MAKE THE MOST OF YOUR MATERIALS p.56

ISSUE 248 SEPTEMBER 2017

Better Homes & Gardens.

WOOD®

The World's Leading Woodworking Resource

Cut Airtight Miters in Crown Molding

p.64

Plus Great Plans

Backyard barbecue
Smoke Shack p.26

Murphy Bed p.44

Heirloom Tool Tote p.60

Bookshelf Speakers p.34

Mailbox p.68

Belt/Disc Sanders Tested

p.38

Grizzly Industrial®

PURVEYORS OF FINE MACHINERY®, SINCE 1983!

- ALMOST A MILLION SQUARE FEET PACKED TO THE RAFTERS WITH MACHINERY & TOOLS
- 2 OVERSEAS QUALITY CONTROL OFFICES STAFFED WITH QUALIFIED GRIZZLY ENGINEERS
- HUGE PARTS FACILITY WITH OVER 1 MILLION PARTS IN STOCK AT ALL TIMES
- TRAINED SERVICE TECHNICIANS AT BOTH LOCATIONS • MOST ORDERS SHIP THE SAME DAY

14" BANDSAW
30TH ANNIVERSARY EDITION

- 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: 13½" left of blade
- Max. cutting height: 6"
- Blade size: 93½"L (⅛"– ¾"W)
- Blade speeds: 1800 & 3100 FPM
- Approx. shipping weight: 247 lbs.

INCLUDES QUICK-RELEASE BLADE TENSION LEVER

G0555LANV ONLY $575.00

$89 shipping

17" HEAVY-DUTY BANDSAW
30TH ANNIVERSARY EDITION

- Motor: 2 HP, 110V/220V, single-phase, TEFC, prewired 220V • RPM: 1725
- Amps: 20A at 110V, 10A at 220V
- Precision-ground cast iron table size: 17" x 17" x 1½" thick
- Table tilt: 45° R, 10° L
- Floor-to-table height: 37½"
- Cutting capacity/throat: 16¼"
- Blade length: 131½" (⅛" to 1" wide)
- Approx. shipping weight: 342 lbs.

MADE IN AN ISO 9001 FACTORY

G0513ANV ONLY $925.00

$109 shipping

10" HYBRID TABLE SAW
with RIVING KNIFE & IMPROVED FENCE

New!

- Motor: 2 HP, 120V/240V, prewired 120V, single-phase
- Amps: 15A at 120V, 7.5A at 240V
- Precision-ground cast-iron table with wings measures: 40½" W x 27" D
- Table height: 35⅜"
- Arbor: ⅝" • Arbor speed: 3450 RPM
- Max. depth of cut: @ 90° 3¼", 45° 2¼"
- Rip capacity: 30" R, 15" L
- Overall size: 57¼" W x 57½" D x 35⅜" H
- Footprint: 21" L x 19½" W
- Approx. shipping weight: 330 lbs.

FREE 10" X 40T CARBIDE-TIPPED BLADE

G0771Z ~~$895.00~~ SALE $775.00

$109 shipping

10" LEFT-TILTING TABLE SAWS
with RIVING KNIVES & CAST-IRON ROUTER TABLE

- Motor: 3 HP or 5 HP, 240V, single-phase
- Precision-ground cast-iron table size with wings: 48"W x 27"D
- Arbor: ⅝"
- Cutting capacity: 26" R, 8"L
- Max. depth of cut: 3" @ 90°, 2⅛" @ 45°
- Approx. shipping weight: 550 lbs. (G1023RLW), 542 lbs. (G1023RLWX)

3 HP
G1023RLW ONLY $1425.00
5 HP
G1023RLWX ONLY $1475.00

$159 shipping

G1023RLW SHOWN

15" HEAVY-DUTY PLANER

- Motor: 3 HP, 240V, single-phase, 14A
- Max. cutting width: 15", depth: 3/16"
- Max. stock thickness: 6⅞", Min: ¼"
- Min. stock length: 6⅜"
- Feed rate: 16 and 30 FPM
- Cutterhead diameter: 3"
- Number of knives: 3 HSS
- Knife size: 15" x 1" x ⅛"
- Cutterhead speed: 5000 RPM
- Table size: 20⅛" x 15" x 3½"
- Overall size: 32" W x 28" D x 23½" H
- Approx. shipping weight: 382 lbs.

SHOWN WITH OPTIONAL T27650 STAND

G0815 ONLY $925.00

$159 shipping

15" PLANERS

- Motor: 3 HP, 220V, single-phase, 15A
- Max. cutting width: 15", Depth: ⅛"
- Max. stock thickness: 8", Min: 3/16"
- Min. stock length: 8"
- Feed rate: 16 & 30 FPM
- Cutterhead diameter: 3", Speed: 4800 RPM
- Power feed rollers: solid serrated steel
- Precision-ground table size: 15" x 20"
- Overall size: 32½" W x 42" D x 45⅛" H
- Approx. shipping weight: 675 lbs. (G0453), 672lbs. (G0453Z)

BUILT-IN MOBILE BASE!

3-KNIFE CUTTERHEAD
G0453 ONLY $1250.00

FREE SHIPPING! To Lower 48 States

SPIRAL CUTTERHEAD
G0453Z ONLY $1795.00

G0453Z SHOWN

PLANER MOULDER
with STAND

SHOP FOX

- Motor: 2 HP, 240V, single-phase, 10.8A, 3450 RPM
- Precision-ground cast-iron table measures 14⅛" x 10" x 7/16"
- Max planing width: 7"
- Max planing height: 7½"
- Cuts per minute: 14,000
- 2 HSS knives
- Approx. shipping weight: 324 lbs.

W1812 ~~$1920.00~~ SALE $1650.00

$109 shipping

3 HP DUST COLLECTOR

- Motor: 3 HP, 240V, single-phase
- Impeller: 12¾" aluminum radial fin
- Airflow performance: 2320 CFM
- Maximum static pressure: 16.9"
- Sound rating: 87 dB
- 7" inlet has removable "Y" fitting with three 4" inlets
- Canister filter size (dia. x depth): 19⅝" x 23⅝" (x 2)
- Max. capacity: 9 cubic feet
- Overall size: 57⅞"W x 32"D x 71"H
- Approximate shipping weight: 232 lbs.

MADE IN AN ISO 9001 FACTORY

G0562ZP ~~$925.00~~ SALE $725.00

$89 shipping

PRICING CODE 17WOODM
MENTION THIS CODE WHEN PLACING YOUR ORDER
18418R

1-800-523-4777 **grizzly.com®**

VIEW VIDEOS AT grizzly.com

TECHNICAL SERVICE: 570-546-9663 • FAX: 800-438-5901

2 GREAT SHOWROOMS!
BELLINGHAM, WA • SPRINGFIELD, MO

BUY NOW, PAY LATER with Affirm. Choose your monthly payments at checkout

Respect. Urned.

Every year, thousands of American servicemen and women pass away forgotten, after their service to our country. No friends. No family. No money. With no one to claim them, their cremains languish on shelves from sea to shining sea. Tragic, to be sure, but what does it have to do with woodworking?

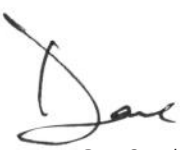
Just moments ago, I left the Charity Build of our fifth annual *Weekend With WOOD* conference for woodworkers. And I gotta admit, this one got kind of emotional, as we built 100 cremation urns like the ones shown *below*, for the Iowa Veterans Cemetery to provide a respectful burial for those indigent veterans.

The project was inspired by an email I received from Phil Noto of the Woodcrafters Club of Tampa (Florida), telling me about the club's Veterans Urn Project. It started when a member saw a news report about the cremains of an indigent veteran disgracefully buried in a cardboard box. Thanks to the generosity of a club member with a laser engraver, each urn bears the emblem of the service branch of the veteran.

If you, or your club or guild, would like to try this as a service project, you can download drawings for the urns we built at woodmagazine.com/veturns. Before you build, check with your local VA to work out a plan for distributing the urns, and make sure the dimensions will work for their columbaria. You'll also need permission to use the emblems.

As woodworkers, we often downplay our skills (to the point of calling attention to our goofs). Just as often, we step up to fill a need in our communities and shy away from the recognition we deserve. Projects like these reinforce my belief that woodworkers are the best people I know.

See you in the shop!



Dave Campbell
dave.campbell@meredith.com
Facebook and Twitter: @WOODeditor

Veterans participating in the build were recognized.

Volunteers built 100 urns, asembly-line style, in about an hour.

Jodi Tymeson, Executive Director of the Iowa Department of Veterans Affairs, helped with the build.

Completed urns dry, awaiting their second coat of lacquer.

Better Homes and Gardens®
WOOD®
September 2017
Vol. 34, No. 4 Issue No. 248

EDITORIAL CONTENT CHIEF **DAVE CAMPBELL**
DEPUTY EDITOR **CRAIG RUEGSEGGER**
ART DIRECTOR **KARL EHLERS**
DIGITAL CONTENT MANAGER **LUCAS PETERS**
SENIOR DESIGN EDITOR **KEVIN BOYLE**
DESIGN EDITOR **JOHN OLSON**
TOOLS EDITOR **BOB HUNTER**
ADMINISTRATIVE ASSISTANT **SHERYL MUNYON**

CONTRIBUTING CRAFTSMEN **JIM HEAVEY, BRIAN SIMMONS, BOB BAKER, BRIAN BERGSTROM, KENT WELSH**
PHOTOGRAPHERS **CARSON DOWNING, JASON DONNELLY**
CONTRIBUTING EDITORS **LARRY JOHNSTON, BILL KRIER, RANDY MAXEY**
CONTRIBUTING ILLUSTRATORS **LORNA JOHNSON, ROXANNE LEMOINE, KURT SCHULTZ**
PROOFREADERS **SAM CADY, BABS KLEIN, IRA LACHER, THOMAS MORIARTY**

ADVERTISING AND MARKETING
VICE PRESIDENT & GROUP PUBLISHER **SCOTT MORTIMER**
GROUP BUSINESS DEVELOPMENT DIRECTOR **CURT BLADES**
ADVERTISING ACCOUNT EXECUTIVE **DANIEL WELLS**
ONLINE MEDIA KIT **WOODMAGAZINE.COM/MEDIAKIT**

BUSINESS MANAGER **DARREN TOLLEFSON** CONSUMER MARKETING MANAGER **BLAINE ROURICK**
PRODUCTION MANAGER **SANDY WILLIAMS** PREPRESS DESKTOP SPECIALIST **RANDY J. MANNING**
COLOR QUALITY ANALYST **PAMELA POWERS**

MEREDITH NATIONAL MEDIA GROUP
PRESIDENT **JON WERTHER**

PRESIDENT AND GENERAL MANAGER OF MEREDITH MAGAZINES **DOUG OLSON**
PRESIDENT OF MEREDITH DIGITAL **STAN PAVLOVSKY**
PRESIDENT OF CONSUMER PRODUCTS **TOM WITSCHI**
CHIEF REVENUE OFFICER **MICHAEL BROWNSTEIN**
CHIEF MARKETING OFFICER **NANCY WEBER**
CHIEF DATA AND INSIGHTS OFFICER **ALYSIA BORSA**

SENIOR VICE PRESIDENTS
CONSUMER REVENUE **ANDY WILSON** DIGITAL SALES **MARC ROTHSCHILD**
RESEARCH SOLUTIONS **BRITTA CLEVELAND** DIGITAL VIDEO **MELINDA LEE**
CHIEF DIGITAL OFFICER **MATT MINOFF**

VICE PRESIDENTS
FINANCIAL **CHRIS SUSIL** BUSINESS PLANNING AND ANALYSIS **RON SILVERSTONE**
CONTENT LICENSING **LARRY SOMMERS** CORPORATE SALES **BRIAN KIGHTLINGER** DIGITAL SALES **MARLA NEWMAN**
DIRECT MEDIA **PATTI FOLLO** BRAND LICENSING **ELISE CONTARSY** HUMAN RESOURCES **DINA NATHANSON**
STRATEGIC SOURCING, NEWSSTAND, PRODUCTION **CHUCK HOWELL** CONSUMER MARKETING **STEVE CROWE**
DEVELOPMENT **DAVID JOHNSON**

meredith

CHAIRMAN AND CHIEF EXECUTIVE OFFICER **STEPHEN M. LACY**
PRESIDENT AND CHIEF OPERATING OFFICER **TOM HARTY**
PRESIDENT, MEREDITH LOCAL MEDIA GROUP **PAUL KARPOWICZ**
CHIEF FINANCIAL OFFICER **JOSEPH CERYANEC**
CHIEF DEVELOPMENT OFFICER **JOHN ZIESER**
VICE CHAIRMAN **MELL MEREDITH FRAZIER**
IN MEMORIAM **E.T. MEREDITH III (1933–2003)**

▶ **For subscription help:**
Online: woodmagazine.com/myaccount
E-mail: wdmcustserv@cdsfulfillment.com
Phone: **800-374-9663,** select **option 1**.

▶ **To find past articles:** Search for previous articles, plan corrections, and article updates online at woodmagazine.com/index.

▶ **To order past articles and issues:** For articles, search woodstore.net. For issues, visit woodmagazine.com/backissues.

Our subscriber list is occasionally made available to carefully selected firms whose products may be of interest to you. If you prefer not to receive information from these companies by mail or by phone, please let us know. Send your request along with your mailing label to Magazine Customer Service, PO Box 37508, Boone, IA 50037-0508.

© Copyright Meredith Corporation 2017. All rights reserved. Printed in the U.S.A.
Meredith Corporation allows the purchaser of this magazine to photocopy the included patterns solely for personal use. Any other reproduction of these patterns is strictly prohibited.

In This Issue of WOOD®

SEPTEMBER 2017 · ISSUE 248

PLANS

TOOLS & TECHNIQUES

DEPARTMENTS

RENEW

So, you've been a woodworker long enough that some of your past projects are showing their age as much as you are? Here are some tips for sprucing up a worn or damaged finish.

What type of finish is it, anyway? woodmagazine.com/finishtest
Revive a worn finish: woodmagazine.com/revive
Remove water or heat rings: woodmagazine.com/removerings
Fix scratches and gouges: woodmagazine.com/fixascratch
Match new stain to old wood: woodmagazine.com/matchstain

REPAIR

So, you accidentally let slip that you're a woodworker and now all your friends and relatives think you should fix their broken furniture? Here are some articles that you can use (or distribute) as needed.

Match and patch veneer: woodmagazine.com/matchandpatch
De-wobble a chair: woodmagazine.com/dewobble
Repair furniture cracks: woodmagazine.com/fixacrack
"Aging" replacement parts: woodmagazine.com/agingparts

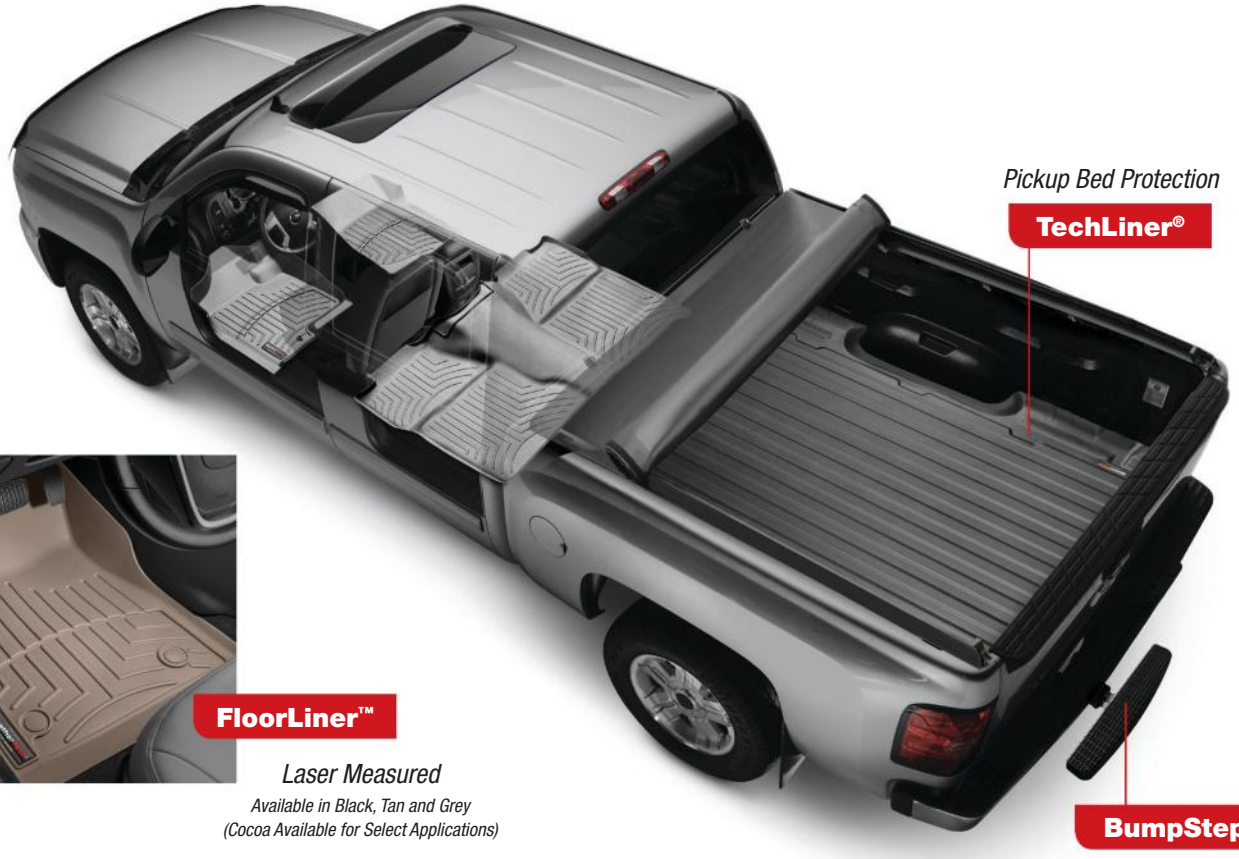
RECLAIM

So, your woodworking habit has gotten so bad that you can't throw out a scrap or pass by a discarded pallet? Here are some ways to employ or reduce your stash before your family calls the white coats.

Be a better board hoarder: woodmagazine.com/boardhoarder
Save money by salvaging: woodmagazine.com/salvagelumber
Finishing reclaimed lumber: woodmagazine.com/reclaimrefinish
Don't discard defective wood: woodmagazine.com/nodiscards
Even sawdust can be used: woodmagazine.com/sawdust

WeatherTech®

American Manufacturing *Done Right*™



Pickup Bed Protection

TechLiner®

FloorLiner™

Laser Measured

Available in Black, Tan and Grey
(Cocoa Available for Select Applications)

BumpStep®XL

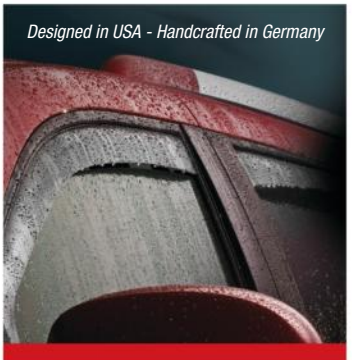
24" of Hitch Mounted Bumper Protection

COMPLETE COVERAGE FOR YOUR VEHICLE

See our full line of Automotive Accessories at **WeatherTech.com**

All-Weather Floor Mats

Roll Up Truck Bed Cover



Side Window Deflectors

No-Drll MudFlaps

Accessories Available for

Acura · Audi · BMW · Buick · Cadillac · Chevrolet · Chrysler · Dodge · Ferrari · Ford · GMC · Honda · Hummer · Hyundai · Infiniti · Isuzu
Jeep · Kia · Land Rover · Lexus · Lincoln · Maserati · Mazda · Mercedes-Benz · Mercury · Mini · Mitsubishi · Nissan · Oldsmobile
Plymouth · Pontiac · Porsche · Saab · Saturn · Scion · Subaru · Suzuki · Toyota · Volkswagen · Volvo

Order Now: 800-441-6287

American Customers
WeatherTech.com

Canadian Customers
WeatherTech.ca

European Customers
WeatherTech.eu

© 2017 by MacNeil IP LLC

Totally waxed

I heartily agree with Douglas Ward's article, "Wax On, Wax Off" in issue 246. I'm often asked how I get such a nice finish on my projects. My secret: Johnson's Paste Wax and 0000 steel wool. Like Douglas, I recently discovered Black Bison wax from Liberon. I encourage any woodworker who has not tried this finishing technique to try it. You won't be disappointed!

—Bill Kuespert
Fond du Lac, Wis.

Tree for two

The old maple tree that grew right through the middle of our deck created many childhood memories for my girls, so when it began to die, I promised to make them something beautiful from it. My youngest needed a shelving unit for her first post-college apartment, and loved your plans for the Floating Shelves from issue 215 (November 2012), so that seemed like a good use for the old maple.

As I milled the log, I discovered remarkable spalting and an infestation of powderpost beetles, both of which added a ton of character to the wood. (I exterminated the little buggers with a Googled chemical concoction reminiscent of Breaking Bad *and some quality time on the gas grill.) I left the front edge of the boards natural and used a black Java gel stain to show the grain.*

After seeing this one, my older daughter now wants one as well. Both of my girls are pleased to see their childhood tree live on in such a unique and beautiful heirloom.

—Daniel Thompson
Olmsted Falls, Ohio

A hold to hand into

A few years ago I built the beautiful pencil-post bedroom set that began in WOOD *issue 187 (November 2008). While building the chest of drawers, I flashed back to all the household moves I made in my 38 years as a United Methodist pastor. Each time, I thought there must be a better way to move a dresser, which is always awkward to carry because there's nothing to grip on the back.*

Suddenly, it occurred to me that the solution was was quite simple: I cut two slots in the back panel just below the dust panel at a convenient height for lifting. This makes it a breeze for two people to carry.

—Ernest Metheny
Terra Alta, W.Va.

Two-door convertible

Like your Backyard Shed project in issue 246, most two-door sheds use doors of equal size that can be clumsy to close and do not meet well. Yet most times, you really only need to open one door to grab or throw in a small item. My shed, shown above, *also has two doors, but one is about one-third the width of the other. The T-111 sheeting makes the smaller door almost invisible until it's opened.*

—Marvin Rosenfeld
Latham, N.Y.

The truth couldn't be planer

I've owned the DeWalt DW735 planer for 11 years, and your thoughtful review in issue 246 (May 2017) aligns with my experience. After replacing several sets of high-speed-steel knives (at $50 a set), I decided to invest in the Byrd Shelix cutterhead for the DW735. Although it costs almost as much as the planer itself, the helical cutter transformed an already very good planer into one of my favorite tools, and the four-sided carbide cutters will probably last the rest of my life.

—Chris Bennett
via email

Connect with us

facebook.com/woodmagazine
twitter.com/WOOD_magazine
pinterest.com/woodmagazine
instagram.com/woodmagazine

E-mail **woodmail@woodmagazine.com**; or write to *WOOD* magazine, 1716 Locust St., LS-253, Des Moines, IA 50309; or call 800-374-9663, option 2.

continued on page 8

Big thumbs up for an awesome Weekend With WOOD™!

A special thanks to our sponsors!

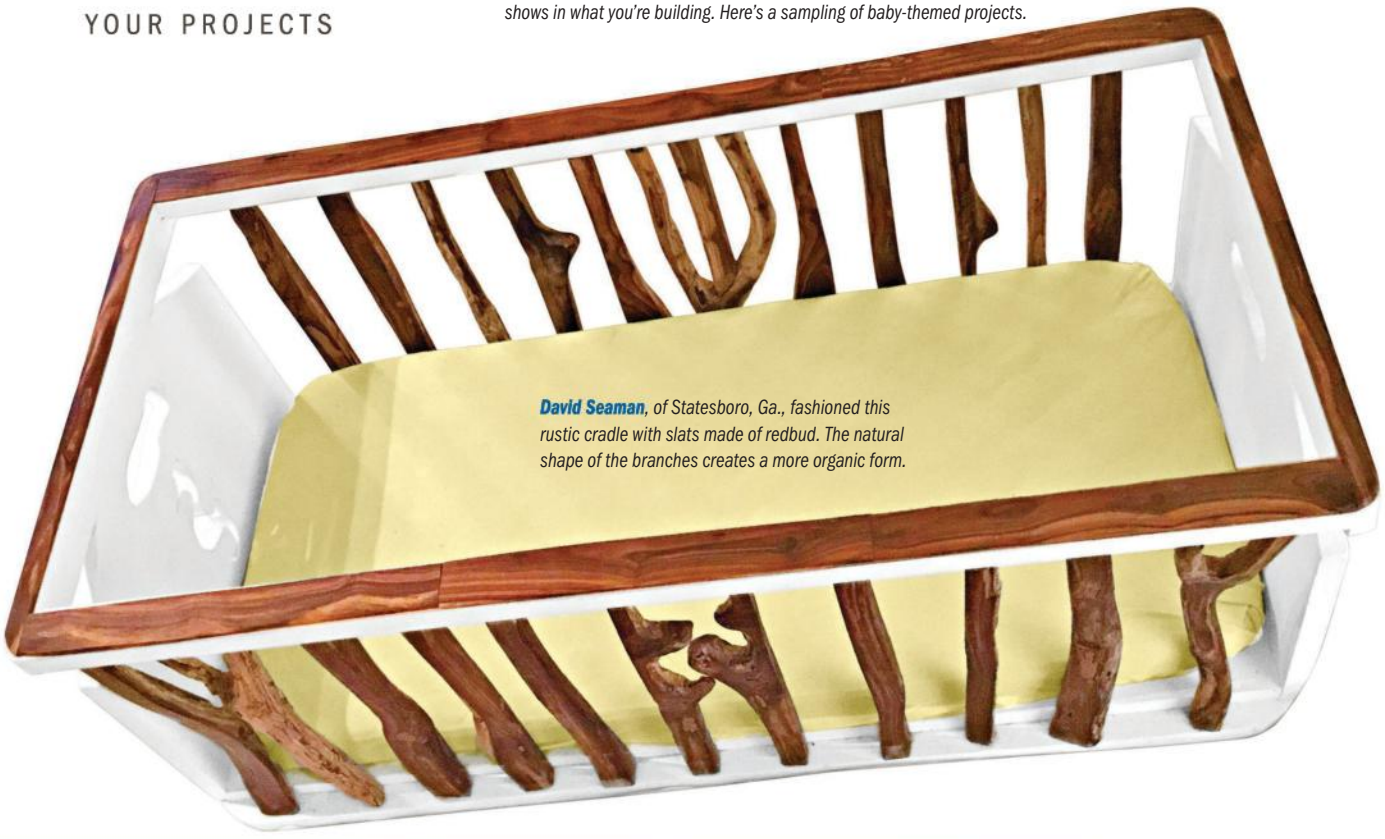
RIDGID · RYOBI · Earlex · Titebond THE PRO'S ADVANTAGE™

Peachtree Woodworking Supply Inc. "Your One Stop Supply Shop" · FUJI SPRAY · SuperMax Tools · EPILOG LASER

Kreg · DULUTH TRADING CO · ACME TOOLS BUILDING • REMODELING • WOODWORKING • LANDSCAPING DO YOUR BEST WORK™ · ICONIC CNC™

Watch for the info about the 2018 event soon at weekendwithwood.com!

More people are born in September than any other month (merry Christmas, indeed!), and it shows in what you're building. Here's a sampling of baby-themed projects.



***David Seaman**, of Statesboro, Ga., fashioned this rustic cradle with slats made of redbud. The natural shape of the branches creates a more organic form.*

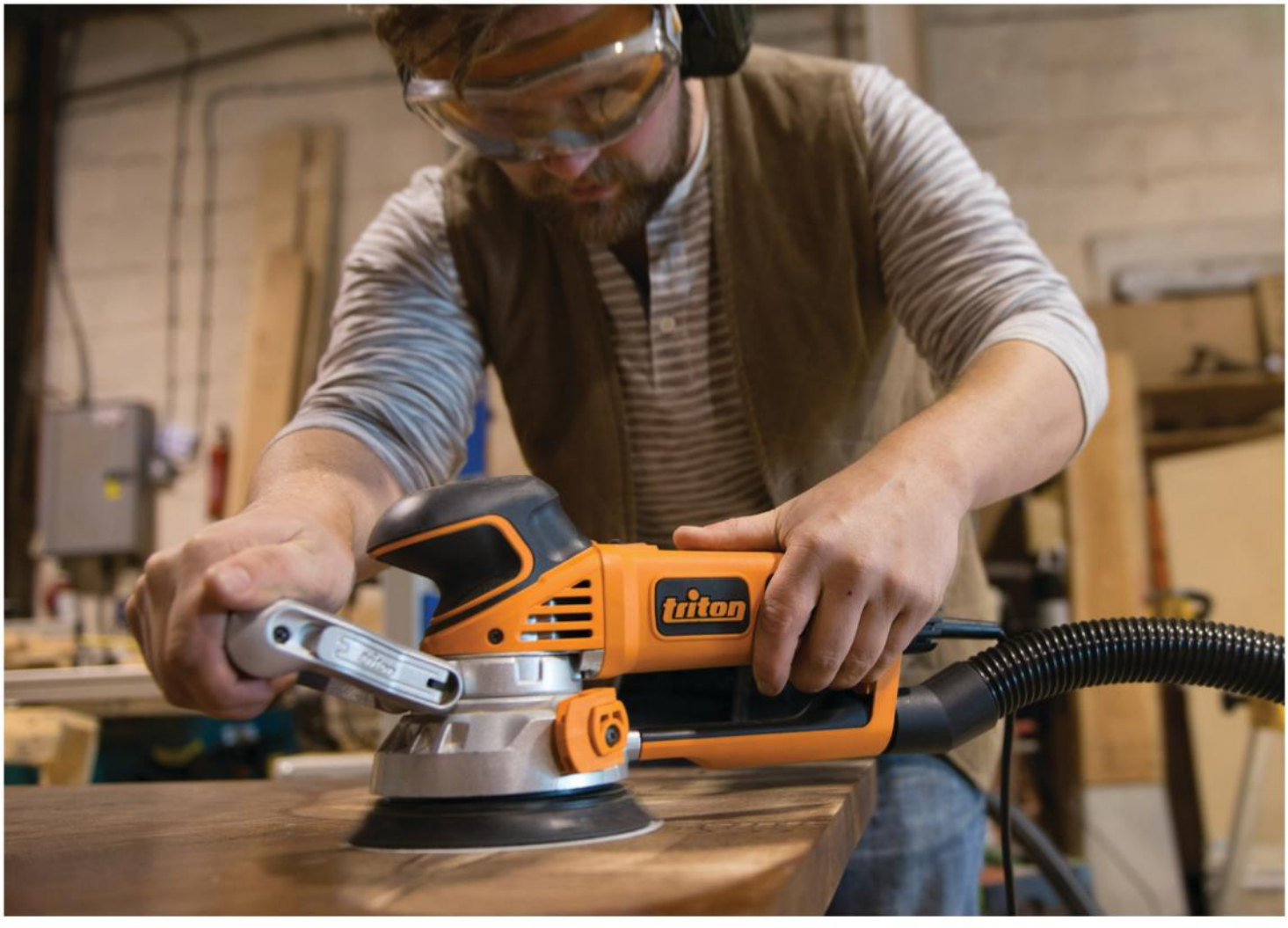
*Fourteen years after milling a felled yellow birch, **Robert LaVeyra**, of Duanesburg, N.Y., used it—and cherry milled from another downed tree—to build this changing table. The drawer fronts are tulip poplar.*

*Instead of the maple plywood called for in the original plans, **Terry Fick**, of Hoover, Ala., made solid-cherry panels for the 3-in-1 Transition Bed in issue 173 (November 2006).*

*Inspired by the look and feel of the Pint-size Rocking Chair in issue 236 (November 2015), **Keith Kroma**, of Menomonie, Wis., made a table and two matching chairs.*

continued on page 10

Engineered Precision



Tough Starts and Fine Finishes

Equipped with a powerful 500W motor and all-metal gearing, the Triton Eccentric Orbital Sander tackles the most demanding sanding and polishing tasks with two sanding modes in one tool.

A forced orbit rotation mode is used for rapid material removal on the toughest surfaces, while free-run random orbit mode delivers fine, uniform sanding results for perfect finishing.

For every sanding task, the Triton **TGEOS** gets you through the tough starts to leave a fine finish.

TGEOS

triton
Precision Power Tools

#tritontools

advertisement

Finishing Answers

Each issue, the finishing experts at Varathane answer your staining and finishing questions.

Question:

What is the best way to achieve high end finish on soft woods like pine ceder or redwood?

—Joseph L. - Platte City, MO

Answer:

Soft woods are inexpensive to obtain through reclaimed lumber or even at big box stores. They can be a great alternative to expensive hardwoods to create beautiful pieces.

Soft woods are often full of flaws. If finished correctly, the flaws are what give the project character.

The high pigment content in Varathane Wood Stain will really compliment these flaws creating uniqe beauty.

Varathane Polyurithane has the durability to protect even the softest woods and provides a great finish for your soft wood project.

Varathane Since 1958

For more finishing tips, visit: www.varathanemasters.com

SOUNDING BOARD

YOUR PROJECTS

*This cherry and maple pendulum cradle, built by **Mark Krysler**, of North Royalton, Ohio, breaks down easily for storage. The cradle swings smoothly on ball bearings Mark inserted into the frame.*

***Tom Krueger**, of Burlington, Wis., built this solid-oak child's rocking chair. It was his first attempt at mortise-and-tenon joinery, and each joint was cut by hand.*

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.

FINISH FAST. FINISH ONCE. FINISH LIKE A MASTER.

Nathan Wiens
Artist & proprietor, Chapel Arts
Master woodworker
Vancouver

Varathane® stain gives true color in one coat. And Varathane Triple Thick Polyurethane has the durability of three coats, in only one. Providing you the ultimate finish, in less time. That's why master woodworkers, like Nathan, prefer Varathane. So don't just finish it. Varathane it.

Varathane®
SINCE 1958

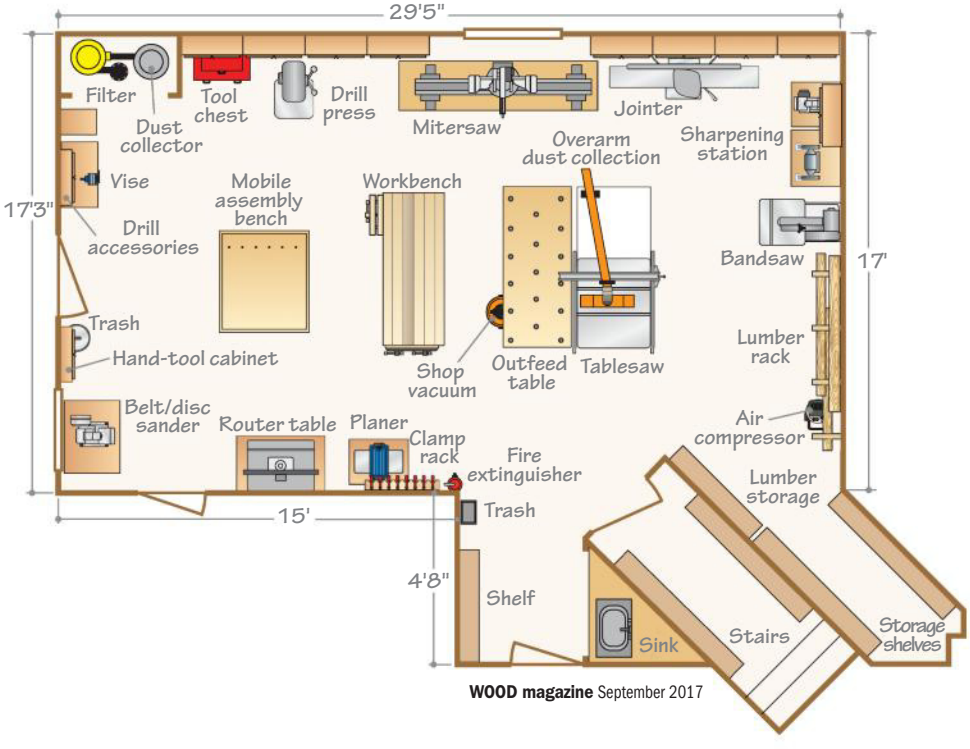
VARATHANE.COM

© 2017 Rust-Oleum

With just 550 square feet to work with in a walk-out basement, John and Shelley Glover planned well to make their shared shop neat and organized. That meant six months of fine-tuning the floor plan by moving around sticky-note cutouts of the tools and cabinets on graph paper. As a result, they shrank the basement exercise room to make the shop a little bigger. And they put to use a narrow nook next to the stairs for lumber storage, adding long shelves to hold finish and supplies.

Although compact, the shop has no shortage of power, with six 110-volt circuits and five 220-volt lines. "When our contractor saw the plan for wiring," John said, "he asked if we planned to light a shop or power a tanning parlor. We have 19 double-bulb 4'-long fluorescent ceiling fixtures. And we get natural light from two windows and a door.

"I do have two planning regrets. First, I didn't plan an outlet in the floor for the



Prized hand tools rest on custom holders or are held in place by rare-earth magnets in this maple cabinet with clamshell doors.

No sharpening system is perfect for every tool, so John has five, including a horizontal abrasive wheel, vertical sanding belt, bench grinder, and a water-cooled slow-speed grinder on a roll-out cart. Waterstones and a lapping plate rest on a locking slide-out shelf.

A window recessed in a knee wall provides 14" of clearance behind the sliding compound mitersaw, reducing the depth of the workstation's footprint. As the owner of a hardware store, John knows how to keep fasteners organized, using a 10' run of bins and cabinets above the jointer.

