology which I’ve never even considered. For example, a client recently asked me to work with Corian, a solid-surface material.

Now, solid-surface material is something I probably should have already known about, but I gravitate toward the things I’m comfortable with, putting off things I should be learning in favor of working with tried-and-true materials. After all, with the comfort of familiarity comes the comfort of expected results, expected time allowances, and expected expenses.

But the client didn’t know that. They just knew I make cool things and Corian is the

cool thing they wanted. So I researched to learn everything I can—including the exorbitant cost of the material. That’s when the intimidation really set in. I don’t want to be out on a limb for that kind of cost! What if I blow it? But the client had more confidence in me than I did. So, after a little time playing with the material, I began to think of it as wood without grain. And just like that, without the exaggerated significance I was adding to the material, the fear factor for the project melted away.

You know you need to stretch out of your comfort zone when you see a kid mastering a technique that you’ve been afraid to learn. For me, that technique was CNC routing. I kept telling myself it wasn’t fear; it was just that I could already make anything I wanted



Many woodworking tools and tricks work with solid-surface materials. Cut and rout with sharp carbide blades. You can even sand it like wood.



Woodworking skills transferred outside of my comfort zone to make seats, under-seat storage, and the beam wraps from a solid-surface material, creating modern, durable, easy-to-clean surfaces.

with a router and a bandsaw. Or my awesome set of carving chisels. What more do I need? Besides, learning the software needed to run a CNC just seemed like a huge hurdle. So I avoided it at every turn.

When I saw a young boy at a Maker Faire operating a CNC router—and the amazing precision the machine was capable of—I laid down my credit card for a ShopBot Desktop unit. If he can do it, I can do it!

And then the fear set in again—this time with the added worry that I'd wasted thousands of dollars. I let that machine sit in my shop staring at me for three months before I finally opened the software. I won't pretend the process was easy once I finally dove in. I broke several bits and had to reload the software more than once. But in time, I began to realize I was learning things I never thought I needed to know. And before long I was transforming a set of skills I had been scared of for years into a comfortable confidence.

I always tell my students that a new skill isn't hard, it's simply unknown. Watch; then try. It's the only way to begin assembling the rights and wrongs of the process into a frame of reference that becomes knowledge. Use that confidence to remind yourself that the fears, frustrations, trials, and errors in store for your next challenge—when you step out of this new comfort zone—will be well worth the challenge. 🌱

"I began to realize I was learning things I never thought I needed to know."



► Jimmy DiResta makes many things—among them, an electric guitar made from an AK-47, a show on the Discovery Channel (*Dirty Money*), and tons of project videos at jimmysdiresta.com.

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GLUE MAKES A FLAW IN THE FINISH

Dried glue along the joint on this book-matched panel affects finish penetration, so it shows up as a lighter spot after staining and finishing.

Dried glue disappears on bare wood, but rears its ugly head when the finish goes on. Try these tactics to prevent—or fix—the problem.

The best cure: prevention

Your first line of defense is removing any glue squeeze-out before it hardens. Instead of wiping off wet glue, which can force it into the wood grain, let the glue dry to a rubbery consistency and peel it off with a putty knife. Take care not to squeeze glue into the wood grain. Next, shave the area where you removed the squeeze-out with a cabinet scraper. Then, sand to the same grit as the finish sanding. If squeeze-out has dried, remove the beads with a chisel or paint scraper, and sand the area.

Usually, you can't effectively remove glue that has soaked into end grain. Instead, spread water-thinned glue onto the surrounding end grain to seal it. Then, scrape and sand the area to achieve even stainability.

Now, go looking for trouble

To uncover glue spots before applying stain or clear finish, brush or wipe water or mineral spirits across the joint [Photo A]. Scrape away any glue you find with a cabinet scraper, sand the surface, and test again. Water raises the grain, so after the wood dries, sand the area with the same-grit abrasive you used for finish-sanding.

When the worst happens

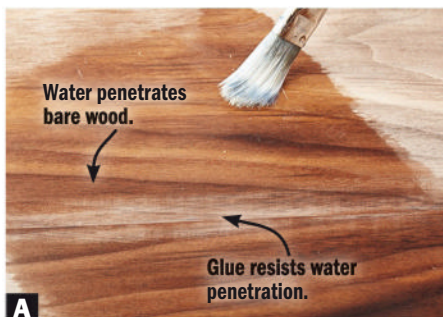
Glue spots discovered *after* finishing (top), may require sanding and refinishing the part or panel. But first, try scraping, then sanding, the area with the same grit used to finish-sand the project [Photos B, C]. Then, reapply finish to the spot.

After fixing a clear-finished surface, sand the repair, feathering the edges of the finish to blend into the repaired surface. Then, touch-in finish with a small brush, and wet-sand the repair to even out the finish. 🌲

► How to use a cabinet scraper:
woodmagazine.com/cardscraper

► Learn about wet sanding.
woodmagazine.com/wetsanding

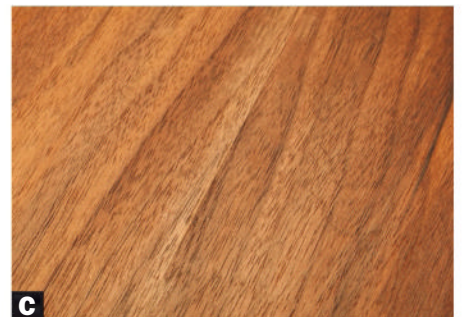
► Two ways to reduce squeeze-out:
woodmagazine.com/excessglue
woodmagazine.com/gluegroove



A It all shows up in the wash. Wet the wood along glue joints to find dried glue that will mar the finish. Water will soak into bare wood but not into the dried glue.



B Remove dried glue to fix a finish. Scrape and sand glue from only the affected area (Photo B) if you can, going down to the bare wood. Test the area as in Photo A, to make sure you've removed all traces of glue. With finish applied and blended into the surrounding area, the flaw nearly vanishes (Photo C).



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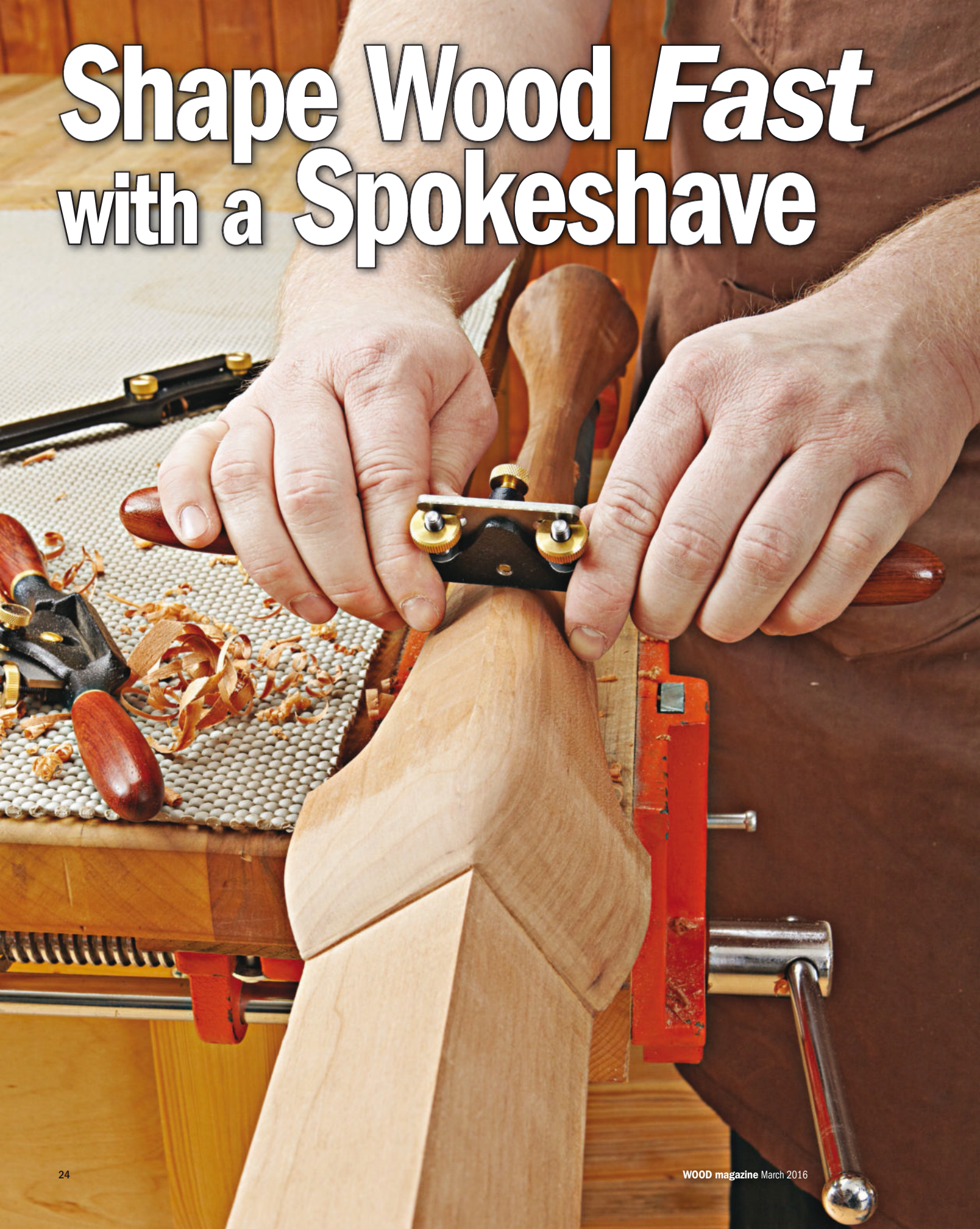
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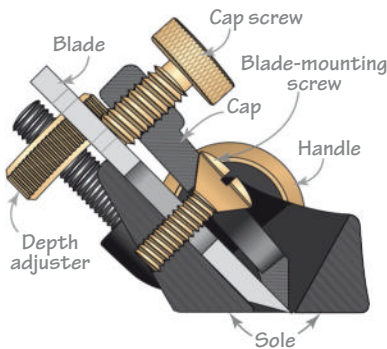
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Shape Wood *Fast* with a Spokeshave

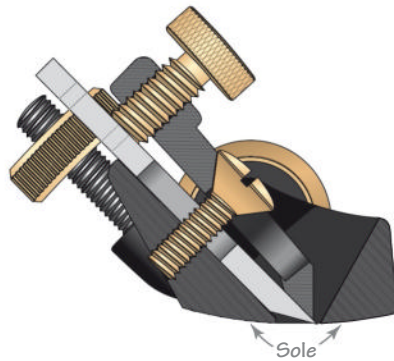


Three typical spokeshaves in two body styles

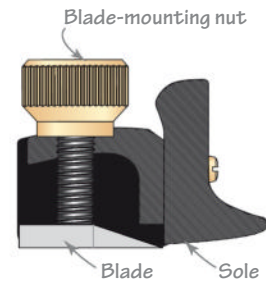
Standard angle, flat sole
(Cross-section view)



Standard angle, rounded sole
(Cross-section view)



Low angle, slightly rounded sole
(Cross-section view)



Standard angle body



Low angle body



In the same way a carrot peeler slices away the vegetable's irregular surface, a spokeshave removes ribbons of wood from curvy project parts, such as cabriole legs, turned spindles, and arched table aprons. Essentially a short plane with winglike handles, a spokeshave has a 2–3"-wide blade and a sole to register against the wood. Additionally, this centuries-old tool rounds over edges and cuts clean chamfers faster than you can set up a router to do the same job.

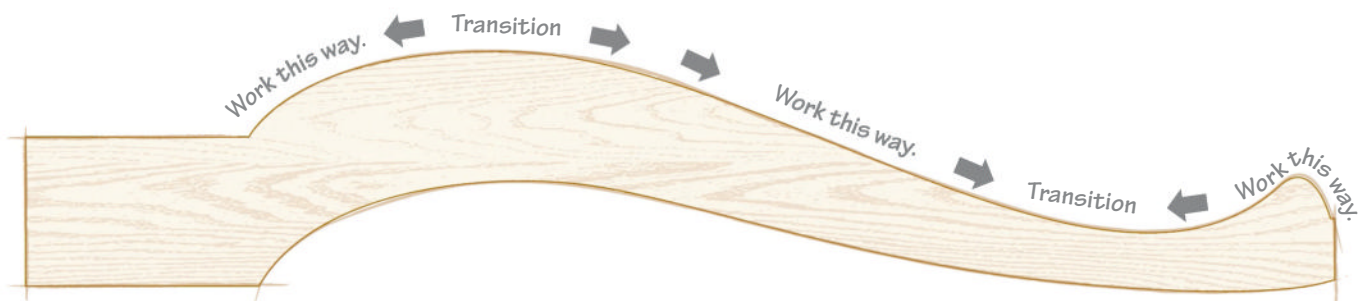
The three most common types of spokeshaves, shown in the illustrations above, vary by blade angle and the shapes of their soles. A standard-angle spokeshave with a

flat sole in front of and behind the blade excels at shaping narrow, flat surfaces and outside curves. A standard-angle shave with a rounded sole works better for inside curves. A low-angle shave has only a slightly rounded front sole and works best on tight inside curves and end grain.

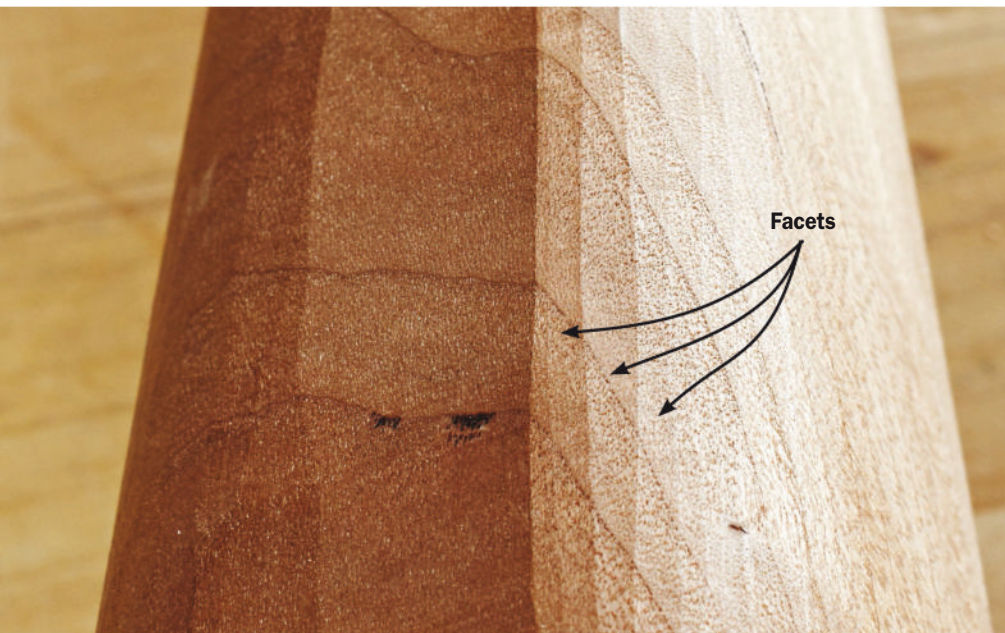
How to “shave” wood

When you're ready to shape wood with a spokeshave, such as finessing a cabriole leg's contours, begin by “reading” the wood grain to determine the best directions for making cuts. (See illustration below.) Secure your workpiece on a benchtop using a face vise or

continued on page 26



Cut with the grain to avoid lifting and tearing it. Always work “downhill” of the grain to prevent tear-out. Identify the transition areas where grain changes direction or flattens out. As you approach a transition, lift the shave gradually and exit the cut. Do the same from the opposite direction, and then **lightly** pare away the transition to blend, using alternating strokes from each direction. If you get tear-out, switch to rasps and files to even out the transitions.



Clean up cut marks after the shave. Each stroke you make with a spokeshave leaves a narrow, linear facet along the workpiece edge. For a cleaner look, scrape or sand these areas smooth after you've finished the shaping process.

tail vise and bench dogs. If you don't have those, a pipe or bar clamp secured in a vise holds workpieces just as well.

Gripping a spokeshave by the ends of the handles gives you greater leverage for deep cuts, but choking up on the handles near the blade, as shown *page 24*, and *right*, helps you better control the cut. A sharp spokeshave cuts effectively with either a push stroke (cutting edge pointed away from your body) or pull (pointed toward your body). Get comfortable with both methods so you can quickly adjust to changes in grain direction by flipping the tool without having to reposition the workpiece. Because low-angle

spokeshaves have single soles, you will develop a feel for "balancing" the tool to maintain a consistent cutting depth. Before tackling one of your project parts, practice in knot-free scrap wood to learn how each shave works.

Ideally, you'd own all three types of shaves (they sell new for about \$70–150 each) because each handles specific tasks better than the others. But if you can buy only one, get a standard-angle, flat-sole shave. When you're ready to add a second one, get a low-angle model. 🌲

Produced by **Bob Hunter** with **John Olson** and **Tom McLaughlin**



Give it a push on end grain. Gripping a low-angle shave near the blade, push the tool down and away for end-grain cuts, such as this cabriole-leg foot.

No-fuss sharpening

Spokeshave blades measure only about $\frac{1}{8}$ " thick and 1–2" long, so you can't hold them in a honing guide or freehand and expect good results. Instead, use the method shown *right*.

To sharpen a blade, guide it against a beveled block that matches the blade's bevel angle. Slide the blade side-to-side on the abrasive.



Sources

Dave's Shaves
603-356-8712,
ncworkshops.com
Lee Valley 800-871-8158,
leevalley.com
Lie-Nielsen Toolworks
800-327-2520,
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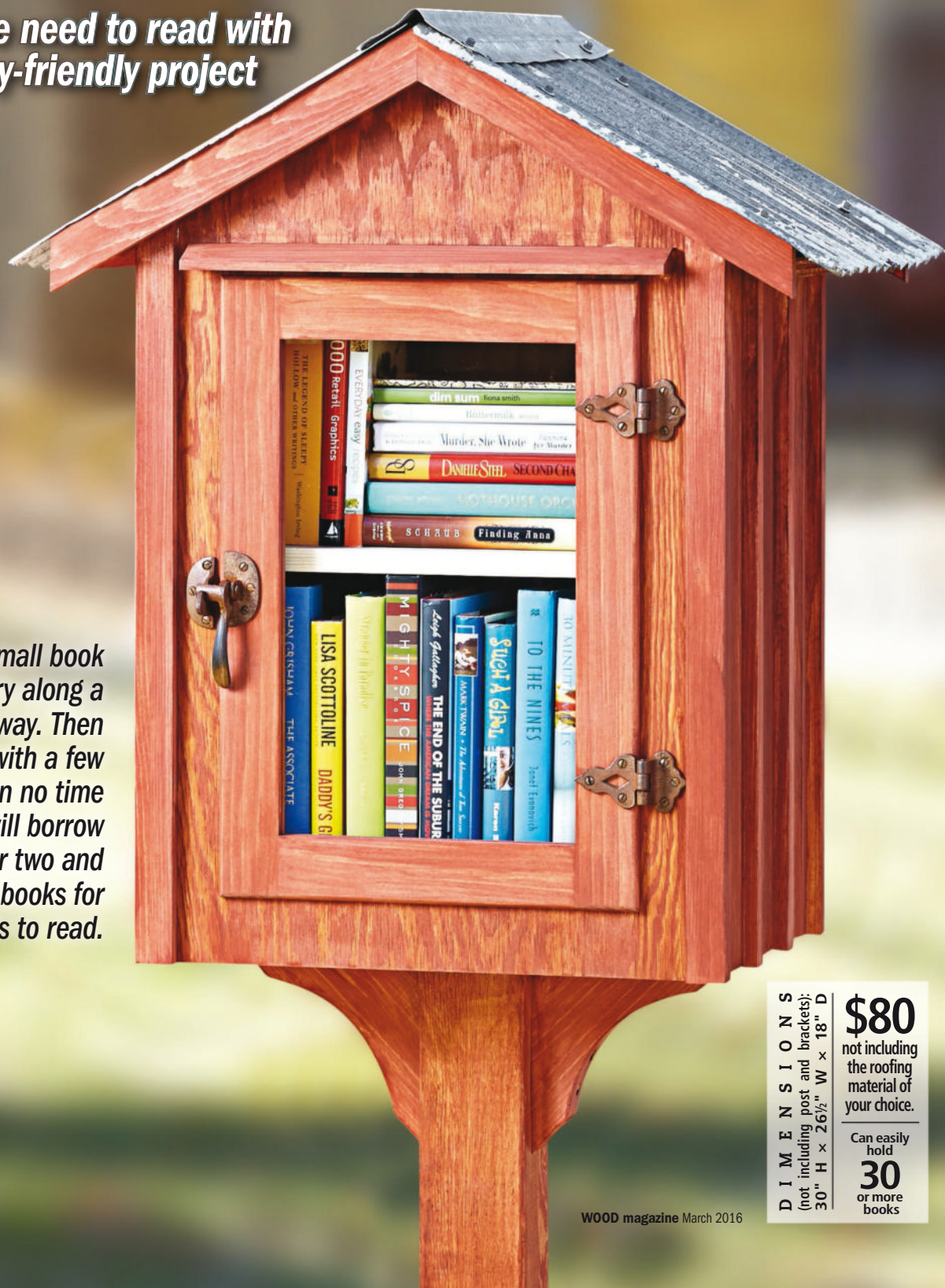


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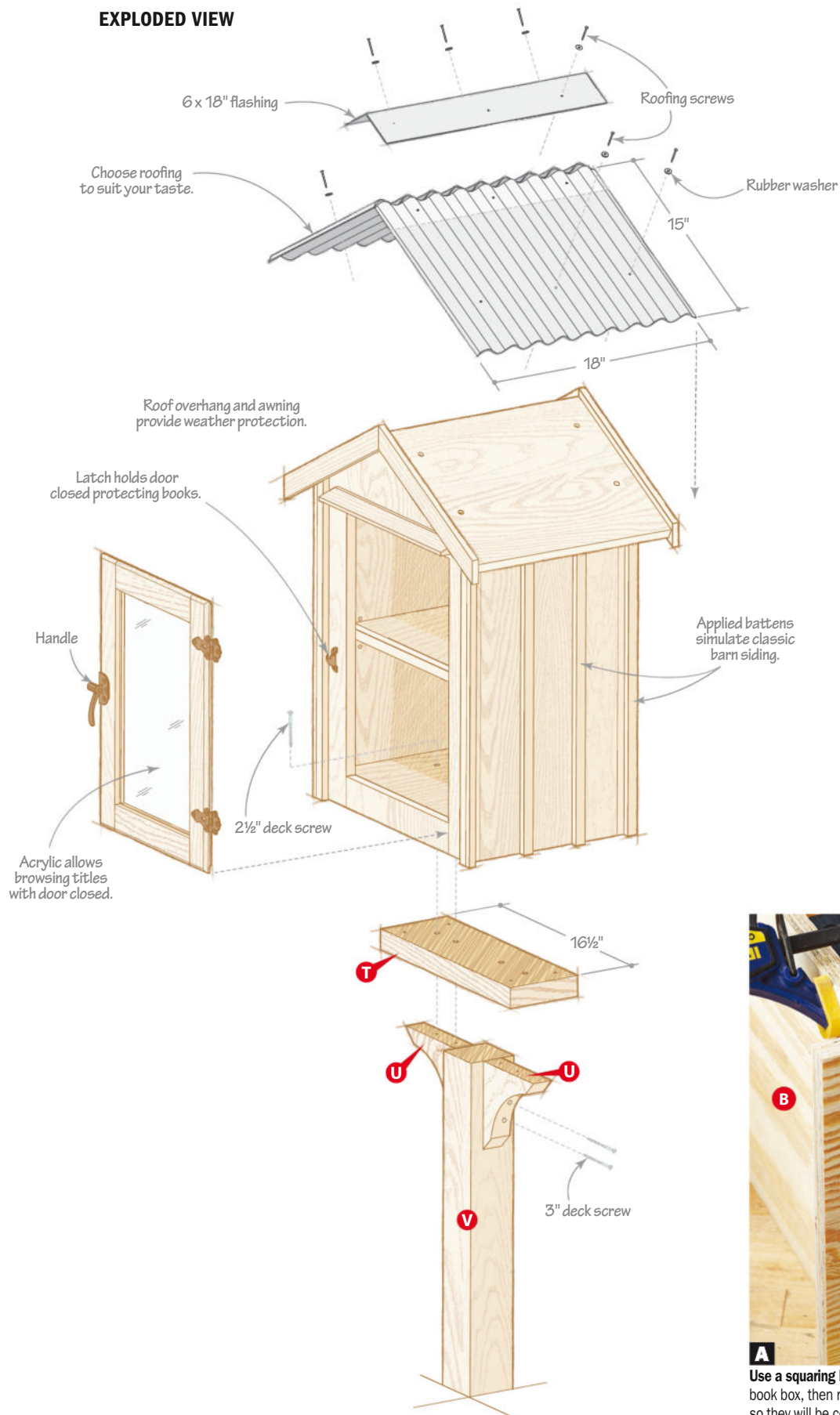
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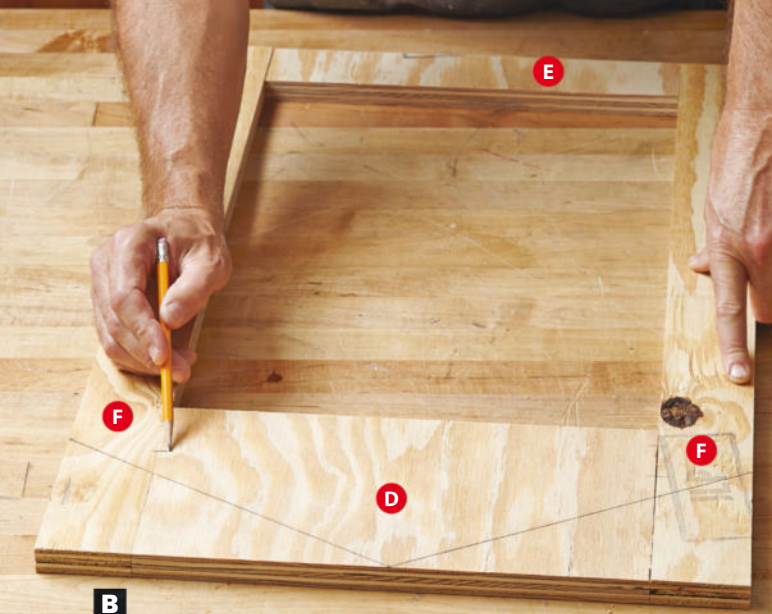
Start with the book box

1 From 3/4" exposure-rated plywood (we used CDX) cut the box sides (A) and top/bottom (B) [Materials List]. Drill shelf-pin holes in each side [Drawing 1]. Sand the inside surfaces to 150 grit. Glue and clamp the top and bottom between the sides and then add screws [Photo A]. Drive the screwheads just below the surface and fill the dimples with wood filler.

