

TAUNTON'S

Fine Woodworking



Sharpening
doctor works
wonders, p. 42

Guide to using wood grain

**High-gloss finish
made easy**

**Beautiful tables
from large slabs**

**Better ripcuts
on the tablesaw**

**Great mortisers
for all budgets**

**Build a low
Shaker chest**



August 2009 No. 206

U.S. \$7.99/Canada \$8.99



08

www.finewoodworking.com

When you're done playing with toys, give us a call.

3000
SERIES

LAGUNA



Our award-winning bandsaws just got better by incorporating features from our Heavy-Duty Series bandsaws.

The long list of standard features now includes foot brake with micro-switch, rack and pinion for the upper guide post, geared trunions with gas spring, quick tension release, and Ceramic Laguna Guides. This new version that we are known for has plenty of power for resawing. The cast-iron double-trunion table is the heaviest in its class and features 2 parallel t-slots. Heavy cast-iron fly wheels provide the inertia and stability needed to accurately slice wafer-thin veneers from a tall block of hardwood. Our award-winning Laguna Guides insure unequalled blade guidance and (2) 4-inch dust ports which provide optimum dust control. The 3000 Series bandsaws provide the perfect balance between price and performance.



LT16 3000 Series



LT18 3000 Series

THRIVING ON INNOVATION
LAGUNA TOOLS

17101 Murphy Avenue, Irvine, CA, 92614

www.lagunatools.com

READER SERVICE NO. 64

Se Habla Español
800.234.1976
949.474.1200

Teardrop Trailer Plans

Build your own classic camping trailer!
The ultimate woodworking project

- NO WELDING REQUIRED!
- FULL GALLEY IN REAR

8' Cubby



Complete plans include built-in icebox, stove, water tank, 12V electric system, cabinets, floor hatch for porta-potty. Sleeps two inside the cabin, 4' x 8', 900 lbs.

Kuffel Creek Press • www.kuffelcreek.com
PO Box 2663 • Riverside • CA 92516 • fax 951/781-9409

READER SERVICE NO. 45

CENTER for FURNITURE CRAFTSMANSHIP

Teaching Creative Excellence

WORKSHOPS
TWELVE-WEEK INTENSIVES
NINE-MONTH COMPREHENSIVE
STUDIO FELLOWSHIPS



Armstrong Chair by Instructor David Uffitt-Brown

Rockport, Maine ■ 207-594-5611 ■ www.woodschooll.org

Titebond®
THE PRO'S ADVANTAGE™

Making the Invisible...

visible

For more information,
visit www.titebond.com/invisible



READER SERVICE NO. 86



BRAND NEW IN BRAD NAILING

Our brand new 18 ga. brad nailer re-invents the classic. All metal construction provides a sturdy tool that will stand up in industrial applications. It includes our blow-gun and self-adjusting magazine. It also has a unique compact nose, design, where the nose is the safety, so there is no additional bulk and you can shoot exactly where you want to.

How's that for the next greatest thing?

FOR MORE INFORMATION & DEALER LOCATIONS
www.cadextools.com
604.876.9909

READER SERVICE NO. 73

Cabinet & Millwork Shops • Contractors • Remodelers
Design/Build Firms • Project Managers

Commercial & Residential Casework

The quality you demand. The service you deserve.

- Easily assembled, frameless cabinet boxes
- Storage & Closet Systems
- Custom-sized casework
- Drawer boxes
- Adjustable shelves
- Full overlay slab-style fronts
- Superb customer service
- Increased profitability
- Higher productivity
- Better cost control
- Consistent quality

For more information or to
download a FREE digital catalog,
please visit our website.

CabParts, Inc.™

Your Case Work Made EasySM

www.cabparts.com

970-241-7682



Confirmat
Joinery

Dowel
Joinery



READER SERVICE NO. 56

**YOUR CUTS
AREN'T PERFECT.
BUT IT'S NOT
YOUR FAULT.**



And it's not your saw's fault either. The real problem... is your tape measure and pencil. Because you're measuring and marking each workpiece separately, you're getting small inconsistencies which add up in a hurry come assembly time. Our **Precision Trak and Stop System** eliminates this problem and helps you make perfectly accurate cuts one after another.

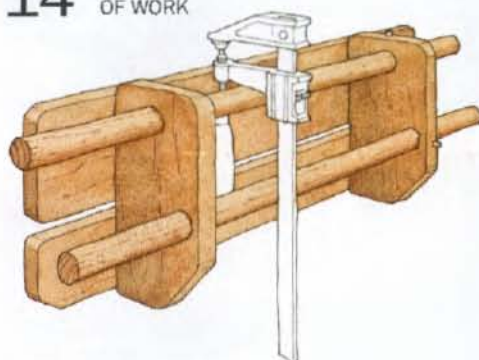
See it in action online
at kregtool.com/precision.

Kreg

www.kregtool.com
800.447.8638

READER SERVICE NO. 43

14 METHODS OF WORK



up front

6 On the Web

8 Contributors

10 Letters

14 Methods of Work

- Hold-down makes routing safer
- Two clever clamp racks

20 Tools & Materials

- Value-priced planes shine after tune-up
- One bit, 16 different rabbets

24 Fundamentals

Ripping on the tablesaw

30 A Closer Look

Wood allergies: A reaction can strike randomly and with little warning



20 TOOLS & MATERIALS

features

34 Shaker Chest of Drawers

A pro's jigs and tips simplify joinery on chests of any size

BY CHRISTIAN BECKSVOORT

42 A Visit to the Sharpening Doctor

Two readers hone their skills with help from our expert

BY STEVE SCOTT

48 Designing With Grain

COVER STORY

English-walnut sideboard demonstrates how grain patterns can take a piece to the next level

BY JASON ROBERTS

55 High-Gloss Finish Made Simple

Automotive polish makes it fast and foolproof

BY SEAN CLARKE

60 Success With Large Slabs

From flattening to butterfly keys, how to handle one-of-a-kind pieces of wood

BY DOUG MOOBERRY AND MICHAEL ZUBA

66 Mortisers for All Budgets

If you can cut mortises quickly, furniture making is faster and more fun

BY TIM ALBERS

72 How to Veneer a Sunburst

Dazzling tabletop, step by step

BY MARK ARNOLD



42 SHARPENING DOCTOR



LOW SHAKER CHEST 34



88 BEAUTIFUL BORDER

in the back

80 Readers Gallery

84 Q & A

- Offset rabbets make double doors stronger
- Identifying finishes for repair
- Buying roughsawn lumber

88 Master Class

Beautiful border frames a sunburst tabletop

98 How They Did It

The back cover explained

Back Cover

Forensic Furniture Making



The Taunton Press
Inspiration for hands-on living®

60

BUTTERFLY KEYS IN LARGE SLABS



on the web

THIS MONTH ON **FineWoodworking.com/extras**

Visit our Web site to access free Web tie-ins, available June 4. While you're there, don't miss our collection of totally free content, including tool reviews, an extensive project gallery, and must-read blogs.



Free eLetter

Sign up for our FREE eNewsletter at FineWoodworking.com/newsletter to get free plans, videos, and articles.



VIDEO: Sharpening Woes?

Visit the sharpening doctor and get the Rx for dull blades.

Fine Woodworking's Guide to Safety

Videos, quizzes, and more to help you avoid injury in the shop



VIDEO: High Gloss in Minutes

Automotive buffer creates a gorgeous finish.

Win a SawStop Tablesaw

Tool chests/cabinets wanted: Upload pictures by June 30 for a chance to win.

Become a member

Access more than 500 exclusive project and technique videos by subscribing to FineWoodworking.com. You'll also get more than 30 years of magazine archives at your fingertips including 1,400-plus articles and project plans.



VIDEO WORKSHOP

Build a Footstool

- Step-by-step video instruction
- A complete lesson in wedged mortise-and-tenon joinery
- The perfect beginner's project



Fine Woodworking®

Editor **Asa Christiana**

Art Director **Michael Pekovich**

Managing Editor **Mark Schofield**

Senior Editor **Thomas McKenna**

Associate Editors **Thomas G. Begnal**
Steve Scott
Anissa Kapsales
David Heim
Matthew Kenney

Associate Editor,
Online **Gina Eide**

Senior Copy/
Production Editors **Elizabeth Healy**
Julie Risinit

Associate Art Directors **Kelly J. Dunton**
John Tetraault

Shop Manager **Robert Nash**

Administrative Assistant **Betsy Engel**

Contributing Editors **Christian Becksvoort**
Gary Rogowski
Garrett Hack
Roland Johnson
Steve Latta

Consulting Editor **Jonathan Binzen**

Methods of Work **Jim Richey**

Executive Editor,
Books & Video **Helen Albert**

Fine Woodworking: (ISSN: 0361-3453) is published bimonthly, with a special seventh issue in the winter, by The Taunton Press, Inc., Newtown, CT 06470-5506. Telephone 203-426-8171. Periodicals postage paid at Newtown, CT 06470 and at additional mailing offices. GST paid registration #123210981.

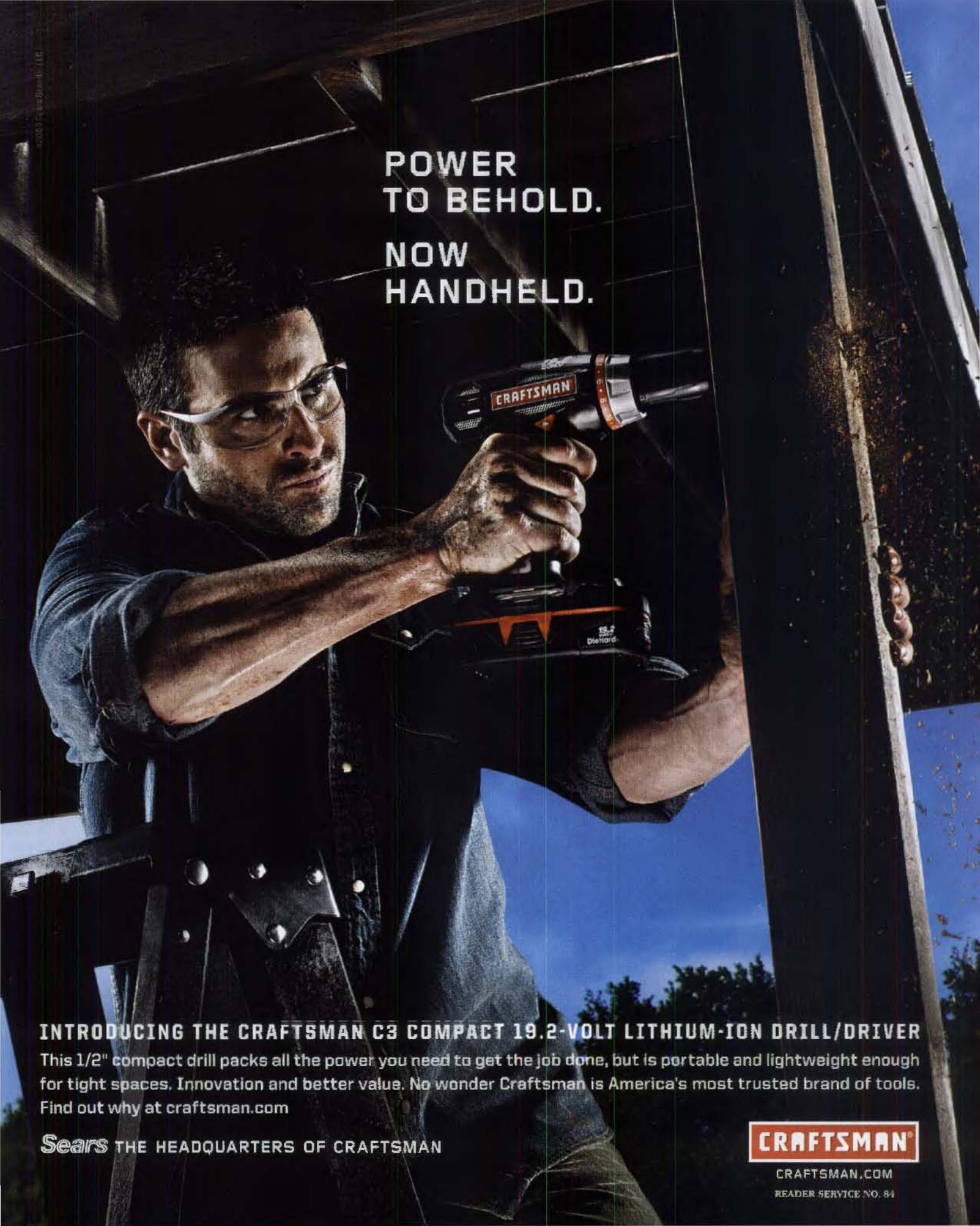
Subscription Rates: U.S. and Canada, \$34.95 for one year, \$59.95 for two years, \$83.95 for three years (in U.S. dollars, please). Canadian GST included. Outside U.S. and Canada, \$41.95 for one year, \$73.95 for two years, \$104.95 for three years (in U.S. dollars, please). Single copy, \$7.99. Single copies outside the U.S. and possessions, \$8.99.

Postmaster: Send address changes to *Fine Woodworking*, The Taunton Press, Inc., 63 S. Main St., PO Box 5506, Newtown, CT 06470-5506.

Canada Post: Return undeliverable Canadian addresses to *Fine Woodworking*, c/o Worldwide Mailers, Inc., 2835 Kew Drive, Windsor, ON N8T 3B7, or email to mnfa@taunton.com.

Printed in the USA



A man wearing safety glasses and a dark shirt is using a Craftsman C3 compact drill to work on a metal structure. The drill is black and orange, with the Craftsman logo visible. The background shows a clear blue sky and some trees.

**POWER
TO BEHOLD.
NOW
HANDHELD.**

INTRODUCING THE CRAFTSMAN C3 COMPACT 19.2-VOLT LITHIUM-ION DRILL/DRIVER

This 1/2" compact drill packs all the power you need to get the job done, but is portable and lightweight enough for tight spaces. Innovation and better value. No wonder Craftsman is America's most trusted brand of tools. Find out why at craftsman.com

Sears THE HEADQUARTERS OF CRAFTSMAN

CRAFTSMAN®

CRAFTSMAN.COM
READER SERVICE NO. 84

contributors

Doug Mooberry ("Success With Large Slabs") has been amassing wood for more than 30 years. His two-level barn in the Brandywine area of southeastern Pennsylvania is stacked to the rafters with domestic and tropical hardwoods, including a piece of bubinga that's 53 in. wide. Cleveland native **Michael Zuba** (at left in the photo) learned woodworking at the University of Rio Grande in southern Ohio. He is a lead craftsman at Mooberry's Kinloch Woodworking Ltd.



Mark Arnold ("How to Veneer a Sunburst") is both an excellent woodworker and an accomplished writer. The former skill comes partly from a two-year course at North Bennet Street School in Boston, while the latter is displayed in *American Period Furniture* (www.sapfm.org), which Arnold edits jointly with his wife, Margaret. You can see more of Arnold's work and sign up for classes in his central Ohio shop at www.bostonwoodworking.com.

Tim Albers ("Mortisers for All Budgets") lives in Ventura, Calif., where he juggles his day job as CFO of a large produce distributor with his woodworking hobby and obsession with power tools. As a furniture maker, he focuses mainly on chairs, from three-slat ladderbacks to Morris designs and Maloof-inspired rockers. He's also a leading member of his local club, Conejo Valley Woodworkers. Retirement is just around the corner, he says, but his wife isn't buying it.



David H. Jones (*A Closer Look*) is the woodshop manager in the Department of Wood Science at Virginia Tech in Blacksburg, Va. It is also his alma mater. In the 20 intervening years, he worked in furniture making, from large manufacturers to small shops as far away as Alaska. Today, he trains students in woodworking and produces fine wood products for display. When not working, he splits his time between renovating his home and hiking.

A self-proclaimed wood addict, **Jason Roberts** ("Designing With Grain") has quite a collection of exotic and domestic hardwoods. For the last decade he has worked in the United States and Europe, taking time along the way to train at the College of the Redwoods, and with English cabinetmaker Nicholas Chandler. Currently he works in his own shop in Olympia, Wash., and in sales for Horizon Wood Products.



For more information on our contributors, go to FineWoodworking.com/authors.

We are a reader-written magazine. To learn how to propose an article, go to FineWoodworking.com/submissions.

Fine Woodworking®

Publisher Anatole Burkin
Sr. Marketing Manager Melissa Robinson
Administrative Assistant Christina Glennon

Advertising Director Peter Badeau
203-304-3572
pbadeau@taunton.com

Director of Advertising Marketing Kristen Lacey
203-304-3757
klacey@taunton.com

Sr. National Account Manager Linda Abbett
203-304-3538
labbett@taunton.com

Associate Account Manager Kimberly Parrilla
203-304-3590
kparrilla@taunton.com

Sr. Ad Sales Support Associate Marjorie Brown
Advertising inquiries: 800-309-8954
fwads@taunton.com

Member Audit Bureau of Circulation



Sr. Consumer Marketing Director Beth Reynolds, ProCirc
Circulation Manager Noelia Garcia, ProCirc
Business Managers David Pond, Megan Sangster



The Taunton Press

Inspiration for hands-on living®

Independent publishers since 1975
Founders, Paul & Jan Roman

President Suzanne Roman
EVP & CFO Timothy Rahr
SVP Operations Thomas Luxeder
SVP Creative & Editorial Susan Edelman
SVP Technology Jay Hartley
SVP & Group Publisher Paul Spring
SVP & Publisher, Book Group Donald Linn
SVP Advertising Sales Karl Elken
SVP & Group Publisher Janine Scopolino
VP Human Resources Carol Marotti
VP & Controller Wayne Reynolds
VP Fulfillment Patricia Williamson
VP Finance Kathy Worth
VP Taunton Interactive Jason Revzon
VP Single Copy Sales Jay Annis

Publishers of magazines, books, videos and online
Fine Woodworking • Fine Homebuilding
Threads • Fine Gardening • Fine Cooking
www.taunton.com

VAKuum Pressing equipment

Air-Powered (venturi) & Electric Vacuum Systems

Polyurethane & Vinyl Bags (25 Stock Sizes)

Custom Bags & Frame Presses (Shipped within 24 hrs. 99%)

Flip top Frame Presses (10 Stock Sizes)

Professional Systems with 4 x 8 bag from \$555

For a free brochure & price list call

800 547-5484

Be sure to ask for our free 40 minute product line cd-rom

Quality VAKuum Products, Inc.

43 Bradford St. Concord, MA 01742

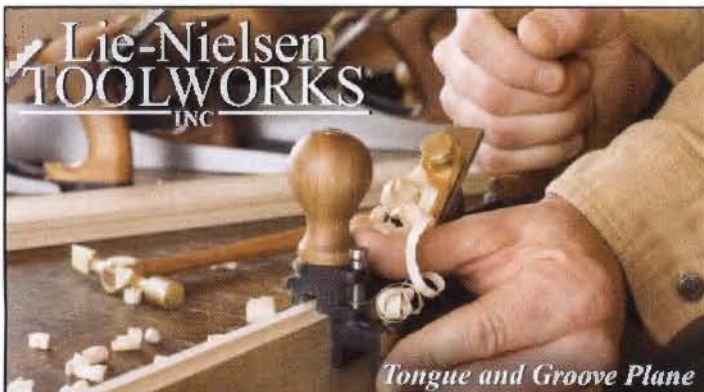
Phone: (978)369-2949 - Fax (978) 369-2928 - E-Mail: qvp@qualityvak.com

www.qualityvak.com

Q.V.P.



Lie-Nielsen TOOLWORKS INC.



Tongue and Groove Plane

www.lie-nielsen.com 1-800-327-2520 Warren, Maine USA

READER SERVICE NO. 93

Forrest Blades

For building cabinets and fine furniture, nothing beats Forrest saw blades.

Craftsmen appreciate the way our blades deliver smooth, quiet cuts without splintering, scratching, or tearouts. They know our unique grade C-4 micrograin carbide, proprietary manufacturing process, and hand straightening produce exceptional results. In fact, independent tests rate us #1 for rip cuts and crosscuts.

"From the first cut on, I realized that this blade was a bargain at any price! Nothing else I have cuts comparably." Calvin Brodie, Spanaway, WA

Forrest Quality Shows

Woodworker II—Best rated, all-purpose blade for rips and crosscuts.

Chop Master—Perfect for tight, perfectly cut miter joints without splinters.



Order from any Forrest dealer or retailer, online, or by calling directly. Our blades are manufactured in the U.S.A. and backed by our 30-day, money-back guarantee.

FORREST

The First Choice of Serious Woodworkers Since 1946

www.ForrestBlades.com
1-800-733-7111
(In NJ, call 973-473-5236)

Code FIV

© 2008 Forrest Manufacturing

Woodworker II
Fine Woodworking



Chop Master
Woodshop News



Duraline HI-AT
Woodshop News



Dado King
Wood Magazine



READER SERVICE NO. 88

"Thanks for the amazing dust collector."

"I am amazed how much suction the Mini Gorilla has. The cyclone really separates the dust. There is no longer fine dust covering everything in the shop. Shop cleanup is now actually fun. Thanks for the amazing dust collector!"

R. Conti March 09

No more clogged filters!



Invented and made in the USA. Built to last a lifetime.

A unique cyclonic Dust Collector with ultra-high efficiency separation.

Summer Sale! Call for details!

Complete Ductwork & Shop Plan Design Packages



Solving Your Dust Problems Since 1993

Call Today for FREE Catalog!

1.800.732.4065

Order Online!

www.oneida-air.com

READER SERVICE NO. 96

Patent Pending

Oneida Air Systems



See Us at AWFS 2009 Booth #6901

Oneida Air Systems

From the Editor

BEWARE OF HERO WORSHIP

When I first came to *Fine Woodworking*, I was intimidated by the big names—Maloof, Boggs, Hack, Lowe, and so on. But when it came time to visit them and take photos for their articles, I got along famously with every one. Turns out we are all—basically—inquisitive people who love to build things. The main difference between me and the “masters” was that they had built a lot more pieces and made a lot more valuable mistakes. As I helped to edit and shape their articles, I was surprised to find my ideas blending in with theirs—and being welcomed.

I began to notice that the best woodworkers are usually the most humble. They have nothing to prove, and they know enough to know how much they still don’t know. Beware of people who imply that their way is the only way. Phil Lowe is among the most skilled woodworkers I’ve ever watched, but he’s never preachy; he only says, “This is how I do it.”

There are heroes out there, to be sure, people like Lowe with an extra measure of raw talent and determination, plus the courage (in many cases) to choose woodworking as a profession. But the truth is that good ideas can come from anyone, and anyone can make something that is beautiful.

Fine Woodworking magazine used 77 different authors last year—a mix of hobbyists and pros—plus 125 other people who sent in tips and pictures of their work. On *FineWoodworking.com* we posted blogs, videos, and gallery items from thousands more. We’ll take good ideas wherever we can find them.

So beware of hero worship. You might start to think you need all of the top-rated tools plus weeks of classes with a big-name guy before you can build another piece.

But your instincts and ideas are better than you know. Make projects your own. Change dimensions. Use the wood you have. Trust your eye. And when in doubt, figure it out. You’ll be proud of yourself when you do.

—Asa Christiana



Fair test for outdoor finishes?

In “Torture Test for Outdoor Finishes” (*FWW* #205), associate editor Tom Begnal rated the two Epifanes products as superior to the other three finishes. I can’t be the only one to note that he used between two and four coats of finish for the three down-rated ones and seven or eight for the winning ones. I wonder if he would have reached the same “epiphany” had he used eight coats of the oil finish or the marine varnish. I understand that he was following manufacturers’ directions, but the questions remain. I do know that an annual coat of Watco Teak Oil on my deck furniture has been quite satisfactory for me.

—ADRIEN COBLENTZ, Mendham, N.J.



Tom Begnal replies: As you noted, we tested the products based on the manufacturers’ recommendations. That’s the way most buyers would be expected to use them. Of course, at the start of the test, we didn’t know which finish, if any, would stand out. Had we applied seven coats of McCloskey’s spar varnish, for example, and it worked as well as the Epifanes, we’d be left wondering if the recommended four coats of spar would have done the job. That said, we have tentative plans for another outdoor-finish test based on what we learned from this one. We will try extra coats with some of the other products. Also, we’ll add a few new contenders suggested by readers.

Hammer-on-hammer crime

I see a no-no in the recent Fundamentals (“Miter-Gauge Basics,” *FWW* #205). The photo shows the author making a dimple in the miter gauge (to tighten its fit in the miter slot) by striking the face of a ball-peen hammer with the face of another hammer. I have always been taught *never*



PHIL LOWE

Fine Woodworking

To contact us:

Fine Woodworking
The Taunton Press
63 South Main Street,
P.O. Box 5506, Newtown,
CT 06470-5506
Tel: 203-426-8171

Send an email:

fw@taunton.com

Visit:

www.finewoodworking.com

To submit an article proposal:

Write to *Fine Woodworking* at the address
above or
Call: 800-309-8955
Fax: 203-270-6753
Email: fw@taunton.com

To subscribe or place an order:

Visit www.finewoodworking.com/fworder
or call: 800-888-8286
9am-9pm ET Mon-Fri;
9am-5pm ET Sat

To find out about *Fine Woodworking* products:

Visit www.finewoodworking.com/products

To get help with online member services:

Visit www.finewoodworking.com/customerservice

To find answers to frequently asked questions:

Visit www.finewoodworking.com/FAQs

To speak directly to a customer service professional:

Call 800-477-8727 9am-5pm ET Mon-Fri

To order products for your store:

Send an email to magazinesales@taunton.com

To advertise in *Fine Woodworking*:

Call 800-309-8954
Or send an email to fwads@taunton.com

Mailing list:

We make a portion of our mailing list available
to reputable firms. If you would prefer that
we not include your name, please visit:
www.finewoodworking.com/privacy
or call: 800-477-8727 9am-5pm ET Mon-Fri

For employment information:

Visit www.careers.taunton.com

The Taunton guarantee:

If at any time you're not completely satisfied
with *Fine Woodworking*, you can cancel your
subscription and receive a full and immediate
refund of the entire subscription price. No
questions asked.

Copyright 2009 by The Taunton Press, Inc. No
reproduction without permission of The Taunton
Press, Inc.



HIGHLAND Woodworking
fine tools & education

The Wood Slicer®
LEGENDARY RESAWING BLADE

- CUTS SMOOTHER
- STAYS SHARP LONGER
- WORKS FASTER
- SOUNDS QUIETER
- MAKES VENEERS

"Best All-Around Performer"
Rated by *Fine Woodworking*

800-241-6748
highlandwoodworking.com

- FESTOOL
- FEIN
- LIE-NIELSEN
- TORMEK
- KREG
- STEEL CITY TOOLS
- ONEWAY LATHES
- LEIGH DOVETAIL JIGS
- CARVEWRIGHT
- GRANSFORS BRUKS AXES
- Hoffman & Hammer German Workbenches

WOODWORKING BOOKS 25% OFF

We invite you to subscribe to
WOOD NEWS

Highland Woodworking's
FREE Online Magazine

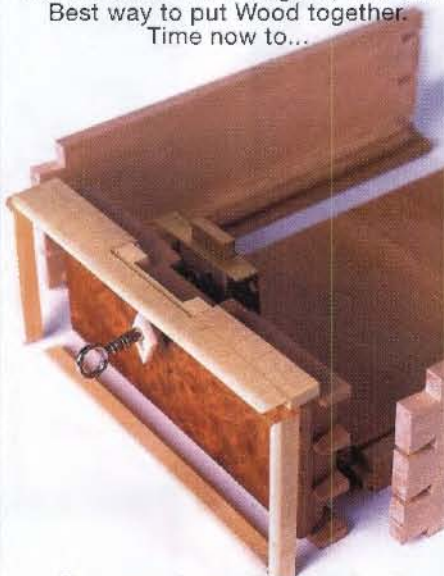
- Woodworking Tips
- New Tools
- Class Schedules
- Special Savings

woodnewsonline.com

READER SERVICE NO. 58

21 Years of Innovation

and Tried and Tested Research have
produced a tool designed for
Woodworkers by guys who know
Woodwork. It's the Original, and the
Best way to put Wood together.
Time now to...



See the Movie!

and find out all the ways you can use it

www.woodrat.com

or give us a call on 1-866-254-9260
or an email to sales@woodrat.com

READER SERVICE NO. 100



OSBORNE
Wood Products, Inc.

CUSTOM TURNINGS!

Since 1979, we've been supplying
furniture makers and craftsmen with
unique wood turnings, table legs, kitchen
island legs, sofa legs and more!

Need a unique size or shape?
Send us your designs and we'll work with
you to create the turning you need.

www.osborneturnings.com



Making your
designs into quality,
finished turnings
for your custom
projects.

Sign up for E-letters to get updates
about promotions, new products and
woodworking tips at www.osbornewood.com

Call us at 866-350-2575

READER SERVICE NO. 37

to hit the faces of two hammers together. The face of a hammer is hardened in order to wear well when pounding softer metals, and a blow by another hardened hammer face could cause a piece of hard shrapnel to chip off at a very high rate of speed. Was I taught incorrectly?

—DICK MARTIN, Vernonia, Ore.

Steve Latta replies: Tail between my legs time. In all my years, I've never had a problem lightly tapping hammer heads together for a job like this. But when this letter came, I asked a fellow professor, Tom Dennes, who works in the machine tool department here at Thaddeus Stevens College of Technology (Lancaster, Pa.), about the risks. "Small chance of incident, no doubt, but still not a good idea

regardless of force," was his reply. A small piece of leather, say an old piece of belt, placed between the two would have made all the difference. Or, though it requires a better aim, just hit the bar directly with the ball-peen hammer.

Corrections

We neglected to point out that the design and plans for the Bow-Arm Morris Chair project featured in *FWW* #205 were created by Brian Murphy of American Furniture Design. Full-size plans are available at FineWoodworking.com/PlanStore.

In "Low-Cost Lumber" (*FWW* #205), the specific gravity for beech should have been listed at 0.64, not 0.064.

Clarification

In the recent tool test, "14 Bench Vises" (*FWW* #205), we listed Highland Hardware as a source for the Groz 9-in. Quick Release vise. They have stopped carrying it, but it is available at www.woodcraft.com for \$130.



About your safety

Working wood is inherently dangerous. Using hand or power tools improperly or ignoring standard safety practices can lead to permanent injury or even death. Don't perform operations you learn about here

(or elsewhere) until you're certain they are safe for you. If something about an operation doesn't feel right, find another way. We want you to enjoy the craft, so please keep safety foremost in your mind.

Ready for the next level?

Berea Brand Pen Kits!

- High Quality
- Original Designs
- Reasonably Priced

Visit us at:
www.bereahardwoods.com,
 call us at 1-877-736-5487 or
 e-mail us at bereahard@aol.com
 18745 Sheldon Rd.
 Middleburg Hts., OH 44130

BereaHardWoods CO. Inc.

You Did It Yourself!

**Raised Panel Doors,
Dovetail Drawer Boxes, or
Complete Cabinet Kits
from**

Scherr's
Cabinet and Doors, Inc.

email: info@scherrs.com (701)839-3384
Fax (701)852-6090

www.scherrs.com



From the company that invented versatility,
here's some more.



				
Cut	Remove	Grind	Scrape	Sand
wood, drywall, metal	grout, caulk, paint	thinset, cement, mortar	adhesive, paint, vinyl	wood, metal, chipboard

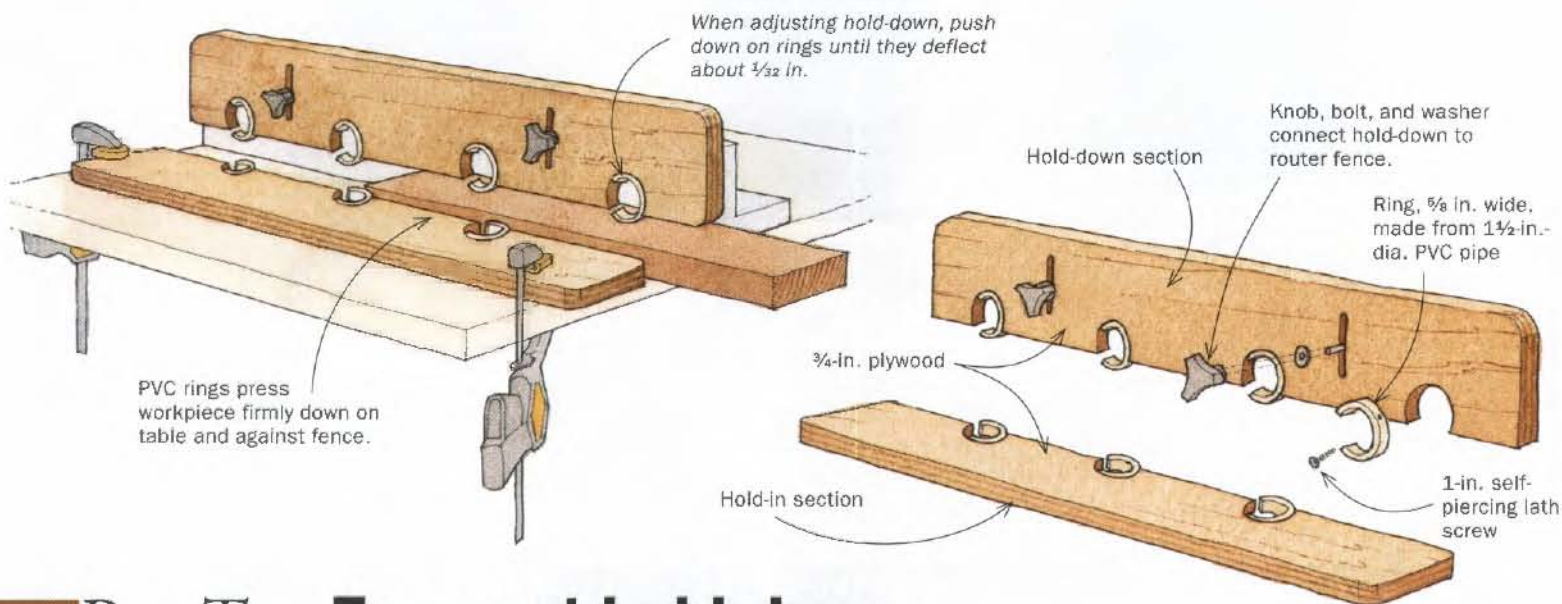
The all-new Multi-Max™ Oscillating Tool System.

Its fast side-to-side motion and compact design make it the perfect tool for even your most demanding remodeling projects. From cutting a door jamb to removing grout—and every job in between. It's exactly the kind of versatility you've come to expect from a Dremel tool. Call 1-800-437-3635 today for a free DVD. Or visit dremel.com to view project videos.

DREMEL®
MULTI-MAX™
Repair. Remodel. Restore.™

Available where power tools are sold.

READER SERVICE NO. 35



Best Tip Two-part hold-down makes routing safer



Richard Babbitt has become a woodworking machine since his retirement in 2000, building scores of raised-panel doors in his home (51 in the kitchen alone) and many pieces of furniture, from entertainment centers to clocks and lamps. He's currently building a table using wood from a locally felled oak tree.

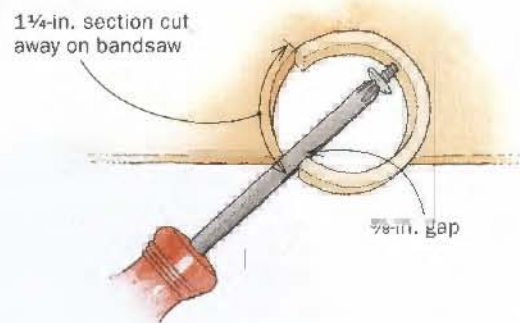
This versatile two-part fixture uses sections of PVC pipe to hold the workpiece against the router table and the fence to reduce the chance of kickback and to make a cleaner, more consistent cut.

To make the fixture, cut two pieces of 3/4-in.-thick plywood 4 1/2 in. wide and as long as your router table. On the vertical hold-down piece, rout two 3/8-in. adjustment slots. Now, use a drill press and Forstner bit to make four 1 7/8-in.-dia. through-holes, aligning the bit so that it will overlap the edge by about 7/16 in. Drill three holes in the horizontal hold-in piece, centering them between the holes in the vertical hold-down.

Cut the 5/8-in.-wide rings on the tablesaw from a 1 1/2-in.-dia. schedule 40 PVC pipe. The rings should be slightly thinner than the plywood; otherwise, their freedom of action will be impaired when the hold-down is clamped in place. Next, use a bandsaw to remove a 1 1/4-in. section from each ring.

Insert the rings with all the openings facing the same direction. Holding a Phillips-head screwdriver in the opening at about 45° to the bottom edge, rotate the PVC ring to pinch the screwdriver shaft (see drawing) and mark the inside where the tip touches the PVC. Drill a 5/32-in.-dia. hole through the PVC only and then attach it to the plywood with a 1-in. self-piercing lath screw.

To use the fixture, place the stock flat on the router table under the rings of the hold-down.



Push the hold-down onto the workpiece so that the rings deflect slightly, roughly 1/32 in. Do the same for the hold-in.

