

 BUILD THE **PERFECT SUMMER PROJECT** . . .
A CLASSIC ARTS & CRAFTS SCREEN DOOR (page 38)

WOODWORKER'S JOURNAL

"America's leading woodworking authority"™

SKETCHUP:
FREE CAD SOFTWARE!
(page 48)

Shaker Makeover

What happens when a classic design meets some wild maple (page 28)

7 **Benchtop Mortisers:**
Who comes out on top?
(page 52)

PLUS:

- Jointer Basics
- Kubb: Ultimate Lawn Game
- Table Saw Dovetail Jig



August
2010



Display until September 5, 2010

14 Tips for a perfect outdoor finish



Plug In Anywhere.

SawStop's Professional Cabinet Saw
Now in 120v, 1.75HP



Coming Summer 2010

Visit your nearest SawStop dealer today
to place a preorder.

**AWARD WINNING SAFETY AND
DUST COLLECTION FOR EVERY SHOP**

The SawStop Professional Cabinet Saw - it stops on contact with skin, preventing serious injuries. It sets the standard in its class for quality and durability, and offers unmatched 99% dust collection with the optional blade guard. And now with a 120v, 1.75HP model*, the Professional Cabinet Saw is available to everyone.

*20 amp circuit recommended.

www.SawStop.com

(Circle No. 40 on PRODUCT INFORMATION form)



Meet Coach

He's a legend around these parts. For 27 years, he rallied his football teams to 212 wins. However, Coach's greatest accomplishment was devotedly shaping boys into young men. On and off the field, Coach's commitment to excellence is visible. It's especially evident in his workshop where he meticulously crafts heirloom furniture from 100 year old reclaimed barn wood. Coach embodies everything we believe in at Old Masters...Dedication, Attention to Detail, Integrity and Enduring Craftsmanship.

Old Masters...

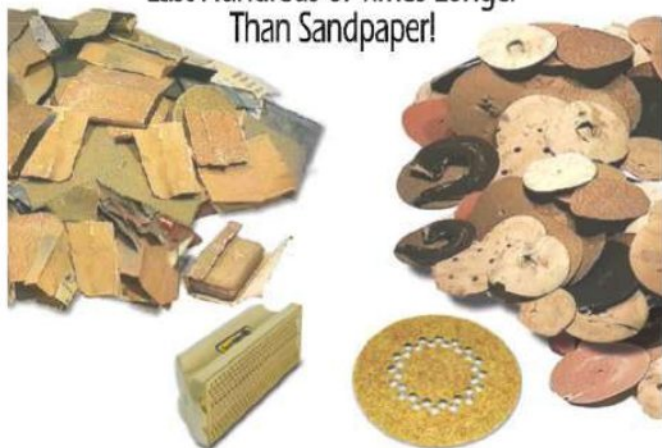
...where the
Craftsman
finds quality.

www.oldmasters.biz 1-800-747-3436

(Circle No. 27 on PRODUCT INFORMATION form)

TIRED OF CHANGING WORN SANDPAPER & DISCS?

DuraGrit Carbide Blocks and Discs
Last Hundreds of Times Longer
Than Sandpaper!



TruSander™
90° Carbide Sanding Block
Wood Handle with Dust Trap
60 & 120 grit

DuraDisc™
5" Carbide Sanding Disc
5 & 8 Hole Compatible - Loop Back
46, 60, 80 & 120 grit

"I've been using the same DuraGrit block and disc since 1998"
John D. (Tradesman, Toronto)

Check Out These & Other Great Carbide Tools at:
www.duragrit.com/wj



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

(Circle No. 10 on PRODUCT INFORMATION form)

Introducing the

Kreg Deck Jig™

Concealed Fastening System

NEW

How it Works

The Kreg Deck Jig™ guides your drill bit and self-tapping screw at a precise optimal angle.

✓ Looks Better ✓ Lasts Longer ✓ More Comfortable

See the video at www.kregtool.com

Build the Deck you've always wanted!

Unlike traditional concealed-decking systems which rely on thin plastic clips or awkward 'pound-in' steel fasteners to hold your deck boards in place, the Kreg Deck Jig™ creates an incredibly strong wood-to-wood bond through precisely placed steel self-tapping screws.

See this and other exciting
NEW products in action
at www.kregtool.com

Kreg

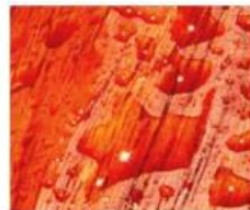
www.kregtool.com | 800.447.8638

(Circle No. 24 on PRODUCT INFORMATION form)

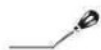


Woodworker's Journal

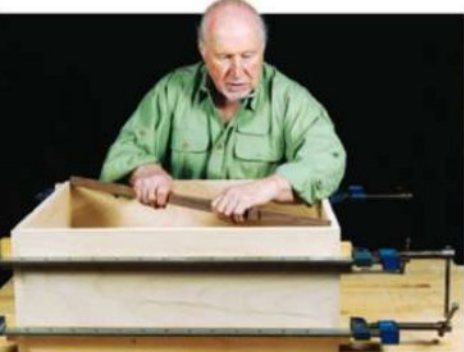
Contents



July/August 2010



Volume 34, Number 4



Page 28

26 The Case for a Jointer

By A.J. Hamler

Is it the second most useful tool in a well-equipped shop?

28 Shaker End Tables

By Rob Johnstone

A simple design gets paired up with some wild maple.

34 Table Saw Dovetail Sled

By Sandor Nagyszalanczy

Create this one-of-a-kind shop-made dovetail jig.

38 Make A Screen Door

By Frank Grant

A classic summer project, featuring sustainable wood and beautiful Arts & Crafts elegance.

44 Kubk: Perfect Lawn Game

By Brad Becker

It's easy to play, and the parts are simple to make: Spend an afternoon in the shop and create a new lawn game for summer gatherings.

Page 34



Page 44



Departments

Page 20



6 Editor's Note and Letters

Readers love/hate our rolling pin.

12 Questions & Answers

The safe way to rout small pieces.

14 Stumpers

Mystery tools keep rolling along.

16 Tricks of the Trade

Shop uses for household hardware.

18 Shop Talk

A family creates an heirloom cradle.

22 Techniques

Pinch rods: get square without a tape.

24 Woodturning

The basics of spindle turning.

48 Today's Shop

SketchUp: Free CAD software.

52 Tool Review

Benchtop mortisers battle it out.

62 What's In Store

New tools, new formulas.

68 Finishing Thoughts

Tips for outdoor finishes.

70 Skill Builder

Keeping tool edges sharp.

GENERAL®**E-Z Pro™****Cut Dovetail Joints
with Your Router!**

THE DOVETAILER™

DOVETAIL JIG



No. 860

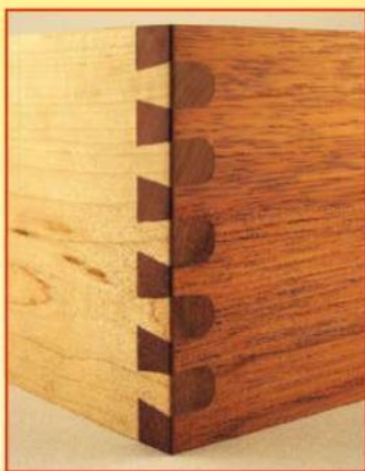
**CAN BE USED WITH ALL
HANDHELD ROUTERS
AND ALL ROUTER TABLES**

With THE DOVETAILER™ Jig and your router, you can cut professional Through or Half Blind Dovetail Joints, simply and accurately . . . **Right Out of the Box!**

- Accommodates boards of any width
- Includes 1/2" Dovetail Router Bit



1/2" Dovetail Router Bit included



Cuts Through Joints



Cuts Half-Blind Joints

EASY TO USE FOR THE BEGINNER AND THE PROFESSIONAL

- Self-aligning design ensures that both ends of the dovetail joint match up evenly every time
- Portable to your work site or work area
- Sturdy machined aluminum construction
- Easily adjust the dovetail interference to create loose or tight joints
- No need to bolt the jig onto workbench like many other expensive Dovetail Jigs
- You bring the jig to the work piece, not the work piece to the jig
- Integrated clamps allow precise clamping of jig to work piece
- Can be used with all handheld Routers or Router Tables

**The Easy Way
to Make Professional
Furniture Joints**

GENERAL®

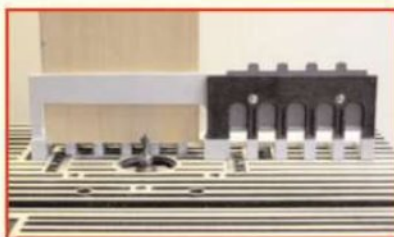
©2009 General Tools & Instruments™

80 White Street, New York, NY 10013-3567

TEL: 212.431.6100 TOLL FREE: 800.697.8665

FAX: 212.431.6499

sales@generaltools.com www.generaltools.com



(Circle No. 20 on PRODUCT INFORMATION form)

Patent Pending

Letters

"He Took a Gold Medal and Had it Bronzed"

WARM WEATHER WOODWORKING ...

As the dog days of summer arrive, I can't help but think that they are really woodworking's prime time in my shop. Even though my shop is heated and comfy in the winter, for me, there is nothing better than rolling up the big overhead door and letting the sawdust fly in the breeze. (Have you ever used a leaf blower to dust off your shop? It is awesome!) Yes, there may be some mosquitoes to slap, and drops of my sweat have messed with a water-based finish or two — but summer evenings are long here in the north country, and I like to fill them with woodworking. So don't let the distractions of a busy summer schedule keep you from enjoying warm weather woodworking. It is a simple pleasure that is too sweet to pass up.

—Rob Johnstone



Ravioli starts out square, tortellini starts out round, manicotti starts out wide and flat, lasagna is extra wide. Those fancy machines are mainly for rolling the dough to the correct thickness. Well, maybe one day it will be a mystery tool. All that work for a very limited tool.

Ralph Shartle
Cedar Hill, Texas

I enjoyed the Rolling Pin article by Ralph Bagnall in the April issue and applaud his ingenuity in independently reinventing a small scale version of an old tool called the Sears Craftsman Router Crafter. I've been using [mine] for nearly 40 years. In addition to simple round items, it can be used to make tapers and, with the addition of a template in the front for the sled follower, it can make repeated complex shapes. Craftsman no longer makes it, but someone should.