Tip! For best joint life outdoors, use a water-resistant glue such as Titebond II, or waterproof adhesive such as Titebond III, polyurethane glue, or epoxy.



Use a squaring brace when gluing and clamping together the book box, then reinforce the joints with 1 3/4" screws spaced so they will be covered by the battens (K). (See Drawing 3.)

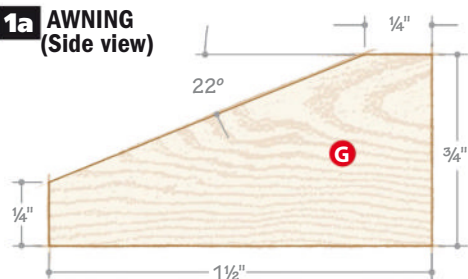


B Mark the locations of two pocket-hole screws or dowels at each joint in the box-front assembly (D–F).

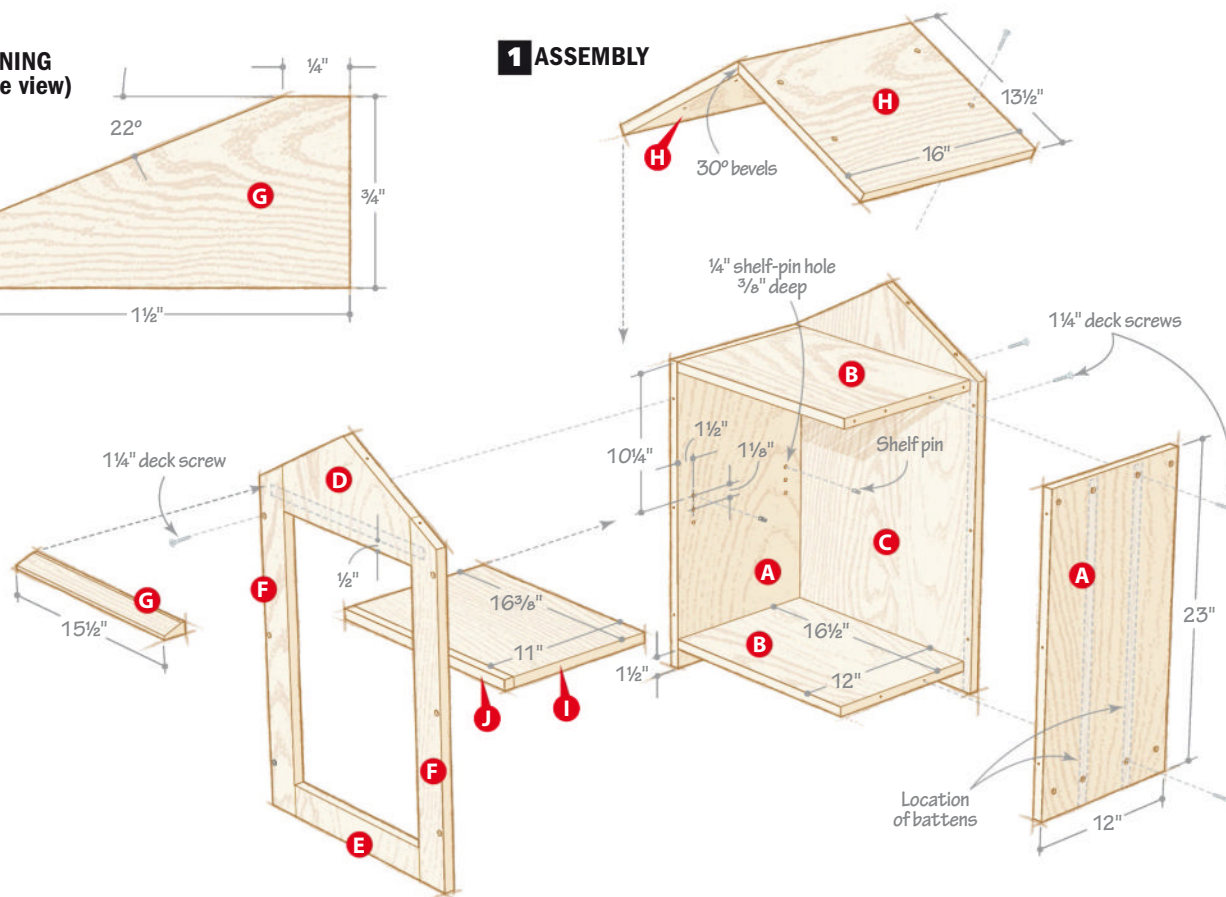


C Clamp and glue the fascia (O) to the roof edges before nailing. The corrugated tin we used required raising the fascia $\frac{1}{2}$ " (the thickness of the tin) above the roof top.

1a AWNING (Side view)



1 ASSEMBLY



2 Saw the back (C) to size and cut the peak [Drawing 2].

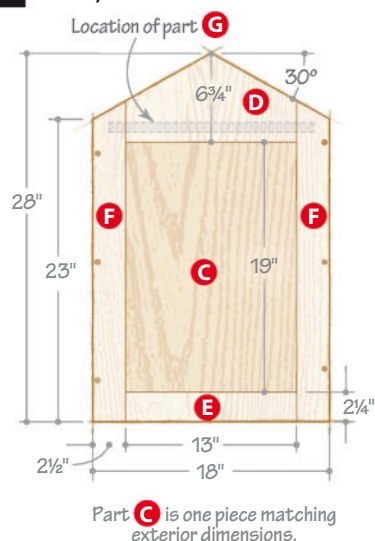
3 Cut the box front top (D), bottom (E), and stiles (F). Place the parts so they form the box front. Lay the back (C) atop those parts with all edges flush and trace the peak onto the front parts. Remove the back and mark locations for pocket-hole screws or dowels [Photo B]. Apply glue, assemble the

front, and cut the peak. Finish-sand this assembly.

4 Cut to size the awning (G), and rip its 22° bevel [Drawing 1a]. Glue it centered $\frac{1}{2}$ " above the door opening. Glue and screw the front (D–G) and back (C) to the box assembly (A/B) [Drawing 1].

5 Cut to size the roof panels (H), bevel-ripping one edge of each panel at 30°

2 FRONT/BACK LAYOUT



[Drawing 1]. Glue and screw them to the top of the box (A–G).

6 Cut and glue together the shelf (I) and its edging (J), and sand smooth.

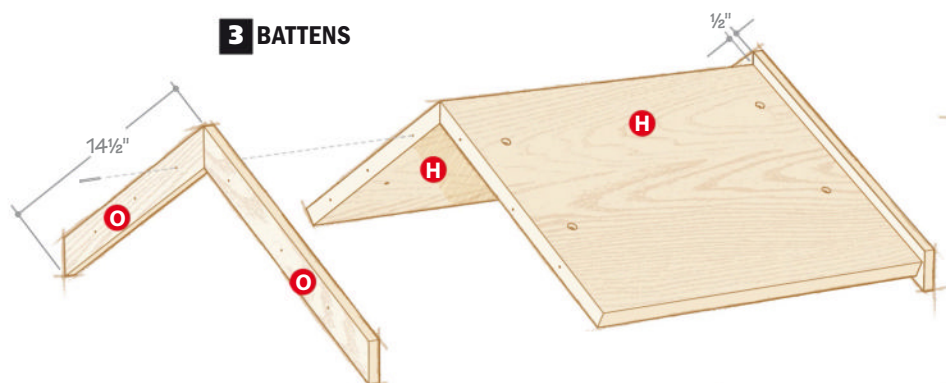
Add trim and a door

1 From 1/2" pine, cut blanks for the battens (K–N) about 1" longer than listed [Materials List]. Cut a 30° miter on the end of each batten. Trim each batten to length and attach with glue and nails, beginning with the corner battens (L) [Drawing 3]. The side battens (K) then overlap the corner battens.

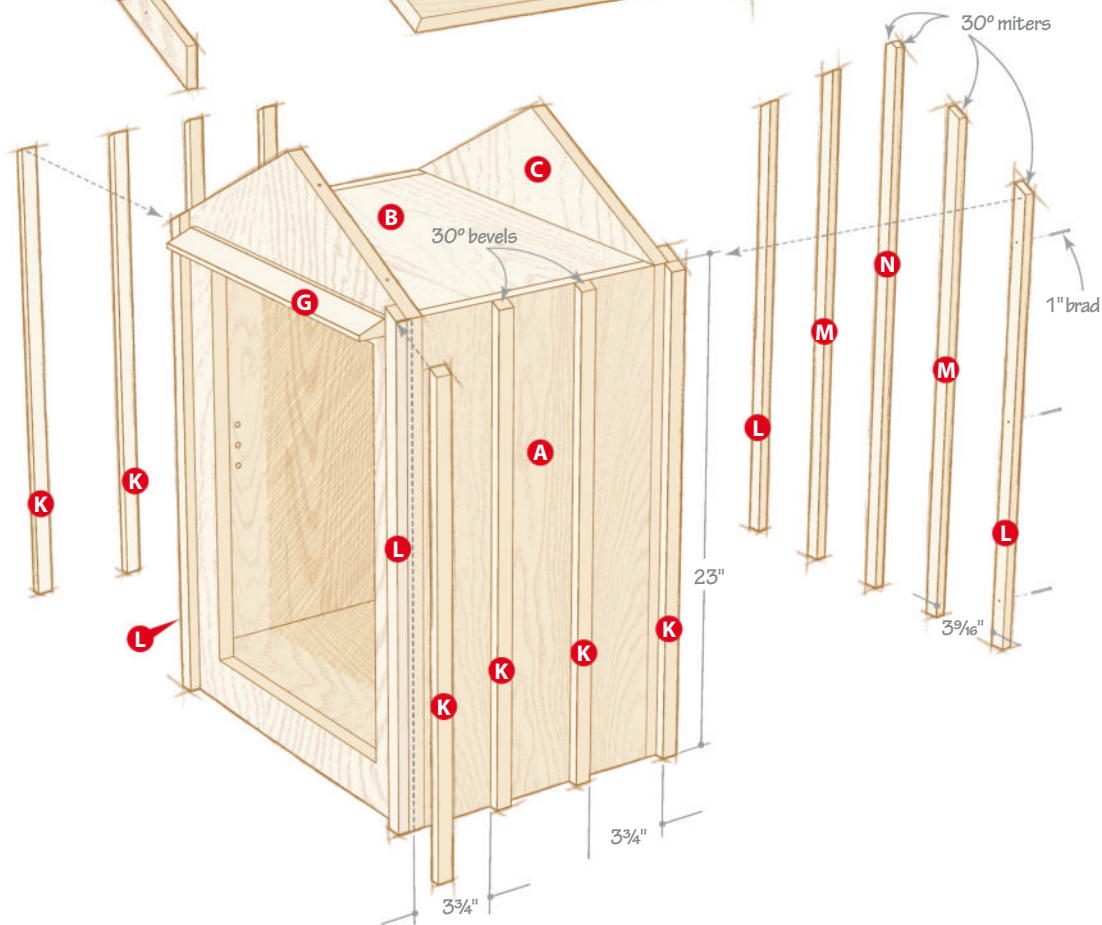
2 Miter-cut the fascia (O) to finished length [Drawing 3a]. Glue and nail it flush with the top edges of the front and back roof edges unless your roofing material requires raising the fascia [Photo C].

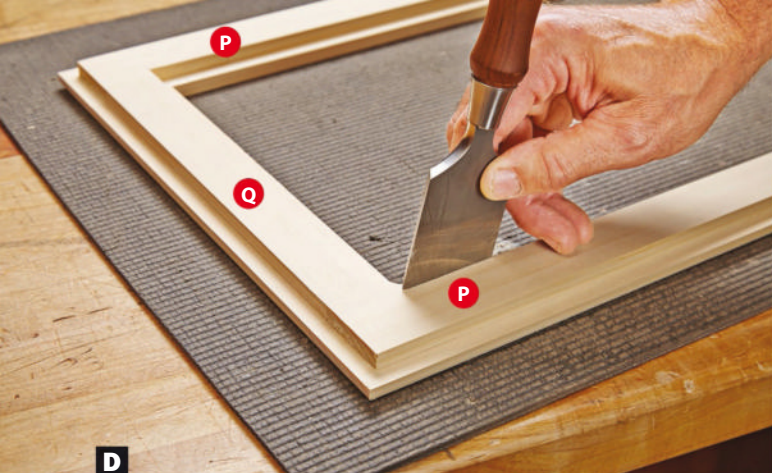
► Unlike the other battens that get a single miter on one end, the center back batten (N) gets a double miter on its top end to match the peak.

3 BATTENS



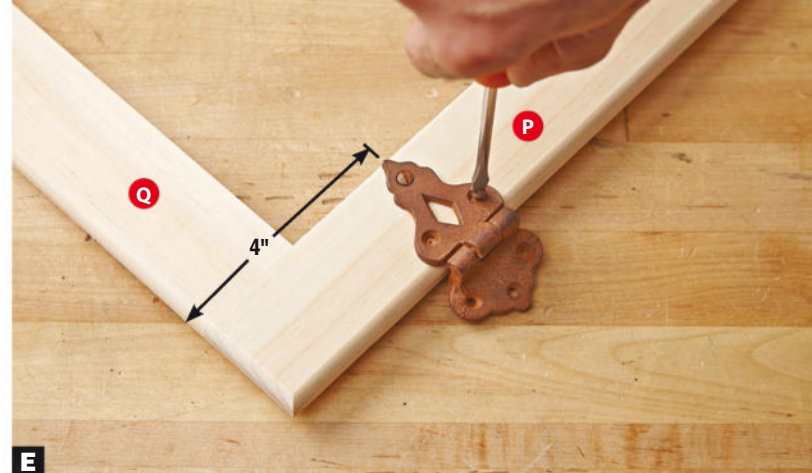
3a FASCIA





D

Square each inside-rabbet corner using your widest chisel. Align the back of the chisel with the rabbet wall and rock the chisel back and forth. Remove small bits of material from each side before moving deeper in the cut.



E

Install the door hinges with their tips flush with the inside door edge and 4" from the door's top and bottom. Pre-drill the screw holes for best results.

3 Cut to size the door stiles (P) and rails (Q). Join them with dowels placed to stay clear of upcoming rabbet cuts [Drawing 4a]. Clamp the door, let the glue dry, and sand.

4 Round-over the outside edge of the door's front face [Drawing 4]. Then rabbet the door's back face and square the corners [Photo D]. Do any further required sanding.

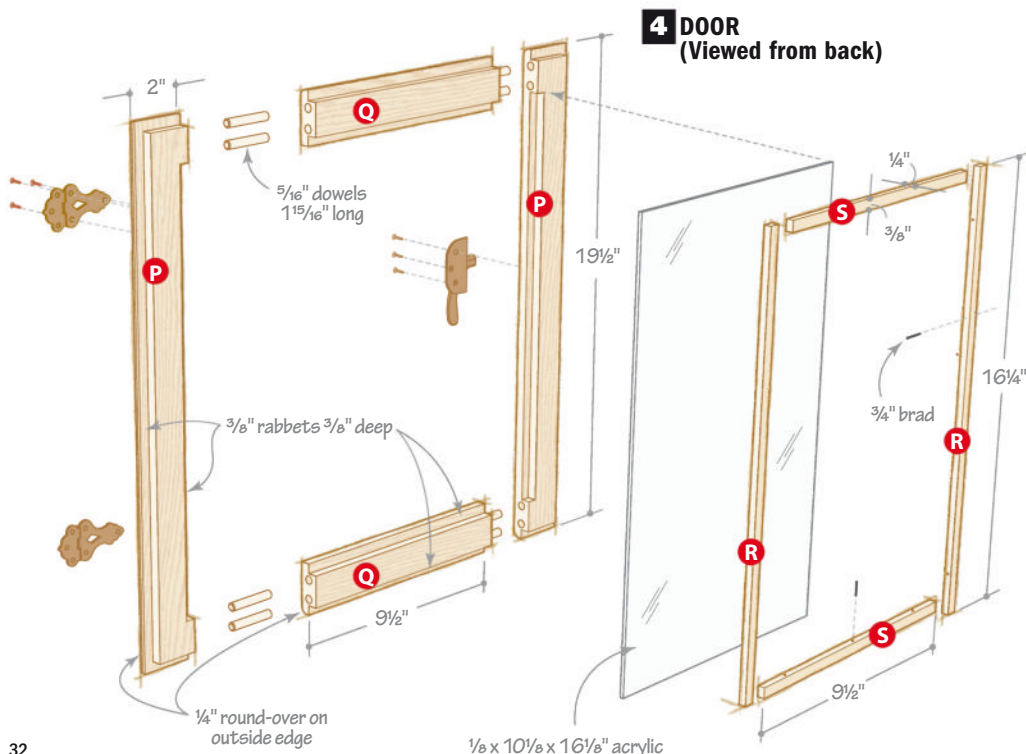
5 Attach the hinges [Source] to the door [Photo E]. With the book box laying on its back, center the door in its opening, and attach the other leaves of the hinges to the box front stiles (F).

6 Center the latch on the length of the door. Attach the door handle first, then add the latch [Photo F]. Cut the glass stops (R, S) about 1" longer than listed, and set them aside.



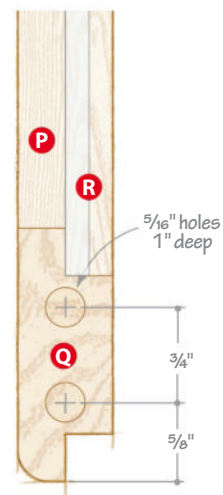
F

Install the door latch so the handle pulls the door tightly shut for a good seal.

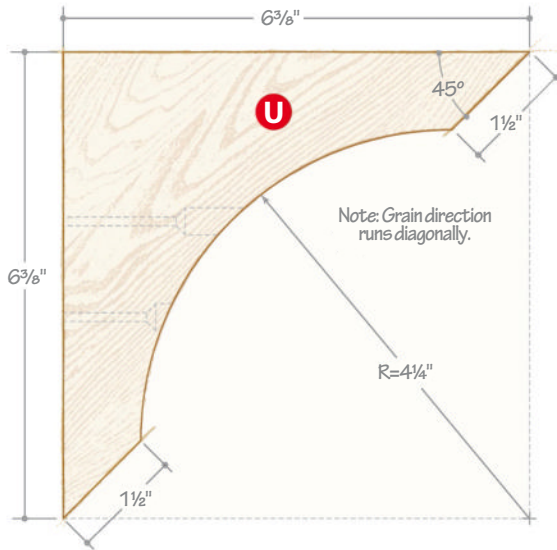


4 DOOR
(Viewed from back)

4a DOOR FRAME DETAIL



5 BRACKET



Now finish it up

1 From a pressure-treated 2x6, cut the post mount (T) [Exploded View] and brackets (U) [Drawing 5]. Check your local building code for how deep the post (V) should be in the ground, then cut a 4x4 post long enough for the bottom of the box to sit 32" above ground.

2 Remove the hardware and do any final sanding. Apply a stain or paint scheme of your choice. We brushed on a coat of semi-transparent Olympic Maximum Stain + Sealant in One tinted in No. 728 Rosewood color (available at Lowe's).

3 After the finish dries, cut a piece of acrylic 1/8" smaller in width and length than the rabbeted inside opening in the door. Secure with the glass stops (R, S) [Drawing 4]. Reinstall the hinges and latch.

4 Attach the roofing material of your choice. We used corrugated tin from a demolished farm structure, cut it to extend past the wood on all sides, secured it using roofing screws with rubber seal washers, and capped it with ridge flashing [Exploded View].

5 Install the post (V) plumb in the ground. Center the mount (T) on top of the post, then screw it and the brackets (U) to the post. Position the book box on top of the post mount and secure it with screws driven through the bottom and into the post mount [Exploded View]. Seed it with a few starter books and watch the sharing begin! 🌳

► Consider registering your book nook with the Little Free Library organization, which was established in 2009 to promote literacy and the love of reading through the placement of free book exchanges. Today, more than 32,000 such book-sharing sites have been established worldwide. To learn more about the program, go to littlefreelibrary.org.

Materials List

Part Box	FINISHED SIZE			Matl.	Qty.
	T	W	L		
A sides	¾"	12"	23"	X	2
B top/bottom	¾"	12"	16½"	X	2
C back	¾"	18"	28"	X	1
D front top	¾"	6¾"	13"	X	1
E front bottom	¾"	2¼"	13"	X	1
F* front stiles	¾"	2½"	25"	X	2
G awning	¾"	1½"	15½"	P	1
H roof panels	¾"	13½"	16"	X	2
Shelf					
I shelf	¾"	11"	16⅜"	X	1
J front edging	¾"	¾"	16⅜"	P	1
Trim					
K* side battens	½"	¾"	23"	P	8
L* corner battens	½"	¾"	23⅜"	P	4
M* mid back battens	½"	¾"	25⅛"	P	2
N* center back batten	½"	¾"	28"	P	1
O* fascia	½"	1½"	14½"	P	4
Door					
P door stiles	¾"	2"	19½"	P	2
Q door rails	¾"	2"	9½"	P	2
R* vertical glass stops	¼"	⅝"	16¼"	P	2
S* horizontal glass stops	¼"	⅝"	9½"	P	2
Post					
T mount	1½"	5½"	16½"	T	1
U brackets	1½"	4½"	9"	T	2
V post	3½"	3½"	**	T	1

*Parts initially cut oversize. See the instructions.

**32" plus length in ground

Materials key: X-exposure-rated plywood, P-pine, T-treated pine.

Supplies: 3/4" and 1" brads, 1 1/4", 2", 2 1/2", and 3" deck screws, 1/4" shelf pins (4), 5/16" dowels 1 5/16" long, roofing screws and rubber washers (if installing a corrugated tin roof), wood filler, 1/8x10 1/8x16 1/8" acrylic.

Bits: 1/4" round-over and 3/8" rabbeting router bits.

Source: Restorers 3/8" Offset Rusty Iron Icebox Hinge, no. 02003872, \$10.09 per pair; Restorers Right Hand Brass Icebox Latch and Catch, no. 203205, \$11.99. Van Dyke's Restorers, 800-237-8833, vandykes.com.