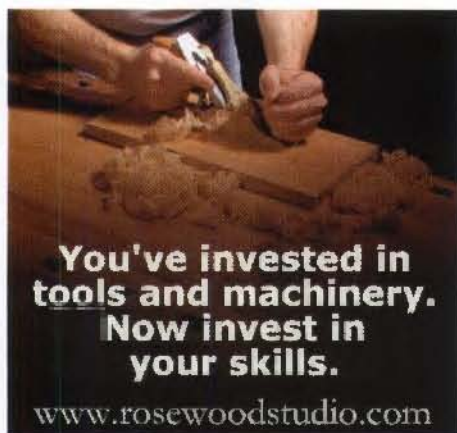
The pressure the rings exert on the workpiece helps keep it against the table and the fence, and will prevent the stock from kicking back. Use moderate feed pressure, and be sure to use a push stick at the end of the cut.

—RICHARD BABBITT, Friday Harbor, Wash.

A Reward for the Best Tip

Send your original tips to Methods of Work, *Fine Woodworking*, PO Box 5506, Newtown, CT 06470. If published, we pay \$50 for an unillustrated tip; \$100 for an illustrated one. If your tip is the best, you win Jet's framing clamp kit, which includes four parallel-jaw clamps and handy accessories.





You've invested in tools and machinery. Now invest in your skills.

www.rosewoodstudio.com

READER SERVICE NO. 16

Custom Dovetail Drawers

by Eagle Woodworking

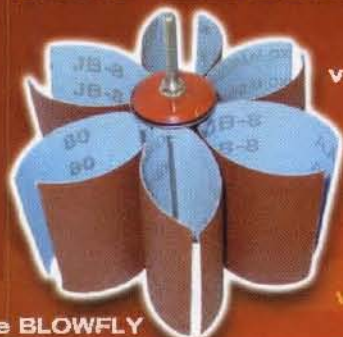


Trust us to create and deliver the finest quality custom dovetail drawers. Call: 800-628-4849

EagleDovetailDrawers.com

READER SERVICE NO. 95

T&T DESIGN PTY LTD *tools for life*



the BLOWFLY

the SPIDER



The most versatile **FLAP** and **DISC SANDERS** available today

Watch the video & ORDER ONLINE at: www.tandtdesign.com.au

READER SERVICE NO. 81

SINCE 1972
Hartville Tool
OHIO'S LARGEST TOOL STORE!

Special Offer! NEW!

- Find hidden metal in wood up to 6" deep.
- Prevent damage to expensive bits & blades

Only! \$79
#63897

Offer Expires October 31, 2009

FREE! SHIPPING
On Orders Over \$99 Lower 48 States

MADE IN THE U.S.A.

hartvilletool.com
800-345-2396

READER SERVICE NO. 23



Multi-Purpose Routing Jig

An amazingly versatile tool for routing wood

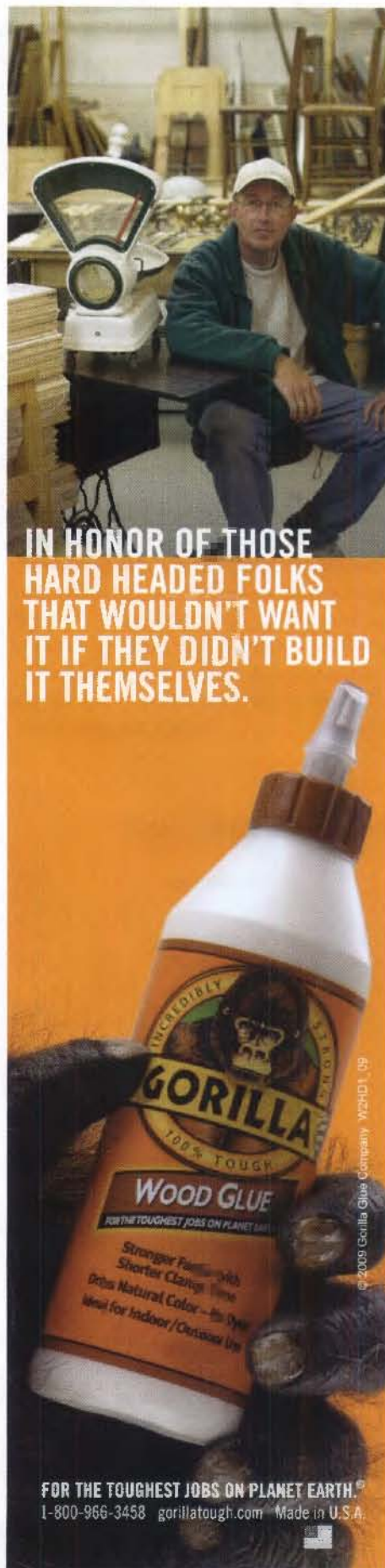


- Innovative design
- Routes any wood joint
- Power feeds the wood
- Breakout free climb cuts
- Angle/compound angle cuts
- Digital display of cut location
- Simple & quick operation
- Affordable



Call 866.966.3728
www.chipsfly.com

READER SERVICE NO. 33



IN HONOR OF THOSE HARD HEADED FOLKS THAT WOULDN'T WANT IT IF THEY DIDN'T BUILD IT THEMSELVES.

GORILLA
100% TOUGH
WOOD GLUE
FOR THE TOUGHEST JOBS ON PLANET EARTH

Stronger Fasteners with Shorter Clamping Time
Dries Natural Color - No Yellowing
Ideal for Indoor / Outdoor Use

FOR THE TOUGHEST JOBS ON PLANET EARTH.®
1-800-966-3458 gorillatough.com Made in U.S.A.

© 2009 Gorilla Glue Company V22H01_09

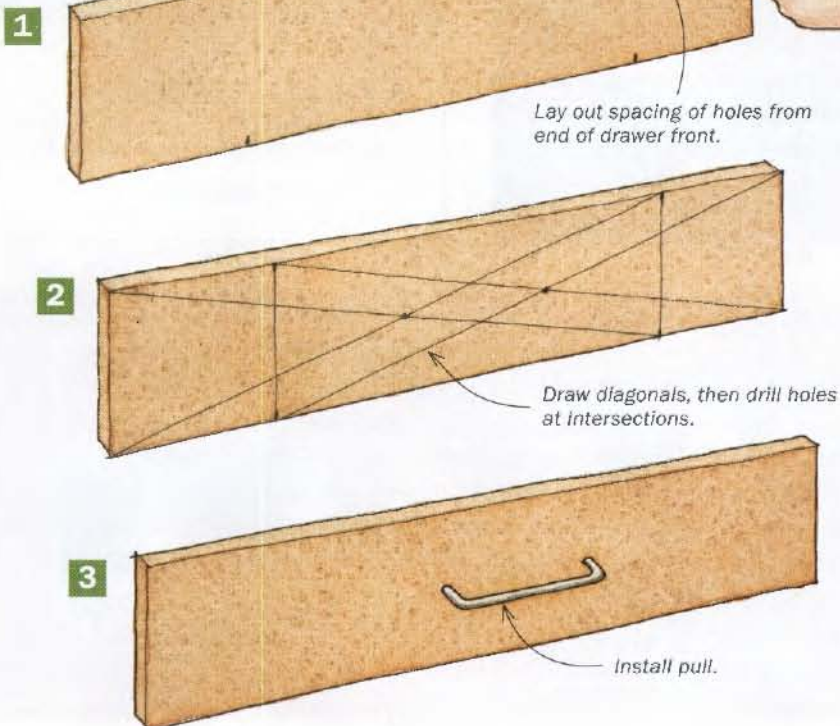
READER SERVICE NO. 5

No-math layout for drawer pulls

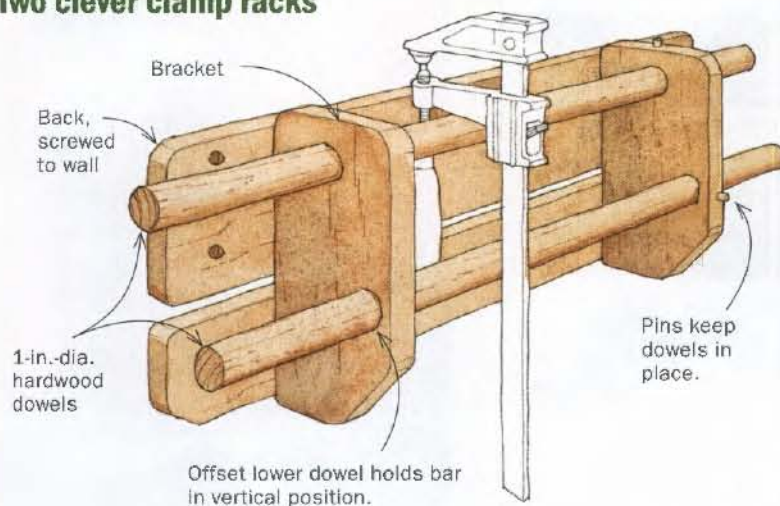
More often than not, drawer handles are located in the middle of the drawer front, both vertically and horizontally. The intuitive method most of us use to locate the holes for the handle takes about five steps and requires measuring the dimensions of the drawer front and the handle. But I have a method that requires no math.

I simply transfer the width of the handle (between hole centers) onto each end of the drawer front and draw diagonals as shown. The points where the diagonals intersect are the locations for the holes. There's much less chance for a mistake with this method, but it's critical that the drawer front be square on the ends. Also, if the height is small compared to the width, it is easy to introduce a small error in the hole location. In that case, checking the hole spacing before drilling is a good idea.

—SCOTT COLLINS, Sildell, La.



Two clever clamp racks



BAR CLAMPS

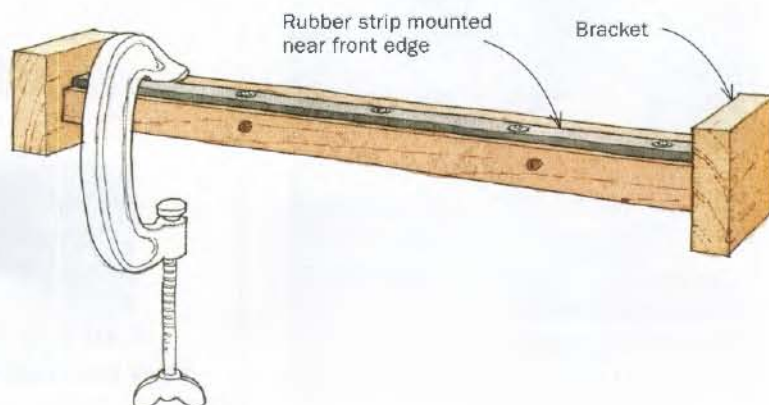
I store my bar clamp collection on a simple rack, consisting of two 24-in.-long, 1-in.-dia. oak dowels supported by two oak brackets that are mounted, in turn, to two oak backs. The dowels are positioned in the brackets so that the clamp handles slide down behind the top dowel and the clamp bars are supported vertically by the lower dowel. To fix the position of the large dowels, I use smaller dowels to pin them in the right-hand bracket.

—ANDREW BELOUSSOV, Bolton, Ont., Canada

C-CLAMPS

I store C-clamps on a narrow shelf. A rubber strip, cut from a black rubber stretch tie-down, prevents the clamps from falling off the front, while brackets prevent the clamps from falling off the ends. This storage shelf has several advantages. The clamps will stay put without having to screw them closed, and it is easy to pick out a particular clamp because they are all visible. If you have several sizes of C-clamps, build a shelf for each size.

—JOHN BEAL, Excelsior, Minn.



Multi-Router
A Furniture Maker's
Dream Machine!



\$2695.00

Mortise and Tenon in Seconds!!

Angles and Compound Angles Easily Done!!

Constructed of heavy aluminum castings.

Work table tilts to a full 45 degrees.



800.480.7269
www.jdstools.com

READER SERVICE NO. 28

PHASE-A-MATIC

NEED 3-PHASE POWER for your woodshop? **1-800-962-6976** CNC available



PHASE CONVERTERS
www.phase-a-matic.com

READER SERVICE NO. 20

FALL 09
one week & weekend workshops in woodworking



scholarships
studio assistantships
work study
residencies
credit | CEUs

Woodworking
Charrisa Brock
Sarah Martin
David Scott

Woodturning
Bobby Clemmons
Clay Foster
Alan Hollar
Robert Rosand
Betty Scarpino

ARROWMONT
school of arts and crafts
556 Parkway, Gadsdenburg, TN
865-436-5860
www.arrowmont.org

READER SERVICE NO. 69

Introducing the W&H Model 206!



NEW

7 Year Warranty

Multi-Pass Kit **Vari-Feed Kit**

70 Powers St. Milford, NH 03055
phone. 800.258.1380
www.williamsnhussey.com

READER SERVICE NO. 55

QUALITY FOR LIFE!

5-Function Combo-Machines for every need and budget!

5-Function Combo-Machine Features:

- Three 4-HP motors w/ electrical brake
- 9" planing height
- European style sliding table saw w/ 4" cutting height
- Sawblade tiltable from 90°-45°
- Dado capacity up to 3/4" width
- 12" or 16" Jointer-Planer
- Quick knife change system
- CF 741 offers 1 1/4" shaper spindle tiltable from 90°-45°



Felder CF 531



Call for DVD!



Felder CF 741

visit our booth



July 15-18, 2009
Las Vegas, Nevada



Hammer C3 31

Quality and Precision made in AUSTRIA



FELDER-GROUP USA

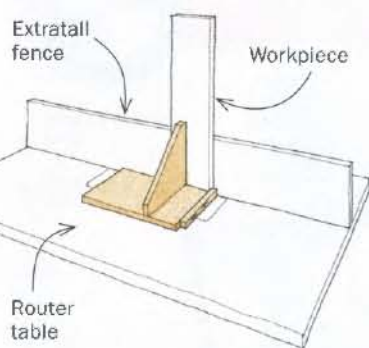
East: 2 Lukens Drive, Suite 300, New Castle, DE 19720
West: 1851 Enterprise Blvd., West Sacramento, CA 95691
S. Ca: Laguna Hills, CA 92653

salesinfo@felderusa.com
west@felderusa.com
s.ca@felderusa.com

DE: 866-792-5288
N Cal: 800-572-0061
S Cal: 866-714-6005
800-340-0233

READER SERVICE NO. 62

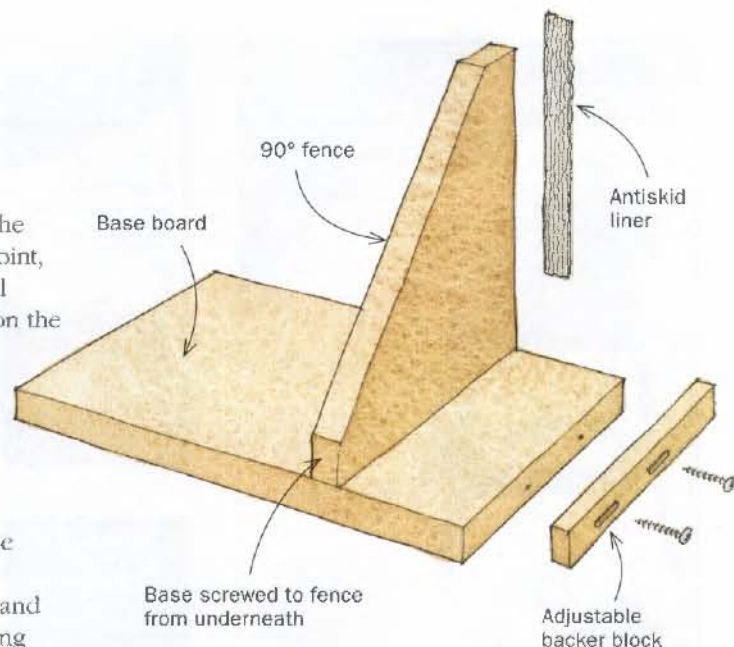
Safer way to rout vertical workpieces



While using a router table to cut the key, or pin, for a sliding dovetail joint, it's a challenge to keep the vertical workpiece against the fence and on the router table, while keeping your fingers away from the spinning bit. I've devised a surefire, safe method that also ensures a good, clean cut. It utilizes a tall fence and a vertical push stick.

The push stick also serves as the handle, helping you to keep the board tight and plumb against the router-table fence. The adjustable (and replaceable) backer block hooks the board to help keep it from rocking and also helps to prevent tearout at the end of the cut.

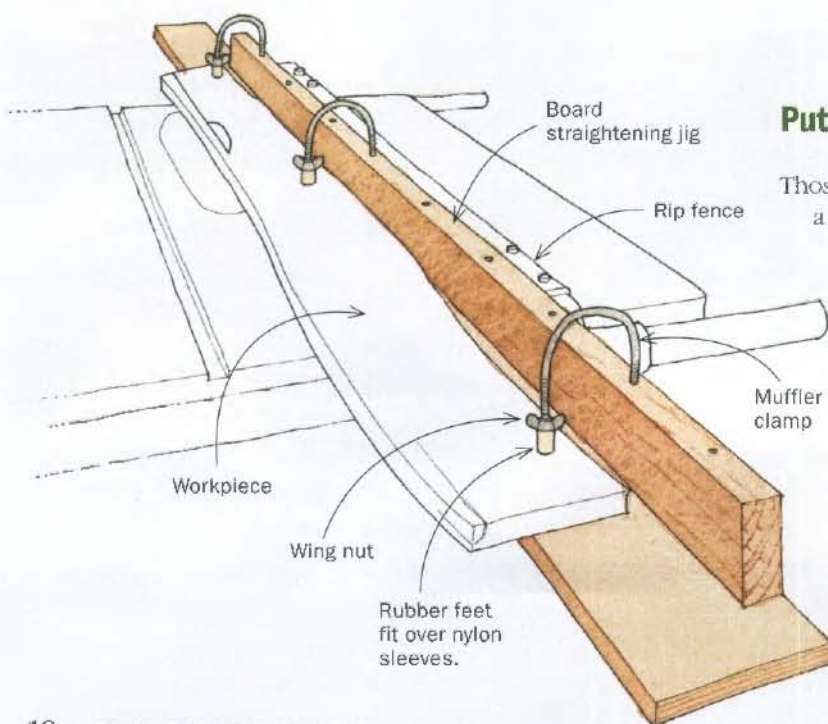
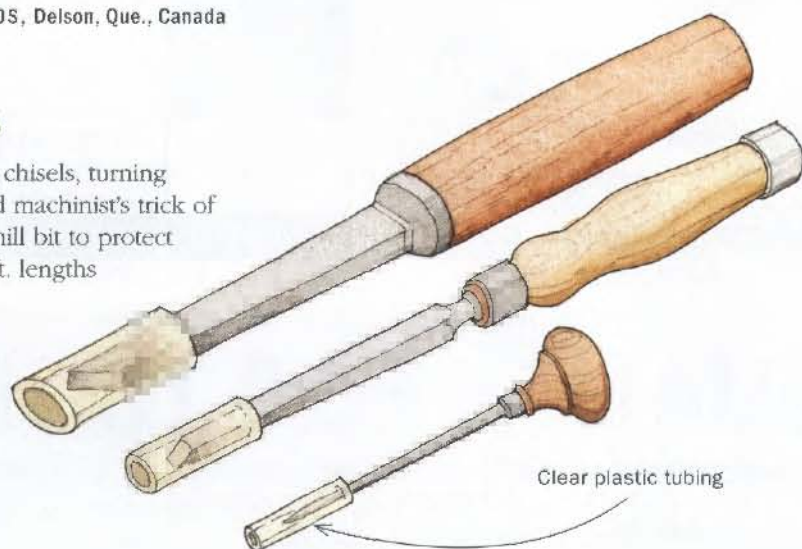
—SERGE DUCLOS, Delson, Que., Canada



Plastic tubing protects sharp tools

While looking for a way to protect my sharp chisels, turning gouges, and router bits, I remembered an old machinist's trick of sliding a piece of rubber hose onto an end-mill bit to protect it. At the hardware store, I bought several 1-ft. lengths of clear plastic tubing in different sizes. I then matched up the tool with the right-size tubing and clipped off a short length to protect the cutting end.

—JERRY HONEYCUTT, Winsted, Conn.



Put a straight edge on a bowed board

Those of us who have wanted to straighten bowed boards on a tablesaw have seen elaborate jigs that ride along the saw fence to give defective stock a perfect, straight cut. Here's one that's cheap and easy to make.

Start by screwing and gluing a 6-ft.-long board, 1½ in. thick by 2½ in. wide, to a 7-ft. scrap piece of hardwood plywood to make the base. The hold-downs are 3-in. muffer clamps (\$3 at auto-supply stores), with wing nuts, snug-fitting nylon sleeves, and rubber feet. The threads on the opposite leg of the clamps simply drop into ⅜-in.-dia. holes in the base. These clamps flex a bit and consequently lock down tight on the stock when the wing nut is tightened. I drilled multiple holes in the base so that I can shift the clamp positions as needed.

—KARL AROMAA, Rumford, Maine



Funny, the stain that protects family heirlooms can also protect your family business.

- Finest grade pigments and oils.
- ColorFast fade resistant technology.
- Consistent quality and color in every can.
- Innovative products and technology to meet the demands of today's pro.
- To learn more, visit cabotstain.com. Or call 1-800-US-STAIN.



OUR PERFORMANCE IS LEGENDARY.™

HAND TOOLS

Value-priced planes shine after tune-up

WOODCRAFT IS OFFERING a new line of handplanes, made in China, that carry their own Wood River trademark. I recently examined the complete line: four bench planes ranging in size from No. 3 to No. 6, and a low-angle block plane. According to Woodcraft, all are patterned after vintage Stanley bedrock-style planes.

I tried them all, but focused most of my testing on the No. 4 bench plane, as that's the size I use most often in my shop.

For starters, the plane looked beautiful. All the machining was clean and crisp. And the sole was about as flat as you can get. Indeed, I couldn't fit a 0.001-in. feeler gauge under a straight-edge spanning toe to heel.

The plane weighed in at a hefty 4½ lb. A smooth, thick coating of satin black paint covered the interior. The tote and knob, made from African rosewood, were nicely shaped and fit comfortably in my hands. Brass trimmings and a nickel-plated lever cap wrapped up the elegant detailing. I also liked the beefy high-carbon blade, measuring ⅞ in. thick and ground square to a 25° bevel. The back of the blade was flat, so it took little time to lap to a polished surface. After just a few minutes, I had honed the blade sharp and the plane was ready to use.

The plane's chipbreaker has a contemporary design that resembles a Lie-Nielsen or a Hock. Its beefy ⅞-in. thickness really stabilizes the blade. However, the bevel of the chipbreaker was ground out of square and it took about 20 minutes to correct it.

Also on the downside, the frog had been machined out of square, forcing the blade to drop lower on one side. In other words, with everything lined up, the blade was not parallel to the sole. This can be corrected by tilting the lateral adjustment lever. But, to me, a perpetually tilted lateral lever is a definite nuisance. I checked the remaining three bench planes for a repeat of the problem. Turns out, one had the same issue,

although it sloped in the opposite direction. The other two were just fine.

In use, after I reground its chipbreaker and learned to live with the lever tilt, the No. 4 performed as well as high-end planes, for about half the price. Of course, high-end planes don't require such prep work to get them cutting properly.

The Wood River planes have a lot going for them, but with some quality issues still to be resolved. Once sharpened and tuned, though, they can perform with the best. The No. 4 sells for \$109. Go to www.woodcraft.com for more information.

—Chris Gochnour builds furniture and teaches woodworking in Murray, Utah.

PLANE WARS

The introduction of Woodcraft's Wood River line of handplanes started a spirited discussion on Knots, our online forum at www.finewoodworking.com. Several posters suggested that the Wood River is a dead-ringer for the American-made Lie-Nielsen bench planes. Others noted that when Tom Lie-Nielsen began 25 years ago, he borrowed heavily from the Stanley bedrock designs. To add perspective, I put three No. 5 planes side by side—an old Stanley bedrock, a Wood River, and a Lie-Nielsen—and gave them an up-close look. To find out what I discovered, check out my blog at www.finewoodworking.com.

—Tom Begnal is an associate editor.



■ ACCESSORIES

The monster truck of mobile bases

I WORK IN A CORNER OF MY BASEMENT, so I keep several machines on mobile bases, moving them as needed. It's not always easy, as space is tight and the mobile bases I have are not very mobile. So I was eager to try Rockler's All-Terrain Mobile Base on my bandsaw and tablesaw. It features larger-than-usual 5-in.-dia. wheels, with urethane tires. Two swivel, and two lock. The base is easy to assemble and adjusts from 18 in. to 28 in.

The Rockler base made it easy to zigzag around my workbench and other machinery. To test its off-road capabilities, I made a proving ground of extension cords, sawdust, chips, and wood scraps. My bandsaw and tablesaw rolled effortlessly across all the debris, though I had to hold the tall bandsaw with extra care to prevent it from tipping as I pushed. Also, the bandsaw had some problems while parked. The large, soft wheels give the base some spring, making the bandsaw feel unstable. Also, when I'm cutting curves, I stand close to the machine, and the wheels and housings often interfered with my footwork.

I wouldn't use the base on a bandsaw, but it certainly has found a home on my tablesaw. The All-Terrain Mobile Base costs \$190 and is available from Rockler (www.rockler.com).

—Thomas McKenna is a senior editor.



■ ACCESSORIES

Lumber metal detector works well up to 1/8 in. deep

WE WERE LUKEWARM on the Lumber Wizard when it was reviewed about eight years ago (FWW #152), as the process was slow and the results were inconsistent. So when the company came out with a new version, the Lumber Wizard III, I wanted to see if the metal detector worked any better. In this test, it proved effective at finding metal parts within 1/8 in. of the wood's surface. So, if you work with relatively thin stock (under 3/4 in. thick), and scan from both sides of the stock, the Lumber Wizard can find any metal in the wood.

However, if the stock is thicker, and the metal is buried deep enough, the Wizard might not tell you it's there.

The Lumber Wizard III sells for around \$100. For more information, go to www.wizarddetectors.com.

—T.B.

Metal finder.

The Lumber Wizard metal detector nails thin stock, but is less impressive when the stock is thick.



■ BITS AND BLADES

One bit cuts 16 different rabbets and flush-trims, too

A NEW RABBIT-BIT SET from Infinity Cutting Tools comes with 17 different-size bearings so you can cut rabbets from 1/16 in. to 3/4 in. wide. You also can cut metric sizes from 6 mm wide to 18 mm wide. A flush-trim bearing rounds out the package.

The 2-in.-dia. bit has a 1/2-in.-dia shank and 1-in. cutting length. To get a sense of cut quality, I mounted the bit in a router table and made a number of rabbet and flush-trimming cuts in red oak and pine. All the cuts were clean and burn-free.

The Infinity Cutting Tools Mega-Rabbit set (Item No. 00-557) sells for \$130. When you consider that a single 3/8-in. rabbet bit can cost you \$15 to \$20, the set can save you some cash if you cut a lot of different rabbets. To learn more, go to www.infinitytools.com.

—T.B.



Vacuum Pressing Systems, Inc.



The leader in vacuum technology for woodworking offers innovative products for:

**VENEERING • LAMINATING
CLAMPING**

vacupress.com

Vacuum Presses, FlipTop Tables,
Veneering Accessories and Videos

553 River Road, Brunswick, ME 04011 • 800-382-4109

READER SERVICE NO. 101

Everything... but the Wood

The leading supplier for all your woodworking needs



- Best industry products
- Everyday low prices
- Same day shipments
- Huge warehouse selection
- Fast, accurate service
- Honest return policy
- Visit or call us today!

Join Twitter, Facebook and YouTube
for special discounts

888.CMS.HDWE
www.CabinetMakersSupply.com/discount

READER SERVICE NO. 92

Mortise Pal™

PRECISION MORTISING JIG



MORTISES MADE EASY!

WWW.MORTISEPAL.COM

READER SERVICE NO. 70

THE NORTHWEST WOODWORKING STUDIO

A SCHOOL FOR WOODWORKING

**Summer Classes 2009
Portland Oregon**



503.284.1644 www.northwestwoodworking.com

READER SERVICE NO. 27

Operate 3-phase woodworking machines from single-phase!



- Immediate delivery
- Two year warranty
- True 3-phase output
- Whisper quiet operation
- No-charge tech support, 24-7
- Regulated output for CNC Machines
- The most capacity at the least cost, guaranteed!
- Protect your investment - Insist on Phasemaster®
- Visit us today at www.kayind.com

NEW!
Turn-on 3-phase
with wireless
remote.



General Offices
804 N. Hill St.
South Bend, IN 46617
800-348-5257
574-289-5932 (fax)

Western Region
4127 Bay St. #6
Fremont, CA 94538
510-656-8766
510-657-7283 (fax)

The World Leader in Single to Three-Phase Power Conversion

READER SERVICE NO. 17



Pinnacle is defined by Webster's as *the highest point of development or achievement*. The latest offering of accessories that bear the Pinnacle® name have certainly lived up to this definition. Every detail of these Pinnacle® tools was engineered with one thing in mind: to provide woodworkers with tools that empower them. Pinnacle® tools are available exclusively at Woodcraft.

Made In The USA

**Pinnacle®
36" Heavy Duty Clamp Rack**
148549



**Pinnacle®
24" Light Duty Clamp Rack**
148548

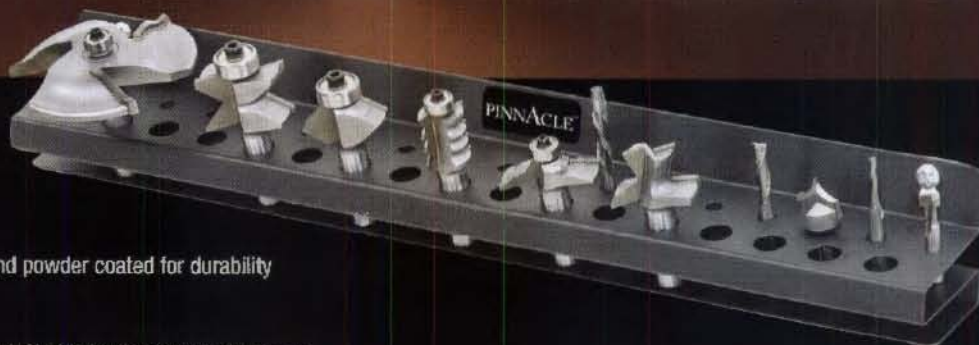


Pinnacle® Clamp Racks

- Made of sheet steel and accurately formed and powder coated for durability.
- Both racks have pre-drilled mounting holes on 16" center to line-up with wall studs.
- The Light-duty Clamp Rack is constructed with ¼" wide slots to fit most F-style clamps with a capacity of up to 23 clamps.
- The Heavy-duty Clamp Rack has welded construction to hold hundreds of pounds of clamps at one time and the ½" wide slots will fit most bar and parallel style clamps with a capacity of up to 18 clamps.
- These racks will not fit pipe clamps.

**Pinnacle®
Router Bit Rack**
148547

- Made of sheet steel and accurately formed and powder coated for durability
- Overall length is 18"
- Each rack holds up to 35 different router bits: (18) ¼" shank and (17) ½" shank
- Pre-drilled mounting holes on 16" centers allow easy attachment to the side of a cabinet or on a wall



Router bits and clamps not included.

PROFESSIONAL QUALITY TOOLS™

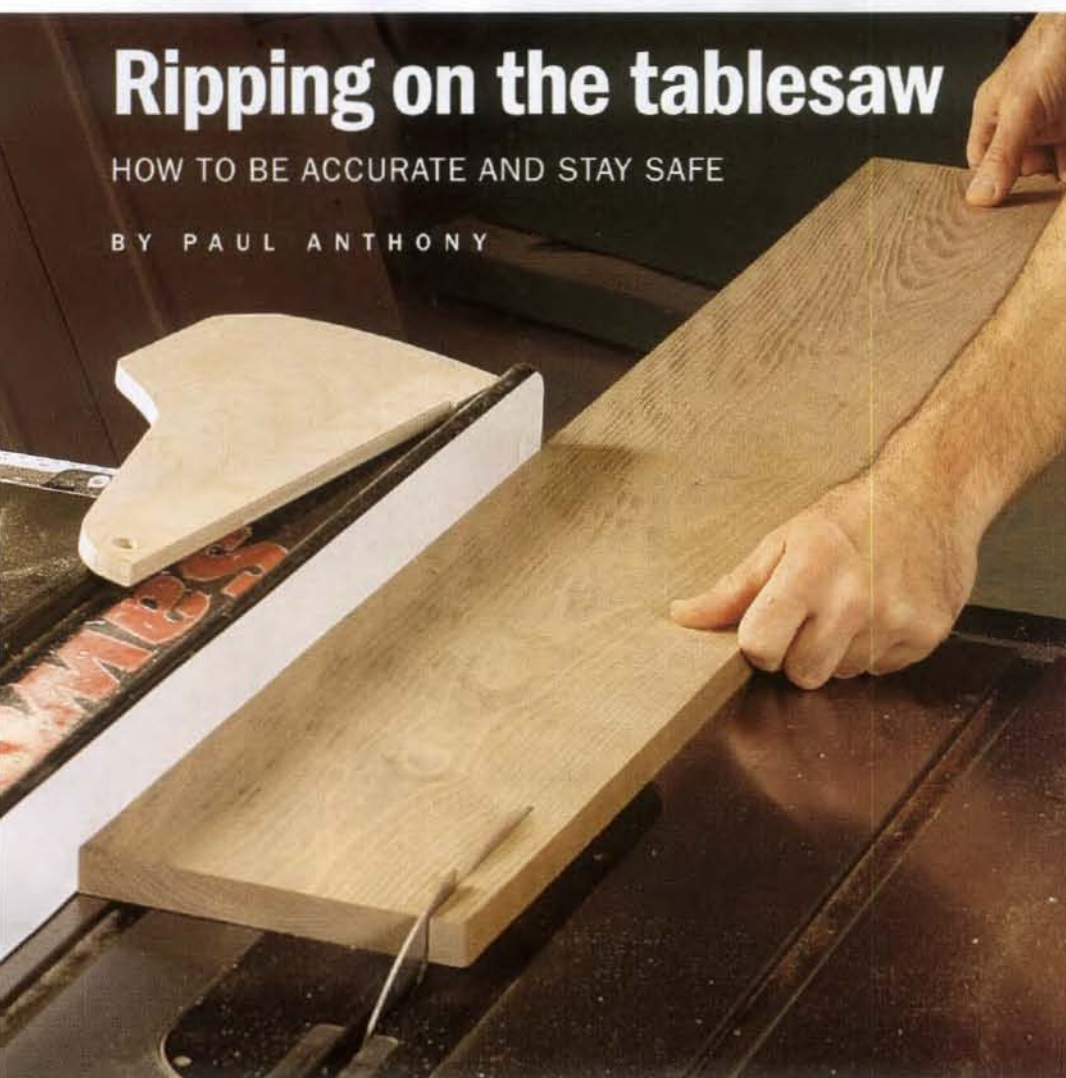
Available Exclusively At Woodcraft!

**For A Free Catalog Or To Find Your Local Woodcraft Store, Visit [woodcraft.com](http://www.woodcraft.com)
Or Call 800-225-1153. http://www.woodcraft.com/pinnacle_FW.aspx**

Ripping on the tablesaw

HOW TO BE ACCURATE AND STAY SAFE

BY PAUL ANTHONY



The tablesaw is a wonderful tool for cutting parts to size, and ripping is its most common task. "Ripping" means sawing wood parallel to its grain—usually when cutting boards to narrower widths. You can do the job with a bandsaw or a portable circular saw, but a tablesaw is much more efficient. It is powerful, and the rip fence allows you to cut identical multiples. The large surface also makes handling stock of all sizes much easier.

This article will tell you how to safely and accurately use the tablesaw to rip solid lumber as well as sheet stock.

To do the work safely, you need to follow the proper steps and use the

right accessories, including—most importantly—a splitter. A riving knife is a more sophisticated splitter, and works even better.

Prep the saw

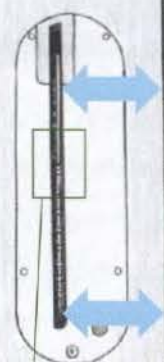
Most tablesaw accidents result from violent kickback during ripping, but a properly aligned splitter will prevent kickback by keeping the workpiece from contacting the rising rear teeth of the blade and being thrown back at you. Also, when possible, use a blade guard to prevent hand-to-blade contact and keep sawdust out of your face.

Safety and quality of cut also depend greatly on a straight fence that's set parallel to the blade. Even a premium

IS YOUR SAW READY?

SET THE FENCE

Measure from the blade to the fence at both the front and back of the blade to ensure the blade and fence are parallel. A fence that toes in toward the blade can cause rough cuts, burning, or even violent kickback.

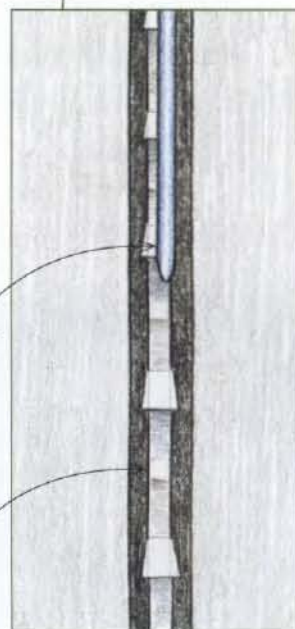


ALIGN THE SPLITTER

The blade and splitter should be flush on the side that faces the fence. Raise the blade to full height and use a straightedge to align them.