Harlan Howe, Jr.
Wingate, Texas

I commend Mr. Bagnall for such a clever jig. I believe you could also use it to rout a basket-type weave onto a sphere fairly easily. That could make for an interesting design on a bowl. Clever idea.

Charles Wray
U.S. Army

(Grand)Kids in the Shop

About Dan Humphrey's grandson's picture: Dan says he failed to "enforce ... safety glasses." Maybe you should include a tongue depressor also! Wonderful picture.

Butch Garber
West Union, South Carolina



I loved the picture of the little boy with the drill [Letters, April 2010]. Here are some of my grandson in my shop. We built a cardboard sled. I just bought a "man's toolbox" for my grandson with a hammer and some finishing nails in it. I plan to add new tools to the box each gift-giving occasion.

Ken Munday
Frenchburg, Kentucky

The Missing Bits

My question is directed at A.J. Hamler. In his *Shop Test* article on countersinks ["Countersink Options for Woodworkers"] in the April issue, he shows on page 64 the old style piloted countersinks. [I] had a set and used it for

Letters continues on page 8 ...



Were our rolling pins a fun or foolish project? Even Texans have differing opinions!

On a Roll

Here are a couple of pics (left) of my finished project ["Multi-Sleeve Rolling Pin," April 2010]. I really enjoyed doing this. I could not find the bird's-mouth cutter in my area, so I used a straight cutter along with a jig I made to hold the wood at the proper angle.

Norm Connors
Belgrade, Montana

The article "Multi-Sleeve Rolling Pin" has got to be one of the most worthless articles I have read. What shapes can you cut with it? Noodles, fettucini and such; that is it.

WOOD ENGRAVING AND CUTTING

WITH AN EPILOG LASER SYSTEM



Laser Engraving and Cutting Systems from Epilog Laser

An Epilog Laser system makes it easy for woodworkers and wood shops to customize any wood product with graphics, text, logos and much more. From creating and personalizing 3D models, to engraving photos, to cutting and creating intricate inlays, our laser systems create the products you see here and more!

Your vision, coupled with Epilog's powerful equipment will allow you to bring your creative visions to life. From creating custom keepsake plaques to rapid customization of your existing product line, Epilog systems allow you to:

- Provide new services to your customers.
- Expand your current product offerings.
- Create new business opportunities.

(Circle No. 12 on PRODUCT INFORMATION form)

**Systems Starting
at \$7,995**



For more information contact us today at 888-437-4564
sales@epiloglaser.com • epiloglaser.com/wwj.htm

MADE IN USA

Letters continued

A Colorado reader liked our cold weather battery solution — it's similar to the old fridge (with a rewired light switch) he uses for wintering his finishing supplies.



years. I have not been able to find these anymore. Does Mr. Hamler have a link or know of a supplier that still sells these?

Dave Selewski
Wayne, Michigan

A. J. Hamler:

When I was working on the article, I used every source I had to locate some — I'm somewhat of a

braggart when it comes to my search abilities — and I could find them nowhere. The ones I photographed in the article were the very ones I mentioned that I'd had for years. I honestly think that no one makes them anymore.

No Beer in His Fridge

Having read your response to temperature changes in the Q&A section [April 2010], I thought I would submit my method for maintaining paints, glues and equipment through the season changes in my workshop/garage. My solution was to acquire an old refrigerator from a second-hand shop for nothing. I rewired the light switch to "on" and connected it to a timer that is on 15 minutes and off one and one-half hour. No more toting supplies back and forth.

Bill Fleet
Englewood, Colorado

Finishing Questions

Just finished reading your article ["Approaching a Stickley Finish," April 2010], and I am about to go out to my shop and try it; however, I have a couple of questions first. You state, "in this case, we used gel stain and polyurethane combination" — was your gel stain mixed with polyurethane, or was it, in fact, purchased as stain and finish combined? If your gel stain was purchased and/or mixed with polyurethane, then why would you then apply "two more wipe-on coats of clear poly"?

Rick Kinney
China, Michigan

W.J. Responds: The General Finishes product does have poly mixed into the stain right from the factory. We put two more coats of clear poly over the top of the stain coat to protect it further. I can't speak to the intentions of the supplier, but one wiped-on coat of poly is not a sufficient protective coat for a project that will get a lot of handling, like the blanket chest.

Silk Purse or Sow's Ear?

In regards to your April 2010 article "Built-in Cabinet Makeover," I would like to comment on the author's materials. The cabinet looked

Letters continues on page 10 ...

ROCKLER PRESS

THE VOICE OF THE WOODWORKING COMMUNITY

JULY/AUGUST 2010

Volume 34, Number 4

ROB JOHNSTONE *Editor in Chief*
JOANNA WERCH TAKES *Senior Editor*
CHRIS MARSHALL *Field Editor*
JEFF JACOBSON *Senior Art Director*
JOE FAHEY *Associate Art Director*
MATTHEW BECKER *Internet Production Coordinator*
LARRY N. STOIAKEN *Publisher*
MARY TZIMOKAS *Circulation Director*
KELLY ROSAAEN *Circulation Manager*
LAURA WHITE *Circulation Assistant*

Founder and CEO

ANN ROCKLER JACKSON

Editorial Advisors

NORTON ROCKLER JOHN KELLIHER

Advertising Sales

DANA SEVERSON *Advertising Director*
dseverson@woodworkersjournal.com
(763) 478-8306 Fax (763) 478-8396

ALYSSA TAUER *Advertising Operations*
atauer@woodworkersjournal.com
(763) 478-8366 Fax (763) 478-8396

Member



Audit Bureau of Circulations

Editorial Inquiries

ROB JOHNSTONE
rjohnstone@woodworkersjournal.com

JOANNA WERCH TAKES
jtakes@woodworkersjournal.com

CHRIS MARSHALL
cmarshall@woodworkersjournal.com

Subscription Inquiries

(800) 765-4119 or
www.woodworkersjournal.com
Write Woodworker's Journal, P.O. Box 8572,
Red Oak, IA 51591-1572

email: WWJcustserv@cdsfulfillment.com. Include mailing label for renewals and address changes. For gift subscriptions, include your name and address and your gift recipient's.

Book Sales and Back Issues

Call: (800) 610-0883
www.woodworkersjournal.com

Woodworker's Journal (ISSN: 0199-1892), is published in February, April, June, August, October and December by Rockler Press Inc., 4365 Willow Dr., Medina, MN 55340. Periodical postage paid at Medina, Minnesota and additional mailing offices. Postmaster: Send all address changes to Woodworker's Journal, P.O. Box 8572 Red Oak, IA 51591-1572. Subscription Rates: One-year, \$19.95 (U.S.); \$25.95 U.S. funds (Canada and other countries). Single copy price, \$5.99. Reproduction without permission prohibited. Publications Mail Agreement Number 0861065. Canadian Publication Agreement #40009401.

©2010 Rockler Press Inc. Printed in USA.

August 2010 Woodworker's Journal

woodworking.com — now a part of the Woodworker's Journal award-winning family of websites! **NEW!**



LEARN:
The most complete and interesting woodworking instruction site on the web. Learn as you never have before!

COMMUNITY:
Woodworking forum, blogs, gallery photos, share tricks and techniques with fellow woodworkers, games, fun facts, crossword puzzles and more!

PRODUCTS:
Over 17,000 products ... from adirondack chair plans to zebra wood. Plus, books, magazines and new CDs!

Lignomat
the Woodworker's Choice

Moisture Meters
you can count on!

Accurate. Reliable. Backed by professional customer service.
2 Year Warranty.

Lignomat
800-227-2105
www.lignomat.com
PO 30145, Portland OR, 97294

MEMBER TESTED AND RECOMMENDED
HANDYMAN

(Circle No. 25 on PRODUCT INFORMATION form)

VROOM!...Power Up!

Apollo ramps up the turbine world!

Our TrueHVLP **Power Series** give you more power, more performance, and more value than ever before...

Model 1050VR
New
Precision + Power
22% more power in a 5-stage turbine



Model 1035
New Power Series
12% more power in a 4-stage turbine

Model 835
New Power Series
15% more power in a 3-stage turbine



888-900-4857 (HVLP) www.hvlp.com

Dept. WJ710



(Circle No. 3 on PRODUCT INFORMATION form)



Woodworkerjournal.com has the best woodworking content on the web, and now it is getting even better. Our brand-new site, **woodworking.com**, is up and running with an instructional focus that will help woodworkers, from beginner to expert. Check it out at: www.woodworking.com

www.woodworkerjournal.com
MORE ON THE WEB
woodworkersjournal.com/MOW

woodworkersjournal.com/eZine

www.woodworkerjournal.com
QUICK-LINK
woodworkersjournal.com/QuickLinks

WWJ STORE
woodworkersjournal.com/Store

facebook
facebook.com/WoodworkersJournal

twitter
twitter.com/WoodworkersJrnl


woodworkersjournal.com/WWJBlog

good as it was, but he felt the need to use cheap-looking veneer to cover the oak. Refinishing it would have been fine, not covering it with a bland exterior. The character of the piece was compromised when he did that. In short, he took a gold medal and had it bronzed.

Bruce Bohy
Clinton Township, Michigan

Multi-(Tasking) Tool

In the Q&A section [April 2010], Mr. Schultz asked about miter saw value. I faced the same issue and arrived at a different answer. As a homebuilder, remodeler and woodworker, I already had a 12" single bevel saw and was frustrated by its limitations. I bought a 10" slide double bevel compound miter saw. It crosscuts like a radial arm saw, square cuts stock to length easily, and has clear markings on both scales to cut crown lying flat on the table.

This means I can buy 10" blades for this saw and my table saw for greater economy (12" blades aren't cheap), and I don't need a radial arm saw in my tiny little shop. Cutting crown is a lot less confusing in the shop or on the job.

I like any tool that multitasks. If it saves me time, space and money, I like it even better.

C.W. Boen
Lone Oak, Texas



Before: "Looks good!" After: "Bland!" Did our editor-in-chief take a gold medal and have it bronzed? At least one Michigan reader thought so!