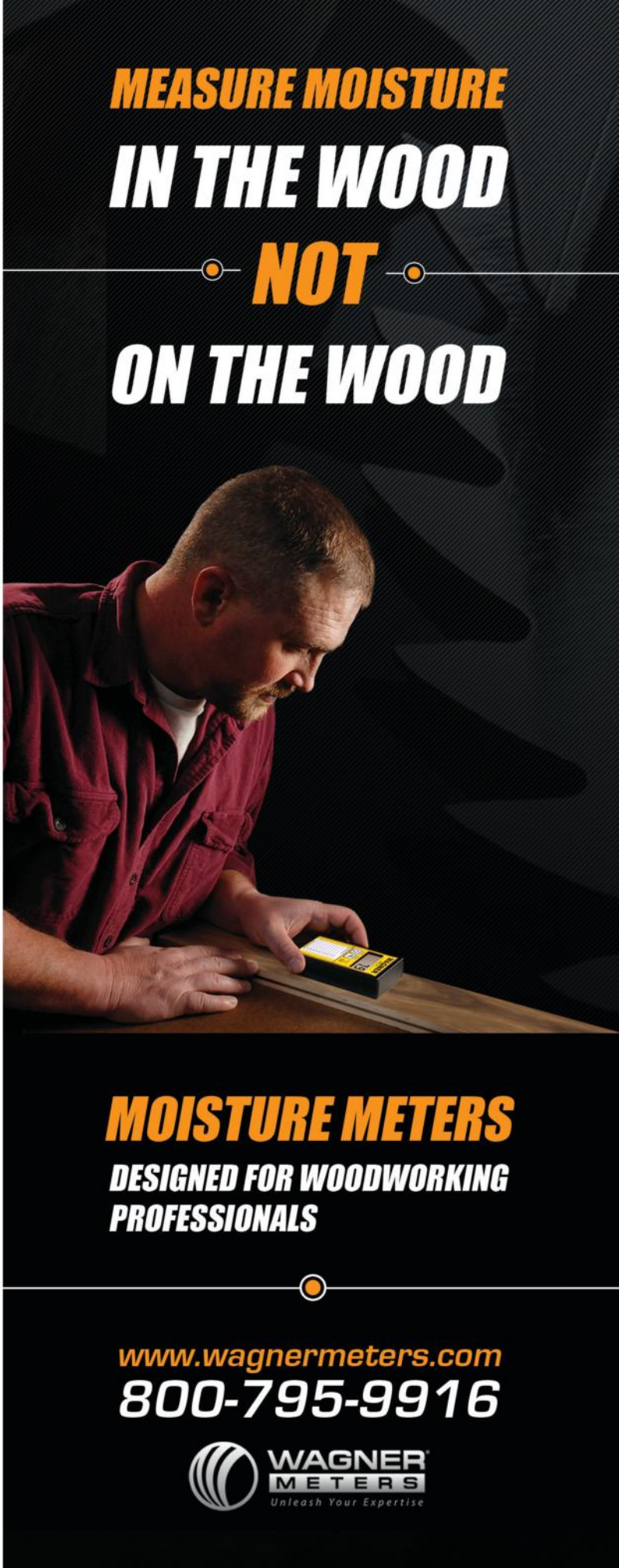
tablesaw. Too late now—we have radiant-heat pipes buried in the floor. And, I wish I had placed the 3-hp cyclone dust collector outside of the shop—it's noisy."

To keep tools honed, John built and equipped a sharpening center [*above, center*]. "I have an 8" grinder for freehand sharpening. I do quick touch-ups of kitchen knives on the 1" belt; chisels and handplane blades on the Veritas Mk.II Power Sharpener; and scissors and finishing work on kitchen knives with the Tormek sharpener."

A wall-mounted cabinet [*top*] houses many of those keenly honed tools. "Except for my grandfather's square," John says, "I bought everything in this cabinet from Lee Valley. I appreciate quality and I don't mind paying for it." Look to Shelley to head to the hand-tool cabinet, the proud husband says. "She really likes to hand-cut dovetails."

Show us your shop

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



Ask Wood
YOUR QUESTIONS

A sticky dilemma

Q I'm having trouble removing the adhesive from the metal platen of my benchtop disc-sander. Mineral spirits just turn it slimy. Any suggestions for cleaning the leftover gunk from the platen?

—Hal Souers, Friendswood, Ind.

A A number of solvents and chemical automotive cleaners will cut through any remaining adhesive residue, Hal, but we prefer using a citrus-based cleaner. Use a rag and the cleaner to remove the old adhesive, then wipe the platen down with a window/glass cleaner, such as Windex, and let it dry. That ensures a clean surface to which the new sanding disc will bond.

Next time, use a hair dryer or a heat gun set on low to warm the abrasive disc and platen and soften the adhesive. Work on one section at a time, and the disc should peel cleanly off. (Tip: If the old disc isn't worn out, use the backing paper from the new disc to preserve the old one for reuse.)

A citrus-based cleaner removes left-behind adhesive without harsh chemicals or noxious fumes.

Have a question? Drop us an e-mail.
askwood@woodmagazine.com

freud®

How Can You Get the Most Out of Your CNC Router?

Use Freud's New CNC Router Bit Series

Freud's new CNC router bits are specially formulated with our exclusive TiCo™ carbide, unique cutting geometries and Perma-SHIELD® non-stick coating for unmatched cutting performance and durability on workshop and small CNC machines.

With over 25 years experience in developing premium CNC bits combined with being the only manufacturer that produces its own carbide, Freud is able to create these new finite, yet durable CNC bits that the woodworker needs to create premium quality projects.

8 Pc General Purpose Set
Item # 87-208

Whether you are creating detailed inlays, decorative projects or sign making, Freud's unique, initial offering of seven new CNC bits and two new sets will deliver superior cutting performance and quality finish. Ideal for hardwoods, softwoods, aluminum and plastics.

8 Piece Sign Making CNC Bit Set
Item # 87-108

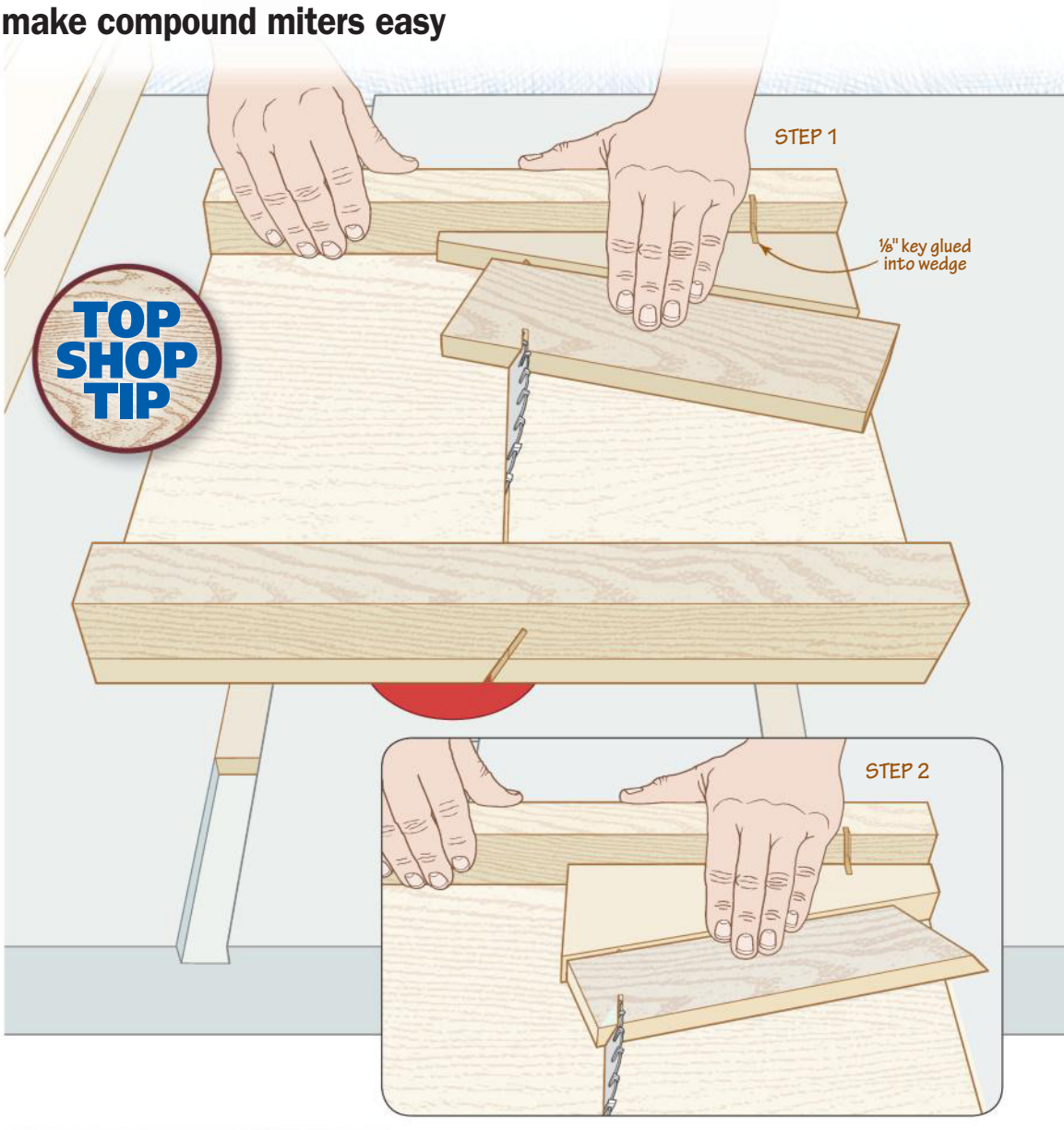
LEARN MORE AT WWW.FREUDCNC.COM

Shop-made wedges make compound miters easy

Boxes and trays look more interesting when their sides angle out toward the top because of corners cut at compound miters. Fortunately, you can turn your tablesaw's plain-Jane 90° cutoff sled into an easy-to-control and spot-on accurate jig for cutting compound miters by just adding wedges of any desired angle. (I keep on hand wedges cut at various angles, with 8° being one of my favorites. Experiment with wedges a few degrees different from that to discover what you like best.)

You'll need a mirrored pair of wedges—one with the key at the narrow end of the wedge and the other with the key at the wide end—for cutting opposite ends of each box or tray side. To anchor each wedge, notch one side of the sled's fence to accept a ⅛"-thick key. For four-sided boxes, set the blade at a 45° bevel. Cut one end of the workpiece, as shown in Step 1, then substitute the mirrored wedge and cut the opposite end, as shown in Step 2.

—Joe Godfrey, Forest City, N.C.



Tips earn up to $150.

If your tip is the best of the issue, it wins **Top Shop Tip** honors, and you receive a **tool prize** worth at least **$300**.

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

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

For sending this issue's Top Shop Tip, Joe receives Work Sharp and Drill Doctor sharpening systems worth $300.

continued on page 18

Your Life Just Got Easier.

"I can't believe there's no dust!"

U.S. Pat. Pend.

UNIVERSAL DUST FREE ROUTER HOOD

MADE IN USA

If there's any tool that needs effective dust collection, it's your router. Chips are flying, dust is piling up, and you can barely see through the cloud.

Finally there's an affordable solution that works for almost any portable router!

PLUNGE FIXED-BASE TRIM

Router, hoses, and vacuum not included.

May be too large for some trim routers.

Visit routerhood.com
for more details and to see it in action

Oneida Air Systems

The Leader In Dust Collection

800.732.4065

Shop Tips

See and quickly retrieve shop liquids

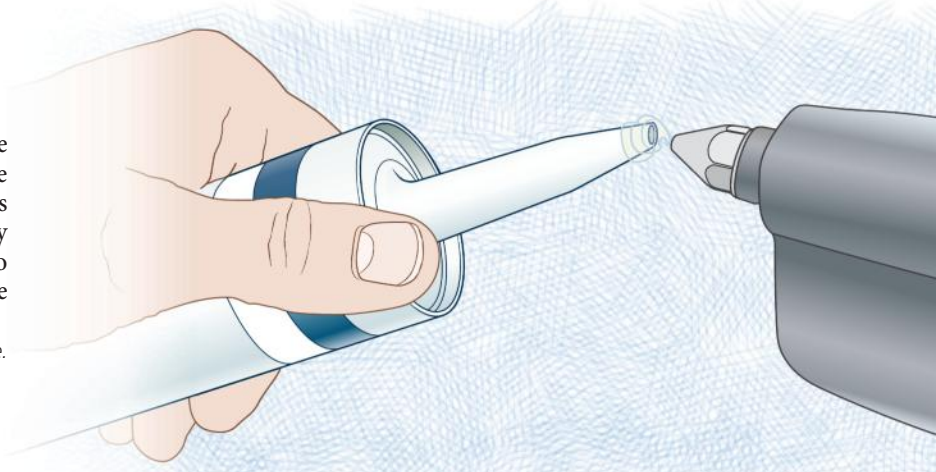
For years I scrounged deep into the back recesses of cabinet shelves to locate the right container of finish, stain, paint, or glue. Then it dawned on me how much easier that task would be if I stored those items in a slide-out vertical drawer, like the ones found in kitchens. (Be sure to use drawer glides rated to support at least 100 lbs.) Now I have four such shop drawers, in varying widths for pint, quart, and gallon containers. Finding my fluids couldn't be easier.

—Dennis Cope, Knoxville, Tenn.

Hotmelt helps cork caulk tubes

Over the years I've tried nails, screws, plastic wrap, wire nuts—you name it—to seal opened nozzles. None of those items proved effective; after a few weeks a hardened mass of caulk, silicone, or adhesive formed in the nozzle. Finally I tried placing a dab of hotmelt glue on the opened end. To my pleasant surprise, the resulting airtight seal kept the nozzle's contents workable for months.

—Dick Powell, Corvallis, Ore.



continued on page 20

Moisture Meters from Lignomat

The Woodworker's Choice:

Nobody can beat our quality, price and proven measuring technology.

Mini-Lignos are acurate, reliable and versatile: Used when drying lumber, buying lumber, selecting lumber for a project, installing floors ...

The best tools and excellence in craftsmanship cannot guarantee lasting beauty in woodwork, if the wood for the project was too wet.

The solution is simple: Use a moisture meter and check the wood moisture before you start.

Best Lignomat Price
www.mini-Ligno.com

Buy a pin or pinless meter from Lignomat:

- ✔Better **Quality**
- ✔Better **Warranty**
- ✔Better **Accuracy**
- ✔Better **Customer Service**

For a Recommendation call:
800-227-2105
www.Lignomat.com

YOU NEVER FORGET YOUR FIRST MINIMAX

For over 65 years we have been developing machinery which heeds your voice before anything else. The voice of our customers teaches us to build machines that are flawless, reliable, durable. They are designed to overcome your challenges and help you accomplish your projects —big or small.

scm

Contact us for more information at scmgroupna.com or marketingusa@scmgroup.com

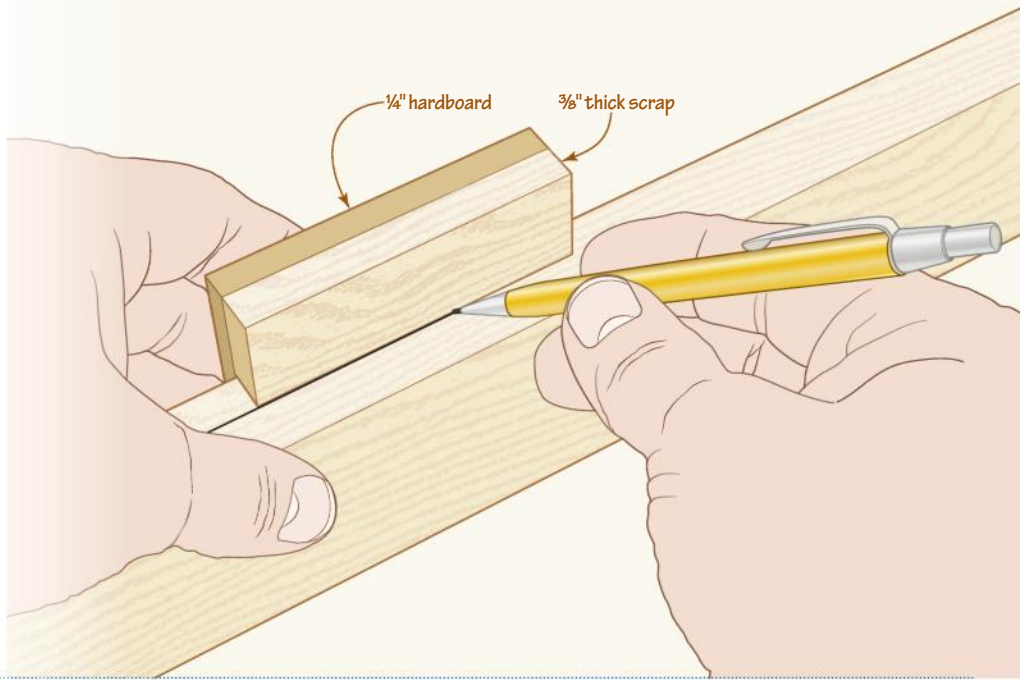
minimax

Shop Tips

Shop-made guides make easy work of spacing holes

A recent project required drilling a large number of holes ⅜" from the edge of a workpiece. It wasn't possible to use a drill press and fence to drill the holes, so I pondered a quick and accurate way to mark a line that distance from the edge for locating hand-drilled holes. Then I built the guide shown from scraps of ⅜"-thick wood and ¼" hardboard. It worked so well, I made a set for other common dimensions.

—Len Urban, Rancho Mirage, Calif.



Super-simple outfeed table features oodles of storage

I couldn't find a commercially available tablesaw outfeed table with ample built-in storage, and didn't want to invest weeks in building one. So I bought a large tool chest and attached to it a 3×4' top made of two layers of ¾" MDF with solid-wood edges. Carriage bolts through the side edges hold the top to the chest; wooden blocks under the chest position the table level with the tablesaw top. Depending on your tablesaw and miter gauge, you may need to rout channels into the outfeed table to accommodate the miter gauge's bar.

—Evan Freese, Cedar Rapids, Iowa

LET US HELP YOU CREATE THE KITCHEN OF YOUR DREAMS

CABINET INSTALL SCREWS

Sand & White Painted Heads seamlessly blend into multiple cabinet colors.

Self-Drilling screws for light, medium, or heavy gauge metal studs.

QX^2 approved by the Woodworking Institute as a Multipurpose Install Screw.

CABINET ASSEMBLY SCREWS

Nibs countersink your screws for you, so the head sits flush with the wood.

Double Type 17 Point allows you to drive your screws without a pilot hole and prevents splitting.

Funnel Head Screws let you work with melamine without worrying about chipping.

QUICKSCREWS INTERNATIONAL CORPORATION 19 87

VISIT US AT AWFS BOOTH #4250
JULY 19TH - 22ND | LAS VEGAS

www.quickscrews.com | 800.743.6916

Get Out There and Fail

Guaranteed success can be bad

by Chris Wong

Fear of failing sometime steers us towards taking unnecessary precautions to better the odds of success. It makes perfect sense, but it's a shame because when things are overdesigned and overbuilt, we often don't have the opportunity to observe the true strengths of the components involved.

Taking the time to build prototypes enables you to get a feel for the overall design and strength of the materials. Applying stress to a prototype can surprise you...in good ways.

Understand the materials, techniques, and tools you use

Forget cosmetic appearance—the real beauty comes from the strength within. Take the wood species ash as an example. The true beauty of ash, despite its strong grain lines, is its strength and flexibility. These physical properties allow components to be shaped more aggressively. Likewise, fine-grained hardwoods allow us to cut finer details, including joinery and carvings. For those reasons, it is important that the maker have a good understanding of the materials when matching them to the design.

As with most things, you can learn from books about the physical properties of materials, and the strengths of different joints. That's an excellent place to start, but a terrible place to finish. Books and pictures don't adequately convey the strength of a certain material or joint. Descriptions such as "good load strength and medium hardness" or "an excellent joint for a drawer" don't tell you how the material or joint will fare in the real world. Videos are slightly better, but are still poor replacements for hands-on experience. The best way to learn is to experiment. Seek failure.

Experiment. Seek failure.

Gather real-world experience

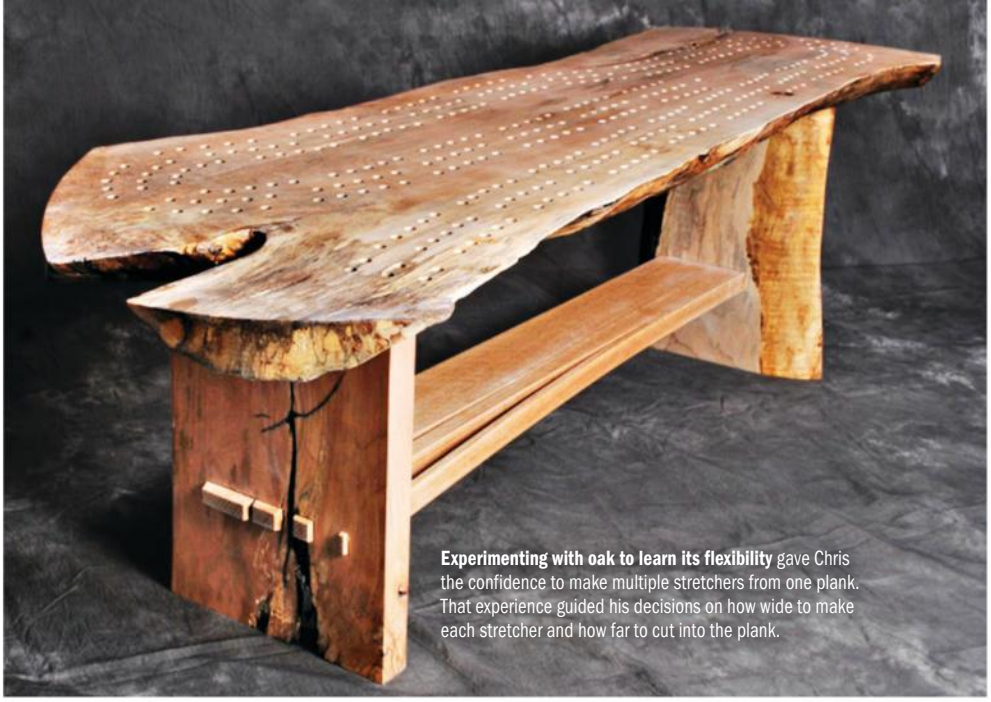
Here's a simple exercise I use to learn the strength of materials: A project always yields some offcuts. Instead of cutting down over-length offcuts to fit in the firewood box, I first try to break them.

For small pieces, I may try to fold them with just my upper-body strength. Larger ones I may try to break over my knee. But for most offcuts, I set one end on the ground and the other on a block of wood, then stomp on it. It is impressive how strong wood is. Quite often, the wood will kink or bend before it fails.

Apply your knowledge to your designs

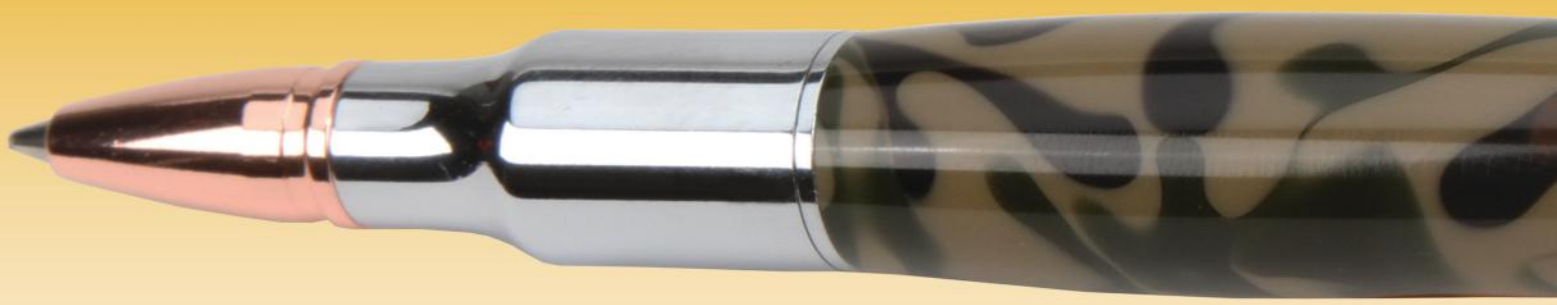
We can apply our knowledge of materials and joints to the things we build. Remember that in most projects, the piece of wood taking a load—whether it be a tabletop, chair stretcher, or drawer bottom—is wider if not thicker than our sacrificed scrap and hopefully not the subject of somebody stomping on it.

I think that this exercise will build your confidence in material strength, and possibly get you thinking about using materials in more daring ways.



Experimenting with oak to learn its flexibility gave Chris the confidence to make multiple stretchers from one plank. That experience guided his decisions on how wide to make each stretcher and how far to cut into the plank.

Chris Wong makes sculptural furniture and is passionate about finding ways to elevate a design by adding unexpected twists. Ever seen a twisted mortise-and-tenon joint? Find one along with more of his work at flairwoodworks.com



Penn State Industries

Top Quality, Great Prices and Expert Advice!

1-800-377-7297 • www.pennstateind.com

Everybody Will Want Their Hands on One

Discover the joy of making these completely original and irresistibly fun Bolt Action and New Revolver Pen Kits. A great gift for every hunting, target shooting and gun aficionado. Both pen styles are completely authentic with precision engineered components that were carefully designed to ensure uniqueness and reliability. They feature a Parker™ style refill for smooth writing performance. And they're so easy, fun and fulfilling to make on a lathe, no one will believe you made something of this quality in 15 minutes.

Bolt Action Pen Kits

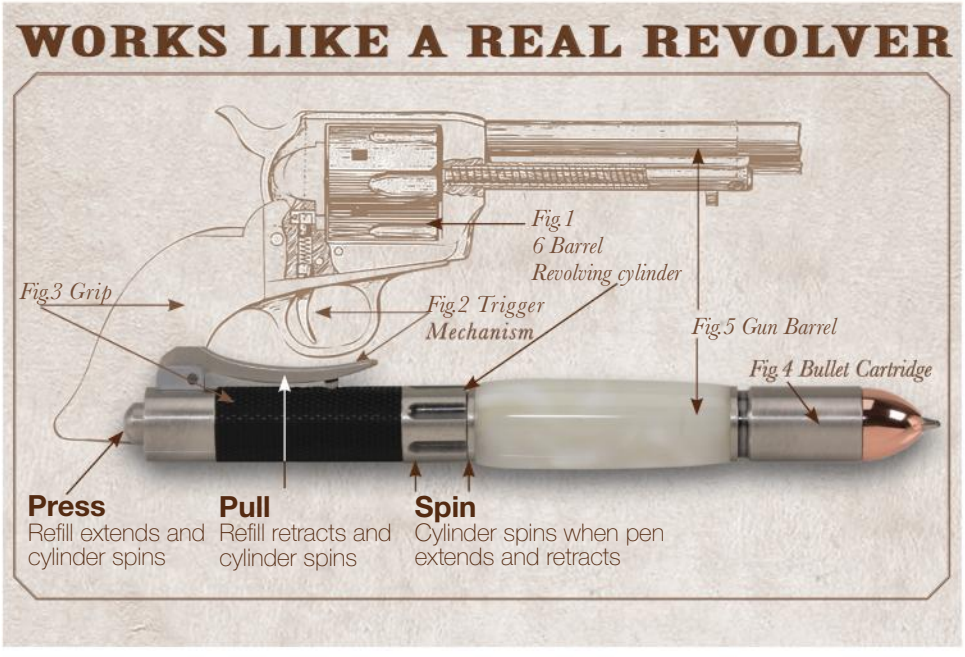
Our best-selling pen kits enjoys a huge following in the pen making community. It's beloved for its realistic bolt-action handle that smoothly advances and retracts to securely lock the refill in place. Includes a bolt-action rifle clip and replica 30 caliber cartridge and rose gold tip for added authenticity. You can even reverse the bolt for left handed operation! Requires a pen making mandrel, bushings (Item # PKCP3000BU $5.95) and 3/8" drill bit (Item #PKEXEC-3/8 $3.95). Patent No.: US D682,352 S

Easy to start with a FREE DVD! A $20.95 value!

Our FREE 45-minute instructional DVD is packed with all the info you need to start making pens. Order Item # DVD. You'll join thousands of other pen makers who love creating beautiful gifts!

Revolver Pen Kits *NEW!*

These nostalgically stylish pens look and work just like a real revolver. When you press the click mechanism the pen tip extends, the trigger clip moves up and the 6-barrel cylinder rotates to replicate you loading the gun. Then, when you pull the hairpin trigger pen clip the tip retracts while the 6-barrel cylinder quickly spins to replicate you firing the gun. Right above the cylinder you'll find a black metal grip that mimics a revolver handle. And the bullet cartridge pen tip represents your favorite revolver bullet. Requires a pen making mandrel, bushings (Item # PKREVBU $5.95) and 3/8" drill bit (Item # PK10-10 $3.95).
Patent pending.



Bolt action handle smoothly advances and retracts the refill

Bolt Action Pen Kit in Chrome

Revolver Pen Kit in Antique Brass

Revolver Pen Kits *NEW!*

	Item #	1-4	5-9	10-24	25+
Chrome	#PKREVCH	$22.95	$21.95	$20.95	$19.95
Gun Metal	#PKREVGM	$22.95	$21.95	$20.95	$19.95
Antique Brass *(shown above)*	#PKREVAB	$24.95	$23.95	$22.95	$21.95
Antique Pewter	#PKREVAP	$24.95	$23.95	$22.95	$21.95

4 Revolver Pen Kit Starter Set

You get 1 Pen Kit in Chrome, 1 in Gun Metal, 1 in Antique Brass and 1 in Antique Pewter. Plus, you get the bushings and drill bit.

#PKREVSS SAVE $25 **Only $79.95**

**Kits in packs may vary subject to availability*

SAVE 24%

Chrome

Gun Metal

Antique Pewter

Bolt Action Pen Kits *BEST SELLER!*

	Item #	1-4	5-24	25-49	50+
Chrome *(shown above)*	#PKCP8010	$12.95	$12.05	$11.15	$10.25
Gun Metal	#PKCP8020	$12.95	$12.05	$11.15	$10.25
24kt Gold	#PKCP8000	$14.95	$13.95	$12.95	$11.95
Antique Brass	#PKCP8040	$14.95	$13.95	$12.95	$11.95

3 Bolt Action Pen Kit Starter Set

You get one of each pen in Chrome, Gun Metal and 24kt Gold plus the 3/8" drill bit and 2pc Bushing Set

#PKCPBAPAK SAVE $8 **Only $42.75**

** Kits in packs may vary subject to availability*

SAVE 16%

Gun Metal

24kt Gold

Deer Hunter Bolt Action Pen Kits

	Item #	1-4	5-24	25-49	50+
Antique Brass	#PKCP8DHAB	$16.95	$15.95	$14.95	$13.95
Antique Pewter	#PKCP8DHAP	$16.95	$15.95	$14.95	$13.95

Antique Brass

Antique Pewter


DIMENSIONS:
68½" H × 34" D × 35¼" L
Approximate materials cost:
$400
not including propane cooker and oven racks.
Rolls on casters for easy storage between uses.

Backyard barbecue Smoke Shack

Smoke your own meat and more in this easy-to-build propane-fueled smoker cabinet.

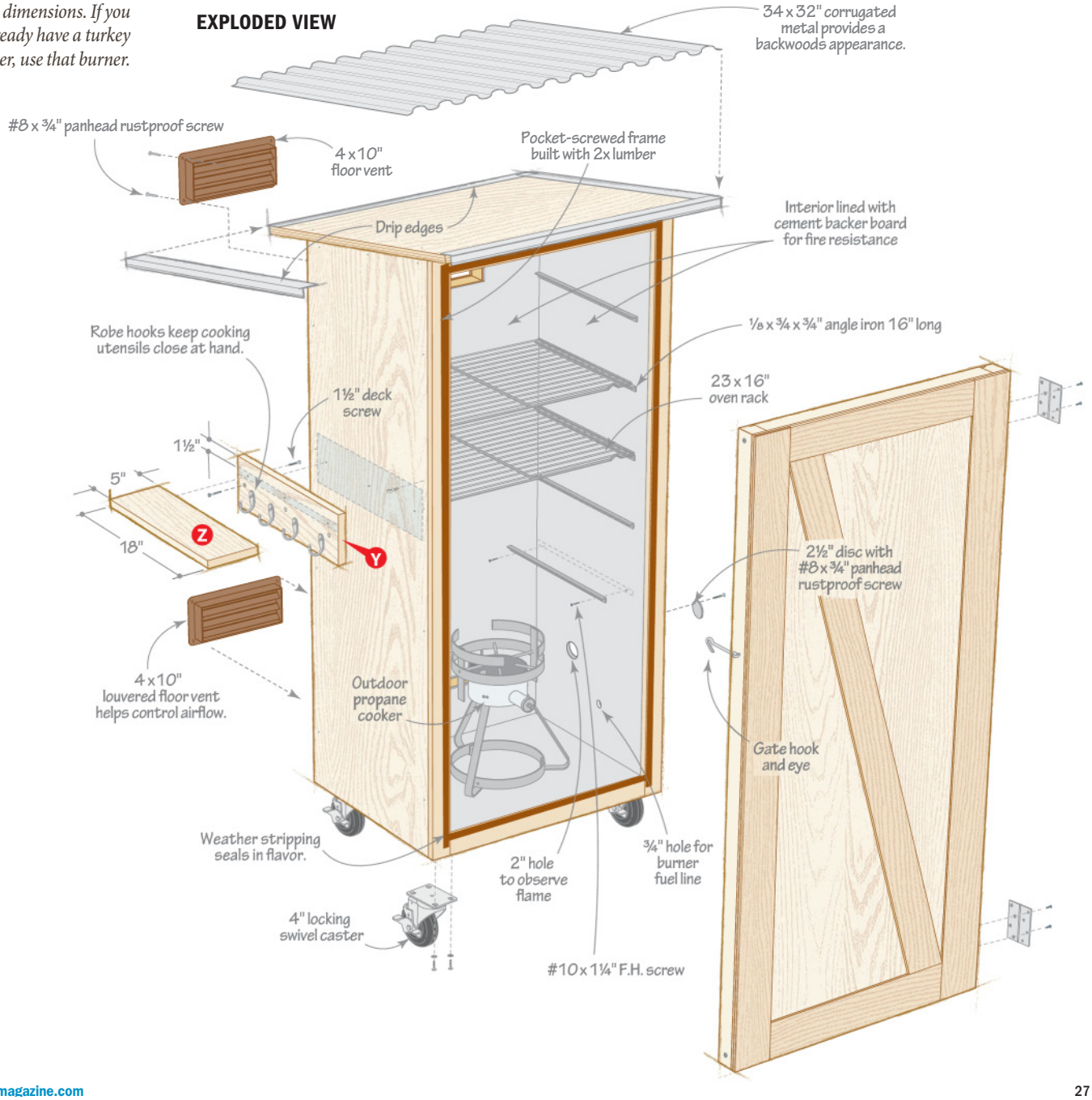
Note: *Buy an outdoor propane cooker and oven racks* [**Sources**, page 31] *before building the smoker. Their sizes could affect project dimensions. If you already have a turkey fryer, use that burner.*

Build the frame

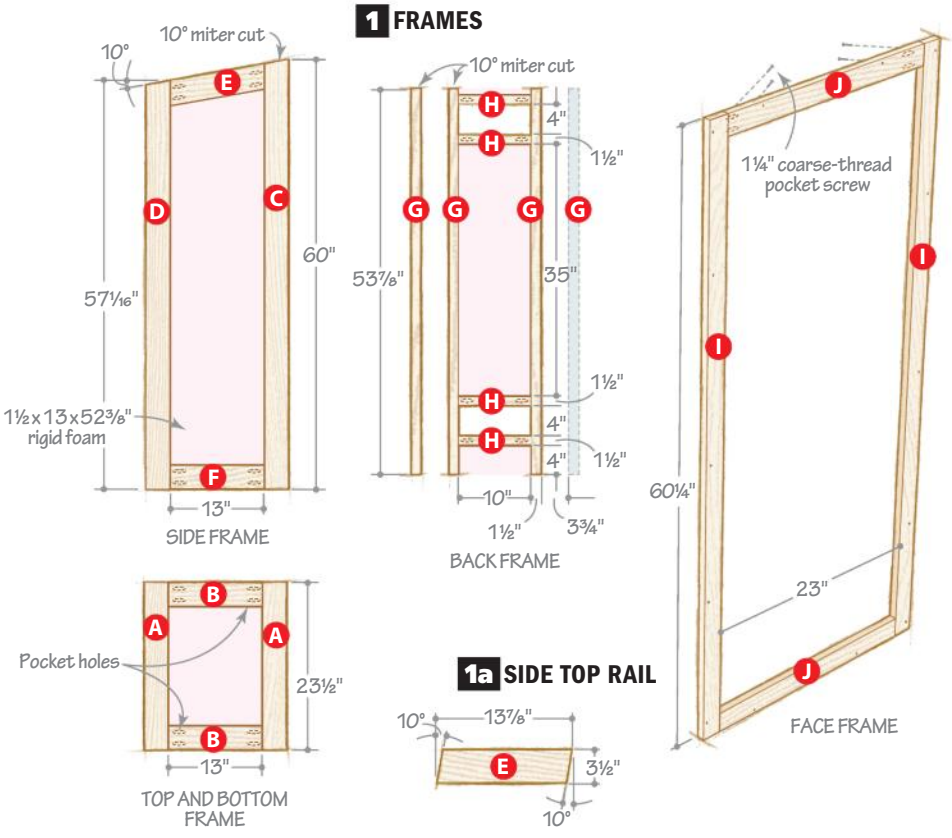
1 Cut frame parts A–J to size [**Materials List**], mitering the ends of parts C, D, E, and G [**Drawings 1** and **1a**].