► Download a free cutting diagram. woodmagazine.com/booknookCD

► Learn to install a post properly. woodmagazine.com/postmaster

Produced by Bill Krier with Kevin Boyle
Project design: Kevin Boyle
Illustrations: Roxanne LeMoine; Lorna Johnson

Coopered-door Cabinet



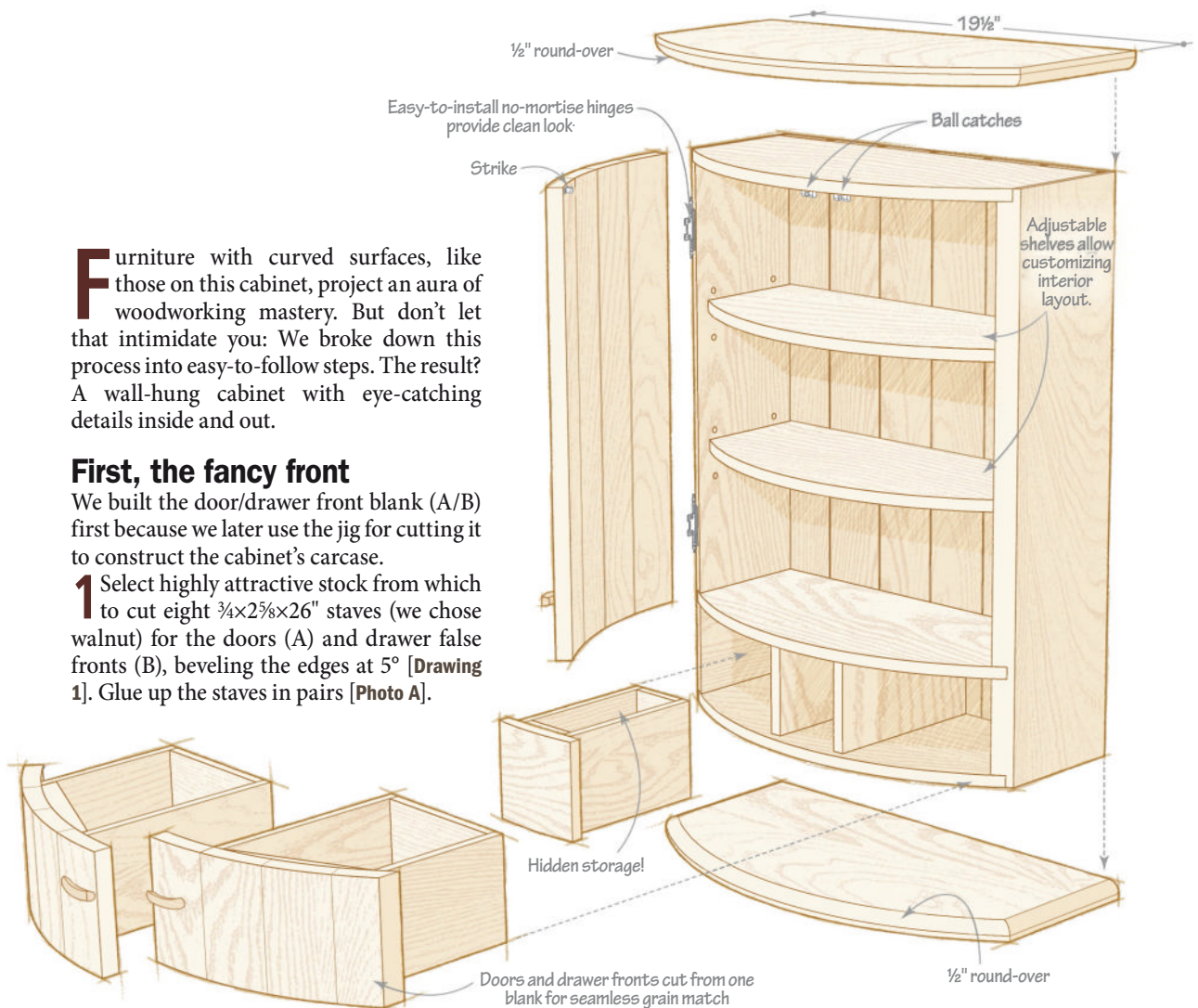
DIMENSIONS:
25½" H x 19½" W x 9¼" D

Approximate materials cost:

\$100

Make 8
flat boards
look like
1 curved
one!

EXPLODED VIEW



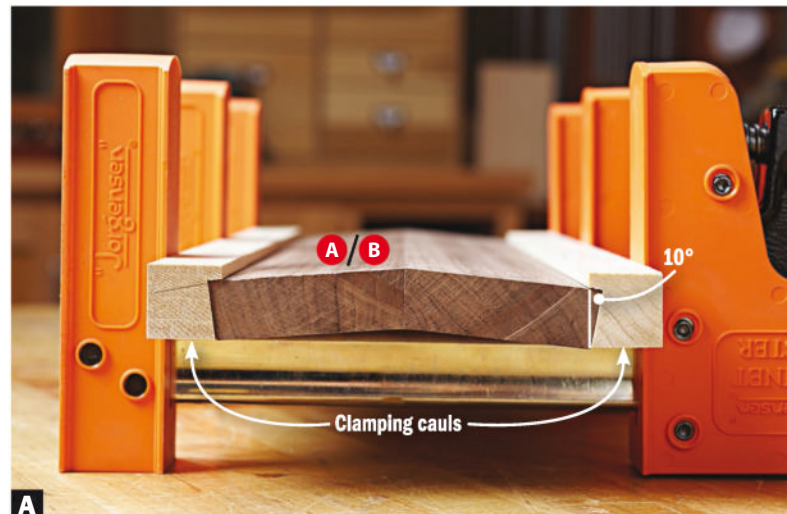
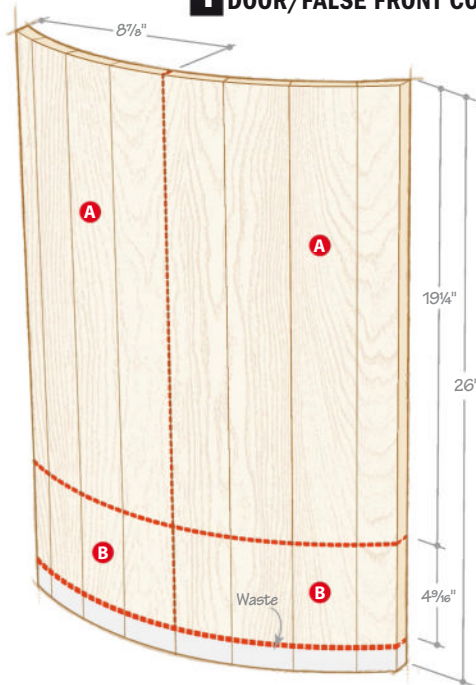
Furniture with curved surfaces, like those on this cabinet, project an aura of woodworking mastery. But don't let that intimidate you: We broke down this process into easy-to-follow steps. The result? A wall-hung cabinet with eye-catching details inside and out.

First, the fancy front

We built the door/drawer front blank (A/B) first because we later use the jig for cutting it to construct the cabinet's carcass.

1 Select highly attractive stock from which to cut eight 3/4×2 5/8×26" staves (we chose walnut) for the doors (A) and drawer false fronts (B), beveling the edges at 5° [Drawing 1]. Glue up the staves in pairs [Photo A].

1 DOOR/FALSE FRONT CONSTRUCTION



A **Make your staves stay.** Mill four 1×1×26" clamping cauls and cut 10° notches in an edge of each. Use these to keep the joints between staves tight during glue-up.

Skill Builder

Old-school tools save you time

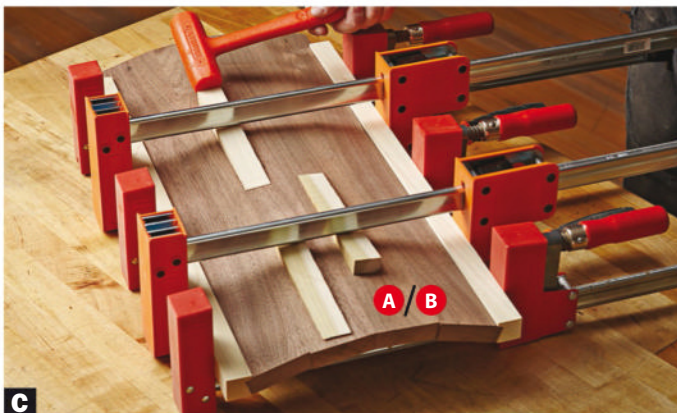
Don't assume modern power tools always surpass hand tools. Case in point: A circular plane helps you smooth the inside surfaces of the door blanks faster and more effectively than any corded tool. Adjust the plane's flexible sole to match the radius of the blanks, or the convex front edge of the shelves (D, F).

Track down an antique circular plane made by Stanley, Record, or Sargent, or buy a new plane—Kunz (traditionalwoodworker.com) and Anant (anant-tools.com) still produce them.

To make the tongue-and-groove joints on the back (G) without multiple machine setups, use a tongue-and-groove plane, such as this Lie-Nielsen #49 (lie-nielsen.com). This plane was designed to work with ½" stock—tongue-and-groove planes are sized for specific stock thickness—so we taped a thin shim to the plane's fence to center the blade on the stock's ⅜" edge.



B **Mind the gap.** The joint between the stave pairs will want to open up during clamping.



C **For a fix,** position clamps above the assembly, and drive wedges to close the gap.

2 Recut the 10° notches in the cauls to 20°. Then glue the stave pairs together to make two curved assemblies [Photos B and C]. After the glue dries, sand the inside face smooth [Photo D]. See “Old-school tools save you time” to learn how you can plane the inside face, instead.

3 Now make a door-cutting sled by cutting two scraps of ¾" plywood to 4×18½". Scribe the curve of the blanks (A/B) onto the plywood [Photo E], then bandsaw to shape. Cut notches to fit your clamps [Photo F]. Countersink and screw (no glue) these ply-



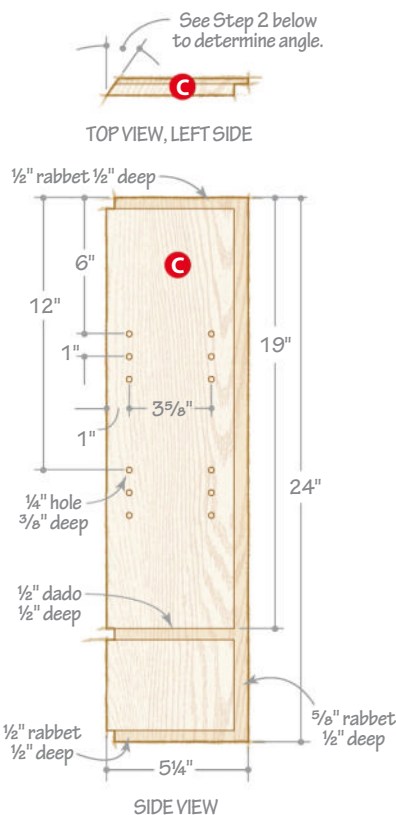
D **Add a curve to your sanding block.** Use a sanding block, rounded to match the curve of the blanks, and aggressive abrasive, to smooth the inside. It may take longer than using a random-orbit sander, but the curve will be smooth and even.



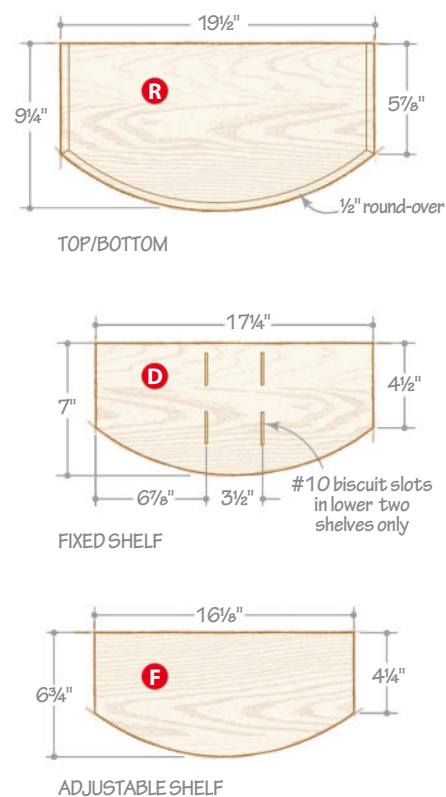
E

Position the blank on the plywood, trace the curve and cut the plywood to shape. This will serve as one of two ends of a tablesaw sled.

2 CABINET SIDE



3 TOP/BOTTOM AND SHELF DETAILS



► Watch a free video on drilling shelf-pin holes accurately.
woodmagazine.com/shelfpin

wood forms to a $\frac{1}{4} \times 18\frac{1}{2} \times 26$ " plywood base-plate flush at each end.

4 Clamp one blank to the sled and rip it to width [Photo F]. Remove the blank, rotate the sled end-for-end, and clamp on the other blank. Adjust the fence for a $17\frac{3}{4}$ " rip and cut the second blank to width. Now, smooth the outside face of the blanks [Photo G].

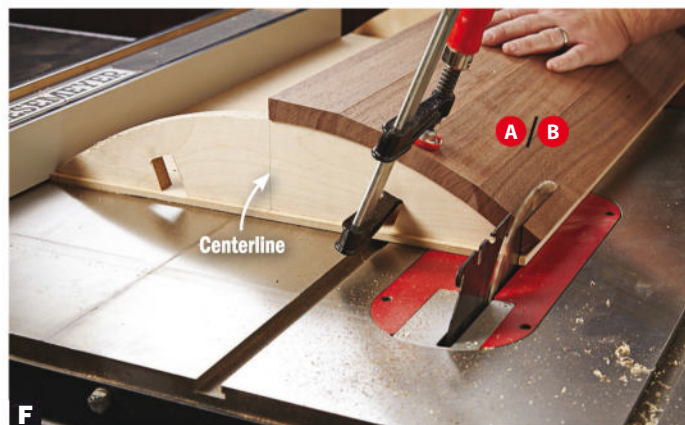
Construct the cabinet

1 Cut the sides (C) to size [Materials List]. Machine the dados and rabbets, and drill the shelf-pin holes [Drawing 2].

2 To determine the bevel on the sides (C), disassemble your door-cutting sled and cut $\frac{1}{4}$ " from each end of one of the curved ends, bringing it to $17\frac{1}{4}$ " long. Measure the angle where the end meets the start of the curve [Photos H and I]. Ours measured 35° , but depending on how much you sanded the inside face of the blank, your mileage may vary.

3 Cut the fixed shelves (D), dividers (E), and adjustable shelves (F) to size [Drawings 3 and 4]. Use a curved end from the sled to lay out the front edges of the shelves, then cut and sand them to shape. Assemble the

Tip! When using a circular plane to smooth the shelves' (D, F) front edges, start at the curve's apex and plane down to the corners to avoid tear-out.



F

Draw a centerline on the front and back ends of the tablesaw sled. Clamp the door/false-front blank to the sled, aligned with those lines. Set the fence on your tablesaw for an $18\frac{1}{2}$ " rip, and cut the first door/false-front to width.



G

Start with a hand plane to quickly remove the highest spots. Then transition to a concave, cork-faced sanding block.

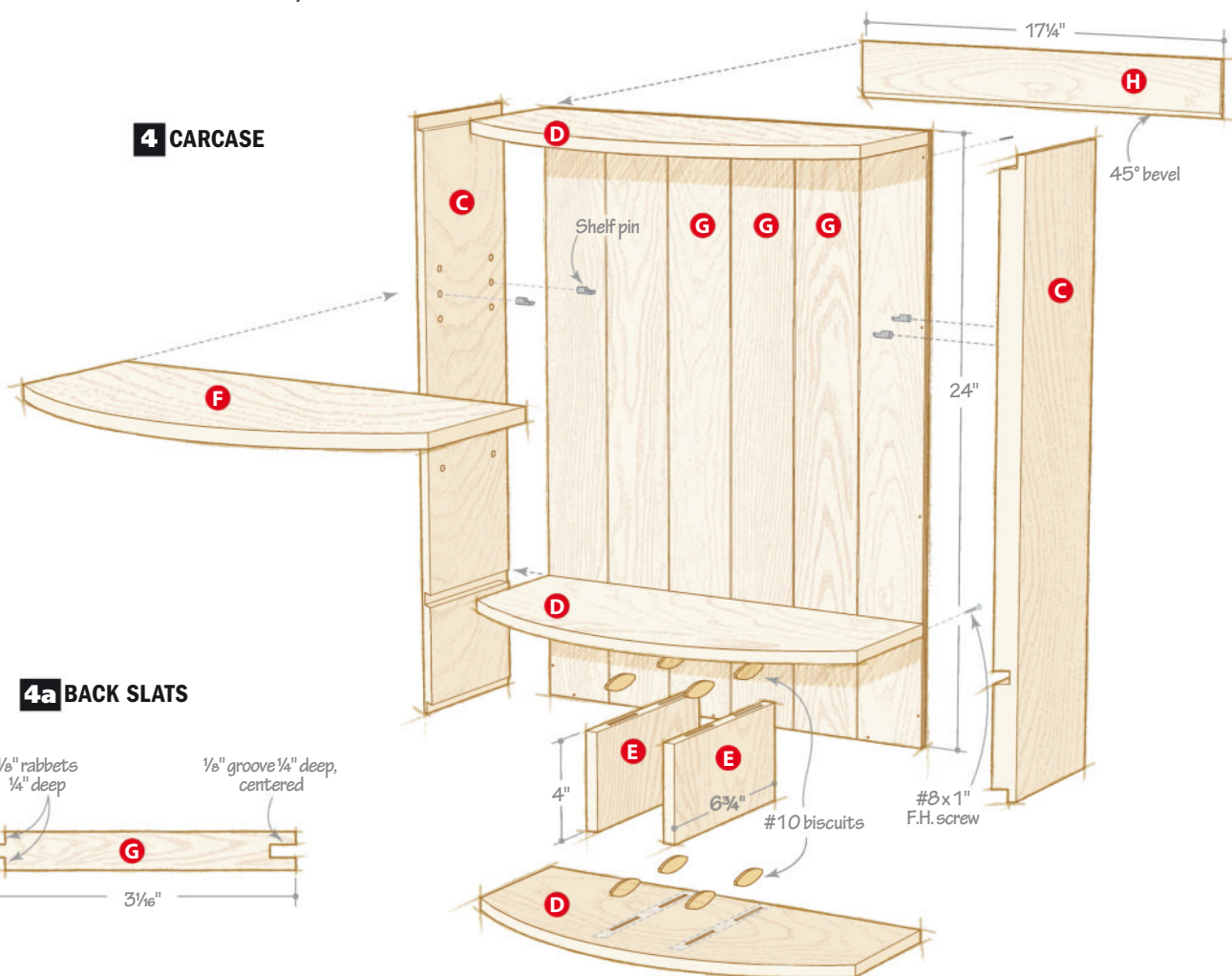


H

I

Arrange a meeting place. Once you've determined the angle where the doors meet the sides (C), tilt your tablesaw blade to that angle and bevel each side's front edge. Now, the curve of the doors and false fronts will transition seamlessly to the sides of the assembled cabinet.

4 CARCASE



4a BACK SLATS



dividers between the two bottom shelves [Drawing 4]. Then, glue the fixed shelves into their dados and rabbets.

4 With the cabinet frame assembled, check the fit of the door blanks. Fix any gaps between the doors and the carcass.

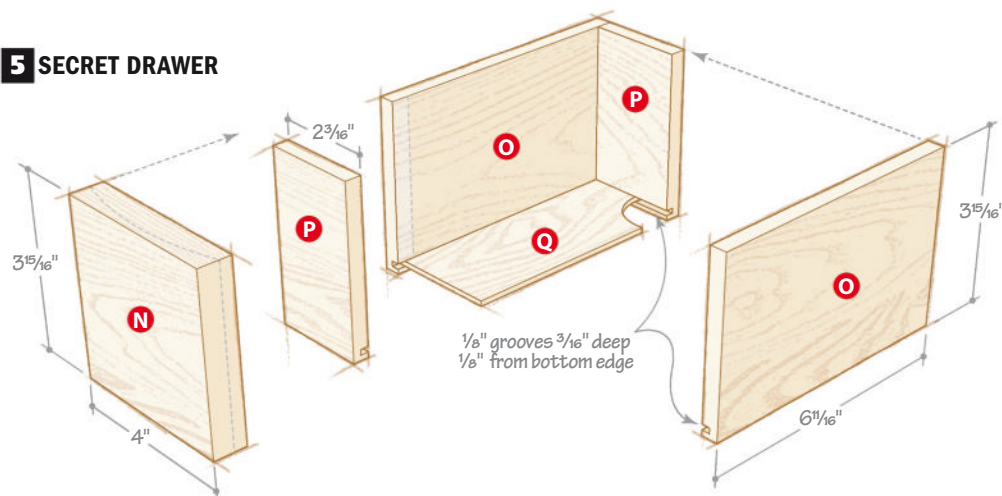
5 We used spalted maple for the back slats (G) and drawers for a dramatic contrast

with the walnut. For a subtler look, substitute soft maple.

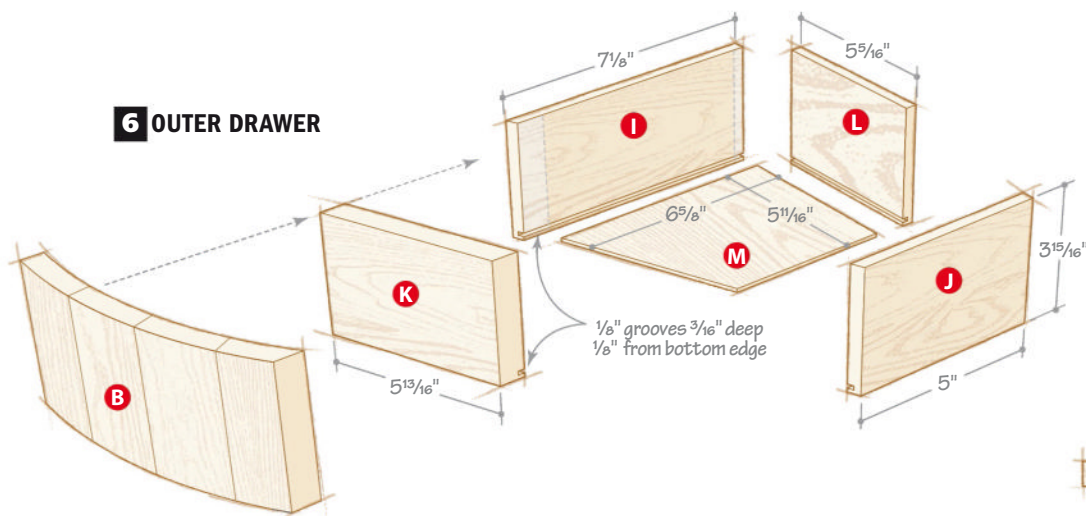
Cut the back slats, then machine the tongue and groove on each [Drawing 4a]. Fit the slats together to form the back (no glue), then screw each slat to the fixed shelves (D). Cut the hanging cleats (H) to size and set them aside.

Note: The outermost slats will have only one tongue or one groove, not both.

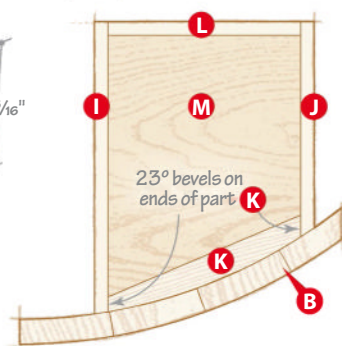
5 SECRET DRAWER



6 OUTER DRAWER



6a DRAWER DETAIL



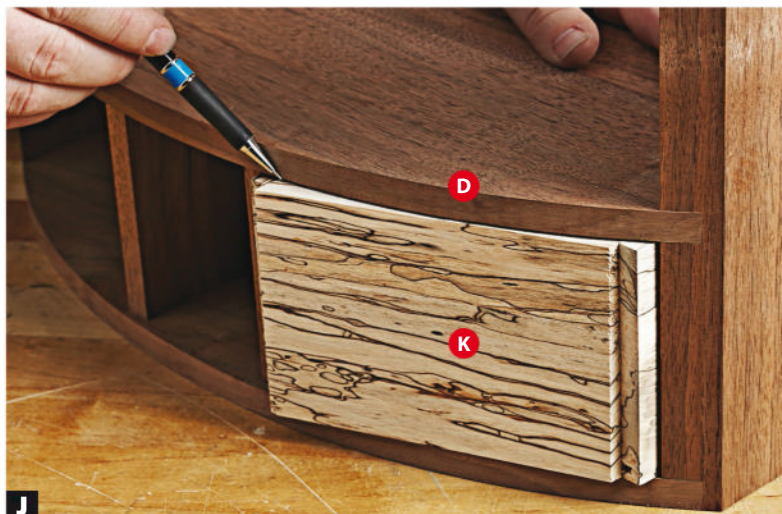
Tip! For extra strength, pin the drawers with $\frac{1}{8}$ " dowels, or use brass or aluminum rod for a more prominent accent.