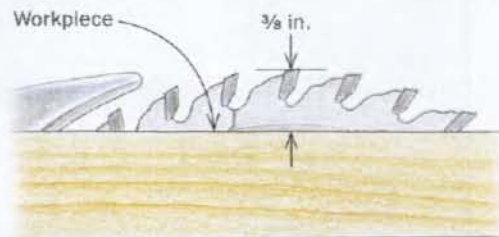
Splitter

Blade



ADJUST THE BLADE HEIGHT

Set the blade to about $\frac{3}{8}$ in. above the surface of the workpiece.



Crooked edge spells danger

fence goes out of alignment after a while, so make sure to check it for parallel occasionally by measuring from the blade to the locked fence at both the front and the rear of the blade. Some woodworkers cock the outfeed end of the fence away from the blade by $\frac{1}{32}$ in. or so, which is fine.

Finally, an outfeed table is an absolute necessity, even when ripping short pieces. Without one, your work just falls to the floor, possibly damaging edges and corners. Outfeed support is critical when ripping long stock, which may otherwise start to tip off the saw table before the cut is complete, forcing you to bear down on the trailing end of the board right at the spinning blade.

You might also want to set up infeed support, especially for long, heavy boards or sheet goods.

Prep the stock

To rip safely, the edge that contacts the rip fence must be straight, and the face that bears against the table should be flat. That way, the board doesn't pinch against the blade or rock as you're feeding it.

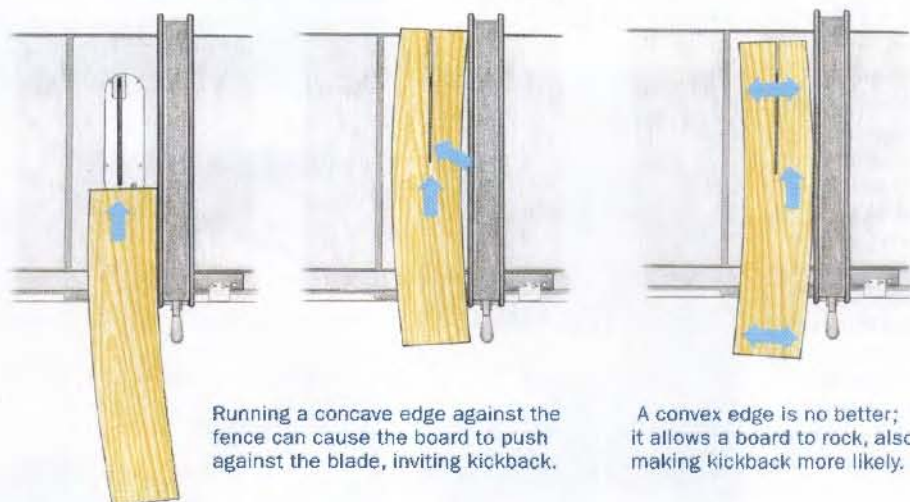
So the first step is to create a straight edge. If the edge is already reasonably straight, the quickest approach is to run it across the jointer. If the edge is severely crooked or is a waney, "live" edge, you'll need to saw it.

You can trim the edge straight on the tablesaw by temporarily tacking a straightedge guide board to the workpiece and running that edge against the fence. Alternatively, strike a cut line on the board and saw to it using a bandsaw, which poses no danger of kickback. After bandsawing, joint the edge straight.

Ideally, your stock should be jointed and planed to final thickness before ripping. In the process, you create the flat face for safe feeding. But this isn't always possible. For example, a board that's too wide for your jointer may have to be ripped into narrower widths first.

Let it rip

With one edge of the board jointed straight (and a push stick at hand) you're ready to make the cut. The exact way you



Running a concave edge against the fence can cause the board to push against the blade, inviting kickback.

A convex edge is no better; it allows a board to rock, also making kickback more likely.

TWO GOOD SOLUTIONS



Mild curve? Joint it. With relatively straight stock, a pass or two over the jointer should yield an edge straight enough to run against the tablesaw fence.



Serious curve? Saw it. Tack a straightedge guide board to the workpiece (above left). The guide runs against the fence so the saw can make a straight cut (below left). Anthony keeps several lengths of $\frac{1}{4}$ -in. plywood on hand for this. He puts the nails into a waste area of the board.



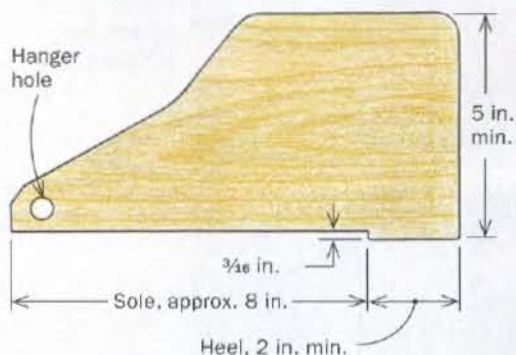
A dance with 3 steps

Take a balanced stance. Stand slightly to the left of the workpiece, facing the fence with your legs roughly parallel to the blade. The idea is to remain solidly grounded and well balanced throughout the cutting process.



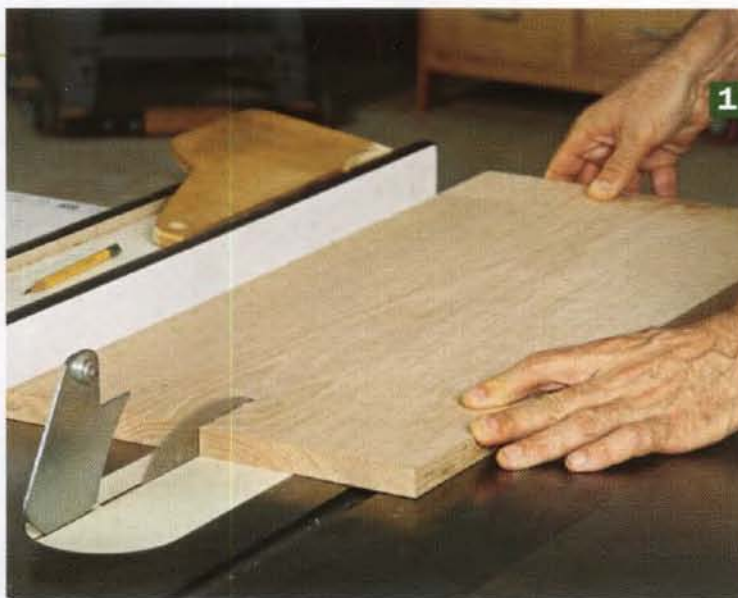
SHOPMADE PUSH STICK

A shoe-style push stick like this offers the best control. The long sole holds the workpiece down and also helps you keep it against the fence to prevent kickback. The heel hooks over the end for feed force.

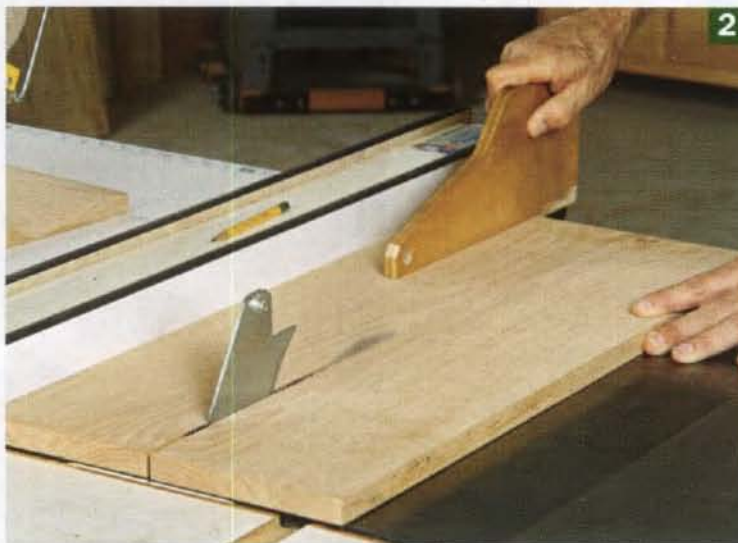


handle the workpiece will depend on the material itself, how long, thick, or heavy it is, and how wide a rip you're making.

Turn on the saw first, then lay the board on the table against the fence with the leading end a couple of inches from the blade. Use your left hand to press the board downward and against the fence at the same time. With your right hand on the trailing end, push the board steadily forward into the spinning blade. When the trailing end of the board is completely on the table, pick up the push stick with your right hand and use it to continue feeding the stock. As the cut nears completion, remove your left hand from the board for safety's sake,



1 Start the cut. Push the stock with your right hand on the board's trailing end. Use your left hand to press the board downward and against the fence at the same time. If the leading edge isn't on the table, the blade can slap it down ferociously.



2 Reach for the push stick. When the board's trailing end is on the table, pick up the push stick and use it to continue feeding the stock. Feed the stock as quickly as you can to prevent burning. There's no reason to go slow unless the saw is bogging down.



3 Follow through with one hand. As the cut nears completion, take your left hand off the board. Keep pushing with the stick until the right-hand piece is past the splitter. Throughout the cut, be sure to keep the board against the fence.

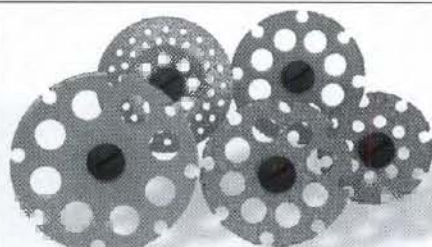
**WAREHOUSE
SALE**

**50%
OFF**

**FEATURING
OVER
200 BOOKS**

**Hurry!
Limited Time - Limited Quantities
Visit:
www.FineWoodworking.com/Sale
Open to our readers until midnight July 31, 2009.**

© 2009 The Taunton Press



**HIGH PERFORMANCE CARBIDE WHEELS
FOR YOUR DREMEL® TYPE DRILL!**

Fast, Clean, Cutting & Shaping - 1/8" Shafts / 35,000 rpm
Take them for a spin & Buy at: www.duragrit.com/fw



Tools That Really Work! And Work! And Work...

READER SERVICE NO. 30

Moisture Meter

**HIGH-PERFORMANCE
LOW-COST**

- mini-Ligno E/D -
Proven accuracy and
quality.

Check
moisture
to avoid
shrinking!



Designed for woodworkers.
New!! 2 year warranty!!!



**LIGNOMAT USA : 800-227-2105
www.lignomat.com**

READER SERVICE NO. 51



Check our website for the techniques DVD

Success needs more than just joinery...

To be a successful furniture maker requires many skills. You need to understand design and the essential survival skills of selling your work. Established over 25 years ago David Savage Masterclass Workshops teach old world values with new world insight. First class building techniques, style and design, and the essential survival insights that help pay the bills. Choose from: a One Week Taster Course, a Ten Week Intensive, or a One Year 'Lifetime Master Class'.

David Savage
BRITISH MASTERCLASSES
www.finefurnituremaker.com

The David Savage Workshops and Masterclasses have trained and influenced one out of ten makers in a generation of British craftsmen

866-350-2575

www.osborneturnings.com



Distinguish your designs with moldings available in a variety of wood species.



Osborne Wood Products, Inc. introduces NEW

Half Round Cabinet Moldings

READER SERVICE NO. 39

Mortise & Tenon
Made Easy with the Leigh FMT



Router not included

See the Videos at leighjigs.com

LEIGH

Leigh Router Joinery Jigs

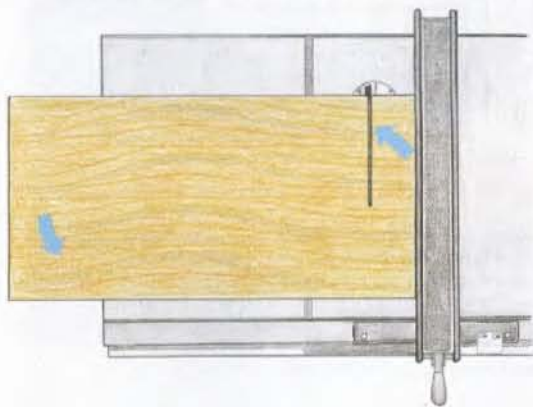
leighjigs.com 800-663-8932

READER SERVICE NO. 15

How to rip sheet goods

WHAT NOT TO DO

If a panel is wider than it is long, don't try to run it against the rip fence. It is too easy to rotate the panel, sending it dangerously onto the back of the blade. Use some other method for a cut like this.



continuing forward with the push stick until the right hand is past the splitter.

Get some support

The key to ripping large sheets of MDF or plywood is proper support. Best is a large outfeed table that extends at least 50 in. beyond the splitter. You might also want infeed support for heavier panels.

For easiest handling, begin with the cut closest to the center. Lock the rip fence in position. Instead of hoisting the panel onto the saw and infeed support at the same time, place the panel on the saw (with blade lowered and splitter removed), then drag it onto the infeed support.

With the blade raised and the splitter reinstalled, turn on the saw and stand at the left rear corner of the panel. Keep your eyes glued to the fence, push the panel forward with your right hand, and apply enough sideways pressure with your left to keep the panel against the fence. Push until the saw table is carrying the full weight of the sheet. Let the panel sit for a moment, move around to its rear edge, and place your hands so that each one is centered between the blade and the panel edge. Maintain your focus on the fence. Push straight forward until the cut is complete. □

Paul Anthony is a woodworker and the author of Taunton's Complete Illustrated Guide to Tablesaws (The Taunton Press, 2009).



1 Lift the sheet onto the table. It's easiest to place a large panel on the saw first (with the blade lowered and the splitter removed), and then drag it onto the infeed support, in this case a router table that's the same height as the saw table.



2 Stand at the rear corner. Position yourself at the left rear of the panel, with your right hand on the trailing edge and your left as far forward as is comfortably possible. Keep a wide, balanced stance.



3 Focus your attention on the fence. Push the panel straight forward with your right hand, and apply enough sideways pressure with your left hand to keep the panel against the fence.



4 Finish the cut at the rear. Once the saw table is carrying the full weight of the sheet, move around to the rear and place your hands so that each is centered between the blade and the panel edge.

"Star Drive" Wood Screws

The Ultimate Wood Screw

- ★ Pocket, Cabinet & Finish Screws
- ★ Yellow Zinc Screws 1" - 14"
- ★ Lag Screws 2-1/2" - 12"
- ★ Stainless Steel 1-1/4" - 4"
- ★ ACQ Comp. (Exterior) 1-1/4" - 6"
- ★ Trim Head Stainless Steel 1-5/8" - 4"
- ★ New "Star Drive" Gutter Screws
- ★ New 1-3/4" Composite Fence/Fascia Screws
- ★ New Cement Board Screws *Since 1999!*



FREE SHIPPING ON ORDERS OVER \$100 IN CONTINENTAL US!

SCREW PRODUCTS INC. 1-888-888-3306
www.screw-products.com

READER SERVICE NO. 25



Inside Passage School
of Fine Woodworking

founded on the teachings of
James Krenov
& Robert Van Norman

One & Six Week Artisan Programs
Nine Month Craftsman Program

1.877.943.9663

www.insidepassage.ca

READER SERVICE NO. 12

Vacuum Presses

for all your veneering and laminating needs.



Vacuum Laminating Technology
800-403-2344 707-961-4142
www.vacuum-press.com

ROUTERBITS.COM

Order on-line at
www.routerbits.com



Made in the USA

Whiteside Router Bits

READER SERVICE NO. 99

HEARNE HARDWOODS, Inc

Extraordinary Hardwood Lumber
www.hearnehardwoods.com
Internet Store

One of the Largest Specialty
Lumber Yards in the World!

~ Over 100 species in stock!
~ Domestic & Exotic lumber
~ Specializing in Cherry,
Walnut, European Lumber,
Burls, Figured Hardwoods,
Custom Flooring, Flitches,
Wide Slabs & rare wood!

Call Toll Free!
(888) 814 - 0007

200 Whiteside Drive
Oxford PA, 19363
info@hearnehardwoods.com

READER SERVICE NO. 65

zing
LASER

Expand Your
Capabilities
Starting at \$7,995!

MADE IN USA

1.888.437.4564
sales@epiloglaser.com
www.epiloglaser.com/fw.htm

EPILOG
LASER

READER SERVICE NO. 60

Dovetails

Made Easy with Leigh Joinery Jigs



Through



Single Pass
Half-Blind



Variably Spaced
Half-Blind



Sliding



24" Leigh D4R



24" Leigh Super 24



18" Leigh Super 18



12" Leigh Super 12

See the Videos at leighjigs.com

LEIGH
Leigh Router Joinery Jigs

leighjigs.com 800-663-8932

READER SERVICE NO. 14

Wood allergies

A REACTION CAN STRIKE RANDOMLY
AND WITH LITTLE WARNING

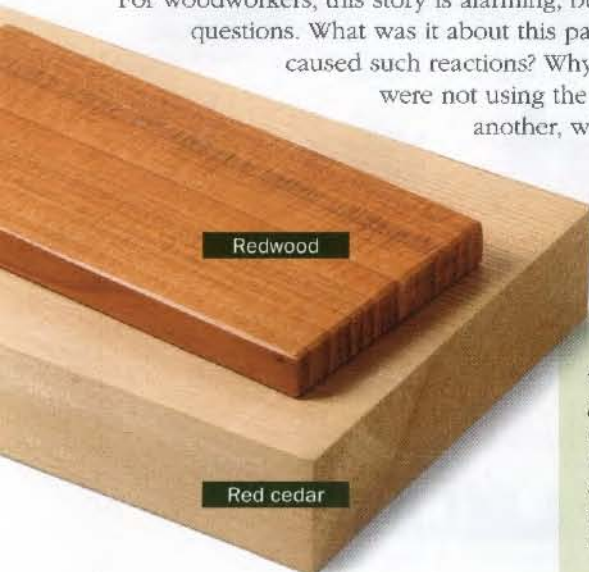
BY DAVID H. JONES

The cabinetmakers at ShackletonThomas, a custom furniture maker in Bridgewater, Vt., were excited at the prospect of working with a new wood. A customer had ordered a bedroom set to be made from Australian lacewood. Five workers assigned to the order began jointing, planing, and rough-cutting the boards as normal.

On the third day, one of the workers developed a red rash on his arms that soon turned into blisters. Taking no chances, the shop manager sent him to the hospital. But the genie was already out of the bottle. Of the five people directly working with the lacewood, four had allergic reactions, as did two others working on different projects in the same room.

While the six victims were recuperating at home on steroids, the remaining woodworkers donned Tyvek suits and respirators to complete the bedroom set. After the pieces were shipped, the entire workshop was professionally vacuumed, air filtration units were installed, and the bags on the dust-collection system were replaced.

For woodworkers, this story is alarming, but it also raises questions. What was it about this particular species that caused such reactions? Why did some who were not using the wood react while another, who was in direct



Even domestic woods can cause problems. Western red cedar and redwood can cause allergic reactions in a few who work with them.



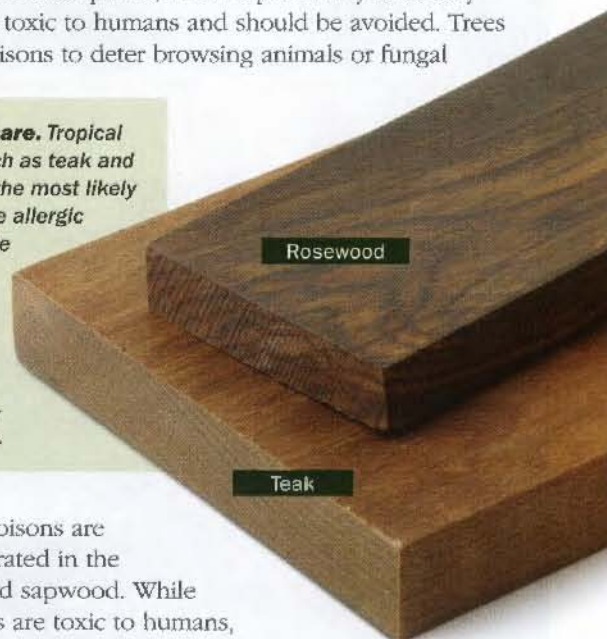
Near fatal attraction. Australian lacewood is strikingly attractive, but some of the woodworkers making this piece had a serious allergic reaction to the wood.

contact with it, didn't? Finally, is there any way you can avoid such a reaction yourself, short of looking like a member of a hazmat team every time you use a new wood?

A wood's natural defenses are to blame

We all know that some plants, such as poison ivy or deadly nightshade, are toxic to humans and should be avoided. Trees also contain poisons to deter browsing animals or fungal

Handle with care. Tropical hardwoods such as teak and rosewood are the most likely woods to cause allergic reactions. While benign to the majority of woodworkers, they can give others skin irritation or flu-like symptoms.



attack. These poisons are mostly concentrated in the leaves, bark, and sapwood. While very few woods are toxic to humans, many can cause allergic reactions.

An allergenic plant is different from a toxic one because while the latter affects almost everyone, the former can be benign to one person yet cause a severe reaction in another. Wood allergies are triggered by extractives, chemical compounds found in the heartwood. Who is sensitive is a matter of chance, since each person's unique metabolism

determines whether he or she will have a reaction. Some people have an immediate reaction to a certain wood, but the chances of a reaction increase as exposure increases.

What is more frightening is that after you have an initial reaction you enter a permanent state of sensitization or hypersensitivity. From that point on, your body will always respond to this particular wood, and you may become allergic to other woods that did not bother you before.

Symptoms to look for—Wood allergies affect the skin or the respiratory system. Sensitization dermatitis, a skin allergy, is similar to a poison ivy outbreak. The reaction ranges from simple reddening and itching of the skin to swelling, blisters, and possibly permanent skin thickening and cracking.

Two reactions occur in the respiratory system. Wood dust-triggered asthma is a swelling of the air passages in the lungs that makes breathing difficult. A rarer respiratory reaction is hypersensitivity pneumonitis, which exhibits flu-like symptoms. Sometimes allergies cause general symptoms such as swelling or stiffness in the hands, severe headaches, visual disturbances, a rapid pulse, difficulty in swallowing, and diarrhea.

With allergies, exposure refers to the amount of an allergen that contacts the body. Several factors determine the degree of your exposure. The smaller the particle, the greater the danger for two reasons: Small particles can lodge deeper in the lungs; and, for the same weight of wood, small particles have a larger surface area that can contact the skin. For example, you sustain a greater exposure from a pound of fine dust than the same weight of handplane shavings.

Also important is the intensity of the contact: More dust in the air increases your exposure. And, obviously, the longer you work with a wood the greater your exposure.



Approved protection. Don't rely on a simple hardware-store dust mask to protect you. Use a NIOSH-approved dust mask or respirator.

Woods that may cause reactions—Unfortunately there has been no comprehensive scientific study of wood allergies, and among the published reports there is very little agreement on which woods are most dangerous. In very general terms, the risk of allergies increases from domestic softwoods to domestic hardwoods to tropical species.

Exceptions to the safe softwoods rule are western red cedar and, to a lesser extent, redwood. While slightly more dangerous overall than domestic softwoods, no domestic hardwood seems to stand out as causing widespread allergies. The real danger comes from certain tropical woods. The good news is that American mahogany, probably the most common tropical wood used for fine furniture, is relatively benign. Among the woods to look out for are rosewood, cocobolo, Goncalo alves, olive, teak, and the aforementioned Australian lacewood, also known as silky oak.

Minimize the risk

Although allergies affect only 2% to 5% of people, if you are a regular or first-time user of tropical woods in particular, it is still worth taking precautions. Various Internet sites give lists of allergenic woods, the types of allergic reaction each wood causes, and the likelihood of a reaction (see p. 32).

If you choose to use a wood that causes allergic reactions, minimize your contact,



The big cover-up. If you are susceptible to allergic reactions, minimize your contact with dust when sanding tropical hardwoods.

particularly with the dust. Use a central dust-collection system or shop vacuum attached to power tools to catch as much dust as possible at the source. Open some windows and outside doors to draw fresh air into the shop. Since dust collectors are not 100% effective, also use dust masks and respirators approved by NIOSH (The National Institute for Occupational Safety and Health; for more, see *FWW* #201, "Protect Yourself from Wood Dust"). Meticulously clean the shop by removing dust immediately after completing a task, and ultimately when you finish the project.

To prevent skin contact, wear long pants, a shirt with tight, long sleeves, close-fitting gloves, and a hat. An apron will add protection by keeping dust from entering the top of your pants. Once you have finished work for the day, take a shower and change clothes as soon as possible. The key is to minimize your total exposure time.

Be ready for the worst

For most woodworkers who suffer an allergy to wood, the experience is more of a nuisance than an emergency, with just a rash or flu-like symptoms. In the most extreme circumstances,

Web info on toxic woods

www.mnwoodturners.com/New_Member_Docs/Toxic_Woods_Chart.html

www.mimf.com/archives/toxic.htm

<http://old.mendelu.cz/~horacek/toxic.htm>

If possible, search by the scientific name, as some common names cover multiple species, some benign, others potentially dangerous.

if swelling develops rapidly, particularly involving the mouth or throat; if you have trouble breathing, or feel dizzy, light-headed, or faint, doctors advise that you leave the shop and call 911 for an ambulance to the hospital. Anaphylactic shock (hypersensitivity to a foreign substance) can be fatal if it leads to severe low blood pressure or respiratory or cardiac arrest. While waiting for the ambulance, take an antihistamine such as Benadryl if you can swallow without difficulty.

If you are feeling faint or light-headed, lie down with your feet higher than your head. If you have been prescribed an epinephrine kit, or EpiPen, inject yourself. Bystanders may have to administer CPR if you lose consciousness, quit breathing, and have no pulse. Be prepared to tell the medical

professionals what medications you have taken or injected—if you are alone, write down this information in case you lose consciousness.

The chances of this kind of reaction are very, very small. Woodworkers should go on exploring the world of beautiful woods but just use a little caution when using them. Have fun and remain healthy. □

www.hammerusa.com

Hammer

The obvious choice!

The most popular European woodworking machine delivered to your door for FREE!

A3 31 Jointer-Planer

- 12" Jointer-Planer
- Change functions within seconds
- 3-self-setting planer knives
- 4 HP single phase motor
- Massive cast iron tables
- Rolling carriage available
- Digital readout for planer bed (available upon request)

NOTE:

Free delivery to the 48 contiguous states only!
Offer valid for orders placed in July/August 09



visit our booth



July 15-18, 2009
Las Vegas, Nevada

FELDER-GROUP USA

DE: 866-792-5288

N CA: 800-572-0061

S CA: 866-714-6005

CAN: 800-340-0233

HAMMER.
Quality and precision
made in AUSTRIA

READER SERVICE NO. 61

Made in USA

VAC-U-CLAMP

Superior products for the woodworking professional!

NEW! Pro 6.0

Vacuum Pressing System

\$899.00

Our NEW Pro 6.0 combines the best pump with the best bag!

Specifications:

- 0.5 CFM
- 27.5" Hg. Vacuum Level
- 37 LBS
- Electronic Check Valve
- Powder Coated Steel Case
- All Controls And Vacuum Port Front Mounted
- In-line Cleanable Vacuum Filter
- Vacuum Hose
- 20 mil, 54"x109", polyurethane vac. bag

visit: www.vac-u-clamp.com call: 888-342-8262

READER SERVICE NO. 68

Center for Essential Education School of Woodworking



www.cfeeschool.com

(254) 799-1480

for full details

1-12 day foundational courses in
woodworking and fine furniture making

READER SERVICE NO. 4

14-DAY
FREE TRIAL
FineWoodworking.com/tryit

dream it

then build it

Imagine creating the workshop of your dreams – with everything you need in just the right place. Then find out exactly how to make it happen with a 14-day free trial subscription to FineWoodworking.com.

Videos Discover more than 450 videos from seasoned pros demonstrating woodworking techniques.



Gallery Explore over 1,000 pieces of furniture, including tables, chairs, desks and chests in our inspirational gallery.

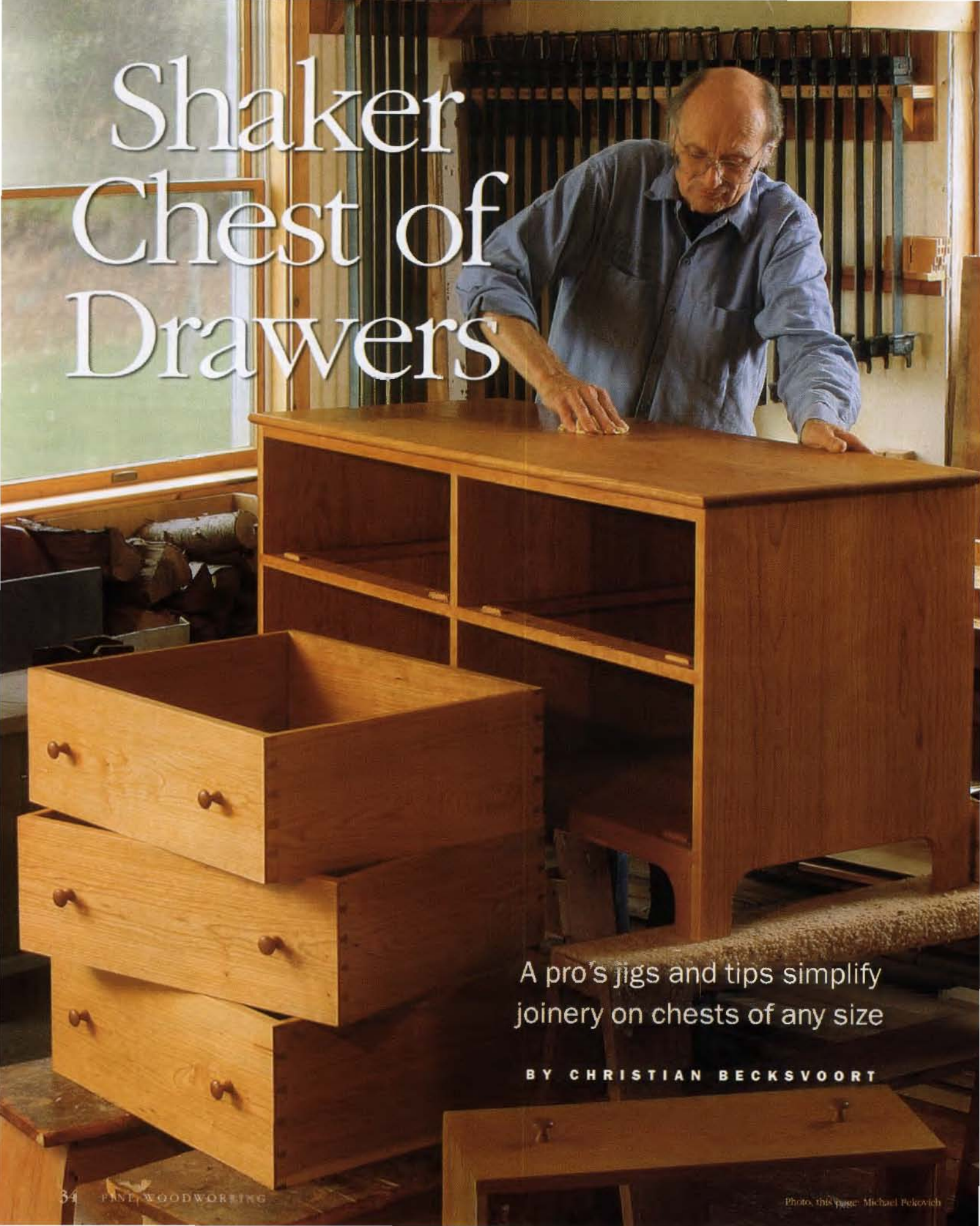


Archive Find over 1,700 articles from *Fine Woodworking* issues #1 through the latest, including those out of print.



FineWoodworking.com
Find fresh ideas that click.

Shaker Chest of Drawers



A pro's jigs and tips simplify
joinery on chests of any size

BY CHRISTIAN BECKSVOORT

Years ago, clients wanted me to make a blanket chest to store shirts and sweaters. Blanket chests are great for quilts and blankets, but they tend to allow small items to drift toward the bottom and get lost. For clothes, I mused, drawers would make the contents more accessible. And if I used the same outside dimensions as a blanket box, they could still place the chest at the foot of the bed and sit on it, or push it against the wall to use as a dresser. The different drawer depths would add to the versatility of what the chest could hold. They took my advice and they still love the finished chest.

As with much of my work, this design is heavily influenced by the Shaker design ethic, with its simple lines, functional design, solid construction, and cherry wood. There are a number of parts, but the construction is straightforward. I use half-blind dovetails to secure the sides to a subtop, and a sliding dovetail to secure the bottom to the sides. A vertical divider gets centered in the top and bottom and dadoed in place. Front and back rails are notched around the vertical divider and dovetailed into place. I use a sturdy frame-and-panel back, glued into a rabbet, so the piece looks beautiful from all directions. And the main top gets screwed in place from the underside of the subtop. This is the same construction I use on all my case pieces, so the anatomy could work for a taller chest, too.

Tackle the sides first

Most of the business happens on the side pieces. But before I hand-chop any half-blind dovetails, the side pieces get a rabbet, leg arches, a sliding dovetail, and a dado with a dovetail at the front.

First, rabbet the side pieces with two rip-cuts on the tablesaw. This rabbet will accept the back. Then, draw the leg arches on the side pieces and use a band-saw to cut them out and a block plane to smooth the straight edges. I clean up the arches using a balloon sander on my lathe and finish up with hand sanding.

Now it's time to pick up the router and tackle the dado/dovetail that holds the front and back rails and the drawer runners, as well as the sliding dovetail that

Pro method

DUAL-PURPOSE JIG FOR DADOES AND DOVETAILS

Like many chests of drawers, the sides of this one need a dovetail/dado combo for the rails and drawer runners, and a long sliding dovetail for the bottom. One simple jig handles them all.



Setup is easy. Registering off the front edge of the side, it's easy to clamp the jig square and cut dados and dovetails precisely.



Dovetail meets dado. Use a $\frac{3}{4}$ -in. dovetail bit to cut the dovetail notch for the front and back rails (above left). Without moving the jig (Becksvoort has two identical routers so he doesn't have to change bits), use a $\frac{3}{4}$ -in. straight bit to cut the dado that will hold the drawer runners (above right).



Two cuts for a long sliding dovetail. Before the final pass with a $\frac{3}{4}$ -in. dovetail bit, Becksvoort uses a smaller straight bit to waste away the material, making the dovetail cleaner and easier to cut.

Online Extra

For Becksvoort's complete finishing recipe for cherry, go to FineWoodworking.com/extras.

holds the bottom. For all three I use a shopmade jig with two parallel bars, spaced the width of the router base, clamping it square to the carcass side. The same jig works for the dados on the sides of the vertical divider and the dados in the subtop and bottom that hold the vertical divider. While the router and jig are out, cut the dados in each side of the vertical divider. Along with the dados in the sides, these will hold the drawer runners. Line them up with the dados on the sides, but leave the piece a bit long until you glue up the carcass and get an exact measurement.

Dovetailing a large case piece

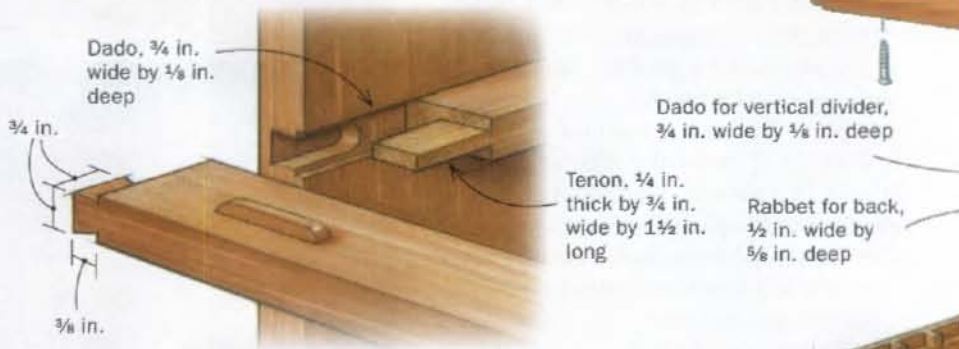
Cutting dovetails on a large piece is very similar to cutting dovetails on a smaller box or drawer, but there are a few more things to consider. Holding the pieces is more challenging, keeping them flat is important, and of course there is more material to remove. The good news, at least with this piece, is that even if your dovetails don't look perfect they'll be hidden by the subtop. I always lay out and cut the tails first, then transfer them and finish up with the pins (see photos, p. 38).

Once you have the dovetails cut, it's time to glue the subtop to the sides. But first rout the dados for the vertical divider in the subtop and bottom (using the same jig as before). To find the center of both, it isn't necessary to do a dry-fit. The subtop, the bottom piece, and the rails are all the same length, so just stack the top and bottom together with the ends flush and measure for the center. After routing the dados, glue the dovetailed subtop to the sides. The bottom doesn't go in yet, so use spacers at the bottom of the legs to keep everything straight and square.