2 Assemble the frames with pocket-hole screws. Note that you will have two unattached parts G.

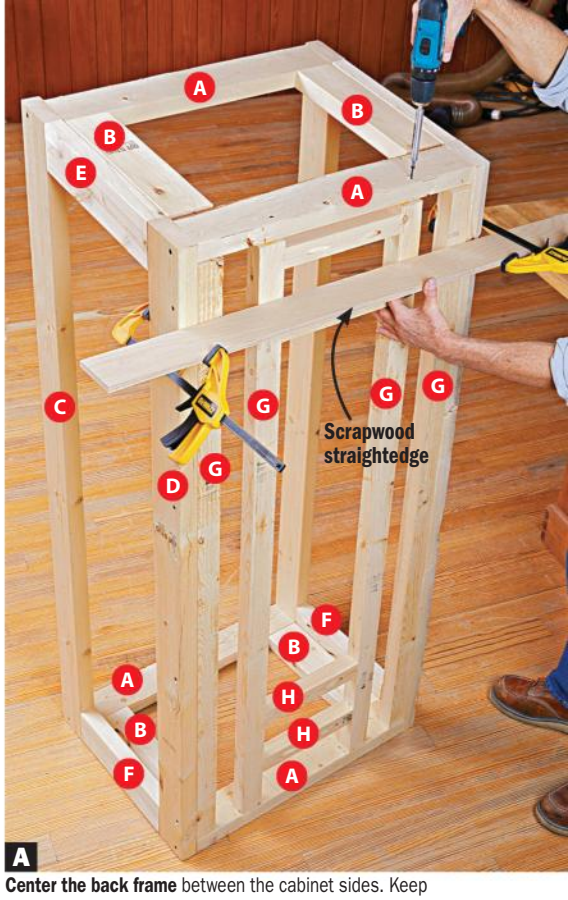
EXPLODED VIEW



1 FRAMES



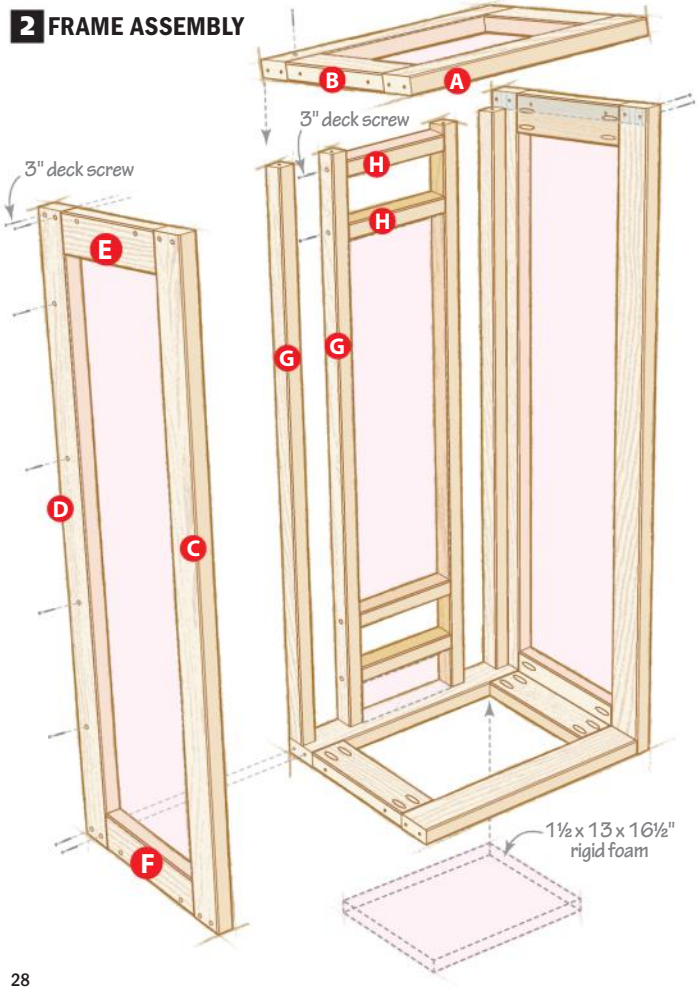
1a SIDE TOP RAIL



A

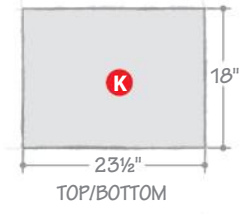
Center the back frame between the cabinet sides. Keep the frame flush with the back edges as you drive screws into the stiles.

2 FRAME ASSEMBLY

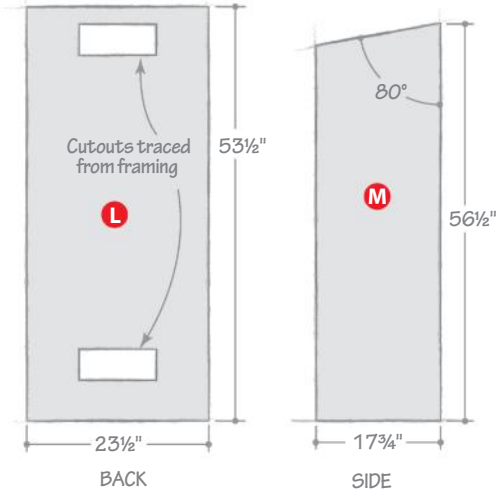


3 Clamp the top and bottom frames (A/B) between the side frames (C–F), flush at front and back, and screw them together [**Drawing 2**].

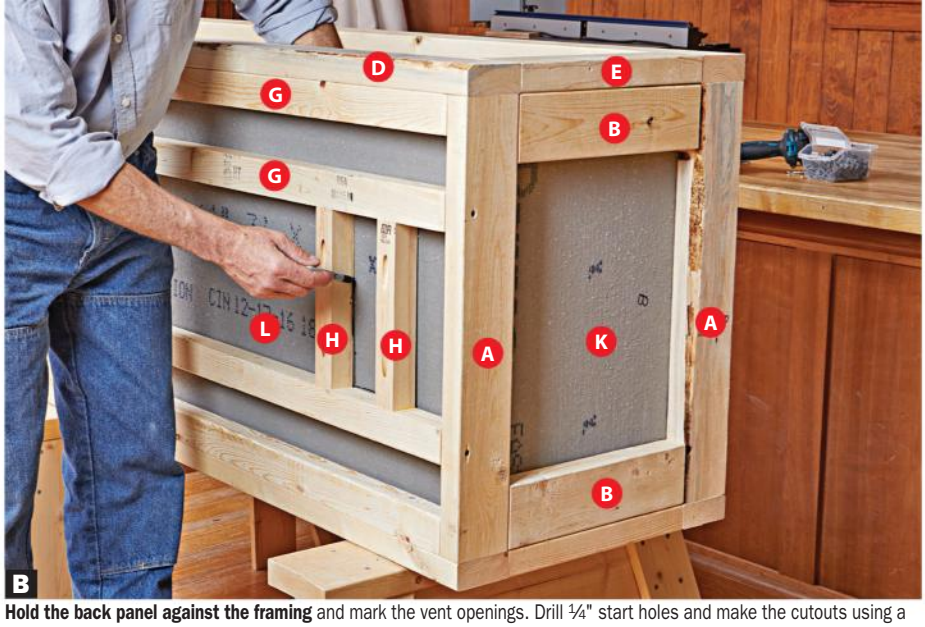
4 Screw the loose back stiles (G) to the assembly, flush with the back of the side rails (D). Then, install the back frame (G/H) [**Photo A**].



3 INTERIOR PANELS



Tip! *Use your circular saw with a masonry blade to cut the backer board. Work outside; the job creates a lot of abrasive dust.*

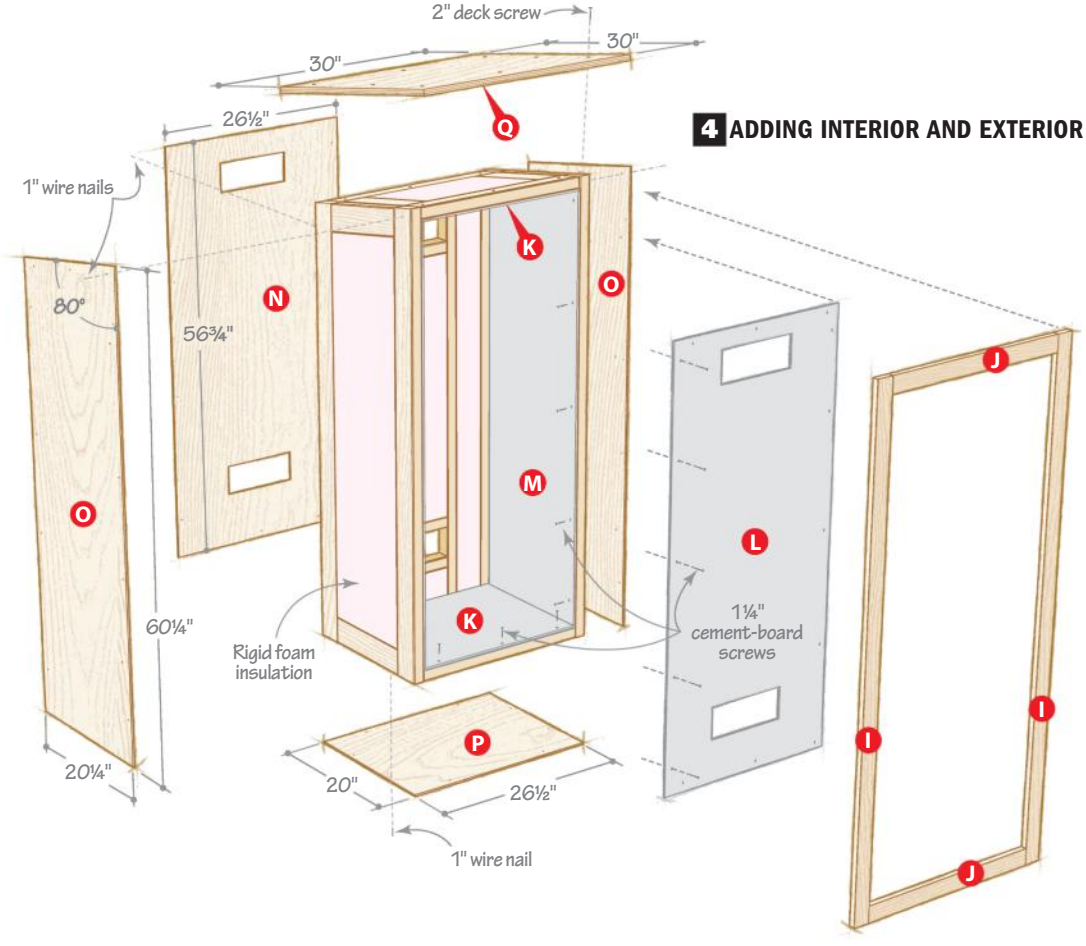


B

Hold the back panel against the framing and mark the vent openings. Drill ¼" start holes and make the cutouts using a jigsaw with a metal-cutting or carbide-edge blade.

C

Cut foam insulation board to fit snugly between the framing members and secure it with construction adhesive.



4 ADDING INTERIOR AND EXTERIOR PANELS

Note: *Lumberyards and home centers sell tile backer board (also called cement board). When buying the board, also purchase the self-drilling screws that go with it for easier installation.*

Add the panels and insulation

1 Verify the interior dimensions, and cut interior panels K and L to size from ¼" cement backer board [**Drawing 3**].

2 Run a bead of construction adhesive along the framing and screw on the top and bottom panels (K) [**Drawing 4**].

3 Temporarily slide the back panel (L) into place, and trace the vent openings on it [**Photo B**]. Jigsaw the slots, and install the panel. Cut the side panels (M) to fit, making tight corners, and attach them.

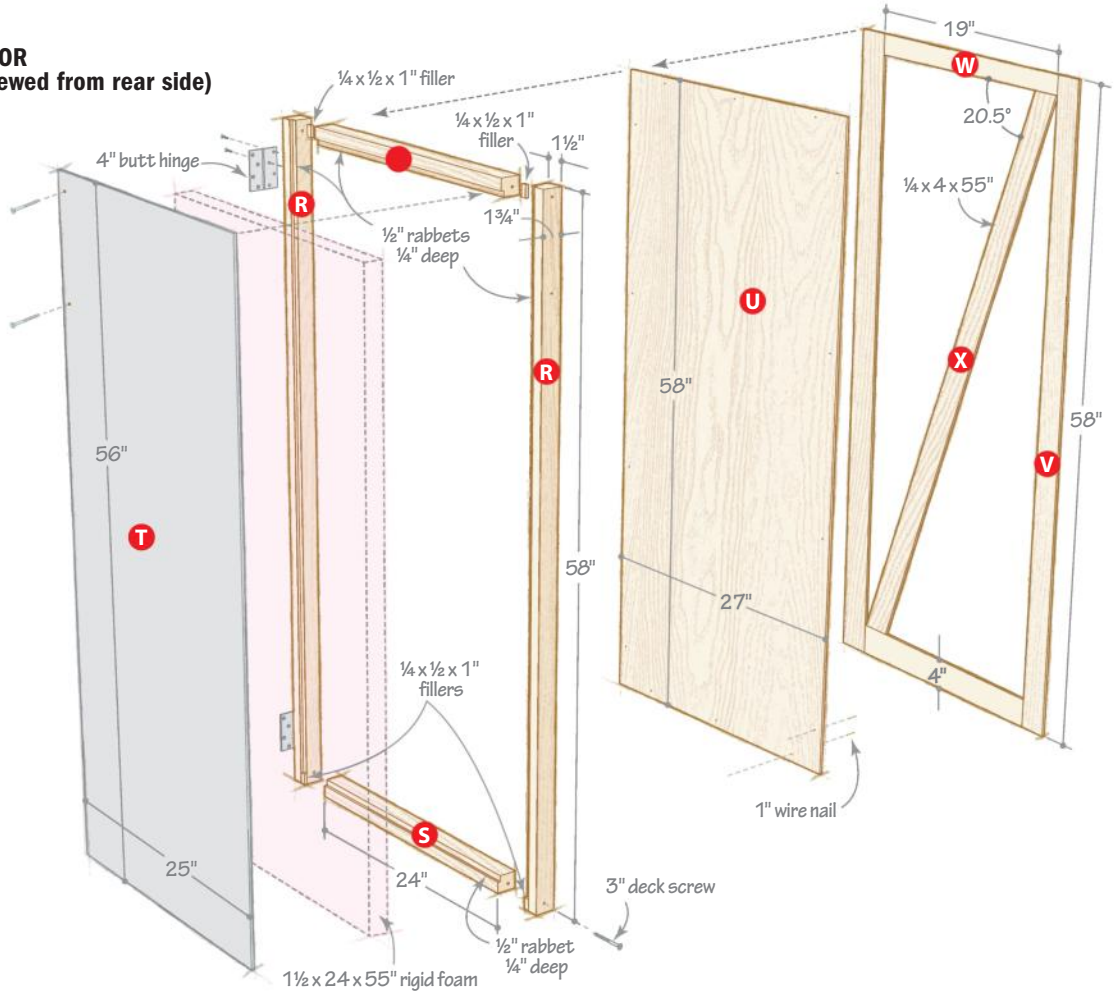
4 Cut 1½"-thick rigid foam insulation to fit inside all framing cavities [**Photo C**].

5 Cut exterior panels N–P to size [**Drawing 4**]. Make sure panels N and O meet neatly at the corners and fit flush along the cabinet top. Glue and nail the panels in place.

6 Glue and nail the face frame (I/J) to the front of the cabinet. Position the frame flush at the top of the cabinet, with equal overhangs at the sides and ¼" overhang at the bottom [**Drawing 4**].

7 Cut the roof (Q) to size. Glue and screw it to the top of the cabinet, centering it. Caulk the gap between the face frame and the underside of the roof panel, if necessary.

5 DOOR
(Viewed from rear side)



Make the door and shelf next

1 Cut the door stiles and rails (R, S) to size. Rabbet the inside faces [**Drawing 5**].

2 Assemble the door frame with screws and glue. Cut four blocks to fill the rabbets at the corners, and glue them in place with weatherproof glue.

3 Cut the interior and exterior panels (T, U) to size. Check the frame (R/S) for square; then nail and glue the exterior panel (U) in place, flush on all edges. Cut the door trim (V, W, X) to fit and attach it using weatherproof glue and a brad nailer.

4 Glue rigid foam insulation into the frame cavity. Then, glue the interior panel in place [**Photo D**].

5 Cut shelf parts Y and Z to size. Screw and glue them together [**Exploded View**]. Drill holes for mounting screws, and pilot holes for screws to attach four robe hooks to hang oven mitts, tongs, and such.

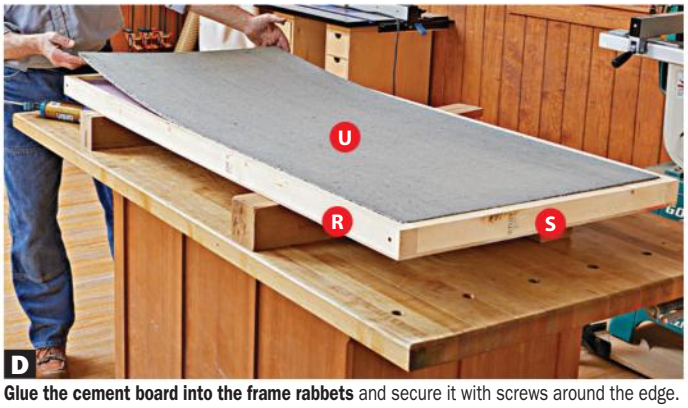
Take care of the last details

1 Cut 10 pieces of ⅛×¾×¾" angle iron 16" long for the oven-rack slides. Drill and countersink holes for #10×1¼" panhead screws 1" from each end of each piece.

2 Stand your outdoor propane cooker inside the cabinet on the bottom. Mark the level for the lowest pair of slides about 2" above the top of the burner. Drill pilot holes in the smoker sides and attach the first pair of slides. Space the remaining slides evenly [**Exploded View**].

3 Finish the cabinet and door exterior surfaces and the shelf (Y/Z) with semi-transparent exterior stain. (We applied Olympic Maximum stain and sealant in redwood natural tone.)

4 From outside the smoker, install floor vents in the cabinet openings. Attach them with ¾" rustproof screws.



Glue the cement board into the frame rabbets and secure it with screws around the edge.

Cooking in the smoker

Smoking cooks meat at a low temperature (usually 200–250°) in a smoky atmosphere for a long time. (Smoking burgers, steaks, or salmon fillets can take an hour or so; a turkey breast or whole chicken, 4 hours; ribs, 4–8 hours; and a roast, 12 hours or longer.) Smoldering wood chips produce the smoke, which adds distinctive flavor to the meat.

Wood species determines flavor. Mesquite, hickory, oak, and cherry give strong flavor, while alder, apple, peach, and pecan are less intense. You can buy hardwood chips for smoking at many hardware, outdoor sports, or food stores. Soak the wood chips in water for several hours before use.

Light the burner and adjust the valve to establish a low flame. Then, place a 10–14" cast-iron skillet on the oven rack just above the burner [**Opening photo**]. Close the smoker door and allow the interior temperature to reach 200–225°.

With the smoker heated up, spread your wet wood chips in the skillet, and place the meat on the racks. Close the door and continue to monitor interior temperature with a remote digital thermometer. Hang the probe on the top rack and route the cable to the readout outside the cabinet. (You could use another remote thermometer for the meat, as shown in the **Opening photo**.)

Some grillmasters like to remove the chips after the meat reaches about 140° and bring the meat to final temperature (see **Smokin' hot**, *below*) without smoke.

Smokin' hot

The USDA recommends smoking to these internal temperatures (check with a probe meat thermometer) to ensure food safety:

- Beef, pork, veal, and lamb (steaks, chops, and roasts): 145°
- Ground meats: 160°
- Ham, fresh or smoked, uncooked: 145°
- Ham, fully cooked: reheat to 140° if USDA inspected; otherwise, 165°
- Poultry: 165°
- Fish and shellfish: 145°

Most authorities suggest at least 150° for wild game; check with hunting officials in the area where you harvested the animal.

Important Note! *Never allow the temperature inside the smoker to exceed 250°. Higher temperatures could set fire to the smoker. In use, position the unit well away from combustible surfaces.*

Tip! *Follow the manufacturer's instructions for lighting and adjusting your burner. Check fuel consumption specs to ensure you'll have enough gas to finish the cooking.*

5 Attach 4" casters to the bottom of the smoker [**Exploded View**]. Screw the shelf (Y/Z) to the side and install the robe hooks.

6 Apply drip edge around the roof and install finish roofing. (We used galvanized corrugated metal.)

7 Stick self-adhesive foam weather stripping on the face frame around the door opening. Lay the smoker on its back, and install the door, making it flush at the sides and 1" up from the bottom. Attach the gate hook and eye and stand the unit up.

8 On one side, drill a ¾" hole for the burner fuel line and a 2" hole at flame level so you can check the flame without opening the door. Attach a 2½" disc cut from galvanized flashing metal that you can flip down to cover the larger hole between observations.

Materials List

Part		FINISHED SIZE T	W	L	Matl.	Qty.
Cabinet frame						
A	top/bottom stiles	1½"	3½"	23½"	P	4
B	top/bottom rails	1½"	3½"	13"	P	4
C	side front stiles	1½"	3½"	60"	P	2
D	side back stiles	1½"	3½"	57 1/16"	P	2
E	side top rails	1½"	3½"	13⅞"	P	2
F	side bottom rails	1½"	3½"	13"	P	2
G	back stiles	1½"	1½"	53⅞"	P	4
H	back rails	1½"	1½"	10"	P	4
I	face frame stiles	¾"	2"	60¼"	P	2
J	face frame rails	¾"	2"	23"	P	2
Panels						
K	top/bottom interior	¼"	18"	23½"	CB	2
L	back interior	¼"	23½"	53½"	CB	1
M	side interior	¼"	17¾"	56½"	CB	2
N	back exterior	¼"	26½"	56¾"	Ply	1
O	side exterior	¼"	20¼"	60¼"	Ply	2
P	bottom exterior	¼"	20"	26½"	Ply	1
Q	roof	¾"	30"	30"	Ply	1
Door						
R	stiles	1½"	1¾"	58"	P	2
S	rails	1½"	1¾"	24"	P	2
T	interior panel	¼"	25"	56"	CB	1
U	exterior panel	¼"	27"	58"	Ply	1
V	trim stiles	¼"	4"	58"	Ply	2
W	trim rails	¼"	4"	19"	Ply	2
X	diagonal trim	¼"	4"	55"	Ply	1
Shelf						
Y	back	¾"	5"	18"	P	1
Z	shelf	¾"	5"	18"	P	1

Materials key: P-pine, CB-cement backer board, Ply-BC sanded plywood.

Supplies: 4×10" floor vents (2), robe hooks (4), 22⅞×16" oven racks (5), ⅛×¾×¾" steel angle (14'), 4" zinc-plated butt hinges (2), 4" gate hook and eye (1), self-adhesive foam weather stripping (16'), 10' metal drip edge (2), finish roofing (8 sq. ft.), 4" locking swivel casters (4), 1½×48×96" rigid foam insulation board (2), #8×¾" panhead rustproof screws (9), 1¼" coarse-thread pocket screws (48), 1¼" cement-board screws (200-pack), #10×1¼" panhead screws (20), 1½" deck screws (6), 2" deck screws (8), 3" deck screws (44), #8×1¼" flathead screws (24), 1" wire nails (108), galvanized flashing metal, semitransparent exterior stain.

Blades: Circular-saw masonry blade, jigsaw metal-cutting or carbide-edge blade, 2" holesaw.

Sources: Replacement oven rack WB48X5099 for GE Range (5), $26, Chard BSR-13 burner, fryer stand, and regulator set, $41.25, Walmart stores or walmart.com.
Bayou Classic 14" cast-iron skillet, $35, Bed, Bath, and Beyond stores or bedbathandbeyond.com.

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

Cutting Diagram

1½ x 3½ x 96" Pine

1½ x 3½ x 96" Pine (2 needed)

1½ x 3½ x 96" Pine (2 needed)

1½ x 1½ x 96" Pine (4 needed)

1½ x 3½ x 96" Pine (2 needed)

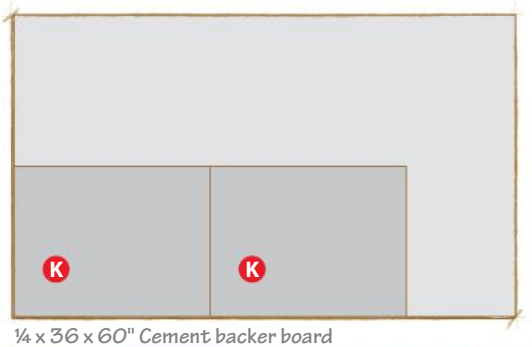
¾ x 3½ x 96" Pine (2 needed)

¾ x 5½ x 48" Pine

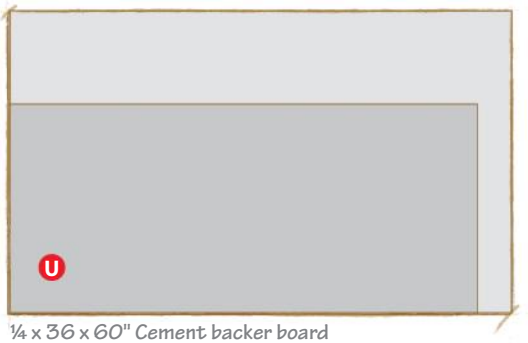
¼ x 48 x 96" Plywood

¼ x 24 x 96" Plywood

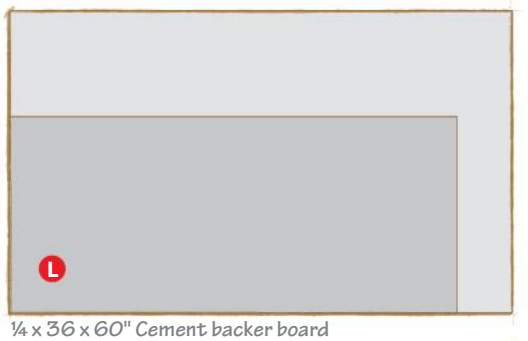
¼ x 48 x 96" Plywood



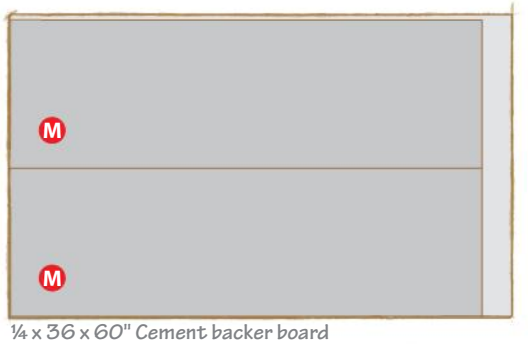
¼ x 36 x 60" Cement backer board



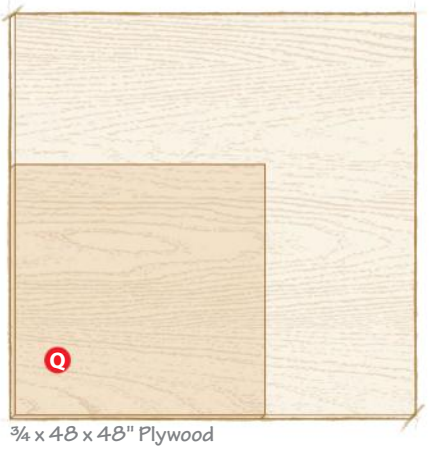
¼ x 36 x 60" Cement backer board



¼ x 36 x 60" Cement backer board



¼ x 36 x 60" Cement backer board



¾ x 48 x 48" Plywood

SM SuperMax Tools

Superior Quality. Affordable Efficiency.

- 1-3/4 HP TEFC 110V/15A Drive Motor.
- Indexed alignment setting for flawless wide sanding.
- INTELLISAND Technology.
- Easy height adjustment with thrust bearing prevents backlash, slop or creep.
- Drum never goes out of alignment to base.
- Sand as thin as 1/32", as thick as 4", as short as 2-1/4".

Fast Lever makes it easy to change alignment settings for narrow and wide stock.

Easiest access to abrasive fastening system of any drum sander!

25-50 DRUM SANDER

19-38 DRUM SANDER

- **Please visit SuperMaxTools.com for full specs and distributor locations.**

SANDING SIMPLIFIED.

P. 888.454.3401
F. 651.454.3465

SuperMaxTools.com
sales@SuperMaxTools.com

A Murphy Bed that's easy to build and a dream to use

With a sturdy steel mattress frame, arched wood slats and fold-out legs, this Murphy Bed hardware sets a new standard for ease of construction and sleeping comfort. The smooth piston lift mechanism makes the bed easy to open and close, and the included instructions show you how to build a basic enclosure. It's easier than ever to *create with confidence.*

I-Semble Vertical Murphy Bed Hardware Kit with Mattress Platform (54386) $374.99

EMAIL SUBSCRIBERS
FREE SHIPPING EVERY DAY ON $35+ ORDERS

Sign up for our emails and get every day FREE SHIPPING!
For details go to **rcklr.co/235** or call **1-800-279-4441** and mention code 235 at checkout.

ROCKLER WOODWORKING AND HARDWARE
Create with Confidence™

For a store near you or free catalog: Rockler.com | 1-877-ROCKLER

Materials code 235

Bookshelf Speakers

You'll hear waves of compliments when friends learn you built these beauties.

Why shouldn't speakers look as good as they sound? With the right components [**Source**] and a weekend in the shop, you can crank out a pair with looks that match their rich tones. Sound good? Let's get started.

First, crank up the tablesaw

1 Cut the sides (A) and top and bottom (B) to width and ½" longer than listed [**Materials List**]. (Edge-glue narrower stock if needed.) Bevel the front edges, then miter-cut these pieces to final length [**Exploded View**].

2 Rabbet the back edge of each piece [**Exploded View**]. Then cut the groove near the front edge.

3 Cut the front and back (C, D) to size. Cut four pieces of ash veneer ½" wider and longer than a front (C). Glue veneer to one face of each front, using a back as a clamping caul to spread pressure. Place waxed paper between the back and the veneer to prevent gluing the back down.

4 After the glue dries, use a razor knife or veneer saw to trim the veneer flush with the panels. Repeat to veneer the other face of

DIMENSIONS
8¾" W × 9" D × 13½" H

Approximate materials cost:
$220
for speaker components and lumber

98
dBa measured at 6' *

*Measured during Led Zeppelin's "Rock and Roll" cranked to just under the point where a group of middle-aged woodworkers determined distortion was occurring.

▶So how do they sound? Read reviews from several testers. woodmagazine.com/howdotheysound

▶Buy a veneer saw to make clean cuts. woodmagazine.com/buyveneersaw

Tip! *Use a rip blade to cut flat-bottomed slots.*

both fronts. Then, cut the speaker holes as described in the **Skill Builder** *below*. Notch the tweeter holes to accommodate the wire terminals [**Exploded View**].

5 Rabbet the front face of each front (C), then finish-sand both faces of the fronts and the inside of the other parts to 220 grit. Glue up each speaker (A, B, C) [**Exploded View**].

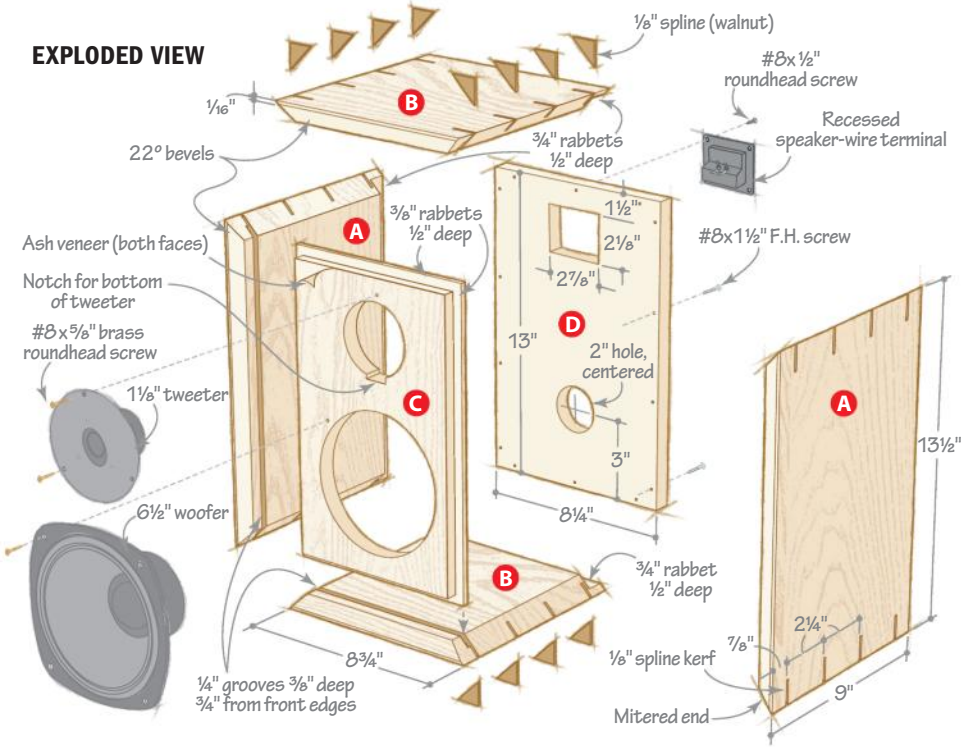
6 Build a sled to hold the speakers at a 45° angle [**Photo A**]. Cut the spline slots [**Exploded View**], glue in the splines, and trim them flush after the glue dries. Finish-sand the outside of the speakers.

7 In each back (D), cut a round bass port and a rectangular hole to accept the speaker-wire terminal [**Exploded View**]. Apply a finish to the carcase, then mount the crossovers, woofers, tweeters, and speaker-wire terminals [**Skill Builder,** *next page*]. Drill pilot holes and screw the back in place, and you're ready to rock.

Produced by **Craig Ruegsegger** with **Kent Welsh**
Project design: **John Olson** with **Carson Downing**
Illustrations: **Roxanne LeMoine, Lorna Johnson**

▶Learn to solder in a free video. woodmagazine.com/solder

EXPLODED VIEW



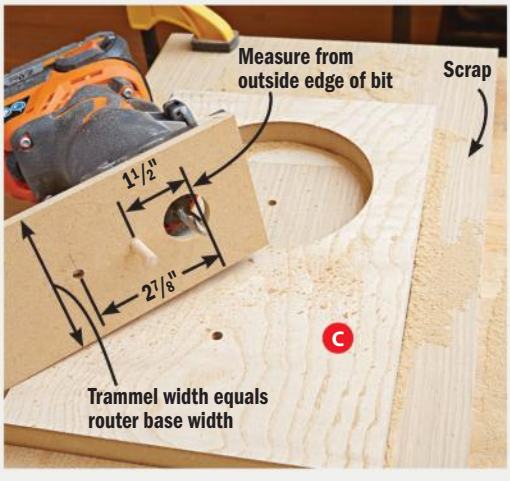
Cut the spline slots in pairs. After cutting one, flip the speaker to place the opposite edge against the sled fence and cut the opposite slot. Cut eight slots in each speaker, then reset the rip fence to cut the remaining slots.

SKILL BUILDER

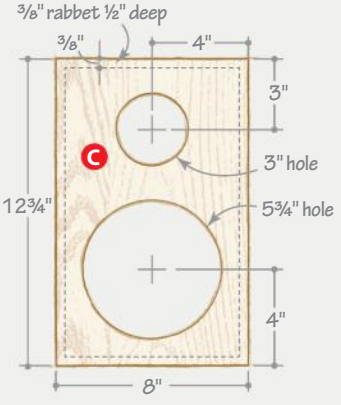
Cut perfect circles using a trim router

Begin by cutting a 12" length of hardboard the same width as your router base. Chuck a ¼" straight or spiral upcut bit in the router, and align the router base with an end and the edges of the hardboard. Lower the motor and press the bit into the hardboard. Drill a 1" hole centered on this mark, and the ¼" holes where shown in the photo. Mount the router to the base with double-faced tape.

Secure a front (C) to a scrap of sheet-goods using double-faced tape, and drill ¼" holes centered in each speaker hole [**Front Panel Drawing**] and into the scrap. Place a 2" length of dowel through the trammel and into each hole in turn, then rout the holes in succesively deeper passes.



FRONT PANEL



SKILL BUILDER

Get connected with solid solder skills

The components we used [**Sources**] have lug terminals, so making connections can be as easy as crimping a spade connector to the end of a wire, then sliding the spade onto the lug [**Photo B**]. Spade connections allow for easy disassembly if you need to replace a component. For permanent connections, solder the wires to the lugs.

First, screw the crossover assembly to a side (A), placing the terminals closest to the back of the box. Then wire things up as shown in **Photos C–E**.

B


D


C

Connect leads to the crossover first. Solder the wire to a pair of terminals, then cut the wire to length so that you can easily solder to the woofer, tweeter, and speaker-wire terminal [**Photos D** and **E**].


E

Solder the wires to the woofer and tweeter, then mount the speakers in the box [**Exploded View**]. Solder the last lead to the speaker-wire terminals, and test the speakers before screwing the back in place.

Materials List

Part		FINISHED SIZE T	W	L	Matl.	Qty.
A*	sides	¾"	9"	13½"	W	4
B*	top/bottom	¾"	9"	8¾"	W	4
C	front	¾"	8"	12¾"	MDF	2
D	back	¾"	8¼"	13"	MDF	2

*Parts initially cut oversize. See the instructions.