Build the drawers and doors

1 Cut the drawer parts (I–Q) to size and shape [Drawings 5, 6, and 6a]. Machine the grooves to accept the drawer bottoms, and bevel the ends of the outer drawer fronts (K). Glue the drawer boxes together and fit them to the cabinet face [Photo J]. Glue the secret drawer false front (N) to the secret drawer's front (P).

2 Crosscut the door blanks to form the doors (A) and outer drawer false fronts (B) [Drawing 1]. Position the outer drawer false fronts on the outer drawer fronts (K) using double-face tape [Drawing 6a], leaving a $\frac{1}{16}$ " reveal between them and the doors. Screw the outer drawer false fronts in place from the inside.

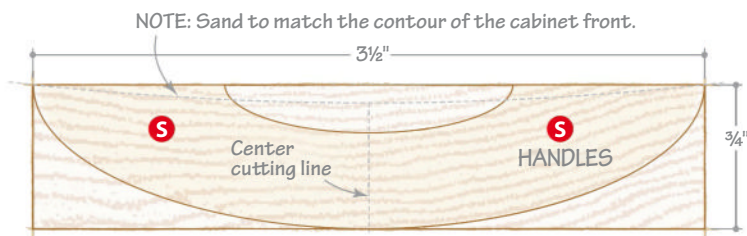
Before hanging the doors, cut the screws for the door leaves of the hinges to $\frac{7}{16}$ " to avoid driving them through the doors. Mount the doors and check the doors and drawers for fit and function, making any necessary adjustments. Mount the ball catch and strike [Exploded View].



J **Ride the curve.** Slide the drawers into position and scribe them to match the curve of the fixed shelves (D). Then, bandsaw and sand the drawer fronts to shape.

3 Cut to size the case top/bottom (R) [Drawing 3]. Use the tablesaw sled ends to lay out the curve, making sure the parts will overhang the front and sides of the cabinet

7 HANDLE FULL-SIZE PATTERN



by 1/2". Cut the top/bottom to shape, sand and rout the edges, and glue them to the cabinet [Exploded View]. Cut and shape the handles (S) [Drawing 7]. Screw them to the doors and drawers with #8x1 1/8" wood screws [Photo K].

4 Apply a clear finish. We sprayed on three coats of satin lacquer, sanding between coats with 800-grit sandpaper. Mount one hanging cleat (H) to the cabinet, snug against the top (R) [Drawing 4] and one to the wall. Hang the cabinet, then stand back and admire those curves. 🌲

Produced by **Nate Granzow** with **John Olson**
Project design: **Kevin Boyle**
Illustrations: **Lorna Johnson**



K Round the inside of each handle using a chisel and by hand sanding. Crosscut each handle in half and screw the two parts to the doors.

Materials List

Part	FINISHED SIZE			Matl.	Qty.
	T	W	L		
A* doors	3/4"	8 3/8"	19 1/4"	W	2
B* outer drawer false fronts	3/4"	8 3/8"	4 9/16"	W	2
C sides	3/4"	5 1/4"	24"	W	2
D fixed shelves	1/2"	7"	17 1/4"	W	3
E dividers	1/2"	6 3/4"	4"	W	2
F adjustable shelves	1/2"	6 3/4"	16 1/8"	W	2
G back slats	3/8"	3 1/16"	24"	SM	6
H hanging cleats	1/4"	2 1/2"	17 1/4"	SM	2
I outer drawer long sides	3/8"	3 15/16"	7 1/8"	SM	2
J outer drawer short sides	3/8"	3 15/16"	5"	SM	2
K outer drawer fronts	3/8"	3 15/16"	5 13/16"	SM	2
L outer drawer backs	3/8"	3 15/16"	5 5/16"	SM	2
M outer drawer bottoms	1/8"	6 5/8"	5 1/16"	BP	2
N secret drawer false front	1/2"	3 15/16"	4"	SM	1
O secret drawer sides	3/8"	3 15/16"	6 1/16"	SM	2
P secret drawer front/back	3/8"	3 15/16"	2 3/16"	SM	2
Q secret drawer bottom	1/8"	2 1/8"	6 7/16"	BP	1
R case top/bottom	3/4"	9 1/4"	19 1/2"	W	2
S handles	1/2"	3/4"	1 1/16"	W	2

*Parts initially cut oversize. See the instructions.

Materials key: W—walnut, SM—spalted maple, BP—Baltic birch plywood.

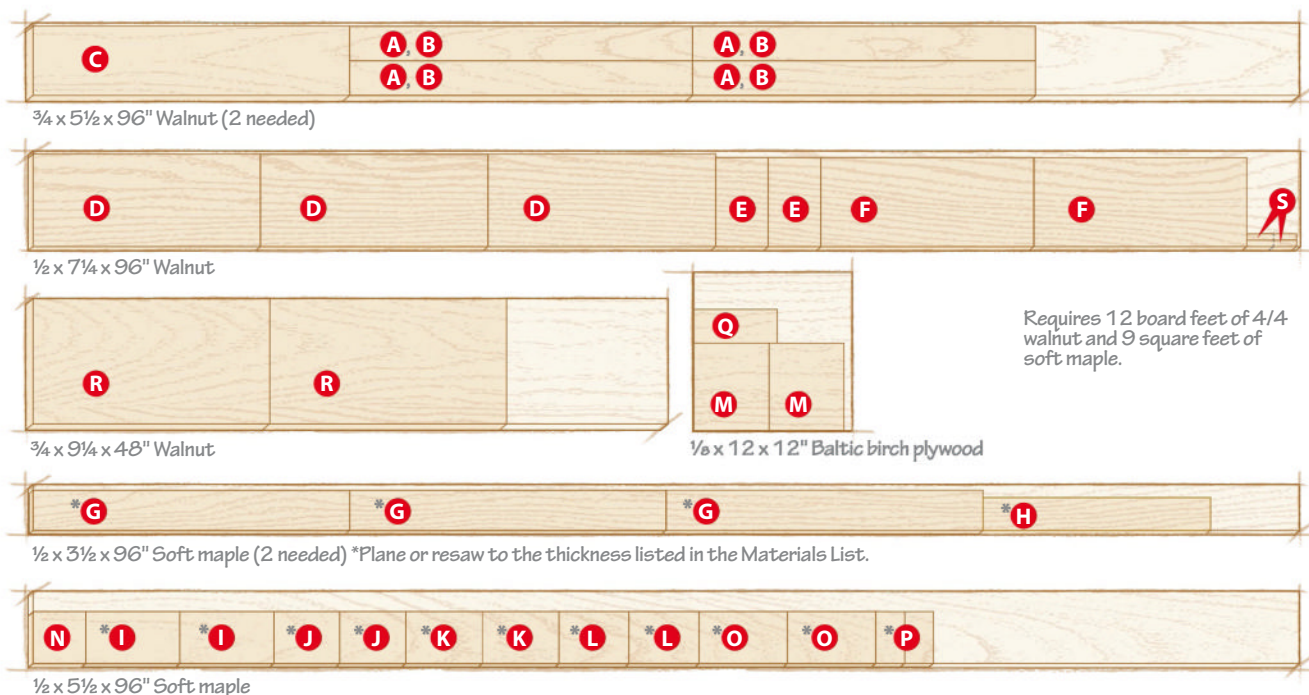
Supplies: Ball catches (2); shelf pins (8); #10 biscuits (8); #8x1", #8x1 1/8" flathead wood screws.

Blade and bits: Dado set, 1/2" round-over router bit, 1/4" brad-point drill bit.

Sources

Hinges: 2x1 1/8", bronze, no. 00H51.22, \$1.80 per pair, (2 pairs); #4x3/8" screws, antique brass, 0710.51, \$2.10 for 100, Lee Valley, 800-871-8158, leevalley.com

Cutting Diagram



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WOOD IDEA SHOP™ 6

Built on a Budget

Outfit a shop in under a year by earmarking money each paycheck.



BEFORE

So the woodworking bug bit hard, and now you want a nice space to build more stuff. But setting up a fully outfitted shop can be expensive and confusing. Not any longer.

Starting with this article, and through the next six issues, discover how to set up a shop by working within a budget of \$150 every two weeks over 26 pay periods. On that modest amount, you can take an empty space such as the one shown *previous page, bottom*, and transform it into a full-on woodworking shop, outfitted with quality tools, accessories, jigs, and fixtures. You'll see immediate results, building things with your new tools right from the start.

Every two weeks, beginning January 14, 2016, to coincide with that paycheck's budgeted \$150, we'll provide online a new batch of related articles, plans, and videos at

woodmagazine.com/ideashop6. To receive an email reminder of that posting, sign up for our newsletter at woodmagazine.com/newsletter.

On the *next pages*, we outline what to invest in with your first four installments. Because not all of the money gets spent each two weeks, bank the leftover cash for purchasing big-ticket items such as a tablesaw, planer, and jointer. We will recommend good-quality tools but, because this is a budget-based shop, they may not be class-leading. If you can afford more than the budget (or already own some of the items listed), put extra money towards upgraded tools. Find tool evaluations to guide your choices at reviewatool.com. At its core, Idea Shop 6 is less about the specific items in it, and more about how to create a workable shop, over time, without breaking the bank.

► **Jig:** An accessory for a tool that helps you perform an operation safer and/or more accurately. Jigs can be purchased or shop-made.

► **Fixture:** "Shop furniture" such as sawhorses, cabinets, or a lumber rack.

Ya gotta start somewhere

You likely already own the tools *below*. If you don't, acquiring them will cost only about \$150, so just tack one more two-week period onto the year. You'll need them mainly to assemble stationary tools, but the

hearing and eye protection, tape measure, and extension cord will be needed from the get-go. Purchase any or all of these items in one fell swoop, and have them delivered to your door: woodmagazine.com/is6basickit.

The basic tool kit:

Wrench set (metric and imperial)

Pliers

Hacksaw

Hex-key set (metric and imperial)

Safety glasses

Ratchet and socket set (metric and imperial)

12' or 16' tape measure

Screwdrivers (Phillips and slotted)

14-gauge extension cord and/or power strip

Hearing protection

Hammer



► Curious about Idea Shops 1–5?

Idea Shop, 14×28' shed, issue 54 (September 1992)

Idea Shop 2, 24×24' two-car garage (above), issue 72 (September 1994)

Idea Shop 3, 12×16' basement room, issue 100 (November 1997)

Idea Shop 2000, 12×20' outbuilding, issue 119 (December 1999)

Idea Shop 5, 15×22' garage stall, issue 151 (October 2003)

See highlights at woodmagazine.com/ideashops.

Evaluate your space

You may already have a space in mind for a shop. Give it a fresh look, considering each of these criteria:

► Is it weathertight/dry? A damp basement or leaky garage roof will need to be fixed. If the shop isn't heated or cooled, will that affect how much and how comfortably you can work there?

► Explore heating and cooling options and strategies.

woodmagazine.com/heatcool

► How much power do you have? A couple of 110-volt circuits are a minimum, and you'll soon wish for more. Consult with an electrician to develop a plan for adding needed circuits. Remember to account for ample lighting needs, too.

► Learn the basics of assessing your electrical and lighting needs.

woodmagazine.com/electric

woodmagazine.com/lighting

► Will the doorways and approaches allow you to bring in long sticks of lumber and 4x8' sheet goods, and move completed projects out?

► Does the ceiling height allow for moving those same materials around the shop and onto machines?

► Do you have enough square footage to accommodate machinery, a bench and other counter space, lumber storage, and allow space for you to walk and work?

► Use our online shop planner to determine space requirements.

woodmagazine.com/shoplayout

► Will dust or noise transfer to adjacent living areas? If so, can the shop space be sealed off acceptably?

► Seal up your shop.

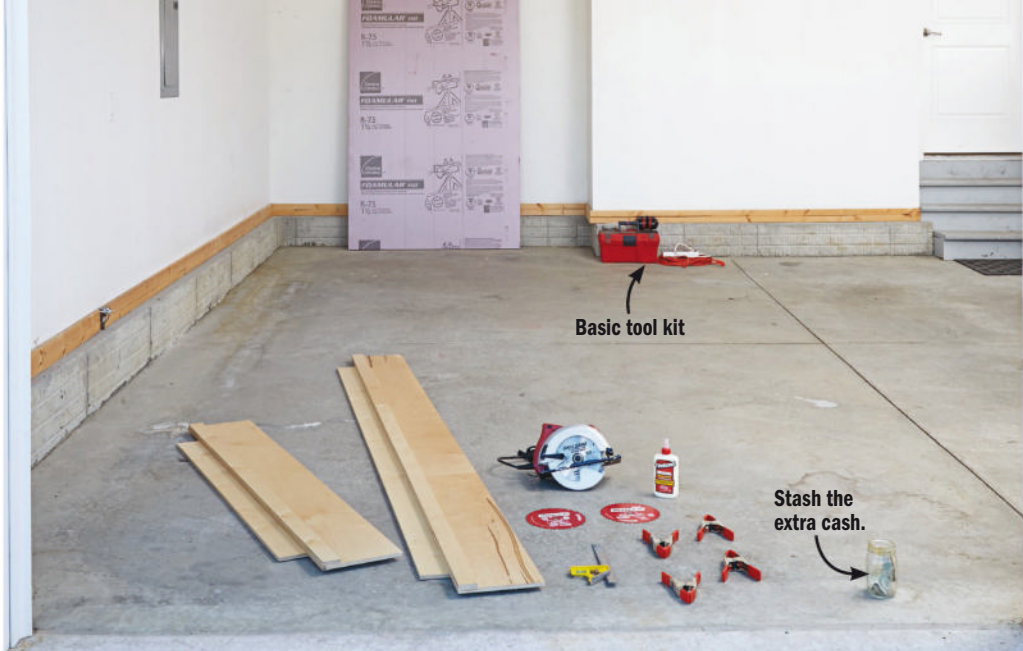
woodmagazine.com/dustseal

Start buying...and saving

So let's get down to the actual shop shopping. Following the plan at *right* and on the *next pages* for the first four paychecks, purchase a circular saw, cordless drill, accessories for both, and build several useful jigs and fixtures. And start building your nest egg for those bigger items.

Note: Find our specific tool choices, and plans for the jigs and fixtures.

woodmagazine.com/ideashop6



Paycheck 1

Buy a 7¼" circular saw, a couple of upgrade blades, a combination square, spring clamps, a full sheet of ½" plywood, yellow wood glue, and a sheet of 1" extruded foam insulation. Bank the leftover money, about \$10. Then, head to your new shop and make your first projects: two straightline cutting guides.

► **Crosscut:** A cut that runs perpendicular to the wood grain.

► **Rip cut:** A cut that runs parallel to the wood grain.



Start with straight cuts. Use your new circ saw to turn a sheet of plywood into two jigs that guarantee perfectly straight crosscuts and rip cuts on sheet goods. Find free plans and a video of the process at woodmagazine.com/ideashop6.



Paycheck 2

Bank everything from this check. But still spend a little time in the shop making a simple but accurate crosscut guide for your circular saw. It will come in handy when you make a pair of sawhorses from materials purchased with the next paycheck.



A guide made from leftover plywood helps you make accurate and square crosscuts in dimensional lumber.

woodmagazine.com



Paycheck 3

Buy a 12- or 18-volt cordless drill, some driver bits to make it easier to drive screws, and materials to make a pair of folding sawhorses. Stuff the few remaining dollars in your bank. Don't worry about drill bits yet; you don't need them to build the sawhorses, so buy them with the next check.



Use your crosscut guide to help cut 1x4s to length, and the drill to drive screws to assemble a pair of these sawhorses that store flat against a wall.



Paycheck 4

► Watch a short video of Idea Shop 6 taking shape, updated with each paycheck. woodmagazine.com/is6progress

About half of this amount buys some drill accessories and one-hand bar clamps. Make a drum-sanding jig and a drilling guide from scraps of plywood. And of course, bank the leftover money.

You're on your way! Next issue, with the next four paychecks, you'll add more tools, accessories to make the most of them, and begin building lumber storage. 🌲

► **Buying Smart:** The one-hand clamps we purchased came from Menards (menards.com) and work with blocks in the workbench built later to secure items to the edges and ends of the bench. Suitable substitutions are Jorgensen ISD-3 (ponytools.com) and Irwin SL300 (irwin.com).

Produced by **Craig Ruegsegger** with **Lucas Peters**



A jig can be as simple as two scraps of plywood glued together to help guide a drill bit perpendicular to a workpiece.



Two more scraps of plywood and two hose clamps create a jig to hold a drill equipped with a sanding drum. Use it to smooth edges without rounding them over.

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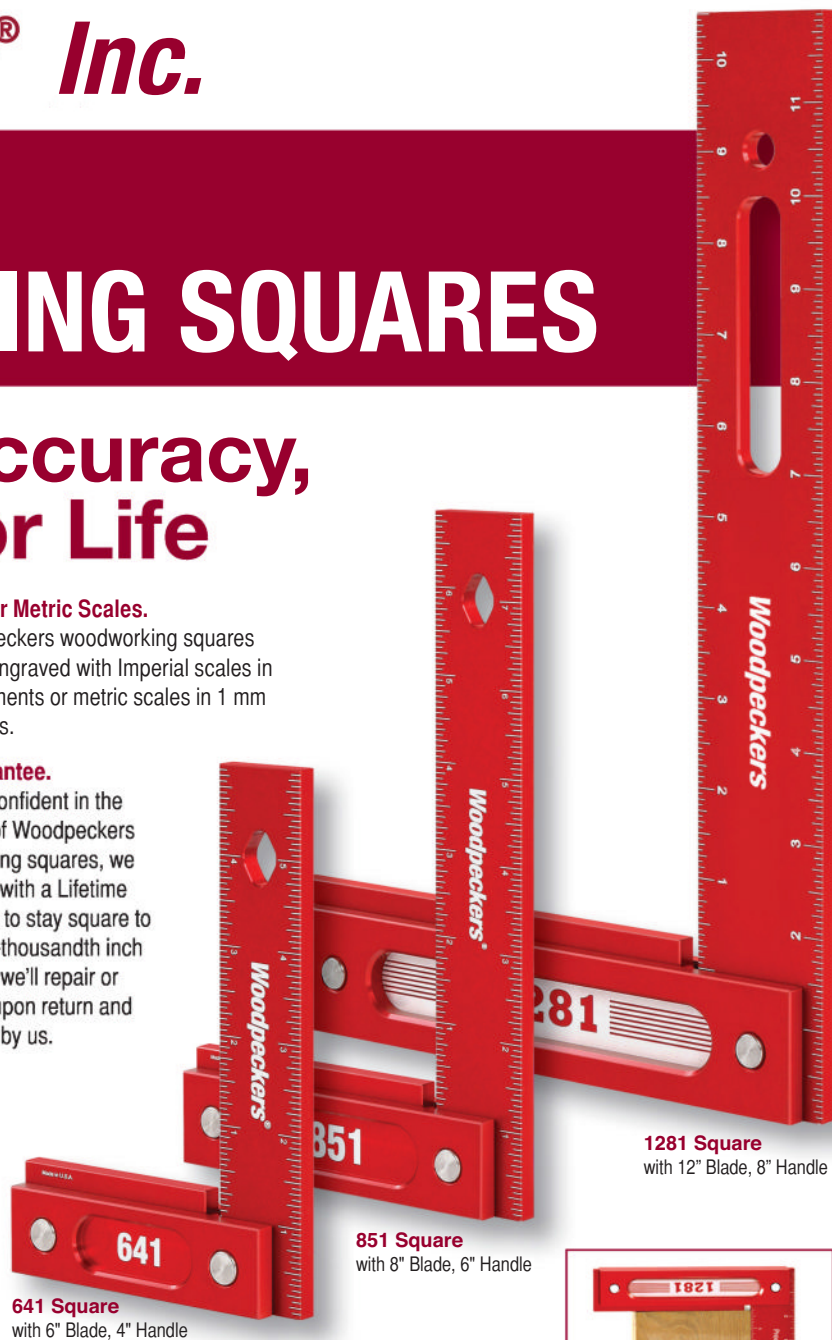
To complete the square handle we add two precision-machined aluminum cheeks. Stainless steel pins fasten the cheeks and ensure bulletproof rigidity and perfect alignment. The result is strength and precision that cannot be matched by squares using separate blade and handle parts.

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641 Square
with 6" Blade, 4" Handle

851 Square
with 8" Blade, 6" Handle

1281 Square
with 12" Blade, 8" Handle



All our woodworking squares feature a notch on the inside corner of the handle so you can mark your pencil line all the way to the edge of your stock.



The 641 Square, like its big brother 1281, also sports a $3/4$ " thick handle allowing it to stand on edge. You can check machine setups with both hands free to make adjustments. This handy little square is small enough to tuck into your shop apron pocket.



Our squares' handle design includes a lip so they can rest on the work unaided. The cheeks register against the stock for precisely square layout work.



The $3/4$ " thick handle easily stands on edge so you can check and adjust assemblies hands-free. The 1281 Square features handy finger holes for a firm grip when checking stock.

Woodpeckers® Inc.

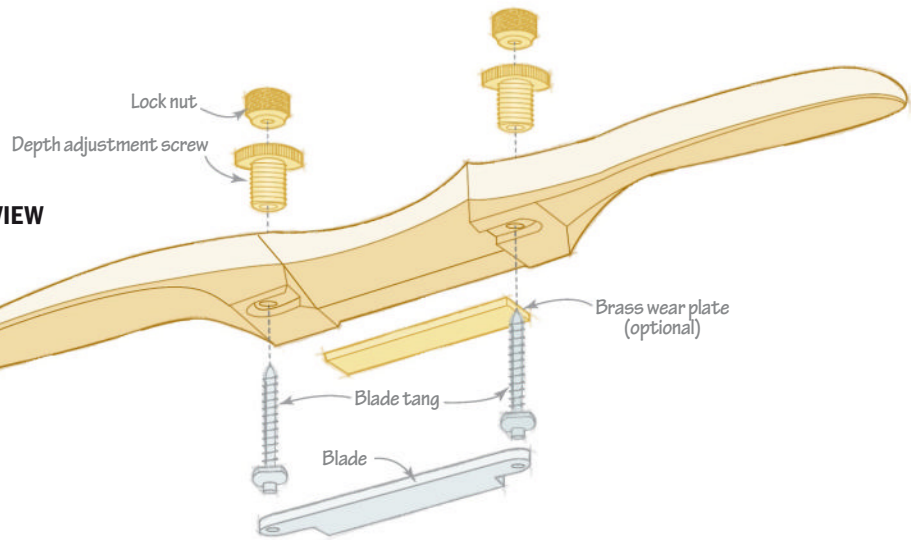
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Bent-lamination Spokeshave

Craft your own tool with a kit and a handful of wood.



EXPLODED VIEW



A spokeshave is the perfect choice for shaping and smoothing curved surfaces, oftentimes finishing the job quicker than a spindle sander. Store-bought spokeshaves can cost \$100 or more, though, so we created this project that uses a sub-\$40 hardware kit [Source] and lets you build the body from small cutoffs you've been saving. This shave, made of laminated thin strips, is the result of Design Editor John Olson's tinkering and prototyping. Here's how you can make it.

Source:

Veritas small spokeshave kit: no. 05P33.40, \$38.50, Lee Valley, 800-871-8158, leevalley.com.

Laminate the body

Before you glue up the body from a lamination of eight strips, you'll make the clamping form. And that clamp form has a cocobolo insert that actually becomes the sole of the spokeshave.

► We show how to make the wood body to our specifications, but follow the kit's instructions for installing the blade.

1 Prepare a maple blank 1 1/4" thick, 11" long, and at least 6" wide. To one edge, glue a 3/8x1 1/4x11" strip of a dense hardwood. (We used cocobolo.)

2 Rip 1/16" strips from the blank [Photo A], creating two pieces of cocobolo and six of maple.



A A large blank makes ripping thin strips safer, so glue the cocobolo to the maple block before ripping the cocobolo and maple strips.

3 Rip a 2 1/2"-wide piece from the remaining blank. Into this piece, cut a 4" notch 1/2" deep centered on one edge. (Don't worry about getting a perfectly smooth bottom in the notch—that portion will be cut away later.) Cut a piece of cocobolo to fit the notch and glue it in [Photo B]. Joint this edge and glue the cutoff back onto the original blank [Photo C].