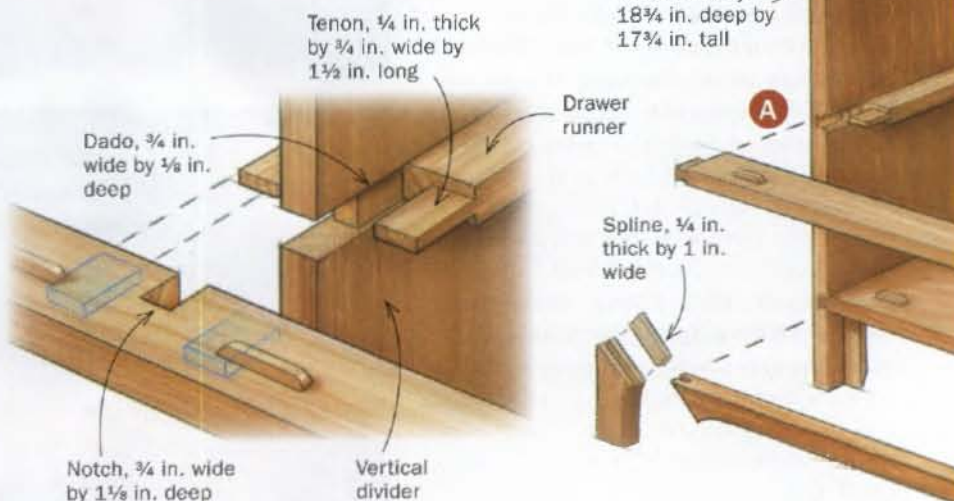
While that assembly is drying, move to the router table to cut the sliding dovetails in the ends of the bottom and front and back rails. Then slide the bottom into place. I glued only the last 3 in.

BUILT TO LAST

Half-blind dovetails, sliding dovetails, and dados ensure decades of flawless function. A frame-and-panel back makes the chest look good from all directions.



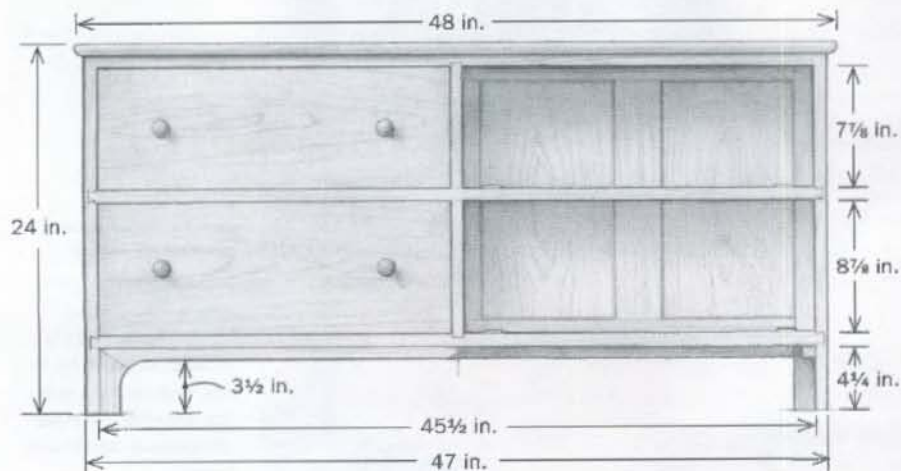
A STRETCHER END DETAIL

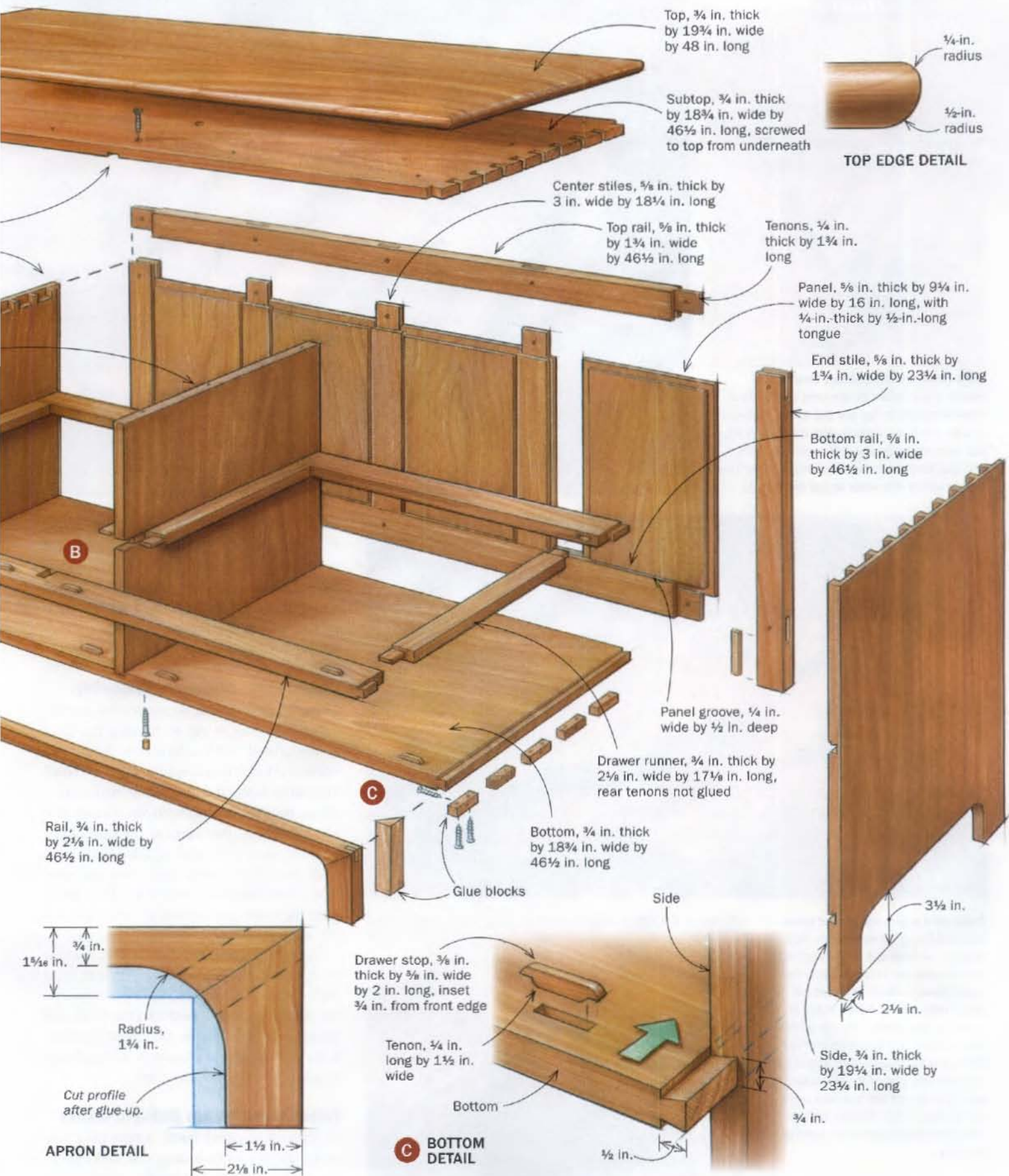


B STRETCHER/VERTICAL DIVIDER DETAIL



Full-size plans for this chest and other projects are available at FineWoodworking.com/PlanStore.





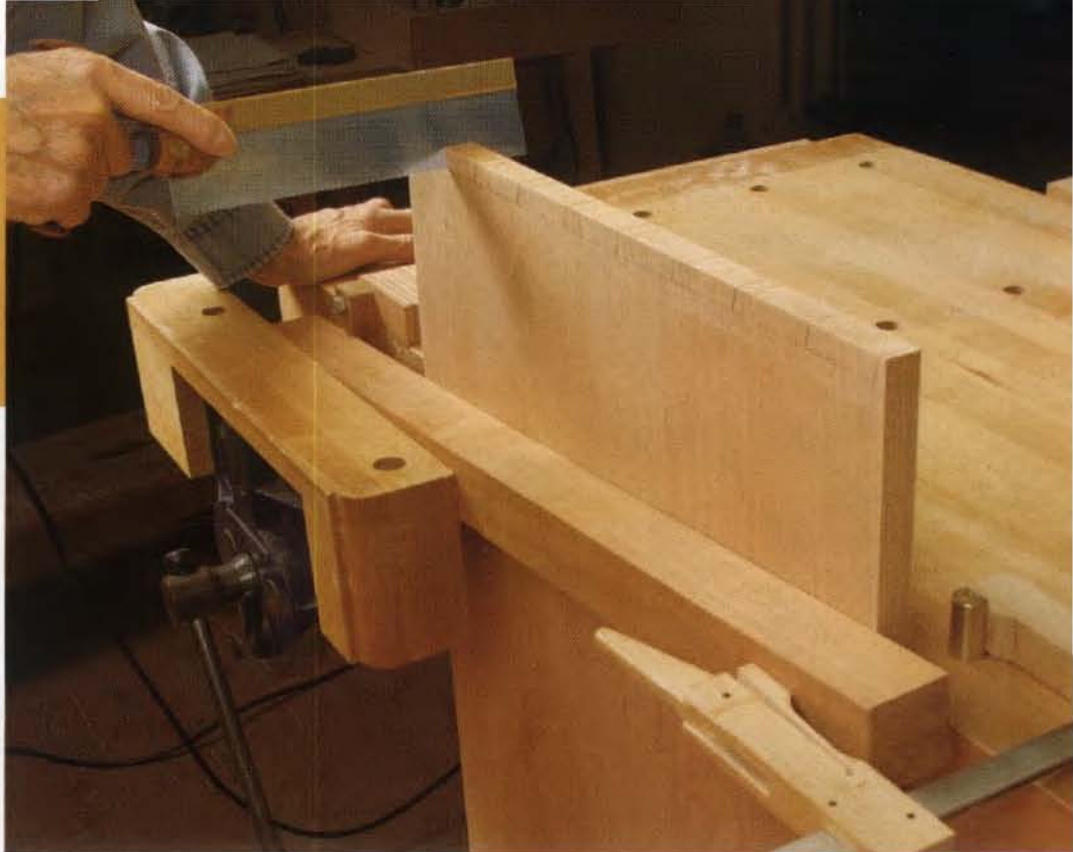
Pro method

HALF-BLIND DOVETAILS IN LARGE PANELS

Half-blind dovetails make a strong but clean-looking case. They can be a challenge on big pieces, but Becksvoort has tricks for keeping the pieces flat and aligned.



Tails first. On the subtop, Becksvoort marks the centers of the pins and uses a dovetail guide to lay out the tails (above). To saw the long, wide board, he rests it on the floor and secures it in a vise. A thick, straight hardwood board clamped near the action keeps the wide board flat (right).



Chop and pare, chop and pare. Keeping the wide workpiece flat, make a vertical cut in the scribed line, tipping the chisel slightly forward (above). Make the first cut light. Then, paring horizontally in from the end grain, remove a chip (right). Alternate between cutting down and cutting in until about half-way through, then turn the board over and repeat the process until you've met in the middle. Follow the same procedure after sawing the pins.



to 4 in. at the front of the sliding dovetail. Because the dovetail slot is deep, it weakens the sides of the case, so I added five glue blocks underneath each side. This strengthens and anchors the lower sections of the case sides to the bottom, yet still allows for wood movement.

Divider helps drawers run smoothly

The four drawers are separated by a vertical divider that is cut to fit after the case is assembled. With a handsaw, notch the vertical divider to accept the notched front and back rails, and then slide it in place. These notches line up with the dados that are already in the vertical divider. Don't glue the vertical divider in place because it is an end-grain to long-grain joint, and glue won't hold. Instead, screw it in place, plugging the holes in the bottom. The holes in the subtop will be covered by the top.

The bottom drawers run on the bottom of the case, but the top drawers run on a frame: two rails and four drawer runners. The runners are tenoned into the front and back rails. The tenons get glued into the front rail but are left loose in the back rail to allow for wood movement.

Finish panels before gluing in frames

A frame-and-panel back, although more work, gives as much diagonal racking resistance as plywood (unlike nailed ship-

TIP

NAIL DOWN THE TAIL BOARD TO MARK PINS

Mark the location of the tails on the pin board. On long, wide workpieces, Becksvoort uses a small nail to help in the transfer. Align the boards and predrill. Tap in the nail partway so it can be easily removed (above right). Using a marking knife and working from the nailed corner, scribe the tails onto the pin board (below right). Pivot the tail board into alignment whenever necessary.

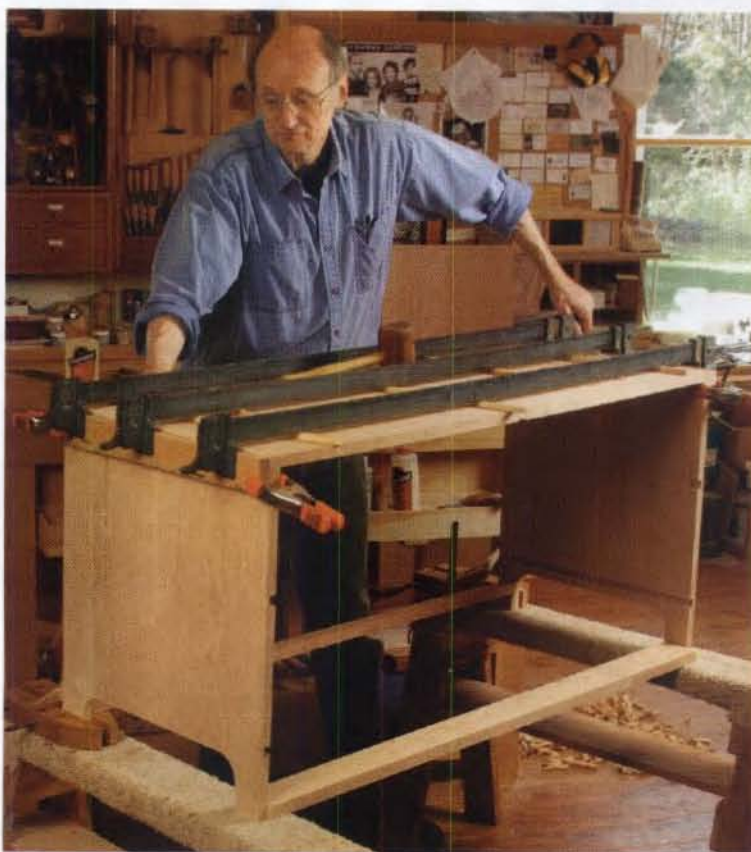


lapped, tongue-and-groove boards) and looks much better. Once the case and all the dividers are in place, make the frame-and-panel back, leaving it a little too wide so you can sneak up on the perfect fit with a block plane. I profile the four panels with a 22½° panel-raising bit. I pin the rails and stiles for extra support and a nice design detail. Then I sand the inside face and fit the back to the case. I glue the back in place, secure it with small brads, countersink them, and plug the holes.

Complete the base and profile the top

To finish the front of the case, miter and spline the three-piece base assembly, bandsaw the arches to the same radius as the sides, and glue it into place. A one-piece base would introduce cross-grain gluing and could self-destruct. This way, the base expands and contracts (up and down), while the case side it is glued to does not change in length.

Next, sand the entire case, and then cut the top of the case to size, allowing a ½-in. overhang on the front and on each side. Rout



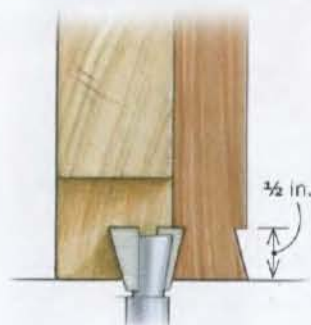
Cut the pins and then glue the top and sides.

Spacers between the legs keep the assembly square while Becksvoort attaches the sub-top to the sides. To keep from marring the carcass with heavy bar clamps, he uses spacers on the top and cauls on the sides (left).

Pro method

HOW TO TAME LONG SLIDING DOVETAILS

Long sliding dovetails can bind and freeze during assembly, but not if you follow Becksvoort's steps closely.



Big workpiece is an added challenge. A featherboard applies even pressure, keeping the long board on track and the cut precise. Go for a snug fit.



the profile into the front and sides, sand the top, and screw it into place from underneath through the subtop.

Drawers are the final step

Before starting the dovetails on the drawers, groove the sides and front. Now lay out the tails, saw and chop them, and move on to the pins. I cut the pins and tails slightly proud and flush everything up with a belt sander after the drawers are glued. Knob holes also can be drilled at this point. I use a pencil to mark the tight spots and a belt sander to remove material as I carefully fit the drawers to their openings.

Insert the drawer bottoms, and hold them in place with two saw slots and round-head screws in the underside of the drawer backs. The knobs are turned on the lathe, tenons cut to length, and then glued into place. My technique can be found in "Authentic Shaker Knobs," *FWW* #196.

Before applying a finish, I go over the entire piece to break and sand all edges including around the drawer openings, and the gaps between the frames and panels on the back. Then I sign the piece and give it three coats of an oil finish. The first coat is straight Danish oil, and the final two coats are a mixture of Tried & True varnish oil and spar varnish. □

Christian Becksvoort is a contributing editor.



Please don't freeze. To prevent binding, don't use glue yet, and keep the bottom as straight as possible as you slide it in most of the way. Glue only the front 3 to 4 in. of the bottom; otherwise, the joint will seize while you are trying to bring the piece home. Use clamps to pull the bottom evenly and steadily. Clamping blocks that extend over the side keep the workpieces from getting damaged, but, more importantly, stop the bottom when it is exactly flush with the sides.

RAILS AND DIVIDERS GUIDE THE DRAWERS

This simple system keeps drawers from racking back and forth, tipping up, or dropping down.

1. Fit the vertical divider, and tap it into position without glue. Screw it in from the top and bottom.

2. Fit the front rail and glue it into the sides and onto the vertical divider panel.

3. Install the four drawer runners. Apply glue only to the front tenons.

4. The back rail is glued into the dovetail slots and onto the vertical divider. The back mortise-and-tenon joints are not glued. This allows the web frame to telescope in and out as the case expands and contracts.

5. Fit the back. The end stiles extend beyond the bottom rail and become an integral part of the back legs. Use a block plane to sneak up on the fit before clamping and gluing.

6. Apply the mitered front base assembly. Add glue blocks afterward to strengthen the corner joints.





A Visit to the Sharpening Doctor

Two readers hone their skills with help from our expert

BY STEVE SCOTT

For decades, *Fine Woodworking's* tradition has been to offer expert guidance from great woodworkers, helping readers learn new techniques and avoid mistakes. But try as we might, we can't always anticipate which parts of a woodworking task will trip a reader up.

So we stopped trying to guess.

Late last year, we experimented with a brand-new kind of article. In "A Trip to the Dovetail Doctor" (*FWW* #201), we let you follow along and learn from a fellow reader's mistakes as he struggled with one of woodworking's most familiar but challenging tasks. Contributing editor Gary Rogowski corrected his flaws in technique and answered his questions, letting us pinpoint some often lingering misconceptions.

Now the experiment continues.

We sought new patients for the woodworking doctor, asking readers which tasks—despite careful study and practice—continue to frustrate them. The most common cry for help came from readers who've fallen in love with hand tools but can't quite master the dance of getting them sharp.

To make sure we would encounter a broad range of problems, we chose two patients: Aaron Petersen of Grand Rapids, Mich., and Marco Cecala of Phoenix.

"My sharpening skills have been built on reading articles in your magazine and on-

line, watching videos, and trial and error—mostly error," Petersen told us. "Without understanding what it's like to use a truly sharp edge, it's hard to know if I'm doing it correctly."

Both Petersen and Cecala are longtime power-tool woodworkers who started using hand tools in the last couple of years. Each man was frustrated by inconsistent sharpening results. And, with our help, both traveled to Rogowski's school in Portland, Ore., to figure out why.

The doctor reviews the symptoms

We met at the Northwest Woodworking Studio on a chilly February morning. As Petersen and Cecala unpacked their tools, the brightly polished backs and bevels said both had worked hard on sharpening. Still, a quick test in end-grain pine showed that the edges weren't quite right. Softwood end grain is a great gauge of sharpness. Instead of slicing cleanly, a dull edge will push over the pliable fibers, tearing and crushing them and leaving a rough surface.

Petersen's chisels—the chief focus of his frustration—cut inconsistently, fighting him at first and then slicing suddenly forward. Cecala's plea for help centered on his handplanes: They turned end grain to dust instead of shavings. On edge and face grain, the planes took a shaving but

WHAT IS SHARP?

The truest test of an edge is how well it cuts wood. A sharp chisel pares end-grain pine cleanly. A plane with a well-honed iron can take thin shavings and leave a glassy surface.





Flatten the back

Bad news. After watching Petersen struggle to make this chisel cut, Rogowski used a straightedge to show the back was not flat. Cecala's technique of polishing on a hard felt buffing wheel tended to give his tools rounded backs, like this one (right).



Flattening. To flatten, rub the last inch or so of the tool's back on a flat abrasive surface such as a waterstone. Sandpaper, glued to a flat surface, works too. Be sure to hold the back dead flat.

GOOD

The result. A mirror polish is one goal, but not the only one. The back has to be flat as well.

left unacceptable tearout. And after feeling the silky, unblemished surfaces left by Rogowski's planes, Cecala was starting to see room for improvement.

"I always thought 'if I'm taking a shaving, then I'm doing OK,'" Cecala said.

"You are doing OK," Rogowski answered, "but you could do a whole lot better."

Throughout the next two days, Rogowski watched as each student demonstrated his own sharpening techniques, stepping in to offer coaching in each phase of sharpening—flattening and polishing the tool's back, grinding the bevel, and honing it.

Make sure the back is flat—Possibly the biggest discovery for both students involved the very beginning of the sharpening process—flattening the tool's back. Creating a sharp edge involves making two polished surfaces intersect. For chisels and plane irons, these two surfaces are the tool's beveled tip and flat back.

Flattening and then polishing the back is tedious but crucial work that, thankfully, has to be done only once. You must flatten first to ensure that the polishing abrasive will reach all the way to the cutting edge, where it matters most. The good news is that once it's polished, all you'll ever have to do with the back is rub it with your finest abrasive to remove the burr created by honing the bevel. For chisels, a flat back is important for controlling cuts, because it acts as a reference surface that keeps the chisel on a straight, predictable path.

All of this was clearly on Rogowski's mind as he watched Petersen struggle with his $\frac{3}{4}$ -in. paring chisel, working to coax it into a cut with a slight lift of the handle.

"We need to find out how flat the back of this tool is," Rogowski said. With that, he laid a straightedge against the chisel's highly polished back and held them up to the light, revealing an inch-long gap of light that grew wider at the cutting edge.

"I was very surprised," Petersen said. "I had previously flattened them on sandpaper and thought they were flat."

Petersen then showed Rogowski his sandpaper technique. As Rogowski watched, he cautioned Petersen to avoid lifting the tool's handle as he worked it across the abrasive.

Cecala used a diamond plate and waterstones to flatten and polish the backs of his plane irons, and Rogowski saw no glaring flaws in his technique. But as it turned out, Cecala's final step in the entire process—polishing the bevel and back on a hard felt



Grind the bevel

Bench grinder is aggressive. It will form a fresh bevel quickly, but Rogowski recommends a white abrasive wheel, a light touch, and careful technique.



BAD

Precarious grip. Cecala tried to keep the iron square to the wheel by registering his fingertips in the tool rest's horizontal grooves. The grip made it tough to grind a nice, straight edge on the iron.



GOOD

Positive grip. Rogowski demonstrated how to hold the tool flat with his thumbs while running one finger against the bottom of the tool rest as a guide.

buffing wheel—undid much of this work.

"If you're having troubles with inconsistency, I think that final step is the one that's causing the problem," Rogowski explained, adding that the wheel would quickly round the tool's back at the cutting edge. This tends to blunt the edge slightly and prevent the cap iron from seating flatly against the iron's back, resulting in tearout. The sim-

tween the bevel's heel and the edge.

As Cecala began grinding his plane iron, Rogowski eyed his grip. When the sparks started flying, he spoke up.

"Stop, please! How do you know you're going to get a nice straight cut across there?" Rogowski asked, pointing to the tool's edge. Cecala explained that he kept the edge square to the wheel by registering his fingertips against one of the horizontal ridges in the face of the tool rest. Rogowski raised a skeptical eyebrow.

He urged Cecala to adopt a more secure grip, riding the outside of his right index finger under the bottom edge of the tool rest to act both as a depth stop and a brace, keeping the iron square to the wheel. He used his left hand to control the tool's side-to-side movement, pressing down lightly on the tool with his thumbs. As he demonstrated, Rogowski said the grip allowed him to keep the tool flat against the tool rest, pressed lightly against the wheel, and tracking in a straight line. The grip also proved helpful to Petersen, who found himself lifting his chisel during grinding, re-

Good grind. Leave a very thin band of the old bevel to ensure an even grind and avoid burning the tip.

sulting in a multi-faceted bevel.

Like many of us, Cecala was grinding the hollow all the way to the tip, until he could feel a consistent wire edge across the back. Rogowski strongly discouraged that practice. A thin band of unground steel at the tip provides a visual reference to help ensure a square, consistent grind. It also helps prevent the thin steel at the cutting edge from burning on a high-speed grinder. Rogowski recommended leaving $\frac{1}{64}$ in. or so, which can quickly be honed away later.

He also demonstrated a simple way to check the positioning of the tool rest: He set the tool in place, turned the wheel by hand, and then checked the scratches



Online Extra

For a free video of this sharpening clinic, as it happened, go to FineWoodworking.com/extras.

plest improvement, he told Cecala, would be to avoid the buffing wheel religiously.

Mastering the hollow-ground bevel— The next step in sharpening is to prepare the bevel for honing by grinding it to the proper angle. This must be done each time the honed portion of the bevel becomes too wide to polish efficiently. Like Rogowski, both men used a grinding wheel with a tool rest for this step. In the process, the wheel's radius scoops out a hollow be-

Hone the edge

A JIG MAKES IT EASY

A honing jig helps you maintain a precise, consistent angle so you know the finest abrasives are reaching the very tip of the tool.



Catch a wave. Petersen's loosely stacked sandpaper bowed up in front of and behind the cutting edge.



The alternative. Rogowski suggested setting up a station like this, with individual strips of sandpaper held in place with spray adhesive.

on the bevel to see where the wheel was meeting the steel.

Hone the edge—The third phase in sharpening involves honing the tip of the bevel with successively finer abrasives until it is as polished as the back. Petersen honed his chisels on sandpaper and plate glass, using a honing guide and working his way through 2,000 grit.

When Petersen switched to a finer paper, Rogowski frowned. Petersen laid the next sheet on top of the previous one, relying on the abrasive underneath to hold it in place. But the layered sandpaper rolled up like a wave in front of and behind the edge, rounding the bevel and preventing subsequent grits from reaching all the way

to the cutting edge.

Rogowski stopped him and recommended using a single sheet at a time, gluing each sheet to the plate glass with spray adhesive. He also suggested that Petersen try waterstones, saying they offer a flatter surface if maintained properly, and he demonstrated how to flatten a stone by rubbing it on a diamond honing plate.

After several more honing strokes on the sandpaper, Petersen paused. As they examined the bevel and its honed tip, it

appeared that Petersen was honing at a steeper angle than he had intended. The discrepancy suggested that he needed help in setting the angle of the honing guide accurately and consistently. For better results, Rogowski suggested using a shopmade jig for setting the angle or switching to a guide like the Veritas Mark II, which comes with a reliable angle-setting attachment.

But Rogowski also urged Petersen to try honing freehand. He demonstrated how a hollow grind makes it possible to maintain a consistent angle when honing because it affords two distinct contact points at the edge and the heel of the bevel.

Cecala was already a freehand convert. He honed his plane iron carefully and without apparent trouble on waterstones, stopping at 8,000 grit. This would have been plenty sharp for most woodworking tasks. Of course, Cecala's work would have then been marred by the buffing wheel—had Rogowski allowed him to go there.

Instead, Rogowski demonstrated a different way to take an edge a step further for the most demanding tasks, such as planing difficult grain. He suggested taking a few final honing passes on a leather strop charged with very fine abrasive compound. To demonstrate, he placed Petersen's chisel dead flat on the strop (to avoid rounding) and drew it toward him for several strokes. Next, he flipped the tool to work the bevel with several quick pull strokes.



A jig for consistent angles. For any given honing angle, the blade must extend a specific distance from the guide. Rogowski suggested a simple jig like this one, which will deliver the exact same angle every time.



Precision honing. By setting the jig slightly steeper than your grinding angle, you polish just the tip of the tool.



Lock the arms to lock in the angle. Rogowski showed Cecala how to concentrate pressure on the blade's tip while keeping his arms rigid to help maintain the honing angle.

Rogowski's strop is a simple 2½-in.-wide strip of thin leather, mounted suede-side-up on a piece of ¾-in. hardwood.

After a final pass on the back, the group moved to a bench to test their edges on end grain. The result? Buttery shavings and a clear, glossy surface. Cecala contrasted the strop technique to his own efforts with the buffing wheel. "So I had the right idea, but the wrong execution," he concluded.

"That's it exactly," Rogowski said.

On the road to recovery

Late on the second day, Petersen's chisel roll was spread out on one of Rogowski's

student benches. He was still hard at it, lapping the backs of his tools.

Cecala described Rogowski's tips on flattening the back and honing on the strop as "a couple of revelations" that gave him greater confidence about getting sharp edges.

Petersen agreed.

"I wasn't sure exactly what I'd get out of it," he said. "But now I have a really good understanding of what a sharp tool is, what it looks like, and how to get there." □

Steve Scott is an associate editor.

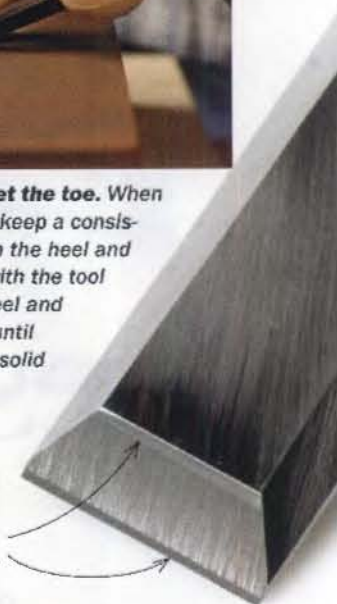
FREEHAND IS FAST BUT TAKES SKILL

You save setup time when working freehand, but it takes practice to maintain the angle.



Plant the heel, then set the toe. When honing without a guide, keep a consistent angle by riding both the heel and tip on the stone. Start with the tool resting on the bevel's heel and rock the bevel forward until both heel and tip are in solid contact with the stone.

An edge honed by hand will show two polished bands where the heel and tip meet the stone.



FOR THE FINEST EDGE, TRY A STROP



Keep the back flat. Pull the tool toward you for several strokes. Don't push: This will dig the tool into the leather.



Maintain a proper angle on the bevel. Again, pull the blade toward you. The finished edge will be amazingly sharp.



Designing With Grain

English-walnut sideboard demonstrates how grain patterns can take a piece to the next level

BY JASON ROBERTS

Have you ever looked at a piece of furniture and thought something wasn't quite right, but you couldn't put your finger on it? The craftsmanship was impeccable and the proportions were nice. But something about the design still wasn't right. Chances are, it was the way the grain of the wood was arranged in the piece, or what I call the grain graphics.

Grain can add lines to a piece of furniture and enhance your project, but if it doesn't complement the shape, it will compete with or overpower the design. Color is critical, too. If it isn't consistent, it will be distracting. It takes extra time and effort to consider grain and color carefully when buying boards and cutting them up, but the benefits are many, and they go beyond appearance. Choosing the right types of boards helps certain furniture parts

to function better, combating movement in drawers and doors, for example.

This sideboard, made from beautiful English walnut, is the perfect prop for a lesson in grain graphics. It contains most types of furniture parts: thick legs, thin panels, narrow frame pieces, a broad top, and so on. Yet I was able to build the entire exterior—all of the visible parts—using just four boards, saving money but also guaranteeing harmony.

I depended heavily on resawing to stretch this special wood, but you don't need a large bandsaw to take advantage of many of my tips.

Jason Roberts is a furniture maker in Olympia, Wash.

SHOP SMART

IT ALL STARTS WITH THE LUMBER



From the same tree. Boules, or flitches, are sets of boards that were consecutively cut from the same log, like a flitch of veneer. Lumber cut this way will have perfectly matching color and all three types of grain that furniture makers need: flatsawn, quartersawn, and riftsawn.

It's hard to turn bad materials into wonderful projects, so it is worth spending more for higher-quality lumber. Lumber selection does not have to be complicated. The best place to start is by using wood from the same tree: It will have the same color, grain, and texture. The easiest (though not least expensive) way to get matched boards is by buying boules or flitches of lumber (for a list of suppliers, go to FineWoodworking.com/extras).

It is harder to get consistent color and grain when the lumber comes from different trees. Yet there are plenty of woodworkers who do exceptional work without ever buying flitch-cut lumber. If flitchsawn isn't available or you don't want to spend the extra money to get it, the best solution is to dig through lumber piles and select pieces that match. It's not unheard of to find boards from the same tree in a stack. Look for distinguishing characteristics like knots and dark streaks that carry through boards. Whenever possible, cut like parts out of the same board to ensure they match. For example, cut all the legs from the same board; likewise for drawer fronts, aprons, and other parts.

Matching color, grain, and texture is not limited to solid wood. You can get more out of a thicker board by resawing it for parts or by slicing it into veneers.

In this Edward Barnsley-inspired sideboard, I combined these techniques. Two of the boards are from the same tree, as you can see from the nearly identical grain pattern and color, and are used for similar, prominent parts. The other two boards, while not from the same tree, match the others in color. Read on to see how I managed to stretch the four boards to cover the entire case without sacrificing grain selection.

THREE DIFFERENT TYPES OF GRAIN

FLATSAWN

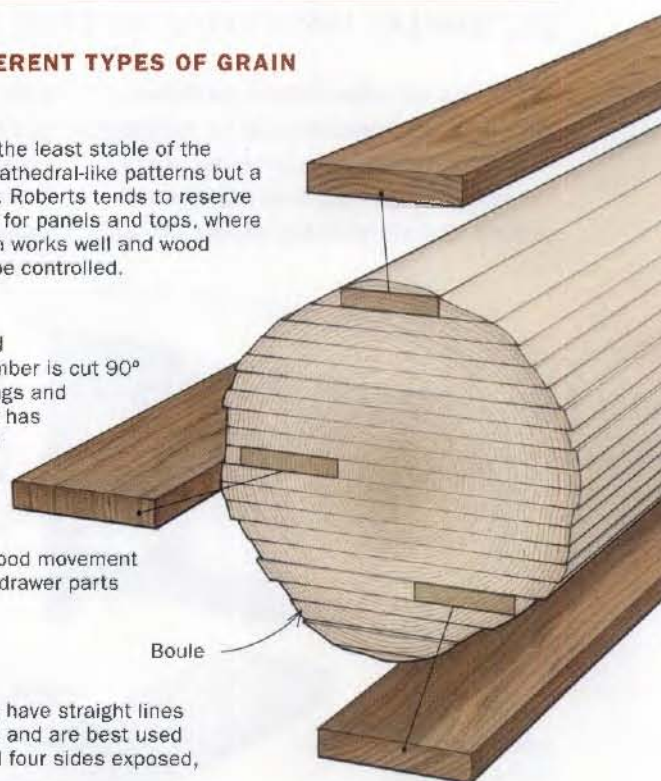
Flatsawn wood, the least stable of the three, has big, cathedral-like patterns but a tendency to cup. Roberts tends to reserve flatsawn boards for panels and tops, where the grain pattern works well and wood movement can be controlled.

QUARTERSAWN

Quartersawn lumber is cut 90° to the growth rings and is very stable. It has straight lines on two opposite faces. Roberts usually uses quartersawn boards where wood movement is a concern, in drawer parts for example.

RIFTSAWN

Riftsawn boards have straight lines on all four sides and are best used for parts with all four sides exposed, such as legs.



Mix and match.

If you can't purchase a boule, sort through stacks for boards that are similar in color. In this situation, Roberts checks the grain to make sure he gets the type he is looking for. If the dealer allows, he uses a block plane (below) to reveal characteristics in the grain that can prove two boards are from the same log.



USE WOOD WISELY

CUT SIMILAR PARTS FROM THE SAME BOARD

This English-walnut sideboard demonstrates the ideal use of grain direction. I started by laying out everything, deciding which parts to cut from each section of the board. By resawing thicker lumber,

I was able to maintain continuity of color and grain throughout the piece, more so than if I had used a greater number of thinner boards. In the end, I got all the solid pieces and veneers for the project out of four boards.

Two of the boards came from the same log. I resawed the first into three pieces. I got six stiles from one, two stiles and all three drawer fronts from the second, and the veneers for the faces of all the vertical divid-

ers and aprons from the third (it's fine to laminate veneers onto solid wood). The second board produced all four legs and all eight rails.

Another, bigger slab was from a different tree with a similar color. I used it for the top and the veneers for the side panels. The fourth board was a crotch slab, similar in color to the rest. It was thick, so I was able to resaw eight slices for the fronts and backs of the door panels, laminating them onto a Baltic-birch core.