Materials key: W-walnut, MDF-medium-density fiberboard.
Supplies: #8×1½" flathead screws (28), #8×⅝ roundhead brass screws (14), #8×½" roundhead screws (8), speaker wire.
Blade and bits: ¼" straight or upcut spiral router bit.
Sources: Ash veneer, 2×8', $35, woodworkerssource.com, 800-423-2450. Dayton Audio 6½" classic woofer (RMS: 50 watts) (2), no. 295-305, $21.78 each; Dayton Audio 1⅛" silk-dome tweeter (RMS: 50 watts) (2), no. 275-070, $19.75 each; Dayton Audio 2-way speaker crossover (2), no. 260-140, $29.50 each; recessed speaker-wire terminal (2), no. 260-303, $3.49 each, Parts Express, 800-338-0531, parts-express.com.

This project requires 6½ board feet of 4/4 walnut and a 24x48" piece of ¾" MDF.

SHOP TEST

Belt/Disc Sanders

These machines help you smooth and shape wood and fine-tune joinery with ease.

There's an old adage that says combination tools perform multiple tasks, but none very well. Although that's often true, it's simply not the case for the six sanders in this review. These combination machines performed admirably at both belt and disc functions. Adding one to your shop would be a smart decision.

Start with power

Note: *All six tested machines have 110-volt induction motors.*

We tested each machine for its ability to hog away wood aggressively. The Powermatic BD31A and Laguna DB12/6 resisted our attempts to bog them down, earning top marks. With the others, we could bog down the belts easily enough, but the discs fared better. Bottom line: In normal use, you'll be fine with any of the tested models.

Then add finesse

▶A belt sander's platen, typically metal, backs and reinforces the sanding area.

For precision sanding, a sturdy table and flat platen make all the difference. Cast-iron tables, anchored well, provide the best workpiece support. We like those on the Grizzly G1276, Laguna, and Powermatic. The belt platens all supported the 6×48" belts well, but the longer platens on the Laguna, Powermatic, and Rikon 50-122 provide the most sanding area.

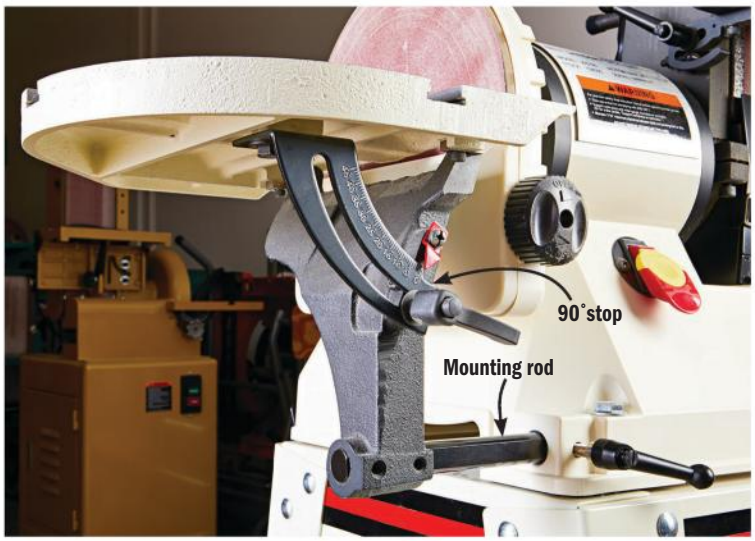
Three of the machines have 12" discs (Grizzly G1276, Laguna, and Powermatic), while the others have 9" or 10" discs. That smaller surface area means less contact for your workpieces, and potentially quicker abrasive wear. All but the Rikon had disc platens that showed no wobble; with that machine, workpieces tended to vibrate more.

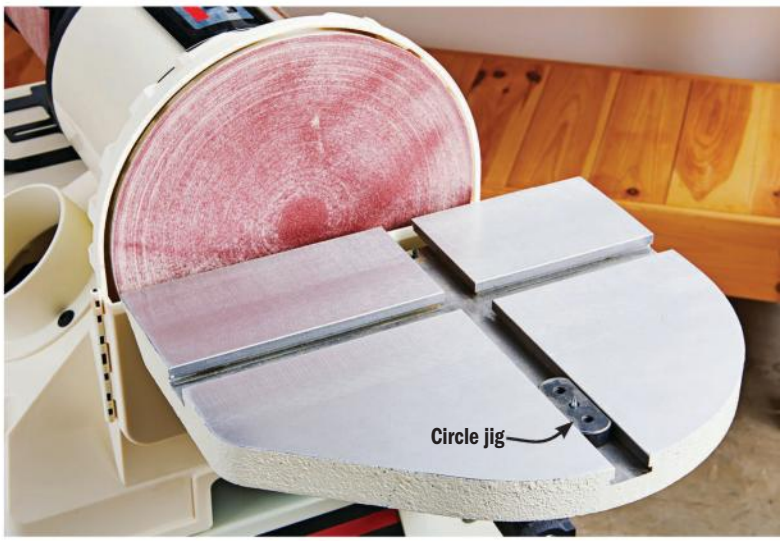
Sanders create choking dust that must be sucked up by a vacuum or dust collector. A single 4" port on the Jet JSG-96OS and Powermatic serves both belt and disc; the Jet fared best. The other machines have odd-size ports that require adapters for a typical shop-vacuum hose. (Connecting a dust collector to a 2½" or smaller port greatly reduces the collector's effectiveness.)

▶To maintain a level playing field, we used Klingspor's aluminum-oxide sanding belts and discs in all tests.

Tip! *Use different abrasive grits on your sander's belt and disc. For example, use an 80- or 120-grit belt for shaping, and a 150 or 220 disc for detailing.*

▶Need help replacing a worn adhesive-backed sanding disc? See *page 14*.





The cast-iron table of the Jet (and the Grizzly G1014Z) mounts on a single rod, resulting in a not-so-steady worksurface. But the Jet table's crisscrossed miter slots and circle jig provide lots of sanding options.

You can mount Powermatic's belt-sanding table in-line with the belt, ensuring precise-angle sanding along the platen. Or, mount it perpendicular to the belt, but that renders nearly 40 percent of the platen area unusable.

Drawing lines in the sand(paper) among these combo sanders

Grizzly G1014Z, $410

Also available on an enclosed stand (G1014ZX, $495)
800-523-4777, grizzly.com

High Points

▲The table removes easily for faster disc-abrasive changes.
▲A layer of graphite on the belt platen should help reduce platen wear over time.

Low Points

▼The cast-iron table—which swaps between the belt and disc—mounts to the base on a single ¾"-diameter rod. Even when tightened securely, the table still wiggled a bit.
▼We could easily stall the belt with moderate workpiece pressure.
▼The two dust-collection ports require different-size hoses—a big nuisance.
▼The stamped-steel stop for the belt lacks the surface area of most other machines' tables (for sanding in the vertical position).
▼The belt-tension lever protrudes 8" from the housing—a snag waiting to happen.

More Points

▶The power switch, located on the back side of the base, was not easy to reach when using the belt vertically.

Grizzly G1276, $755

High Points

▲Spot-on 45° and 90° tilt stops on the disc table ensure quick and accurate settings.

Low Points

▼You get the shortest belt-sanding area in this test group with the table removed and the stop in place (10") or removed (14½").
▼The two dust-collection ports require different-size hoses—a big nuisance.

More Points

▶You cannot remove the housing on the belt sander's idle roller, preventing use of that end for sanding an inside radius. (All other machines allow this.)
▶At 145 pounds, this unit will not be easy to move or lift. Plan to dedicate it to a benchtop space or shop-made stand.

Jet JSG-960S, $790

Also available without stand (JSG-96, $715) or on an enclosed stand (JSG-96CS, $865)
800-274-6848, jettools.com

High Points

▲The small aluminum belt table holds solidly with ratcheting locks on each side, and tilts down 55°, 10° more than the cast-iron table—which swaps between the belt and disc—in the same position.
▲A layer of graphite on the belt platen should help reduce platen wear over time.
▲The cast-iron disc table's 90° tilt stop, shown on *page 39*, ensures quick and accurate right-angle sanding. We like the X-Y miter slots and circle-sanding pivot for sanding circles 5–19" in diameter.
▲The table removes easily for faster abrasive-disc changes.
▲Dust collection was best on this model because of its single 4" port and blast gates that let you close off the side not in use.
▲This model comes with a 5-year warranty.

Low Points

▼The cast-iron table mounts to the base on a single ¾"-diameter rod. Even when tightened securely, the table still wiggled a bit.
▼We could easily stall the belt with moderate workpiece pressure.

More Points

▶The plastic housing on the base belies the overall quality of this machine.
▶The disc spins clockwise, and you have to work on the right side of the disc. (Most discs spin counterclockwise.)

Laguna DB12/6, $1,000

800-234-1976, lagunatools.com

High Points

▲Despite belt and disc speeds slower than the others, we could not bog it down.

▲It has the longest belt-sanding area in the test with the stop in place (15½") or removed (18").

▲When powered on, this machine jumps almost immediately to full speed. Others take 1–4 seconds to ramp up.

Low Points

▼The disc table's miter slot, 4⅝" from the platen, allowed more wiggle room for the workpiece to move when sanding miters with a miter gauge.

▼The two dust-collection ports require different-size hoses—a big nuisance.

▼Belt changes require patience because you have to remove the table and guards.

▼The owner's manual can be difficult to follow; its photos and illustrations lack clarity.

More Points

▶The 33"-high disc table requires taller users to stoop.

▶The disc spins clockwise, and you have to work on the right side of the disc. (Most discs spin counterclockwise.)

▶We wish the enclosed base had an access door. It's a shame to waste that potential storage space.

▶No miter gauge provided.

Powermatic BD31A, $1,490

800-274-6848, powermatic.com

High Points

▲This machine sanded fastest in our trials, both on the belt and disc.

▲Its cast-iron belt table can be used either perpendicular to the belt or in-line next to it, as shown on *page 39*. (You can add the included stop when sanding in-line, but it must be removed to position the table perpendicular.)

▲No tools needed to change the belt orientation from vertical to horizontal or back.

▲The table's 90° tilt stop ensures quick and accurate right-angle sanding.

▲This model comes with a 5-year warranty.

Low Points

▼When using the table perpendicular to the belt, you reduce the sanding area to 8⅝" in length, nearly 6" less than when using the stop alone.

More Points

▶The enclosed base houses the motor, but there's no storage for accessories.

Rikon 50–122, $475

Also available without stand (50-120, $450)

877-884-5167, rikontools.com

High Points

▲Its belt was among the easiest to adjust for tension and tracking.

▲This model comes with a 5-year warranty.

Low Points

▼The aluminum disc platen measured .032" out of flat, producing a notable wobble. All the other discs measured within .009" of flat, more than acceptable.

▼We could easily stall the belt with moderate workpiece pressure.

▼The disc's aluminum table wiggled slightly, its miter gauge fit sloppily in the miter slot, and the ¼×⅝" miter slot won't accept standard ⅜×¾" miter gauges and accessories.

▼The stamped-steel stop for the belt lacks the surface area of the other machines' tables (for sanding in the vertical position).

More Points

▶The dust-collection housing around the belt's drive roller cannot be removed, limiting workpiece length when sanding in-line with the belt.

▶The disc table has the only rack-and-pinion adjuster in the group, but excessive play and a lack of positive stops made it difficult to reliably set table-tilt angles.

▶The power switch, located on the back side of the base, was not easy to reach when using the belt vertically.

Get double duty from a belt/disc sander

BRAND	PERFORMANCE RATINGS (1)									BELT			DISC				OVERALL DIMENSIONS WITH BELT IN VERTICAL POSITION (W x D x H)	MITER GAUGE INCLUDED? (YES, NO)	WEIGHT, LBS	WARRANTY, YEARS	COUNTRY OF ASSEMBLY (3)	SELLING PRICE (4)
		BELT				DISC									TABLE							
	POWER	EASE OF CHANGING	EASE OF TENSIONING AND TRACKING	EASE OF SETTING TABLE ANGLE	DUST COLLECTION	EASE OF CHANGING	PLATEN FLATNESS/LACK OF RUNOUT	EASE OF SETTING TABLE ANGLE	DUST COLLECTION	LENGTH OF PLATEN TO STOP WHEN HORIZONTAL SANDING (INCHES)	DUST-COLLECTION PORT DIAMETER (OD) (2)	TABLE-TILT RANGE, DEGREES	DIAMETER, INCHES	DUST-COLLECTION PORT DIAMETER (OD) (2)	FLOOR-TO-TABLE HEIGHT (INCHES)	TILT RANGE, DEGREES						
GRIZZLY G1014Z	B	A	A-	A	B	A	B	A	B	12	2	45 down	9	2½	35½	45 down	22 × 24 × 56	Y	117	1	T	$410
GRIZZLY G1276	B+	A-	A	A	B-	A-	A	A	B+	10	3	20 up, 45 down	12	2½	N/A	45 up, 45 down	32 × 18 × 29½	Y	145	1	T	$755
JET JSG-960S	B+	B	A	B	A	A	A	A	A	11⅜	4*	55 down	9	4*	37¼	45 down	31 × 18 × 57½	Y	100	5	T	$790
LAGUNA DB12/6	A	C	A	B	A-	A-	A	A	C	15½	2⅜	7 up, 45 down	12	2	33	7 up, 45 down	35 × 18 × 55	N	165	1	T	$1,000
POWERMATIC BD31A	A	A-	A-	A	B-	A-	A	A	B+	14⅜	4*	45 down	12	4*	34¼	15 up, 45 down	25 × 21 × 55	Y	247	5	T	$1,490
RIKON 50-122	B	B	A	N/A	C-	A-	C	B-	B+	13½	2*	None	10	2*	36½	45 down	21 × 24 × 58¼	Y	85	5	C	$475

1. A Excellent; B Good; C Fair; N/A Not applicable
2. (*) One port serves belt and disc.
3. (C) China (T) Taiwan
4. Prices current at time of article production and do not include shipping, where applicable.

Care to make that a combo?

As you might expect from a sander that costs nearly $1,500, the Powermatic BD31A emerged as our Top Tool. It scored high marks for power, easy abrasive changes, and ease of making adjustments. It also has reasonably effective dust collection and a 5-year warranty.

But for about half that amount, you could get the Jet JSG-96OS (or the benchtop version for $715), which performed nearly as well as the Powermatic, but with even better dust collection, and the same 5-year warranty.

Produced by **Bob Hunter** with **Bob Saunders**

Turn the belt sander into a spindle sander, such as on this Laguna, by removing the top guard, exposing the idle roller. You don't get the benefit of a table, so use care to keep workpieces oriented as needed.

envi™
WALL-MOUNTED ROOM HEATER

ENERGY SAVING
heats room as little as 4 cents per hour!*

SILENT
fanless design, auto dimming power light

ULTRA-SAFE
leave unattended 24/7; cool to the touch

STYLISH AND SLEEK
slim space saving design, 19"w x 22"h x 2" thin!

HEALTHY
fanless - doesn't blow dust or dry the air, great for those who suffer from asthma or dry eye

EASY INSTALL
installs in minutes, no drill required;
120v & 220v hardwired and plug-in models available

10% off coupon : **WDJJ10** | 2 or more 15% off coupon: **WDJJ15** | free shipping to the USA & Canada

THE FUSION M2 40

ENGRAVE IT. CUT IT. MARK IT.

- Large 40" x 28" engraving area
- Flame-polished edge cuts
- Laser tube wattages up to 120 watts
- Large viewing door with LED lighting
- Our highest CO_2 engraving and cutting speeds
- Engrave items up to 13.25" in height
- Dual source (fiber and CO_2)
- eView™ camera options
- Maximum substrate compatibility

EPILOG LASER

Get **MORE INFO** or
SCHEDULE A DEMO!
888.437.4564 | sales@epiloglaser.com
www.epiloglaser.com/bhg-wood

à la carte or complete
Murphy Bed

Build just the bed, a bookcase or two, or the whole ensemble.

Transform almost any room into nighttime guest quarters in minutes with minimal effort. Tug on the door pulls and the spring-balanced mechanism [**Sources**] almost effortlessly lowers the queen-size mattress. Lift the end of the bed platform and it easily tucks away.

Note: *Use the construction plans and assembly instructions included with the bed hardware to identify parts, confirm hardware placement, adjust lifting power, troubleshoot problems, and replace the gas springs, when necessary. Follow the safety warnings in the instructions and save all documents for future reference. Should there be any discrepancy in dimensions shown in the manufacturer's instructions and those shown here, use ours.*

Note: *Total mattress thickness, including a pillow top, cannot exceed 12".*

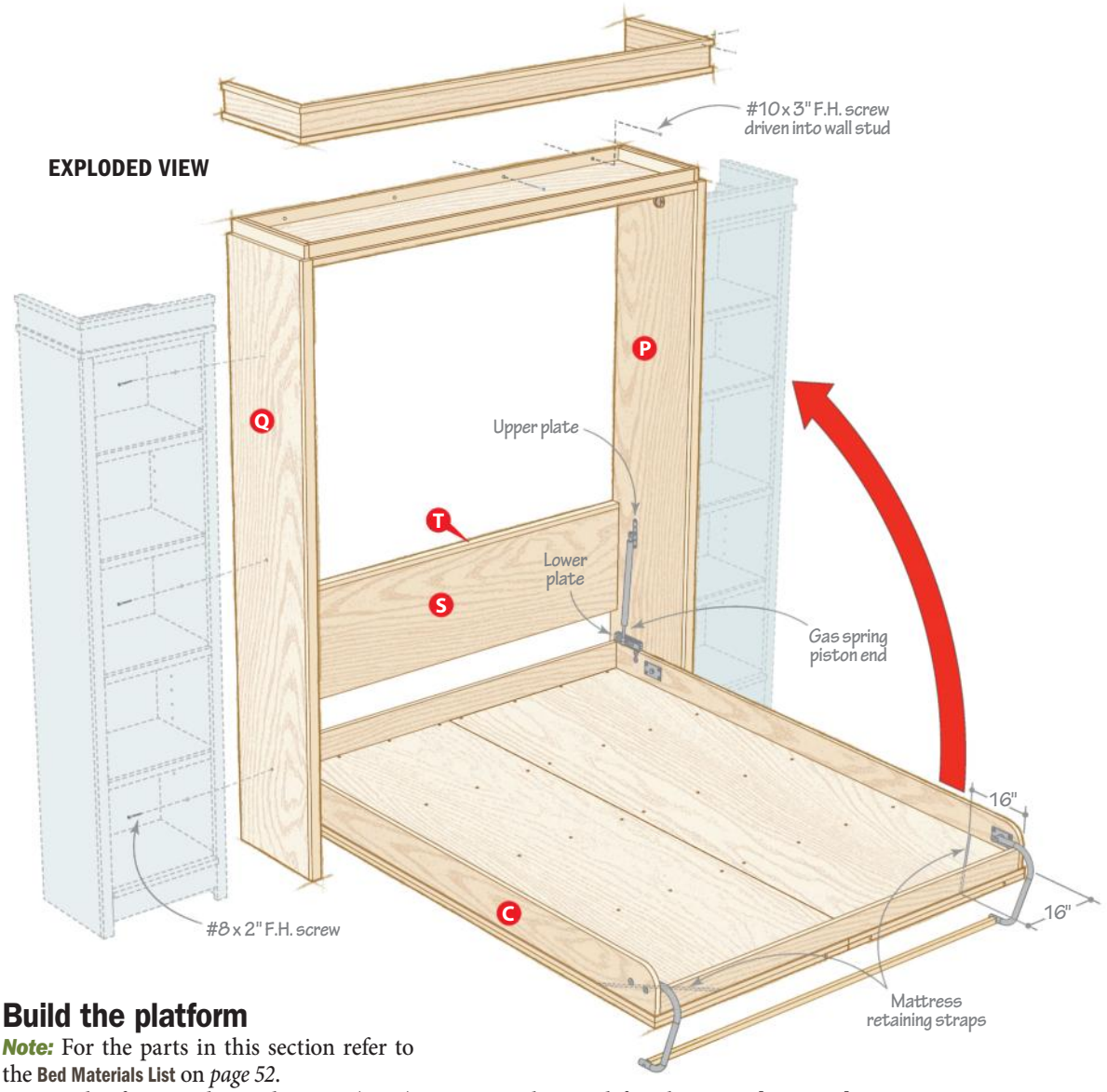
The bed gets its name from William Lawrence Murphy (1876–1959), who applied for his first patents on the bed around 1900. Legend has it he was wooing an opera singer while living in a one-room apartment in San Francisco. The moral code of the time frowned upon a woman entering a man's bedroom. Murphy's invention converted his bedroom into a parlor, enabling him to entertain. It apparently worked; he later married the singer.

DIMENSIONS, STOWED: 90⅛" H × 17" D × 106⅛" L

Approximate lumber cost: **$960**

17 inch projection, stowed

1 queen-size bed, deployed



Build the platform

Note: For the parts in this section refer to the **Bed Materials List** on *page 52*.

1 Cut the frame sides and struts (A, B) [**Materials List, Drawing 1**]. Glue and screw five strut assemblies [**Drawing 1a**]. With the glue dry, assemble the frame [**Photo A**].

2 Cut the side rails (C). Making a mirror-image pair, drill holes for the plates of the pivoting legs and female pivots [**Drawing 2**]. Radius the foot end of each rail. Finish-sand the rails and set them aside.

3 Cut the head rail (D) and foot rail (E) [**Drawing 1**]. Finish-sand these parts and attach them to the frame [**Photo B**].

Tip! *For a self-squaring frame, cut the ends of the struts perfectly square and carefully align their ends when gluing up the strut assemblies.*

Glue and screw the frame sides (A) to the strut assemblies (B/B). Ensure the assembly is square, then allow the glue to dry.

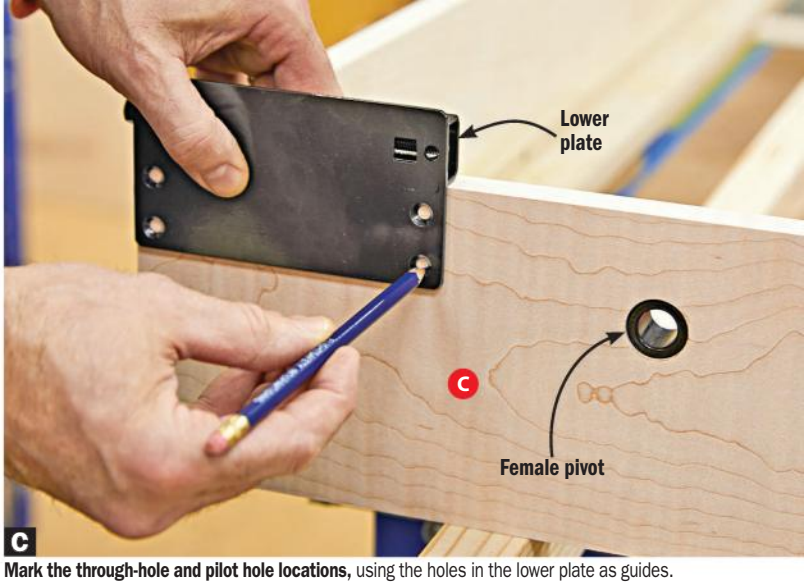
Glue and screw the foot rail (E) to the frame, flush at the bottom and ends. Repeat with the head rail (D).

Note: *Plywood for hidden parts can be any high-quality plywood. We chose birch plywood but you may substitute another type if it is cheaper in your area.*

4 Glue and screw the side rails (C) to the frame and install the female pivots. Drill mounting holes for the lower plates [**Drawing 2, Photo C**]. Mount the lower plates and pivoting legs.

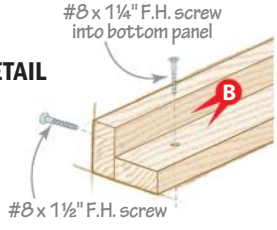
5 Cut the mattress supports (F) and set them aside. Cut the bottom panels (G) and apply iron-on banding [**Sources**] to the outside edges and ends (no banding where the panels meet). Dry-clamp the panels to ensure a tight center joint. Position the frame assembly on the panels with the head rail flush and the panels protruding ¼" along the sides and foot-rail end [**Drawing 1**]. Drill pilot holes and screw the frame to the panels [**Drawing 1a**].

6 Cut the leg rail (H) and drill a centered hole in each end [**Drawing 1**]. Finish-sand the part and set it aside.

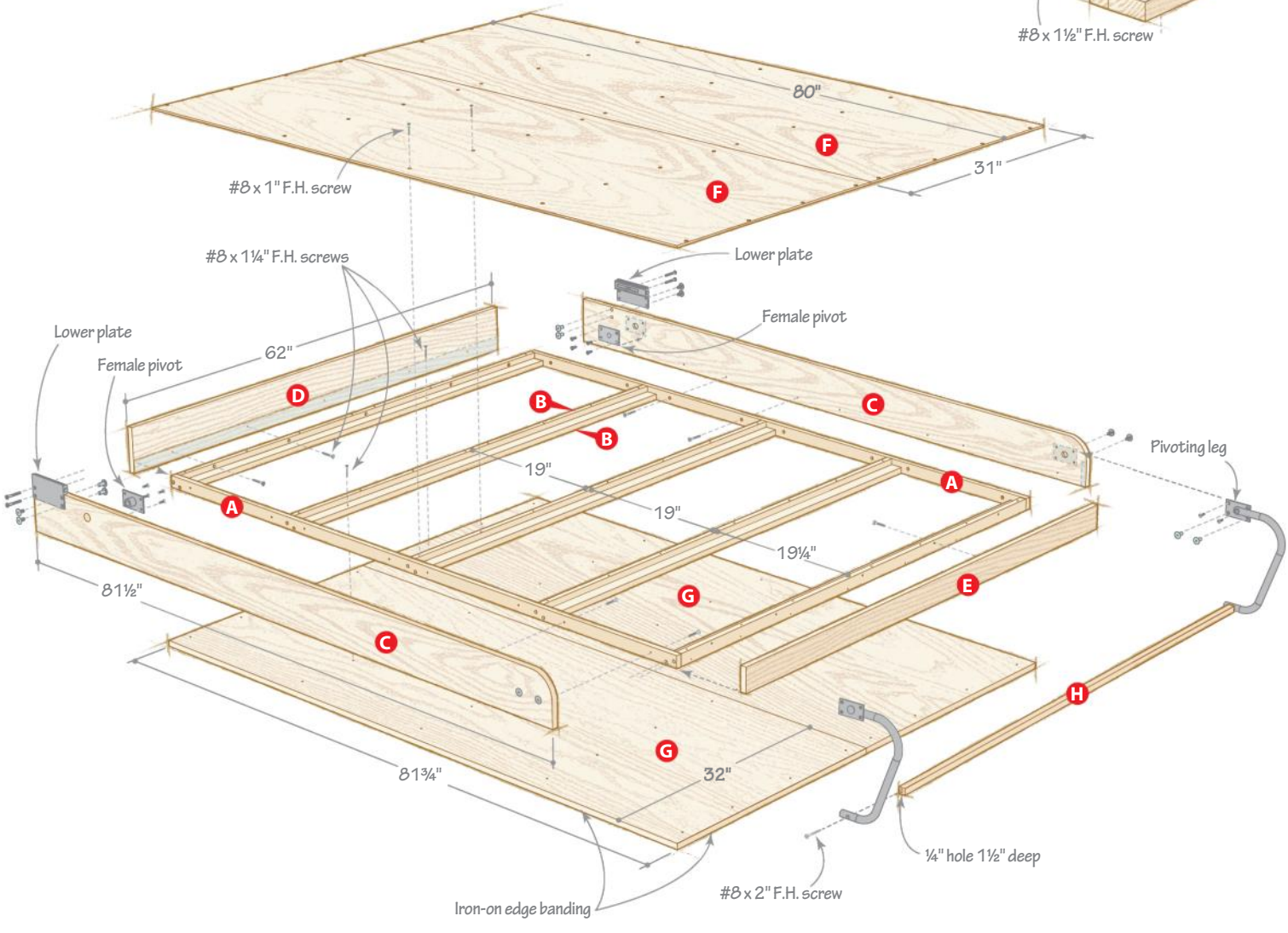


Mark the through-hole and pilot hole locations, using the holes in the lower plate as guides.

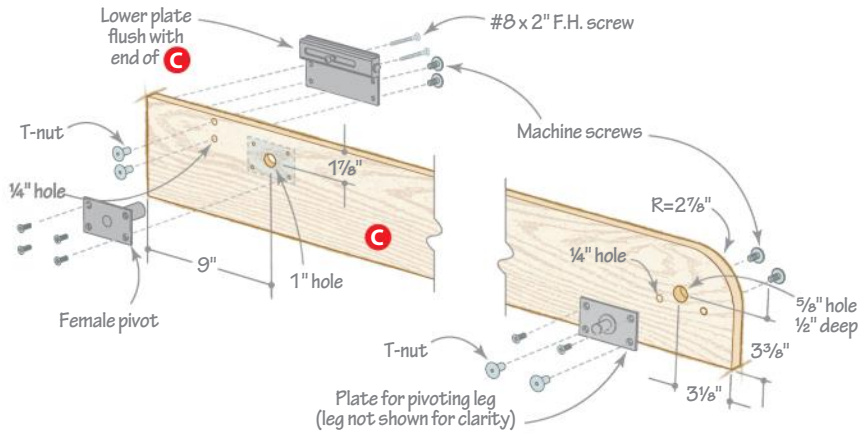
1a STRUT ASSEMBLY DETAIL



1 PLATFORM ASSEMBLY



2 RAIL HARDWARE DETAIL



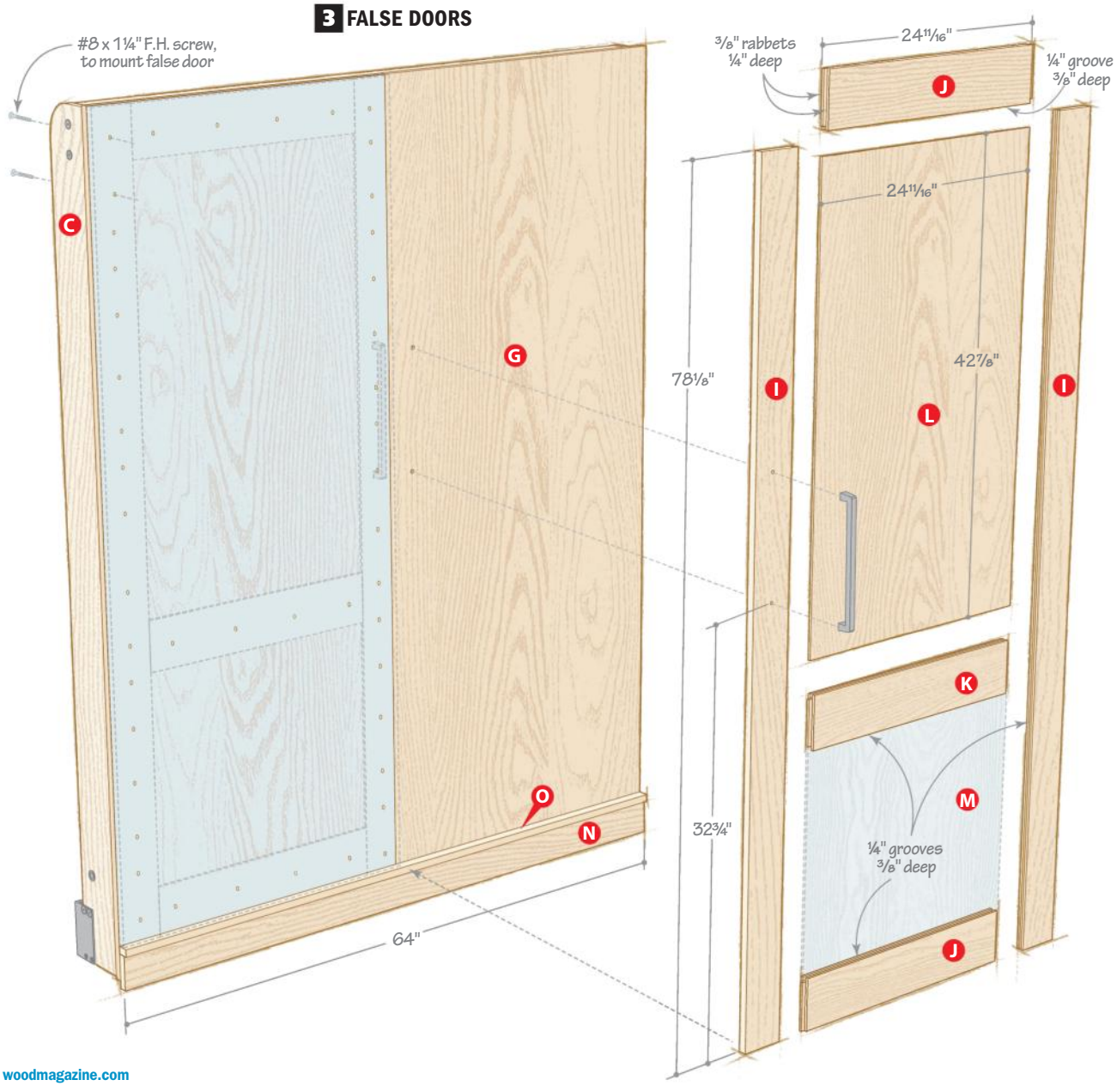
Add a pair of false doors

1 Cut the stiles (I), rails (J, K), and panels (L, M). ***Note:*** *To ensure the door-panel grain flows continuously from the upper panels to the lower panels, cut them as shown on the* **Cutting Diagram**, page 53, *and mark their orientation.* Finish-sand the panels. Groove the stiles and rails to fit the panel thickness [**Drawing 3**]. Then form tenons on the rail ends to fit the stile grooves.

2 Glue and clamp the doors, check for square, and set them aside to dry. Drill holes for the door pulls [**Sources**]. Finish-sand the stiles and rails.

3 Cut the base (N) and cap (O). Glue and clamp the cap to the base, flush at the back and ends. Finish-sand the assembly and set it aside.

3 FALSE DOORS

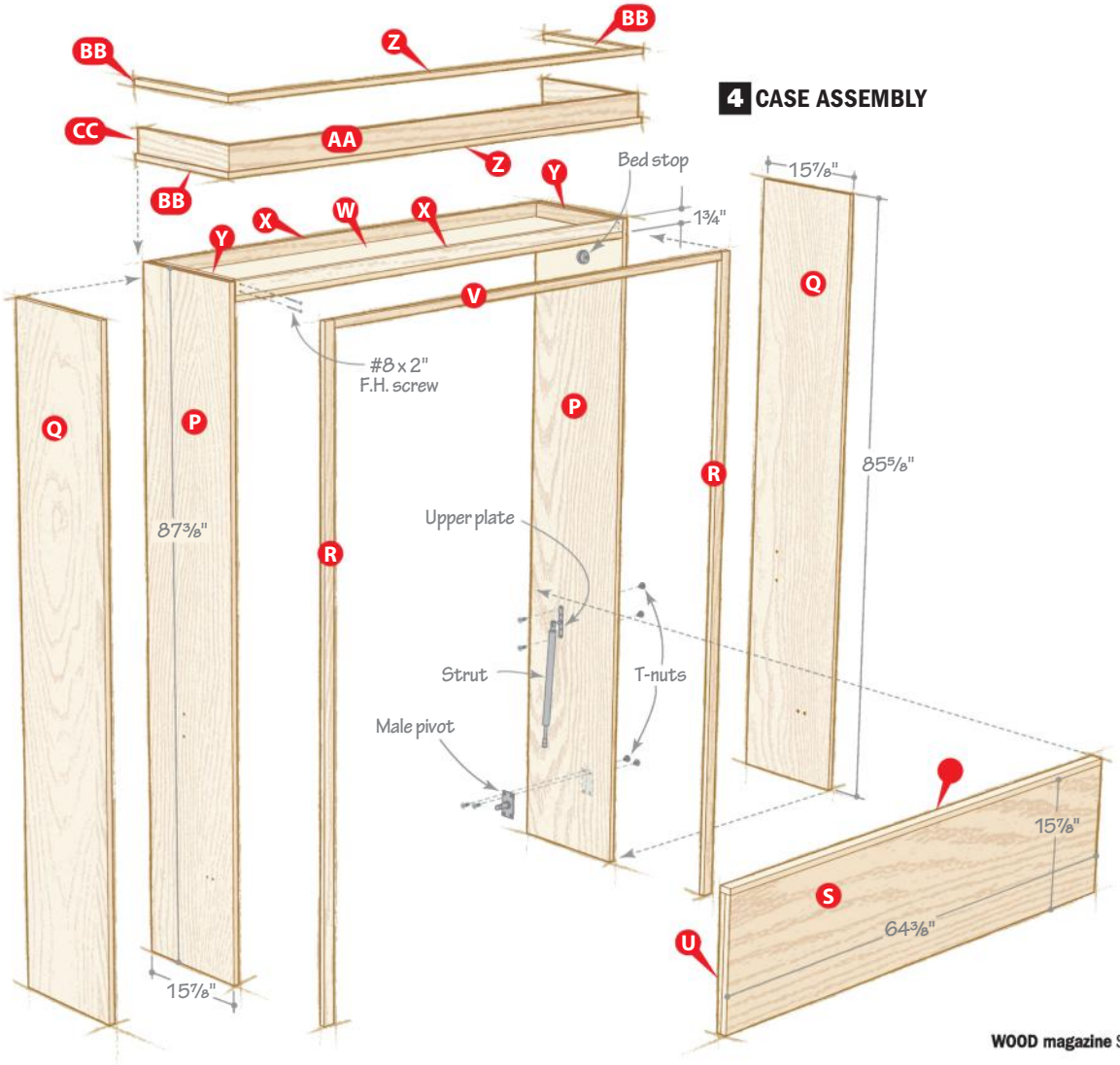


Insert the upper plate in the routed recess and drill ¼" holes, using the plate holes as guides. Drill ⅛" into the outer side (Q), clamped below.