More Un-Sticking Bits

In the latest issue, there is a letter about hitting the router nut to help dislodge the bit [Letters, April 2010]. Being that I designed routers at one time for the now-defunct Stanley Power Tools, never hit the bit collet or nut, as you will brinnell the bearings, flat the balls or put the unit out of round. Wax the bit shaft or use WD-40® to make the bit easy to remove. The router shaft turns at 20,000-30,000 rpm, and the bearings are very sensitive to hard knocks.

Phillipp J. Quedens
Berlin, Connecticut

Reader Alert: Are Finish Formulas Changing?

Having failed on a second attempt of applying a water-based spray-clearcoat (Fuhr Int. #255 urethane — great stuff) over an oil-based stain (Cabot red mahogany), something that I have done several times in the past without any problems, I threw in the towel and called Fuhr tech support.

What they confirmed was that I was having adhesive problems between the oil-based stain and water-based clear coat. The clear coat was peeling off in sheets. I have

always known that this procedure is risky; however, I have always allowed the stain to dry for several days prior to spraying and, as I said, everything used to be fine.

What I learned is that, with the more stringent VOC laws in California, many manufacturers are changing their formulas slightly to conform with these laws. This is most likely what has happened as I did purchase a new can of stain for this project (however, I did not confirm this with Cabot); considering that my previous projects always used this same exact brand and color this makes perfect sense. All other steps in this procedure were exactly the same as previous.

I just thought perhaps you may be interested in this, and you could let other woodworkers (especially in California) know that manufacturers' formulas are changing and that they may run into serious problems when applying water-based clear coats over oil-based stains, even with identical stains they may have used in the past.

Father Chrysanthos
Etna, California



Model *10-305
10" BANDSAW

Model *10-315
12" DELUXE BANDSAW

Model *10-325
14" DELUXE BANDSAW

Model *10-336
16" BANDSAW

Model *10-345
18" BANDSAW

Model *10-370
18" WOOD/METAL BANDSAW

Model *10-380
22" BANDSAW

A BANDSAW FOR EVERY NEED.

RIKON

877-884-5167
www.rikontools.com

(Circle No. 32 on PRODUCT INFORMATION form)

The Right CNC for Any Shop

Whether you're a weekend woodworker looking to expand the scope of your projects or a serious craftsman ready to turn your passion into a business, ShopBot has an affordable, American-made CNC fabrication system to meet your woodworking needs.



PRSAlpha 120-60

Our PRSstandard CNC gives you the performance necessary to take your designs to the next level, while our PRSAlpha offers professional-grade speed, power and accuracy at a fraction of the cost of a big-iron machine, and both are available in a variety of sizes to fit your shop.

To get you up and running as quickly as possible, we offer training at our headquarters or in your shop. And, with some of the best customer service in the industry and a worldwide peer support network, help is never more than a phone call or a mouse click away.

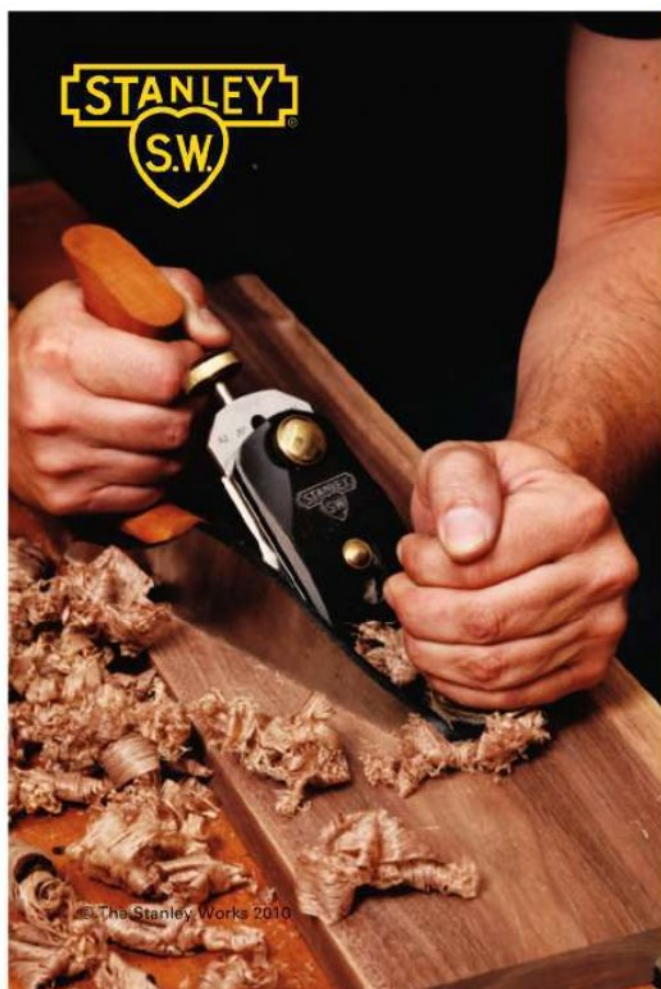
Give us a call, visit us online today or stop by **IWF Booth #5452**, and let ShopBot build you a CNC system ready to meet your needs at a cost that won't break your budget.

IWF 2010
AUGUST 25-28 ATLANTA GA USA
GEORGIA WORLD CONGRESS CENTER
www.iwfatlanta.com

ShopBot
What will you make today?

888-680-4466
shopbottools.com
twitter.com/shopbot

(Circle No. 41 on PRODUCT INFORMATION form)



THEY'RE BACK



Stanley® Revisits A Cherished Era of Quality and Craftsmanship.

Introducing the new line of Stanley® premium hand planes. Their mechanical precision, simple adjustment features, and top-quality materials are once again worthy of the famous Sweetheart™ logo ... a distinction that professionals and serious woodworkers recognize as a coveted symbol of quality. Not only do these hand planes maintain a tradition of quality and craftsmanship, they also offer a Sweetheart™ price as well.

Visit a participating Stanley® dealer near you to own yours today.

STANLEY

stanleytools.com

(Circle No. 42 on PRODUCT INFORMATION form)

Questions & Answers

Dealing With those Devilish Details

THIS ISSUE'S EXPERTS

Chris Marshall is field editor of *Woodworker's Journal* and author of several books on woodworking.

Michael Dresdner is a nationally known finishing expert and the author of *The New Wood Finishing Book*.

George Vondriska is a professional woodworker and teacher. He is the proprietor of the Wild Earth School and a contributing editor to the *Woodworker's Journal*.

Q What is the best way, or perhaps I should say, the safest way, to rout a profile on the edge of a small round piece such as a pedestal base on a router table? With a square or rectangular piece you maintain a straight push, but, as you're constantly re-orienting your fingers on a round piece, one that's less than six inches or so can put your digits in danger.

Jerry Spears
Shreveport, Louisiana

A I have a healthy respect that borders on fear when it comes to routing really small objects on a router table. So, in order to protect both my fingers and my sanity, I take three lines of



Bleached wood, like the highlight in Betty Scarpino's solid walnut turning at left, requires a special bleach, not the standard household fare.

defense when routing the small, circular sorts of shapes you suggest.

First, I get my fingers well clear of the bit by attaching a two-handed fixture on top of the workpiece — something made from scrap that keeps my hands far enough up and out of harm's way but not so tall as to limit my control of the work. I attach it to the workpiece with a few dabs of hot-melt glue or a strip of heavy-duty double sided tape.

Second, I always begin each routing pass with the workpiece held against a starter pin that's fixed in the table. It gives me a fulcrum to pivot the wood safely into the cutter and bearing.

And third, I cut the profile in a series of deepening passes to remove material a

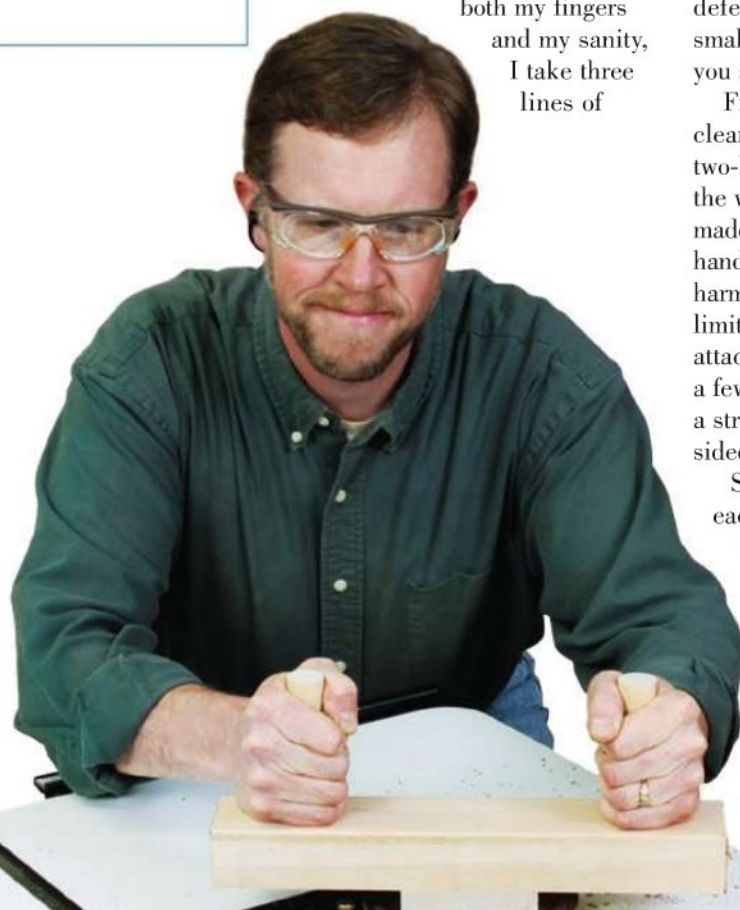
little at a time. That reduces stress on the bit and router and leaves a cleaner final cut.

I recommend that you not be overly concerned about trying to cut all the way around the circle in one continuous pass. Rout a third of it or so, pull the workpiece away to rearrange your grip on the handles, if necessary, and resume. There's no need to be a contortionist and risk throwing yourself off balance.

— Chris Marshall

Q I was in a furniture store recently and saw a bedroom set that was made from walnut but had a very light color. I tried to duplicate that color by applying household bleach to a couple of pieces of scrap walnut. Everything I try seems to leave the walnut the normal dark color. Can you suggest anything that would lighten the color of walnut?