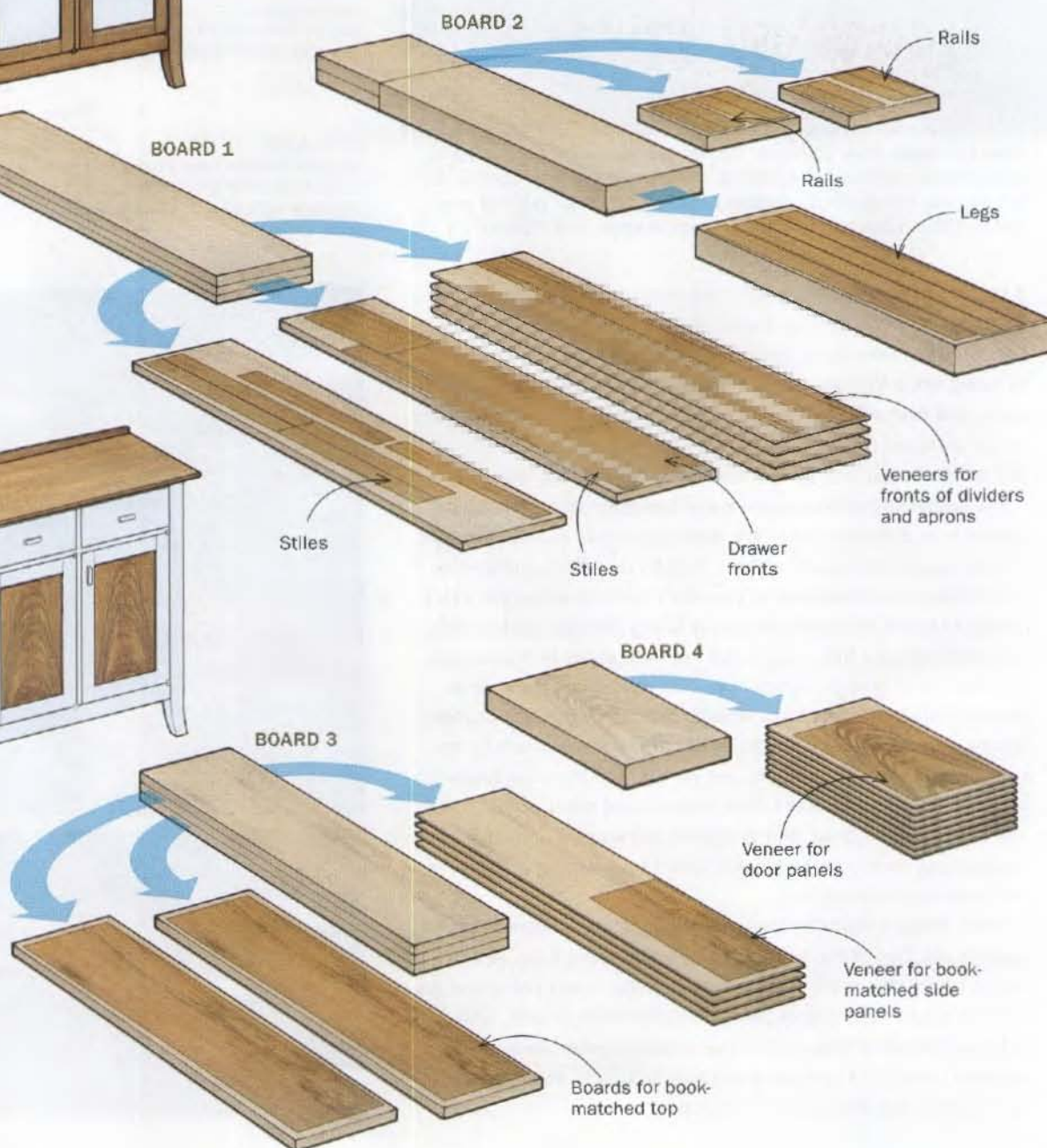
TWO BOARDS FROM ONE TREE

Lumber from the same tree guarantees that the grain and color will match. To take advantage of that, Roberts used these boards for all of the similar parts—legs, rails, stiles, dividers, and drawer fronts.



TWO MORE BOARDS COMPLETE THE CASE

The final two boards match the first two in color and are used in places that complement the other parts—the top, sides, and door panels.





STRAIGHTEN THE GRAIN

CORRECT THE ANGLE AS YOU MILL



Need to resaw? Do it first. Roberts resawed this thick plank into the three thinner boards (left) before marking out individual parts and straightening the grain. He works this way because the grain can vary throughout the thickness of a board.

Sometimes the grain lines don't run straight down a board but instead drift off on an angle or curve. Known as runout, it's one of the biggest grain problems you'll see in furniture, yet many people don't bother to fix it. But it is easy to correct by drawing a straight line with the grain, bandsawing to the line, and then jointing the board straight. You need extra room in your stock to accommodate the unusable wedge that gets cut away. If you have a long board but only need 10 in. for rails, cut off the rail stock before correcting the runout, so you don't create a lot of waste.

Also, if you are working with a too-thick board, you should resaw before you get rid of the runout, as the grain pattern can change throughout the thickness of the board.



More than one straight line. To mark out the eight stiles and three drawer fronts on these two boards, it was necessary to correct for wayward grain more than once, creating multiple wedges of waste wood.



Joint a clean edge and rip. After bandsawing away the angle, use the jointer to clean that edge (left). The jointed edge will ride the tablesaw fence as you rip the part to size (right).

RESAWING TIP If boards are too wide to resaw on your 14-in. bandsaw, consider adding a riser block to extend the saw's height capacity. You can also rip the board to a manageable height, resaw the pieces, and glue them back together, but that is less than ideal. If you try this, take care to rematch the grain.

LEGS

END GRAIN HOLDS THE KEY

The best type of lumber for legs is riftsawn with no runout. You should orient the blank so the end grain runs diagonally across the top of the leg, not parallel to the sides. Even when the end grain runs diagonally across the blank, the runout on the face may still need to be corrected. For legs, you may have to straighten out parallel sides, and then straighten the other set of parallel sides. Also, I oriented the grain to follow the subtle curve of the sideboard's legs. If there is any curved grain left in your leg blanks, it will be less obtrusive at the top of the legs than at the bottom.

STRAIGHT OR TAPERED LEGS

NO

End grain that runs parallel to the sides of the leg will yield two straight-grained faces and two flatsawn faces.



YES

To achieve straight grain on all four sides of a straight or tapered leg, look at the end. The grain should run diagonally across the leg instead of parallel to the sides of the leg.



CURVED LEGS

NO

Oriented this way, the grain runs out at the bottom of the leg instead of following the subtle curve.



YES

Make sure the diagonal runs in the direction of the outer corners (in their final positions, the grain of all four legs should be oriented in an X-pattern).



Take time to straighten the grain. Begin by marking a new edge, aligned with the grain. Bandsaw close to the line, joint the board, and then finally rip the blanks to width (1), referencing off the jointed side to get parallel cuts. The first step leaves two parallel sides with straight grain, but the other two parallel sides still might have runout. So repeat the process, beginning by marking a straight line with the grain (2). Once it is marked, bandsaw the wedge off the leg blank (3), and then clean up that side on the jointer. Finally, rip the opposite side parallel (4). This leaves a blank with four sides of straight grain and little or no runout.



TOP

SHOW OFF CONSISTENT GRAIN AND COLOR

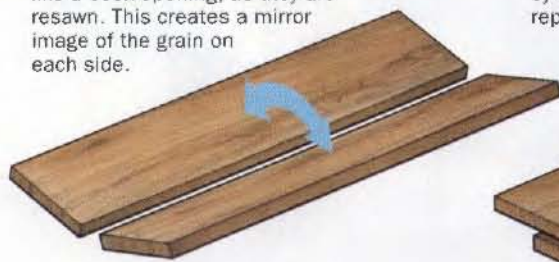
The best choices for a top are a single wide plank, a book-match, or a slip-match. These options look the best because the color and grain are consistent. I use either quartersawn or flatsawn boards for tops, depending on what works best with a particular design. The added expansion of flatsawn boards isn't a concern if the top is attached correctly so that it can expand and contract with changes in humidity. For the top of this sideboard, I used a book-matched piece of quartersawn English walnut. If you don't have a board wide enough for the top or thick enough to resaw, and you need to glue several boards together, be sure to choose pieces that match as closely as possible in color and figure. Try to keep flatsawn sections next to flatsawn and straight grain next to straight grain.



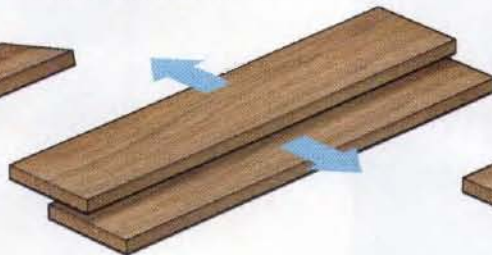
The trouble with book-matching. Although it isn't a problem with walnut, with some woods, like maple, one side of the book-match may look darker than the other because of the way they reflect the light. This can be prevented by slip-matching. Also, when planing book-matched boards, one board may plane better in one direction, the other in the opposite direction.

MATCHING OPTIONS

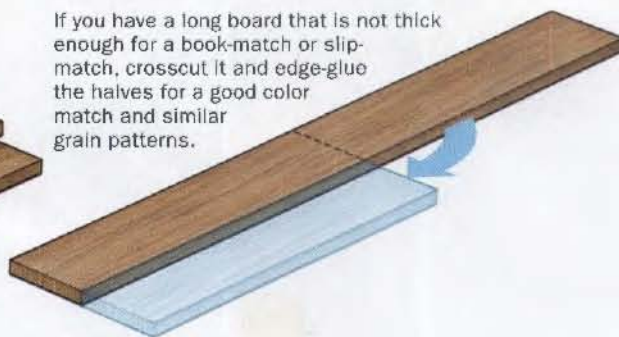
Book-matched boards are hinged open, like a book opening, as they are resawn. This creates a mirror image of the grain on each side.



Slip-matched boards are placed side by side as they are resawn, creating a repeating grain pattern.



If you have a long board that is not thick enough for a book-match or slip-match, crosscut it and edge-glue the halves for a good color match and similar grain patterns.



DRAWERS

CONSIDER BOTH LOOKS AND MOVEMENT

If you are building inset drawers, solid drawer fronts can bind as they expand from changing humidity. The narrower the drawer front, the less of an issue this is. If your drawer fronts are tall and you are worried about movement, quartersawn lumber is best (at 5½ in. tall, these drawers were borderline, so I used quartersawn). If you want to use figured wood on the fronts, you

should veneer it onto something more stable, such as quartersawn lumber. Sides and bottoms also should be of quartersawn lumber, so they don't expand and contract much across the grain. This will help the drawer function at its best in any season. Bottoms should expand toward the back, which means that the grain should run parallel to the face.

All three drawer fronts are from one board, so the grain runs continuously from one to the next.



PANELS

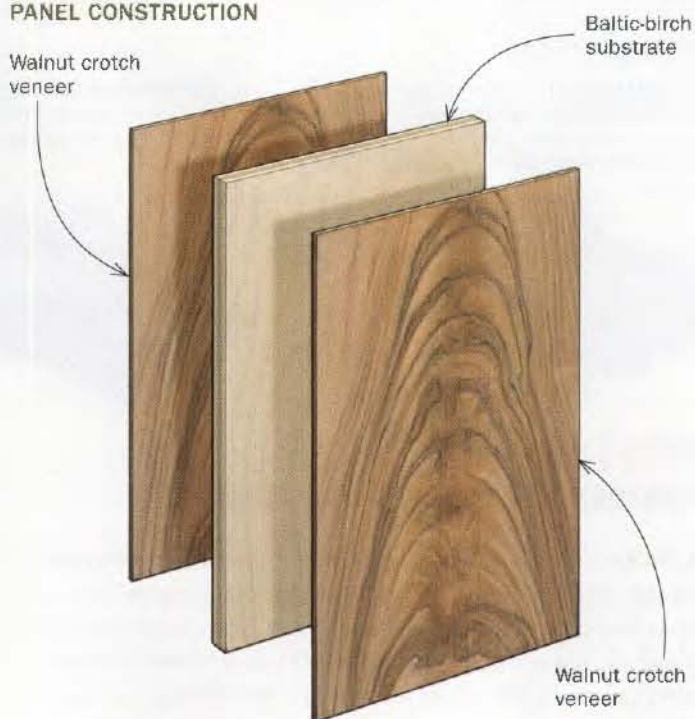
CONSIDER USING VENEER

Although I didn't have to use veneers for the door panels (the frame-and-panel construction allows for the expansion and contraction of solid wood), I chose to because I wanted to extend a gorgeous piece of walnut crotch across the inside and outside of the door panels. To do this, I resawn the board into eight slices, one for each side of the four doors.



Veneers maximize a beautiful board. Roberts decided to show off a nice piece of figured wood in his door panels. To stretch the one board he had, he resawn it and glued the veneers to a substrate. To prevent warping, both sides of the substrate should be veneered at the same time.

PANEL CONSTRUCTION



DOOR FRAMES

GRAIN DIRECTION IS ESSENTIAL

Use riftsawn or quartersawn lumber for door frames. Not only does the straight grain look the best, but it also expands and contracts far less across its grain than flatsawn, an important characteristic that helps avoid binding in inset doors. If the grain isn't perfectly straight and you don't have the option of straightening it, orient the curves or angles so they move into the panel, accentuating the framing action.



Yes
Straight grain subtly frames the panel instead of competing with its pattern.



Yes
Orient curved grain inward so it frames the panel in an oval.



No
Keep frame parts uniform. Never mix flatsawn grain with riftsawn or quartersawn.

High-Gloss Finish Made Simple



Automotive polish
makes it fast
and foolproof

BY SEAN CLARKE

Nothing matches a high-gloss, rubbed-out finish for enhancing the color, depth, and figure in wood. However, you won't get this flawless and glossy look from brushing or spraying alone: It is achieved by applying certain types of film finish and then polishing them either by hand or machine.

I recommend shellac or lacquer (not water-based) for this process. While I'll demonstrate by brushing on lacquer, I'll also give recipes for spraying lacquer and for brushing or spraying shellac (see p. 57).

Although certain styles of furniture such as Art Nouveau may have the whole surface polished (or "rubbed out"), with other styles it is quite acceptable to rub out just the most noticeable surface, such as a tabletop. Or, you can start the rubbing-out process but stop before a high gloss is reached, and instead achieve a flawless, semigloss sheen.

A perfect surface is critical

For this highly reflective finish, the surface of the wood must be absolutely flat and smooth. This means that all milling marks, whether the telltale ripples of a power planer or the ridges from a handplane, must be removed. Start sanding at P150 grit and work up to P220 grit. If you are working with a harder wood such as maple, you may need to start with P120 grit. If

1. Fill the grain on open-pored woods

SEAL

Shellac prevents stains. When using grain filler, first apply a washcoat of shellac to prevent the filler from staining the wood.



you plan to use a water-based dye, wet the surface with water to raise the grain, let the wood dry for one to two hours, and sand lightly with P320-grit paper to remove the raised grain. Apply the stain, allow it to dry for at least four hours, and lightly sand with P220-grit paper.

Open-pored woods need to be filled.—

When applying a film finish to open-grained species such as oak, walnut, and mahogany, use grain filler. You'll need fewer coats of finish and less sanding between coats to achieve a flat surface, and you'll avoid the risk of the grain structure reappearing as the finish cures and shrinks down into the pores. Cherry and maple are sufficiently close-grained not to need filling. Before applying grain filler, apply a washcoat of dewaxed shellac to prevent staining.

FILL



Use a stiff brush. Apply the filler using an old, paint-stiffened brush, going across the grain. Commercial fillers come in neutral, light, and dark tones, but you can tint them with dye powder to match the finished wood.

SCRAPE



Remove the surplus. After the filler has started to dry but before it becomes hard, use a plastic spreader or an old credit card at 45° to the grain to scrape away surplus filler on the surface.

You can use oil-based filler (I like Bartley's; www.bartleycollection.com), or water-based (I use Behlen's; www.woodcraft.com). Both come in light, dark, and neutral, but you can tweak them with water- or oil-soluble dye powders (www.woodworker.com) to customize the color. The oil-based filler gives you a longer working time, which first-time users may appreciate, but the water-based is ready more quickly for topcoating.

Apply the filler with an old natural-bristle brush, working across the grain.

Wait about five minutes, then use a plastic scraper or credit card to gently remove the excess from the surface. Wait about 15 minutes and then use a piece of burlap or a white abrasive pad to remove the remaining excess. The next day, lightly sand to leave the pores uniformly filled but with no filler on the surface.

WIPE

Clean the surface. Use a piece of burlap (or a white abrasive pad) to remove remaining surface filler that the scraper missed. Work at right angles to the grain so you don't pull the filler out of the pores. Let the filler cure overnight and then sand the surface lightly with P220-grit paper.



Build a finish thick enough to sand flat

Whether working with lacquer or shellac, I recommend two to three fully cured coats depending on how thickly you apply it. This gives you enough material to sand flat and then polish out. After applying a sealer, don't go beyond four coats, or you risk achieving a thick, plastic look. I'll focus on brushing lacquer; see the facing page for spraying lacquer and using shellac.

2. Build up a topcoat

SEAL



Two sealcoats. Working with the grain (top), apply a coat of lacquer sanding sealer using either a conventional flat brush or a mop brush, which can hold more finish. Wait an hour, then apply a second coat, but this time go across the grain (bottom). Let the sealer dry for at least four hours.

SAND



Block keeps surface even. After the sealer dries, sand it with P220-grit paper wrapped around a cork block. Sand across the grain, then with the grain.

Layer on the topcoats. Thin the lacquer and then brush on two coats across the grain. After an hour, brush on two coats with the grain. Let the finish dry for four hours, wet-sand the surface with 600-grit paper, and apply four more coats.

BUILD



I use M.L. Campbell's Magnasand sealer and Magnamax clear gloss lacquer. Sold by the gallon, they are designed to be brushed or sprayed. Alternatively, Deft, Watco, and Behlen sell quarts of sealers and lacquers. Begin by applying two coats of lacquer sanding sealer, brushing with the grain. Wait one hour, then brush on two more coats across the grain. No sanding is necessary between coats as long as you recoat within four hours.

Reduce the lacquer by 25% to 50% with lacquer thinner until it flows out evenly on a test board, and brush on two coats across the grain. Within two hours, brush on two more coats, this time with the grain. These four coats count as one fully cured coat. Allow four hours of drying time, then sand with P220-grit paper and dust off the residue. Repeat the four coats as described above. Depending on how thickly the lacquer was applied and how lightly you sanded, the build might be adequate at this point. To be safe, once this application has dried for four hours, sand with P320-grit paper, brush on two more coats with the grain, and let it dry overnight.

You are now ready to begin flattening the surface with increasingly finer grits of

Two alternatives to brushing lacquer



Spray lacquer and normal shellac are both easy to apply and repair. While the former has greater resistance to impact, chemicals, and heat, thick coats can look synthetic. Shellac gives rich amber tones with a deep, organic feel.



FOR A FAST BUILD, SPRAY LACQUER

Apply two coats of lacquer sanding sealer in quick succession, allowing them to dry for four hours. Sand with P220-grit paper and spray on two coats of clear gloss lacquer reduced by 20%. Wait at least four hours and then block-sand with P320-grit paper. Wipe off the sanding residue and apply two more coats of the clear gloss lacquer, also reduced by 20%, and allow at least eight hours of drying time. Now follow the rubbing-out process described in the article.

SHELLAC CAN BE BRUSHED OR SPRAYED

Brush on two coats of shellac sanding sealer such as SealCoat. Allow to dry for a minimum of four hours, then block-sand with P220-grit paper. Brush or spray on two coats of a 2-lb. cut of super-blond shellac, allowing 15 minutes between coats. You can use either SealCoat or dissolved flakes. After four hours, block-sand with P220-grit paper, first across the grain, then with the grain. Apply two more coats. Let dry for one or two days before starting the rubbing-out process.

3. Level the topcoat



Start sanding across the grain. Wrap some 600-grit paper around a cork block and start sanding. Stop frequently to check your progress, and rinse the paper in warm water to resist clogging. Sand away almost all the low, shiny spots (right), but use caution near edges to avoid sanding through.



wet-and-dry sandpaper (all wet-and-dry grits specified are CAMI grade). To lubricate the paper, add one drop of hand soap per 8 oz. of warm water, and change the water each time you move to a higher grit. Start by wrapping a piece of 600-grit paper around a solid cork block (or stick some cork flooring tile to a block of wood), splash a little water on the surface, and sand across the grain in straight strokes. Wipe off the sanding residue frequently with a cotton cloth to monitor your progress and to prevent the paper from clogging too quickly.

Although you aren't aiming to eliminate 100% of the shiny brushed surface, you should come very close, with only a few slight depressions unsanded. Use caution near edges so that you don't sand through the finish. Switch to 1,000-grit paper and sand with the grain, removing the 600-grit lines. Repeat with 1,500 grit across the grain, then 2,000 grit with the grain until all the sanding lines have been removed and the surface is dull but flawless.

At this point, if you choose a hand-rubbed, semigloss sheen, wrap a cork block with Liberon 0000 steel wool and buff with the grain, applying firm, even pressure in long, straight strokes to dull

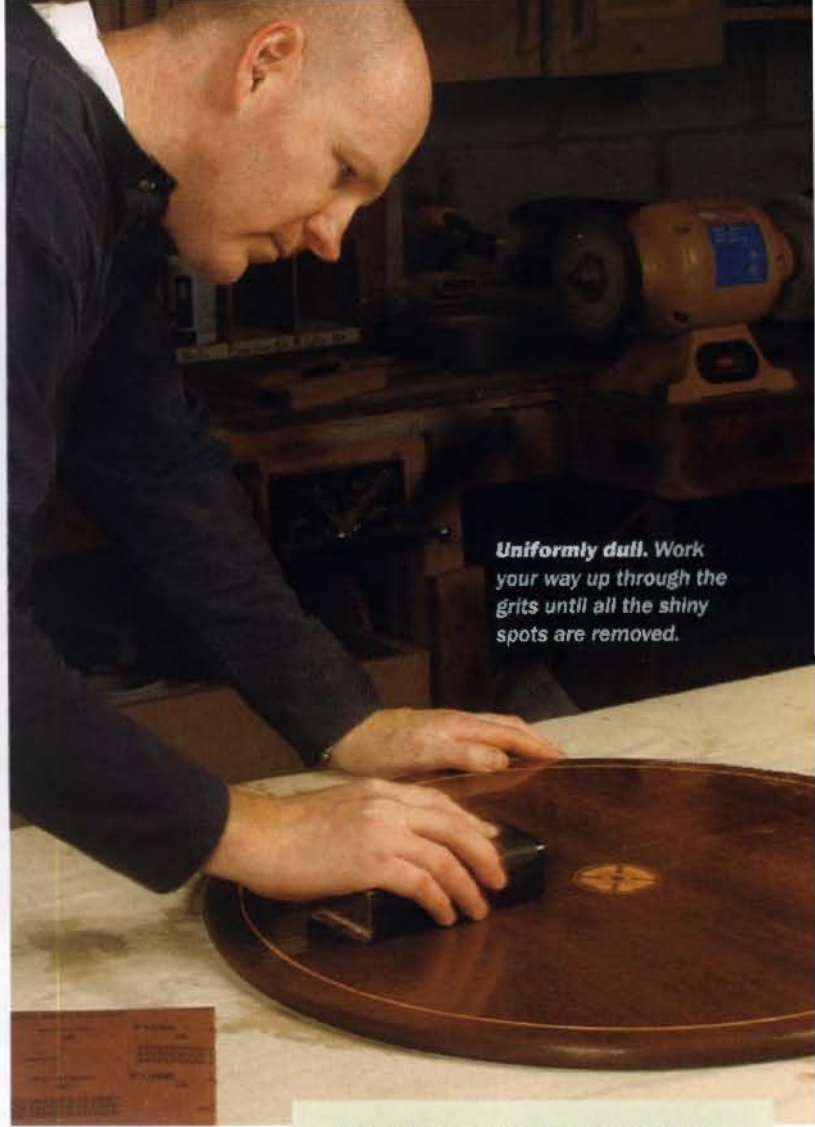
the surface. Apply paste wax and then buff with a clean cotton cloth.

Rub out to a high sheen

In the past, woodworkers used pumice and rottenstone, lubricated with oil, to rub out a finish. Today's automotive polishing compounds are much easier to use. I use 3M's Imperial Microfinishing Compound-Liquid from www.levineautoparts.com (or ask at your auto-parts store for an alternative).

Elbow grease for small surfaces—If the surface area is small, I polish it by hand. Wrap a cork block with a clean, damp cotton cloth. Apply a small amount of compound and a few drops of water directly to the surface. Begin to polish in a circular motion, working in an area about 8-in. square. As the compound starts to dry out, add a few more drops of water and continue to polish. Apply more compound and water until a high gloss appears and all of the 2,000-grit sanding lines are gone.

Change often to a fresh section of cloth and move across the surface, adding water and compound until all areas are covered. When the whole surface has a high gloss



Uniformly dull. Work your way up through the grits until all the shiny spots are removed.

ALTERNATE DIRECTIONS WHEN LEVELING THE FINISH

Your first shop teacher told you never, ever to sand across the grain, but here is an exception to this rule. Level the surface with 600-grit paper, then progressively reduce the size of the scratches until they are small enough to be rubbed out with polishing compound. It is critical to remove all the scratches, and by alternating the sanding direction, it is much easier to see any scratches that remain from the previous paper.



4. Polish to a mirror finish

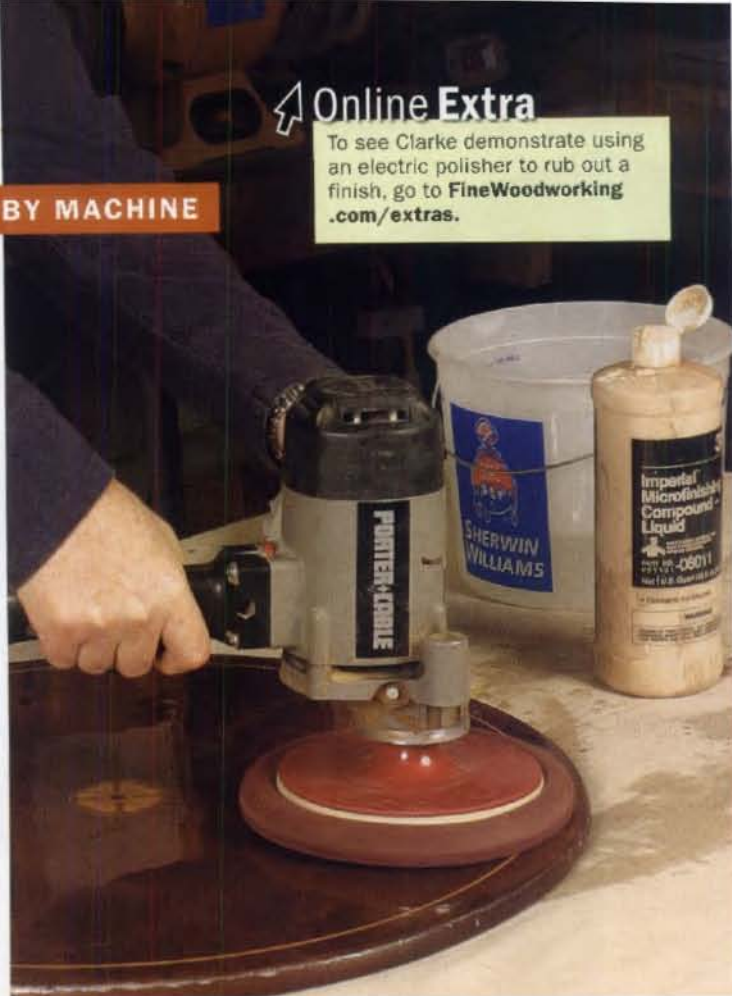


BY HAND



New material, traditional method. Automotive polishing compound is less messy than traditional pumice and rottenstone, but you can still work small surfaces and edges by hand using a damp cloth wrapped around a cork block.

BY MACHINE



Online Extra

To see Clarke demonstrate using an electric polisher to rub out a finish, go to FineWoodworking.com/extras.

with no lines, wrap a clean cloth around the block. Sprinkle water on the surface, add a small amount of compound to the cloth, and do a final polish with the grain. Finally, use another clean, dry cloth or paper towel to polish off any residue.

An electric polisher saves time—On a larger surface, I use a polisher with a sponge pad attachment. A right-angle grinder also can be used, if it has variable speed. If you don't have a polisher, you can use a variable-speed electric drill or a random-orbit sander and polishing pads. Be very careful to keep water away from electrical parts.

Moisten the sponge pad to soften it, and then spin the disk a few times to remove surplus water. Apply a few drops of compound directly to the surface, start at one end, and slowly move the buffing wheel back and forth across the grain, polishing out the 2,000-grit sanding lines. Use a slow speed to reduce friction that could blister the finish. Apply more compound and water as needed. Be cautious near the edges where the finish may be slightly thinner.

Once the sanding lines begin to disappear, reduce the amount of compound and increase the water to keep the surface lubricated and cool. Now work the buffer in a circular motion. The surface should take on a high gloss. Once all of the sanding lines are gone, finish polishing by hand, using a cloth-wrapped cork block. □

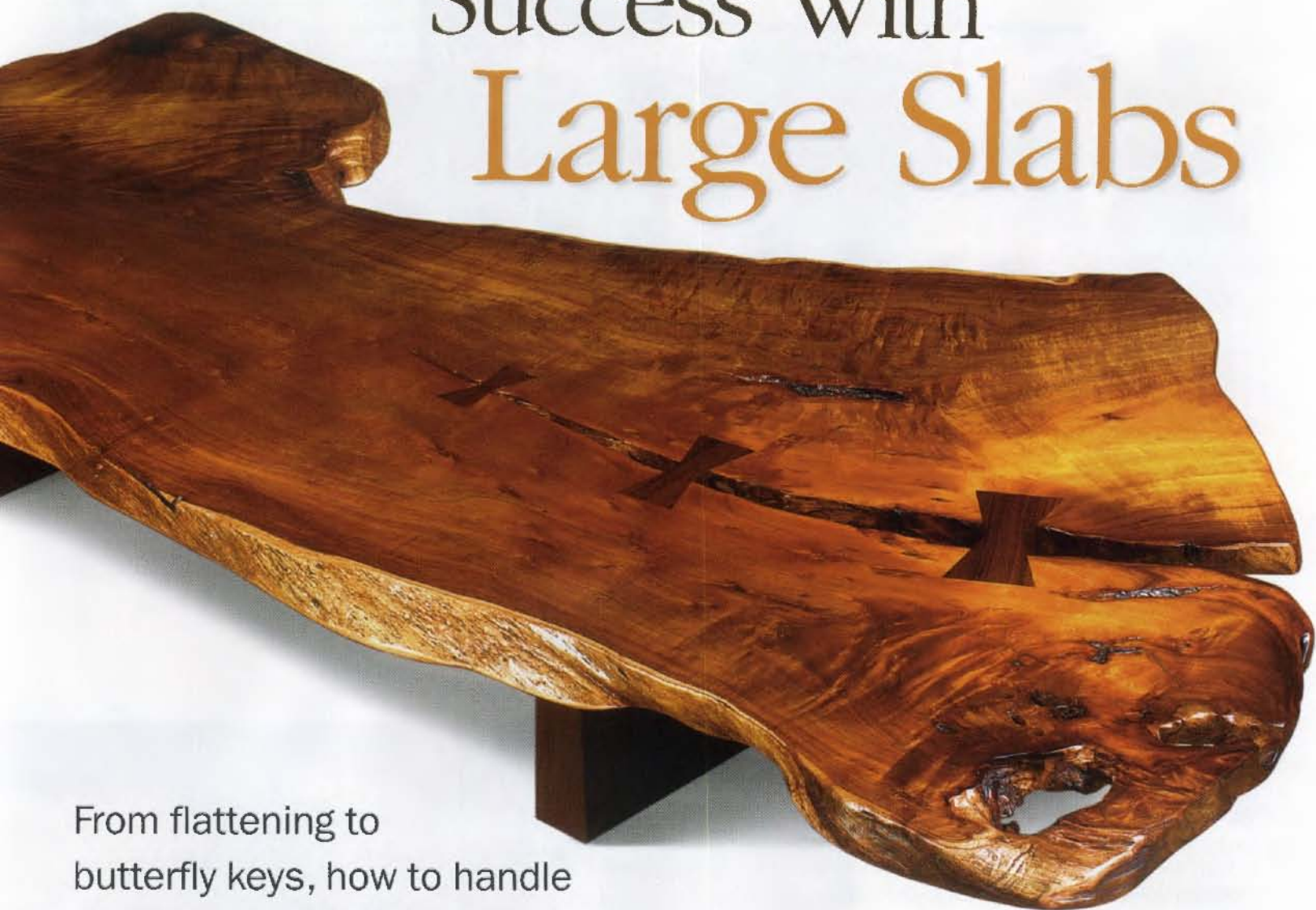
Labor-saving method. An electric polisher with a sponge pad brings up a high-gloss shine in a matter of minutes. Keep the machine moving to avoid overheating the finish.



Wet-look wood. Remove any remaining compound with a dry cloth or paper towel. This leaves a rubbed-out, high-gloss finish that gives the wood great clarity and depth.

Sean Clarke is a professional finisher in Columbus, Ohio.

Success With Large Slabs



From flattening to butterfly keys, how to handle one-of-a-kind pieces of wood

**BY DOUG MOOBERRY
AND MICHAEL ZUBA**

Normally, when you build a piece of furniture, you shape the wood to fit the style—ball-and-claw feet, cove moldings, raised panels, and so on. But when you work with a slab, you have to shape your woodworking technique to fit the wood. The slab is the star, with all its seeming blemishes—swirly grain, knots, splits, and sapwood—adding to its character. You may think of a slab as a thick piece that's very long or very wide, or both. Or, you may think that a slab must have a live edge. That's not always true. A slab can be small (or smallish). It can have four sawn edges. It's any piece of wood too big for your planer and jointer, with unique characteristics that you want to preserve and highlight, rather than remove or resaw away.

Like Hollywood stars, slabs can be temperamental and difficult to handle. Our furniture-making business builds period and contemporary designs. We've worked with plenty of slabs over the years, so we can show you how to make them behave.



You won't find slabs at every lumberyard, so we'll begin by talking about where and how to shop. Then we'll explain how to move big pieces without injury, the best techniques for flattening slabs and cleaning up their edges, and how to deal with splits, checks, and wood movement.

Tips on buying slabs and moving them safely

If you're lucky, you already have a big, interesting piece in your shop. If not, you can buy slabs from hardwood dealers on the Internet or from a local lumberyard or sawmill. Whatever the source, something about the slab should draw you to it: lively grain or figure, say, or an interesting combination of heartwood and sapwood, characteristics that give the slab its organic appeal.

In our experience, lots of companies sell great slabs. Even if you buy from a dealer miles away, you can ask for digital images of the slab, with closeups of the grain and any unique details. Shipping couldn't be simpler. Chances are, the dealer will write your address directly on the slab and ship it bare. When shopping at a local dealer, bring a moisture meter and some water or mineral spirits to pour on the surface to reveal the grain. A small handplane also comes in handy to smooth a small area.

The slab needs to be dry when you buy it. If the wood continues to lose moisture when you bring it to your shop, it will check and split; other imperfections may worsen, too. Kiln-dried slabs have a moisture content of around 7.5%; in our experience, that will increase to around 11% if the wood is allowed to stabilize indoors; that's the maximum moisture content you want. On the other hand, in most of the country, slabs left outdoors to air-dry won't be dry enough even after years in a stack. Whenever possible, check the slab's moisture content before you buy.

Hardwood weighs about 5 lb. per board foot, so any slab will be very heavy. Some bubinga slabs in our barn weigh more than 1,000 lb. Make sure you round up enough helpers to handle the weight safely. Try to keep lifting and hand-carrying to a minimum. Don't flip the slab any more than necessary; it can slip and fall on someone or damage an edge. If you back your truck as close to the shop as you can, then slide the wood onto a sturdy cart, you may be able to move the wood without lifting it

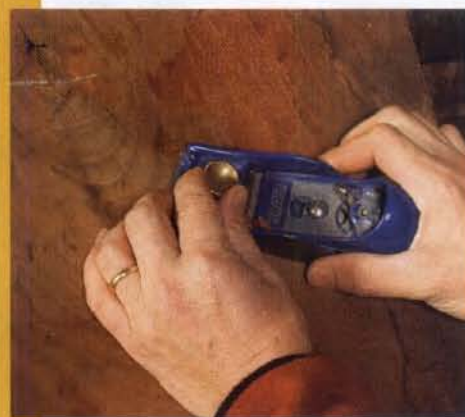
How to choose a slab



Preview the finished look. Mooberry floods the face of a slab with water or mineral spirits to bring out the grain and figure.