Glue and clamp the inner side (P) and outer side (Q). Align the bottoms and edges and use cauls to distribute clamp pressure.

Make the bed case

1 Cut the inner and outer sides (P, Q) [**Drawing 4**]. Making a mirror-image pair, drill in each inner side holes for the bed stop and male pivot and rout a recess for the upper plate [**Drawing 5**]. Clamp each inner side to an outer side, flush at the bottom and edges, and drill mounting holes for the upper plates [**Photo D**]. Likewise, insert the male



pivots in the holes. Drill ¼" holes through the upper holes in the male pivots and ⅛" into the outer sides.

2 Enlarge the holes in the outer sides to ¾" [**Drawing 5**]. These holes accept T-nuts when laminating the parts.

3 Attach the upper plates and male pivots to the inner sides (P) with T-nuts, machine screws, and wood screws [**Drawing 4**]. Laminate the sides [**Photo E**].

4 Cut the case stiles (R) [**Drawing 4**]. Glue and clamp them to the laminated sides, flush at the outside edges. Trim the stiles [**Photo F**] and finish-sand the sides.

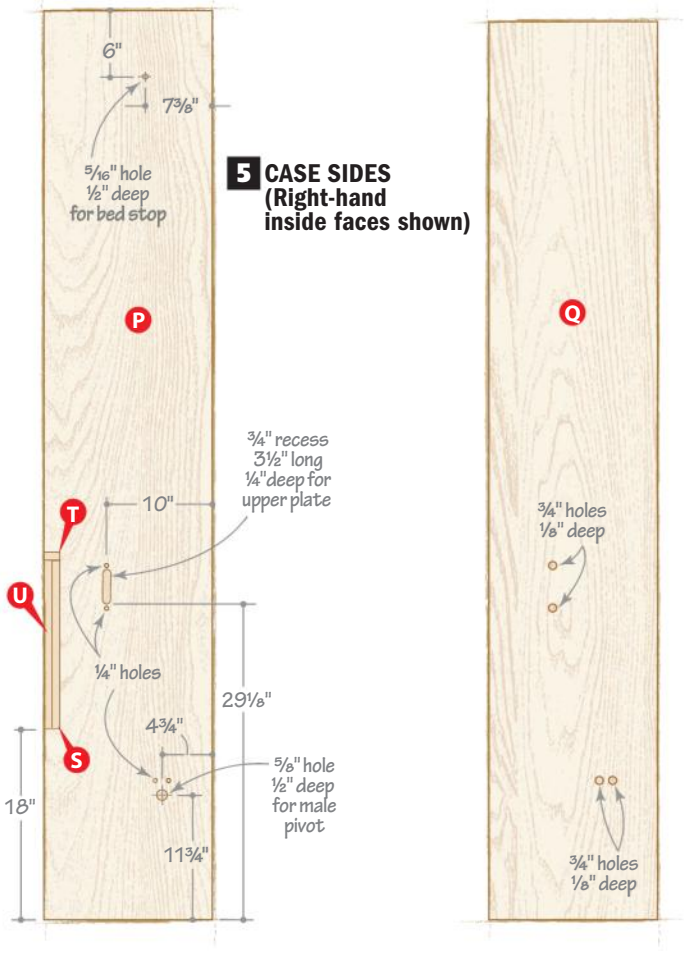
5 Cut the headboard (S), trim (T), and cleats (U) [**Drawing 4**]. Glue and clamp the trim to the headboard, flush at the front and ends. Glue and clamp the cleats to the back of the headboard, flush at the ends. Finish-sand the assembly.

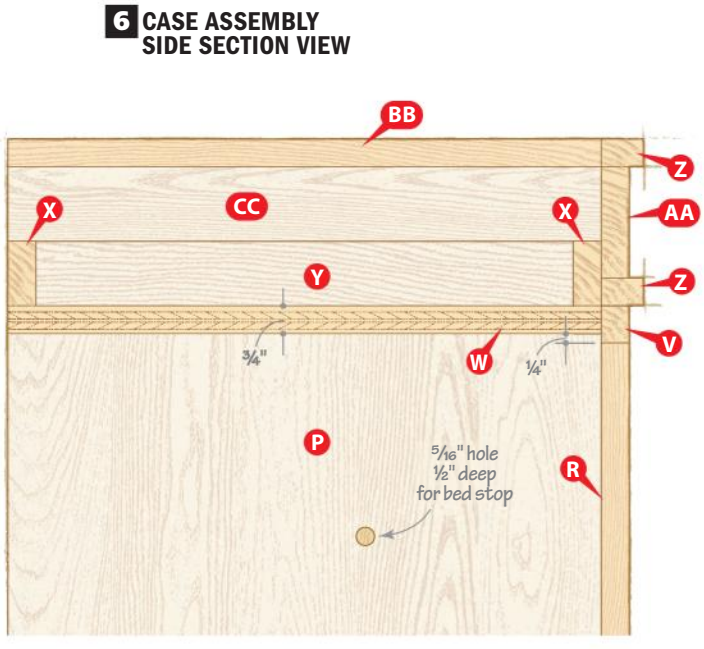
6 Cut the case rail (V), top panel (W), and cleats (X, Y) [**Drawing 4**]. Glue and clamp the cleats to the top panel, flush at the edges. Screw the front and back cleats to the side cleats at the corners. Glue and clamp the case rail to the top panel/cleats assembly, flush at the ends and overhanging ¼" at the bottom [**Drawing 6**].

Trim the stile (R) flush with the face of the inner side (P) using a bottom-bearing flush-trim bit.

7 Cut blanks for the front bands (Z) and front fascia (AA) to the widths listed but 72" long. Cut blanks for the side bands (BB) and side fascias (CC) to the widths listed but 20" long. Finish-sand the fascias and glue and clamp the front bands to the front fascia and the side bands to the side fascias, flush at the backs and ends [**Drawing 6**]. Finish-sand the bands and set the parts aside.

8 Remove all hardware from the bed platform and case sides. Finish-sand where necessary, then apply a finish.





Build a pair of bookcases

For the parts in this section, refer to the **Bookcases Materials List** on *page 54*. When making one bookcase, reduce the quantity shown for each part by one-half.

1 Cut the sides (A), tops/bottoms/fixed shelves (B), and backs (C) [**Drawing 7**]. Making mirror-image pairs, dado and rabbet the sides, and drill shelf-pin holes [**Drawing 8**]. To form the fixed-shelf dadoes, see the **Skill Builder**, *next page*. Finish-sand the parts.

2 Glue and clamp the tops, bottoms, and fixed shelves between the sides. Check the cases for square and set them aside.

3 Cut the stiles (D), and rails (E, F) [**Drawing 7**]. Drill pocket holes and assemble the face frames with pocket screws. Glue and clamp the face frames to the cases, aligning the top edges of the middle rails and the top faces of the fixed shelves. Finish-sand the face frames.

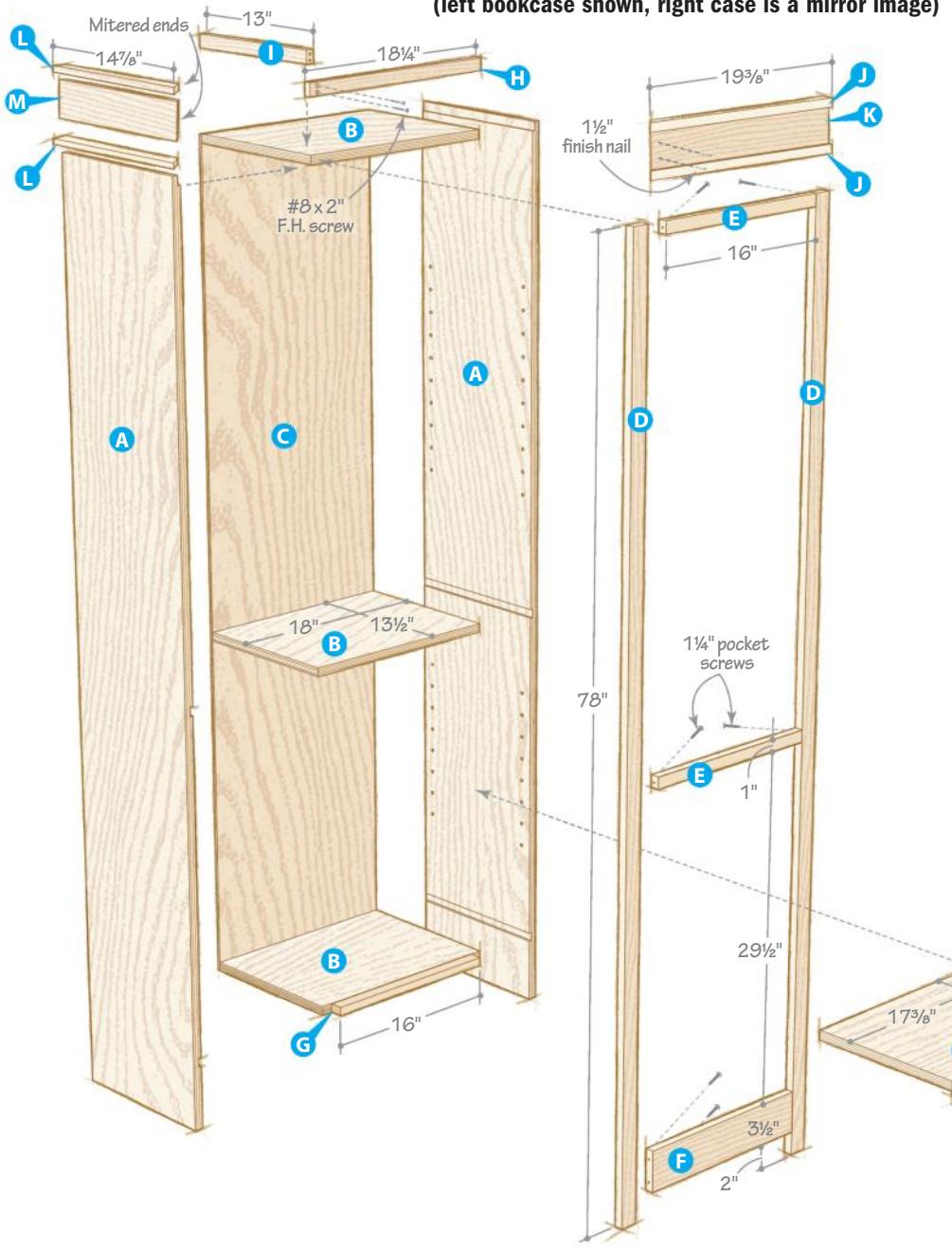
4 Cut the bottom shelf trim (G). Adjust the thickness as necessary to make the top faces of the trim and shelves flush. Glue and clamp the trim to the bottom rails and shelves.

5 Cut the front cleats (H) and side cleats (I). Making right-hand and left-hand cases, glue and clamp the cleats to the tops (B), ¾"

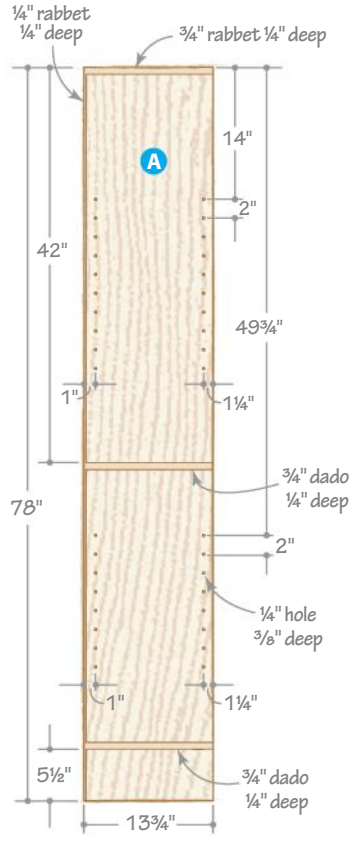
Tip! *For face frames that fit perfectly flush with the outside faces of the bookcases, cut the stiles (D) 1/16" wider than listed. Then after assembly, trim them with a bottom-bearing flush-trim bit.*

▶ Learn a variety of methods for accurately drilling shelf-pin holes. woodmagazine.com/shelfpinjigs

7 BOOKCASE
(left bookcase shown, right case is a mirror image)



8 BOOKCASE SIDE
(right side shown, left side is a mirror image)



Note: *When building a free-standing bookcase, cut two side cleats (I), four side bands (L), and two side fascias (M).*

back from the case front and outside edges [**Drawing 7**]. Screw the front cleats to the side cleats at the corners.

6 Cut blanks for the front bands (J) and front fascias (K) to the widths listed but 22" long. Cut blanks for the side bands (L) and side fascias (M) to the widths listed but make them 17" long. Finish-sand the fascias and glue and clamp the front bands to the front fascias and the side bands to the side fascias, flush at the backs and ends so the bands protrude ⅜" forward of the fascia fronts [**Drawing 7**]. With the glue dry, finish-sand the bands.

7 Miter-cut the front and side fascia assemblies to length and glue and clamp them to the cleats (H, I).

8 Cut the adjustable shelves (N) and shelf trim (O). Glue and clamp the trim to the shelves. Finish-sand the shelves.

9 Inspect all parts and finish-sand where necessary. Apply a clear finish. After the finish dries, nail the backs (C) to the cases.

SKILL BUILDER

Rout perfect-fitting dadoes, first time, every time

As you have likely discovered, ¾" plywood measures less than ¾" thick. So how do you rout a tight-fitting shelf dado without a lot of trial and error? First, make this quick-and-easy jig.

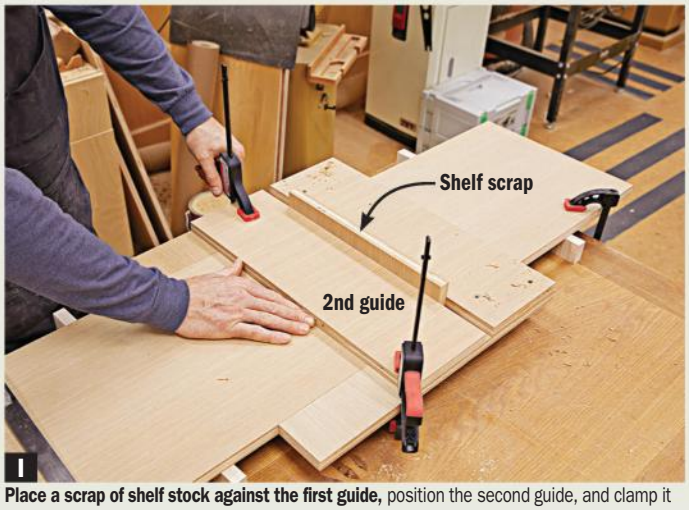
From ¾" plywood scrap, cut two 6"-wide guides 6" longer than the width of the bookcase side (the 6" width keeps clamps from interfering with the router when forming the dadoes) and two 3"-wide cleats at least 14" long. Then follow **Photos G–J**.

G

Square one 6"-wide guide to the edge of the workpiece with 3" overhanging each edge. Clamp the guide in place.

H

Position a 3"-wide cleat against one edge of the workpiece and clamp and screw it to the guide. Repeat at the other edge.



I

Place a scrap of shelf stock against the first guide, position the second guide, and clamp it in place. The scrap should fit without play but be easy to remove. Screw on the second guide.

J

Align the edge of one guide with the dado-layout mark and clamp the jig in place. Rout the dado in two passes with a top-bearing pattern bit.

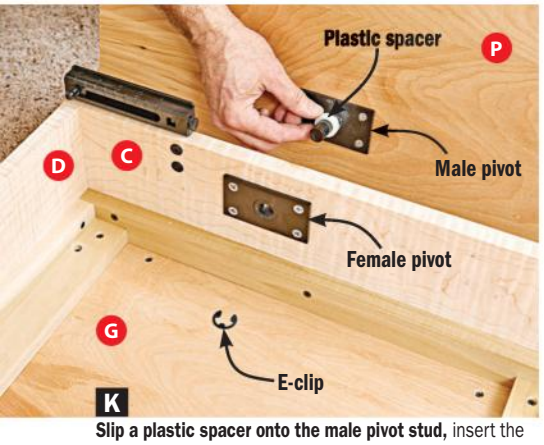
Install the bed

1 Move all the bed-case parts and bookcase parts to the installation location. Place the false doors facedown on the floor, ⅛" apart and aligned at top and bottom. With a helper, position the bed-platform assembly on the doors and align the top and side edges of the doors and the bottom panels (G). Drive screws through the bottom panels and into the door stiles and rails (I, J, K) [**Drawing 3**].

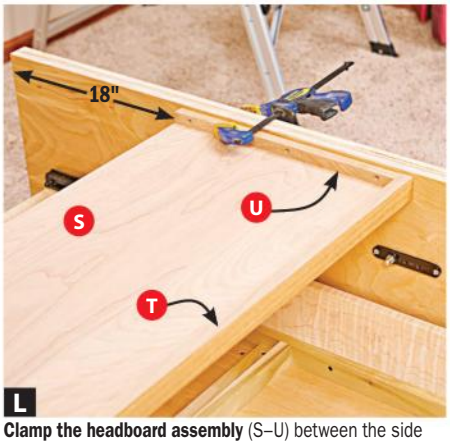
2 Tuck the base/cap (N/O) assembly under the lower end of the bed-platform assembly. Align the ends of the base/cap with the side edges of the bottom panels (G), leave a ⅛" space between the base/cap and the false doors, and clamp it in place. Drive 2" screws through the strut (B) and bottom panels and into the base (N).

3 Install the lower plates, female pivots, and pivoting legs on the side rails (C) with T-nuts, machine screws, and wood screws [**Drawings 1, 2**]. Adjust the ball-stud location on both lower plates to the "4" position by turning the hexhead adjuster with a socket wrench. Install the leg rail (H).

4 Install the male pivots and upper plates on the inner sides (P) [**Drawing 4**]. Position the upper plate holes marked "3" toward the bottom of each side. Slip spacers onto the ball studs and thread the studs into the "3" holes in the upper plates. Attach the case sides to the



Slip a plastic spacer onto the male pivot stud, insert the stud into the female pivot, and snap the E-clip onto the stud to secure the pivot.



Clamp the headboard assembly (S–U) between the side assemblies. Drive #8×1½" flathead wood screws through the headboard cleats (U) and into the sides.

Clamp the top assembly (W–Y) between the side assemblies, flush with the top edges of the inner sides (P). Drive screws through the side cleats (Y) and into the sides.

Tilt the bed frame assembly forward to expose the bed-stop mounting hole. Insert the bed-stop stud and screw the stop in place.

Bed Materials List

Part		FINISHED SIZE T	W	L	Matl.	Qty.
	Platform					
A	frame sides	¾"	1½"	80"	P	2
B	frame struts	¾"	1½"	60½"	P	10
C	side rails	¾"	5⅞"	81½"	M	2
D	head rail	¾"	5⅞"	62"	M	1
E	foot rail	¾"	3"	62"	M	1
F	mattress supports	¼"	31"	80"	BP	2
G	bottom panels	¾"	32"	81¾"	BP	2
H	leg rail	¾"	¾"	60¼"	O	1
	False Doors					
I	stiles	¾"	4"	78⅛"	O	4
J	upper and lower rails	¾"	5"	24$^{11}/_{16}$"	O	4
K	middle rails	¾"	5"	24$^{11}/_{16}$"	O	2
L	upper panels	¼"	24$^{11}/_{16}$"	42⅞"	OP	2
M	lower panels	¼"	24$^{11}/_{16}$"	21¾"	OP	2
N	base	¾"	3½"	64"	O	1
O	cap	¾"	1"	64"	O	1
	Case					
P	inner sides	¾"	15⅞"	87⅜"	BP	2
Q	outer sides	¾"	15⅞"	85⅝"	OP	2
R	case stiles	¾"	1½"	86⅝"	O	2
S	headboard	¾"	15⅞"	64⅜"	OP	1
T	headboard trim	¾"	1½"	64⅜"	O	1
U	headboard cleats	¾"	¾"	15⅞"	O	2
V	case rail	¾"	1"	64⅜"	O	1
W	top panel	¾"	15⅞"	64⅜"	BP	1
X	front and back cleats	¾"	1¾"	64⅜"	O	2
Y	side cleats	¾"	1¾"	14⅜"	O	2
Z*	front bands	¾"	1⅛"	68⅛"	O	2
AA*	front fascia	¾"	3"	67⅜"	O	1
BB*	side bands	¾"	1⅛"	17"	O	4
CC*	side fascias	¾"	3"	16⅝"	O	2

*Parts initially cut oversize. See the instructions.

Materials key: P-poplar, M-maple, BP-birch plywood, O-oak, OP-oak plywood.
Supplies: #8×1", #8×1¼", #8×1½", #8×2" flathead screws; #10×3" flathead screws; 1½" finish nails.
Blade and bits: Dado set; ⅝", ¾", and 1" Forstner bits, bottom-bearing flush-trim router bit.
Sources: Vertical wall-bed mechanism, deluxe kit, queen, $299, C.A.B., Inc., 877-966-3852, wallbed.com.
Door pulls, 320mm, black nickel no. BE2323-1098-P, $23.37 ea. (2); ⅞"×25' birch iron-on edging, no. ET078 PB25, $5.23, Woodworker's Hardware, 800-383-0130, wwhardware.com.

platform assembly by mating the male and female pivots [**Photo K**]. Proceed with the case assembly [**Photos L** and **M**].

5 With your helper, tip the case upright about one foot from the wall. Let the bed platform rest on the floor. Snap the piston ends of the gas springs onto the side-rail lower-plate ball studs [**Exploded View**]. Tilt the bed frame up into the case, push it far enough back to expose the upper-plate ball studs, and snap the gas springs onto the studs. Install the bed stops [**Photo N**].

6 Position the assembly against the wall and mark, cut, and remove the baseboard trim to accommodate the bed-case sides. Mark all wall-stud locations just above the top assembly back cleat (X). True up the case to leave equal gaps between the doors and bed-case stiles. Drill pilot holes through the cleat and drive screws into the wall studs [**Exploded View**].

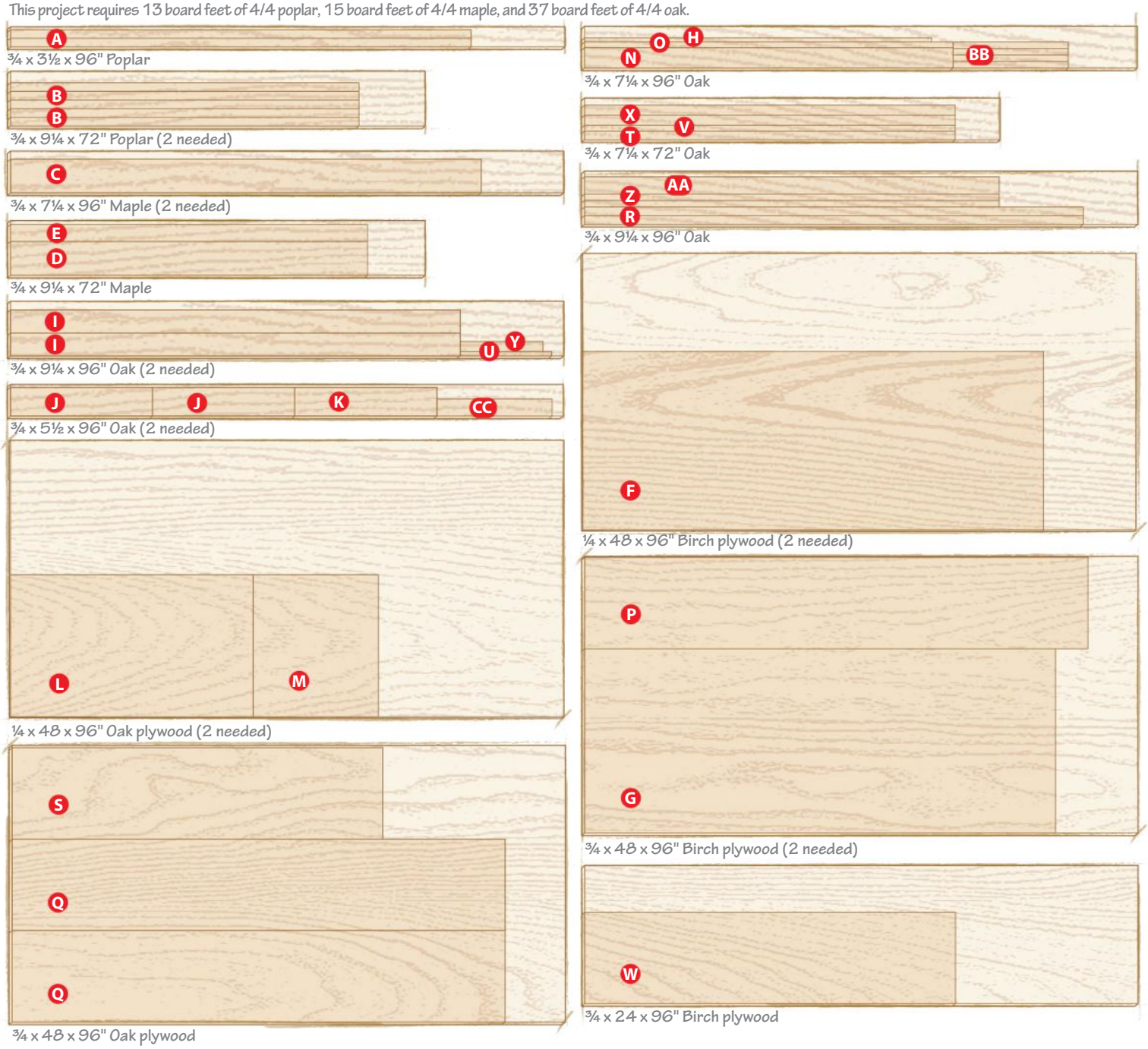
7 Miter-cut the band/fascia assemblies (Z/AA, BB/CC) to length and glue and screw them to the bed case. Secure the mitered corners with finish nails and fill the holes with a matching-color putty stick.

8 Using the door-pull holes as guides, drill through the bottom panels (G) and attach the pulls [**Drawing 3**]. (You may have to purchase longer machine screws.)

9 Screw the mattress supports (F) to the frame sides and struts (A, B) [**Drawing 1**]. Fasten the mattress-retaining straps with screws driven through the mattress supports and into the frame sides and struts [**Exploded View**]. Slip the bottom corners of the mattress under the straps.

Bed Cutting Diagram

This project requires 13 board feet of 4/4 poplar, 15 board feet of 4/4 maple, and 37 board feet of 4/4 oak.



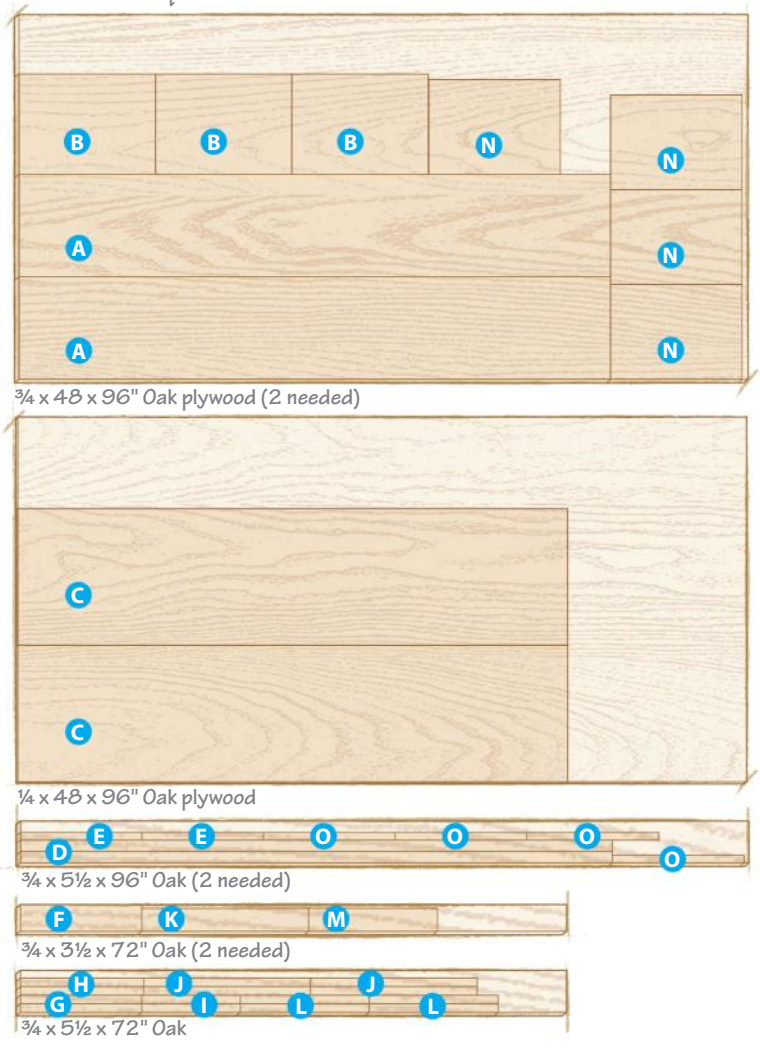
Add the bookcases and adjust

1 Position the bookcases against the bed case and wall. Cut and remove the baseboard trim behind the bookcases. Drill pilot holes and screw the bookcases to the bed case [**Exploded View**].

2 With the mattress in place, test the bed operation. To adjust the lifting power, refer to Step 17 in the assembly instructions included with the bed hardware. Now, before you fold up the bed and put away your tools, you may want to take a little snooze—you've earned it!

Bookcases Cutting Diagram

Two bookcases require 15 board feet of 4/4 oak.



Bookcases Materials List

Part		FINISHED SIZE T	W	L	Matl.	Qty.
A	sides	¾"	13¾"	78"	OP	4
B	tops, bottoms, fixed shelves	¾"	13½"	18"	OP	6
C	backs	¼"	18"	72½"	OP	2
D	stiles	¾"	1½"	78"	O	4
E	top and middle rails	¾"	1"	16"	O	4
F	bottom rails	¾"	3½"	16"	O	2
G	bottom shelf trim	¾"	1⅛"	16"	O	2
H	front cleats	¾"	1⅛"	18¼"	O	2
I	side cleats	¾"	1⅛"	13"	O	2
J*	front bands	¾"	1⅛"	19⅜"	O	4
K*	front fascias	¾"	3"	19"	O	2
L*	side bands	¾"	1⅛"	14⅞"	O	4
M*	side fascias	¾"	3"	14½"	O	2
N	adjustable shelves	¾"	12½"	17⅜"	OP	8
O	shelf trim	¾"	1"	17⅜"	O	8

*Parts initially cut oversize. See the instructions.

Materials key: OP-oak plywood, O-oak.
Supplies: #8×2" flathead screws, 1¼" pocket screws, 1½" finish nails.
Blade and bit: Dado set, top-bearing pattern router bit.
Source: ¼" shelf pins, nickel, no. THB0144, $3.60 pack of 20 (2 packs), Woodworker's Hardware, 800-383-0130, wwhardware.com.

Produced by
Craig Ruegsegger with **Kevin Boyle** and **Jan Svec**
Project design: **Kevin Boyle**
Illustrations: **Roxanne LeMoine, Lorna Johnson**

MAKE ANY PLACE YOUR WORKSPACE

THE KREG® MOBILE PROJECT CENTER MAKES IT POSSIBLE TO WORK ON PROJECTS **WHEREVER, WHENEVER,** AND **HOWEVER** YOU WANT.

THE MOBILE PROJECT CENTER IS A

- ☑ WORKBENCH
- ☑ SAWHORSE
- ☑ ASSEMBLY TABLE
- ☑ CLAMPING STATION

ALL IN ONE!

Kreg

WWW.KREGTOOL.COM | 800.447.8638

Turn ORDINARY INTO MASTERPIECE!

MAKE IT.
Bonds Everything So You Can Create Anything.

GIVE IT LIFE.
Vibrant Colored Gel Stain For Use On Wood, Glass, Metal, Fabric, Concrete, Laminate & More

PROTECT IT.
1 Step Finish Equals 70 Coats of Varnish

MADE IN USA by Eclectic Products
eclecticproducts.com

Can Your Old Dust Collector Work Better Than A New One?

Yes, With Optimized Filters From...

- Optimum Performance
- Low Maintenance
- Custom Designs
- Cleaner Air
- Longer Life
- Economical
- Best Size & Fit
- Proudly Made in USA

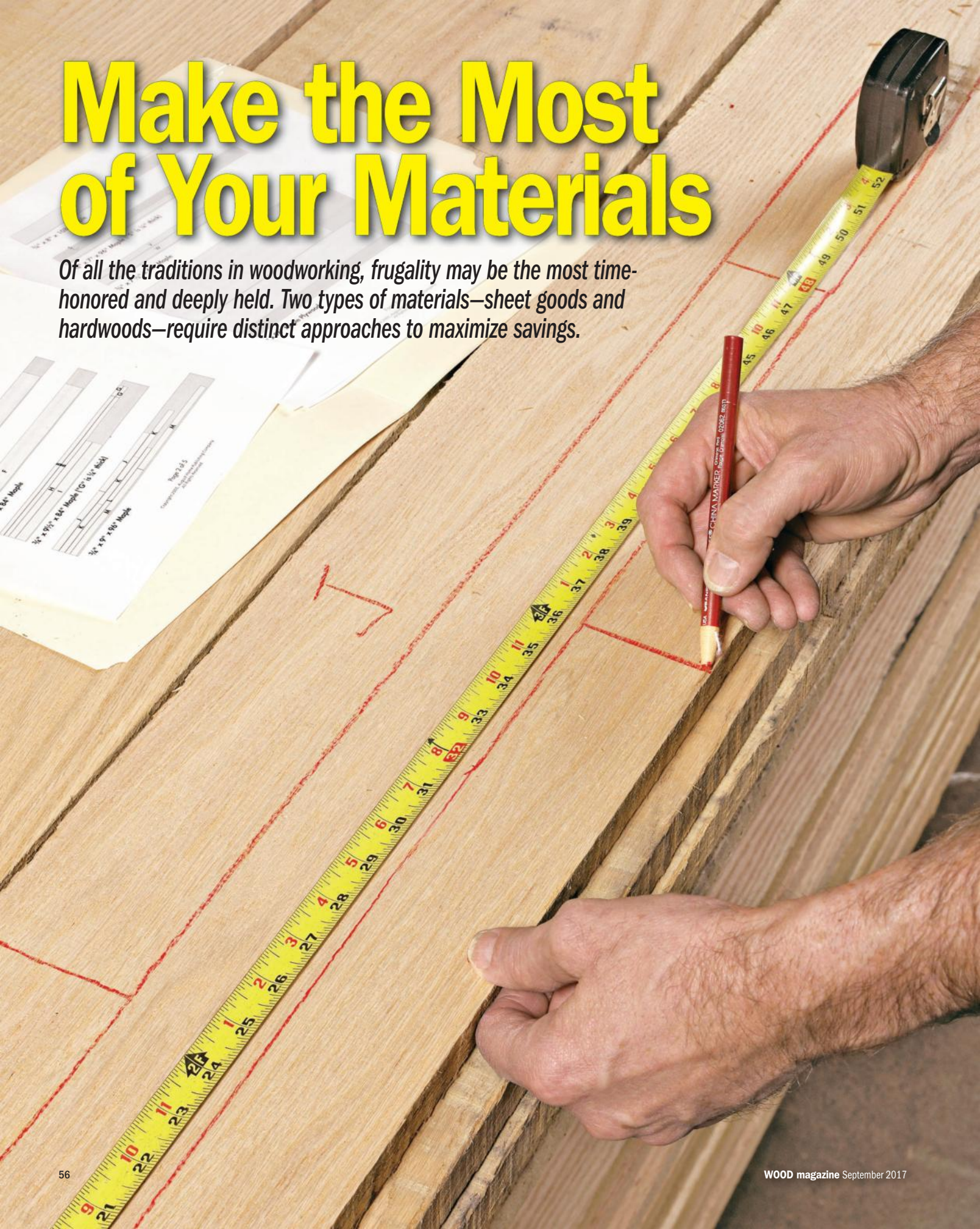
6 Mil Poly Bags In Stock!

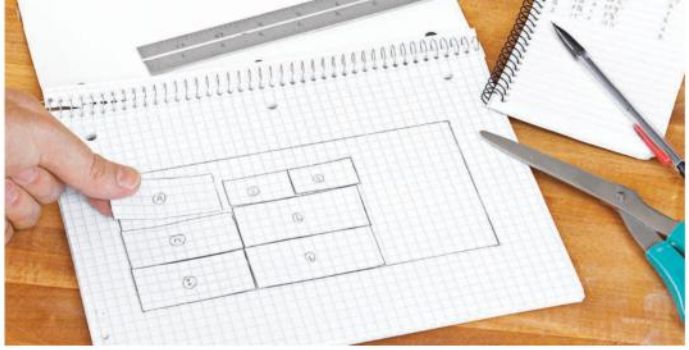
We Design & Fabricate Custom Filter Bags That ***REALLY WORK!***

American Fabric Filter Co.
(800) 367-3591 americanfabricfilter.com

Make the Most of Your Materials

Of all the traditions in woodworking, frugality may be the most time-honored and deeply held. Two types of materials—sheet goods and hardwoods—require distinct approaches to maximize savings.





For the cost of a piece of graph paper, a scale mock-up can save you expensive miscuts by arranging cuts on sheet goods to the best advantage.

With the drawer closed, pricier walnut hides the inexpensive birch plywood.