Dave DeYoung
Hartland, Wisconsin



WOODWORKER'S JOURNAL

Steps to a Cedar Facelift

A new screen door made the old cement steps seem even more drab.

With a new screen door in place, I was unable to ignore my cracked and boring-looking cement steps any longer. The traditional way to deal with replacing the steps would have been to rent a jackhammer, break them up and pour a new set. That option did not please me (especially the jackhammering part).

Then another idea came to me. The steps were ugly, but they were structurally sound. What if I just covered them in cedar ... a fun woodworking project without the heavy labor! At the same time, I could add a bit more wood framing to widen the treads.

As you can see here, I covered the leading edge of each step and the top "landing" with mitered cedar, then filled the field area and the stair risers with butted cedar. I left about 1/8" between the boards to allow for wood expansion and for proper drainage.

Where the riser boards and mitered stair treads met, as well as in my newly framed areas, I locked the joints with screws. But, where the cedar met concrete, I reached for



Aging concrete steps did nothing to enhance the beauty of a new screen door project, but removing the old steps wasn't an attractive option either.

This Tear-out Technique sponsored by:

LOCTITE

TRUSTED PERFORMANCE. PROVEN RESULTS.™

Carefully tear out this page along the perforations, punch holes where indicated and save in a three-ring binder.

Loctite's Power Grab Heavy-duty Constructive Adhesive. Power Grab is water-resistant and bonds to most exterior building materials. It dispenses from a caulk gun, which made the job quick and easy — and thankfully, jackhammer free!



With a bit of added framing and a fresh stack of cedar, the former concrete steps served as a foundation for what looks like a completely new door entrance. Loctite's Power Grab Heavy-duty Construction Adhesive was used to bond the cedar directly to the old concrete, with no additional fasteners.





THE ADHESIVE BRAND TRUSTED ON SUSPENSION BRIDGES. AND GARDEN SHEDS.

For over 50 years, people have trusted the proven performance of Loctite® adhesives to stand up to the world's most challenging jobs. And there's a Loctite specially formulated for your important job, too. Find it at loctiteproducts.com.





Is it a good idea to involve glue with your pocket hole joinery? Wouldn't the screws be strong enough to hold securely? Our expert's answer just might surprise you (following page).



Winner!

For simply sending in his question on bleaching walnut, Dave DeYoung of Hartland, Wisconsin, wins an Osborne Miter Gage by Excalibur (from General International). Each issue we toss new questions into a hat and draw a winner.

A You were on the right track, but used the wrong bleach. Laundry bleach will remove dye stains, but it will not remove the natural color from wood. For that you need so-called AB bleach, a wood bleach sold as a two-bottle kit.

The bottles contain strong solutions of lye and peroxide, and when the two come in

contact with the wood and each other simultaneously, they will bleach wood white. Because both bottles contain strong caustic solutions, they are dangerous to handle. Read the safety warnings carefully and wear appropriate safety gear, including gloves, goggles and protective clothing. Do not let it get onto your skin or in your eyes.

By the way, are you sure the wood was walnut? It might be butternut, which looks almost exactly like walnut except that it is a light beige color. Other light colored woods can also share walnut's grain patterns, and there are some fruit woods that often pose as walnut in furniture.

— Michael Dresdner

Continues on page 14 ...

A router table that thinks it's a shaper



What do you get when you put the industry's biggest, flattest, most durable top on a rock-solid base with unrivaled storage space?

The ultimate router station

- Over 5 square feet of cast-iron work surface
- Award winning fence
- Dust collection above and below the table.
- Clever storage including pull-out router bit trays

ProMaxRT Complete
Stock No. 40-300

Learn more at benchdog.com



(Circle No. 35 on PRODUCT INFORMATION form)

Stumpers

Rolling Back in Time



A tool to track how far your covered wagon traveled.



If you recall the mystery tool submitted by **Jim Eslinger** of Bismarck, North Dakota, published in our April issue, you may also recall that it had markings on it from Lionel Corporation, New York. Yes, that made many people — including us — think trains. **John Lasser** of Jacksonville, Alabama, for instance, had a friend who used to work on the railroad who told him the tool was used by train watchers to count cars.

The train connection, however, turned out to be a red herring.

We're pretty sure that **Don Baker** of Tulsa, Oklahoma, was joking when he suggested that the tool was "an early jogger's counter," but he may have reached closer to the mark than he thought with his guess, "Or maybe it was used by horses trotting as a mileage meter."

As described by **Dave Fessler** of Albuquerque, New Mexico, who lent us his 1903 Keuffel & Esser Catalog showing this tool as backup for his claim, "The mystery tool is an odometer for counting the revolutions of a wagon wheel. The leather

case [touted in the catalog copy as "dust proof"] would be tied to the spokes of the wheel close to the hub. It then rotates inside the tin box inside the leather cover and counts the revolutions up to 10,000. If you look at it closely, you will see a small window on the dial. For each 100 revolutions on the outer dial, it will register 1 on the inside dial. So it will count up to 10,000. These were used by surveyors for distance as well as teamsters for figuring distance when hauling freight."

Art Edgren of Bend, Oregon, further commented that, if the tool can count up to 10,000 revolutions, "with normal wagon wheels of about four or five feet, that's good for 20 to 40 miles."

As the counter dial flips with the turns of the wagon wheel, the screw threads in the center of the tool advance the dial.

— Joanna Werch Takes

Winner! J.E. "Bud" Martelle of Sapulpa, Oklahoma, wins a Porter-Cable 4-Gallon Air Compressor. We toss all the Stumpers letters into a hat to select a winner.



Questions & Answers continued

Q I have been using pocket screws and gluing the joints as well. Now I see some people use pocket screws without glue. What is the correct way to build pocket screw joinery?

Carl Strand
Gainesville, Florida

A For a number of years, I assembled screw pockets without using glue in the joint. My feeling was that there was so little strength from glue on end grain, what was the point? Then I was helping my friend Charlie at his cabinet shop, where he builds kitchen cabinets. My job for the day? Making face frames. Charlie saw me assembling frames without glue and said "Uh, uh. We ALWAYS use glue in those joints." Whatever ... It's his shop, his jobs, so I'll use his technique. Well, I managed to assemble a couple of frames incorrectly (I'm still sure it was someone else's fault) and when I tried to disassemble them, I could barely get them apart, even with the screws out. Disassembly ended up tearing out pieces of grain. Wow! So now, thanks to Charlie, I always use glue with my screw pocket joints, convinced that it adds a lot of strength to the joint.

— George Vondriska

Contact us by writing to

"Q&A," Woodworker's Journal,
4365 Willow Drive,
Medina, MN 55340,

by faxing us at (763) 478-8396

or by emailing us at:

QandA@woodworkersjournal.com

Please include your home address, phone number and email address (if you have one) with your question.

What's This?

Jim White of Chapin, South Carolina, has had the tool below for years — and still doesn't know what it is.

Do you know?

Send your answer to
stumpers@wwj.info for a
chance to win a prize!



IWF
2010
Booth 1325

CLEARLY ADVANCED



Wagner Moisture Meters

- More accurate* and over 10 times faster than pin-type meters
- Full thickness measurements without the holes
- Manufactured in the United States
- Support provided by Wagner's solution-oriented team

Providing fast accurate moisture measurements, Wagner's **clearly advanced** moisture meters have been the preferred choice by professionals for over 25 years. **Come see us at IWF 2010, booth 1325!**



www.wagnermeters.com 1-800-634-9961

*Accuracy proven by several different university studies.

(Circle No. 49 on PRODUCT INFORMATION form)

Turn to Quality



Shop on-line @
www.hutproducts.com

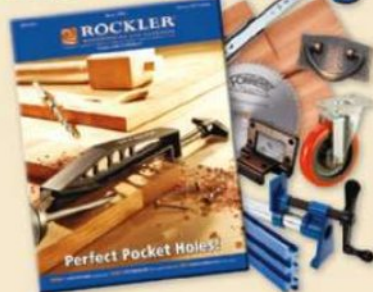


1-800-547-5461

(Circle No. 23 on PRODUCT INFORMATION form)

ROCKLER
WOODWORKING AND HARDWARE
Creates with Confidence

FREE Catalog!



This catalog could be the most useful tool in your shop. It's where you'll find that elusive hardware solution, rare piece of hardwood, unique molding and innovative tool or jig that takes your project to the next level. You'll find over 10,000 items to choose from, with new items being added every month!

Get your **FREE** catalog today at
www.rockler.com/go/V0328 or
call 1-800-403-9736 (Code 181).

(Circle No. 36 on PRODUCT INFORMATION form)

For the **ultimate** in
dust collection,
harness the **power** of a
cyclone.



The cyclonic action of
our award-winning
products whirls away
dust for health, safety
and easy cleanup.

Serious woodworkers everywhere are breathing easier - and cleaning up in a snap - with our Pro Series Dust Collection System. This revolutionary system delivers the dust-free work environment you've always wanted. Custom engineered to fit seamlessly into your shop.

"One of the best
investments I ever
made. I thank you,
and more importantly,
my lungs thank you."

- John Sasso
Colorado

Made in USA



Order Online at
oneida-air.com

Call for your **FREE** catalog!
800.732.4065

(Circle No. 28 on PRODUCT INFORMATION form)

Tricks of the Trade

Common Hardware to the Rescue

Safety First

Learning how to operate power and hand tools is essential for developing safe woodworking practices. For purposes of clarity, necessary guards have been removed from equipment shown in our magazine. We in no way recommend using this equipment without safety guards and urge readers to strictly follow manufacturers' instructions and safety precautions.



Securing Vac Hoses with Shelf Pins

I was just about to order one of those fancy (and expensive!) quick-connect fittings to solve the problem of my vacuum hoses always pulling apart at the most inopportune moments. But then it occurred to me that a metal shelf pin might just do the trick. I connected the hose to one of my vac attachments, drilled a 1/4" hole through them both and wedged in a shelf pin. The pins have a long enough shank to lock the assembly together, yet they're not so long as to protrude into the airstream and obstruct the airflow. They work well!

Tom Woods
Oak Ridge, North Carolina

Cheap Alternative to Thumbscrews

The next time you are in need of a thumbscrew for a jig or a clamp, try an eye bolt with a machine thread instead of buying more specialized hardware. They are available in various diameters and lengths and, when used with a T-nut, they have great holding power. The loop in the bolt allows you to apply plenty of force — just with your hand.