► Make a thin-strip ripping jig for making repeated precise cuts. woodmagazine.com/thinstrip



B Make a hard-wearing sole. The cocobolo insert becomes the spokeshave's sole (after all cutting and shaping has been done). Trim it flush to the maple edge when dry.

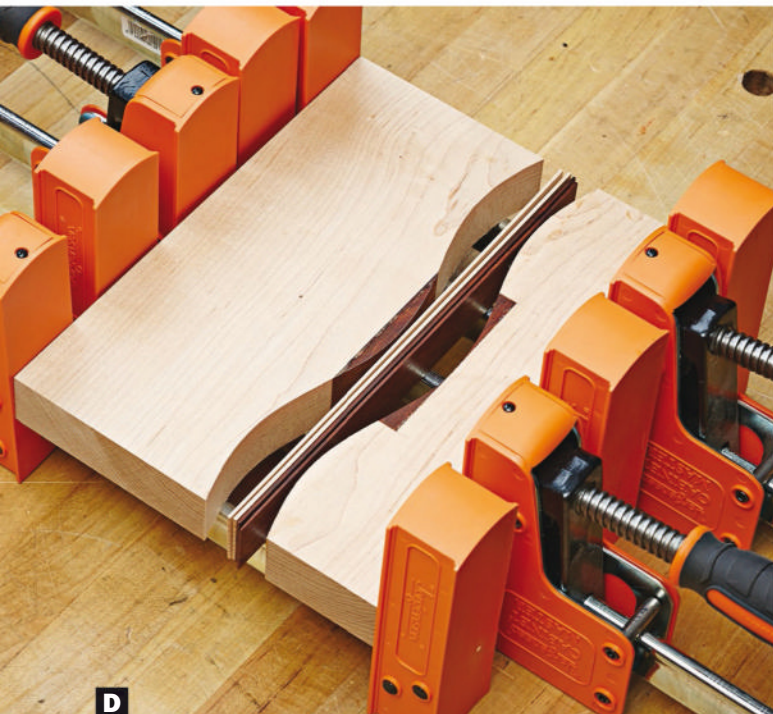


C Reclamp the blank's two sections, being careful to align the ends and faces of the workpieces.

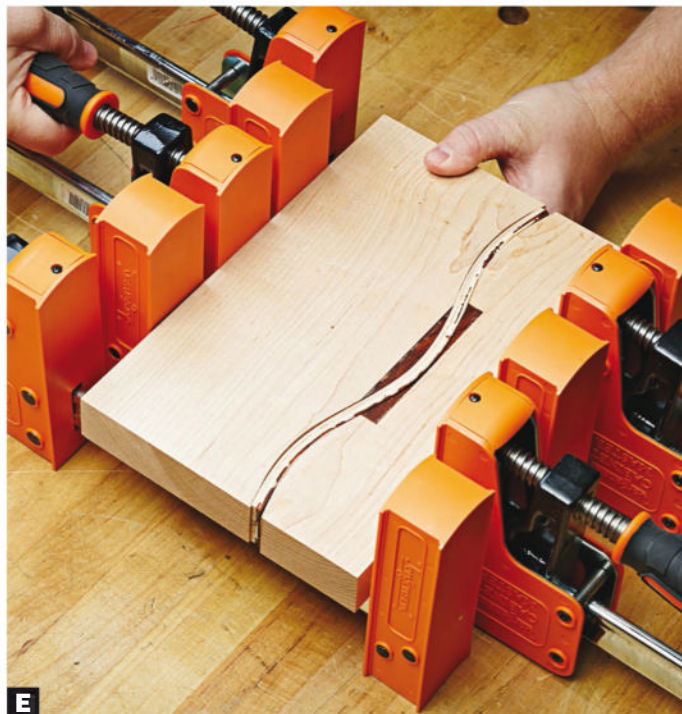
Tip! Before gluing oily woods, such as cocobolo, wipe the surfaces with acetone or lacquer thinner. This ensures a strong glue bond.

4 Make a copy of the **Side-View Full-Size Pattern**, page 52, cut it out, and trace along the top curve onto the blank, intersecting the top corners of the cocobolo section. (Save the pattern for use again, later.) Bandsaw along that line in one continuous cut, and sand both edges smooth. As you sand, nest the forms to make sure they fit together with no gaps.

5 As you begin the laminations, know that you won't be able to glue all eight strips together at once because the clamp form won't bend them all correctly. Instead, glue four strips together [**Photos D and E**], letting them dry in the clamped form for 24 hours. This will prevent the oily cocobolo from delaminating. When dry, glue the remaining maple strips together and to both forms; clamp and let dry for 24 hours.



D Start with two pairs. Position the two cocobolo strips next to the narrower form, and two maple strips next to the wider form.



E Glue up four strips and one form. Glue the four strips together, and glue those to the narrower form. Clamp them tightly before the glue sets.



F Drill $\frac{5}{8}$ " deep counterbores on the top to create clearance for the knurled depth-adjustment screws.



G Counterbore $\frac{5}{16}$ " holes in the bottom to a depth equal to the blade's thickness. Then drill $\frac{1}{4}$ " holes through the blank, centered in the counterbores.

Cut the body to shape

1 Scrape away dried glue and smooth both faces of the assembly. Rip along the top of the laminated “handle,” being careful to avoid cutting into the laminations. Next, rip the blank to 1¼", which should intersect the bottom of the cocobolo insert. Then, cross-cut the blank to 9¾" long, centering the cocobolo insert.

2 Lay out and drill the blade-tang holes according to the kit instructions [Photos F and G]. Rout a groove between the holes [Photo H], then thread the holes [Photo I].

3 Cut and shape the ware (the angled exit point for shavings behind the blade) [Photos J and K]. If you elect to install the included brass wear plate [Photo L], do so now according to the kit instructions.



Spokeshave blank

Router edge guide

H

Rout a 5/16"-wide groove parallel to the edge, connecting the two counterbores. Use a plunge router with an edge guide attached.



I

Thread the adjustment-screw holes. Using the tap included in the kit, cut threads into the body blank for the depth-adjustment screws.



J

Lay out the ware according to the kit instructions. Then, handsaw a series of closely spaced angled cuts, and chisel away the waste. Smooth the ware with a file.



K

Test-fit the blade to make sure it sits flush with the bottom. File the ware, if needed, to seat the blade.



L

The wear plate mounts in a dovetailed mortise in front of the blade. A dense hardwood, such as cocobolo, will resist wear without the plate.

4 Make a copy of the **Top-View Full-Size Pattern**, *right*, cut it out, trace around it onto the body blank, and cut to shape [Photo M]. Rotate the blank a quarter-turn and lay out the **Side-View Full-Size Pattern**, then cut to shape [Photo N]. Sand smooth when finished. Use rasps, files, and sandpaper to round over the top edges of the handles.

5 After sharpening the blade, install the blade assembly in the body, set the cutting depth by adjusting the large knurled knobs, lock the blade in place with the smaller knobs, and try out your shave on scrap wood. Once satisfied that your shave works well, remove the hardware and apply finish to the body. We used hard-wearing water-based polyurethane. 🌳

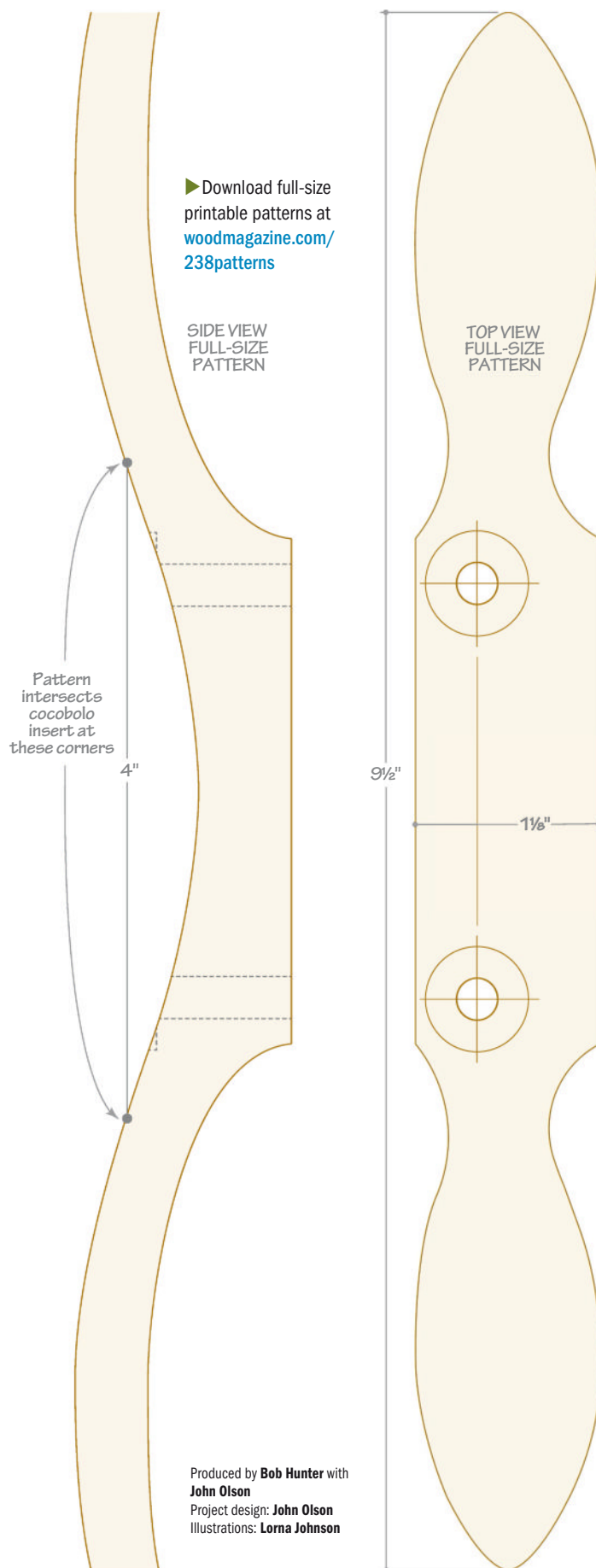
► To sharpen, simply remove the blade assembly from the body, and then the tang posts from the blade for no-restrictions sharpening on a flat surface. See how on page 26.



M **Shape the body front to back.** Bandsaw the handle curves to shape, staying just outside your pencil lines.



N **Now shape it top to bottom.** Cut just outside the lamination glue-lines—except for the sole's pattern—to bring the spokeshave to its rough final shape.



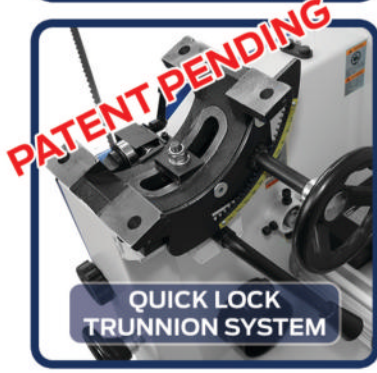
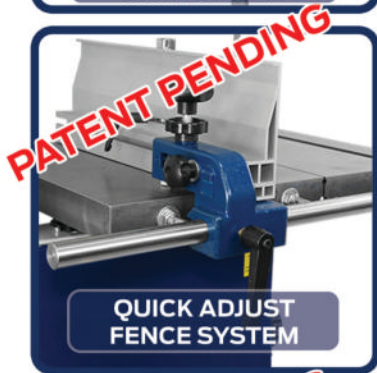
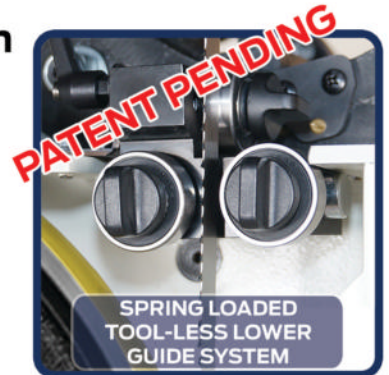
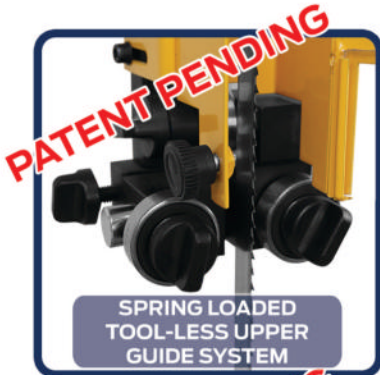
Produced by **Bob Hunter** with
John Olson
Project design: **John Olson**
Illustrations: **Lorna Johnson**

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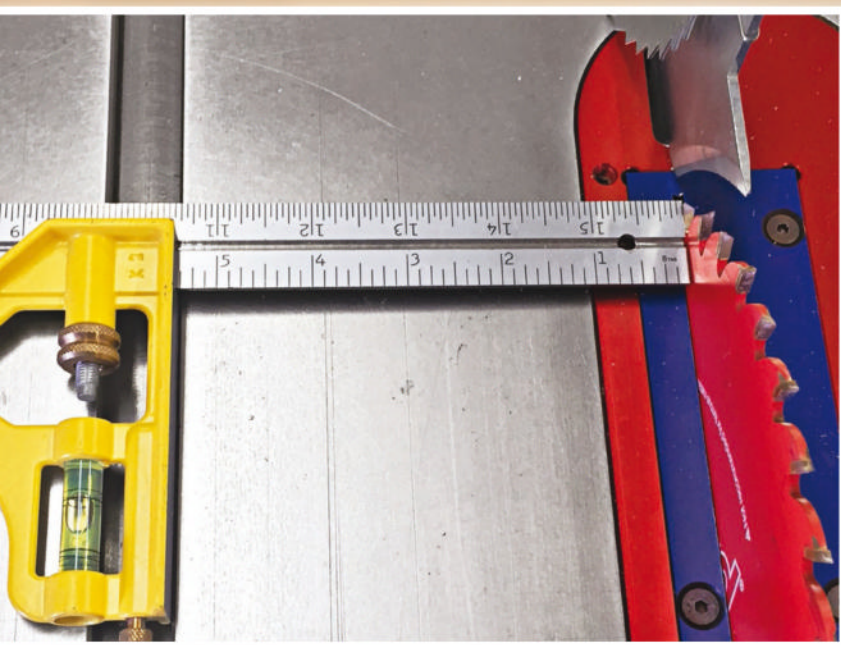
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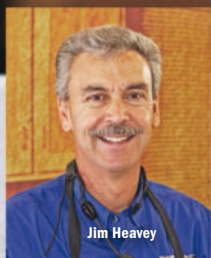
Two-saw Tune-up

Invest a day in bringing your bandsaw and tablesaw back to peak performance.

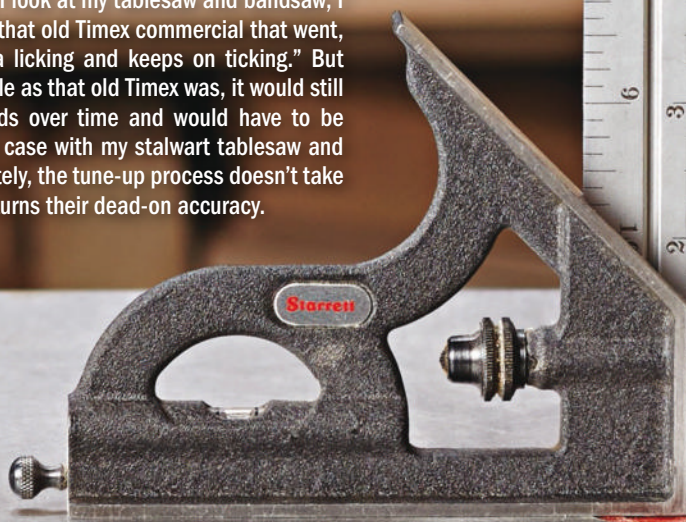
By Jim Heavey



Whenever I look at my tablesaw and bandsaw, I think of that old Timex commercial that went, "Takes a licking and keeps on ticking." But even as dependable as that old Timex was, it would still lose a few seconds over time and would have to be reset. Such is the case with my stalwart tablesaw and bandsaw. Fortunately, the tune-up process doesn't take much time and returns their dead-on accuracy.



Jim Heavey



First, tune-up the tablesaw

► With each saw, have your owner's manual handy, unplug the tool, and remove the blade before beginning.

My tablesaw is a cabinet-style saw, but the steps to tuning it up are much the same for a contractor-style saw.

First, crank the blade arbor to full height, then inspect and clean the faces of the arbor flange and the blade washer. This ensures that the blade seats well when reinstalled [Photo A].

With the arbor raised, you can see the blade height and tilt worm gears and mating gear

teeth. These should be cleaned of all sawdust and old grease using a wire brush, compressed air, and, if necessary, a degreasing spray. I prefer using Gunk brand carburetor and choke spray cleaner; it works well to remove grease and varnish from metal parts.

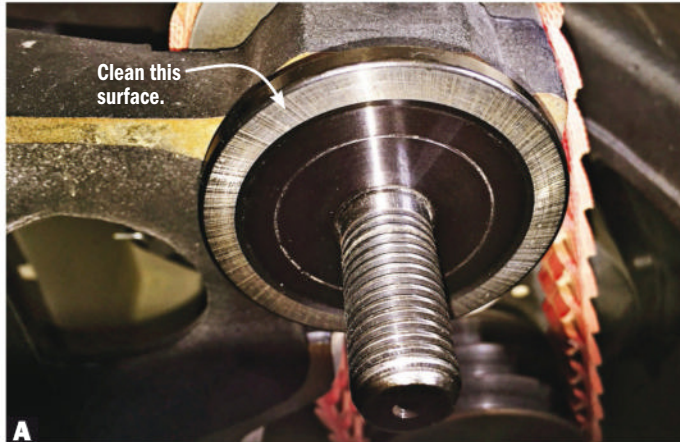
When the parts are clean and dry, apply a dry-spray lubricant to the worm gears, teeth, and the trunnion (the mechanism that holds the arbor and blade) pivot points. For this, I prefer WD-40 Dirt & Dust Resistant Dry Lube spray. Last, apply penetrating lubricant to the hand-wheel shaft points and bearings [Photo B]. Standard WD-40 works well for this.

Check the belts next. Replace cracked pulleys and frayed belts. While you're there, a good blast of compressed air into the motor will clear dust that can keep the motor from running cool. Now it's on to the top of the table.

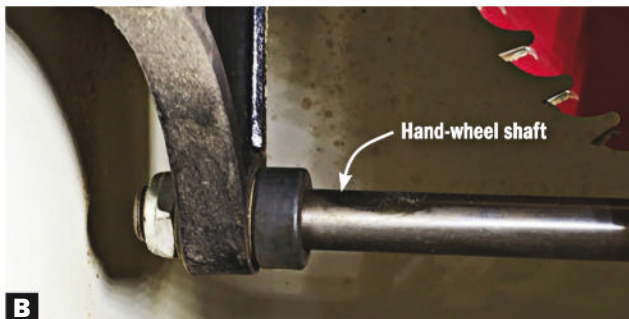
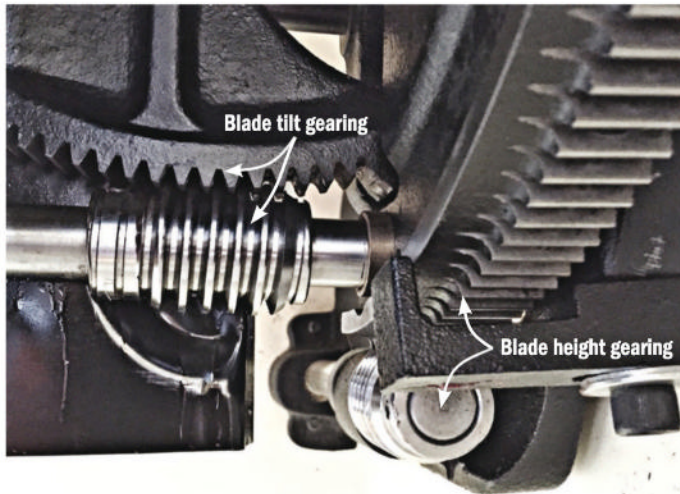
To check for flatness, place a long straight-edge across the width of the table and any extensions. Inserting thin brass shim stock (available in assortment packs online) at a couple of points between the extension and the table can change the "pitch" of that extension. Shims at the top of the joint lower the outside end of the extension; shims at the bottom of the joint raise the end. Tighten all connecting bolts and nuts. Then use that straightedge to ensure the saw's throat plate rests flush with the tabletop [Photo C]. Most throat plates have screws for adjusting the plate up or down. A plate without these screws can be shimmed with pieces of painter's tape.

► Dirty blades? Clean them up.
woodmagazine.com/cleancutters

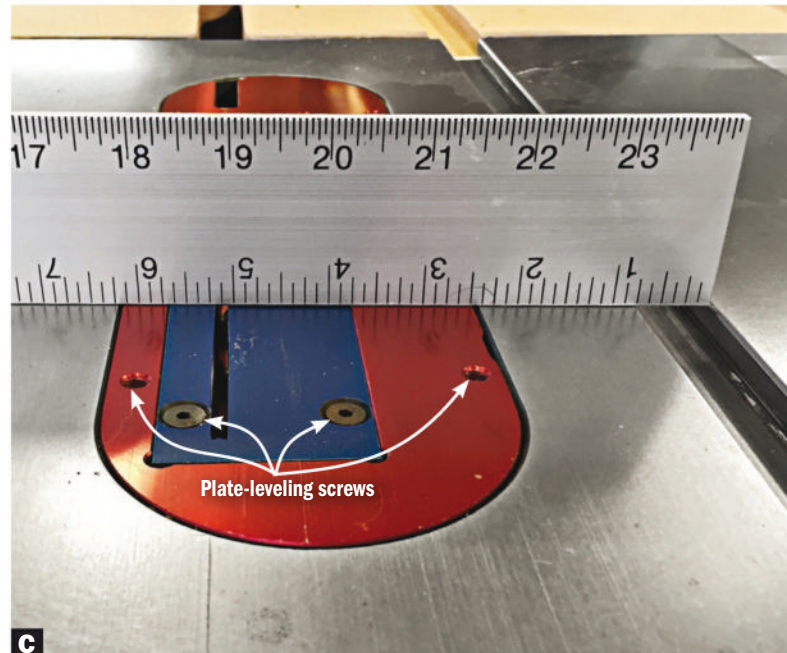
► Replacing your old V-belt with a link belt is easy and results in a much smoother-running saw. This "cure" also works well in other belt-driven tools such as bandsaws and jointers.
woodmagazine.com/linkbelt



A **Clean your face and take a seat.** Remove debris stuck on the arbor flange with a putty knife and a bit of mineral spirits. A blade will rest flat against this freshly cleaned flange.



B **Tough to reach, crucial to clean.** Access to these areas is tight, but cleaning the dust and pitch from between the teeth is vital to maintaining the tool's accuracy and ease of use. Keeping the wheel-shaft bearings (bottom) lubricated will make turning the wheel to make adjustments a breeze.

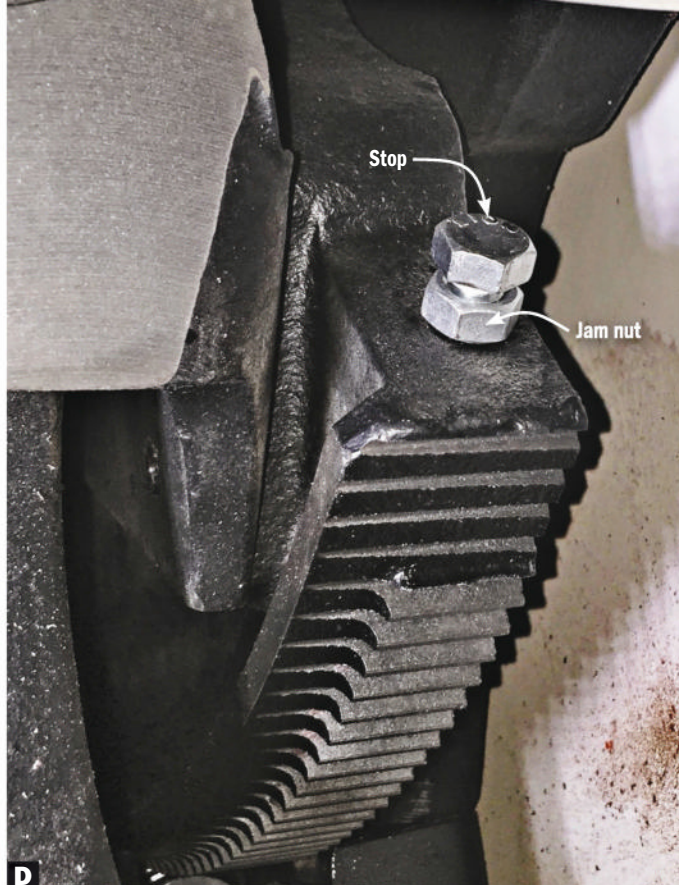


C **Pieces should slide smoothly across the throat plate.** If the saw's throat plate isn't flush with the table, the inaccuracy will transfer to workpieces.