Sheet goods: Size defines design

48×96". Those are the magic numbers when working with most sheet goods. The exceptions: medium-density fiberboard (MDF), usually 1" longer in each dimension to allow for saw kerfs; and Baltic birch plywood, which often comes in 60×60" sheets. Plywood's consistent size and absence of surface blemishes make it easy to plan your exact materials needs at the design stage. Here's how you can save money by reducing the number of sheets in your project:

1. Cost-cutting starts with a cutting diagram. Whether you sketch it on a pad, model it on the computer, or cut out scale mock-ups, as shown *above*, a cutting diagram helps you optimize the use of any sheet goods as you design your project.

Start by laying out the largest pieces and filling in with smaller pieces, making sure to add ⅛" to account for saw kerfs. Where possible, group pieces of like length and width. This minimizes the number of cuts needed to break down the sheet. It may take several arrangements to find the fit that maximizes yield.

2. Cheat to stretch your sheets. Next, recheck your design. Can you eliminate a sheet by altering part dimensions? If so, you've saved a lot of money before making the first cut.

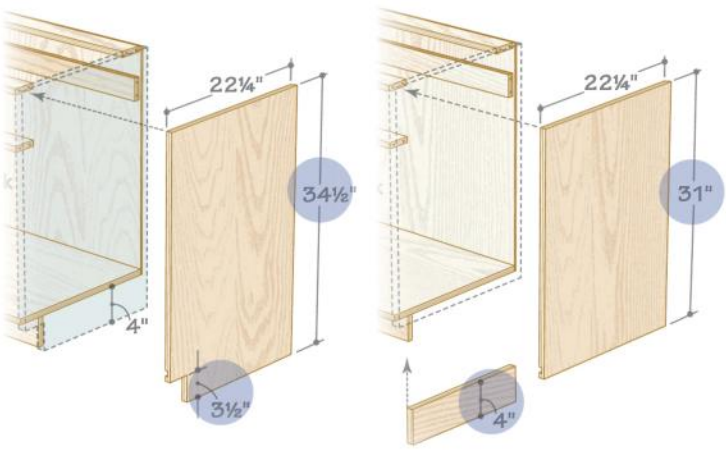
For example, eliminate a cabinet's toekick in favor of a 4" hardwood base, as shown in the example at *right*. This shortens the standard cabinet-side height from 34½" to 31", netting six cabinet sides from a single sheet of plywood rather than the normal four—a gain of 50 percent!

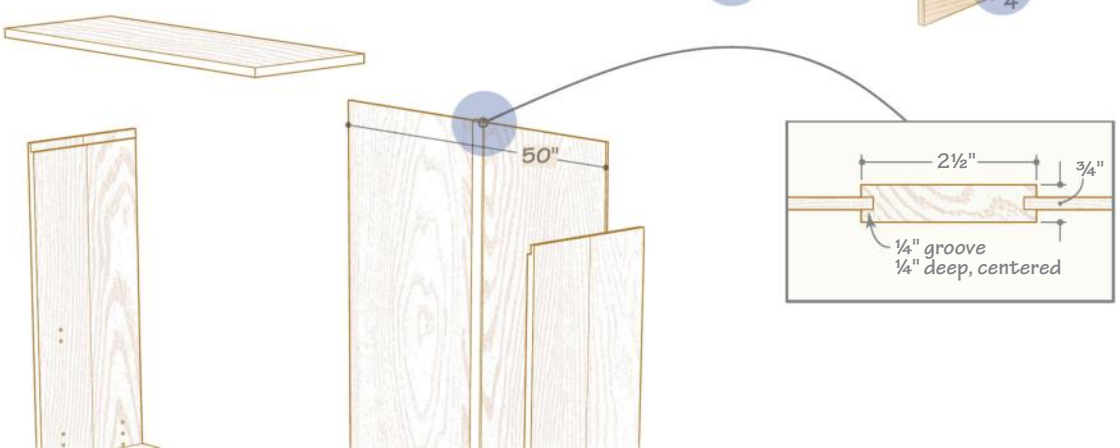
And expanding television sizes don't have to expand your materials bill. Adding a divider to the back of a 50"-wide entertainment cabinet, as shown *bottom* stretches the plywood to get the full width of the cabinet from a single sheet.

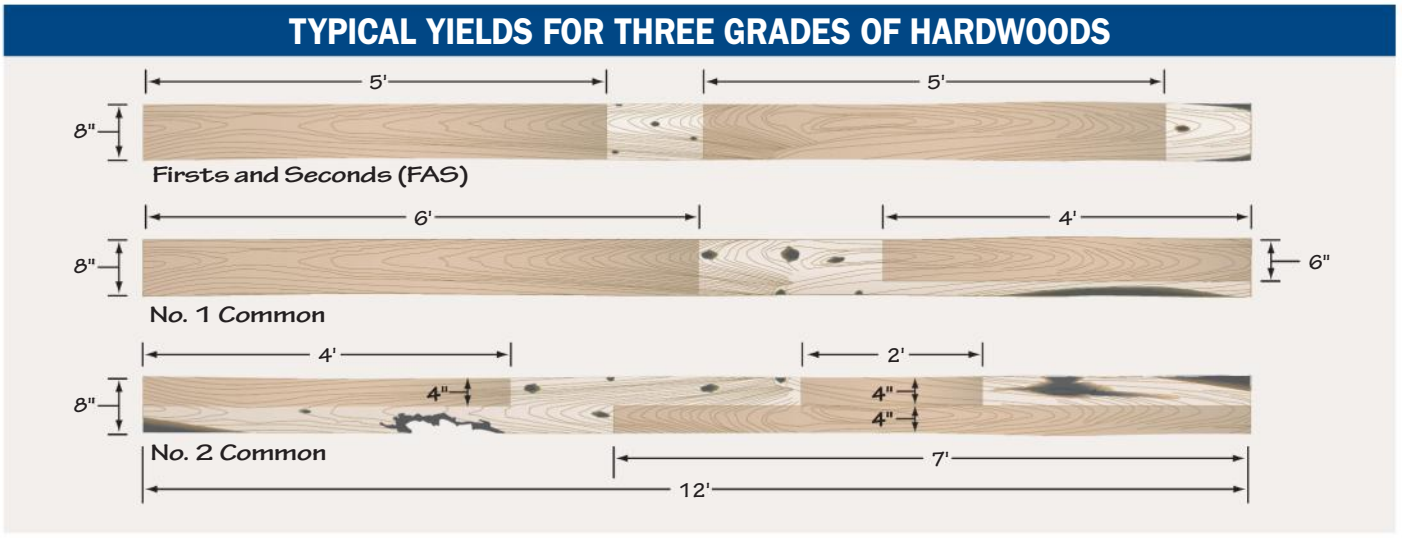
3. Thriftiness and sneakiness go hand in hand. Don't use up expensive hardwood plywood on furniture parts that will rarely be seen. In the barrister's bookcase *above*, using inexpensive birch plywood on the case bottom and top kept the amount of walnut-veneered plywood to less than a half sheet.

Even if you have to orient the grain the wrong direction to make a scrap piece of plywood fit in a hidden area, don't sweat it. Because plywood consists of multiple plies with alternating grain directions, it won't compromise the structural integrity of the piece. And no one will be the wiser.

▶Find plans for the bookcase in *WOOD* issue 195 (Dec/Jan 2009/10), or at woodmagazine.com/barrister.







Each grade requires a certain minimum clear yield from a board. FAS should have at least 84 percent clear-face cuttings; No. 1 Common, 66 percent; and No. 2 Common, 50 percent. For projects that you plan to paint or stain, a lesser grade could save you 30–50 percent in wood cost.

Solid woods: No two boards alike

Unlike sheet goods, solid woods don't come in predictable sizes; irregularity is the norm. Therefore, using the material efficiently becomes an exercise in working around size variations, blemishes (such as knots and sapwood), and warped wood.

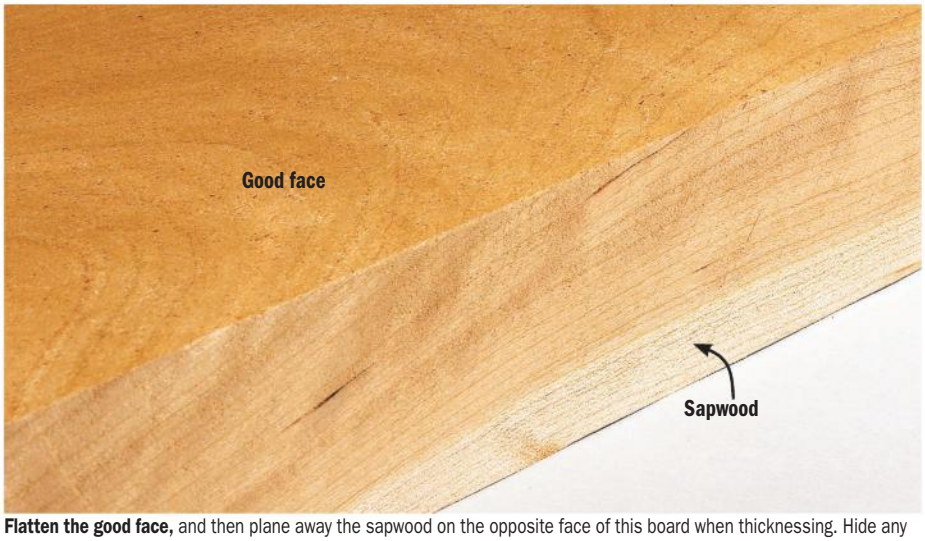
1. Shop for parts, not board feet. A materials list, like the ones at the ends of project articles in this magazine, helps you focus your search for boards that are good matches for your project parts—just don't get too hung up on finding a magic board that fits all of your project parts like a completed jigsaw puzzle. Instead look for consistent coloring and grain pattern for each individual part.

At first it seems counterintuitive in the name of efficiency to buy more wood than your plans call for. But you'll end up using much of it in short order, averting the need to buy fresh poplar for secondary project parts or maple for shop jigs. In effect you'll reap the savings from your scrap bin. And your project benefits from using the best-looking parts of each board.

Once you get used to shopping selectively, start looking in your lumber dealer's lower-grade bins. You won't get as much wide, clear yield as found in the Firsts and Seconds (FAS) grade, but you'll usually save enough money buying No. 1 or No. 2 Common boards to more than make up for the lower yields, *above*.

2. Don't reject the defects. Take a closer look at that sapwood-streaked board in your reject pile, *below*. Does the sapwood go all the way through the piece? A simple board flip might hide it for a spectacular save. The same holds true for knots.

In both cases look for opportunities to minimize their appearances when machin-



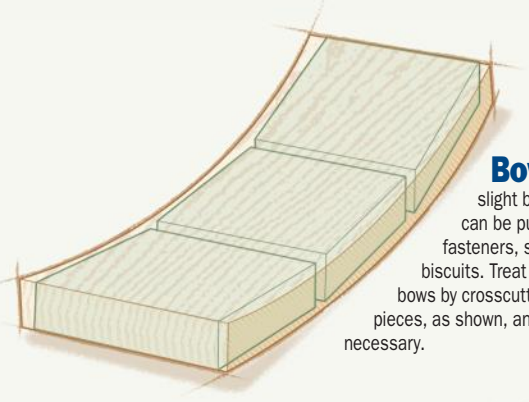
Flatten the good face, and then plane away the sapwood on the opposite face of this board when thicknessing. Hide any remaining blemishes.

ing the wood. You may be able to surface away the defective side during thicknessing, even if that means using wood slightly thinner than your plans call for. No one will notice if your face frame measures a hair shy of ¾" or the jewelry-box sides are slightly under ½". Just be sure to account for the size difference when machining the joinery.

Also keep in mind that a project built with defect-free lumber can lack character. Strategically placing voids, sapwood, live edges, and knots, as shown *below*, can enhance a project's aesthetics and take it from being everyday furniture to a stunning work of art.

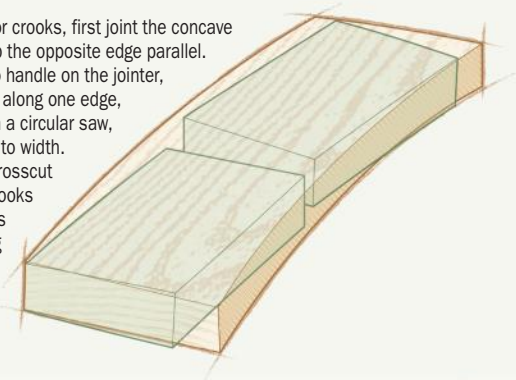
Rustic furniture often incorporates knots as features. Rather than dotting the project willy-nilly, be deliberate about their placements as you would with other figured wood.

3. Turn bad boards into good wood. Even when you shop carefully, lumber that started out straight and true at your local hardwood retailer doesn't always stay that way in your shop. All is not lost, however; salvageable wood hides in those boards. Follow the steps *below* to rescue wood from the most commonly encountered warps.

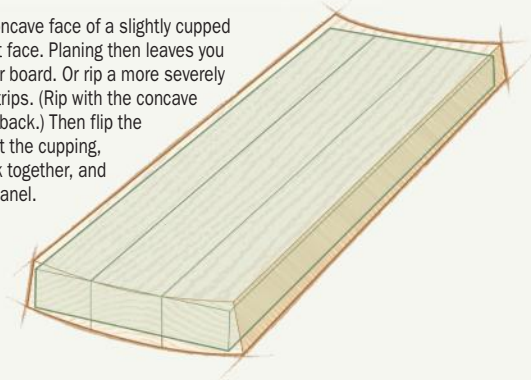


Bow: Don't sweat slight bows where they can be pulled straight by fasteners, such as screws or biscuits. Treat more substantial bows by crosscutting into shorter pieces, as shown, and resurfacing as necessary.

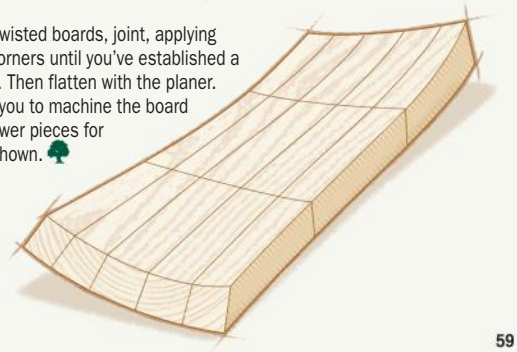
Crook: For minor crooks, first joint the concave edge flat, and then rip the opposite edge parallel. For boards too long to handle on the jointer, first snap a chalk line along one edge, cut along the line with a circular saw, and then joint and rip to width. Whenever possible, crosscut boards with severe crooks into shorter pieces, as shown, before jointing and ripping.



Cup: Joint the concave face of a slightly cupped board, creating a flat face. Planing then leaves you with a slightly thinner board. Or rip a more severely cupped board into strips. (Rip with the concave side up to avoid kickback.) Then flip the center piece to invert the cupping, edge-glue them back together, and joint and plane the panel.



Twist: For short twisted boards, joint, applying pressure on the low corners until you've established a flat reference surface. Then flatten with the planer. Severe twists require you to machine the board into shorter and narrower pieces for secondary parts, as shown.



Heirloom Tool Tote

Put your most-used tools in a smart carrier that's easy to store, move, access, and build!

DIMENSIONS: 23" L × 10¼" D × 9½" H

Approximate materials cost: **$40**

Weighs only **7½** pounds empty

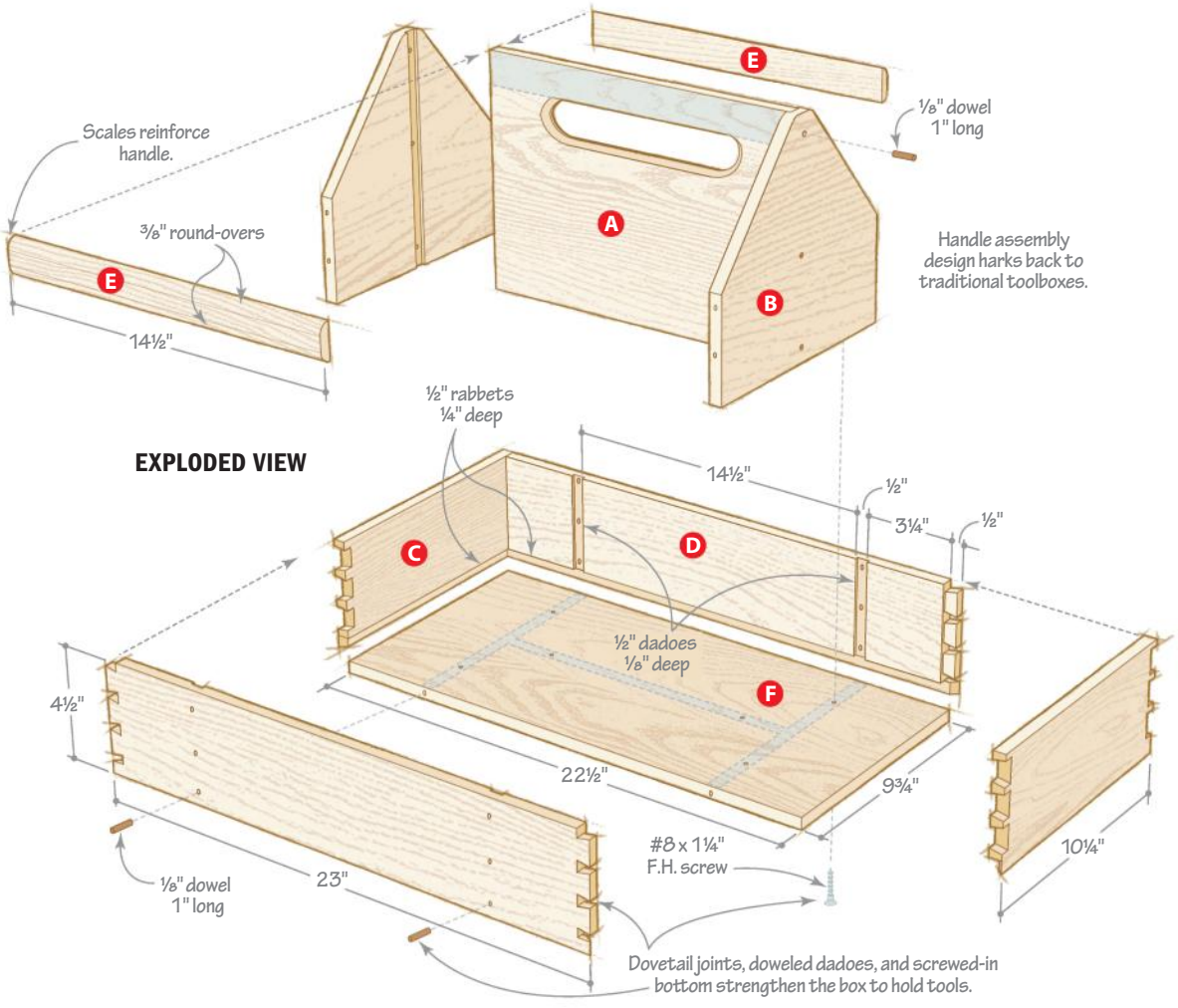
Why buy a canvas bag or plastic toolbox when you can make one that shows off your skills as well as your tools? With this tote, you'll learn to create through-dovetail joints with hand tools. But if you prefer to skip the dovetails, we provide an alternative joinery method. Let's get started.

Build from the inside out

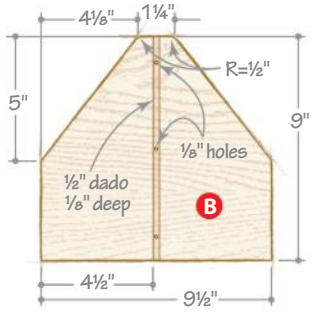
1 Cut the handle (A), handle ends (B), box ends (C), and box sides (D) to size [**Materials List**], but don't cut the angles on the handle ends.

2 Dado, groove, and rabbet the handle ends, box ends, and sides [**Exploded View, Drawing 1**]. Cut rabbets on the inside ends of the box sides (D).

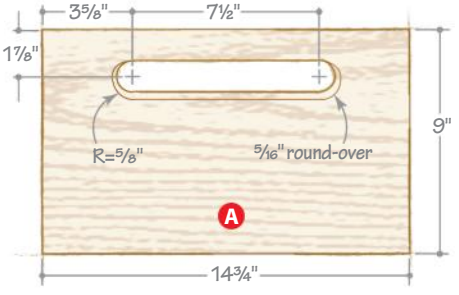
Tip! We used contrasting walnut dowels throughout, but you can use dowels made of any "blond" wood. Simply soak one end in a dark walnut or ebony stain before gluing in place.



1 HANDLE END



2 HANDLE



3 Cut the handhold slot in the handle [**Drawing 2, Photo A**]. Rout round-overs along the bottom and ends of the slot on both faces, but not the top. (The scales [E], added later, will match up better this way.)

4 Cut the angles on the handle ends [**Drawing 1**], and sand or plane them smooth. Finish-sand the handle ends and handle.

5 Glue the handle into the dado in the handle ends [**Exploded View**]. When that dries, drill ⅛" holes and glue in dowels.

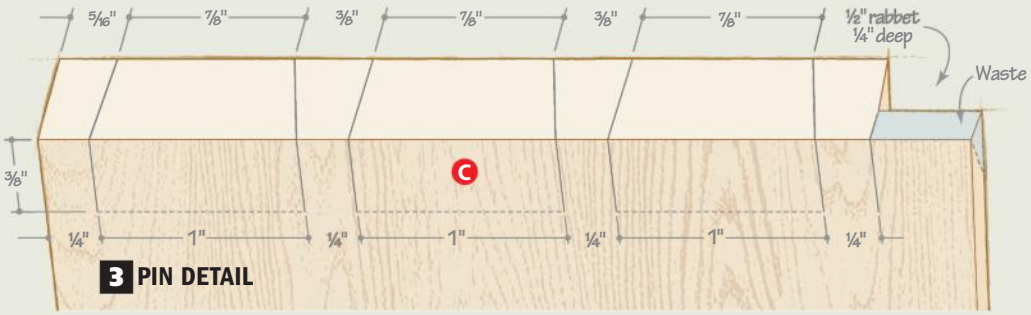
6 Cut the dovetails for the box ends and sides as shown on the *next page*.

Create the handhold slot by drilling 1¼" holes at each end of the marked slot, then connecting them with jigsaw cuts. Sand the edges smooth when finished.

Earn your degree in dovetails

▶Don't want to cut dovetails? Then simply trim the box ends (C) to 9½" long and join the box sides and ends with glue and dowels to match the other joints.

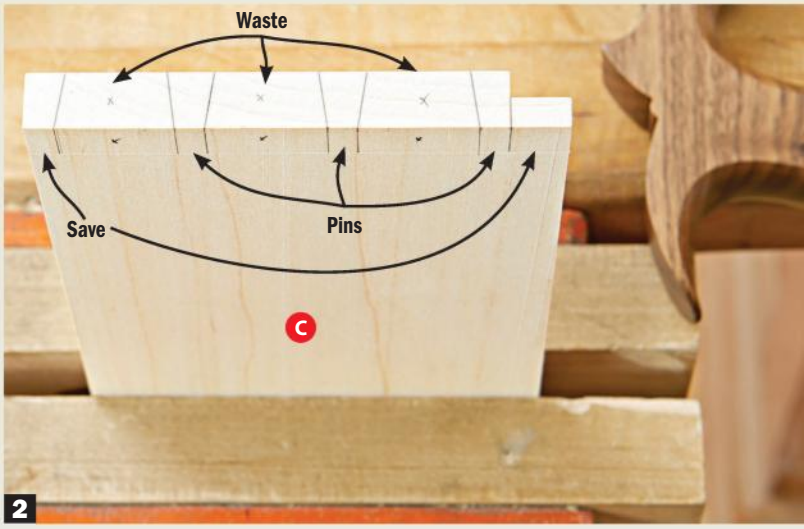
To hand-cut the dovetail joints, you'll need a few tools: marking gauge, handsaw (with a spined back for making straight cuts), ½" and ¾" chisels, sliding bevel gauge, and a mallet. For this box, we mitered the bottom tail and pin at each corner—a nod to traditional dovetail joinery—to prevent having a partial tail.



3 PIN DETAIL

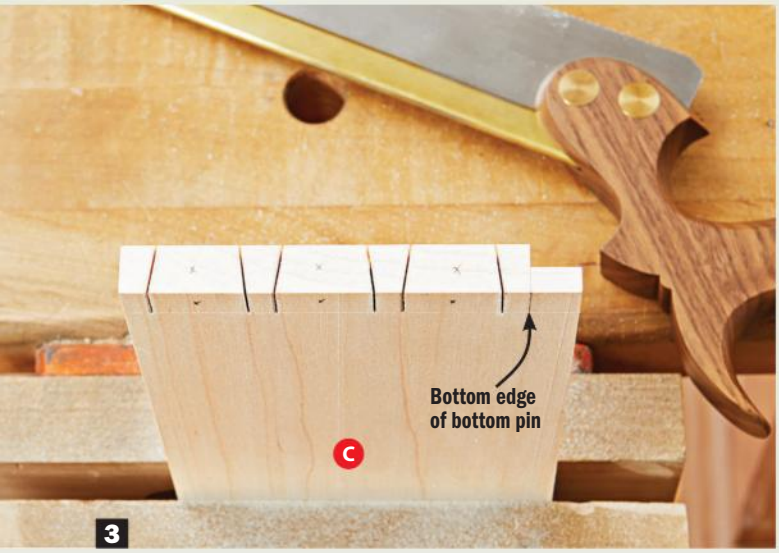
1

Using a marking gauge, mark the baseline (the length of the pins and tails) on both faces of the box sides and ends. Mark the lines on the box ends (C) ⅜" from the end (to account for the rabbets on the box sides), and ½" from the ends of the box sides.



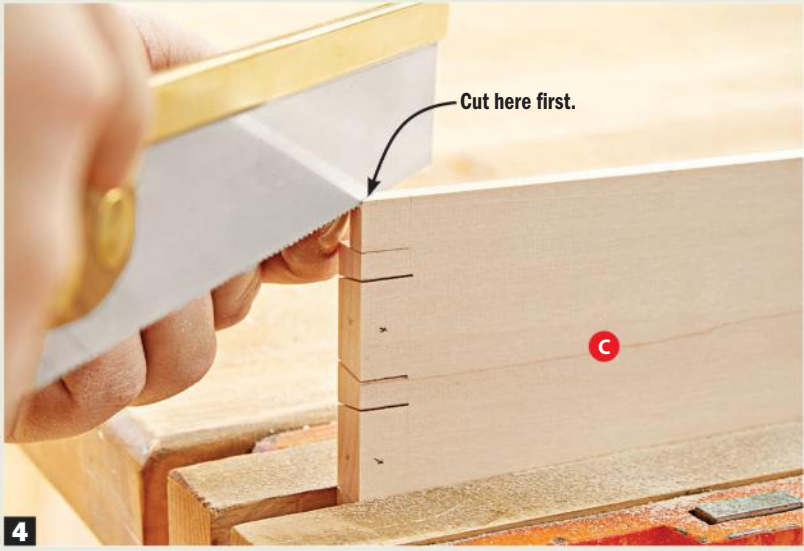
2

Lay out the pins on the box ends [Drawing 3]. Continue the layout lines across the ends and to the baseline on both faces.



3

Cut to the lines with a handsaw, making sure not to cut below the baseline on both faces. Do not cut the bottom edge of the bottom pin yet.

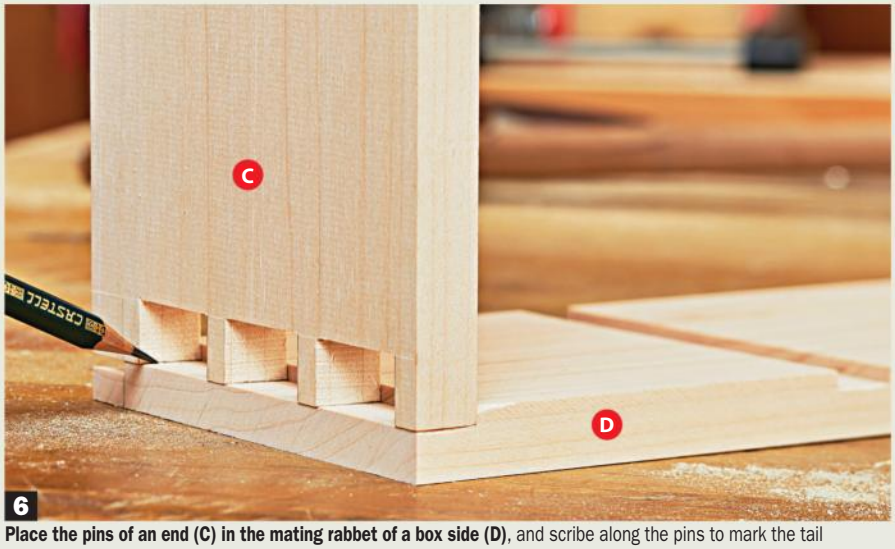


4

Cut a 45° miter on the rabbeted portion beneath the bottom pin [**Drawing 3**]. Then, guiding the saw along the wall of the rabbet, cut between the interior baseline and the tip of the miter to remove the wedge of waste.

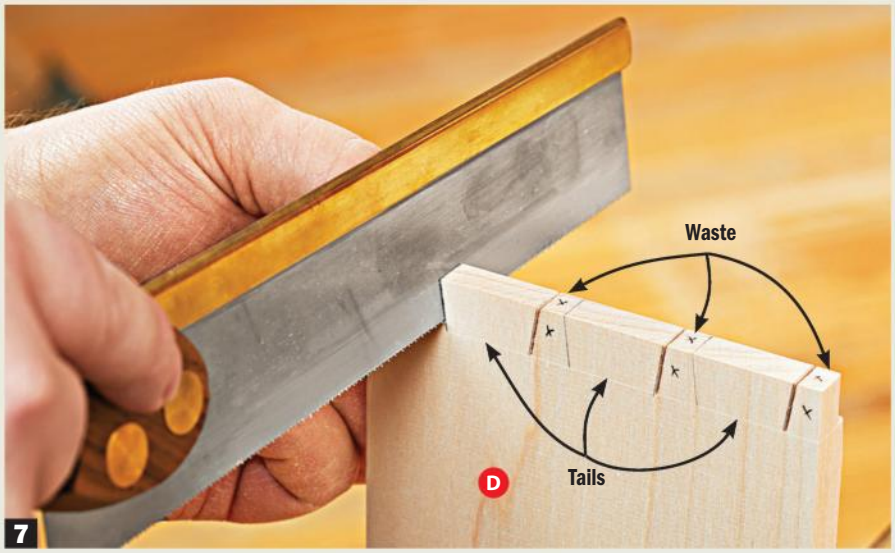
5

Chop out the waste between the pins, starting 1/32" or so inside the baseline. When finished, pare away material up to the baseline.



6

Place the pins of an end (C) in the mating rabbet of a box side (D), and scribe along the pins to mark the tail positions. Transfer the tail markings across the ends at 90° with a square and to the baseline on the other face (with a sliding bevel gauge).



7

Saw the tails to shape—cutting on the waste side of the lines, to allow for trimming—and miter-cut the bottom as before. Chop out the waste, and pare as needed to fit with the pin board.

Put it all together

1 Finish-sand the inside faces of the box ends and sides, and glue and clamp together with the handle assembly. Wipe away any glue squeeze-out. When dry, sand the outside faces smooth.

2 Cut the scales (E) to size, round over the edges [**Exploded View**], and glue them to the handle with their top edges flush. When dry, sand to blend the scales with the handle and handle ends.

3 Cut the bottom (F) to size and drill countersunk pilot holes through the *bottom* face. Sand the bottom smooth.

4 Apply finish to the bottom and the inside surfaces of the box assembly. (We sprayed on two coats of Varathane water-based polyurethane.) After that dries, install the bottom.

5 Drill holes through the box sides into the handle ends, and plug with dowels. Sand smooth, and apply finish to the outside surfaces. Enjoy your new tool tote!

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

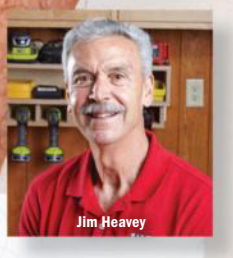
Materials List

Part		FINISHED SIZE T	W	L	Matl.	Qty.
A	handle	½"	9"	14¾"	M	1
B	handle ends	½"	9"	9½"	M	2
C	box ends	½"	4½"	10¼"	M	2
D	box sides	½"	4½"	23"	M	2
E	scales	⅜"	1¼"	14½"	M	2
F	bottom	½"	9¾"	22½"	W	1

Materials key: M-maple, W-walnut plywood.
Supplies: ⅛"×3' walnut dowel, #8×1¼" flathead screws (6).
Blade and bits: Dado set; 5/16" and ⅜" round-over router bits.

Master Miter-cuts on Crown Molding

By Jim Heavey



You've seen examples of crown molding topping kitchen cabinets or adding interest to an entertainment center. Learning how to properly miter-cut crown molding gives you the confidence to include this classy trim in furniture projects as well as throughout your home. And the best part? You'll do all this without buying a jig or modifying your compound mitersaw.

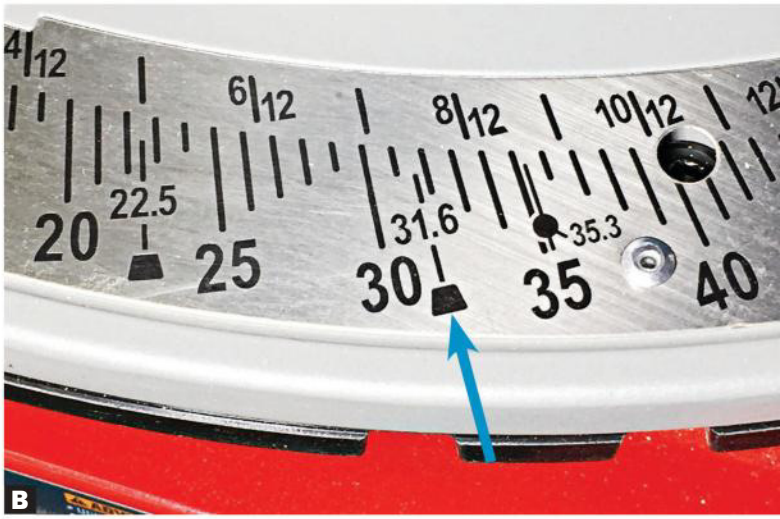
Work the angles

Crown molding tilts forward from the cabinet or wall to add the rich look of depth. That 38° tilt is called the *spring angle*. A 52° bevel on the top edge of the trim complements the spring angle. Most store-bought trim comes in this 38/52° style.

The trick is making compound cuts (both bevel and miter at the same time) accounting for the spring angle, so that the corners meet at 90°. One method miter-cuts crown molding "upside down and backwards" to its installed orientation while using a jig or a

A

Many saws have a detent or stop at 33.9°. If your saw tilts both left and right, as this one does, use only the left tilt for cutting crown molding. This saw has a stationary pointer—the dial pivots under it as the blade tilts.



B

Find the miter stop at 31.6°. You'll see one for both left and right. Some saws also have a stop at 30°. Make sure you're locked into the correct one.

fixture to support it during the cut. Although this technique works, it can be confusing and lead to mistakes. Plus, cutting long or wide trim this way can be difficult.

Flat is where it's at

Cutting crown molding while it lies flat on the mitersaw table allows easy cutting of both long and short pieces; an unwieldy piece can be firmly clamped to the mitersaw because it doesn't rest at an angle. Cutting the trim flat calls for some rather complex math to determine the proper settings for the bevel and miter cuts. But don't worry—mitersaw manufacturers have done the math for you and placed markings on the tools for the proper angles: 33.9° on the bevel scale and 31.6° on the miter scale [**Photos A, B**]. You'll see these numbers or some other obvious markings that indicate the "crown" settings. You may have wondered what those markings or stops were for. Now you know.

▶See the "upside down and backwards" technique. woodmagazine.com/moldingvideo

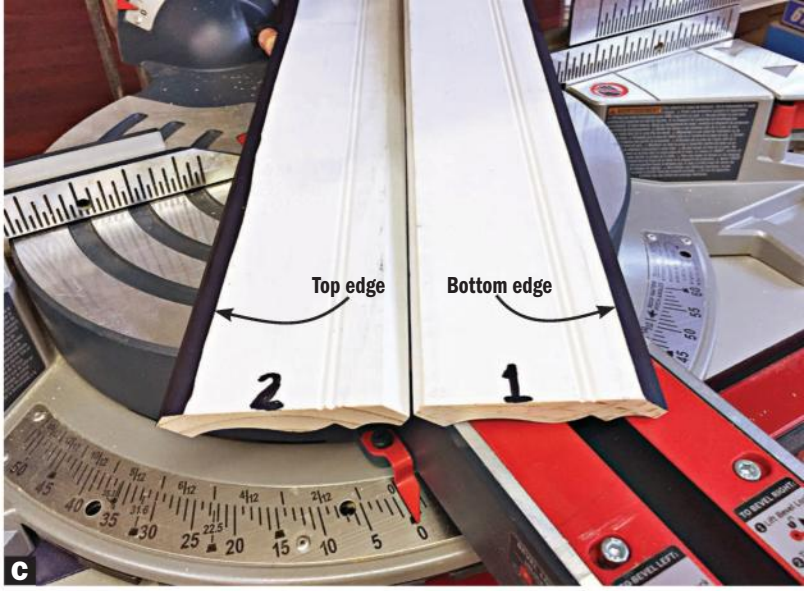
▶Refer to this chart for mitering non-square corners, such as around a bay window or range hood. woodmagazine.com/crownangles

Templates make it easy

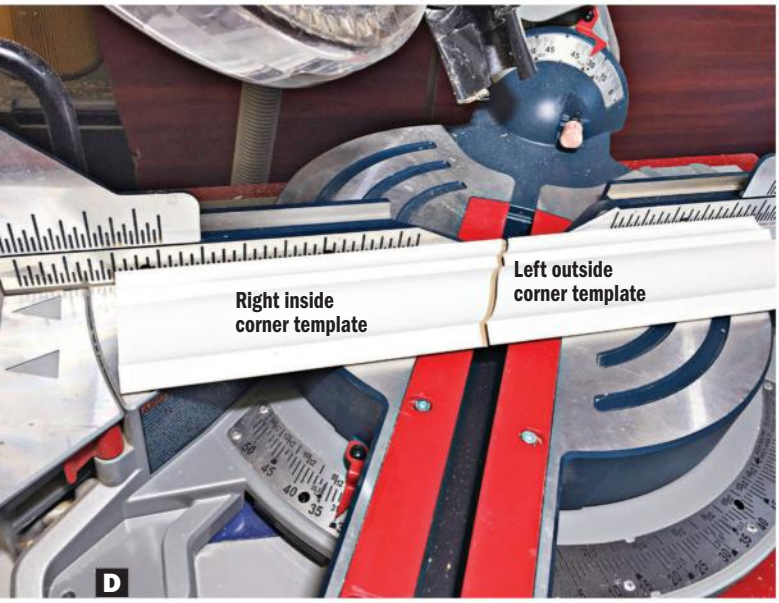
The first step in cutting molding flat is making a simple set of templates, then using them to set up your saw for cutting the correct angles. Just follow the steps in **Photos C–F.**

Placing and cutting crown molding on the saw is now a snap! Simply place a template on the saw (for example, template R-IC for the right side of an inside corner). Knowing that the bevel is always set left at 33.9° and the black edge of the template always goes against the fence, you only need to pivot the table left or right to align with the cut end of the template. Place your stock on the mitersaw to match the template orientation and, ta-da! You've just earned your masters in cutting crown molding.