John Esposito
Foster, Rhode Island

Connecting the Dots

I keep sheets of colored adhesive dots in the shop to use for part assembly. I find them at office supply stores. After I prepare and dry fit each joint, I mark the two part ends with a pair of matching colored dots. Different joints receive other colors. I leave them on during sanding and finishing stages. They keep my part ordering clear and peel off easily at glue-up time.

Kenneth Minnaert
Olympia, Washington



Keyed into Easier, Accurate Box Joint Setups

Box joints make for strong construction, but I always found the pin-style miter gauge jig for my router table fussy to set up. I usually ended up cutting more test pieces than workpieces in order to get the spacing dialed in. Finally, I had a breakthrough: instead of using a wooden pin for the jig, I switched to metal key

stock that you can find at a hardware store. Its dimensions match my 1/4" straight bit exactly. I installed a short piece permanently in the jig to register the cuts. A second, longer piece helps me precisely index the space between the bit and the metal pin during initial setup.

John Jogerst
Navarre, Florida



Drilling oversized holes in the drawer box makes the face easier to adjust.



Easy-to-adjust Drawer Faces

When I build drawers with applied faces, here's how I make the faces easy to adjust. First, I mark and drill the holes through the face for the washerhead screws I use to attach the pull or knob. Then, I set the face in place on the drawer box and mark pilot holes with an awl. I switch to

a drill bit that's 1/8" to 1/4" larger than the original screw holes and bore holes through just the drawer box. With this done, I mount the drawer face and tighten the screws enough to hold it in place. When I hang the drawer, the large holes make it easy to shift the face around. Once it's aligned,

I tighten the screws fully. Allow the drawer to settle under the weight of its contents, readjust the face, and drive a few more screws to lock it in place for good.

Alan Shaffter

Washington, North Carolina



Winner!

In addition to our standard payment (below) John Jogerst of Navarre, Florida, will also receive a Stanley-Bostitch CPACK300 Combo Kit for being selected as the "Pick of the Tricks" winner. We pay from \$100 to \$200 for all tricks used. To join in the fun, send us your original, unpublished trick. Please include a photo or drawing if necessary. Submit your Tricks to Woodworker's Journal, Dept. T/T, P.O. Box 261, Medina, MN 55340. Or send us an email: tricks@woodworkersjournal.com

Turn your woodworking **PASSION** into **PROFITS** with the **EUREKA** turn-key Producer* Program and start building 100% Western red cedar furniture like this . . .



Put yourself in the driver's seat and be your own boss when you sign on as a EUREKA Producer!



*Authorized distributor of Eureka Woodworks, Inc. All trademarks, tradenames, and copyrights are property of their respective owners, and are used under license. All rights are reserved.

For all the details call 877-731-9303 or go to www.eureka-business.com

(Circle No. 14 on PRODUCT INFORMATION form)

Woodworking for the Generations



A special stash of wood and a desire to build one more project together led Robert McAnany and his 80-plus-year-old dad, John, to work on this cradle as a team — in anticipation of future generations.

Heirloom Cradle *Waiting for a Baby*

I completed my first woodworking project with my dad's help when I was 10 years old. It was a bookshelf made of 1x12 yellow pine, cut with a handsaw, fastened with 8d box nails, and finished with shellac. It was full of knots and didn't have a single straight board or square cut anywhere. I still have it.

We've worked on many projects since, but now, over 40 years later, my dad's in his eighties and not in the best shape. He suggested that we do one more project together while he still had the energy.

As it happened, we already had some very special wood. Some years ago, the old walnut tree in Dad's backyard had to be removed. A local sawyer milled the massive trunk for us, yielding over 600 board feet of clear heartwood.

Somehow, we landed on the idea of a cradle. No one in the family was expecting a baby, yet we thought that a custom-

made cradle would be a meaningful endeavor. This one piece could be shared among his seven grandchildren and perhaps even by generations to come. Having settled on a project, we began by looking at dozens of existing designs. Some were simple, some elegant, some downright ugly, but none was "just right." We set out to design our own.

In my professional life as a mechanical engineer, I have access to a solid modeling CAD system. I started by drawing a simple frame for a standard 16" x 32" cradle mattress, then used the program's surfacing tools to play around with shapes.

Once we had a concept worked out, the next step was to refine the design. To enhance the natural flow of lines, I added an arch to the end panel of the mattress-frame, then echoed it again in the base stretchers. To emphasize the graceful curves along the top of the cradle, I decided not to use conventional corner posts.

Instead, I used the spindles themselves as the structural elements tying the piece together.

In terms of craftsmanship, my dad and I would have to be considered more "determined" than "gifted." My wife jokes that I spend more time building jigs than I do building furniture.

The dovetail joints were made using a

Leigh dovetail jig. However, since the side rails curved along the length of the board, they couldn't be clamped directly to the jig. To address this, we made a simple clamping fixture to hold the rails firmly in the proper position for the dovetail cutter.

With eight dovetails and 56 spindles, the cradle had too many joints to be glued all at once. We decided to glue up the four side panels, one at a time. Once these were complete, we would then glue the eight dovetail joints simultaneously.

The challenge with this approach, gluing the sides and ends separately, was to guarantee that the heights and angles would match at final assembly. To accomplish this, we assembled the whole cradle dry. The dry assembly then acted as a positioning fixture as we glued the panel assemblies in turn.

After assembly, all the joints were hand-sanded to eliminate any slight



A homemade jig

to hold curved rails in position for a dovetail jig, a benchtop mill for drilling — with a separate block to set the angle for each of 56 spindles — and a dry assembly used as a positioning fixture for glue-up of panel assemblies were all part of Robert McAnany's cradle construction.



John McNany hand-sanded the cradle following assembly; wood filler repaired slight defects.

mismatches. Naturally, a few surface defects were discovered in the process. These were repaired with wood filler and sanded smooth. Then two coats of Danish oil were applied and allowed to dry.

My wife, Marianne, is an art school grad and amateur painter. Thanks to me, she has developed a skilled hand at replicating wood grain. With oil pigments and a tiny brush, she was able to blend in the wood filler to match the adjacent grain pattern on the finished cradle.

The Danish oil finish was beautiful, but not very practical. After all, real-life babies are known to be messy on occasion. For a protective finish we applied several coats of wipe-on polyurethane.

We presented the cradle to Dad's grandchildren at the

big family gathering this Christmas. Along with the cradle, we proposed a new tradition: As each new great-grandchild comes along, their parents will receive the cradle and carve the baby's name and date of birth on the underside of the wooden mattress frame.

Over time, we like to imagine that the McNany Family Cradle will become a treasured heirloom, a recording of family history and an enduring connection through the generations. The only thing we need now is a baby.

—Robert McNany

Shop Talk continues on page 20 ...



photos by Mark McCabe

Marianne McNany's

painting skills came in handy to match wood filler to adjacent grain when finishing the cradle.

✓Yes ✓Yes ✓Yes ✓Yes ✓Yes ✓Yes ✓Yes xNo ✓Yes

✓ Huge Selection
✓ Everyday Low Prices

✓ Fast Shipping
✓ Easy to use Website

ROCKAUTO.COM

ALL THE PARTS YOUR CAR WILL EVER NEED
GO TO WWW.ROCKAUTO.COM ROCKAUTO, LLC (EST. 1999)

(Circle No. 33 on PRODUCT INFORMATION form)

ROCKLER
WOODWORKING AND HARDWARE
Create with Confidence™

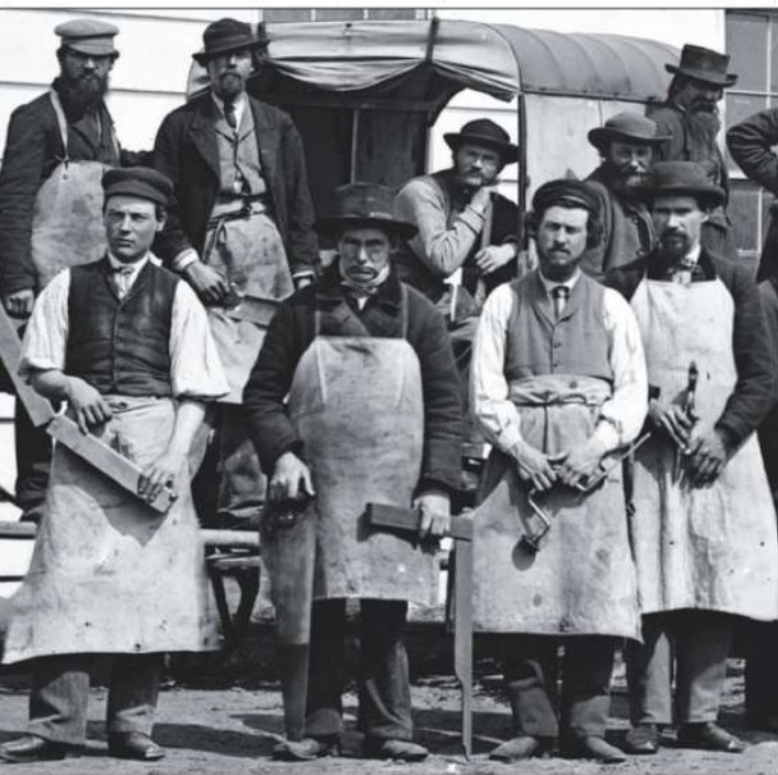
Item 36358

Aiming to carry the hottest pen kits on the market

See our Bullet Cartridge Pen Kit in stores or online.

Rockler.com | 1-877-ROCKLER

(Circle No. 5 on PRODUCT INFORMATION form)



photos above and at immediate right courtesy of Library of Congress

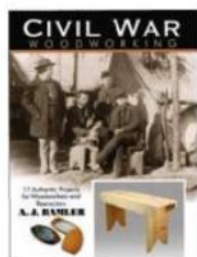


A.J. Hamler (left, in top photo) is both a woodworker and a Civil War reenactor. One of his reproductions (right) is the camp table used by the 179th New York regiment (above).



A group of woodworkers

pose for a photo in 1865 (above), showing off some of the typical tools that would have been used during the Civil War era. In his new book (below), author A.J. Hamler reinterprets projects from the era for modern-day use.