After reinstalling the blade, raise it fully and tilt it to its 90° stop. Confirm an exact 90° using a quality square, touching the blade body and the tabletop. Adjustments to the stop are done under the table. Find the stop's location [Photo D] in the owner's manual. Use the same process to check the 45° setting of the blade and adjust its stop as necessary.

The last check of the blade is to assure that it is parallel with the table's miter-gauge slot. Place a combination square in the saw's left miter-gauge slot, resting against the right edge of the slot. Slide the rule to just touch a tooth at the front of the blade. Rotate the blade, moving the same tooth to the back of the table and use the square to check the distance there [Photos E and F].

To fix a gap or binding, the process is different based on the type of saw: On a cabinet saw, slightly loosen three of the four bolts that hold the top to the base and pivot the top slightly. Then, retighten the bolts. On a contractor-style saw, the bolts are inside the saw underneath the top and a bit more difficult to reach. There, you'll be moving the trunnion instead of the table to adjust the blade parallel to the miter slot.



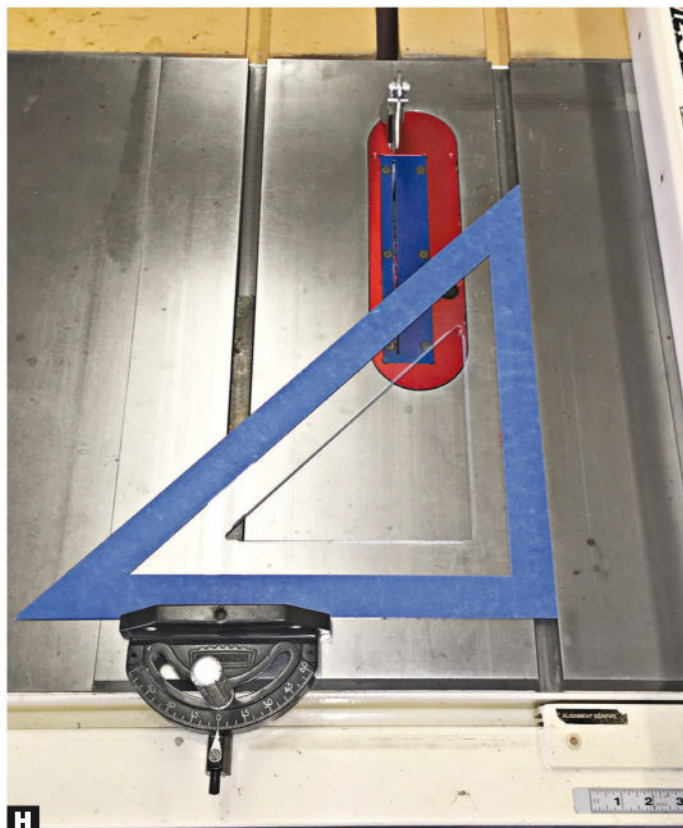
D **Just stop it!** On my cabinet saw, the 90° stop adjustment is at the end of the blade tilt gear. Loosening the jam nut and turning the hex bolt sets the correct angle. The 45° stop is at the opposite end of the gear.



E **Slide from front to back.** Use care when sliding the square so as not to damage the blade teeth. A gap or binding between the square and tooth means the blade is not parallel to the miter slot.



G **Slide in the slot.** Rest the combination square against the right edge of the right miter slot. The square's rule should touch the fence face at the rear as it does the front edge.



H **Watch your edges.** Apply painter's tape to a plastic 90° triangle to help define the triangle edges and make any misalignment easy to spot.

Now, in a similar fashion, use the right miter slot to align the fence [Photo G]. Each fence has a different method of adjusting its alignment, and the manual will show you how.

Because the miter slot is used as a reference to align the blade and the fence, it makes sense to use it to align the miter gauge, too. A drafting triangle placed along the edge of the right slot will accurately square the face of the miter gauge [Photo H]. Once set, lock the miter gauge's cursor (and stop, if any) at 0°.

Last, it's important to check the alignment of the splitter or riving knife. A properly placed splitter will all but eliminate any chance of a dangerous kickback. Whether it's part of the blade guard or an aftermarket stand-alone, the splitter must sit directly behind the blade and not extend beyond the edges of the blade. One of the simplest ways to check this is to lay two straight boards on either side of the blade and set the splitter evenly between them [Photo I]. Recheck this alignment whenever the splitter is removed and reinstalled.

Finish up the tablesaw tune-up with a thorough cleaning of the tabletop and a coat or two of a non-silicone wax. This will inhibit rust formation while reducing the drag you feel when pushing stock across the table.

► Check the fence's alignment regularly. Normal use can knock the fence out of alignment.



I **Now is the time to split hairs.** The splitter shown is sized to work with regular 1/8"-kerf blades. If you use both regular and thin-kerf (3/32"), you'll need a separate splitter for each.

Now, strike up the band(saw)

► How to fold a bandsaw blade:
woodmagazine.com/foldbandsawblade

► Learn how to remove and replace bandsaw tires.
woodmagazine.com/bandsawtires

Begin by backing off the guides to remove the blade. It's wise to wear a pair of thick work gloves and eye protection when handling these springy blades.

After thoroughly brushing and vacuuming off any embedded sawdust, inspect the upper and lower wheels. The tires on these wheels are made of rubber, neoprene, or urethane, and they should have no obvious tears, cracks, or checking. If they are very worn or have deep grooves, replace them.

In order for the blade to track correctly, the tires should be crowned. This slightly raised center section is where the blade rides during normal operation. If the tire has become flat from wear, re-crowning can be done in a few minutes using a sanding block and 100-grit sandpaper [Photo J].

The wheels should also be checked to ensure they are coplanar. A long straight-edge should touch the tops and bottoms of both wheels simultaneously in order for the blade to track on the center of both wheels [Photo K]. Make any needed adjustments using the tilt adjustment on the top wheel [Photo L].

Reinstall the blade on the center of the tires and add tension while slowly turning the top wheel by hand. Minute tracking adjustments can be made by using the tilt adjustment until the blade tracks evenly at the center of both tires for at least two complete revolutions.



K Here's the long and short of it. A couple of particleboard extensions allow my straightedge to reach the top and bottom of both wheels while clearing the saw frame. I had to remove the table to gain access to both wheels.



J Get down to the nitty-gritty. While turning each wheel by hand, angle a sanding block with 100-grit sandpaper to restore the radius. I check my progress often using a contour gauge until the tire matches the profile suggested by the manufacturer.



L Keep everything on an even keel. With the bottom wheel's position fixed, use the tilt knob to align the top wheel.

I have faith in my tension gauge. If you don't, raise the blade guard all the way and, using moderate finger pressure, check the blade's side-to-side deflection. It should deflect no more than $\frac{1}{4}$ " at its center when tensioned correctly [Photo, page 54]. When the saw is not in use, remove all tension to preserve the integrity of the wheels and bandsaw frame.

Now, set the blade guides. The side guides keep the blade centered and eliminate twisting.

With the blade under tension, adjust the upper guides (those above the table) [Photos M and N].

Next, adjust the thrust bearing. It rests behind the blade and stops rearward movement of the blade during cutting [Photo O].

Repeat these steps when setting the lower blade guides. Hand-spin the wheels to check blade tracking and make any final adjustments before giving the blade a short test with the motor running.

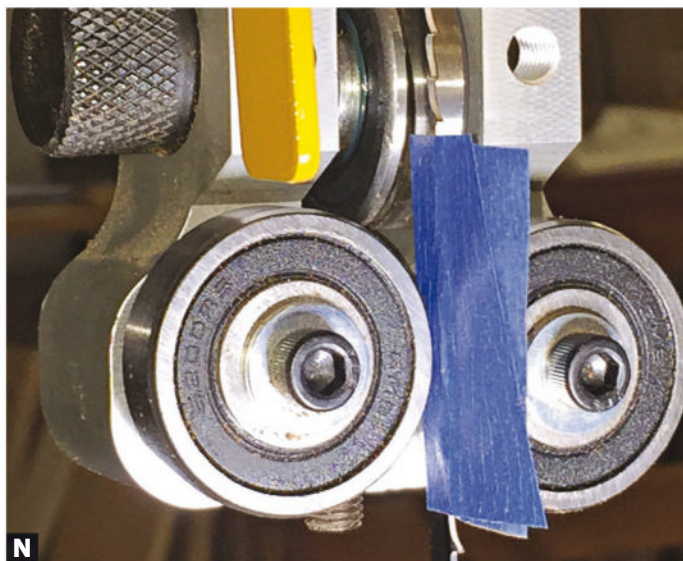
Like the tablesaw, the tabletop must be set

90° to the blade [Photo P]. Using a square, check if the bandsaw's fence sits perpendicular to the tabletop. To align my fence, I added a thin shim to the underside of my fence where it was bolted to its base. But having done that, I then had two tools that ran just like that old Timex watch. 🌲

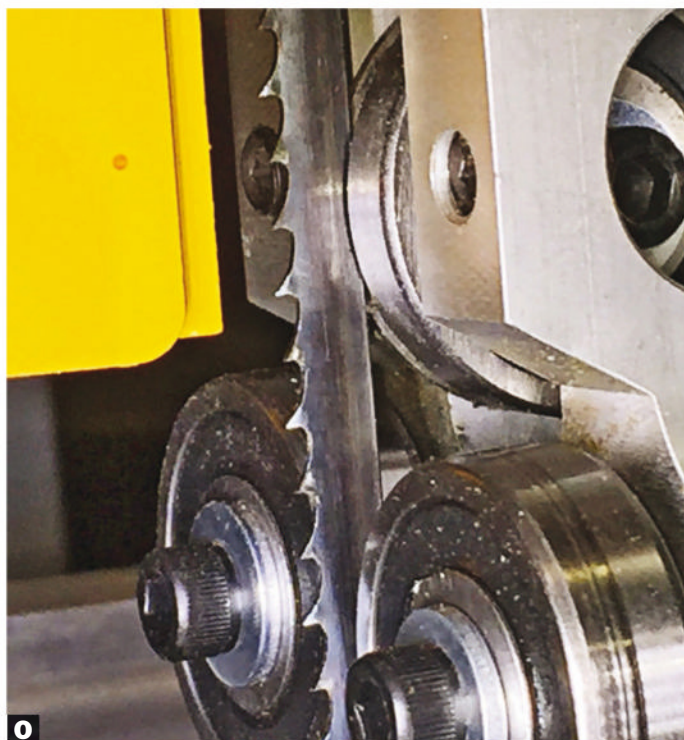
► Check out these top-rated bandsaw blade guides. woodmagazine.com/bandsawbladeguides



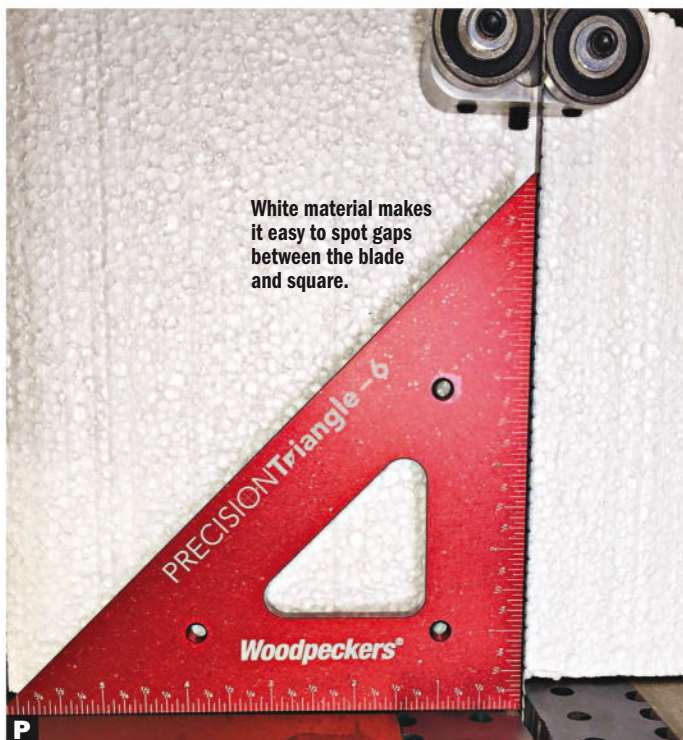
M **Don't get too close to the teeth.** Position the edge of each guide approximately $\frac{1}{64}$ " behind the blade's gullets. The guides should never touch the teeth.



N **Mind the gap.** Wrap a piece of painter's tape around the blade and gently press each guide against it to ensure the correct spacing between the blade and guides.



O **This bearing has your back.** The space between the face of the thrust bearing and the back of the blade should be, as with the side guides, about the thickness of a strip of painter's tape.



P **It's good to be square.** Using a square, check the blade and adjust the table tilt to get that perfect 90° before locking it in place, and setting the stop and cursor at 0°. The higher you raise the guard, the more accurate the setting will be.

Pop a Top

It's a bottle opener and a conversation starter.

When we tasked our turning pro, Brian Simmons, to create a handle for this bottle-opener kit [Sources], he initially cranked out a ho-hum handle, then tested his creation on a bottle of cold brew. That's when Brian got a thunderbolt: Make the opener look like the bottle!

► Watch Brian turn this bottle opener.
woodmagazine.com/opener

William Painter invented the “crown cork” crimped and sealed metal lid (with cork liner) for bottles in Baltimore in 1892. Shortly thereafter he invented the churchkey-type of bottle opener. (Probably because he was thirsty.)



Start with the hardware

Tools: Lathe drill chuck, $\frac{3}{16}$ " drill bit, live cup center

Speed: 500 rpm

► If you don't have a dedicated lathe chuck, you can use the chuck from your drill press if its spindle taper matches that of your lathe's headstock.

Tip! A $\frac{1}{2}$ " drill bit will work in hardwoods ($\frac{1}{16}$ " in softwoods) but only if you use two-part epoxy to hold the insert securely.

Prepare a $2\frac{1}{2} \times 2\frac{1}{2} \times 9\frac{1}{2}$ " blank. (We chose walnut to resemble a brown beer bottle.) If you can't find a solid-wood blank this size, laminate two pieces that match closely in color and grain pattern.

Mark the centerpoint on each end of the blank. Mount a drill chuck and a $\frac{3}{16}$ " brad-point or twist bit in the headstock, and a live cup center in the tailstock. Trap the blank between the drill bit and live center, and bore a $\frac{1}{4}$ "-deep hole for the threaded insert [Photo A]. Remove the blank when finished drilling.

To seat the threaded insert (included with the kit), make a custom mandrel by cutting the head off a $\frac{5}{16}$ -18 $\times$ 3" bolt. Mount the cut end in the drill chuck [Drawing, page 62]. Thread on a pair of hex nuts against the chuck jaws, followed by a $\frac{5}{16} \times \frac{3}{4}$ " flat washer. Thread the insert onto the bolt tight against the washer and nuts; lock the nuts together. Trap the blank between the insert and live center, and thread the insert in until flush [Photo B]. Leave the blank mounted in this manner for turning to shape—no need for a drive center.

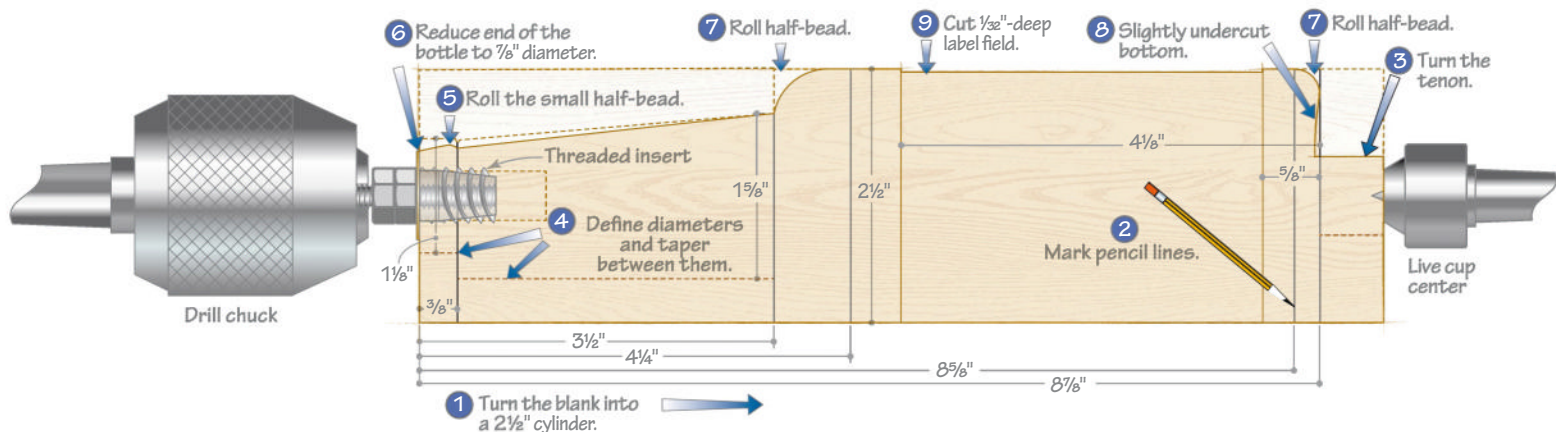
► A copper washer is easier to see than a steel washer while turning and won't damage turning chisels should you accidentally cut into it. Brass also works in this case.



A Position the tool rest against the blank to keep it from turning. With the lathe running at 500 rpm, slowly feed the blank into the bit by turning the tailstock's quill-feed handle.



B Without running the lathe, use a $\frac{1}{2}$ " wrench to thread the insert into the blank while also advancing the tailstock quill-feed handle.



Now shape the bottle

Tools: Spindle roughing gouge, parting tool, spindle detail gouge, skew chisel

Speed: 1,200 rpm

Use a spindle roughing gouge to turn the blank to a 2½" cylinder. Smooth the cylinder with a skew chisel if necessary. Mark the critical dimensions [Drawing], and then use a parting tool to reduce the diameter at the tailstock end to a tenon slightly larger than that of the live center.

Make parting cuts to define the base of the lip [Photo C] and the neck, and then shape the neck [Photo D]. Next, define the bottom of the lip [Photo E]. Make planing cuts with the skew to refine the neck. Then, finish shaping the lip [Photos F and G].

Add a half-bead at the top and bottom of the barrel [Photo H, Drawing]. Undercut the end of the blank slightly with the same gouge [Photo I]. This helps the opener sit upright when finished.

Using the skew chisel, make a ⅛"-deep V-cut at the pencil lines. Sand the lip, neck, and barrel half-beads, progressing from 120 to 220 grit. Cut away the section between the V-cuts for the label [Photo J]. Sand the label field when finished.

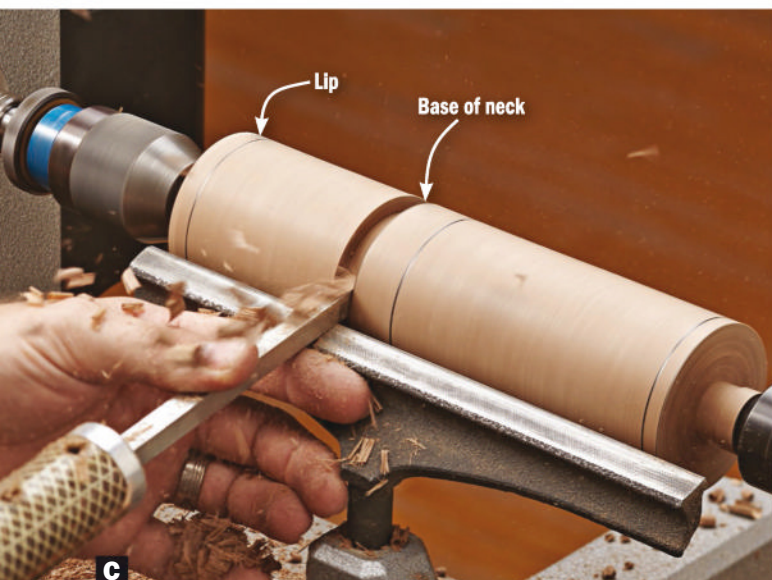
Stop the lathe, pull the tailstock away, and snap off the tenon. Unscrew the bottle and remove the mandrel. Mount a small sponge-back sanding disc [Sources] in the chuck, turn it on at 500 rpm, and sand the bottom smooth. Apply your choice of clear finish. We used water-based polyurethane for its durability, a necessary feature when opening wet bottles. Screw the opener into the insert and pop a top.

Produced by **Bob Hunter** with **Brian Simmons**

Project design: **Brian Simmons**

Illustrations: **Lorna Johnson**

► If you'd like to apply an actual label to your opener, you can find many brands and styles, including vintage ones, on eBay. Glue the label in place, then coat it all with a clear finish.



C Remove material from the blank until the base of the neck measures 1⅞" in diameter. Reduce the end of the neck (lip) to ⅞" diameter.



D With your spindle roughing gouge, remove most of the material between the lip and the base of the neck.



E Make a $\frac{1}{16}$ "-deep V-cut with a skew chisel at the base of the lip. This defines the top of the neck.



F Chamfer the lip to $\frac{7}{8}$ " diameter at the end with a skew chisel.



G Make a small half-bead with a detail gouge on the bottom of the lip.



H Using a spindle detail gouge, form a smooth half-bead transition from the barrel to the neck. Leave the pencil line for the label.



I When undercutting the bottom of the barrel— $\frac{1}{16}$ " deep will do—taper the tenon down to about $\frac{1}{2}$ " in diameter.



J Create the label field with a skew chisel by making planing cuts from the center of the section outward to each V-cut. 🌲

► Watch FREE videos with turning tips and techniques.
woodmagazine.com/turningvideos

Sources

■ Bottle opener hardware kit: no. 44185 (pewter) or 42387 (chrome), \$9.99, Rockler Woodworking and Hardware, 800-279-4441, rockler.com.
■ 1" sponge-back disc sander (sandpaper discs sold separately): no. FR71000, \$8.95, Klingspor's Woodworking Shop, 800-228-0000, woodworkingshop.com.

► Find more turning projects.
woodstore.net/plans/turning

Versatile, roll-around Culinary Island

This handy helper adds more than 4½' of counter and always-useful drawer space to any kitchen. And you can wheel it wherever you need it.