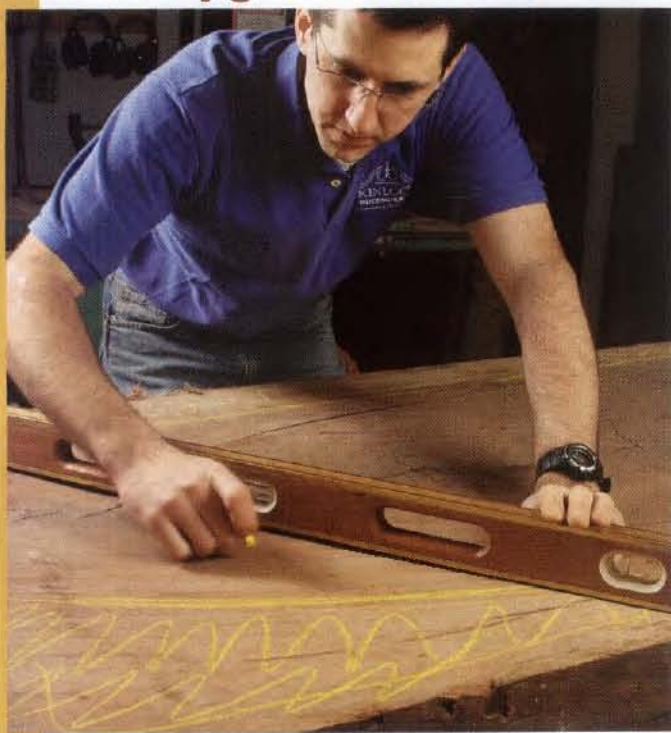
Check the dryness. Use a moisture meter to determine whether the wood is dry enough. Aim for a moisture content of about 11% or less.



Plane a patch. You can check the wood's color and grain by smoothing a small area with a block plane.



Router jig flattens slabs



Mark the high spots. Lay a long straightedge across the slab to find its high spots, then mark those areas with a pencil or a lumber crayon.



Steady the slab. Push shims under the slab to prevent it from wobbling in the jig as you flatten the face.



Cut away high spots. A plywood sled holds the router as it's moved from side to side. A 1-in. straight bit (Inset) quickly removes the waste. When one side is relatively flat, turn the slab over and flatten the other.

completely. Bottom line: Don't work with slabs that are too big for you to handle safely.

A really big board needs a really big jig

Don't use a board that looks like a potato chip. Even after you flatten it, the board will tend to revert to that shape. At the same time, remember that wood doesn't need to be dead flat. We consider small amounts of warp, cup, or twist perfectly acceptable in a slab top as long as it is smooth enough for the table's purpose—a dining table needs to be flatter than a coffee table. If you don't need perfect flatness and don't want to make the piece too thin, try using only a random-orbit sander, even though it takes time and makes way too much dust. You also can flatten a slab with handplanes, and we've done that. But handplaning tends to be fun for the first 10 minutes, trying for the last four hours. A power plane is faster, but we often use a large router jig.

The jig is basically a plywood trough large enough to hold the slab, with sides about an inch taller than the slab. The router is screwed to a plywood sled that's more than twice the width of the trough, so it can be moved from edge to edge. Find and mark the high spots using a straightedge or winding sticks. Use a 1-in. straight bit and set the router to remove $\frac{1}{8}$ in. of material from the highest part of the slab. Take multiple cuts across the board in an organized pattern, increasing the depth of cut as needed. Check your progress using the straightedge. When you're close to having



How to shape edges

Just a cleanup.

If you like the shape and texture of a live edge, just use a wire brush attachment in a drill or right-angle grinder to strip bark, dirt, and other loose debris without affecting the edge's unique texture.



the board flat, switch to a random-orbit sander to smooth the surface. Work on the bottom face first to flatten it. Make the bottom presentable, not perfect. Then flip the slab and sand the top, after fitting any butterfly keys or patches (more on that later).

With very large slabs that won't fit in a router box, you'll need to get creative. We once rented a four-head random-orbit floor sander (available at home centers). It did the job. When all else fails, find a shop with a combination planer-sander or a wide-belt sander and pay them. In our area, shop charges are \$50 to \$250 per hour.

Refine the edge but keep the character

When we select a slab, we always check the edges. One or both long-grain edges will be freeform, or live, while the cross-grain ends are sawn. We want to be sure that no one edge detracts from the overall appearance. There are several ways to finish a live edge. We usually remove any bark and strengthen punky areas with epoxy (we use West System, but any good epoxy will work). Then we smooth the edge with a star sander, flap sander, or wire brush, mounted on a right-angle grinder. A random-orbit sander works, too. We determine when we've sanded enough by touch. If it feels sharp and rough, we sand more.

If the freeform edge isn't where we want it to be, we move it with a chainsaw and work it over with a grinder, a rasp, and sanders. We may also reshape a cross-grain end if it seems too straight.

Keys turn minuses into pluses

If stabilized properly, cracks, splits, and voids can enhance the



How to rework a long-grain edge. If you need to relocate it, use a chainsaw or try a Lancelot chain-grinding attachment (top). Follow up with a sanding disk (bottom) and other sanders to leave an irregular edge that's smooth to the touch.



How to rework end grain. Trim the end with a chainsaw (left). Use a wire brush (below) or sanding disk in a right-angle grinder to knock down sharp edges left by the chainsaw. Follow with sandpaper for a bit of final smoothing.



How to inlay butterfly keys



Lay out the keys. Well-placed butterfly keys stabilize or hide defects, and enhance the handcrafted, organic look. Zuba uses a series of templates to decide how large to make each key and where to position them. Then he marks their location on the slab.

appearance of the slab. Cyanoacrylate glue fixes small problems, such as a splinter on an edge or a small check. When that's not enough, butterfly keys constrain a check or a split and keep it from opening further. A key can also conceal a defect such as a loose or missing knot or an ugly stain. Keys are a wonderful focal point. The butterfly says, "I meant to do this."

Make the key from interesting wood. We use a lot of rosewood, but other close-pored, attractive woods such as tiger maple will work. The contrast between the key and the slab is part of the attraction.

For strength, we make keys half to three-quarters the thickness of the slab. In our experience, thinner keys may not be strong enough. Pay attention to the shape, too. We have patterns for 30 different ones, ranging from small butterflies to huge pterodactyls. Lay the patterns on the slab and try layouts until you're happy. For some reason, an odd number of butterflies seems to look best.

1 POSITION AND CUT THE KEY



Mark the blank. Trace the shape of the key onto the blank, with the grain oriented lengthwise.



Cut the key on the bandsaw. Use a disk sander to smooth the cut edges, keeping the sides flat and square.

Once the top is patched, keyed, and smoothed, finish it with a clear finish—oil, shellac, varnish. Just be sure to apply finish to both sides of the top.

Big top needs a sturdy, stable base

We design and build sturdy bases that don't use the top as a structural element. To avoid having a tippy table, use moderate overhangs, especially along the sides. On a 2-ft. by 4-ft. coffee table (see bottom photo, p. 60), for example, plan for no more than 8 in. of overhang on the ends and 4 in. on the sides. We attach the base to the top with lag screws, using elongated screw holes in the base to allow the wood to move. You can expect $\frac{1}{8}$ in. of movement per foot of width, no matter how thick the slab. □

Doug Mooberry is the founder of Kinloch Woodworking in Unionville, Pa. Michael Zuba is one of Kinloch's craftsmen.

2 MARK AND ROUT THE RECESS



Score the slab. Use a sharp knife to score the shape of the key onto the slab. The grain direction of the key should be roughly perpendicular to the slab's grain.

3 GLUE AND TRIM



Big key, heavy blows. Coat the key with glue and pound it home with a mallet.



Cut the recess. Make a series of shallow passes freehand with a plunge router to remove most of the wood. Cut as close to the knife line as you can.



Trim the key flush and add finish. After the glue has dried completely, use handplanes and sandpaper to pare the keys flush with the slab (left). The last step is to apply a finish (below).



Finish by hand. Use a wide, sharp chisel to pare to the knife line and flatten the walls of the recess. Use a small square to check that the sides of the recess remain perpendicular to the top.



Mortisers for All Budgets

If you can cut mortises quickly, furniture making is faster and more fun

BY TIM ALBERS

In almost every professional woodworking shop, even the one-man operations, you'll find some kind of mortising machine. Making tight mortise-and-tenon joints is one of the most tedious parts of woodworking, and in the pro environment, time is money.

But time is just as precious for me, a hobbyist woodworker with an expanding day job and shrinking leisure time. Like many pros, I've struggled with the usual mortising methods. Drilling and chopping is OK for a mortise or two, but it is tedious and easy to foul up. For multiple workpieces, I turn to router jigs, but simple ones work for only one size of mortise, and more versatile jigs are complicated to build.

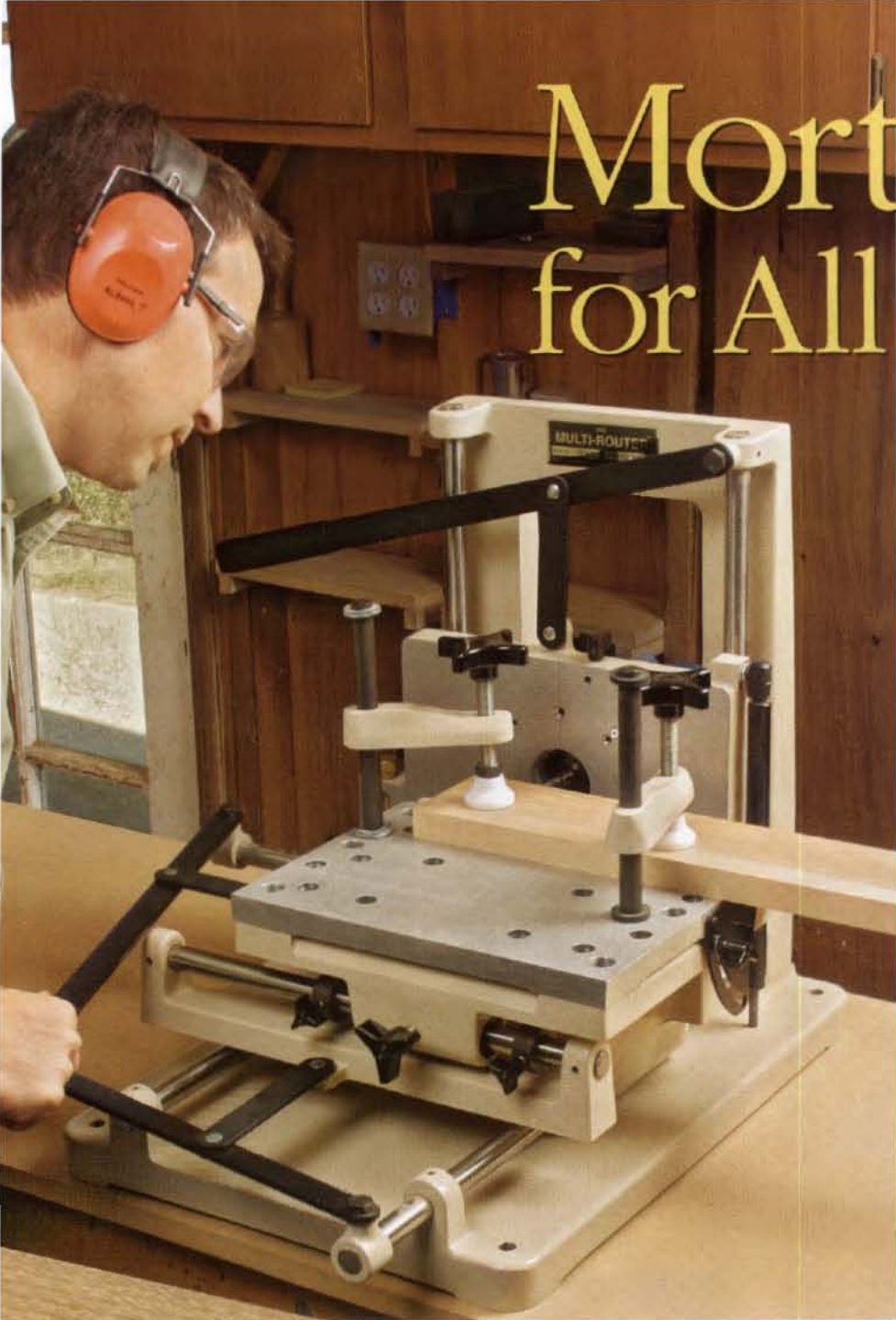
The answer is a dedicated mortising machine, and there is a host of them—from hollow-chisel to horizontal to super-jigs—all promising an accurate mortise in a minute or two. And some can do a lot more than mortise. I've always wanted to try them, seeing which ones deliver on their promises, so I was excited when *FWW* gave me the green light. This is not a brand-vs.-brand, apples-to-apples test. With a wide variety of equipment to test, I chose representative products in each category and price level, looking for typical features and specs. I focused on machines and jigs that can make a range of mortise sizes that a woodworker needs, and I left out jigs and tools, such as Festool's Domino, that make only small mortises.

In the end I found that every machine can crank out a perfect mortise, but some are much faster and easier to use than others.

Tim Albers is a frequent contributor on power tools and machinery.

SQUARE VS. ROUND

Only hollow-chisel mortisers can cut square holes (top). But most of the other machines are horizontal mortisers, which can cut into the ends of workpieces, making slip-tenon joinery possible (center and bottom).



HOLLOW-CHISEL MORTISERS ARE AN AFFORDABLE SOLUTION

These machines are the most straightforward. Pull down the handle, and you get a square hole. An auger bit leads the way, clearing out most of the material, followed closely by a square chisel that removes the corners. Make a row of these square holes, and you have a mortise. The category breaks down into three basic levels.

JET JBM-5

www.jettools.com
Street price: \$350



POWERMATIC PM 701

www.powermatic.com
Street price: \$480



GENERAL INTL 75-075

www.general.ca
Street price: \$1,150



ENTRY-LEVEL BENCHTOP MODELS OFFER THE BEST VALUE

At under 50 lb., the Jet JBM-5 and its close relatives are truly portable. Most come with a set of bits and chisels up to 1/2 in. However, the 1/2-hp motors work best with 3/8-in. sizes or smaller, and chisels have to be kept sharp to work well. My main complaint with these entry-level benchtop units is that the fence and hold-down are fussy to set up accurately. If you don't mind some fine-tuning for each new job, then one of these machines is for you. By the way, shopmade stop blocks can be used to line up the fence accurately in various positions, and additional clamps will help with tall workpieces.

MIDRANGE MODEL IS A BIG UPGRADE

We chose the relatively new Powermatic 701 to represent the heavier category of benchtop units. It is roughly \$100 more than the Jet, and bits and chisels are sold separately. But you get a lot for the extra cash, starting with a 3/4-hp motor that will power a 1/2-in. chisel. The fence and table are larger, and there is more capacity (5 in. vs. 4 in.) under the nicely machined hold-down. And wider mortises can be made by moving the fence, which stays parallel to the chisel. A toolless clamp makes chisel changes faster, and they are easy to keep sharp, thanks to the diamond honing cone that is built into the tool caddy.

FLOOR-STANDING MACHINE IS FASTER AND MORE VERSATILE

Industrial machines like the General 75-075 are a considerable step up in price, but you get a rock-solid machine, featuring a 1-hp motor that can handle the largest chisels and, best of all, a sliding X-Y table (moves forward, back, and side to side). Clamp the workpiece in place, then just crank the table to reposition it to cut mortises of any width and thickness, with stops for repetitive jobs. The fence pivots for angled work, and a tilting head is common.



Fussy fence. With a single clamping point, the fence on this entry-level mortiser goes out of parallel each time you move it, meaning you'll have to square the chisel to it again. Also, the fence is a bit short.



Better system. The fence on the Powermatic runs in two tracks, keeping it parallel to the chisel. A clever roller system keeps the stock in position yet allows it to be slid sideways.



Full-featured machine. On an industrial machine like the General, you crank the table to reposition the stock in any direction. Also, the fence pivots (as shown) for angled mortises.

SLOT MORTISERS ARE PRICEY BUT EFFECTIVE

Horizontal ("slot") mortisers are available in two price categories, both expensive. All use a single joystick to control the X and Y movement, with a handwheel for vertical adjustments. And all are designed for specialized mortising bits, though Albers had equal success with router bits and machinist's end-mills.



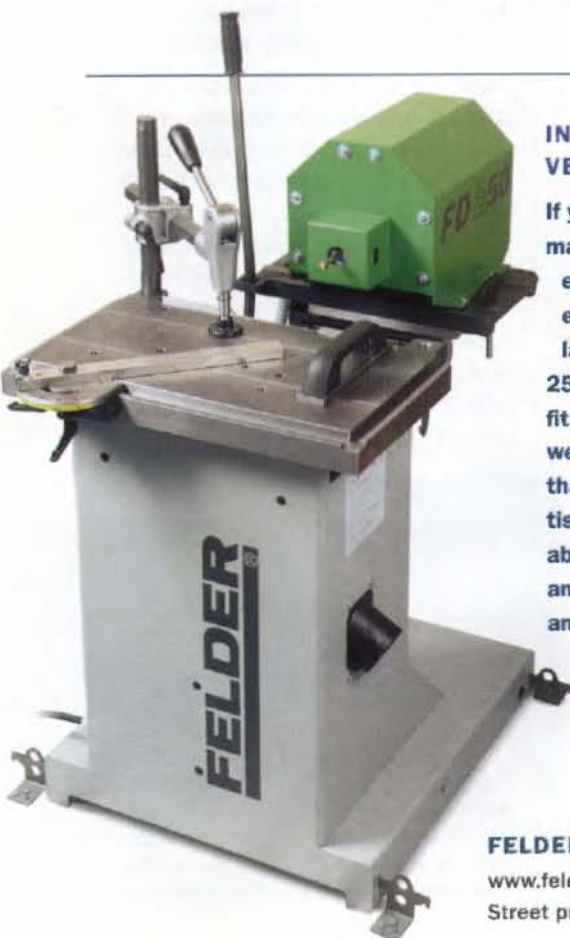
ROJEK IS A GOOD MORTISER FOR SMALL SHOPS

The Rojek VDA 316 falls into the lower-priced tier of these machines. But you get a solid base, a large cast-iron table, a strong cam-action clamp, and a heavy-duty mortising chuck with a $\frac{1}{2}$ -in. bit capacity. Built-in adjustable stops make it easy to dial in the depth and length of a mortise. The table travel was not perfectly smooth in all directions, but that didn't seem to affect the results.

ROJEK VDA 316
www.tech-mark.com
Street price: \$1,900



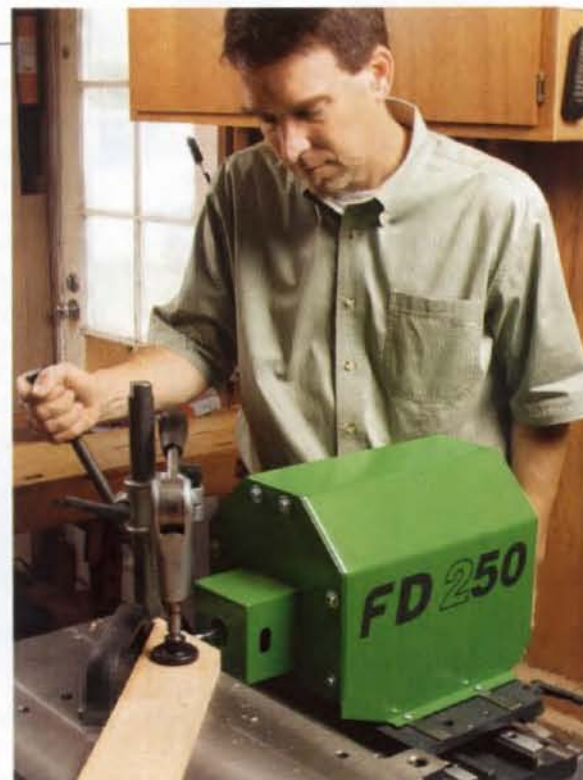
End grain or face grain. Slot mortisers like the Rojek make precise mortises on the edges (left) or ends (below) of workpieces. A single joystick moves the table in, out, and side to side.



INDUSTRIAL MACHINE IS VERY SMOOTH AND SOLID

If you enjoy working with top-end machinery, European manufacturers offer heavy-duty slot mortisers for \$3,000 and up. With a larger machine like the Felder FD 250, you encounter a new world of fit, finish, smooth operation, and well-engineered stops and clamps that make the most complex mortises simple, accurate, and repeatable. The Felder's table is larger and heavier than that of the Rojek, and a model is available that tilts on cast-iron trunnions for regular and compound angles.

FELDER FD 250
www.felderusa.com
Street price: \$3,600



A step up. On industrial slot mortisers, the head moves, not the table, and the action is smoother. Also, there are better clamping options and stops. The Felder has a clever fence that locks onto the table at 45° (shown) and 90°.

JOINT-MAKING JIGS VARY WIDELY

Each of the machines in this category is a different animal, and all can do more than make a mortise. All are powered by portable routers (sold separately), which makes ear protection a must.



LEIGH FMT JIG

www.leighjigs.com

Street price: \$880

LEIGH JIG MAKES MATCHING MORTISES AND TENONS

The Leigh FMT, which stands for Frame Mortise and Tenon, is a compact benchtop unit that is very portable and easy to store. This ingenious jig makes a perfectly matching mortise and tenon, in a wide range of sizes, in just a minute or two. The same template and setup work for both mortise and tenon. The top can be tilted up to 30° for angled mortises. After trying it out once or twice, I found it very quick to use.

One bonus is that you don't have to dedicate a router to this jig: Any plunge router will go on and off the jig quickly and accurately.

The only downside is the price tag for the basic package, which includes only templates for cutting $\frac{1}{2}$ -in.-thick mortises. Additional templates for different-size mortises cost extra.

Setup is simple. A viewfinder (bottom of photo) makes it easy to center the table over the workpiece, and then you pop in a single template for the mortise and tenon you want.



Mortise first. A guide pin rides in the middle of the template to steer the plunge router as it forms the mortise. The plunge mechanism sets the depth.

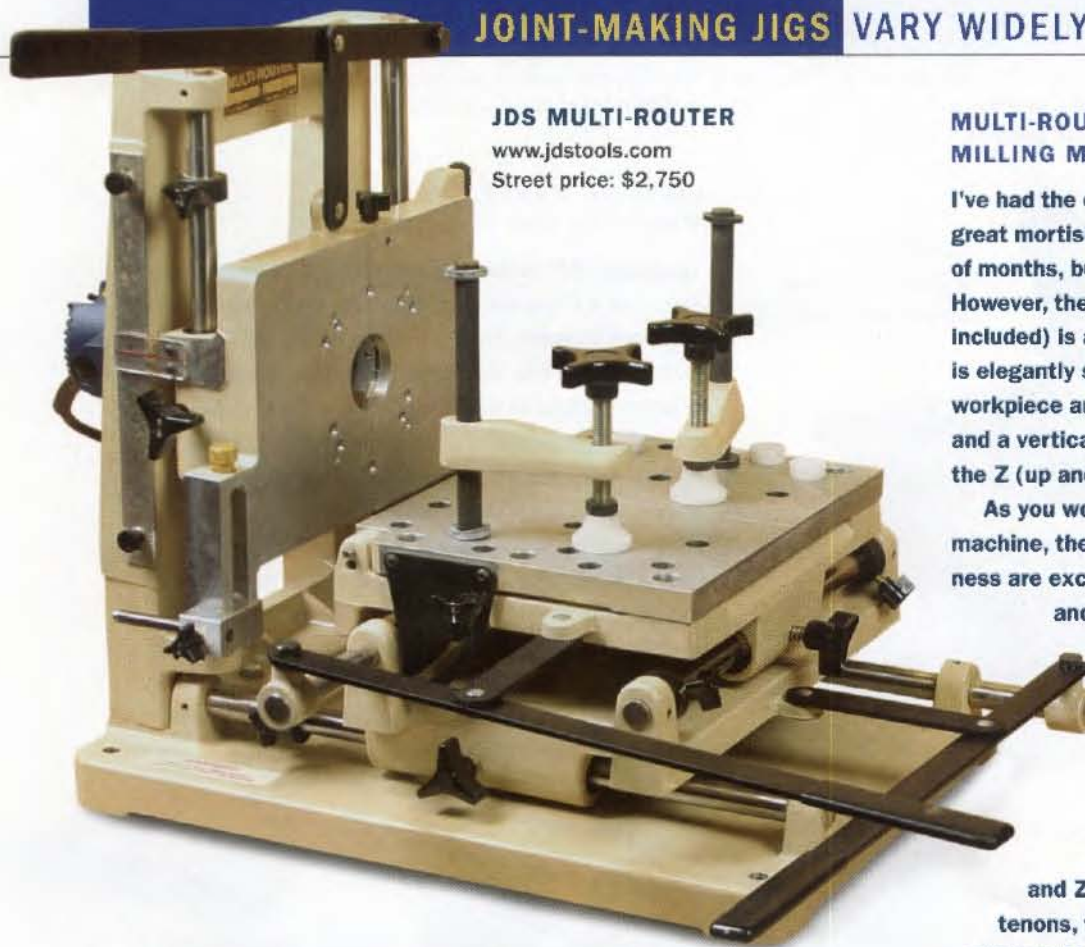


Same setup creates a tenon.

Once the mating piece is clamped in the vertical position, there's no need to change the template or table setting. With the guide pin riding the outside of the template, you can make a perfect, round-cornered tenon (inset) in under a minute.



JOINT-MAKING JIGS VARY WIDELY (cont'd)



JDS MULTI-ROUTER

www.jdstools.com

Street price: \$2,750

MULTI-ROUTER IS A TRUE MILLING MACHINE

I've had the opportunity to work with some great mortising machines over the past couple of months, but the Multi-Router is my favorite. However, the nearly \$3,000 price tag (router not included) is a substantial outlay. The Multi-Router is elegantly simple: A horizontal table holds the workpiece and moves in the X and Y directions, and a vertical table holds the router and moves in the Z (up and down) axis.

As you would expect from a higher-priced machine, the construction, precision, and smoothness are exceptional. Even with a large workpiece and a heavy cut, it moves effortlessly.

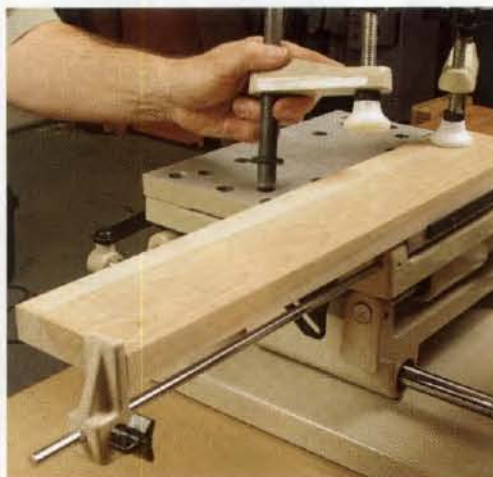
Hold-downs and workpiece stops are just as good. I especially liked the stops for table motion, which allow you to use calipers to set up precise cuts, and feeler gauges to fine-tune them.

There is a separate lever for X, Y, and Z travel, which means you can make tenons, for example, with a single setup. You might not bother, though, since loose-tenon joinery is also easy. The workpiece table tilts in two directions for compound mortises up to 45°.

This is a true X-Y-Z milling machine and thus can make all kinds of precise cuts on small and large parts; the only limit is your imagination.



X, Y, Z versatility. With a tilting table and smooth cutting action in any direction, any mortise is a cinch. But the real fun begins as you explore the possibilities.



Smart stops and hold-downs. A long rod stops the end of a piece, and powerful hold-downs simply drop into holes in the table (above). The same holes accept buttons that align workpieces at various angles (right), and stops for table travel are great, too.





ROUTER BOSS 420

www.chipsfly.com
Street price: \$800, plus
Mortise Table Kit: \$200

ROUTER BOSS DOESN'T EXCEL AT MORTISES

This elaborate jig, and the very similar WoodRat, allow you to move both the workpiece and the router independently for a wide variety of precise joinery and cutting operations, including dovetails. The router goes on a baseplate, where it can stay fixed or slide in various directions. An aluminum extrusion slides below, controlled by a hand crank, and holds various clamps and fixtures for supporting the stock. Versatility is the big selling point here, but there is a learning curve for each function and a lot of accessories. For mortising, you need an optional table attachment and special guide rails. It takes 20 minutes or so to attach the table and accessories each time, and the table needs to be raised or lowered for each new stock thickness, which is an awkward process.



Plunge, crank, repeat. After plunging the router a small amount, you have to switch your hands to the crank to make a sideways pass. Also, an accessory table is required, which is time-consuming to attach and fussy to adjust for each new workpiece.

So what do I buy?

If all you need are mortises, or if your **budget is tight**, you'll be happy with a benchtop hollow-chisel mortiser. If you can afford the extra \$100 or so, go for a midrange machine like the Powermatic. You get more power and capacity, better clamping systems and adjustments, and improved accuracy.



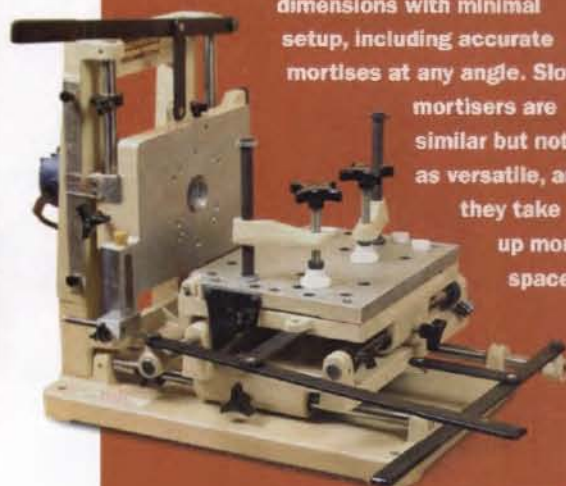
If you want to make perfectly **matching mortises and tenons** with the least amount of fuss, and you can afford it, I highly recommend the Leigh

FMT. This is a wonderfully compact, fast, accurate, and easy-to-use jig.

If you are ready to make a **serious investment** in your woodworking career, get a Multi-Router. It is in a category of its own. It will cut almost anything you can imagine in three

dimensions with minimal setup, including accurate mortises at any angle. Slot

mortisers are similar but not as versatile, and they take up more space.





How to Veneer a Sunburst

Dazzling tabletop,
step by step

BY MARK ARNOLD

Veneer can replicate solid lumber, but if you use it only for that purpose, you are missing out on some dazzling design opportunities. One of the most spectacular of these is to arrange consecutive sheets around a center point. Known as a sunburst, this pattern is ideal for circular tabletops. It creates interesting concentric patterns, and the tapered shape of each segment draws the eye from the perimeter toward the center.

If you try this with solid stock it will fail, either from radial splitting caused by shrinkage or from cupping caused by expansion. I'll show you how to work with veneer to create a beautiful sunburst tabletop, from laying out the pattern to cutting and installing the segments. I'll also show how to install a simple border that frames the sunburst. But I don't stop there. For an ornate scalloped edging that will take a sunburst to another level, turn to Master Class (pp. 88-92).

Crotch veneers create stunning effects and are the traditional choice for sunbursts, but plain sliced veneers also yield interesting results. Cross-grain figure works, such as curly and fiddleback, but bird's-eye and burl tend to understate the sunburst effect. For this tabletop, I chose a blistered cherry veneer with an African satinwood border.

Choose an even number of segments

An accurate layout is critical to success. The first step is to decide upon the number of segments in the sunburst pattern. This may be dictated by the size of the veneer sheets you have. The key to good results is to assemble the pattern in small sections first and then join those sections. In this 12-piece sunburst, the

LAY OUT THE SUNBURST

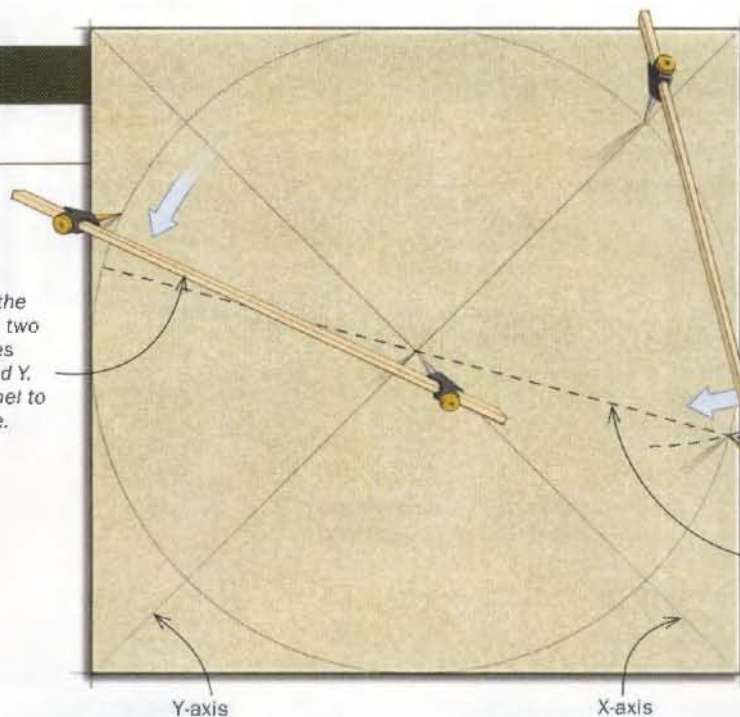
HOW TO DRAW A 12-PIECE PATTERN

Begin with a perfectly square piece of plywood or MDF. Draw lines from opposite corners, then use a trammel to draw a circle slightly larger than the desired circumference (1). Without adjusting the trammel, place the point where one of the diagonals, or axes, meets the circumference, sweep the pencil in an arc, and mark where it crosses the circumference on either side (2). Repeat this on the three other axis points, and then connect each pencil mark with the one diagonally opposite to divide the circle into 12 equal segments (3).

1 Connect the corners with two diagonal lines labeled X and Y. Use a trammel to draw a circle.

2 With the same setting, place the trammel where a diagonal crosses the circle. Mark where the pencil end crosses the circle.

3 Draw in the segment lines from the arc points through the center point.



PREPARE THE VENEER

Make sure that the veneer is flat and dry. Treat it with a veneer-flattening solution such as Rockler's Veneer Glycerin and keep it clamped flat until you are ready to use it. To determine where to cut the veneer, use two mirrors taped along one edge and opened, with the aid of a slice of wood, to 30° (360° divided by 12 segments). Placed over a sheet of veneer, the mirrors give you a preview of the finished sunburst. Find a pleasing pattern, and then faintly trace the outline onto the first sheet. Number the sheets in their correct order in a location that will not be trimmed off later.

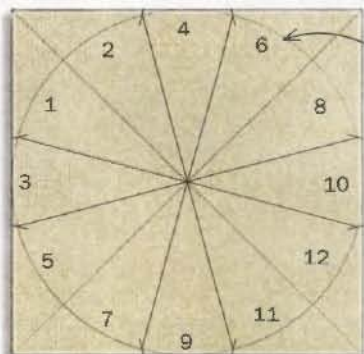


Look in the mirror. Two mirrors angled at 30° preview what the finished sunburst will look like.



Keep the sheets sequence. Number the sheets of veneer in the order they were cut from the log.

HOW TO MINIMIZE THE DIFFERENCE IN GRAIN



Grain and figure change progressively from sheet to sheet. For the best match throughout the sunburst, arrange each numbered segment as shown. In this way, adjacent slices of veneer are never more than two away from each other in the sequence.

ASSEMBLE THE SUNBURST

TAPE THE VENEER SEGMENTS INTO QUARTERS, THEN HALVES

When cutting the sunburst segments to size, the four pieces that adjoin one of the axes are deliberately left oversize. Beginning with these pieces, tape together the three segments in each quarter, flipping and book-matching each alternate piece.

1 Alternate the orientation of adjacent veneers.

U = Upward facing
D = Downward facing

2 Leave the four segments that border the Y-axis oversize.

3 Tape the segments into quarters.

4 Tape the quarters together to form halves.

Online Extra

To see the author tune up a veneer saw and show how to use it, go to FineWoodworking.com/extras.



1 First cut. Use a veneer saw guided by a straight-edged fence to make the left-hand cut on all 12 sheets of veneer.



2 Second cut. Remove the four sheets that border the Y-axis, leaving them oversize for now. Flip the remaining sheets and align them with the left-hand side of the template. Then make the left-hand cut on the segments.



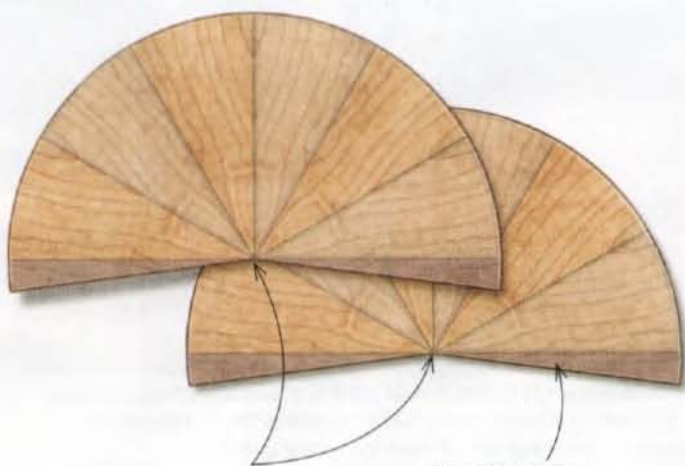
3 Quarter by quarter. Beginning with an oversize segment, use masking tape to assemble each quarter, flipping and book-matching alternate segments.



4 Two halves completed. Join adjacent quarters to form two halves that extend about 190°.

THEN TAPE THE TWO HALVES TOGETHER

Finally, align the points of the two halves and their center seams, cut away the surplus from the four oversize segments (shaded), and tape the sunburst together.