Reenacted Hobbies Not At War

Woodworking author A.J. Hamler (check out his article on jointers on page 26) is, like most people, not solely defined by his woodworking: one of A.J.'s major hobbies is Civil War reenactment. In his new book, *Civil War Woodworking*, he's found a way to combine the two interests.

Civil War Woodworking is both history and how-to. It combines insight into the type of woodworking practiced by Civil War soldiers with step-by-step plans for reproductions of the sorts of things they might have used. Such plans include a hardtack crate, a folding camp stool and folding camp table, portable bucksaw and more. A.J.'s also included historical photos of these wooden items in use in Civil War camps, a recipe for hardtack and an introduction into the levels of authenticity strived for among different groups of reenactors.

His own philosophy is that it's impossible to create a completely authentic reproduction — after all, he points out, back in the 1860s, a pine 2x4 likely came from an old-growth forest and actually measured, well, 2" by 4"; whereas today, purchased pine has likely come from a managed new-growth forest and a "2 x 4" now actually measures 1½" x 3½". Wood was also locally harvested, with Northern soldiers more likely to build from white pine; Southern from yellow.

Still, A.J. offers tips for creating greater (or less, if you have other uses in mind than battlefield camping) authenticity in your own

creations of his projects — what marks you should remove if you use modern tools, how to apply the rivets that were often used for Civil War-era joinery of two pieces of wood that pivoted against each other, and what finishes you should apply (if any: most pieces created by soldiers in the field were left raw).

He also notes that the bucksaw comes in handy not only for cutting up firewood in a reenactment camp, but also around your own shop and yard.

Civil War Woodworking is published by Linden Publishing; ISBN 978-1933502-28-1.

— Joanna Werch Takes

Enjoy the Benefits of HVLP with a FUJI!

- ▶ Pattern Control Knob
- ▶ Non-Bleed Sprayguns
- ▶ High-Efficiency Aircap
- ▶ Powerful & Compact
- ▶ Standard or 'Quiet' Turbines
- ▶ Industrial-rated



Visit www.fujispray.com or call 800-650-0930

(Circle No. 18 on PRODUCT INFORMATION form)



With over 30 years of experience in producing lumber dryers you can count on EIP's dependability and simplicity.



Mention this ad to receive
10% OFF your total purchase
OR FREE Shipping



We offer four models ranging from
800 BF to 10,000 BF

Ebac Industrial Products Inc

700 Thimble Shoals Blvd, Suite 109, Newport News, VA 23606-2575

Tel 757 873 6800 Fax 757 873 3632

Toll Free 1-800-433-9011 www.ebacusa.com

(Circle No. 11 on PRODUCT INFORMATION form)

Osborne
Wood Products, Inc.

*Carefully Crafted
Fine Quality*

Wood turnings and components from **Osborne Wood Products, Inc.** are the perfect complement for your woodworking projects.

www.woodencomponents.com

866.963.5601

Come See Us!

August 25-28

IWF in Atlanta Booth 2019

(Circle No. 29 on PRODUCT INFORMATION form)

WJ woodworkersjournal.com

eZiNE

FREE
plans in
every
issue!

Don't miss out ...
... it's **FREE!**

The *Woodworker's Journal* eZine is the Internet's most popular woodworking magazine — bar none. New, fresh content — always delivered with a sense of humor and respect for the craft. If you are not a subscriber to the eZine, sign up for your **FREE** subscription now!



Sign up at woodworkersjournal.com

BUILD IT TOUGH



High strength with a shorter clamp time along with no dyes for a natural finish makes Gorilla Wood Glue ideal for your woodworking and building projects.

FOR THE TOUGHEST JOBS ON PLANET EARTH®

GORILLA TOUGH .COM

1-800-966-3458 Made in U.S.A.

© 2013 Gorilla Glue Company

(Circle No. 21 on PRODUCT INFORMATION form)

Techniques

Squaring Up Like an Old Master

By Ian Kirby



Pinch rod measurements are gauged in a tactile, not visual, way — a “friction fit.” Grasp the rods firmly and propel the ends into the corners with your thumbs. Then check the diagonals, moving the clamping blocks (inset), until they are equal.



Believe it or not, it was possible to square up cabinets before the invention of the tape measure. The method is still useful today.

The final act of gluing up any frame or case assembly is to be sure that it is square. Most other checks for square are made using a try square — not so when the work is in clamps, the reason being that the pressure exerted to close up the joints and shoulder lines also bends the various parts of the assembly. Although it is only slight, the distortions which occur render a try square ineffective. What we do instead is to check that the diagonals are equal in length. If they are, then simple geometry tells us that the

assembly is, in woodworking terms, “square.” If the diagonals are not equal, the geometry is adjusted by moving the clamping blocks, which redirects the clamp pressure.

Most diagonal checks are made using a tape. Hard to imagine, but there was life and methods to check diagonals before the advent of the yellow tape, when they were checked with a device called pinch rods. I’ll come back to the tape, but first, pinch rods. Like so many things of the hand tool era, they are simple, shop-made

items. First, I’ll describe them and their use, then look at some refinements.

Pinch Rods to the Rescue

They consist of two thin strips of wood shaped at end to a “chisel edge.” The strips are held together face to face, chisel edges out. Holding the rods across a diagonal, the ends are advanced into the corners so that they are a friction fit. Next, transfer the “pinched together rods” to the other diagonal. If the assembly is square, the rods will fit as they did in the first diagonal.



A tape measure's hook end has to be positioned in exactly the same way for each diagonal measurement — and a pinch rod's "chisel edge" must be at the same depth at each end.



Pinch rods

are not made to the sort of accuracy or finish reserved for winding strips/sticks. Indeed, they may well be made with surfaces direct from the table saw. The sawn surfaces resist slipping one on another. The walnut pair is 3/8" x 1" x 26". The chisel end is a few degrees short of 60. In most shops, there would be two or three pairs of different lengths hanging on a nail ... with or without glue on the chisel end, depending on the last user.

This reading is tactile, whereas a tape is visual. In both cases, there is a need for one to ensure accuracy. With the pinch rods, it is important to have the same amount of chisel edge in the workpiece at both ends — otherwise, you are measuring a dihedral. The feel of the friction fit on both readings is something that you need to experience to truly understand. With a tape, the same is true in a different way.

If you are working alone, then how and where you place the lip end of the tape has to be exactly the same on both diagonals. The tape must be as straight as it can be — no sags, no twists.

In the best and simplest of situations, two people measuring a case has one person at the "holding end" of the tape out to two or three inches. The "measured" end can be seen very clearly. Not all assemblies are this simple. Sometimes, complexities and many clamps in the way make a tape impossible, but pinch rods can often do the work.

When the diagonals are not equal, it's almost always the result of the clamping blocks not being positioned symmetrically, or they are sized differently in different corners. Clamps are only as

effective as the clamping blocks you use. Move one set of blocks and check the diagonals. If they are worse, you went the wrong way. Reverse the procedure until you get them "spot on."

A Diagonal Tale

In a small shop, an old hand was gluing up a large, complex assembly with his apprentice, who was soon to graduate as a journeyman.

The glue-up complete, they were checking the diagonals. As a sign of his confidence, the old guy was holding the end of the tape with the apprentice checking the measurement. "How is it?" asked the master. "Near enough" came the answer. To

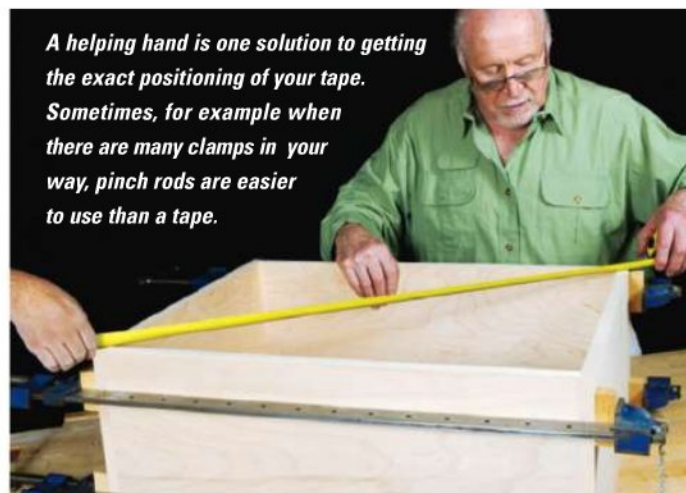
the chagrin of the apprentice came the directive, "We'll check it again." After the moving around and fuss of the check, "How is it?" came the question. "Near enough," the reply. A pause, then, "We'll check it again."

With buttons pushed and short fuses ignited, when the question was put for the third time, "How is it?" "Absolutely spot-explosive-on," was the reply.

"Right," said the old man, "then that's near enough."



Ian Kirby is a master woodworker and regular contributor to Woodworker's Journal. He is the author of The Complete Dovetail from Linden Press and other books.



A helping hand is one solution to getting the exact positioning of your tape. Sometimes, for example when there are many clamps in your way, pinch rods are easier to use than a tape.

Woodturning

Spindle Turning: Learning on the Fly

By Rob Johnstone

What will a 54-year-old woodworker learn from his first serious spindle turning experience? A few commonsense lessons to further his knowledge.



The author learned that he needed to use calipers to create accurate and consistent diameters — and that harmonic chatter can be diminished by lightly holding his hand on the turning spindle, just behind the cutter. A steady-rest, shown below, is another means of fighting those vibrations.

Our Editor-in-Chief recently completed his first historical reproduction and learned a thing or two about turning legs in the process.



From candlesticks to baseball bats, long, slender spindles are often one of the first projects attempted by new turners.

On the other hand, if you're a furniture maker, turned legs may well become the project that gets you hooked on the lathe. For the Shaker Table reproduction project featured on page 28, I had eight chances to get it right, since I built two of the tables. These were very basic legs, but when it comes to turning, my past experience has been limited to bowls and other small projects. So they were a first for me. Here's what I learned from my first go-round.

Turning Takeaways

First, use a good quality spur center and live center. I upgraded to a new Oneway live center for this task (replacing the factory live center that came with my six-year-old lathe).

Next, prepare your turning blanks carefully and mark the mounting points dead center.