▶Purchase a video that demonstrates these techniques. woodmagazine.com/installcrown



Begin by cutting two 18" lengths of crown molding. Mark the *bottom* edge of one piece with a black marker (#1). Mark the *top* edge of the other piece (#2).



Tilt the saw head left to the the 33.9° bevel and pivot the miter to the left 31.6° detent. Place piece #1 face up on the saw table with the black edge against the fence, and cut it in half to produce two templates. Set the pieces aside.

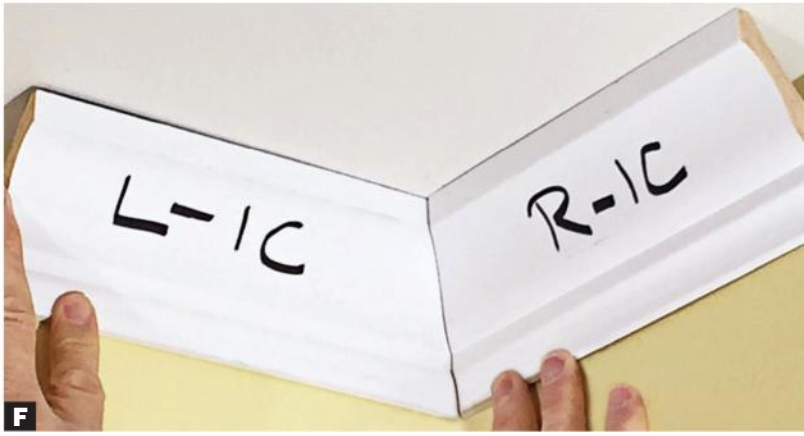
Now, slide the miter to the right 31.6° setting. The bevel remains tilted to the left. Place piece #2 face up with the black edge against the fence. Cut it in half.

SHOP TIP

Managing short pieces

With the saw tilted left, clamping on that side to cut short pieces can be difficult. For safety and accuracy, miter one end of a longer piece. Then, move and reclamp the stock to cut the opposite end to length.

▶Watch Jim miter short returns. woodmagazine.com/shortcrownmiters



Find the two inside corner (IC) mated templates and mark them left and right. Do the same with the two mated outside corner (OC) templates. Placing the templates in their intended position provides a visual cue of how to place your workpieces on the saw.

LUMBER YOU'LL LOVE

No Minimum Order • Friendly Service

Massive Selection of Domestics & Exotics

Walnut	Mahogany
Cherry	Purple Heart
Maple	Zebrawood
Oak	+ more

100% Satisfaction Guarantee Every Order

WOODWORKERS Source

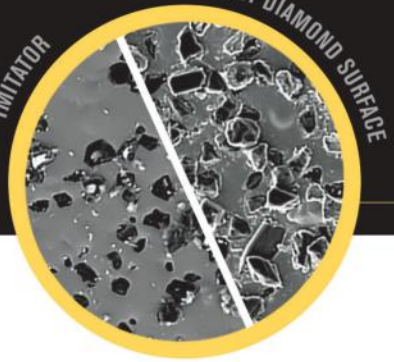
HARDWOODS • TOOLS • SUPPLIES

www.101Woods.com

Toll Free 800-423-2450

VISA PayPal

SHARP STARTS HERE.



When sharpness counts, count on DMT®. Our line of sharpeners has the industry's highest concentration of diamonds per square inch, and an unrelentingly flat surface. Precisely engineered to give you excellent results time and again, trust your tools to DMT.

PROUDLY MADE IN THE USA

DMTsharp.com/WOOD

508.481.5944

DMT

Mailbox

Post up an eye-catching project that improves your home's curb appeal.

DIMENSIONS: 16½" W × 7⅜" D × 11 15/16" H

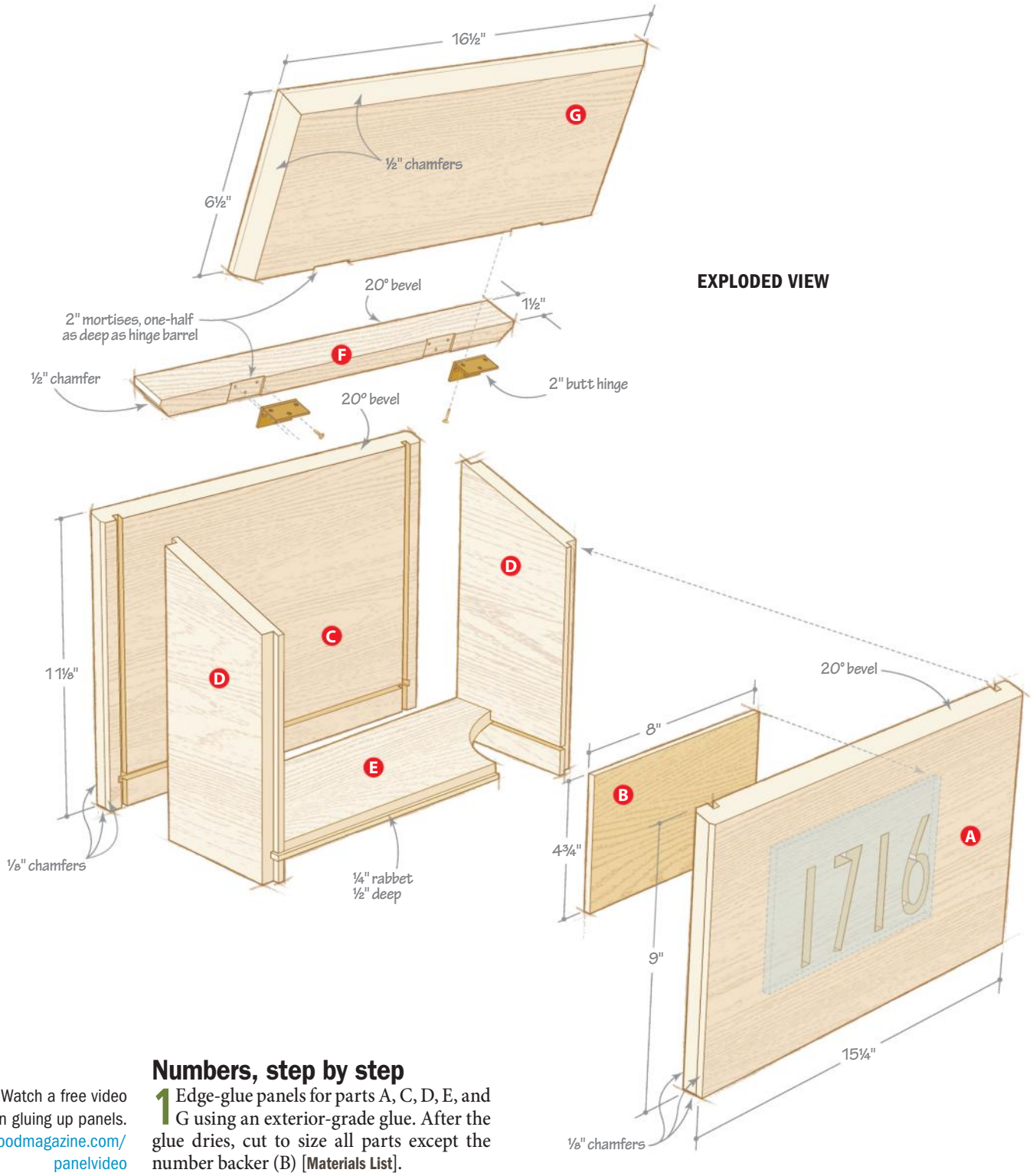
Approximate materials cost: **$40**

1775 year Ben Franklin was named first U.S. Postmaster General

Tip! *If using the box as a countertop caddy, eliminate parts F and G.*

Mounted outside to accept the daily mail, or sitting inside to collect papers, keys, and more, this handsome box makes a statement while it holds your bills. A weather-resistant wood such as white oak (our choice), mahogany, cedar, or redwood looks great indoors or out.

▶Learn about other woods suited for outdoor projects. woodmagazine.com/outdoorlumber



EXPLODED VIEW

Numbers, step by step

▶ Watch a free video on gluing up panels. woodmagazine.com/panelvideo

▶ Download other numeral patterns. woodmagazine.com/mailbox

1 Edge-glue panels for parts A, C, D, E, and G using an exterior-grade glue. After the glue dries, cut to size all parts except the number backer (B) [**Materials List**].

2 Print numbers with your choice of font. (We used Gill Sans MT Condensed at 350 pt.) Cut out the numbers and center them on the front (A), keeping at least ¾" between the closest points of any two numbers. Use small pieces of painter's tape to hold the numbers in position, then trace around thewm. Cut the number backer (B) 1" wider and longer than the area occupied by the numbers.

3 Center the number backer on the inside face of the front (A) and trace around it. Using a router with an edge guide and a straight bit, rout a recess within this area [**Drawing 2**]. Square up the corners with a chisel.

4 Cut out the numbers following the steps in **Photos A–E** [*next page*].

A

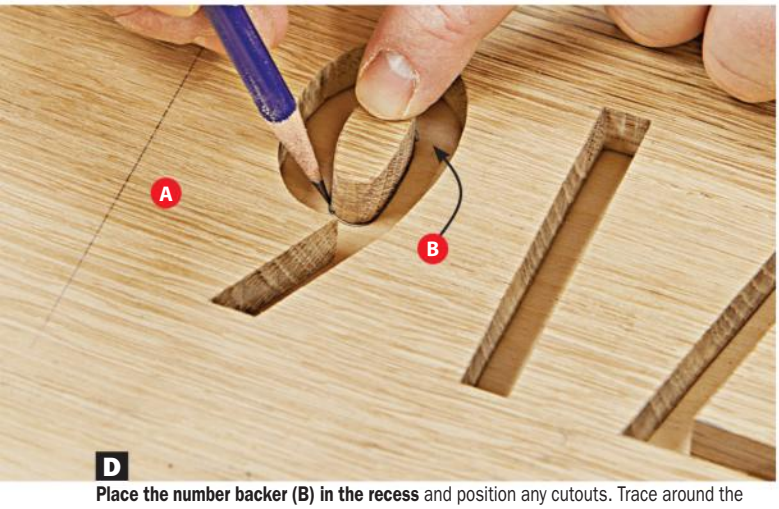
Drill blade starter holes wherever the curve of a number is too tight to pivot the saw blade [see **Photo B**]. Cut carefully, staying inside the lines. For clean edges, use a 20 tooth-per-inch (TPI) blade, and work slowly.

B

File the edges up to the lines, and square the ends with a chisel. If needed, clamp a scrap along the layout line to help get a true vertical edge.

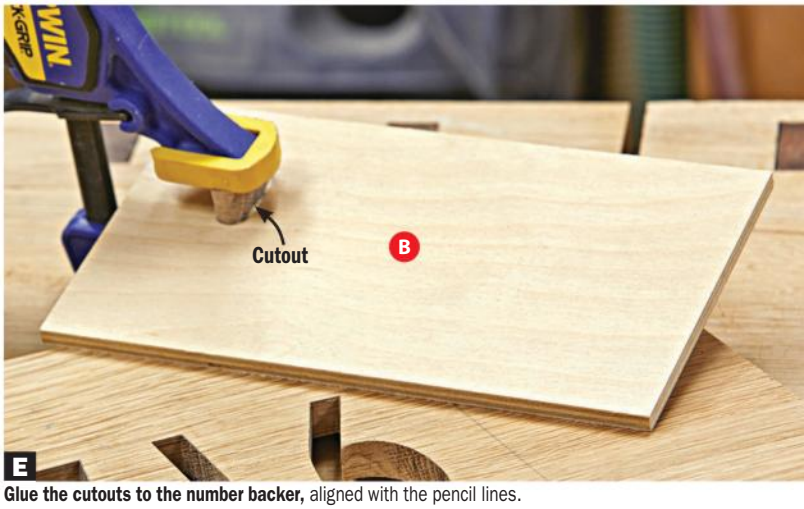
C

On numerals 4, 6, 8, 9, or 0, cut away the interior piece(s) first, staying *outside* the line. File and sand the edges of the cutout piece(s) smooth.



D

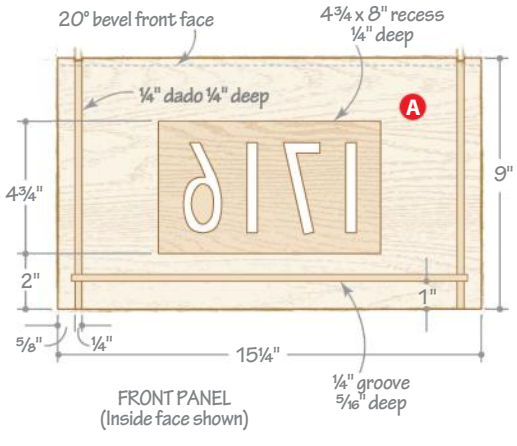
Place the number backer (B) in the recess and position any cutouts. Trace around the cutout with a sharp pencil.



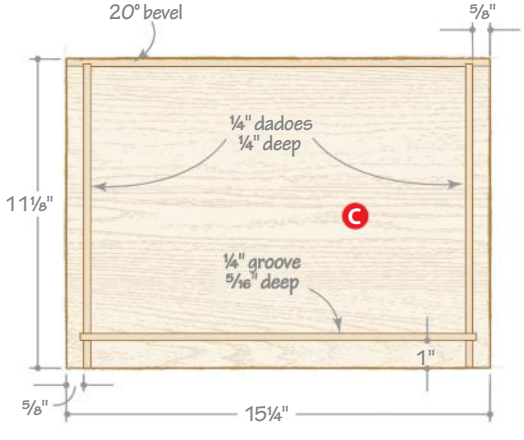
E

Glue the cutouts to the number backer, aligned with the pencil lines.

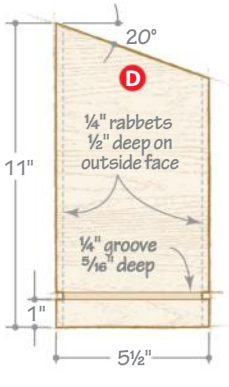
2 PARTS VIEWS



FRONT PANEL
(Inside face shown)



BACK PANEL
(Inside face shown)



SIDE PANEL
(Inside face shown)

F

Cut ¼" dadoes with a dado blade, or by making a pass across each end with a standard blade, and then moving the rip fence to widen the dadoes with another pass.

G

Equip your router with an edge guide and a ¼" straight bit. Rout a groove from one dado to the other. Find the edge guide plan at woodmagazine.com/edgeguide.

H

Attach an auxiliary fence to the tablesaw rip fence. Lower the blade below the table, then raise the spinning blade to cut a shallow recess in the auxiliary fence.

Form the joints

1 Dado the ends of the front and back (A, C) [**Photo F, Drawing 2**].

2 To accept the bottom (E), rout grooves between the dadoes [**Photo G, Drawing 2**]. With the same setup, rout grooves in the sides (D).

3 Rabbet the sides (D) to create tongues that fit the dadoes in the front (A) and back (C) [**Photo H, Exploded View**]. Cut rabbets around the bottom (E) using the same setup.

4 Rip the bevel on the front (A) and back (C) [**Exploded View**]. Dry-fit the box and trace a line on each side (D) connecting the bevels. Cut along the lines and sand them smooth.

5 Cut the mortises in the hinge rail (F) and top (G) to match the length and width of a hinge leaf.

6 Rout chamfers on the front (A), back (C), hinge rail (F), and top (G) where shown [**Exploded View**].

Assemble and finish

1 Finish-sand all parts to 220 grit. Glue and clamp the sides to the front and back, trapping the bottom. Do not apply glue to the bottom so it can expand and contract with changes in humidity. Glue the hinge rail (F) to the box, flush at the rear.

2 Mask off any glued-on number cutouts and ¾" around the edges of the number backer, then spray-paint the number backer (B). (We used Rustoleum Metallic Vintage Copper no. 248637.) We also scuff-sanded the hinges and the hinge screwheads to accept the same paint.

3 Mask off the glue surface of the recess in the front (A). Then apply finish to all unpainted surfaces of the box and lid. After the last coat of finish dries, remove the tape, glue the number backer in its recess, and screw the hinges to the lid and hinge rail. If it receives a stamp of approval, your postal receptacle is ready for delivery.

▶ Check with your post office for mailbox-mounting regulations.

Produced by **Craig Ruegsegger** with **Josh Steele**
Project design: **John Olson**
Illustrations: **Roxanne LeMoine, Lorna Johnson**

Materials List

Part		FINISHED SIZE T	W	L	Matl.	Qty.
A	front	¾"	9"	15¼"	EW	1
B	number backer	¼"	4¾"	8"	Ply	1
C	back	¾"	11⅛"	15¼"	EW	1
D	sides	¾"	11"	5½"	EW	2
E	bottom	¾"	5⁷⁄₁₆"	14"	EW	1
F	hinge rail	¾"	1½"	16½"	W	1
G	top	¾"	6½"	16½"	W	1

*Size depends on your house number. See the instructions.

Materials key: EW-edge-glued white oak, Ply-plywood, W-white oak.
Supplies: 2" butt hinges (2).
Blades and bit: Dado set; 20-tpi jigsaw blade; ¼" and ¾" straight router bits.

This project requires approximately 5½ board feet of 4/4 white oak.

PROFESSIONAL HVLP

SPRAYPORT
The professional spraying series

Get a flawless finish with The SprayPort® 6000 Series

- Compact and robust 2 or 3-stage base turbine
- Pro-8™ non-bleed gun in gravity or pressure-fed options for superior atomization
- 25-foot lightweight and flexible HyperFlex™ hose

Earlex® BY WAGNER

For more information visit **earlex.com**

All 244 issues of WOOD®

(actual size)

62¢

(actual price per issue)

The WOOD® Archive on USB

Complete. Searchable. Compact.

$149.95

Get yours today at
woodstore.net/actualsize
or call **888-636-4478**

UPDATED THROUGH 2016!
Attention previous archive owners: Trade up to the latest *WOOD* Digital Archive on USB for only $20!
CALL FOR DETAILS

Brush Up on Brush Care

A little extra time keeps your brush in perfect shape and protects your investment.

From chisels to tablesaws, it pays to buy quality tools. The same can be said for brushes. Sure, a cheap finish applicator might get the job done, but you'll need a top-notch brush to achieve a high-end finish.

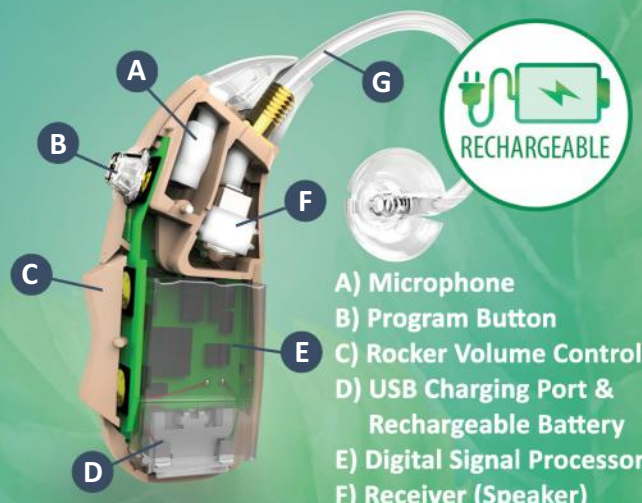
Better paint brushes can cost upwards of $30, and to protect that investment, you need to properly clean and care for them. We talked with professional finishers and painters, who typically use their brushes for several years, to uncover their secrets for making them last.

continued on page 75

NEW Rechargeable Digital Hearing Aid Technology Only $199!*

(*Each when you buy a pair)

Rechargeable is now affordable. The new HearClear™ ***HCRC eco-friendly*** hearing aid combines advanced technology with a low price.



The Rechargeable HCRC!

- Digital sound processing chip provides **crystal clear sound and makes speech easier to understand** with less feedback than old analog technology
- Never worry about replacing batteries again! **2 Hour Charge Gives 16 Hours of Use!**
- **Micro USB Cable** (included) charges your hearing aid in the car, with a computer or plugged in the wall!
- Easy **On / Off Button**
- Automatic Noise Reduction and Feedback Canceler
- **100% Money Back Guarantee**
- Hear up to **3 times better** when you wear a pair of hearing aids compared to wearing just one!

5 Star Reviews ★★★★★

No More Dead Batteries! "This HearClear HCRC rechargeable hearing aid works all the time! Unlike hearing aids powered by throwaway batteries that go dead at the worst time, I plug these in at night and the hearing aid charge lasts all day, every day." *- Xavier J.*

Great Hearing Aid! "I'm really glad I tried the HearClear HCRC! It works as good as or better than the more expensive ones I've purchased in the past. It's great that the price is reasonable. Thank you for the great product." *- Tim M.*

Rechargeable Digital Hearing Aid - For Only $199!*

The new HearClear™ HCRC Rechargeable Digital Hearing Aids are now available to you for an unbelievable price! This quality digital hearing aid has the same key elements that all high end digital hearing aids share, but is also rechargeable. The **microphone** picks up the sound and sends an electrical signal to the **digital signal processor** which is the "brains" of the hearing aid. The sound is then adjusted to amplify important speech sounds as well as filtering out unwanted noise. Once the digital processor has amplified the sound, it is passed to the **receiver** (also known as the speaker) which emits a corrected and amplified sound through the **sound tube** into your ear.

Most importantly, your new HearClear HCRC hearing aids work at a **fraction of the cost** of name-brand hearing aids, and you don't have to keep changing the batteries! You will also love the comfortable, lightweight Open-fit design.

You can spend thousands for an expensive hearing aid or you can spend **just $219** for a hearing aid that just plain works **(only $199 each when you buy a pair)**. We are so sure you will love our product, that we offer a **100% Money Back Guarantee - Risk Free** if you are not satisfied for any reason.

*MONEY SAVING OFFER!

Use Coupon Code: **WD79**

1-877-745-0944

PLUS **BUY A PAIR AND SAVE $40!**

(Coupon Code & Price Valid For A Limited Time Only)

Advanced Affordable Hearing™
Affordable Quality Since 1996!

A+ BBB ACCREDITED BUSINESS | MONEY BACK 100% GUARANTEE | RISK FREE Trial | US Company Owned And Operated | FDA REGISTERED

Visit and Save: **www.AdvancedHearing.com/WD79**

Match the brush to the finish

As a general rule, use a natural-bristle brush for oil-base varnishes and stains, and save synthetic-bristle brushes for water-base finishes or latex. Why? The solvents in oil-base finishes can soften synthetic bristles; natural bristles absorb water if used with latex finishes.

Tip! *When applying finish, dip only the tip of the brush—½" or so—in the finish to prevent overloading the brush. This reduces drips and makes cleanup easier.*

For varnish, our pros prefer oxhair over china (boar) bristles because the finer, softer oxhair makes it easier to flow out the thinner finish. Likewise, our experts prefer nylon bristles over stiffer polyester for applying water-base polyurethane. They also dedicate each brush to a particular finish. This helps avoid cross-contamination and gives consistent results from one job to the next.

Tip! *To keep your brush dedicated to a specific finish, write the finish name on the handle.*

Bring on the clean

Whether cleaning a natural or synthetic brush, follow a similar process. Use mineral spirits for cleaning natural brushes, and warm water and soap for synthetics.

First, brush out as much excess finish as possible on a flat surface. Pour an inch or so of solvent into a clean container and dip the brush in it. Tip the brush bristle-end up and work the solvent down into the bristles toward the metal ferrule [**Photo A**]. Repeat this sequence 10 times, occasionally using a brush comb [**Opening photo**, *previous page*] to help separate the bristles and work solvent through the entire brush.

▶Purchase a brush comb.
woodmagazine.com/brushcomb

Dump the dirty solvent, pour in some new, and repeat the above sequence. Dump the solvent and repeat the cleaning a third time. Thoroughly rinse a synthetic brush with water to remove any remaining soap suds. To remove excess solvent, hold the brush down inside a receptacle and spin it [**Photos B** and **C**].

Use the brush comb to realign and smooth the bristles into shape. Return the brush to its original package or wrap the bristles in craft paper until your next finishing job [**Photo D**].

▶Learn more about choosing and using finishes.
woodmagazine.com/finishes


A

Use multiple rinses with clean mineral spirits to remove all traces of finish, separating the bristles as you go. Take care to keep from bending or breaking bristles—just let the mineral spirits soak the finish out of the brush.

Produced by **Kerry Gibson** with **Vane Overturff**


B


C

Spinning the brush between your hands uses centrifugal force to fling the solvent out. Confine a natural-bristle brush inside a trash can or other bin. Excess water from a synthetic brush can go down the drain in a sink.


D

Storing the brush in its original package protects the bristles and helps them retain their proper shape.

HARBOR FREIGHT
QUALITY TOOLS AT RIDICULOUSLY LOW PRICES

800+ Stores Nationwide
Use Coupons: In-Store, HarborFreight.com or 800-423-2567

FREE
WITH ANY PURCHASE
PITTSBURGH SUPER COUPON
6 PIECE SCREWDRIVER SET
ITEM 62728
62583/47770
62570 shown
$7.97 VALUE
55747683
LIMIT 1 – Cannot be used with other discount, coupon or prior purchase. Coupon good at our stores, HarborFreight.com or by calling 800-423-2567. Offer good while supplies last. Shipping & Handling charges may apply if not picked up in-store. Non-transferable. Original coupon must be presented. Valid through 11/4/17. Limit one FREE GIFT coupon per customer per day.

SUPER COUPON
20% OFF
ANY SINGLE ITEM
Limit 1 - Coupon per customer per day. Save 20% on any 1 item purchased. *Cannot be used with other discount, coupon or any of the following items or brands: Inside Track Club membership, Extended Service Plan, gift card, open box item, 3 day Parking Lot Sale item, compressors, floor jacks, saw mills, storage cabinets, chests or carts, trailers, trenchers, welders, Admiral, Bauer, Cobra, CoverPro, Daytona, Earthquake, Hercules, Jupiter, Lynxx, Poulan, Predator, StormCat, Tailgator, Viking, Vulcan, Zurich. Not valid on prior purchases. Non-transferable. Original coupon must be presented. Valid through 11/4/17.
19835651

Bauer SUPER COUPON
15 AMP, 12-1/2" PORTABLE THICKNESS PLANER
Customer Rating
NEW
- Powerful 15 motor for faster, smoother cuts in hardwood
- Four-carriage frame reduces the movement that causes snipe
- High precision gear and pinion lift system for easier, more reliable adjustment

ITEM 63445
$249.99
~~$289.99~~
56123699
LIMIT 5 – Coupon valid through 11/4/17*

HARDY SUPER COUPON
MECHANIC'S GLOVES

SIZE	ITEM
MED	62434/62426
LG	62433/62428
X-LG	62432/62429

NEW
Item 62429 shown
SAVE 60%
YOUR CHOICE $3.99
~~$5.99~~
Compare $9.98
Customer Rating
55672870
LIMIT 5 – Coupon valid through 11/4/17*

KRAUSE&BECKER SUPER COUPON
AIRLESS PAINT SPRAYER KIT
Customer Rating
SAVE $129
- 3000 PSI piston pump for high pressure and better coverage
- Easy twist knob pressure control
- Stainless steel paint pick-up is easy to clean, won't rust or corrode

ITEM 60600/62915
$169.99
~~$219.99~~
Compare $299.99
55670345
LIMIT 4 – Coupon valid through 11/4/17*

PREDATOR SUPER COUPON
4000 PEAK/ 3200 RUNNING WATTS 6.5 HP GAS GENERATOR
Customer Rating
- 10 hrs. run-time
- 212 CC engine
- 70 db Ultra Quiet
- Weighs 100 lbs.

SAVE $149
ITEM 69729/63080/69676/63079 shown
$289.99
~~$329.99~~
ITEM 69675/69728/63090/63089 CALIFORNIA ONLY
Wheel kit sold separately.
Compare $439
55673530
LIMIT 5 – Coupon valid through 11/4/17*

CENTRAL MACHINERY SUPER COUPON
2 HP INDUSTRIAL 5 MICRON DUST COLLECTOR
Customer Rating
SAVE $215
- 70 gallon capacity

ITEM 61790/97869 shown
$169.99
~~$199.99~~
Compare $384.99
19814978
LIMIT 4 – Coupon valid through 11/4/17*

PORTLAND SUPER COUPON
1750 PSI PRESSURE WASHER
Customer Rating
- 1.3 GPM
- Adjustable spray nozzle
- 20 ft. high pressure hose

ITEM 63255
63254 shown
NEW
$79.99
~~$99.99~~
55689620
LIMIT 5 – Coupon valid through 11/4/17*

PITTSBURGH AUTO #1 SELLING JACKS IN AMERICA SUPER COUPON
RAPID PUMP® 1.5 TON ALUMINUM RACING JACK
- 3-1/2 Pumps Lifts Most Vehicles
- Lightweight 34 lbs.

SAVE $70
Customer Rating
ITEM 68053/62160
62496/62516/60569 shown
$59.99
~~$79.99~~
Compare $129.99
55687911
LIMIT 3 – Coupon valid through 11/4/17*

WARRIOR SUPER COUPON
11 PIECE 1"- 2-1/2" CARBON STEEL HOLE SAW SET
Customer Rating
ITEM 69070
68114 shown
SAVE 74%
$5.99
~~$9.99~~
Compare $23.36
55693325
LIMIT 5 – Coupon valid through 11/4/17*

HaulMaster SUPER COUPON
4 PIECE, 1" x 15 FT. RATCHETING TIE DOWNS
Customer Rating
ITEM 63056/63057
60405/63094
63150/61524
62322/90984 shown
SAVE 80%
$6.99
~~$11.99~~
Compare $34.95
55695634
LIMIT 6 – Coupon valid through 11/4/17*

SUPER COUPON
30" SERVICE CART WITH LOCKING DRAWER
Customer Rating
ITEM 61161/90428 shown
- 350 lb. capacity

SAVE $197
$59.99
~~$69.99~~
Compare $257
55697654
LIMIT 5 – Coupon valid through 11/4/17*

Lifetime CARBIDE SUPER COUPON
ALUMINUM OXIDE SANDING SPONGES - PACK OF 10
COARSE ITEM 46751/63918
MEDIUM ITEM 46752/63915
FINE ITEM 46753/63912
YOUR CHOICE $3.99
~~$4.99~~
Customer Rating
19801447
LIMIT 8 – Coupon valid through 11/4/17*

drill master SUPER COUPON
1/4" TRIM ROUTER
ITEM 61626/62659
44914 shown
SAVE $79
$19.99
~~$29.99~~
Customer Rating
Compare $99
19766424
LIMIT 5 – Coupon valid through 11/4/17*

HaulMaster SUPER COUPON
17 FT. TYPE IA MULTI-TASK LADDER
- Versatile - 23 Configurations
- Safe + Secure + Stable
- Super Strong - Holds 300 lbs.

$119.99
SAVE $161
Customer Rating
~~$139.99~~
Compare $281.87
ITEM 62656/62514
67646 shown
55704556
LIMIT 3 – Coupon valid through 11/4/17*

PITTSBURGH SUPER COUPON
50" CLAMP AND CUT EDGE GUIDE
Customer Rating
SAVE 70%
$14.99
~~$22.99~~
Compare $49.99
ITEM 66581
Tools sold separately.
55725862
LIMIT 4 – Coupon valid through 11/4/17*

CENTRAL MACHINERY SUPER COUPON
10", 12 SPEED BENCHTOP DRILL PRESS
Customer Rating
ITEM 63471/60237 shown
$109.99
SAVE $122
~~$139.99~~
Compare $232.25
19777448
LIMIT 5 – Coupon valid through 11/4/17*

CENTRAL PNEUMATIC — SUPER COUPON

3 GALLON, 100 PSI OIL-FREE AIR COMPRESSORS

Customer Rating ★★★★½

A

B

- Air delivery: 0.6 CFM @ 90 PSI, 1 CFM @ 40 PSI

YOUR CHOICE $39.99

SAVE 59%

A. HOT DOG
ITEM 69269/97080 shown
$54.99

B. PANCAKE
ITEM 95275 shown
60637/61615
Compare $98.62

55750689

LIMIT 4 – Coupon valid through 11/4/17*

CHICAGO ELECTRIC POWER TOOLS — SUPER COUPON

12" SLIDING COMPOUND DOUBLE-BEVEL MITER SAW

- Makes precision cross, bevel and miter cuts
- Powerful 15 amp motor
- Laser guide

Customer Rating ★★★★½

ITEM 69684 shown
61969/61970

SAVE $204

$134.99

$199.99 Compare $339

Blade sold separately.

55753895

LIMIT 4 – Coupon valid through 11/4/17*

FREE WITH ANY PURCHASE

PITTSBURGH — SUPER COUPON

1" x 25 FT. TAPE MEASURE

ITEM 69030
69031 shown

$6.99 VALUE

55736276

LIMIT 1 – Cannot be used with other discount, coupon or prior purchase. Coupon good at our stores, HarborFreight.com or by calling 800-423-2567. Offer good while supplies last. Shipping & Handling charges may apply if not picked up in-store. Non-transferable. Original coupon must be presented. Valid through 11/4/17. Limit one FREE GIFT coupon per customer per day.

Haul-Master — SUPER COUPON

1000 LB. CAPACITY SWING-BACK TRAILER JACK

Customer Rating ★★★★½

SAVE 54%

$17.99

ITEM 69780
41005 shown

$25.99 Compare $39.94

19943308

LIMIT 5 – Coupon valid through 11/4/17*

CENTRAL MACHINERY — SUPER COUPON

16" VARIABLE SPEED SCROLL SAW

SAVE $79

Customer Rating ★★★★½

$69.99

ITEM 62519/63283/93012 shown

$99.99 Compare $149

55755704

LIMIT 5 – Coupon valid through 11/4/17*

BADLAND — SUPER COUPON

Battle Tested

2500 LB. ELECTRIC WINCH WITH WIRELESS REMOTE CONTROL

- Weighs 14.3 lbs.
- 11-1/8" L x 4-1/2" H

Customer Rating ★★★★½

ITEM 61840/61297
63476/61258 shown

Voted Best Winches

$49.99 $60.99 Compare $119.99

SAVE $70

55756900

LIMIT 3 – Coupon valid through 11/4/17*

WINDSOR DESIGN — SUPER COUPON

60", 4 DRAWER HARDWOOD WORKBENCH

Customer Rating ★★★★½

SAVE $265

ITEM 93454/69054
63395/62603 shown

Tools sold separately.

$129.99 $159.99 Compare $395

55753972

LIMIT 5 – Coupon valid through 11/4/17*

drill master — SUPER COUPON

4-1/2" ANGLE GRINDER

Customer Rating ★★★★½

ITEM 69645
60625 shown

SAVE 50%

$9.99

$14.99 Compare $20.13

55769503

LIMIT 7 – Coupon valid through 11/4/17*

WARRIOR — SUPER COUPON

29 PIECE TITANIUM DRILL BIT SET

Customer Rating ★★★★★

ITEM 62281
61637 shown

SAVE 83%

$9.99

$16.99 Compare $59.98

19878606

LIMIT 6 – Coupon valid through 11/4/17*

CENTRAL MACHINERY — SUPER COUPON

4" x 36" BELT/ 6" DISC SANDER

Customer Rating ★★★½☆

ITEM 62502/97181 shown

SAVE $64

$59.99

$74.99 Compare $124.51

55772685

LIMIT 4 – Coupon valid through 11/4/17*

CENTRAL MACHINERY — SUPER COUPON

14" OSCILLATING SPINDLE SANDER

Customer Rating ★★★★½

ITEM 95088/62146
69257 shown

SAVE $53

$99.99

$139.99 Compare $152.99

55774167

LIMIT 5 – Coupon valid through 11/4/17*

PITTSBURGH — SUPER COUPON

12" RATCHET BAR CLAMP/SPREADER

ITEM 46807/68975
69221/62123/63017
69222 shown

SAVE 85%

$2.99

$3.99 Compare $20.76

19921695

LIMIT 7 – Coupon valid through 11/4/17*

SUPER COUPON

16" x 30" TWO SHELF STEEL SERVICE CART

Customer Rating ★★★★½

- 220 lb. capacity

ITEM 60390
5107 shown

SAVE 50%

$29.99

$37.99 Compare $59.98

55776702

LIMIT 5 – Coupon valid through 11/4/17*

CHICAGO ELECTRIC WELDING — SUPER COUPON

90 AMP FLUX WELDER

Customer Rating ★★★★½

ITEM 62719/61849
68887 shown

SAVE $60

$89.99

$99.99 Compare $149.99

- No Gas Required

19915511

LIMIT 5 – Coupon valid through 11/4/17*

HYDROSTAR Lawn Mower Monster — SUPER COUPON

50 FT. ELECTRIC DRAIN CLEANER

Customer Rating ★★★★½

SAVE $199

$199.99

$259.99 Compare $399

ITEM 61856/68285 shown

55781212

LIMIT 4 – Coupon valid through 11/4/17*

CENTRAL MACHINERY — SUPER COUPON

UNIVERSAL TOOL STAND

Customer Rating ★★★★½

- 500 lb. capacity

SAVE 57%

ITEM 69805

$29.99

$39.99 Compare $69.99

19861429

LIMIT 5 – Coupon valid through 11/4/17*

*Original coupon only. No use on prior purchases after 30 days from original purchase or without original receipt. Valid through 11/4/17.