The two halves are aligned using the center points and seams of the segments.

Trim the halves using a straightedge as a guide.

total number of segments is divisible by four, so I'll assemble the pattern in quarters first. An eight- or 16-piece design can be created using the same basic layout.

Sunbursts with an even number of segments not divisible by four must be assembled in halves, each with an odd number of segments. Whatever method you choose, for best grain and color match, you'll need a stack of veneer sheets that were sequentially sliced.

Make sure the veneer is wide enough—Before you lay out the pattern on the substrate, make sure the veneer will fit the pattern. Divide the circumference of the sunburst you want to create by the desired number of segments to find out how wide each sheet must be. In this case, the top has a diameter (D) of 30 in. The formula for the circumference (C) of a circle is $C = \pi D$, so the circumference of the table is slightly more than 94 in. ($30 \times 3.14 = 94.2$). Each segment of a 12-piece sunburst will therefore need to be 7.864 in. wide, or about 7 $\frac{7}{8}$ in.

Lay out the pattern and cut the veneer

Sketch the sunburst pattern on the substrate to use as a template. I use $\frac{3}{4}$ -in.-thick Baltic-birch plywood, but MDF or stable, quartersawn solid wood is also acceptable. Cut the substrate to an exact square, slightly larger than the intended final diameter of the tabletop. Draw out the sunburst pattern as shown in the drawings on p. 73.

Use sequentially cut veneer—Number the veneer sheets in the order they were sliced from the log. Then number the segments on the template as shown on p. 73. In this way, no adjacent pieces of veneer will be more than two sheets from one another as sliced from the flitch. No stack of veneers is identical from the first piece to the last, so if you simply lay them out clockwise, the first and last sheets would likely be noticeably mismatched along their seam. To help make accurate cuts, use a $\frac{3}{4}$ -in. MDF template



Cut the halves. Place the halves together with the taped sides facing each other. Align the tips and the central seam of each half. Place a fence across the top aligned with the tips and saw through both halves.



Complete the sunburst. Use masking tape to join the halves into the finished sunburst.



Apply veneer tape. Flip over the sunburst and apply strips of veneer tape to the seams on the show face. Draw the tape over a damp sponge to avoid over-wetting it. When the veneer tape is dry, remove the masking tape from the glue face of the sunburst.

GLUE AND TRIM



Veneer both sides. To avoid the risk of the substrate warping, glue a backing veneer to the underside and press both sides at once.



Bandsaw the top. After the glue dries, use a trammel to redraw the circumference of the table and then bandsaw just outside the line.

cut to the shape of a segment, but a little longer. Double up the MDF to create a fence on one edge (see photos 1 and 2, p. 74). Align the veneer sheets in the same direction. Locate the four pieces that border the Y-axis (Nos. 5, 6, 7, and 8) at the bottom of the stack.

The best way to cut a stack of veneers is with a veneer saw. Because the saw cuts on the pull stroke, start with the stack upside down and cut the left-hand side first to reduce the likelihood of losing a segment tip on the second cut. After the first cut, remove sheets No. 5, 6, 7, and 8, leaving them oversize for now. Align the cut edge of the remaining eight sheets with the far edge of the angled template, and make the second cut to create the 30° segments.

Assemble the sunburst one quarter at a time

Lay the cut segments on the back of the substrate and, using the numbered pie chart as a guide, assemble them into quarters as

ADD THE BORDER

HOW TO ROUT A SHALLOW RECESS



Attach the pivot point. A pivot point is attached with double-faced tape directly over the center of the sunburst. Shine a flashlight through the hole to align it over the center point.



Rabbet for the border. Make a simple trammel to hold the router, attach it to the pivot point, and use a mortising bit to cut a shallow 2-in.-wide rabbet for the border.

shown on p. 74. Begin with a larger piece that overlaps the Y-axis, such as segment 5. Flip over segment 3 so that it forms a mirror image, or book-match, with segment 5. Pull the two segments together with masking tape, making sure the tips align perfectly. This is more critical than having adjacent halves be perfectly symmetrical. Now connect segment 1, faceup, to segment 3. Repeat the process starting with segment 7 facedown; book-match it to segment 9 faceup, and then add segment 11 facedown. Repeat for the two other quarters.

Once all four quarters are taped up, join the two pairs across the X-axis (segments 1 to 2 and 11 to 12) to create two halves. Next, fold one half over onto the other and align the seams of the two X-axes. Verify that all the segment tips meet at one point, then lay a straightedge across the diameter, perpendicular to the X-axis and aligned to the point where all segment tips meet.

Trim the waste from all four segments at once, open up the two

CUT AND GLUE THE BORDER VENEER



Prepare the sections. Use a trammel to scribe the sunburst curve onto a stack of border veneer.

halves, and attach them with masking tape. Then flip over the sunburst and apply veneer tape to all the seams on the show face. For adhesion, you need to moisten the veneer tape, but don't use too much water or you'll distort the cut seam. Instead, pull the tape across a damp sponge, then apply it. Allow the veneer tape to dry, then remove all the masking tape from the opposite face. The sunburst is now ready to be glued to the substrate.

I use Better Bond (www.veneersupplies.com), a polyvinyl acetate (PVA) adhesive formulated to reduce the risk of glue bleeding through the veneer, and apply it with a paint roller. Veneering only one side of the substrate could cause warping, so stabilize it with a backing veneer. Apply adhesive to the underside of the substrate and position the backing veneer perpendicular to the face grain of the plywood. Then flip the panel onto a $\frac{3}{4}$ -in.-thick MDF caul covered with a sheet of plastic, apply adhesive to the top of the substrate, and center the sunburst face on it, taped side up. Cover the veneer with a sheet of plastic and another MDF caul, and press the stack in a vacuum bag or veneer press for six hours.

A border made from contrasting veneer

A border is a classic way to frame the sunburst veneer. It can either be a simple circle of consistent width, as shown here, or a more ambitious pattern (see Master Class, pp. 88-92).

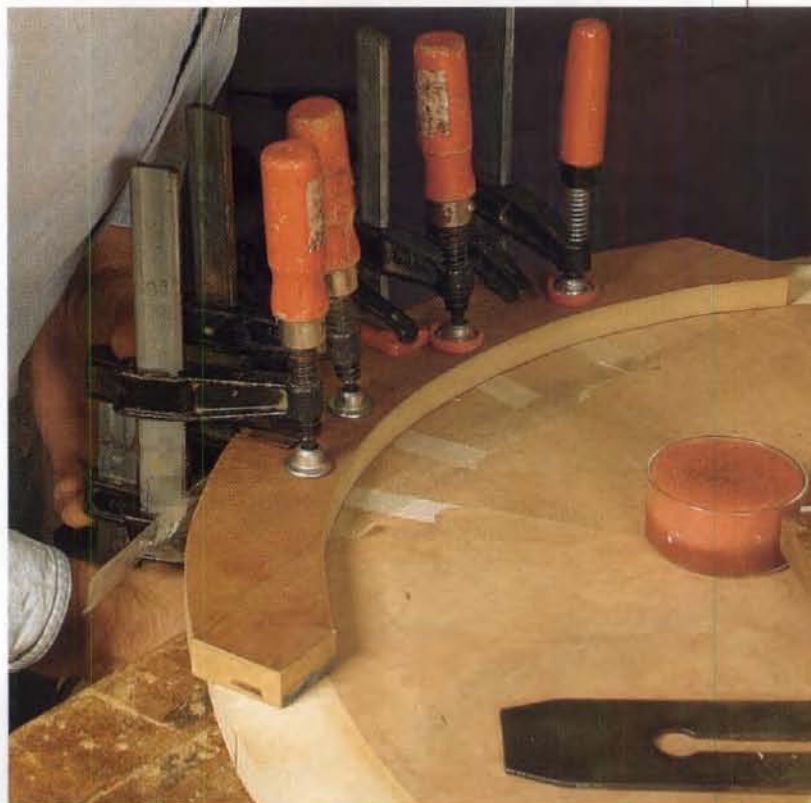
When the glue has cured, remove the panel from the clamps or vacuum bag, dampen the tape, and peel it away. Much of the remaining work is done referencing off the center of the sunburst. First, use a trammel (with the metal point in a plastic tip to protect the veneer) to draw the circumference of the table on the veneer, and cut just outside the line using a bandsaw. Next, make a pivot block with a hole in it that matches the diameter of the



A clean cut. A plane iron creates a tight seam when joining the sections.



Three at a time. Tape three pieces of veneer together, lay them on the substrate, and place masking tape at both ends to help remove glue squeeze-out.

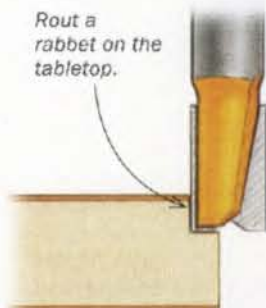


Clamp with a curved caul. After applying glue to the substrate, tape the border to the sunburst to prevent it from moving when clamping pressure is applied.

TRIM THE EDGE AND BAND IT

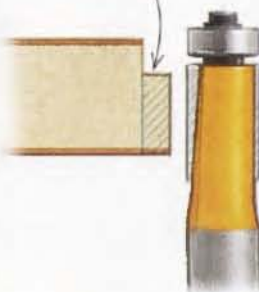
CUT THE CIRCUMFERENCE IN TWO STEPS

Use a straight bit and a trammel-mounted router to make an initial $\frac{1}{4}$ -in.-deep cut.



Complete the cut on the router table with a bearing-guided, flush-trimming bit.

A flush-trimming bit completes the table edge.



metal rod or drill bit you intend to use. Align the hole with the center point of the tabletop and attach the block to the top with double-sided tape. Set up a router on a trammel whose pivot point is connected by a metal rod or drill bit to the pivot block. Use a $\frac{3}{4}$ -in.-dia. mortising bit and set the depth of cut to the thickness of the border veneer. Subtract 2 in. from the intended radius of the finished top, and cut a shallow rabbet from that point to the edge of the top. Go clockwise on all passes to minimize tearout, and keep a firm grasp on the router for this climb cut.

Cut the border veneer into pieces 3 in. wide by a little over 2 in. long, with the grain running perpendicular to the width. Cut enough pieces to go around the tabletop. Mount the trammel point in the center of the pivot block and use the pencil to mark the arc of the sunburst on the stack of border veneer. Use the handsaw to cut the stack along that mark. Place a piece of scrapwood under the stack to create a zero-clearance surface.

A sharp plane iron is the easiest way to cut the joint between the radial seams of the border, but you can also use a veneer saw. After joining three or four sections together with veneer tape, lay them adjacent to the sunburst (stringing will fill any slight gap) and place masking tape on the substrate at both ends of the border. This will make it much easier to remove glue squeeze-out before adding adjacent sections. Use masking tape to attach the border to the sunburst veneer to prevent it from moving. Apply glue and then clamp the border using a suitably shaped caul.

Work around the top in this fashion.

Once all the border has been applied, use the trammel-mounted router to cut the top to final size. This can be done with a straight-cutting bit in $\frac{1}{4}$ -in. incre-



Add the edging. Use narrow strips of edge-banding veneer to cover the edge of the tabletop.



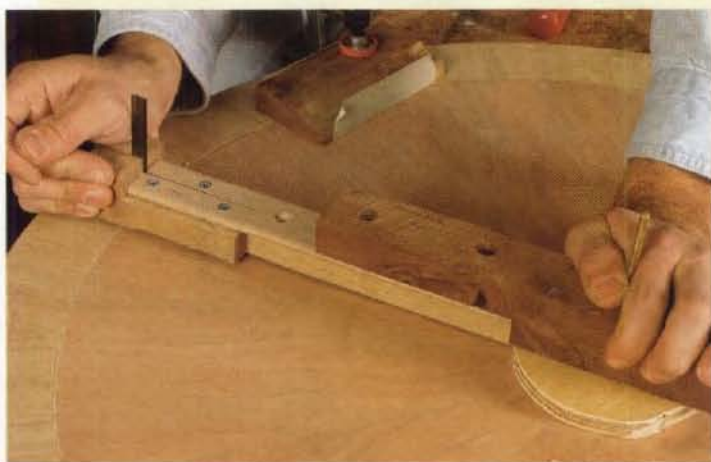
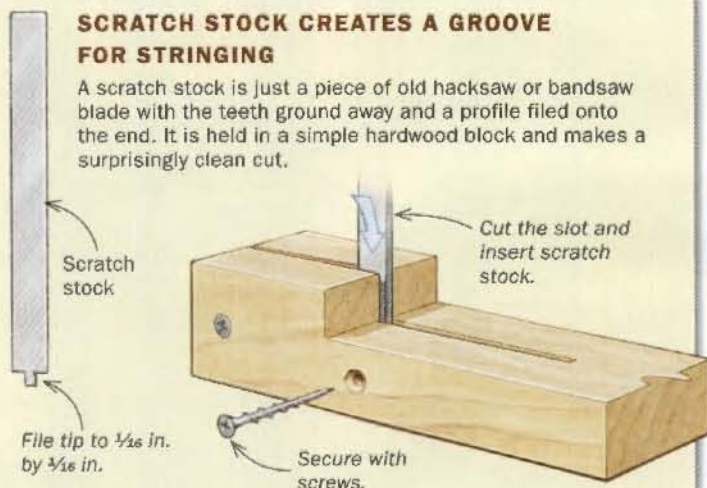
Circle clamp. Apply the edging in short sections and use a band or strap clamp. The large triangular section keeps the clamp jaws off the wood. Note that the section being clamped is along the far edge of the table.

For an alternative border design and technique, see Master Class on pp. 88-92.

ADD STRINGING AND A SOLID CORNER

SCRATCH STOCK CREATES A GROOVE FOR STRINGING

A scratch stock is just a piece of old hacksaw or bandsaw blade with the teeth ground away and a profile filed onto the end. It is held in a simple hardwood block and makes a surprisingly clean cut.



Another trammel. Attach the scratch stock to the pivot point and cut a groove between the sunburst and the border to receive the stringing.

ments, or after the first pass you can go to the router table and trim away the waste using a bearing-guided, flush-trimming bit.

Now wrap the table edge with vertical pieces of the edge-banding veneer. Again, do short sections at a time, place a piece of masking tape at the end to facilitate removing squeeze-out, and use thin strips of wood or bending plywood as cauls. An edge-banding clamp with its steel strapping works best, but you could also employ a nylon strap clamp.

You could use a router to cut the groove for the stringing between the sunburst veneer and the border, but I use a scratch stock indexed to the center point. You could also run it against the table edge. Glue in the stringing and scrape it flush.

To give the vulnerable veneered edge of the tabletop some added protection, I add a thin strip of solid stock. I cut a 1/8-in.-square rabbet in the top corner using the router and trammel and glue in a piece of hard maple. Scrape the edging flush, sand the whole surface, and apply a clear gloss finish to bring out the wood's figure. □

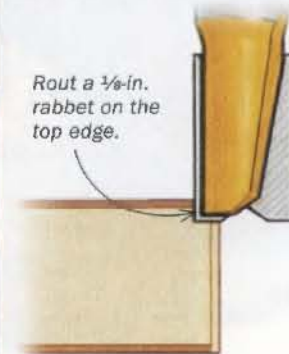
Mark Arnold is the owner of Boston Woodworking in Sunbury, Ohio.



Insert the stringing. Use a syringe to insert glue into the groove, and then add the holly stringing. When the glue has dried, bring the stringing flush with a scraper.



The final cut. Use the trammel-mounted router one last time to cut a 1/8-in.-square rabbet on the top corner of the tabletop.



Rout a 1/8-in. rabbet on the top edge.



Added protection. A strip of hard maple protects the vulnerable veneered edge.

Glue a strip of hardwood into the rabbet.



readers gallery

MARK BELLONBY

Mason Neck, Va.

It's no surprise that Bellonby, an architect by trade, infused this display cabinet (16 in. deep by 31 in. wide by 84 in. tall) with architectural elements, seen in the bridge motif of the base, the Art Deco details, and the crown molding on the cabinet. He spent more than 200 hours designing the piece and more than 300 hours building it. The cabinet is Brazilian rosewood, and the base is soft maple ebionized with water-soluble dye. It is finished with dewaxed shellac followed by a water-based lacquer.



ED STUCKEY

Detroit, Mich.

- Stuckey, a member of the Society of American Period Furniture Makers, built this Federal-style card table with inspiration from an article by Walter Raynes and Carl Clinton in *Home Furniture* #6 (Spring 1996). Rather than make an exact reproduction, the authors merged New York and Baltimore styles: While the oak-leaf and acorn inlays, the round top with sunburst crotch mahogany panels, and the dentil inlay are distinctly New York, the bellflowers on the legs are more consistent with the tables built in Baltimore. When open, the table is 36 in. dia. and stands 28 in. tall. Finished with a French polish, the woods are mahogany, satinwood, Brazilian rosewood, ebony, curly maple, walnut, and holly.



DAVID RINGHEIM

Procter, B.C., Canada

Ringheim's goal was to create an eye-catching desk that didn't overwhelm and was comfortable to use. He met the criteria with subtly contrasting woods, curved stretchers, and a slightly curved front and center drawer. The wenge, sapele, and maple desk is 30 in. deep by 57½ in. wide by 30 in. tall, and is finished with a spray lacquer.

ROBERT BROU

Atlanta, Ga.

Inspired by nature, Brou creates functional furniture that is also very sculptural in form. He refers to this coffee table (36 in. deep by 47 in. wide by 18 in. tall) as the urchin table. All the legs and spikes (more than 250 in rosewood, mahogany, and wenge) were custom turned and fitted to the table. The buckeye-burl top is finished with lacquer, and the bulbs on the spikes are colored with ink and white lacquer, then finished with clear lacquer.



STEVE ORTON

Seattle, Wash.

Orton made this chest of drawers (18 in. deep by 24 in. wide by 66 in. tall) for his sister-in-law. At first she wanted a traditional Shaker-style chest, but then they decided to include more detail. Orton added madrone-veneered drawer fronts with cock beading, bracket feet, and more contemporary knobs. The rest of the chest is African and Honduran mahogany with birch drawer sides and bottoms. The finish is amber dye, gel stain, water-based polyurethane, and dark wax.





CECILIA SCHILLER

St. Paul, Minn.

A professional carver, Schiller designed and built this walnut music stand for her daughter (a flute player who is studying music therapy) as a high school graduation gift. Before picking up carving gouges, Schiller removed the negative space with a jigsaw, and then refined the shapes with hand tools. The stand, finished with an oil/varnish mixture, is 12 in. deep by 20 in. wide by 40 in. tall.

PHOTO: RAMON MORENO



KELLY J. DUNTON

Southbury, Conn.

Dunton, an associate art director at *Fine Woodworking* and an avid woodworker, was influenced by the Shaker aesthetic for the design of this child's desk, 19¾ in. deep by 36 in. wide by 39 in. tall. The base came from a photo of a table built by the Pleasant Hill Shakers in Kentucky. After a visit to the Hancock Shaker Village in Massachusetts, Dunton decided to incorporate the upper drawer gallery. The poplar sections are covered with milk paint and wax, and the maple top and gallery section have an oil finish. The pulls are cherry.

CHARLIE JAMES

Williston Park, N.Y.

Inspired by sideboards from the Winterthur Museum and Country Estate in Delaware and Colonial Williamsburg in Virginia, James spent more than four years (with some time off here and there) refining the design and building this piece from cherry with walnut beading. He scaled down the size to fit a modern-day home, and then he extended the curve on the sides farther back and added hidden compartments. The greatest technical challenges came in the coopered drawers and doors, and the inlays. The sideboard (12 in. deep by 48 in. wide by 33 in. tall) is finished with hand-rubbed varnish. PHOTO: JIM MACCULLUM



GOOD THINGS IN SMALL PACKAGES

The response to FineWoodworking.com's "Build Outside the Box" gallery challenge was overwhelming. The prize that lured more than 350 boxmakers was a Steel City granite-topped tablesaw. Here are just a few of the outstanding submissions. To see the rest, go to FineWoodworking.com/extras.



CHRISTOPHER MOORE

Madison, Wis.

Moore, an instrument maker, designed this spruce and maple box (2¾ in. deep by 7 in. wide by 2½ in. tall) to resemble violin elements. A typical violin corner (back right) serves as a lift for the lid, and the hinge (at left) is made of ebony from an old fingerboard. The overall shape is taken from a cello cutoff. The finish is spirit varnish (the same finish he uses on his instruments) that has been antiqued.



JACK TAYLOR

Philadelphia, Pa.

When asked about the inspiration for this hand-carved pine box, Taylor (not a fisherman himself) said, "I wish I had been guided by some grander impulse other than to make a little joke, but that's all there is to it." The box, 4½ in. deep by 12 in. wide by 8½ in. tall, is finished with amber shellac, gel stain, and wax.

ROY SUPERIOR

Williamsburg, Mass.

This jewelry box (17 in. deep by 17 in. wide by 24 in. tall) is a rotating hexagonal chest with 12 triangular drawers and three cupboards that hold pegs and hooks for hanging jewelry. Superior used Watco oil and wax to finish the padauk, ebony, rosewood, wenge, and bird's-eye maple. Other materials are bone, antique ivory, gold leaf, and brass. PHOTO: SUSIE KUSHNER



JEFF GUTHRIE

Newton, Iowa

Guthrie designed this rosewood, ebony, and fiddleback maple box to challenge himself with bent laminations and veneering.

Once that challenge was met he moved on to the next, using the box to present an engagement ring to his girlfriend (she said yes). Finished with teak oil, the box is 7½ in. deep by 14½ in. wide by 6 in. tall. PHOTO: BOB HAWKINS



TIM COZZENS

Oak Park, Ill.

Experience making curved plywood panels for dining chairs prompted Cozzens to try the technique on this box, 5 in. deep by 12 in. wide by 6 in. tall. Finished with lacquer, the exterior is tamo ash, the interior is pommele sapele, and the base and handles are aluminum. PHOTO: JERRY COX

Offset rabbets make double doors stronger

Q: In "Illustrated Guide to Doors" (FWW #204), Andy Rae shows a pair of doors that meet with a beaded lap. Placing the bead on the right-hand door, as the illustration shows, greatly weakens the lap. Wouldn't it be better to bead the left-hand stile, where the bead would be cut into the full thickness of the stile?

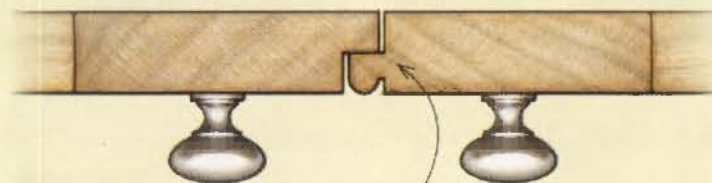
—RICHARD BYRNE, Staunton, Va.

A: THANKS FOR POINTING OUT the danger of weakening the stile by cutting a bead above the rabbet. You can strengthen the bead by cutting unequal rabbets. On the right-hand door, the rabbet should be shallower than on the left. This makes the beaded lap stronger, because there is more material under the bead.

A second option would be putting the bead on the left-hand stile, as you suggest. You also could forego the lap altogether, but you'll allow more dust and light into the cabinet, and you'll also introduce one more critical gap into a series of critical gaps, making a perfect fit harder to achieve. And in either of these two solutions, the stiles would need to be of unequal width to keep the bead centered, giving you more dimensions to keep track of.

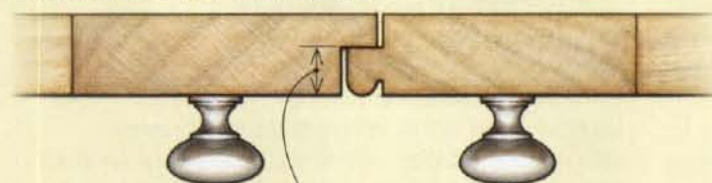
—Andy Rae is a frequent contributor to Fine Woodworking.

WEAK BEAD DESIGN



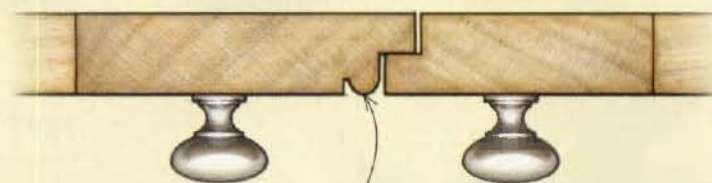
There is little material left after beading if the rabbet is half the thickness of the stile.

SOLUTION 1: OFFSET THE RABBETS



Deepening this rabbet makes the beaded lap stronger.

SOLUTION 2: BEAD THE LEFT STILE



Beading the left-hand stile doesn't weaken either lap, because the bead is over the full thickness of the stile.

Drawings: Christopher Mills

Low-dust lubricant for a tablesaw

Q: I have an old tablesaw that still works well. But the gears often become clogged with sawdust, which makes them hard to turn. I clean them out, but the lubricant I use seems to be a magnet for dust. Is there something I could use that wouldn't attract so much sawdust?

—PAUL COX, Berkeley, Calif.

A: I USE A WHITE GREASE STICK that has the consistency of soft soap. You can find it in the automotive aisle of most hardware stores. A toothbrush will let you apply a thin coat to the gears that won't attract much dust.

If you can't find the stick grease, use a furniture wax like Johnson's paste wax. It works nearly as well.

To help clean the gears before applying the grease, use a spray penetrating oil such as WD-40 and a stiff brush.

—John White is a former FWW shop manager.



Less grease means less dust. A thin coat of Penef's white stick lubricant is easy to apply with a toothbrush and isn't a dust magnet. After scraping some grease onto a toothbrush, press the bristles into the gears as you rotate them with the handle.

GOT CYCLONES?

LAGUNA TOOLS
LAGUNA TOOLS



10-HP

The Laguna Cyclone Dust Collectors offer the benefits of a cyclone combined with the highest-quality filters in the industry. The Cyclone dust separation unit is 99.7 % efficient. This means dust particles do not pass through our high efficiency fan unit. Radio frequency remote control and automatic filter cleaning are just some of our features.

Visit us at www.lagunatools.com or give us a call for more details.



5-HP



3-HP



2-HP

THRIVING ON INNOVATION
LAGUNA TOOLS

17101 Murphy Avenue, Irvine, CA, 92614

www.lagunatools.com

READER SERVICE NO. 85

Se Habla Español

800.234.1976

949.474.1200

Identifying finishes for repair

Q: How can I identify the finish on a piece of furniture so that I can repair it?

—JACK SIMPSON,
Abilene, Texas

A: FIRST, REMOVE ANY WAX ON THE surface by rubbing it with a cotton cloth dampened with mineral spirits.

Next, in an inconspicuous spot, place a drop of denatured alcohol on the surface, wait a few minutes, and then rub the area with a paper tissue. If the finish is shellac, you'll rub some off.

If the surface stays hard, repeat the test with a drop of lacquer thinner. If the surface becomes sticky, the finish is lacquer or a water-based finish. The latter was rarely used before the 1990s, so lacquer is the only candidate on older pieces.



Solvent identifies finish. To know which finish you're dealing with, try to dissolve it. Test a hidden spot. You'll know the finish by which solvent removes it.

If the surface remains undamaged by the lacquer thinner, you have a reactive finish such as varnish.

In the case of a shellac or solvent-based lacquer finish, a fresh coat of the same finish will melt into the existing finish, making repairs relatively simple if the existing finish is in good shape.

A fresh coat of a reactive finish, however, won't chemically bond to an old coat, so you'll either need to sand the existing surface to create a mechanical bond or, if the existing finish is too badly damaged, strip it entirely and start again from bare wood.

—Mark Schofield is FWW's managing editor.

Round the edges of every plane blade?

Q: I've read that the cutting edge of a plane blade should be slightly cambered. Why? And should I do it to all of my plane blades?

—KEVIN LAVOIS,
Holyoke, Mass.

A: NO, YOU SHOULDN'T CAMBER ALL OF YOUR BLADES. Some need to be straight to perform their jobs.

The blade of a shoulder plane or rabbet plane should definitely be left square, because you can't trim a tenon shoulder square or cut a square rabbet with a rounded blade.

And I keep the blades square on all of my bench planes, except for my smoother. But I do round their corners slightly so that they don't cut tiny steps into the surface. A straight edge is also easier to maintain, which is an important consideration if you use your bench planes a lot.

But there's good logic in slightly cambering the blade of a smoothing plane. A cambered blade leaves no marks, and so a cleaner finish, on the surface. The blade only needs a slight camber, just a couple thousandths of an inch. It can be achieved by alternately applying a bit more pressure at each corner when honing.

—Garrett Hack is a contributing editor for FWW.

STRAIGHT WITH SQUARE CORNERS FOR JOINERY



To keep tenons square, a shoulder plane needs a dead-straight cutting edge and crisp corners.



STRAIGHT WITH ROUNDED CORNERS FOR GENERAL USE



Most bench planes need a straight cutting edge, but rounded corners keep the blade from cutting grooves, or steps, into the surface.



CAMBERED FOR SMOOTHING



For smoothing, the radius should be slight, about two thousandths of an inch overall.



Buying roughsawn lumber

Q: I finally have a jointer and planer, so for my next project, a table, I plan to buy roughsawn lumber. I managed to calculate the number of board feet I need, including waste. Is that number all I need to take to the lumberyard?

—GEORGE FARRA,
Wyckoff, N.J.

A: KNOWING THE NUMBER of board feet will help you estimate the cost of your lumber, but it won't help you pick out the best boards for your table.

When I go to the lumberyard, I take a drawing of my project that includes dimensions, a tape measure, and a grease pencil. This helps me find the right size boards and keeps me organized.

Let's say your tabletop is 20 in. square. You could glue it up from two 11-in.-wide boards or three 8-in.-wide boards. Look first for a long 11-in.-wide board with attractive grain and color. Try to find one that's long enough so you can get the entire top and a few other parts from it. Ideally, the board will be long enough to supply the aprons



Pick wood that fits your plan. A dimensioned drawing helps you find boards the right size for your parts. Mark them out, and keep track of what's been found. That way, you'll know when you've got enough lumber.

as well. If it's not, look for a second one that's a close match for grain and color.

Follow the same process when you choose boards for the legs, looking for the best grain and color match with the first board you chose.

As you pick boards, use the grease pencil to mark the parts and to check them off on your plan, ensuring that you've got enough material.

— Kelly Dunton is
an associate art director
for FWW.



Leader in Arts & Crafts Woodworking Plans for Over 17 Years

Beginner - Intermediate - Advanced

A full size plan of this Bow - Arm Morris chair created by Brian Murphy of American Furniture Design is available at the Fine Woodworking store
www.taunton.com

Plan Number is #011085 - \$19.95 + shipping

Featured in Fine Woodworking #205 issue



Visit our website for a free catalog for all of our 125 outstanding Furniture Designs

American Furniture Design Co. - P.O. Box 300100 - Escondido, CA. - 92030-760.743.6923
www.AmericanFurnitureDsgn.com

Beautiful border frames a sunburst tabletop

BY MARK ARNOLD

Depending on the design, the border around the veneered center of a tabletop can have a strong voice, or it can serve its purpose with a whisper.

I'll illustrate how you can use contrasting veneer to increase the "wow" factor of even a piece as dramatic as a sunburst tabletop (see "How to Veneer a Sunburst," pp. 72-79). By cutting the border, also known as crossbanding, with

either a concave or convex curve where it meets the sunburst, you can produce two very different looks: A concave edge produces a floral motif, while a convex curve creates the look of a spider web.

I'll describe how to make the floral motif in this Master Class, but you can learn how to create the spider-web border at FineWoodworking.com/extras. Each method uses the radial seams in the sunburst pattern as the

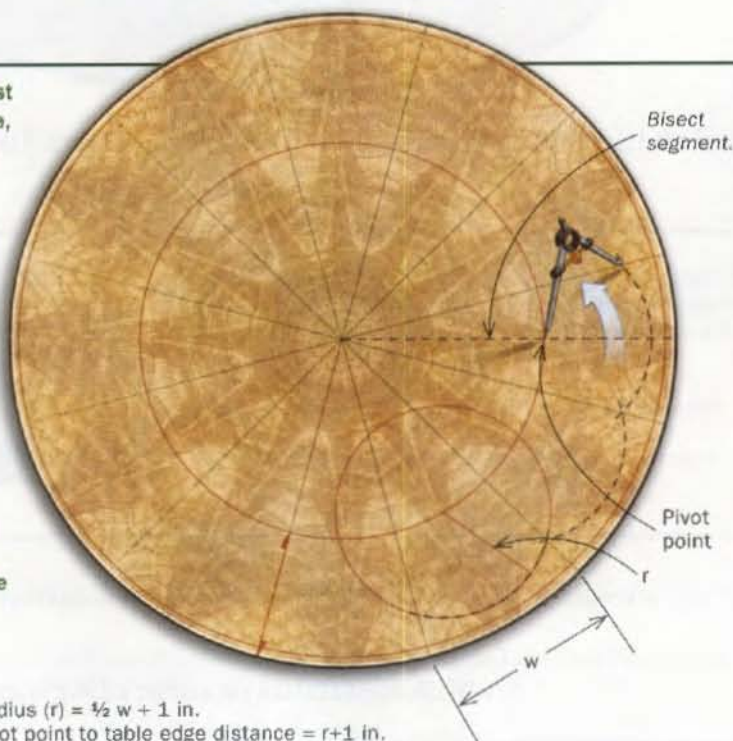
CREATIVE CURVES

The radius at the end of each sunburst segment is a matter of personal taste, but the following formula is Arnold's favorite:

Calculate the width of a segment (w) at the edge of the circle. The radius (r) is half this width plus 1 in. Set a compass to this distance. To find the pivot point in each segment, draw a line that bisects the segment and measure in from the edge the distance of the radius you just calculated plus 1 in. Gently set the point of the compass on this spot and mark where the pencil crosses the two seams of that segment. If the two marks are an equal distance from the edge of the table, you're good to go. Mark the pivot point with a pencil.

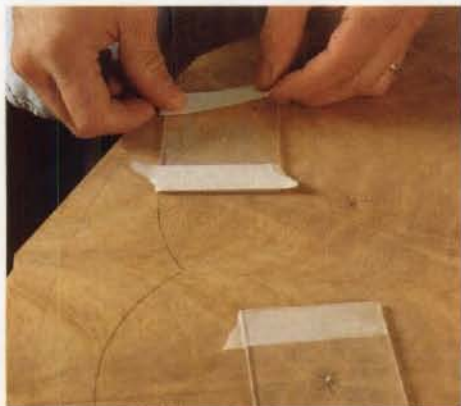
$$\text{Radius } (r) = \frac{1}{2} w + 1 \text{ in.}$$

$$\text{Pivot point to table edge distance} = r + 1 \text{ in.}$$



Draw the design. After deciding on an attractive radius, mark the pivot point in the center of each sunburst segment, and use a compass to draw the arc across the end of each segment.

Rout the recess



Clear pivot block is the trick. Drill a hole in a piece of clear plastic, center the hole over the pivot point of the arc, and attach the block to the veneer with double-stick tape. The block allows you to pivot trammel points without damaging the sunburst veneer.



The right arc. Drive a screw through the trammel just enough that the tip engages the hole in the pivot block. The router bit should align with the outside edge of the scribed arc.



A clean cut. Swing the router around the pivot point, creating a groove at the end of each sunburst segment. Then loosen the screw and move the router freehand to remove the rest of the waste.

terminal points for each section of the border veneer.

Cut the design in the sunburst

To make the concave border, start by cutting a convex arc on the end of each segment of the sunburst. The radius of the arc is determined by several factors, but the most important is appearance. Here's a simple approach that produces an attractive curve. First, locate the pivot points of each segment by dividing the width of the segment at the table edge in half and then adding 1 in. This is the radius of the arc. Add an inch to the radius, measure this distance from the

table edge to the center of each segment, and mark this point.

Because you'll use a trammel twice on each segment of the sunburst, temporarily apply pivot blocks to each segment. Use a piece of 1/8-in.-thick clear plastic with a 3/4-in.-dia. hole drilled in the center. The clear plastic allows you to center the hole directly over the pivot point; the hole receives the trammel point without damaging the veneer.

Set up a router with a 3/4-in.-dia. mortising bit and secure it to a trammel. Attach pieces of clear plastic to the underside of the trammel on both sides of the bit to keep the ends of the



Finish the corners by hand. After routing the waste to the edge of the table, clean up the inside corners with a bench chisel.

Cut and apply border veneer



Profile the border. Book-match the veneer and then bandsaw the concave profile in a stack.

trammel level. Drill a hole in the trammel the same distance from the inside edge of the router bit as the design's radius. Extend a drywall screw through that hole until the trammel sits securely in the pivot point. You can now swing the router from this fixed point and excavate the veneer from the sunburst segment. After cutting the initial groove using each pivot point, retract the pivot screw and rout the rest of the waste freehand toward the edge of the tabletop. The trammel will keep the router level. Use a 1/2-in. bench chisel to clean up the inside corners where the arcs meet.

One scallop at a time

While you could use the same border veneer shown in the article, for added impact I like to use veneer with contrasting colors, such as this Macassar ebony, and book-match it. By making the sections just wider than half the width of each segment, you get a book-matched effect both in the middle of each arc and where they adjoin.