Lay out your legs before you begin turning. Mark your transitions, tapers, etc.

Use calipers to check your diameters. (My bowl-based look-see method didn't work!)

Make a "test leg" from well prepared scrap lumber. This allows you to discover any potential problems in advance. For example, on my test run I

learned that my technique with a skew was not sufficient to accomplish the task of making a uniform cylindrical leg. So I switched to a 1" flat scraper and got the job done.

Also, on this project I experienced what expert Ernie Conover calls "harmonic chatter" — the vibrations that occur when a spindle becomes thin enough to flex as it is being shaped. Mine was mild enough that I could dampen it with my hand held lightly against the turning leg.

The main lesson I learned? Don't let your inexperience get in the way of completing a project.



ROCKLER®

WOODWORKING AND HARDWARE

Create with Confidence™



CNC Routing from **only \$2599⁹⁹**

Priced thousands less than most CNC machines, the new Shark™ and Shark Pro™ give home shops unprecedented access to precision-automated routing. Tools like these will revolutionize your work, bringing pro-level results to every project—another way Rockler helps you *Create with Confidence*.

Rockler Woodworking and Hardware - Since 1954

(Circle No. 37 on PRODUCT INFORMATION form)



For a store near you or free catalog visit

Rockler.com 1-877-ROCKLER

The Case for a Jointer

By A.J. Hamler

From creating perfect joints for butt joint glue-ups to flattening cupped and twisted lumber, a jointer more than earns its keep in a busy woodworking shop.



4" Benchtop Jointer



6" Stationary Jointer



12" Planer Jointer Combo Machine

Many woodworkers agree that, after a table saw, the number one piece of shop equipment is the jointer. One look at the versatility of this workhorse and it's easy to see why.

The machine's primary function — in fact, the one it's named for — is creating ready-to-glue edges on workpieces. A jointer does this the same way a hand plane does, by cutting away high spots on the lumber. With each pass over the blades, high spots are gradually milled away until the edge is a single, continuous plane.

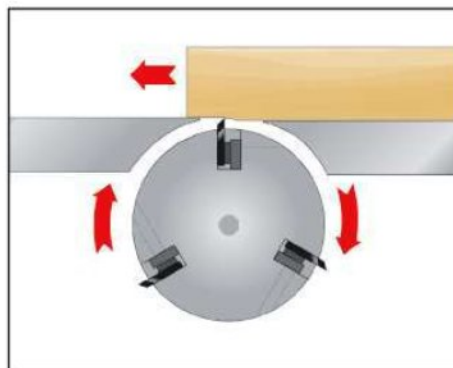
However, a jointer does this far more efficiently than a hand plane in three key ways: It's faster; it creates an accurately leveled edge over a lengthier area; and a jointer's fence makes this edge perfectly square to one face of the stock.

An argument could be made that a table saw can also create square edges, but those edges are rarely glue-ready. Likewise, a router can also create a jointable edge, but that method requires a lengthy setup to get it right. A jointer beats both, hands down.

Beyond the Joint

Because most means of working boards require starting with one square edge, the jointer is the logical first stop when milling project lumber. Before ripping a board on the table saw, for example, it's essential that one edge hug the saw's fence. Once one edge is squared on the jointer, you'll be able to rip the opposite edge perfectly parallel to the first and do it more safely.

Just as a table saw can't give you perfectly parallel edges if one edge isn't already square, a thickness planer can't give you a perfect face unless the opposite face is already true and flat. A cupped or twisted board won't feed properly through a planer; a freshly planed face may be parallel to the opposite side, but you may find that it follows the same twist as the other side. Again, turn to your jointer to get this first face dead flat.



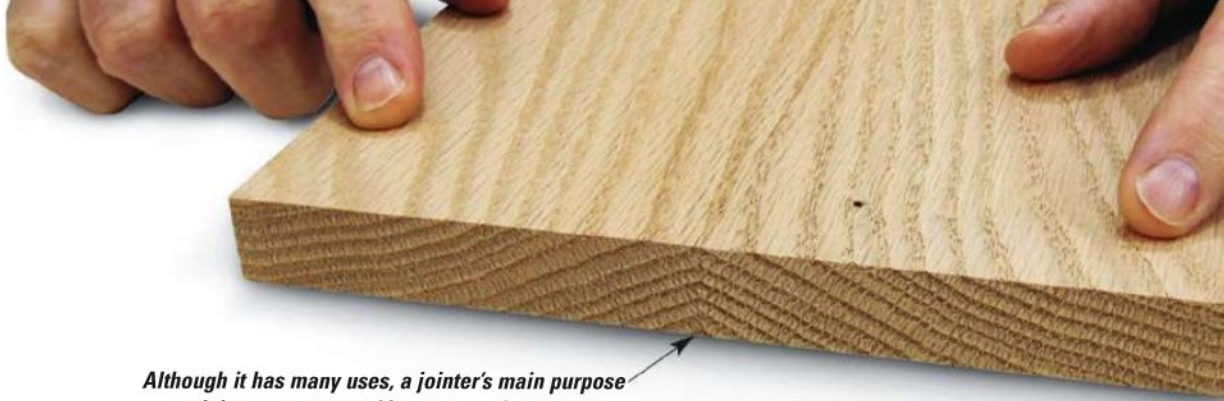
A jointer's outfeed table (left) is set perfectly level with the blades, while the infeed table (right) is raised and lowered to control the amount of material removed with each pass.

As with edge-jointing, feeding a board's face on your jointer attacks the high spots of a cupped or twisted board first, gradually flattening the face as shown in the photo (above, right). Then, once that face is perfectly flat, you can head to the planer and get a second flat face perfectly parallel to the first.

Combining these two techniques on a jointer turns stock preparation into a powerful

Jointers are available in a variety of sizes. The benchtop jointer shown in the top photo works well for shops short on space. The 6"-wide jointer shown in the middle photo is typical of stationary machines in this category, while the combination machine shown in the bottom photo pairs a 12" jointer with a 12" planer beneath the main jointer bed.





Although it has many uses, a jointer's main purpose — and the very source of its name — is to create perfectly square, perfectly flat edge joints critical for making large panels.



In order to further mill a board, one side must first be dead flat; a jointer excels at this task. A few passes over a jointer have begun to flatten this badly cupped board.

one-two punch: You get that dead-flat face, followed by a jointed edge that is exactly 90 degrees to the face. Every other method of stock prep performed after that will register on one or both of those two surfaces, ensuring accurate results.

More than a Pretty Face

If it ended there, a jointer would be indispensable in most shops, but it also performs a few other tricks. Need a rabbeted edge? You can get it with

a rabbeting bit on your router or by mounting a stacked dado blade set on your table saw — both of which can be time-consuming. Or, you can cut rabbets quickly using the built-in “rabbeting ledge” found on just about every jointer made. Move the fence to the side of the bed with the ledge, fine-tune the placement according to the stock thickness and required rabbet depth, and then just lock it down. Make multiple passes just as you would when edge-jointing to quickly form your rabbet.

Similarly, for chamfered edges on stock just tilt the jointer fence. Multiple passes easily and quickly create edges of just about any angle. Sure, you can do that on a table saw, too, but these edges are perfectly smooth and ready for glue-up if that's the goal — and that's a nice goal!

A.J. Hamler is a woodworking author and the former editor of Woodshop News. His last article with the Journal was in our April 2010 issue.





Shaker End Tables

By Rob Johnstone

Combining the elegant yet simple design of an historic Shaker-made table with highly figured maple stock, the author came up with a project that is both practical and beautiful.

The Shakers were part of a larger 19th-century cultural cycle that became known as the Utopian Movement. By separating themselves from the world and basing their behavior on societal norms of their own determination, the Shakers and other groups attempted to create a better world — one small group at a time. Other groups, like the Millerites and the Amana Society, were similar in their separation, but the Shakers were unique in the degree to which their beliefs permeated nearly every aspect of their lives. Their spiritual beliefs affected everything from the way they preserved food to the clothing they wore, behavior regarding procreation and even the furniture they built. And that's where this project finds its origins. The table that these replicas are based on was built in the 1850s. I found an image of the table, along with some measured drawings, in an old book. Never having attempted an historic

reproduction before, I approached the project with an increased level of curiosity and a degree of caution. The Shakers designed their furniture to be ultra-functional and soundly built but with an eye to being efficient with the wood (a concept common to woodworking today). They regularly used solid material that was resawn to 1/2" to 5/8" thickness, rather than our default 3/4" thickness. Simplicity was a key element of beauty in their philosophy. Although lightly built, the fact that many of their pieces remain functional over a hundred years from their construction speaks to the strength of the joinery. And all of this was intentional. Once, when I was talking to woodworker Norm Abram about finding inspiration from projects of the past, he observed how folks who build Shaker projects these days often substitute thicker stock for the original dimensions and how negatively that small change affects the look of the pieces.



As I was getting started, I remembered that conversation and decided to be as true to the original piece as I could regarding the various component sizes. But when it came to the material I used, I decided to veer about as far from the original as I could and still remain on the planet.

It was impossible to determine from the black and white photo what species or combination of woods the original was built from. No doubt it was locally harvested and cured (another concept that is coming back into vogue). What I could see was that it was painted, and so for that reason the type of wood was not aesthetically important. For my tables, I decided to find some exceptionally beautiful wood and incorporate it into the simple Shaker design. I used highly figured flame maple for the legs, aprons and drawer fronts and, after a good deal of calling around, found some stunning maple in a clouded (or “bubble”) pattern for the tops.