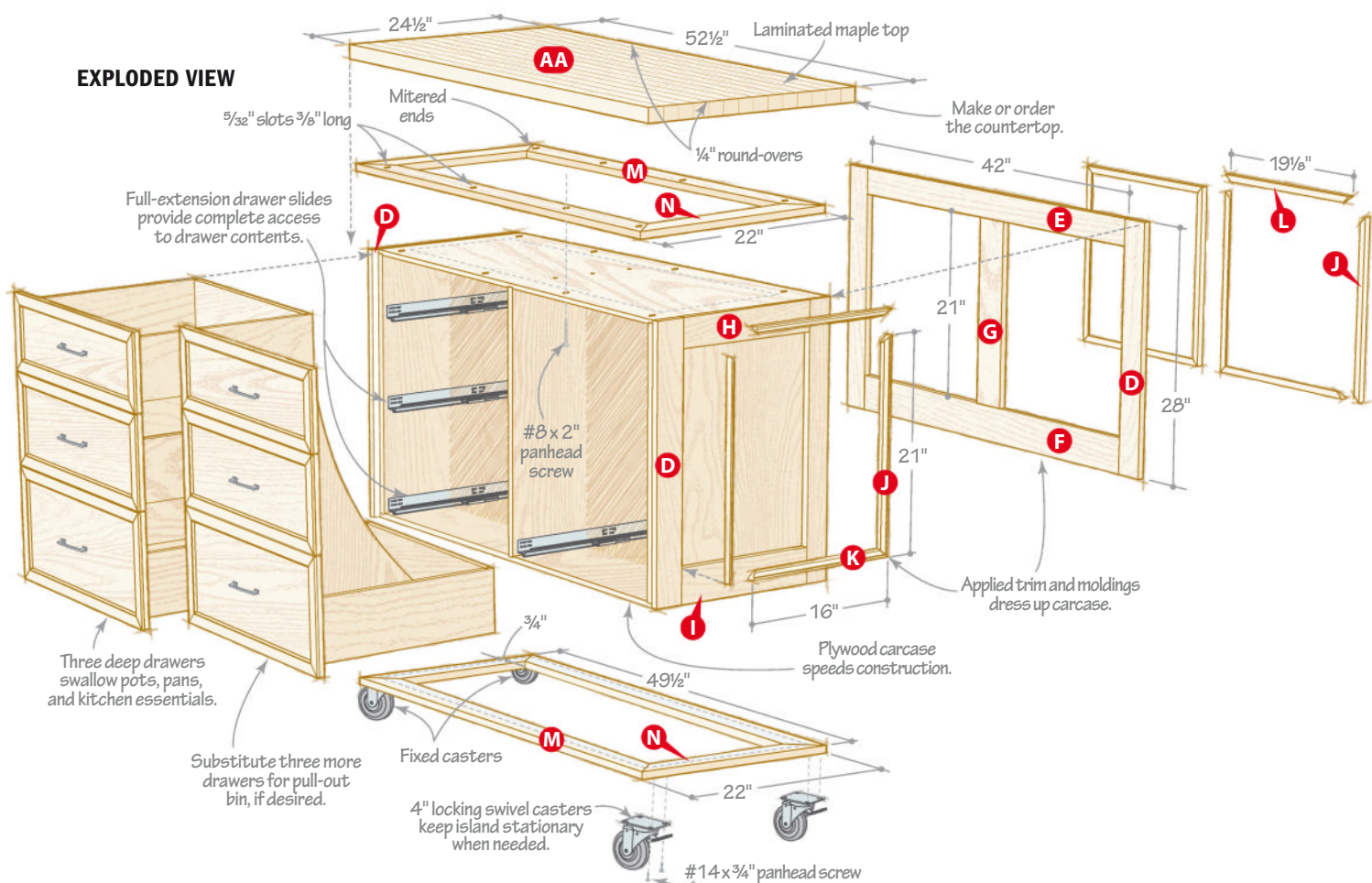


D I M E N S I O N S :
52½" L x 24½" W x 36" H

Approximate materials cost:

\$350

2
garbage/
recycling
bins fit inside



Kitchens and workshops are a lot alike: Neither ever seems to have enough storage or worksurface. This rolling cabinet you can make in your workshop will neatly solve both kitchen problems with a generously sized maple top plus three roomy drawers and slide-out space for trash and recycling bins.

To start, build a basic box

1 Cut to size the carcass top and bottom (A), sides and divider (B), and the back (C). [Materials List, page 70; Drawing 1].

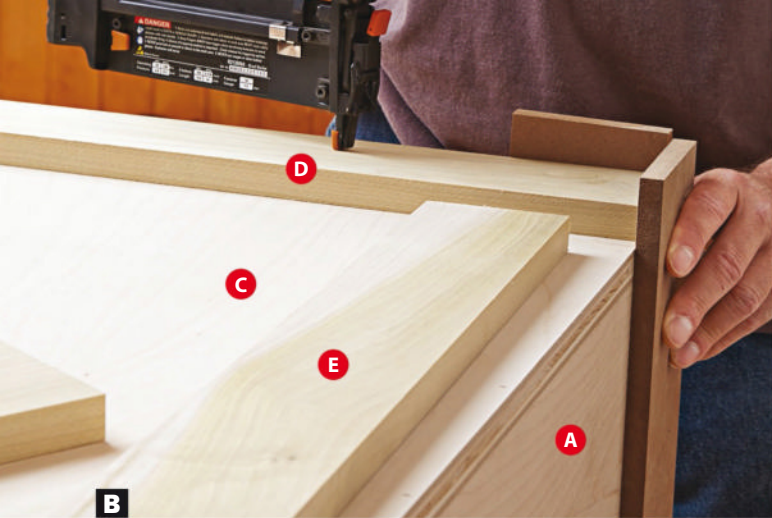
2 Cut rabbets and a dado in the inside faces of the top and bottom. Drill pilot holes for screws, then assemble the top, bottom, sides and divider [Photo A].

3 Glue and screw the back (C) to the A/B assembly. Trim, applied next, covers the screwheads and plywood edges, so don't fill them. Sand the sides and back smooth and flush, working up to 220 grit.

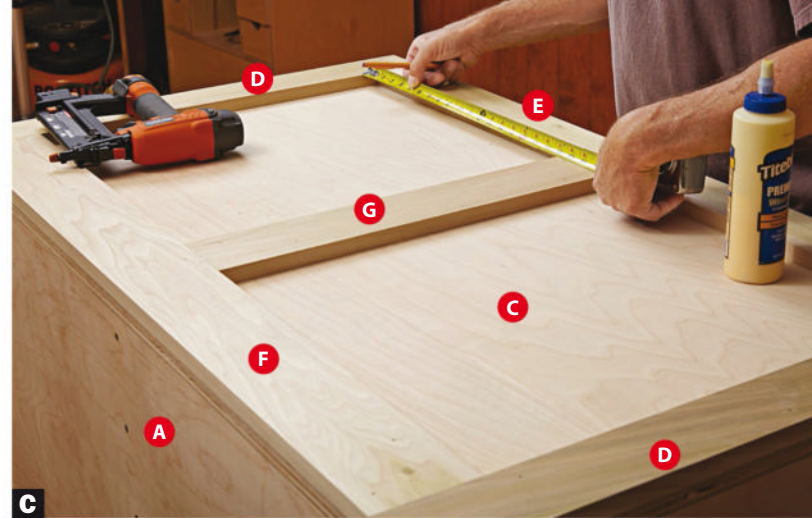
Tip! Measure both diagonals on the front of the carcass as you glue and screw it together—equal measurements indicate a square assembly.



A Keep the edges flush as you glue and screw the sides and divider (B) in place. Drive the screws slightly below the surface.



B Hold two pieces of scrap against the corner to keep the stile (D) flush. A pneumatic brad nailer works faster and better than driving small finish nails with a hammer.



C Measure from each end stile (D) to the center stile (G) to center it on the back. Glue and nail the center stile, followed by the back bottom rail (F).

Refine the box with trim

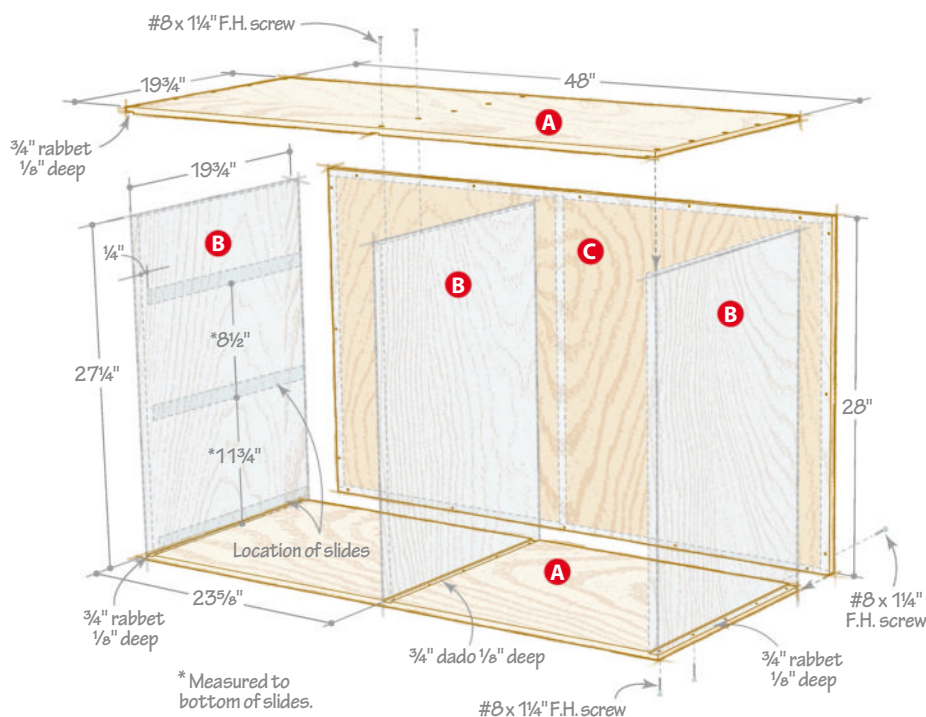
- 1** Cut the rails and stiles (D–I) to size. Sand the edges to 220 grit.
- 2** Lay out the stiles (D, G) and rails (E, F) on the back (C) to double-check their fit. Similarly test the end rails and stiles. Then, glue and nail a stile (D) to the back (C) at one end of the carcass [Exploded View, Photo B].
- 3** Attach the back top rail (E), followed by a stile (D) at the other end of the back. Then, add the back center stile (G) and back bottom rail (F) [Photo C].
- 4** In similar fashion, glue and nail the stiles (D) and rails (H, I), to the sides (B). Start at the back of each side, aligning the edge of

the side stile flush with the face of the stile attached to the back.

5 Cut stock for the moldings (J, K, L) to fit [Skill Builder]. Rout a $\frac{3}{4}$ " reverse ogee [Sources, page 70] along one edge of each piece, then attach the moldings to the carcass [Exploded View].

6 Cut the frame fronts/back (M) and sides (N) slightly overlength, and miter-cut them to fit the top and bottom of the carcass [Exploded View]. Nail and glue the frames in place [Photo D].

1 CARCASE

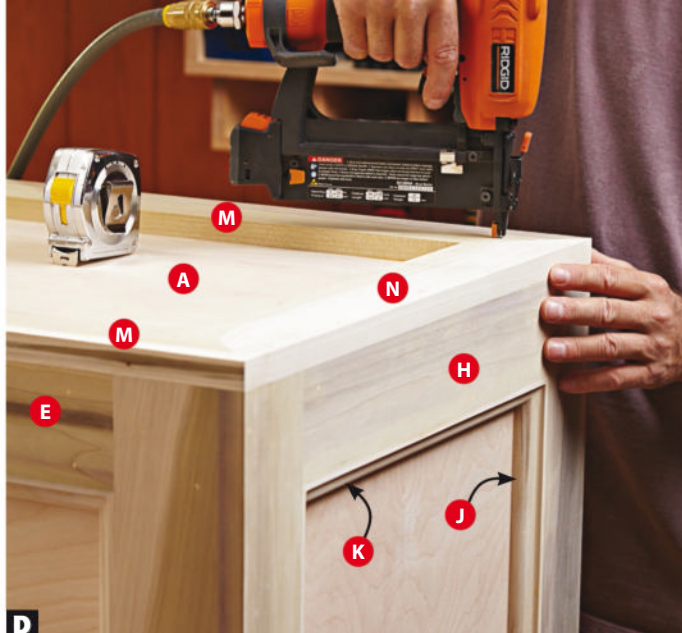


Skill Builder

Measure moldings in place for tight-fitting corners



Instead of cutting moldings to the lengths shown in the **Materials List**, cut each piece an inch or so longer than specified. Then, miter-cut one end of one vertical molding (J). Hold it in position against one back stile (D) and scribe its length. Miter-cut the molding to length. In the same way, miter-cut the other vertical and the back horizontal moldings (L) to fit the frame. Glue and nail the moldings in place, and repeat for the other frame on the back and those on both sides.



D Bring the edges of the top/bottom frames (M/N) flush with the stiles and rails. Sand the faces of the stiles and rails and the edges of the frames smooth for painting.



E A pair of passes over a $\frac{3}{4}$ " dado blade cuts the notch neatly. Set up the cut carefully to avoid cutting into the drawer sides (P) or bottoms (Q).



F Place the clip tight against the drawer front (O) and side (P). Drive the furnished screws snugly into the drawer front.

Build the drawers

We used undermount slides [Sources] so the hardware isn't seen with the drawer open. (See more details in *Sophisticated slides make top-notch drawers*, page 69.)

1 Cut the drawer fronts/back (O), sides (P), and bottoms (Q) to size [Drawing 2].

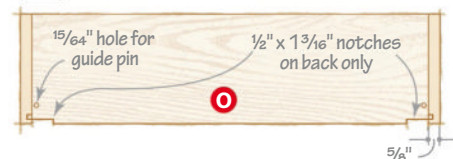
2 Cut grooves to fit the bottom (Q) in the drawer fronts, backs, and sides, followed by dados in the sides (P), and rabbets on the fronts/back (O) [Drawing 2].

3 Glue and clamp the drawer assemblies (O/P/Q), taking care to keep them square.

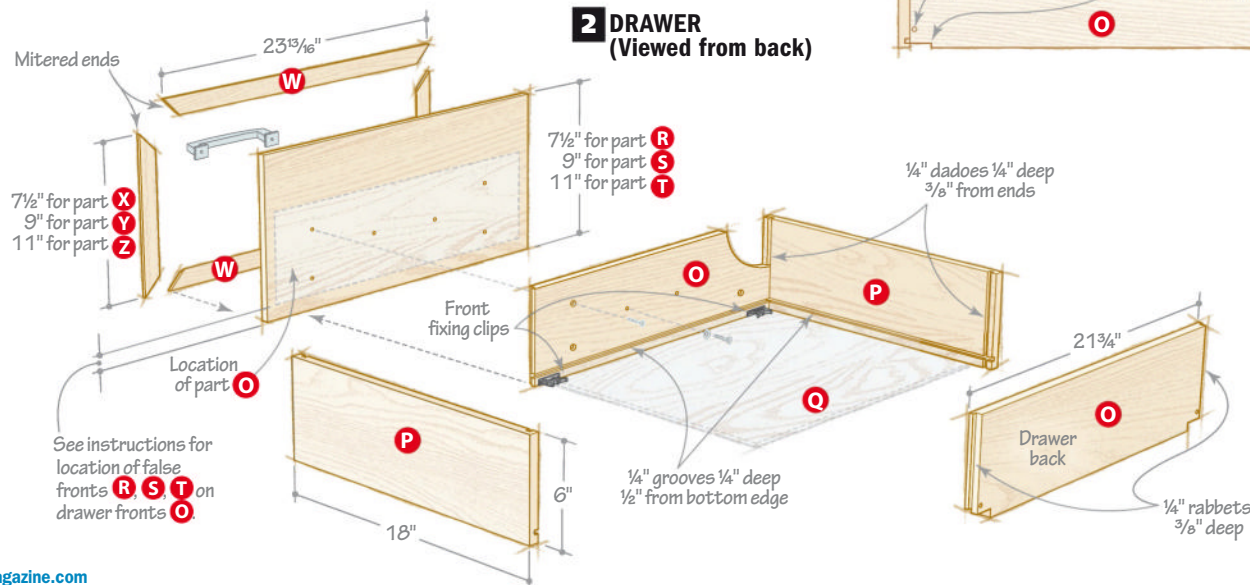
4 Notch the drawer backs for the slides [Photo E; Sources] and drill holes for the guide pins [Drawing 2a]. Refer to the instructions with your hardware for the exact hole locations and size.

Note: You can build the island with six drawers instead of three plus the trash/recycling drawer shown. Just build two more drawers (O–Q) and omit parts U and V. You'll also need two additional sets of drawer slides and clips.

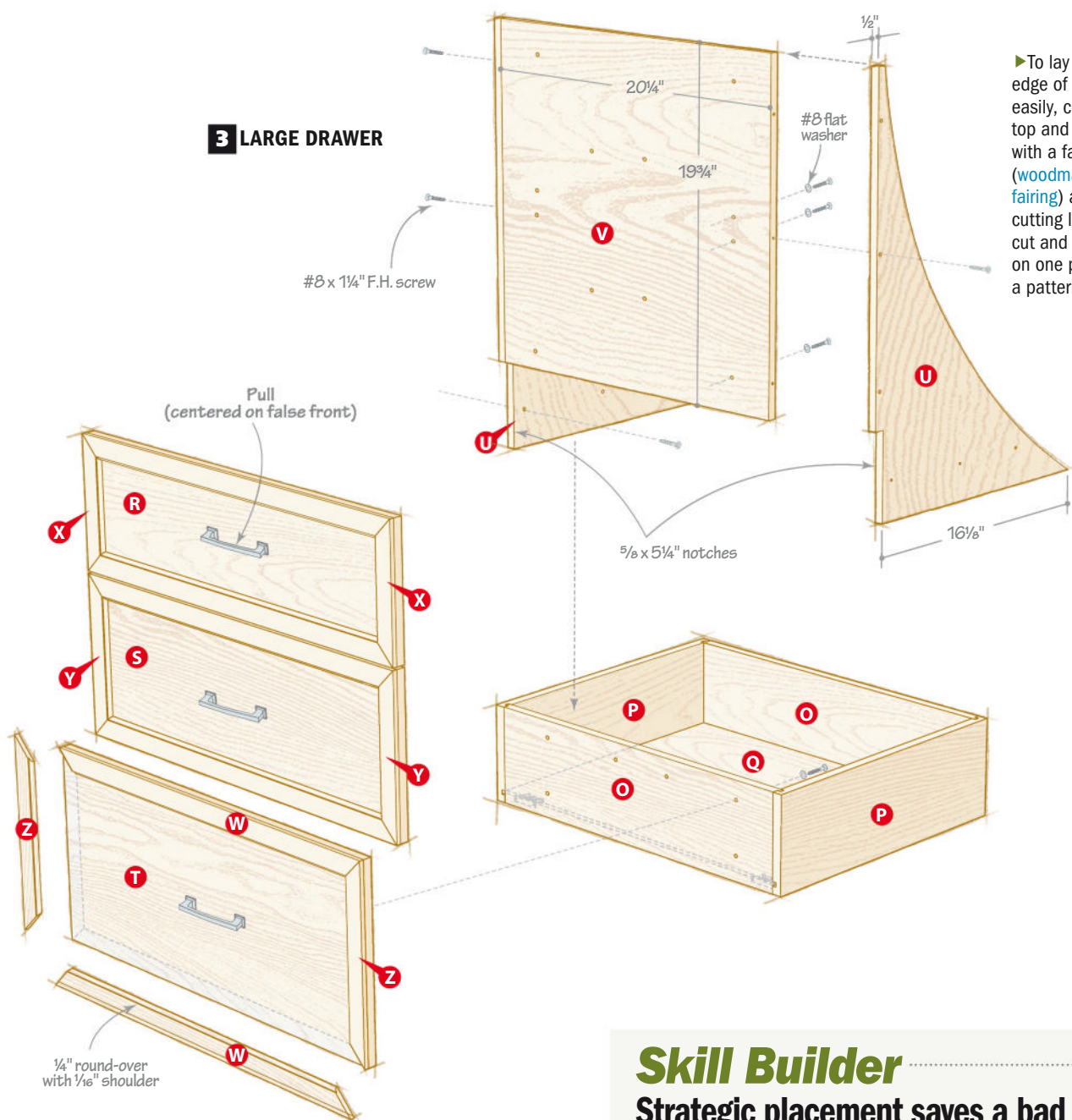
2a DRAWER BACK DETAIL



2 DRAWER (Viewed from back)



3 LARGE DRAWER



►To lay out the curved edge of the tall side easily, connect the top and bottom points with a fairing stick (woodmagazine.com/fairing) and mark a cutting line. After you cut and sand the curve on one part, use it as a pattern for the other.

5 Attach the slide clips to the underside of the drawers at the front corners [Photo F].

Put fronts on the drawers

1 Cut the small, medium, and large drawer false fronts (R, S, T) and the tall sides and tall front (U, V) to size and shape [Drawing 3]. Sand the curved edges of the tall sides smooth.

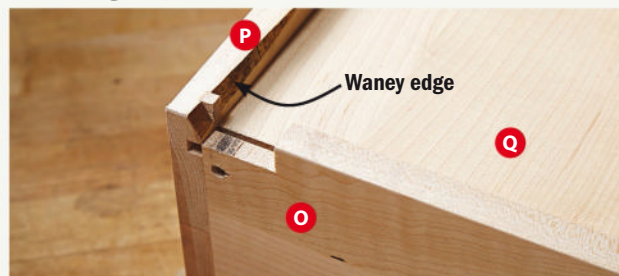
2 Cut the drawer trim (W–Z) to size, plus about one inch longer. Rout a 1/4" round-over with a 1/16" shoulder along one edge.

3 Miter-cut one end of a horizontal trim piece (W) and scribe its length against a large front (T). Miter-cut it to length and continue fitting trim around the front. Once

Tip! Add trim to the large false fronts first, then the mediums. That way, if something gets miter-cut a bit too short, it can still work for the smaller fronts to come.

Skill Builder

Strategic placement saves a bad board



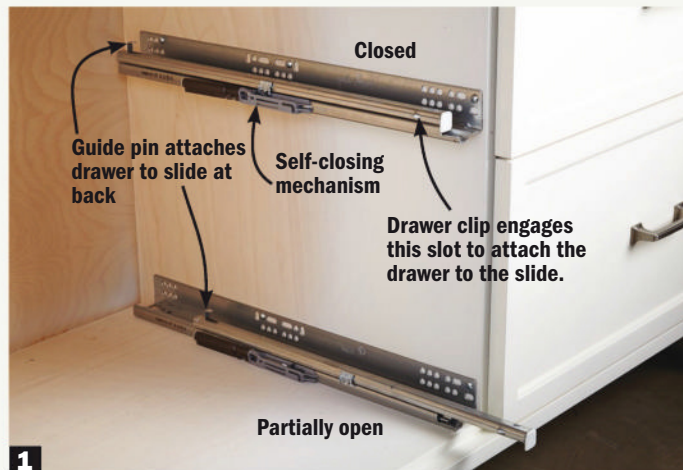
Sometimes a project part doesn't turn out quite perfect. Instead of tossing it on the scrap pile, look for a way to save it.

Building the drawers, we encountered a board just a skosh too narrow to completely rip away a wane edge. But, we oriented the piece to hide the bad corner on the underside of the drawer at the back, as shown. This affects neither appearance nor function.

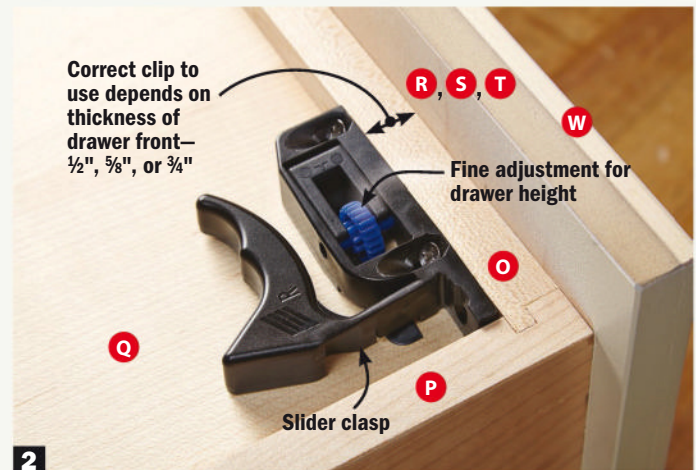
Sophisticated slides make top-notch drawers

Drawers that slide effortlessly, open fully, and close softly are a hallmark of high-quality cabinetry. The undermount drawer slides we selected for the kitchen island [Sources, page 70] bring that first-class

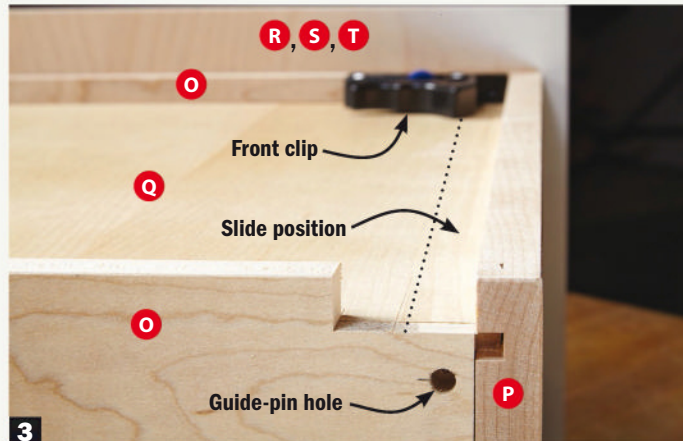
feel to this project. In many respects, they prove easier to install than other types of slides. Here's a closer look at these super sliders.



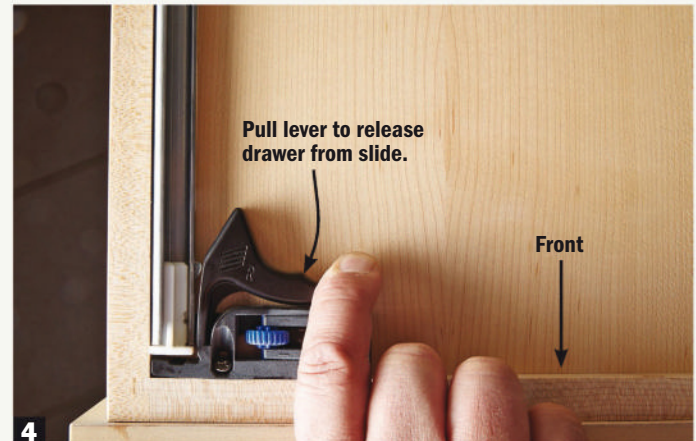
1 Drawers ride on slides attached to the cabinet sides. Plastic clips are the only part attached to the drawers. The self-closing mechanism is a close relative of a storm-door closer.