Using a compass set to the radius of the original arc, trace the curve onto a stack of book-matched veneer, and carefully bandsaw the curve. Because the joint between the sunburst and the border will be filled with stringing, a



Align the pieces. Place the book-matched joint in the border on the center line of a sunburst segment. Then cut the veneer along a line that extends from the sunburst seam.

A clean joint. Align the back of a plane blade against the cut segment, and then cut through the uncut adjoining piece underneath. When making the cut, angle the blade to keep the cut vertical.



Glue one or two sections at a time. Place a bit of plastic film followed by a piece of rubber sheeting on top of the sections. The rubber allows uneven thicknesses of veneer to receive even pressure while the plastic prevents the rubber from getting glued to the veneer.

RAZOR SAW
It cuts FASTER! EASIER! MORE
ACCURATELY!

Order now, only \$25.95 post paid!

Craftsmen around the world have discovered the secret of better quality work. The Razor Saw cuts by pulling and will give a cleaner, more accurate cut in half the time.

Purchase a RAZOR SAW now and we will include our 100 page catalog of the world's finest woodworking tools. Or send \$2.00 for a two year subscription to our Catalog.

The Best handsaw for ALL woodworkers!
www.japanwoodworker.com Dept D2

THE JAPAN WOODWORKER
1731 Clement Ave. • Alameda, CA 94501 • 1-800-537-7820

READER SERVICE NO. 18

WAREHOUSE SALE
50% off OVER
200 BOOKS

Hurry! Limited Time • Limited Quantities
Visit: www.FineWoodworking.com/Sale
Open to our readers until midnight July 31, 2009.

© 2009 The Taunton Press

Since 1979



Order Line:
866-350-2575

www.osborneturnings.com

info@osbornewood.com



Superior Craftsmanship!

Corbels

Onlays

Island Posts and Table Legs

Exceptional Customer Service!

READER SERVICE NO. 38

www.finewoodworking.com

"The V-System dust collector exceeded my expectations!"

"The V-System is excellent! It performs well and is properly engineered. Oneida has been a pleasure to work with, thank you!"

J.L. Casamassima
Vermontville, NY Mar. 2009

**2hp
V-Systems,
Ready to Go
with Stand Start
at \$990.00**

**3hp
V-Systems,
Ready to Go
with Stand Start
at \$1195.00**

American quality at
an import price!

► Wall Mount
Option

► Basic Starter
Ductwork
Packages

See Us at AIFS 2009
Booth #111

Patent
Pending



U.S. Made Baldor Motors

We Build to Last A Lifetime.



Invented and made
in the USA with US
components.



**Complete Ductwork &
Shop Plan Design
Packages**



Solving Your Dust Problems Since 1993

Call Today for FREE Catalog!

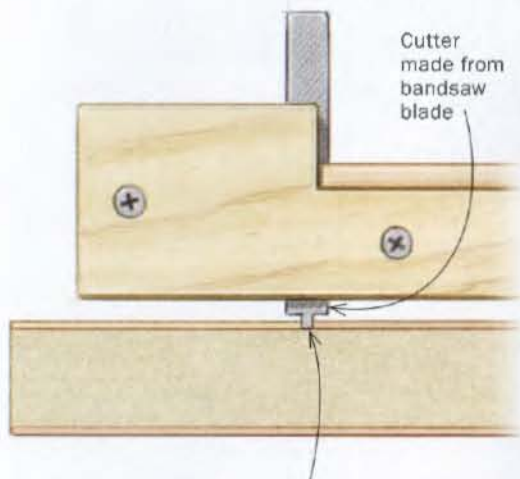
Order Online!

1.800.732.4065

www.oneida-air.com

READER SERVICE NO. 97

Add the stringing



Groove is $\frac{1}{8}$ in. wide and deep enough to reach substrate.

perfect fit is not essential. Work your way around the tabletop, aligning the seams with those of the sunburst. Use a wide chisel or plane iron to chop joints. Fit and glue one or two pieces at a time.

Stringing highlights the design

Once all the veneer has been glued in, inlay stringing to hide the seam between the border and the sunburst. This can be done with a router, but I prefer a scratch stock at the end of the trammel.

You won't be able to scratch or rout the inside corners where the arcs meet, so for these parts I use a piece of bandsaw blade ground down to form a kind of chisel. Inlay the stringing one section at a time, mitering the joints with a chisel. Apply glue to the groove, install the stringing, and push it home with a mallet.

Once the stringing is dry, bring it flush with the surface, then follow the steps in the article, routing the final edge of the tabletop, applying the edge-banding, and adding the protective hardwood corner. The tabletop produced with this method will wow viewers for decades to come. □



Same pivot point. Use a scratch stock on a trammel to cut a groove between the sunburst and the border veneers.



Cut the corners. A knife extends the groove into the corners where adjacent arcs meet.



Miter the ends. Cut the ends of the stringing in line with the veneer seams.



A little persuasion.

The stringing may swell slightly when it contacts the water-based glue, so make sure it sits in the bottom of the groove. After the glue dries, scrape and sand the stringing flush.

Online Extra

To watch Arnold demonstrate a different design, go to FineWoodworking.com/extras.

New England's Largest Selection of Unique Lumber and Burls

Specializing in Slabs up to 6' wide

3 buildings with over 1000 bins of the finest domestic and exotic lumber and burls for you to personally select

Berkshire Products, Inc.
Route 7A, Sheffield, MA 01257
413-229-7919
www.BerkshireProducts.com



Custom Inlays & Veneers



Embellish your furniture simply and easily with ready-to-apply inlaid veneers and pre-veneered parts.

Commercial inquiries welcome

www.missionfurnishings.com



Build your own Rocker

Innovative Design
Templates and Plans
\$30 + \$5 S.H.

Check or Money Order to:

Davison Rockers
17350 Doris Mae Cir.
Palmer, AK 99645
907-745-3550

Philadelphia Furniture Workshop
Hands-On Instruction; All Levels
Mario Rodriguez, Artist in Residence
www.philadelphiafurnitureworkshop.com
215-849-5174

OVER 10,000 BOARDS ONLINE!
SHOP OUR ONLINE STORE TODAY!
www.nwtimber.com

NORTHWEST TIMBER
EXCELLENCE IN SERVICE
1-800-238-8036
Jefferson, Oregon

DIMITRIOS KLITSAS
LEARN WOOD CARVING
Learn the skills to be a wood carver with a European master. From basic to advanced levels in two week programs. Visit our website for more info about our class schedules.

Fine WOOD SCULPTOR
(413) 566-5301 • Fax: (413) 566-5307 • www.klitsas.com

NORTHWEST SCHOOL OF WOODEN BOATBUILDING
Port Hadlock, WA
360-385-4948
VISIT OUR WEBSITE
www.nwboatschool.org

Now offering a
COMPOSITE wooden boat building

Associates Degree in Occupational studies*
Waterfront campus
*Accredited School, ACCSCT

Connecticut Valley School of Woodworking

Learning by Doing
Hands-on woodworking & furniture making classes for all skill levels—Nights, weekends & week-long classes

249 Spencer St.
Manchester, CT 06040
860.647.0303
www.schoolofwoodworking.com

THE BEALL TOOL CO.
WIZARD
Raises the art of pen turning to a new level!

Made in the USA by
THE BEALL TOOL CO.

541 Swans Road, N.E. Newark Ohio 43055
1-800-331-4718 Fax 1-740-345-5880
Dept. FW
www.bealltool.com

OREGON BLACK WALNUT

GOBY WALNUT PRODUCTS
Wide lumber - 4/4 through 16/4
Turning - Carving Stock
Gunstocks - Veneer
Instrument Grade Lumber
No Minimum Order
Web Site: www.gobywalnut.com

5315 NW St. Helens Rd.
Portland, OR 97120
(503)-477-6744

We make the world plane

For prices of 75 E.C.E. planes and other cabinet-maker's tools, write: David Warren Direct, 7317 Chesterfield Rd., Crystal Lake, IL 60012 or call 800-724-7758. Dealers invited. View tools online at www.ecemmerich.com

VISA

We also make it fancy

NEW ONLINE STORE
Shop for Figured Hardwood Lumber at:
www.PINECREEKWOOD.com

Sawyers of Figured Maple, Claro Walnut and Exotic Hardwoods since 1986

Pine Creek Wood Co.
Friend, OR. (541) 467-2288

WOOD RIVER VENEER

Architectural, Cut to Size & Specialty Panels, Tabletops, Doors & Veneer

(800) 875-7084
www.woodriverveneer.com

Groff & Groff Lumber
Exceptionally Fine Furniture & Instrument Grade Woods

PREMIUM WALNUT, CHERRY, CURLY CHERRY, BIRDSEYE AND TIGER MAPLE

Sawmill Direct • Slabs to 40" Wide • 75+ Unusual Native & Imported Species • Matching Flitches • Burls & Turning Blocks
Order 75 Domestic and Imported Species 4/4 • 16/4 • Custom Flooring & Wainscoting • No Order Too Large or Too Small
858 Scotland Road, Quarryville, PA 17566
www.groffslumber.com
1-800-342-0001 • 717-284-0001 • Fax 717-284-2400
National & International Shipping

Signs That You're a Woodworker:

- You cut yourself with a chisel and your #1 priority is to not get blood on your work.
- You know exactly where everything is in your shop... except for a pencil.
- You can correctly pronounce Padauk and Lignum Vitae.
- You have said these words: "I can build that in two weeks."

Real Woodworkers - Read Fine Woodworking

Showcase your business in the Woodworkers Mart
Call Kimberly Parrilla at 800-926-8776
Ext. 3590

BOW ARM MORRIS CHAIR
Introducing the finest plan on the market today! Pages of directions and 36 by 48 CAD generated plan.

This chair has won awards across the country and has become a part of American History, and is a easy project to build. The foot stool is included in the drawing!

FREE CATALOG
With over 125 Great furniture plans!!

AMERICAN FURNITURE DESIGN
P.O. BOX 300100 ESCONDIDO, CA 92030
BOW ARM MORRIS CHAIR \$19.95 + \$5.00 SH
760 743-6923
www.americanfurnishedsgn.com

cabinetparts.com
Leading Internet Distributor of Cabinet Hardware & Accessories

Next Day Shipping
All major brands

Vast selection
Cabinet Hardware
Hinges - Drawer Slides
Locks - Knobs & Pulls - Lighting
Veneers - Laminates and more



PECK TOOL
SUPERIOR QUALITY SINCE 1929

FREE CATALOG AT WWW.PECKTOOL.COM



COOK WOODS cookwoods.com
TOLL FREE 877.672.5275

110 SPECIES OF EXOTIC AND DOMESTIC
INSTRUMENT SETS, LUMBER AND BLOCKS

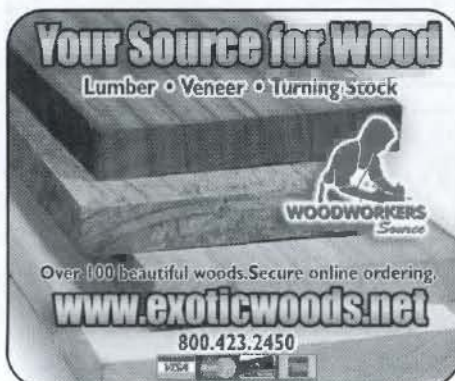
CraftsmanStudio.com
Fine Tools - Fair Prices - Fast Shipping

Weekly email specials
Subscribe and save



**HNT Gordon
A55 Trying Plane**
4848 Ronson Ct • Suite L • San Diego, CA 888-500-9093

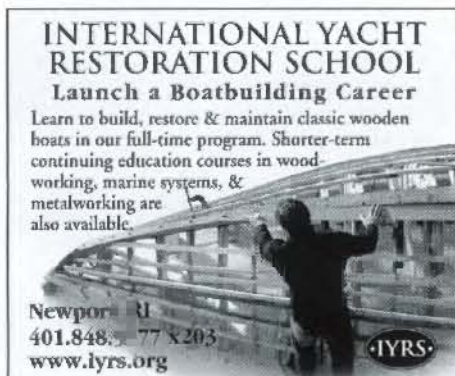
Your Source for Wood
Lumber • Veneer • Turning Stock



Over 100 beautiful woods. Secure online ordering.
www.exoticwoods.net
800.423.2450

**INTERNATIONAL YACHT
RESTORATION SCHOOL**
Launch a Boatbuilding Career

Learn to build, restore & maintain classic wooden boats in our full-time program. Shorter-term continuing education courses in wood-working, marine systems, & metalworking are also available.



Newport RI
401.848.7782
www.iyrs.org **15 YRS**



Build Your Own Windsor Chair
Beginner to advanced 3 Day weekend classes
Taught at your local Woodcraft store
(614) 258-1546
www.colonialchaircompany.com
Colonial Chair Company



TIMBER WOLF™
Band Saw Blades
Swedish Silicon Steel ~ 1/8" - 2"
www.timberwolfblades.com
Free Catalog ~ 800-234-7297

LOGS TO LUMBER

MAKE YOUR OWN LUMBER & SAVE MONEY



8 Sawmill Models Available

Wood-Mizer
800.553.0182
www.SawBoards.com © 2009

GILMER WOOD CO.
Quality Domestic & Exotic Lumber

- Logs, blanks, squares
- Over 50 species in stock
- Thin woods, Assortments, Books
- Musical Instrument woods

Phone 503-274-1271
2211 NW St. Helens Rd, Portland OR 97210
Fax 503-274-9839 www.gilmerwood.com



**THE FURNITURE INSTITUTE
of MASSACHUSETTS**

Study with Fine Woodworking author
Philip C. Lowe • Classes range from 1 day
to 1 week to 2 and 3 year mastery programs.

• See new class schedule on:
(978) 922-0615 www.furnituremakingclasses.com

Let Reader Service work for you.
Receive information direct from your
choice of advertisers by using the
Reader Service form located next
to the inside back cover.

**When Only The
Finest Veneer
Will Do...**



Certainly Wood
Phone: 716-855-0206 Fax: 716-855-3448
www.certainlywood.com

GOOD HOPE HARDWOODS, Inc.
"Where Fine Woodworking Begins"

4/4-24/4 Custom Cut Wide Matched Sets
Custom Flooring Available

Specializing In:
Figured & Plain Cherry, Walnut & Claro Walnut,
Tiger Maple & 58" Wide Bubinga
Plus Many Other Species

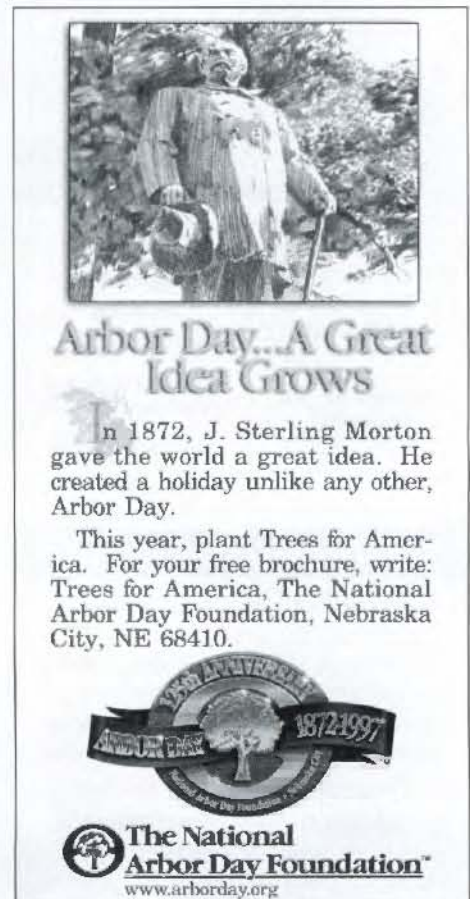
1627 New London Rd., Landenberg PA 19350
Phone 610-274-8842/Fax 610-255-3677
www.goodhope.com
We Provide Personalized Service

Craft Wood
Real Wood Wallcovering

Applies directly to drywall
ASTM E-84 class A fire rated
Wide variety of stainable species
Covers columns and doors
Ships in 3 weeks or less
World friendly



SRWOOD
812-288-9201
812-288-5225 fax
www.srwoodinc.com



**Arbor Day...A Great
Idea Grows**

In 1872, J. Sterling Morton
gave the world a great idea. He
created a holiday unlike any other,
Arbor Day.

This year, plant Trees for America.
For your free brochure, write:
Trees for America, The National
Arbor Day Foundation, Nebraska
City, NE 68410.

**125th Anniversary
Arbor Day
1872-1997**

**The National
Arbor Day Foundation™**
www.arborday.org

**THE NORTHWEST
WOODWORKING
STUDIO**
A School for Woodworking



Mastery Programs

Portland, Oregon 503.284.1644
www.northwestwoodworking.com

Iturra Design
The Bandsaw People

**Your number one source for all
your bandsaw needs**

- Carbide-tipped & bi-metal blades
- Blade Tension meters & Guides
- Re-Saw and Rip Fences
- Tension springs, Tires, Improved Parts

Call 904-371-3998 For Catalog

**HARDWOOD
FLOORING**

Burts
Blocks
Veneers
Decking
Lumber
Plywood
Millwork
Mouldings

**ANY Length
ANY Width
ANY Specie**

Call for our **FREE
Lumber Catalog!**

**M.L. CONDON
COMPANY Inc.**

248 Ferris Avenue, White Plains, NY 10603
Phone: (914) 946-4111 • Fax: (914) 946-3779
www.condonlumber.net

CALL FOR
FAST, FREE
QUOTE

**Keep your Fine Woodworking
back issues looking brand new.**

Store your treasured copies of *Fine Woodworking* in slipcases for easy reference again and again! Bound in dark blue and embossed in gold, each case holds more than a year's worth of *Fine Woodworking*.

Only \$8.95 (\$24.95 for 3, \$49.95 for 6).

Plus shipping and handling. Payable in U.S. funds.

To place an order using your credit card, call
1-800-888-8286.

Outside the U.S. and Canada call 1-203-426-8171.

**CORMARK INTERNATIONAL
EXOTIC HARDWOODS**

- BEST PRICES - DIRECT FROM SOURCE
- EXOTIC LUMBERS, BLANKS, BURLS, SLABS
- TURNING BLOCKS AND MORE.
- NATIONWIDE DELIVERY



WWW.CORMARKINT.COM / CORMARKINT@AOL.COM
181 REEMS CREEK RD, WEAVERVILLE, NC 28787 (828) 658-8455

**Banner Hill School
Of Fine Woodworking**

Woodworking
classes for all
skill levels.



For further information please contact us at:
Banner Hill School of Fine Woodworking
P.O. Box 607 ~ Windham, NY 12896
(518) 929-7821
www.BannerHillLLC.com

**ACCURATE
DOVETAILS**

No wasted wood.
Order your Keller Dovetail System now!
(800) 995-2456

Made in the USA since 1976 • DVD/Video \$8.95 + \$2 p/h

www.accuratedovetails.com

**FoX Flooring Key for
Reliable Flooring Joints**

A flexible, durable fastener made of natural rubber that allows wood to expand and contract without splitting. Ideal for outdoor decks, pool & spa surrounds, garden paths and more.



HOFFMANN
Hoffmann Machine Company, Inc.
Toll-free: (866) 248-0100
www.Hoffmann-USA.com

Diefenbacher Tools



800 • 326 • 5316
Free Hand Tool Catalog

www.diefenbacher.com

lmi.com

A one-stop shop for
stringed instrument makers.
Visit our website to find
woods, tools and finishing
supplies sold nowhere else,
including the incredible KTM9
interbased finish.

800-477-4437
LUTHIERS MERCANTILE INTERNATIONAL, INC.

**WINDSOR CHAIR
WORKSHOPS**

Learn Traditional Windsor Chair
Techniques, NO KITS!

Call for Class Schedules
Jim Rendi, Tel: 610-689-4717
www.philadelphiawindsor.com



Cabinet Hardware, Glass Mosaic Tile, Ceramic Sink
• High Quality Stainless Steel Bar Pull, Bin Pull and Cabinet Knob





Contempo Living Inc
1220 Santa Anita Ave Unit A, South El Monte CA 91733
Order Online or Call 626-450-0560
www.contempolivinginc.com

**European Woodcarving
Instruction & Supplies**
www.norahall.com
970•870•0116

GUILLEMOT KAYAKS
WOODEN BOAT PLANS BY NICK SCHADE



WWW.KAYAKPLANS.COM/F

Dovetail - Tenon - Carcass Saws

Adria



BEST OVERALL
FWW #183
Page 64

www.AdriaTools.com

www.brandingirons.net
CUSTOM BRANDING IRONS
HIGH QUALITY ENGRAVED BRASS DIES
FREE BROCHURE AND SAMPLE BRANDS
Engraving Arts sales@brandingirons.net
PO Box 787 Phone: 800-422-4509
Laytonville, CA 95454 Fax: 707-984-8045

Gemini Carving Duplicator
"The Professional's Woodworking Secret"



**- FAST
- RUGGED
- ACCURATE**

VISIT OUR WEBSITE
www.wood-carver.com
321 Route 3 West
Elbridge, NY 13060
315.252.2559

ALLRed
CONTACT US
INFORMATION KIT
AVAILABLE

INDEX TO ADVERTISERS

Use reader service card - inside back cover.

For quick access to their websites, go to ADVERTISER INDEX at www.finewoodworking.com

Reader Service No. ADVERTISER, page #	Reader Service No. ADVERTISER, page #	Reader Service No. ADVERTISER, page #	Reader Service No. ADVERTISER, page #
31 Adria Toolworks, Inc., p. 95	95 Eagle Woodworking, p. 15	14 Leigh Industries, p. 29	81 T&T Design, p. 15
77 Allred & Associates, Inc., p. 95	Engraving Arts, p. 95	93 Lie-Nielsen Toolworks, p. 9	Taunton Warehouse Sale, p. 27
59 American Furniture Design, p. 87	60 Epilog Laser, p. 29	51 Lignomat, p. 27	86 Titebond Wood Glue, p. 3
59 American Furniture Design, p. 93		67 Luthiers Mercantile Intl., p. 95	
69 Arrowmont School of Arts and Crafts, p. 17	62 Felder Group USA, p. 17		68 Vac-U-Clamp, p. 32
	61 Felder Group USA, p. 32	49 M.L. Condon Company, p. 95	Vacuum Laminating Technology, p. 29
	FineWoodworking.com, p. 33	Mission Furnishings.com, p. 93	
72 Banner Hill School of Woodworking, p. 95	88 Forrest Manufacturing, p. 9	70 Mortise Pal, p. 22	101 Vacuum Pressing Systems, p. 22
57 The Beall Tool Co., p. 93	24 The Furniture Institute of Massachusetts, p. 94	Nora Hall, p. 95	
Berea Hardwoods Co., p. 12		47 NorthWest School of Wooden Boatbuilding, p. 93	55 Williams & Hussey, p. 17
90 Berkshire Products, p. 93	76 Gilmer Wood Company, p. 94		7 Windsor Chair Workshops, p. 95
71 Bostitch, p. 99	50 Goby Walnut Products, p. 93	63 Northwest Timber, p. 93	34 Wood River Veneer, p. 93
	19 Good Hope Hardwoods, p. 94	27 Northwest Woodworking Studio, p. 22	53 Woodcraft, p. 23
92 Cabinetmaker's Supply, p. 22	5 Gorilla Wood Glue, p. 15	26 Northwest Woodworking Studio, p. 95	29 Wood-Mizer, p. 94
3 Cabinetparts.com, p. 93	83 Groff & Groff Lumber, p. 93		100 Woodrat, p. 11
Cabot Stain, p. 19	11 Guillemot Kayaks, p. 95		74 Woodworkers Source, p. 94
56 CabParts, p. 3		96 Oneida Air Systems, p. 9	
73 Cadex Tools, p. 3	23 Hartville Tool Woodworking, p. 15	97 Oneida Air Systems, p. 91	
Center For Furniture Craftsmanship, p. 3	65 Hearne Hardwoods, Inc., p. 29	37 Osborne Wood Products, p. 11	
36 Certainly Wood, p. 94	58 Highland Woodworking, p. 11	39 Osborne Wood Products, p. 27	
Colonial Chair Co., p. 94	66 Hoffmann Machine Co., Inc., p. 95	38 Osborne Wood Products, p. 91	
98 Connecticut Valley School of Woodworking, p. 93		2 Peck Tool Company, p. 94	
22 Contempo Living, p. 95	12 Inside Passage School of Fine Woodworking, p. 29	20 Phase-A-Matic, Inc., p. 17	
48 Cook Woods, p. 94	46 International Yacht Restoration School, p. 94	Philadelphia Furniture Workshops, p. 93	
21 Cormark International, p. 95	52 Iturra Design, p. 95	89 Pine Creek Wood Co., p. 93	
84 Craftsman, p. 7		Quality Vacuum Products, p. 9	
33 The Craftsman Gallery, p. 15	28 JDS Company, p. 17		
1 Craftsman Studio, p. 94	18 The Japan Woodworker, p. 91	16 Rosewood Studio, p. 15	
		99 Routerbits.com, p. 29	
David Savage British Masterclasses, p. 27	17 Kay Industries, Inc., p. 22		
David Warren Direct, p. 93	44 Keller & Company, p. 95	13 S.R. Wood, p. 94	
94 Davisson Rockers, p. 93	43 Kreg Tool Company, p. 3	91 Scherr's Cabinet & Doors, Inc., p. 12	
41 Diefenbacher Tools, p. 95	45 Kuffel Creek Press, p. 3		
40 Dimitrios Klitsas, p. 93	64 Laguna Tools, p. 2	4 School of Woodworking, p. 32	
35 Dremel Tools, p. 13	85 Laguna Tools, p. 85	25 Screw Products, Inc., p. 29	
30 Dura-Grit, Inc., p. 27	15 Leigh Industries, p. 27	9 Suffolk Machinery, p. 94	

CLASSIFIED

The Classified rate is \$9.50 per word, 15 word min. Orders must be accompanied by payment, ads are non-commissionable. The **WOOD & TOOL EXCHANGE** is for private use by individuals only; the rate is \$15/line, minimum 3 lines. Send to: *Fine Woodworking Classified Ad Dept.*, PO Box 5506, Newtown, CT 06470-5506. FAX 203-270-6310, Ph. (866) 505-4687. For more information on advertising go to www.finewoodworking.com/classified Deadline for the Sept. - Oct., 2009 issue is June 12, 2009.

Hand Tool

HIGHLANDWOODWORKING.COM, the world's largest selection of hand planes, plus thousands more fine hand tools.

BOB KAUNE-ANTIQUE & USED TOOLS. Since 1982. Hundreds of quality handtools. Stanley planes and parts. Visa/MC. www.antique-used-tools.com (360) 452-2292.

PETE NIEDERBERGER Used and Antique tools and parts. Special on 3-in. Slicks; old used \$95 each. (415) 924-8403 or pniederber@aol.com Always buying!

Instruction

WM PERRY STUDIO, TORONTO, fine woodworking seminars. Small hands-on classes, professional workshop setting. Personal instruction also available. For seminar details, schedule, inquiries: (416) 429-2323; www.wmperry.ca

WINDSOR CHAIR CLASSES: 1 week intensive. Also turning classes. Lodging and meals included. Midwest. www.chairwright.com

HANDS-ON COURSES in beautiful Maine. Beginner through advanced. Workshops, Twelve-week Intensive, Nine-month Comprehensive. Center for Furniture Craftsmanship (207) 594-5611, www.woodschool.org

GEORGE SLACK 18TH CENTURY furniture making and carving classes. www.georgeslack.com email: periodworkshops@georgeslack.com Warrenton, VA (540) 349-8632.

BENJAMIN HOBBS Furniture Making Classes. Queen Anne and Chippendale chairs, chests, beds, tables, more. Hertford, NC. (252) 426-7815. www.hobbsfurniture.com

COEUR D'ALENE SCHOOL OF WOODWORKING in beautiful north Idaho. Small, personalized classes. Flexible scheduling. Private instruction available. (208) 755-9902. www.cdawoodworkingschool.net

PENLAND SCHOOL OF CRAFTS, in the spectacular North Carolina mountains, offers one-, two-, and eight-week workshops in woodworking and other media. (828) 765-2359; www.penland.org

THE ACANTHUS WORKSHOP, LLC - Traditional woodworking education with lead instructor, Charles Bender, using conventional hand tools and modern machinery. Call (610) 970-5862 or visit www.acanthus.com

COME TO LEARN IN SCOTLAND - The Chippendale International School of Furniture offers a 30-week intensive career program in Design, Making and Restoration. For further information phone: 011-44-1620-810680 or visit www.chippendale.co.uk

Miscellaneous / Accessories

WOODSLICER.COM, resawing blade rated best-performing 1/2-in. bandsaw blade by *Fine Woodworking*. 800-241-6748.

1-FENCE. "The Operating System for the Thinking Man's Shop." Universal T-Slot Fence/Stops/Table Extension, (formerly, Joiner's Edge) (217) 390-3828. info@1-Fence.com

Plans & Kits

FULL SIZE FURNITURE LAYOUTS Drawn by: Philip C. Lowe. Catalog \$3. (978) 922-0615, 116 Water Street, Beverly, MA 01915. www.furnituremakingclasses.com

Power Tools

LAMELLO BISCUIT JOINERS and Accessories/Parts/Repairs. Best prices, most knowledgeable. Call us for all your woodworking & solid surfacing needs. 800-789-2323. Select Machinery, Inc. www.selectmachineryinc.com

CADEX & NIKLE pin nailers & pins, Flexeel air hose & fittings at www.floydtool.com

Wood

MESQUITE LUMBER (915) 479-3988.

QUILTED, CURLY, SPALTED & burl maple, marbled, curly & crotch claro walnut, figured myrtlewood. Huge inventory of lumber, billets & blocks. 10,000 items photographed and priced. Visit our online store at www.nwtimber.net or call (800) 238-8036.

TIGER MAPLE, MAHOGANY, cherry, walnut, butternut, curly birch; plain and figured. Wide boards, matched sets, 4/4 to 24/4. 150-ft. minimum. (570) 724-1895. www.irionlumber.com

DOMESTIC AND IMPORTED EXOTICS. For musical instruments, pool cues, knife handles and custom furniture. Price list. Exotic Woods, 1-800-443-9264. www.exoticwoods.com

SAWMILL DIRECT 100 species of exotics, turning, lumber, logs, slabs, musical instruments **TROPICAL EXOTIC HARDWOODS OF LATIN AMERICA, LLC**. Toll Free (888) 434-3031. www.anexotichardwood.com

CAPEHARDWOODS.COM Teak, maple, oak, birch, sapele, cherry, plywoods & more. (508) 548-0017, West Falmouth, MA.

FIGURED CLARO WALNUT slabs and planks, in dimensions suitable for small to large projects. CWD: 800-660-0203. www.woodnut.com

APPALACHIAN HARDWOODS direct from sawmill. Quartersawn, flitches, crotch lumber. Herbine Hardwoods, Leesburg, VA. (703) 771-3067. www.herbinehardwood.com

NORTH/CENTRAL VIRGINIA. Tiger maple, red cherry, quartersawn oak and sycamore, others. Matched sets, whole logs. Visit our new warehouse in Elkwood, VA off US 15/29. C.P. Johnson Lumber. (540) 825-1006, (540) 937-3059.

BIRD'S-EYE AND CURLY MAPLE, 4/4 to 12/4 lumber, flitches, turning squares and blocks. Black walnut, cherry/quartersawn, and curly oak lumber. Dunlap Woodcrafts, Chantilly, VA. (703) 631-5147.

EISENBRAND EXOTIC Hardwoods. Over 100 species. Highest quality. Volume discounts. Brochure. 800-258-2587; Fax 310-542-2857, eisenbrand.com

CLEAR ALASKAN YELLOW CEDAR vertical grain. Clear vertical Douglas fir. www.EasyCreekLumber.com (541) 521-5107; Fax 541-344-1654 or e-mail: keith@easycreeklumber.com

LONGLEAF HEART PINE (antique). Flooring-lumber-millwork. Red cedar lumber & paneling. Lee Yelton: (706) 541-1039.

LARGE CLARO WALNUT book-matched slabs, turning stock, raw and paper-backed veneer of burl and crotches. www.walnutwoods.net online store. Newton Woods. (559) 277-8456. Fresno, CA.

QUALITY NORTHERN APPALACHIAN hardwood. Custom milling. Free delivery. Bundled, surfaced. Satisfaction guarantee. Niagara Lumber. 800-274-0397. www.niagaralumber.com

WOOD AND TOOL EXCHANGE

Limited to use by individuals only.

For Sale

Fine Woodworking issues: 1-200; missing #132, excellent condition. Acton, MA. \$450 + Shipping. Bruce (978) 635-9889. Prefer Southern New England for direct delivery.

For Sale: A complete set of *Fine Woodworking* magazines, #1-204. Call (561) 995-7273 for details. (FL)

WILLIAMS & HUSSEY MODEL W7 Molder/Planer w/15 cutters. Power feed. Oak stand. \$1000.00.

ROSEWOOD large quantity and hard to get sizes; build an heirloom - cabinets, furniture, etc. (916) 412-3183. vaninwagen@hotmail.com

Fine Woodworking excellent cond. issues 1-201 \$425 + Shipping. Early issues *Fine Gardening*, *Kitchen Garden* avail. Louisville, KY. Ted (502) 583-0850.

Did you know
that over 350,000 people
visit FineWoodworking.com monthly?
Advertise on FineWoodworking.com
The #1 Woodworking website

Call 800-926-8776 or visit
www.finewoodworking.com/advertise

Search issues 1-200 in a flash with the Fine Woodworking Magazine Index

Instantly identify where to find any
piece of information from 33 years
of *Fine Woodworking* magazine.



Product #011350

Order today.

Call 800-888-8286

Mention Offer Code **M1800135**

Or visit FineWoodworking.com/fwi

Ming masterpiece, joint by joint

BY ANISSA KAPSALES



Characterized by a simple yet elegant aesthetic, appealing proportions, and exquisite craftsmanship, Ming Dynasty (1368–1644) furniture has withstood time, wars, and design fads to take its place in history.

When John Cameron began dissecting an original Ming table, the Massachusetts woodworker knew he'd have to pool all his experience and technical resources to build an exact reproduction (both are shown on the back cover).

But the two most important tools used were patience and a delicate touch, as he crept up on the perfect fit for all the complex joinery.

APRON TO SPANDREL TO LEG

Hidden mitered dovetails join the corners of the apron, while bridle joints connect the apron to the spandrel and the spandrel to the leg.

THE ONLY GLUE JOINT

The apron is permanently connected to the spandrel.

Mitered bridle joint

The leg slot, slightly angled on the sides, forms a shallow sliding dovetail on the back of the spandrel to accommodate the leg and ensure its alignment.

Spandrel

THE TOP

Unlike most tabletops, this one uses frame-and-panel construction. The panel rests in a groove in the frame, and the mitered corner has a through-mortise and tenon.

LEGS TO SHELF

Coming in at a $1\frac{1}{2}^\circ$ splay, each individually shaped leg gets two mortises at that same angle. The frame holds the shelf in a groove and forms the mitered tenon and hand-coped joint that straddle each leg.

TAKE YOUR BEST SHOT



FN1664K
16 Gauge Finish Nailer



BT1855K
18 Gauge Brad Nailer



SX1838K
18 Gauge Finish Stapler

Our new oil-free finish nailers are engineered to help you achieve the level of craftsmanship you were always capable of. They offer precision-driven features such as dry-fire lockout, dial-a-depth technology, swivel fittings, patented profile tips ... even an integrated pencil sharpener.

For nearly 40 years, Stanley-Bostitch has designed its products to be the most reliable & durable pneumatic tools available. Maybe that's why more finish carpenters and serious woodworkers rely on Stanley-Bostitch products more than any other major brand*



*Based on third-party survey in U.S. and Canada asking for the brands of finish products used in the previous 12 months.

© 2009 The Stanley Works

www.bostitch.com

READER SERVICE NO. 71

STANLEY

BOSTITCH®

Forensic Furniture Making

John Cameron doesn't relish repair work, so when a friend asked him to fix an old table, he only grudgingly agreed. His mood changed radically when he saw the piece, a very worn but elegant splay-legged table in the classic Chinese Ming style. The Massachusetts furniture maker, long a devotee of the period (1368-1644), wondered if he was looking at the genuine article. He took it to museum curator Nancy Berliner, an expert in Chinese furniture, who encouraged him to take the piece apart to find out. "We do it all the time," she said. "You'll have fun." The joinery would be telling, she said. If the spandrels (see p. 98) passed through the tops of the legs, it likely was the real thing.



Original

Back in his shop, Cameron placed the table on a padded bench, picked up a mallet, and began gingerly knocking it apart. Typical for an old Chinese piece, the table's complex joinery had been assembled without glue, and he was soon surrounded by parts. Sure enough, the spandrels passed through the legs. And the wood was huanghuali, a relative of rosewood used commonly in Ming furniture. Before reassembling the table, Cameron gave himself a seminar in Chinese joinery. Working part by part and without making a drawing, he built this reproduction. He used padauk, which will age to the deep brown of the original wood.

—Jonathan Binzen



Photos: Michael Pekovich

How They Did It Turn to p. 98 to see details of the joinery used both by Cameron and the maker of the original Ming piece.

Pro Portfolio This reproduction was a departure for Cameron. The rest of his work is original. Go to FineWoodworking.com to see it and hear about it.