At Harbor Freight Tools, the "Compare" or "comp at" price means that the same item or a similar functioning item was advertised for sale at or above the "Compare" or "comp at" price by another retailer in the U.S. within the past 180 days. Prices advertised by others may vary by location. No other meaning of "Compare" or "comp at" should be implied. For more information, go to HarborFreight.com or see store associate.

HARBOR FREIGHT

QUALITY TOOLS AT RIDICULOUSLY LOW PRICES

800+ Stores Nationwide

Use Coupons: In-Store, HarborFreight.com or 800-423-2567

*Original coupon only. No use on prior purchases after 30 days from original purchase or without original receipt. Valid through 11/4/17.

FREE

WITH ANY PURCHASE

SUPER COUPON

3-1/2" SUPER BRIGHT NINE LED ALUMINUM FLASHLIGHT

$4.97 VALUE

ITEM 65020/69111 63599/62522/62573 63875/63884/63886 63888/69052 shown

55788250

LIMIT 1 – Cannot be used with other discount, coupon or prior purchase. Coupon good at our stores, HarborFreight.com or by calling 800-423-2567. Offer good while supplies last. Shipping & Handling charges may apply if not picked up in-store. Non-transferable. Original coupon must be presented. Valid through 11/4/17. Limit one FREE GIFT coupon per customer per day.

CENTRALPNEUMATIC

SUPER COUPON

SAVE $138

3/8" x 50 FT. RETRACTABLE AIR HOSE REEL

Customer Rating ★★★★★

ITEM 93897 shown 69265/62344

$59.99

$89.99 Compare $198.45

55796125

LIMIT 5 – Coupon valid through 11/4/17*

PITTSBURGH AUTOMOTIVE

SUPER COUPON

PNEUMATIC ADJUSTABLE ROLLER SEAT

Customer Rating ★★★★★

SAVE 50%

ITEM 46319 shown 61160/61896/63456

• 300 lb. capacity

$19.99

$25.99 Compare $39.99

55797501

LIMIT 4 – Coupon valid through 11/4/17*

WINDSOR DESIGN

SUPER COUPON

DOVETAIL JIG

ITEM 34102

Customer Rating ★★★★½

SAVE 45%

$27.99

$34.99 Compare $51.72

55797662

LIMIT 5 – Coupon valid through 11/4/17*

HaulMaster

SUPER COUPON

Customer Rating ★★★★★

STEP STOOL/ WORKING PLATFORM

SAVE 65%

$19.99

• 350 lb. capacity

$29.99 Compare $57.55

ITEM 62515/66911 shown

55801571

LIMIT 5 – Coupon valid through 11/4/17*

CENTRALPNEUMATIC

SUPER COUPON

2-IN-1 FLOORING NAILER/STAPLER

WE CARRY A FULL LINE OF NAILS

SAVE $279

ITEM 69703 61689 shown

Customer Rating ★★★★★

$99.99

$129.99 Compare $379

55802952

LIMIT 3 – Coupon valid through 11/4/17*

PITTSBURGH

SUPER COUPON

TORQUE WRENCHES

Item 239 shown

Customer Rating ★★★★½

SAVE 77%

• Accuracy within ±4%

YOUR CHOICE $9.99

DRIVE	ITEM
1/4"	2696/61277/63881
3/8"	807/61276/63880
1/2"	62431/239/63882

$21.99 Compare $44.35

55803343

LIMIT 5 – Coupon valid through 11/4/17*

CHICAGO ELECTRIC WELDING

SUPER COUPON

MIG-FLUX WELDING CART

ITEM 69340 shown 60790/61316

Customer Rating ★★★★½

SAVE 48%

$29.99

$41.99 Compare $57.99

Welder and accessories sold separately

55803915

LIMIT 5 – Coupon valid through 11/4/17*

HARDY

SUPER COUPON

Customer Rating ★★★★★

POWDER-FREE NITRILE GLOVES PACK OF 100

Item 68498 shown

• 5 mil thickness

SIZE	ITEM
MED	68496/61363
LG	68497/61360
X-LG	68498/61359

SAVE 59%

YOUR CHOICE $5.99

$7.99 Compare $15.99

55807385

LIMIT 8 – Coupon valid through 11/4/17*

CHICAGO ELECTRIC POWER TOOLS

SUPER COUPON

Customer Rating ★★★★½

RECIPROCATING SAW WITH ROTATING HANDLE

SAVE 59%

ITEM 61884 62370/65570 shown

$19.99

$27.99 Compare $49.97

55808079

LIMIT 5 – Coupon valid through 11/4/17*

PITTSBURGH AUTOMOTIVE

#1 SELLING JACKS IN AMERICA

SUPER COUPON

RAPID PUMP® 3 TON LOW PROFILE HEAVY DUTY STEEL FLOOR JACK

Customer Rating ★★★★★

SAVE $190

• Weighs 73 lbs.

$19.99

$94.99 Compare $269.99

ITEM 61282 shown 61253/62326

55808793

LIMIT 4 – Coupon valid through 11/4/17*

---

drill master

SUPER COUPON

80 PIECE ROTARY TOOL KIT

ITEM 63292/63235 68986/69451 97626 shown

$6.99

SAVE 71%

$9.99 Compare $24.15

55811248

LIMIT 5 – Coupon valid through 11/4/17*

HaulMaster

SUPER COUPON

• 1000 lb. capacity

MOVER'S DOLLY

ITEM 93888 shown 61899/62399/63095/63096 63098/63097

SAVE 59%

$7.99

$19.99 Compare $10.99 Customer Rating ★★★★★

55814959

LIMIT 5 – Coupon valid through 11/4/17*

CHICAGO ELECTRIC POWER TOOLS

SUPER COUPON

Customer Rating ★★★★½

4" BISCUIT PLATE JOINER

SAVE $134

ITEM 68987

$44.99

$64.99 Compare $179

55815045

LIMIT 4 – Coupon valid through 11/4/17*

PORTLAND

SUPER COUPON

14" ELECTRIC CHAIN SAW

ITEM 61592/67255 shown

Customer Rating ★★★★½

SAVE 38%

$39.99

$49.99 Compare $64.99

55815969

LIMIT 5 – Coupon valid through 11/4/17*

PITTSBURGH

SUPER COUPON

SAVE 59%

9 PIECE FULLY POLISHED COMBINATION WRENCH SETS

SAE

ITEM 69043/63282/42304 shown

METRIC

ITEM 42305/69044/63171

Customer Rating ★★★★★

YOUR CHOICE $5.99

$7.99 Compare $14.97

55822497

LIMIT 7 – Coupon valid through 11/4/17*

SUPER COUPON

TILTING FLAT PANEL TV MOUNT

SAVE 73%

Customer Rating ★★★★★

ITEM 62289 61807 shown

$14.99

• 176 lb. capacity

$24.99 Compare $55.82

55824090

LIMIT 5 – Coupon valid through 11/4/17*

HaulMaster

SUPER COUPON

Customer Rating ★★★★★

1000 LB. CAPACITY, 9" x 72" STEEL LOADING RAMPS SET OF TWO

$44.99

$59.99 Compare $77.95

SAVE 42%

ITEM 69591/69646/44649 shown

55824225

LIMIT 5 – Coupon valid through 11/4/17*

THUNDERBOLT MAGNUM solar

SUPER COUPON

Customer Rating ★★★★½

45 WATT SOLAR PANEL 10 PIECE KIT

SAVE $83

$119.99

$149.99 Compare $203.73

ITEM 62443 68751 shown

55834735

LIMIT 4 – Coupon valid through 11/4/17*

CENTRAL MACHINERY

SUPER COUPON

350 LB. CAPACITY FOLDING SAW HORSE

ITEM 61979 shown 69446/60710

Customer Rating ★★★★½

SAVE 44%

$9.99

$12.99 Compare $17.97

55838884

LIMIT 5 – Coupon valid through 11/4/17*

FREE

WITH ANY PURCHASE

SUPER COUPON

CEN-TECH

7 FUNCTION DIGITAL MULTIMETER

$16.45 VALUE

ITEM 63604/63758 98025/69096 63759/90899 shown

55839706

LIMIT 1 – Cannot be used with other discount, coupon or prior purchase. Coupon good at our stores, HarborFreight.com or by calling 800-423-2567. Offer good while supplies last. Shipping & Handling charges may apply if not picked up in-store. Non-transferable. Original coupon must be presented. Valid through 11/4/17. Limit one FREE GIFT coupon per customer per day.

PORTLAND. SUPER COUPON

9.5", 7 AMP ELECTRIC POLESAW

6 ft. to 8 ft. 10"

ITEM 68862/63190 62896 shown

Customer Rating

$64.99 SAVE 29%

Compare $92.84 $84.99

55840530

LIMIT 5 – Coupon valid through 11/4/17*

CHICAGO ELECTRIC POWER TOOLS SUPER COUPON

HEAVY DUTY MOBILE MITER SAW STAND

ITEM 63409/62750 shown

Customer Rating

Supports 16 ft.

• 400 lb. capacity

$99.99 SAVE $69

Compare $169 $119.99

56992880

LIMIT 3 – Coupon valid through 11/4/17*

CEN-TECH. SUPER COUPON

12 VOLT, 10/2/50 AMP BATTERY CHARGER/ ENGINE STARTER

Customer Rating

SAVE 57%

$29.99

ITEM 60581/60653 shown

Compare $69.99 $49.99

55845102

LIMIT 5 – Coupon valid through 11/4/17*

CENTRAL PNEUMATIC SUPER COUPON

21 GALLON, 2.5 HP 125 PSI VERTICAL OIL-LUBE AIR COMPRESSOR

Customer Rating

ITEM 69091/61454 61693/62803 63635/67847 shown

$149.99 SAVE $296

Compare $446.61 $179.99

55854910

LIMIT 5 – Coupon valid through 11/4/17*

Grant's GARAGE SUPER COUPON

MECHANIC'S SHOP TOWELS PACK OF 50

SAVE 44% NEW

Customer Rating

$9.99

ITEM 63365/63360 shown

Compare $17.98 $12.99

55854943

LIMIT 7 – Coupon valid through 11/4/17*

CENTRAL MACHINERY SUPER COUPON

12" x 33-3/8" WOOD LATHE WITH REVERSIBLE HEAD

ITEM 34706 SAVE $68

Customer Rating

$279.99

Compare $347.99 $319.99

55862063

LIMIT 4 – Coupon valid through 11/4/17*

CHICAGO ELECTRIC POWER TOOLS SUPER COUPON

2.5 HP, 10" TILE/ BRICK SAW

Customer Rating

ITEM 62391 69275 shown

SAVE $279

$219.99

Compare $499 $279.99

56999089

LIMIT 5 – Coupon valid through 11/4/17*

PITTSBURGH SUPER COUPON

4 PIECE WOOD CHISEL SET WITH CLEAR PVC HANDLE

ITEM 42429/69471 shown

Customer Rating

SAVE 83%

$4.99

Compare $29.97 $7.99

55868374

LIMIT 5 – Coupon valid through 11/4/17*

WINDSOR DESIGN SUPER COUPON

NO. 33 BENCH PLANE

ITEM 97544

SAVE 82%

Customer Rating

$7.99

Compare $45.78 $9.49

55870792

LIMIT 8 – Coupon valid through 11/4/17*

---

drill master SUPER COUPON

1500 WATT DUAL TEMPERATURE HEAT GUN (572°/1112°)

SAVE 68%

Customer Rating

$8.99

ITEM 62340/62546 63104/96289 shown

Compare $28.83 $12.99

55877964

LIMIT 5 – Coupon valid through 11/4/17*

SUPER COUPON

7 FT. 4" x 9 FT. 6" ALL PURPOSE WEATHER RESISTANT TARP

Customer Rating

ITEM 69249/69115/69137 69129/69121/877 shown

$2.99

Compare $8.48 $4.99

SAVE 64%

55895432

LIMIT 8 – Coupon valid through 11/4/17*

---

drill master SUPER COUPON

ORBITAL PALM SANDER

ITEM 61509 61311 shown

SAVE 66%

$9.99

Customer Rating

Compare $29.97 $13.99

55900067

LIMIT 5 – Coupon valid through 11/4/17*

Bunker Hill Security SUPER COUPON

SAVE 57%

Includes 6V, 900 mAh NiCd battery pack.

60 LED SOLAR SECURITY LIGHT

Customer Rating

$29.99

ITEM 62534/69643 shown

Compare $69.99 $39.99

56716828

LIMIT 4 – Coupon valid through 11/4/17*

PITTSBURGH SUPER COUPON

Customer Rating

6" DIGITAL CALIPER

ITEM 61585 62387/63711 47257 shown

$9.99

Compare $29.99 $17.99

• Includes SAE and metric measurements

Includes two 1.5V SR44 button cell batteries.

SAVE 66%

56768291

LIMIT 5 – Coupon valid through 11/4/17*

Bauer SUPER COUPON

Customer Rating

10 AMP DEEP CUT VARIABLE SPEED BAND SAW KIT

NEW

ITEM 63763/63444 shown

$99.99

$139.99

56769303

LIMIT 3 – Coupon valid through 11/4/17*

SUPER COUPON

SOLAR ROPE LIGHT

ITEM 62533/68353 shown

SAVE 66%

$9.99

Customer Rating

Compare $29.97 $13.99

• Great outdoor accent lighting
• Super bright light

56785863

LIMIT 7 – Coupon valid through 11/4/17*

CEN-TECH. SUPER COUPON

SAVE $145

2.4" COLOR LCD DIGITAL INSPECTION CAMERA

ITEM 61839 67979/62359 shown

Includes hook, mirror, magnet accessories, and video-out cable.

Customer Rating

$59.99

Compare $205.75 $69.99

56792421

LIMIT 3 – Coupon valid through 11/4/17*

WINDSOR DESIGN SUPER COUPON

8 DRAWER WOOD TOOL CHEST

ITEM 62585/94538 shown

Customer Rating

SAVE $275

Tools sold separately.

$69.99

Compare $345 $79.99

56887527

LIMIT 5 – Coupon valid through 11/4/17*

---

drill master SUPER COUPON

2 HP FIXED BASE ROUTER

ITEM 68341

SAVE $114

Customer Rating

$44.99

Compare $159 $54.99

56888810

LIMIT 5 – Coupon valid through 11/4/17*

Cordless curve cutters

Battery-powered jigsaws free you to navigate intricate curves and switchbacks without fighting a power cord. The best cordless jigsaws provide a clear line of sight to the blade, easy speed changes (especially during a cut), and tool-free blade changes. We tested 11 lithium-ion-powered saws, and recommend these three. (Because most jigsaws are sold without battery packs, it might make sense to get one that shares batteries with your drill or other cordless tools.)

18-volt Bosch JSH180
$150 (without battery pack)

2 Ah pack (BAT612) $70; 4 Ah pack (BAT620) $100

With an LED task light, built-in blower, and wide open-front footplate, this saw provided the best line of sight of all models tested, helping you cut precisely. We also like its on/off trigger, with a soft, responsive touch and built-in variable speed. Battery run-time and balance proved good with any size pack, and vibration was minimal.

877-267-2499, boschtools.com

And check out our favorite blade

Bosch Xtra-Clean-For-Wood 12-tpi jigsaw blade, no. T308B, 5-pack $11

This blade cuts cleaner than any we've used. Its multi-angle teeth leave little to no tear-out in solid wood, veneered sheet goods, and even melamine-coated particleboard, with cut edges that need only a light sanding.

877-267-2499, boschtools.com

20-volt DeWalt DCS331B
$150 (without battery pack)

2-amp-hour (Ah) pack (DCB203) $90; 4 Ah pack (DCB204) $120; saw with 4 Ah pack and charger (DCS331M1) $280

At 6¾ pounds (with a 4 Ah pack), this saw weighs a pound more than the Bosch or Ryobi. Still, it handles well in use with little vibration. It has good blade visibility (despite no LED), a variable-speed trigger, tool-free footplate, and an easy-to-use blade release.

800-433-9258, dewalt.com

18-volt Ryobi P523
$60 (without battery pack)

2 Ah pack (P102) $40; 4 Ah pack (P105) $60

You can't beat the value of this saw. Even if you have to buy a battery pack with the saw, you're in for only $100–$120. Although it vibrates more than the Bosch and DeWalt, this saw cuts nicely with good sight lines and balance, and the variable-speed slide switch is within reach of your thumb without letting go of the trigger.

800-525-2579, ryobitools.com

continued on page 82

LOWEST PRICE EVER
on DR® Leaf and Lawn Vacuums!

The **All NEW DR® Leaf Vacuum** is designed from the top down to make yard cleanup easier, faster, and more thorough than ever before. And for a limited time we are offering them at incredible low introductory prices!

- ☑ **Rated #1 in Vacuum Power**
- ☑ **Easy, 1-Hand Dumping**
- ☑ **Stores Flat in Minutes**
- ☑ **Converts to a Rugged Trailer**


Unload with just one hand!


Doubles as a utility trailer!

DRleafvac.com

96787A © 2017

The Ultimate Offroad Trailer!
The DR® VERSA-TRAILER™ is the ONLY trailer for offroad vehicles that—

HAS A SWINGING BOOM for loading and unloading rocks, logs, balled trees, etc. with a back-saving winch.

EMPTIES CLEANLY every time, thanks to steep, boom-assisted dump angle.

CONVERTS TO A STAKE BED trailer (in less than 5 minutes!) for harvesting trees and hauling long loads.

440 lb. LIFTING CAPACITY


Power loading!

- **LIFTS up to 440 lbs.**
- **DUMPS up to 650 lbs.**
- **HAULS up to 2000 lbs.**


Power unloading!

GALVANIZED BED AND FRAME tows easily behind ATVs, compact tractors and lawn tractors.

PIVOTING, TANDEM WHEELS "walk" over obstacles—haul loads anywhere you can drive.

DRversatrailer.com

96787B © 2017

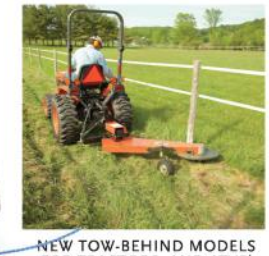
The *EASY DR® Way to TRIM and MOW!*
The DR® TRIMMER MOWER gives you 5X the power and NONE of the backstrain of hand-held trimmers!

NEW LOW PRICE!

TRIMS & MOWS thick grass and weeds without bogging down—the only trimmer guaranteed not to wrap!

ROLLS LIGHT AS A FEATHER on big, easy-rolling wheels!

THICKEST, LONGEST-LASTING cutting cord (up to 225 mil) takes seconds to change.


NEW TOW-BEHIND MODELS FOR TRACTORS, AND ATVS!

DRtrimmers.com

96787C © 2017

All-New DR® CHIPPERS
Larger Capacity, Lower Prices!

CHIP BIG BRANCHES up to 5.75" thick!

SELF-FEEDING models available. No more force-feeding!

POWERFUL ENGINES spin big flywheels (up to 62 lbs.), generating massive chipping force!

MODELS THAT SHRED yard and garden waste as well as CHIP branches.

PTO MODELS TOO!

DRchipper.com

96787D © 2017

FREE SHIPPING | **6 MONTH TRIAL** | **EASY FINANCING**

SOME LIMITATIONS APPLY. CALL OR GO ONLINE FOR DETAILS.

Call for a FREE DVD and Catalog!

Includes product specifications and factory-direct offers.

TOLL FREE **888-206-4246**

PROFESSIONAL POWER DR DONE RIGHT

Get a leg up (or an extra hand) with this workstation

Mobile Project Center, no. KWS1000, $160

To call Kreg's Mobile Project Center a sawhorse sells it short. Its 40-pound weight, wide stance, and rubber feet make it more stable than any sawhorse. That helps when I use it for cutting, drilling, sanding, or assembly, especially when I'm away from the shop. The included Automaxx hold-down clamp slides in the T-track to provide clamping almost anywhere on the 27¾×31½" worksurface. (Kreg's Automaxx clamps work like locking pliers, but with automatic tension adjustment.) I also like that you can install the clamp in keyholes along the ends to either secure pieces to the legs, or pair the clamp with the included bench dogs to secure larger pieces lying flat. The wings fold up and down easily, and hold solidly during use. And if you buy a second unit, you can couple them together to form a larger worksurface.

—Tested by Kevin Boyle, Senior Design Editor

Kreg Tool
800-447-8638, kregtool.com

Seal green wood with white wax

Anchorseal 2, quart $15; gallon $33 (available at Woodcraft)

If you work with fresh-cut lumber or "green" turning blanks, you need to seal the end grain to help prevent checking and cracking as the wood dries. I've used Anchorseal 2 for this purpose for years with great success. The wax-and-water mixture goes on white, and then dries clear to form a barrier against rapid water loss, especially on end grain and cross-grain crotches. I usually apply a second coat a day or two after the first to make sure no cracks occur. One gallon covers approximately 100 square feet.

—Tested by Brian Simmons

U.C. Coatings
888-363-2628, uccoatings.com

continued on page 84

The **DR® STUMP GRINDER** uses carbide-tipped cutting teeth (taking 360 "bites" per second) to reduce any stump to a pile of woodchips. Grinds stumps below ground level so they are gone forever!

QUICKLY ELIMINATE ANY STUMP without digging, burning, or chemicals.

NEW, MORE POWERFUL and lower-priced models.

NOW TOWABLE with your riding mower or ATV.

DRstumpgrinder.com

96786X © 2017

NEW and IMPROVED
DR® Field and Brush Mowers

Faster...Easier... Lower-Priced!

Mow fields, brush, even 3" thick saplings with never-before ease...

☑ **NEW WIDE CUT MODELS** for faster mowing!

☑ **NEW POWER STEERING** for easier handling!

☑ **NEW LOW PRICES** reduced up to $500!

***ROUGH CUT & FINISH MOWERS**— the most complete selection available.*

DRfieldbrush.com

96785X © 2017

FREE SHIPPING | **6 MONTH TRIAL** | **EASY FINANCING**

SOME LIMITATIONS APPLY. CALL OR GO ONLINE FOR DETAILS.

Call for a FREE DVD and Catalog!

Includes product specifications and factory-direct offers.

TOLL FREE **888-206-4246**


✓Yes


✓Yes


✗No


✓Yes

✓Yes


✓Yes

✓Reliably Low Prices
✓Easy To Use Website
✓Huge Selection
✓Fast Shipping
www.rockauto.com

ROCKAUTO.COM
ALL THE PARTS YOUR CAR WILL EVER NEED.

Hitachi tablesaw comes with a stand

10" job-site tablesaw on stand, no. C10RJ, $480

Hitachi recently launched this new portable 110-volt tablesaw. The C10RJ has a 15-amp direct-drive motor with soft start and electric brake. It has 35" rip capacity, and the arbor holds up to a $13/16$" stacked dado blade. The saw comes with the stand shown, and all accessories store on board.

800-829-4752, hitachipowertools.com

Get a grip on carbide-tipped lathe chisels

(left to right in photo)
Axe square-tipped rougher (AXECARBF-SQ) $99.95
Axe diamond-tipped detailer (AXECARBF-DIA) $99.95
Axe round-tipped finisher (AXECARBF-RD) $99.95

Carter Products has expanded its lineup of turning accessories with these chisels featuring replaceable carbide tips. All three Axe tools have stainless steel shanks that extend 5" into the hard-maple handles, with flat bottoms to register tips parallel to the tool rest. The rougher and finisher shanks have slightly rounded edges, letting you rotate them in use without having a crisp point to roll over. The handles are shaped like axe handles at the rear (hence the name). Carter's Lee Perez said other sizes of Axe chisels will join this line at a later date.

888-622-7837, carterproducts.com

AccuMASTER™ XT Moisture Meter

Stop guessing. Save time & money!

Model 7440

Measure moisture in any wood for any project.

- **Large**, easy-to-read, backlit display is always on
- **Stainless steel** replaceable steel pins
- **Versatile** – use for wood and building materials
- **Quality** products since 1978, 1-year warranty

Don't let warping, shrinking or cracking happen to you. Always check your material for moisture before starting any woodworking project.

CALCULATED INDUSTRIES®

For a dealer near you call **1-800-854-8075** or go to **www.calculated.com**

Why struggle?

MADE IN THE U.S.A. ASSEMBLED BY VETERANS

add-a-Handle®

CARRY HOOK HOLD

up to 30 lbs!

For more information and to order your today, go to
Add-a-Handle.com or call 607-442-6353
use code **WOOD** for (2) **FREE*** 11.5" Velcro Easy Pull Tab Straps
*with Add-a-Handle purchase.

TOUGH
Dries Natural Color, No Foam
GLUE

Gorilla Wood Glue's premium formula creates a cross-linking bond to provide superior strength with a Type II water resistance, indoors and out.

For the Toughest Jobs on Planet Earth®

www.gorillatough.com

©2017 The Gorilla Glue Company

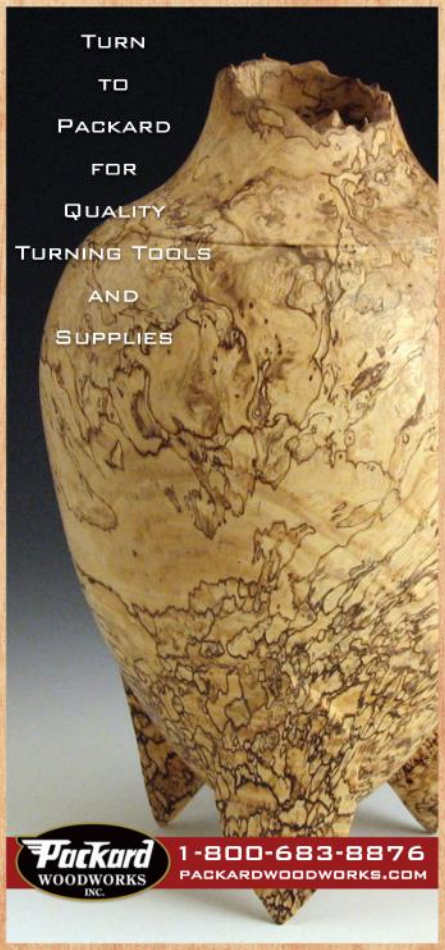
GET YOUR HOUSE IN ORDER!

25 downloadable plans for $25!

Home Organizer Super Bundle

Clean up the closets, beautify the bedroom, and declutter the kitchen with these handy and gorgeous projects. For a limited time, **save more than $200** when you purchase this curated collection.

See all the plans at **woodstore.net/houseinorder**



ROCKLER
WOODWORKING AND HARDWARE
Create with Confidence™

Get your **FREE** catalog today at
www.rcklr.co/236 or
call **1-800-279-4441** (Code 236).

16 Page Catalog
Plans/Parts $2
FREE with order

Visa/MC call
800-292-8296
armorplans.com

Axle Peg 7/32 dia
Great for wheels below
$4 /50 $6 /100

Hardwood Spindles
11" Birch $22/10
11" Birch $40/20
11" Oak $22/10
11" Oak $44/20
9" Birch $22/10
9" Birch $27/20
9" Oak $22/10
9" Oak $40/20
5¾" Birch $10/20
5¾" Oak $15/20

Wood Toy Wheels
size is diameter
WT-1 $7 /50
WT-114 $10 /50
WT-112 $11 /50
WT-134 $17 /50

Birch Shaker Peg 3-1/2"
#51019 $16/50 $27/100

Prices Good Thru 2017
Shipping USA orders to $15 Add $4.50
orders over $15 add $6.95
Armor Box 576 Monterey TN 38574

Projects and Plans

Vendor Cart

Kit to build includes 2-24" **iron wheels** *that really work*, **axles** and step-by-step **plans**. Finished project measures 60"L × 25"W × 34"H. $94.70 P.PD.

ByeGone Workshop
888-279-3941 8-5 M-F EST
www.byegone.com

Create Moldings With Your Table Saw

With Corob Molding Knives & Shaper Cutters
Over 45 Shapes Available
Molding Knife Heads fit standard table saws with ⅝" arbor. Knives are also compatible with Delta heads, and other old style heads.

Corob Cutter Division
www.corobcutters.com
1-800-745-9895
MADE IN USA

Steel of Approval

At $49, this blade of Damascus steel is a real steal

Damascus steel is legendary. Tales of its unmatched strength, sharpness and durability ring through the ages. There are stories of gun rifles being sliced in two by Damascus steel swords and individual strands of hair being sliced in half, even if they gently floated down on to the edge of the blade.

Now, you can be a part of the legend. The ***Legend Knife*** boasts nearly 4" of famed Damascus steel with it's signature, wavy pattern. Damascus steel blade knives can cost thousands. So, at **$49**, the price itself is almost legendary.

Cast Damascus steel, known as wootz, was popular in the East and it's an exacting process that's part metalwork, part chemistry. It's produced by melting pieces of iron and steel with charcoal in a low oxygen environment. During the process, the metals absorb carbon from the charcoal and the resulting alloy is cooled at a very slow rate. The outcome is a beautiful one-of-a-kind pattern of banding and mottling reminiscent of flowing water.

Once a lost art, we sought out a knifemaker who has resurrected the craftsmanship of Damascus steel to create the ***Legend Knife***. The genuine Damascus steel blade folds into a tri-colored pakkawood handle that's prepared to resist the ravages of the great outdoors. When not in use or on display, The ***Legend Knife*** stays protected in the included genuine leather sheath.

Your satisfaction is 100% guaranteed. If you don't feel like we cut you a fair deal, send it back within 60 days for a complete refund of the item price. But we believe that once you wrap your fingers around the ***Legend's*** handle and experience the beauty of its Damascus steel blade, you'll be ready to carve out your own legend. So call today!

Legend Knife ~~$149~~*

Offer Code Price Only **$49** + S&P

1-800-333-2045

Your Insider Offer Code: LGK156-01

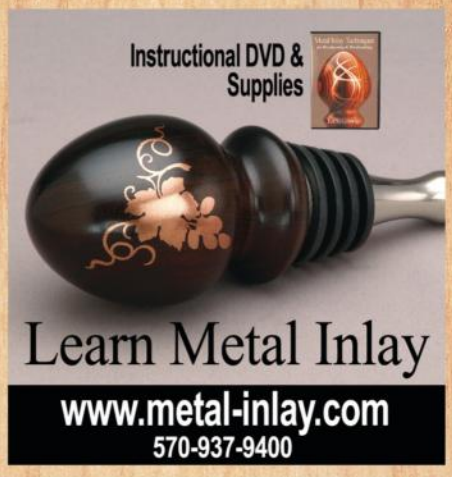
You must use the insider offer code to get our special price.

Stauer®

14101 Southcross Drive W.,
Dept. LGK156-01
Burnsville, Minnesota 55337
www.stauer.com

- **High quality, etched Damascus steel lock back blade**
- **Pakkawood handle with steel bolster**
- **Open: 7 ¾"L; blade: 3 ½"L**
- **Includes genuine leather sheath**

**Discount is only for customers who use the offer code versus the listed original Stauer.com price.*



SCHLABAUGH AND SONS

WOODWORKING SUPPLIES

VISIT SCHSONS.COM

What's Ahead

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

Craft cabinet
Corral the clutter in this copious storage unit that also boasts a spacious fold-down worksurface.

Mirror with a secret
No, it doesn't know her age, but this built-in beauty would keep that (and other valuables) secure.

Tool test: Power sharpeners
Keep your cutters on the bleeding edge with a machine that hones fast and fine.

Naval destroyer
Turn your shop into a shipyard for just a few evenings while building this wood-toy workhorse.

Portable mitersaw stand
Designed for today's ultra-compact battery-powered mitersaws, it boasts ample support but tucks away when not needed.

Better Homes and Gardens® WOOD® magazine (ISSN-0743-894X), September 2017, Volume 34, No. 4, is published 7 times a year in March, May, July, Sept, Oct, Nov, Dec/Jan by Meredith Corporation, 1716 Locust Street, Des Moines, IA 50309-3023. Periodicals postage paid at Des Moines, IA, and at additional mailing offices. Subscription prices: $29.99 per year in the U.S.; $44.99 (U.S. dollars) in Canada; $49.99 (U.S. dollars) overseas. POSTMASTER: Send all UAA to CFS. (See DMM 507.1.5.2); NON-POSTAL AND MILITARY FACILITIES: Send address corrections to Better Homes and Gardens WOOD, PO Box 37508, Boone, IA 50037-0508. In Canada: mailed under Publications Mail Sales Product Agreement No. 40069223; Canadian BN 12348 2887 RT. Return undeliverable Canadian addresses to Better Homes and Gardens WOOD, PO Box 882 STN Main, Markham, ON, L3P 929. © Meredith Corporation 2017. All rights reserved. Printed in the U.S.A.

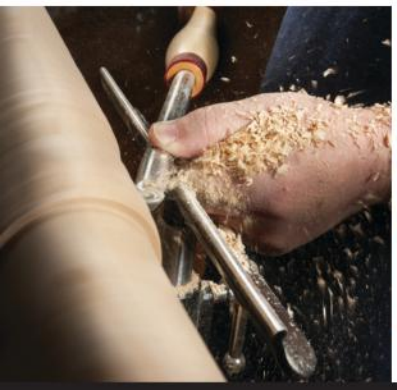
EST 1928

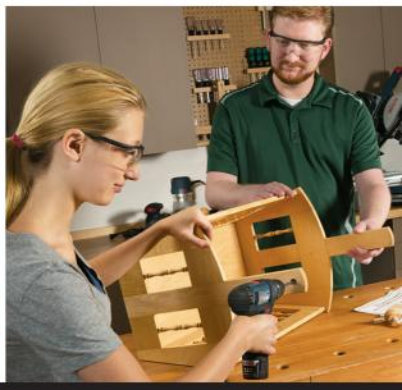
WOODCRAFT®

QUALITY WOODWORKING TOOLS • SUPPLIES • ADVICE®

Helping You Make Wood Work®

Whether you're a turner, carver, cabinetmaker or have a project you want to make, we have the wood supplies you need! In our Woodshop you'll find a full selection of both domestic and exotic woods in sizes that range from pen blanks, to carving blocks, to lumber packs, to thin lumber and veneers, to turning spindles and bowl blanks. Lose yourself in "our woods," and stock up for all your projects!

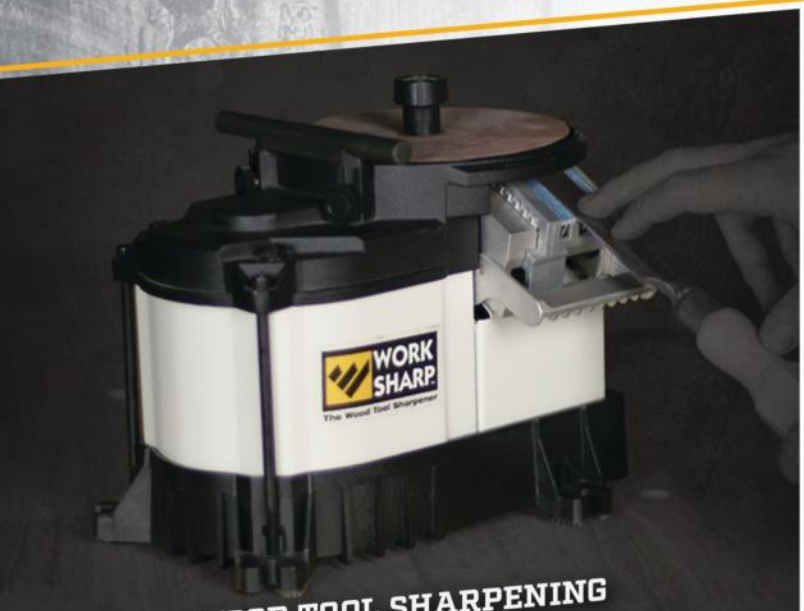




For A Free Catalog Or To Find Your Local Woodcraft Store, Visit woodcraft.com Or Call 800-225-1153.
For Information On Woodcraft Retail Franchise Opportunities, Visit woodcraftfranchise.com 17WI09P

WORK SHARP®
KNIFE & TOOL SHARPENERS

Drill Doctor
The Drill Bit Sharpener



WOOD TOOL SHARPENING

DRILL BIT SHARPENING

SHARPENING SOLUTIONS
SINCE 1973

KNIFE AND TOOL SHARPENING

QUALITY CHECKED
ASHLAND
HAND ASSEMBLED
OREGON

VISIT OUR WEBSITES TO LEARN MORE
WORKSHARPTOOLS.COM / DRILLDOCTOR.COM / 1.800.597.6170