2 Choose the drawer clip specified for your drawer-front thickness. The clip traps the slide against the drawer side at the front and engages a tang on the slide rail to provide positive location.



3 The guide pin on the rail fits into a hole to secure the drawer at the back. The back notch provides clearance for the rail and self-closing mechanism as the drawer slides.



4 To install the drawer, simply set it on the rails (open or closed) and slide it in until you hear the clip click. To remove a drawer, reach under the front corners and pull each clip lever forward, then lift the drawer free.

you cut all the pieces for one front, glue the trim in place. Do the same for all six fronts.

Glue up the countertop

1 Cut 14 1½×54" strips of 8/4 maple to laminate the countertop (AA). Turn the strips on edge and arrange them to make an attractive lamination.

2 Arrange clamps on your bench. Apply glue to the laminations and lay them in the clamps. Start tightening the clamps from one end, keeping the surface flush as you add more clamps to the top [Photo G].

3 After the glue dries, trim the top (AA) to length, using a circular saw and a straightedge guide. Rout ¼" round-overs around the top and bottom edges.

4 Sand the top to 220 grit. Apply an oil finish, such as butcher block finish.

Assemble the island

1 Finish-sand the carcass, drawers, false fronts, tall sides, and tall front.

2 Prime the carcass and drawer false fronts with an interior primer. Paint those com-

► You can buy a ready-made maple (or other hardwood) countertop to save the effort of gluing up the top. A 1½×30×60" (woodmagazine.com/benchtop) or 1¾×30×60" workbench top (no. G9914, grizzly.com) would increase the overhang on each side and end by about 3". (You could cut it to the size shown.) The Grizzly top may require additional sanding for kitchen use. An Ikea kitchen countertop, such as the oak Karlby (no. 702.679.77), would increase front and back overhangs only slightly but at more than 6' long would have to be shortened.



G

Push laminations into alignment. Getting right up on the top lamination gives you leverage to keep the surface flush, minimizing sanding later.

ponents your desired color with a latex semigloss enamel. Apply a clear finish to the drawers, tall sides, and tall front. (We used satin polyurethane varnish.)

3 After the paint dries, invert the carcass and attach a caster at each corner [Sources]. Place the fixed wheels at one end and the locking swivel casters at the other.

4 Stand the carcass on the casters and make $\frac{3}{8}$ "-long slots through the carcass top (A) and the frame front and back (M) to attach the top (AA) [Exploded View]. To make the slots, drill a pair of adjoining $\frac{5}{32}$ " holes and cut or file away the wood between them. Place the slots so you'll be able to drive screws into the top from inside the carcass. Screw the top to the carcass.

5 Install the drawer slides where shown [Drawing 1]. Refer to the instructions for your hardware for the required setback from the cabinet front edge.

6 Install the drawers on the slides. Place double-faced tape on the fronts (O), and press the false fronts (R, S, T) onto the drawers, adjusting them for even reveals. Carefully open the drawers. Drill pilot holes through the drawer fronts into the false fronts, and attach the false fronts.

7 Install the tall sides (U) and tall front (V) in the righthand drawer. Align the false fronts on the tall front with the drawers and screw them in place.

8 Position the drawer handles, drill mounting holes, and attach the hardware. (Screws furnished with the handles we used [Sources] were too short; we cut off #8-32x2" machine screws to work.) Then, wheel the island into the kitchen to create an instant upgrade. 🌲

Materials List

Part		FINISHED SIZE			Matl.	Qty.
		T	W	L		
Carcase						
A	top and bottom	½"	19¾"	48"	BP	2
B	sides and divider	¾"	19¾"	27¼"	BP	3
C	back	¾"	48"	28"	BP	1
Trim						
D	stiles	¾"	3"	28"	P	6
E	back top rail	¾"	3"	42"	P	1
F	back bottom rail	¾"	4"	42"	P	1
G	back center stile	¾"	3¾"	21"	P	1
H	side top rails	¾"	3"	16"	P	2
I	side bottom rails	¾"	4"	16"	P	2
J*	vertical molding	¾"	¾"	21"	P	8
K*	side horizontal molding	¾"	¾"	16"	P	4
L*	back horizontal molding	¾"	¾"	19½"	P	4
M*	frame front/back	¾"	3"	49½"	P	4
N*	frame sides	¾"	3"	22"	P	4
Drawers						
O	fronts/back	⅝"	6"	21¾"	SM	8
P	sides	⅝"	6"	18"	SM	8
Q	bottoms	¼"	17¼"	21¾"	BP	4
R	small false fronts	½"	7½"	23⅜"	BP	2
S	medium false fronts	½"	9"	23⅜"	BP	2
T	large false fronts	½"	11"	23⅜"	BP	2
U	tall sides	½"	16¾"	25"	BP	2
V	tall front	½"	20¼"	19¾"	BP	1
W*	horizontal trim	¼"	1¼"	23⅜"	P	12
X*	small vertical trim	¼"	1¼"	7½"	P	4
Y*	medium vertical trim	¼"	1¼"	9"	P	4
Z*	large vertical trim	¼"	1¼"	11"	P	4
Countertop						
AA*	top	1½"	24½"	52½"	LM	1

*Parts initially cut oversize. See the instructions.

Materials key: BP-birch plywood, P-poplar, SM-soft maple, LM-laminated maple.

Supplies: #8 x $1\frac{1}{4}$ " F.H. screws (31), #8 x 2" panhead screws (8), #8 flat washers (16), #8-32 x 2" roundhead machine screws (12), #14 x $\frac{3}{4}$ " panhead screws (16).

Blade and bits: Stack dado set; $\frac{1}{4}$ " round-over and $\frac{3}{4}$ " reverse ogee router bits.

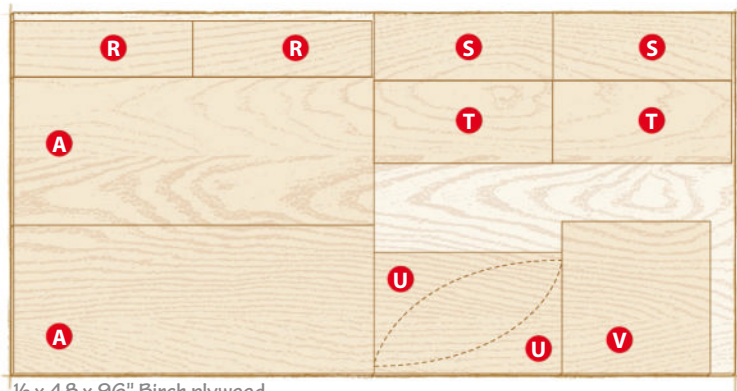
Sources

Drawer slides: Hettich Quadro IW21, 18", zinc, no. HT9134339, \$24.05 per pair, (4 pairs); Quadro front clips for IW21, for $\frac{5}{8}$ " drawer subfront, no. HT9140413, \$1.73 per pair, (4 pairs). Woodworkers Hardware, 800-383-0130, www.hardware.com.

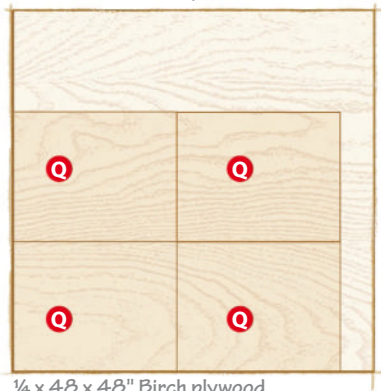
Casters, drawer handles: Set of 4" casters (2 locking, 2 fixed), no. 00K2010, \$65; 96 mm Mulholland Square handle, no. 02A4512, \$7.60 each, (6). Lee Valley, 800-871-8158, leevalley.com.

Reverse ogee router bit: Eagle America, $\frac{1}{2}$ " shank, no. 180-2705, \$45, Eagle America, 800-872-2511, eagleamerica.com.

Cutting Diagram



$\frac{1}{2}$ x 48 x 96" Birch plywood



$\frac{1}{4}$ x 48 x 48" Birch plywood



$\frac{3}{4}$ x 48 x 96" Birch plywood



$\frac{1}{4}$ x 7 $\frac{1}{4}$ x 72" Poplar

$\frac{1}{4}$ x 5 $\frac{1}{2}$ x 48" Poplar



$\frac{3}{4}$ x 7 $\frac{1}{4}$ x 96" Poplar



$\frac{3}{4}$ x 7 $\frac{1}{4}$ x 96" Poplar



$\frac{3}{4}$ x 7 $\frac{1}{4}$ x 96" Poplar (2 needed)



$\frac{3}{4}$ x 7 $\frac{1}{4}$ x 96" Soft maple (4 needed)



1 $\frac{3}{4}$ x 7 $\frac{1}{4}$ x 120" Maple (2 needed)

This project requires 20 board feet of 4/4 poplar, 20 board feet of 4/4 soft maple, 25 board feet of 8/4 maple, and 6 square feet of 1/4" poplar, plus one sheet each of 1/2" and 3/4" birch plywood, and one-half sheet of 1/4" birch plywood.

Produced by **Larry Johnston** with **John Olson** and **Brian Bergstrom**
Project design: **John Olson**
Illustrations: **Lorna Johnson**

Tools We Can't Live Without

Festool ETS 150/3 EQ 6" random-orbit sander (\$360) with CT 26 HEPA dust extractor (\$650)

888-337-8600, festoolusa.com

These two work inseparably to quickly smooth projects and keep the shop air clean. The sander's larger surface area gets more done in the same time than a 5" model, and leaves a flawless finish rarely needing hand-sanding. The vacuum switches on and off automatically via the sander—a handy convenience—and works with many of my other tools as well.

—Kevin Boyle
Senior Design Editor

Between working wood at work and at home, and having the luxury of trying virtually every new tool that hits the market, our staff members get exposed to a lot of tools. Not surprisingly, some become favorites. We're sure you'll like them, too.

Delta Unisaw 3-hp 10" tablesaw

Modern replacement: no. 36-L352, \$3,300
800-223-7278, deltamachinery.com

I'm a tablesaw-centric woodworker, meaning I do everything possible at the saw rather than with other tools. And this dependable cabinet saw has been the cornerstone of my shop for nearly two decades. It has all the power necessary, a trustworthy Biesemeyer rip fence, and good dust collection (tethered to a cyclone). I upgraded to a premium miter gauge (Woodhaven no. 4911 [\$165], 800-344-6657, woodhaven.com), but that's been the only improvement needed.

—Kevin Boyle



DeWalt DW735 13" benchtop planer, \$650

(optional stand, no. DW7350, \$150)
800-433-9258, dewalt.com

I typically build about two dozen projects each year, so my planer gets a workout. But because of expense and power requirements, a 15" planer with spiral cutterhead is not an option for my shop. That's okay, because this DW735 has been getting the job done for more than a decade. Its three-knife cutterhead delivers exceptional cut quality, there's no snipe, and the chip-ejection system works effectively with my dust collector. Plus, its 13" width proves sufficient for the vast majority of projects I build.

—Bob Hunter, Tools Editor



Forrest Woodworker II 10" 40-tooth tablesaw blade, \$145

800-733-7111, forrestblades.com

Buying and using a premium tablesaw blade is like wearing quality shoes: The purchase price might sting at first, but the performance justifies the investment over time. The Woodworker II cuts so well in all materials

that I never have to swap blades. And the clean, burrished edges it leaves on workpieces beats anything achieved at the jointer.

—Nate Granzow, General-Interest Editor



Jointer planes

Lie-Nielsen no. 8, \$475

800-327-2520, lie-nielsen.com

WoodRiver no. 7, \$305

800-225-1153, woodcraft.com

Sure, I like power tools for getting jobs done quickly, but I'm a hand-tool user at heart. Jointer planes hold a special place in my shop for their ability to flatten any board face or edge. Although I use both of these planes regularly and they work great, I prefer the extra length and width and harder-steel blade of the No. 8 over other jointers. The WoodRiver's price makes it a great value.

—John Olson, Design Editor

Grizzly G0555 14" bandsaw, \$555

800-523-4777, grizzly.com

My "Triple 5" has a lot of pro bandsaw features—easily adjustable bearing guides, a smooth and accurate rip fence, and plenty of power for resawing—but sells at a hobbyist price point. And the quick-release tension lever makes blade changes a snap rather than a chore.

With every use, I savor the feeling that only comes from a no-regrets tool purchase.

—Lucas Peters, Digital Content Manager



Bosch MRC23EVSK 2.3-hp multibase router kit, \$299

877-267-2499, boschtools.com

This is the most versatile tool in my shop and one that I use all the time. Whether routing dovetails on a jig or decorative edges on project parts, it's the tool I reach for first. I mounted the fixed base in a router table and use the plunge base for all handheld routing, simply swapping the motor between them. It has variable speed, 1/4" and 1/2" collets, and plenty of power. I love that, regardless of the base used, it powers up with a handle-mounted switch.

—Jim Heavey, Contributing Craftsman



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Kreg PRS1045 router table, \$500, and JessEm Mast-R-Lift II router lift, \$369

Kreg Tool Company
800-447-8638, kregtool.com
JessEm Tool Company
866-272-7492, jessem.com

I customized this router table with storage and an accessory power switch, but the core structure still functions as great as the day I broke the seal. The table offers an ample no-sag top, a handy combo T-track with miter slot for accessories, a dependable T-square-style fence with microadjuster, and a comfortable working height (with optional casters, \$60) for my 6'3" frame. Installing a Mast-R-Lift II took this router table to an even higher performance level. I depend on its spot-on precision and ease of use for all types of routing.

—Bob Hunter



Festool OF 2200 EB 3-hp plunge router, \$900

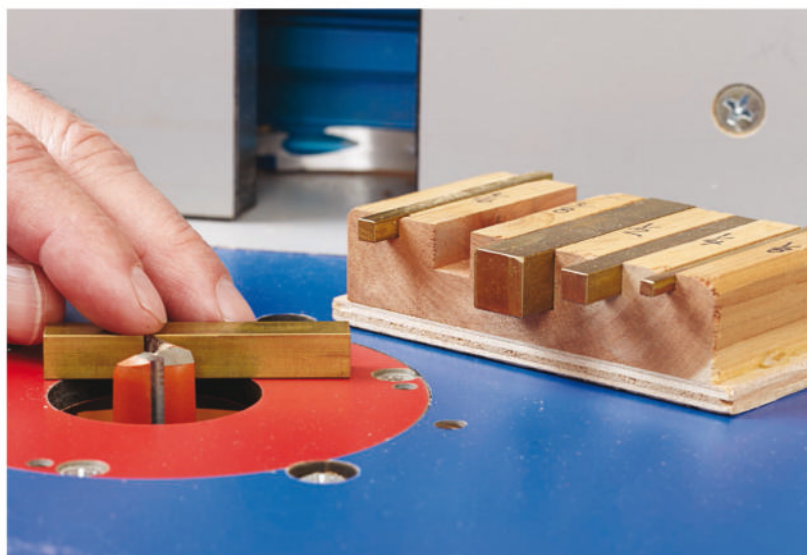
888-337-8600, festoolusa.com

DeWalt DWP611PK 1¼-hp compact router kit, \$190

800-433-9258, dewalt.com

Maybe I'm an enigma, but my two favorite routers are a big 3-hp plunge model that weighs nearly 18 pounds, and a compact router weighing about 2 pounds in either of its two bases. The DeWalt sees more use, proving invaluable for jobs that require more finesse than brute force. I especially like the plunge base for routing inlay recesses and hinge mortises. The variable speed and LED lighting also make it more functional and easy to use than any other compact or trim router. I love the Festool's smooth-running powerful motor, vibration-dampening mass, ratcheting collet for easy bit changes, and its interchangeable bases (sold in one kit, no. 497656, \$378).

—John Olson



Whiteside brass setup bars, no. 144932, \$14

800-225-3982, whitesiderouterbits.com
(Purchase at Woodcraft, 800-225-1153, woodcraft.com)

These handy bars prove easier for setting router-bit and blade heights than squinting at a ruler's tiny markings. My fingertip tells in an instant whether the cutter matches the height of the bar. I've even used them to accurately gauge the thickness of pieces coming out of the planer. 🌲

—Craig Ruegsegger, Deputy Editor

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Tops of the tables

Every shop needs a router table for safely crafting joinery and decorative edges on workpieces. Although it can be as simple as a piece of plywood and a clamped-on straightedge, these high-end models bring accuracy and adjustability to the table, while leaving frustration (and a few Benjamins) behind. All three feature combination T-track and miter slot inset in the top, and an extruded aluminum fence with independent sub-fences, shims to offset the faces, T-track, and a 2½" dust port.

JessEm, \$700 (from components)

Rout-R-Table stand (no. 05001) \$170
Mast-R-Top top (no. 03006) \$230
Rout-R-Plate insert (no. 03101) \$70
Mast-R-Fence II (no. 04010) \$230
866-272-7492, jessem.com



Kreg Precision Router Table System (no. PRS1045), \$500

800-447-8638, kregtool.com



Rockler Pro Phenolic Router Table, \$500

(Shown with optional casters, no. 47034, \$40)
800-279-4441, rockler.com

	Top	Insert plate	Fence	Stand*
JessEm	A ¾×24×32" solid phenolic Smooth surface, no sharp edges.	A 9¼×11¼" phenolic It held flat without sagging, and is the only one with top-side accessible leveling screws. Includes two insert reducing rings.	A 3¾×36" The easiest fence to remove and replace, it adjusts easily, and locks solidly. New to this model, the subfence locks adjust from the back.	A 22"D × 26"W × 35¼"H 1½" square-tube steel legs make it rock-solid.
Kreg	A 1×24×32" MDF with high-pressure laminate Laminate is textured, but stock glides smoothly over it.	B 9¼×11¼" phenolic It never sagged, but the leveling screws must be accessed from below. Includes two insert reducing rings.	B 3¾×36" The only T-square-style fence, it stays parallel with the miter slot, a benefit when using both together. But the cam lock on the "free" end can be fussy. The microadjuster works well.	A 20"D × 28"W × 33½"H Heavy-gauge angle-steel legs and stretchers provide a steady base that's adjustable in height from 29" to 35".
Rockler	A- ¾×23½×31½" solid phenolic Smooth surface, but sharp edges needed a slight rounding.	B+ 8¼×11¼" aluminum It comes predrilled for mounting most routers, a nice touch, and it never sagged. But it's an inch narrower than others, so the opening might not work with some lifts or routers (without removing handles).	B- 3½×31½" The fence slides in two keyhole slots easily and locks solidly, but the locking knobs interfere with the subfence locks on the back of the fence.	B 18"D × 26"W × 35½"H Made of heavy-gauge angle steel, but its smaller footprint makes it seem less stable, although it never tipped.

* Height can vary slightly by adjusting the stand (Kreg) or leveling feet, or adding optional casters.

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JUMP STARTER

CENTECH
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38391/60657/62376

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5 MICRON
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70 Gallon Capacity
LOT 61790
97869 shown

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drillmaster

LOT 44914 shown
61626/62659

Customer Rating
★★★★★

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CUT EDGE GUIDE

LOT 66126

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WITH LASER GUIDE

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61969/61970
69684 shown



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WITH FIBERGLASS
HANDLE

LOT 69006
60715/60714



LOT 47873 shown
69005/61262

Customer Rating
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61637 shown

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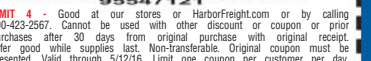
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SUPER COUPON

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SPINDLE SANDER

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Customer Rating
★★★★★



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Make flat panels with no slip-ups

Damstom D300 Black Edition 38" panel clamp, \$70, 450-824-1592, damstom.com
(Zinc-plated 38" model, \$60, at Rockler, 800-279-4441, rockler.com)

If you've ever glued up flat panels from narrow stock, such as when making a tabletop or butcher block, you've probably struggled with workpieces that slip out of alignment once coated with glue and clamped. These Damstom panel clamps eliminate that variable and deliver dead-flat panels every time.

Each clamp consists of two C-shape bars, with square cutouts spaced 1½" on center. Two ¾×¾×6" tubes fit into the cutouts to trap the assembly front to back. After you apply glue to the workpieces,

place them in the clamps, snug down the top bar, and simply tighten the threaded handle to draw it all together. It works easier than it looks, and the black powder-coated bars resist glue and prevent wood staining.

With a pair of these clamps, you can create panels up to 38" wide and 4½" thick. The downsides: They're kind of pricey for clamps used only for creating panels, and the number of loose parts that can potentially get lost.

—Tested by Pat Lowry

Quick, easy shelf-pin holes on the cheap

Bench Dog ¼" shelf pin jig (no. 46350), \$20, Rockler, 800-279-4441, rockler.com

It's nearly impossible to drill perfectly matching shelf-pin holes in a project without using a template. You can make your own or buy one, but most commercial jigs sell for \$30 or more. That's where this Bench Dog jig shines.

By making the jig significantly smaller (only 5 holes), Rockler keeps the price at \$20. And that price includes the self-centering stepped drill bit and reference pin, both of which store on the jig.

To use it, align the jig with layout marks and drill five holes. Then, slide the jig down the workpiece, pin it into the last hole drilled, and drill four more holes. Step and repeat as needed. I made three bookcases, and used this jig to drill all the shelf-pin holes. Each one lined up perfectly, and the shelves don't tip at all.

—Tested by Bob Hunter, Tools Editor



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Makita slides into new 12V platform

12-volt drill and impact driver combo kit (no. CT226) \$129

Makita's new 12-volt lithium-ion drill and impact driver use slide-style battery packs rather than stem inserts. This results in thin, ergonomic handles, and lets you stand the tools upright on the packs. The drill/driver has two variable-speed ranges: up to 450 and 1,700 rpm. The impact driver has variable speed up to 2,600 rpm. Each weighs just over 2 pounds. Plus, Makita offers a 3-year warranty on the tool, charger, and battery packs.

Makita Tools

800-462-5482, makitatools.com



Spline miters at the router table

Router-table spline jig, (no. 9537), \$80

This MLCS jig helps you strengthen miter joints with decorative splines by providing a means to cut the slots on a router table. The 10x15½" jig made of ½" thick, melamine-coated MDF, rides on an aluminum bar that registers in a ¾x¾" miter slot. Two workpiece holders secure your project, and the jig's base provides zero-clearance support against tear-out.

MLCS Router Bits and Woodworking Products

800-533-9298, mlcswoodworking.com

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WOOD MAGAZINE'S
REVIEW A TOOL



Add fence support for your drill-press table

Drill-press fence (no. 53648) \$70

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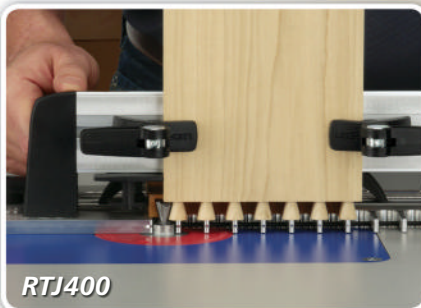
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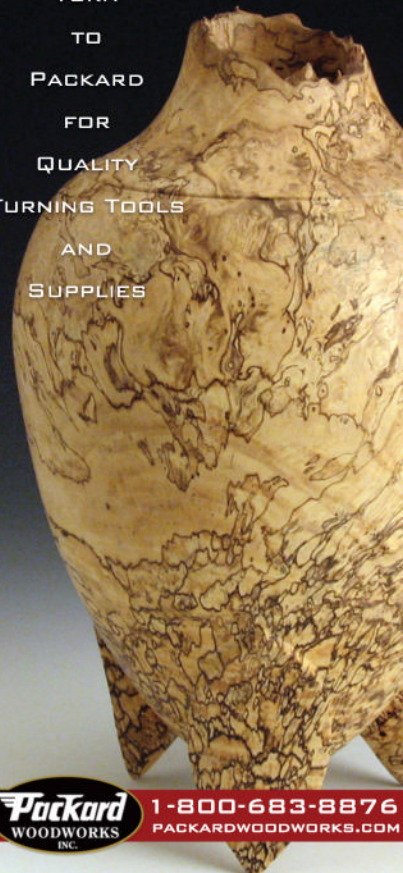
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