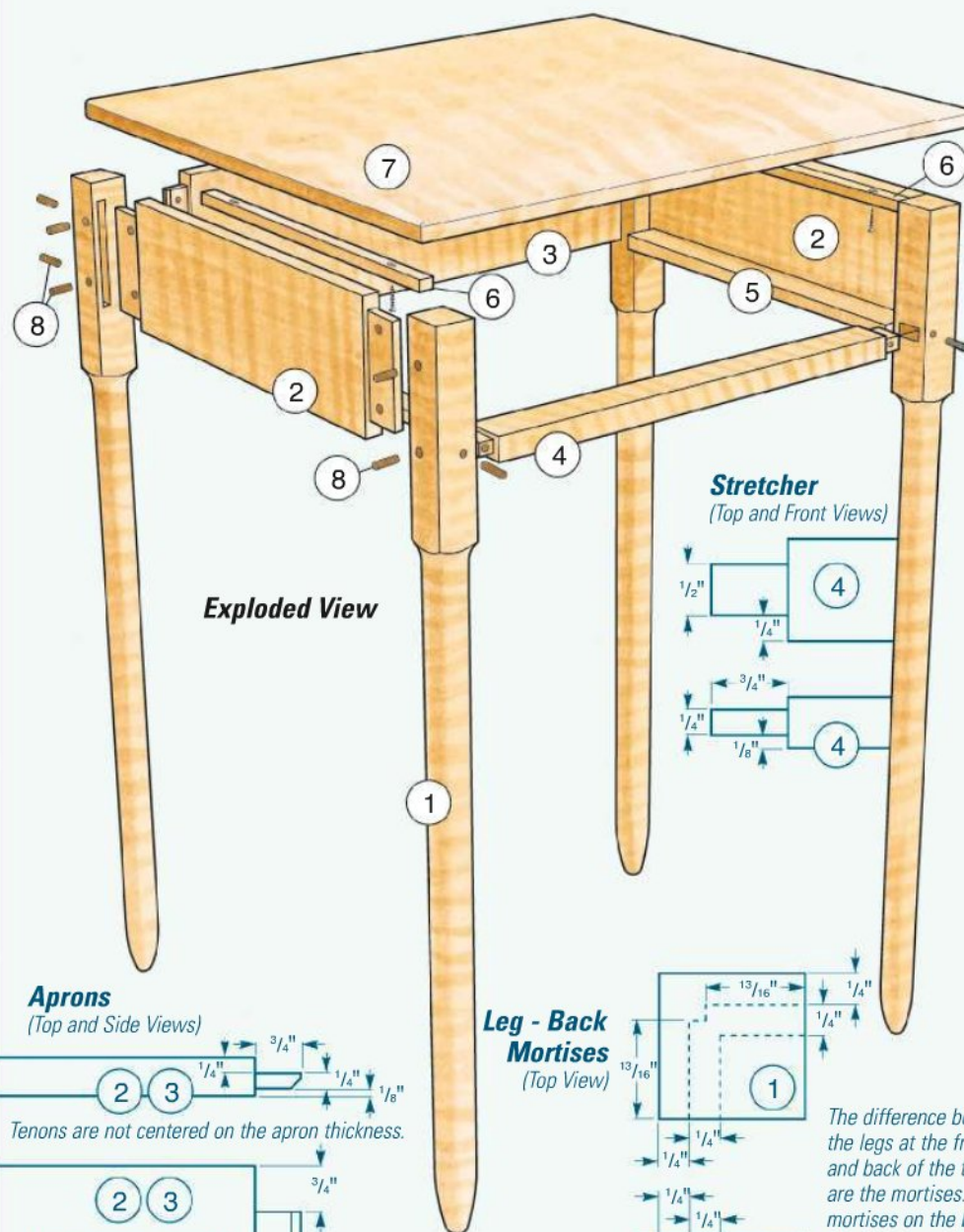
Building from the Ground Up

I began by creating a *Material List* (you can find it on the following page) from the old measured drawings. Even though these drawings were exceedingly helpful, they left a couple of details out. First, how was the top attached to the underframe, and second, how was the drawer supported and guided? These two details ended up being interconnected, but I was unaware of that until later.

As I indicated earlier, I extended a significant amount of effort locating maple with very dramatic grain patterns. I also brought the stock into my shop and let it adjust to the environment for several days. I had decided in advance that I would use the tables on either side of my bed, so I selected sufficient wood to make two of them.

I started by making the legs (pieces 1) from flame maple stock. Although the final squared-up dimension of each leg is $1\frac{3}{8}$ ", the heavy lumber I located was almost $1\frac{3}{4}$ " thick as I began. After carefully inspecting the material to get the best looking grain from the stock at hand, I rough cut pieces to about 30" long and about 3" wide. To create turning blanks for the legs, I started out on the jointer. I face-jointed the stock to get a perfectly flat plane on the wide face, then I jointed an adjacent edge so that it was straight and a perfect 90° to the first face. (Be sure you mark each piece so that you don't confuse which two faces are trued up to one another.) With the table saw blade set accurately to 90° to the table, I adjusted the fence to a distance of $1\frac{3}{8}$ " plus a bit — less than a 32nd of an inch strong — this extra dimension would be removed while I was sanding the legs later. I made the first cut on my roughed-out blank with the flat face down and the squared edge on the fence and then made the next cut in the remaining blank in the same fashion. Then I lowered the blade a bit and, with the squared faces once again on the table and against the fence, finished cutting out my leg turning

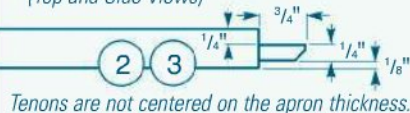




Exploded View

Aprons

(Top and Side Views)



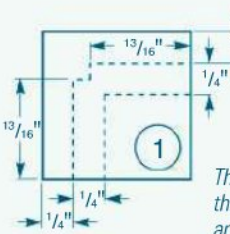
Tenons are not centered on the apron thickness.



A slight miter is formed on the tenons that go into the back legs so they won't run into each other.

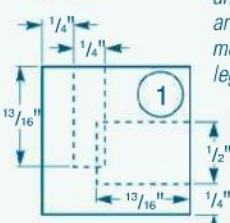
Leg - Back Mortises

(Top View)



Leg - Front Mortises

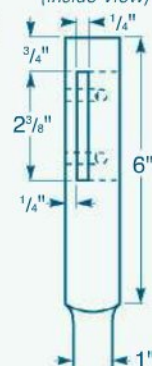
(Top View)



The difference between the legs at the front and back of the table are the mortises. The mortises on the back legs intersect slightly.

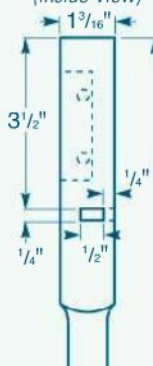
Right Back Leg

(Inside View)



Right Front Leg

(Inside View)

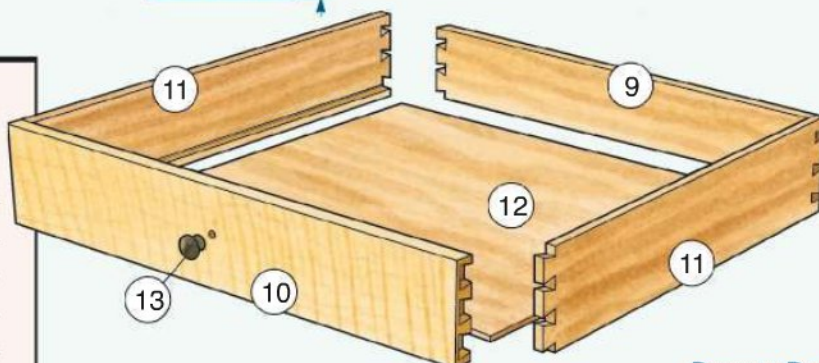


Make mirrored left and right versions of the mortises for the legs.

MATERIAL LIST

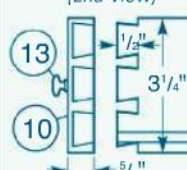
T x W x L

1 Legs (4)	1 3/16" x 1 3/16" x 26 1/2"
2 Side Aprons (2)	5/8" x 3 3/8" x 15 1/2"
3 Back Apron (1)	5/8" x 3 3/8" x 17 1/8"
4 Stretcher (1)	1/2" x 1" x 17 1/8"
5 Drawer Supports (2)	1/2" x 1" x 13 3/8"
6 Tabletop Cleats (2)	9/16" x 9/16" x 13 3/8"
7 Tabletop (1)	1/2" x 16 5/16" x 19 3/16"
8 Tenon Pins (14)	1/4"-diameter x 5/8"
9 Drawer Back (1)	5/8" x 2 7/8" x 15 1/2"
10 Drawer Front (1)	5/8" x 3 3/4" x 13 3/8"
11 Drawer Sides (2)	3/8" x 3 3/4" x 15"
12 Drawer Bottom (1)	1/4" x 15 1/4" x 14 3/4"
13 Drawer Pull (1)	5/8" diameter



Drawer Front

(End View)



Drawer Side

(Inside View)



Drawer Back

(End View)



The dovetail pattern shown is a suggested layout. Yours may vary with your method.

Fantastically figured maple: this is definitely not your grandmother's Shaker table!



The author purchased the flame maple lumber for the underframe from rockler.com. After much searching, he found the clouded or "bubble" maple (photo above) at woodworkerssource.com.

blanks. While you could choose to mark out your mortises and chop them out now, I proceeded to the lathe first. My thought was if I messed something up while turning, or the leg decided it wanted to distort in some way after I removed material, I could discard it without having invested the time and effort of chopping the mortises.

I must confess to being more of an enthusiastic turner than an expert one. And what skill I have is as a result of the bowls that I turn. So, with a bit of research and some practice, I learned a few things about spindle turning while making these tables, which I am detailing in the *Woodturning* department on page 24. As you can see from the *Drawings*, the legs have a 6" long rectilinear section at their top but are cylindrical for most of their length with a gentle taper that starts 4" from the bottom. They are not at all tricky to make, but if you are not experienced in spindle turning, I recommend turning a test leg from scrap stock to get things started. As I completed each leg, I sanded the turned section right up through 400-grit sandpaper. It was my plan from the get-go to put a silky smooth finish on the table, and surface preparation is key to that aim.

When I was done with the turned portion of the legs, I grabbed the lot of them and moved to my mortising machine. I laid out the mortise locations (you can find them on the *Drawings* at left) and set up the machine to chop out the material. The tenons will be 3/4" long, so the mortises must be that, plus 1/16". Don't be surprised that the apron mortises intersect a bit on the back legs, it is just fine.

Once the mortises were done, it was time to sand the rectilinear sections of the leg up through the grits (once again I conclude with 400-grit, but I only machine sanded through 220-grit and finish sanded by hand later, after the underframe subassembly was put together). To keep the parts square while doing all the machine sanding, I clamped them together in quadruples, as shown in the photo on page 33. Once I completed the machine sanding, I cut them to length and set them aside. I was ready to move on to the aprons and stretcher.

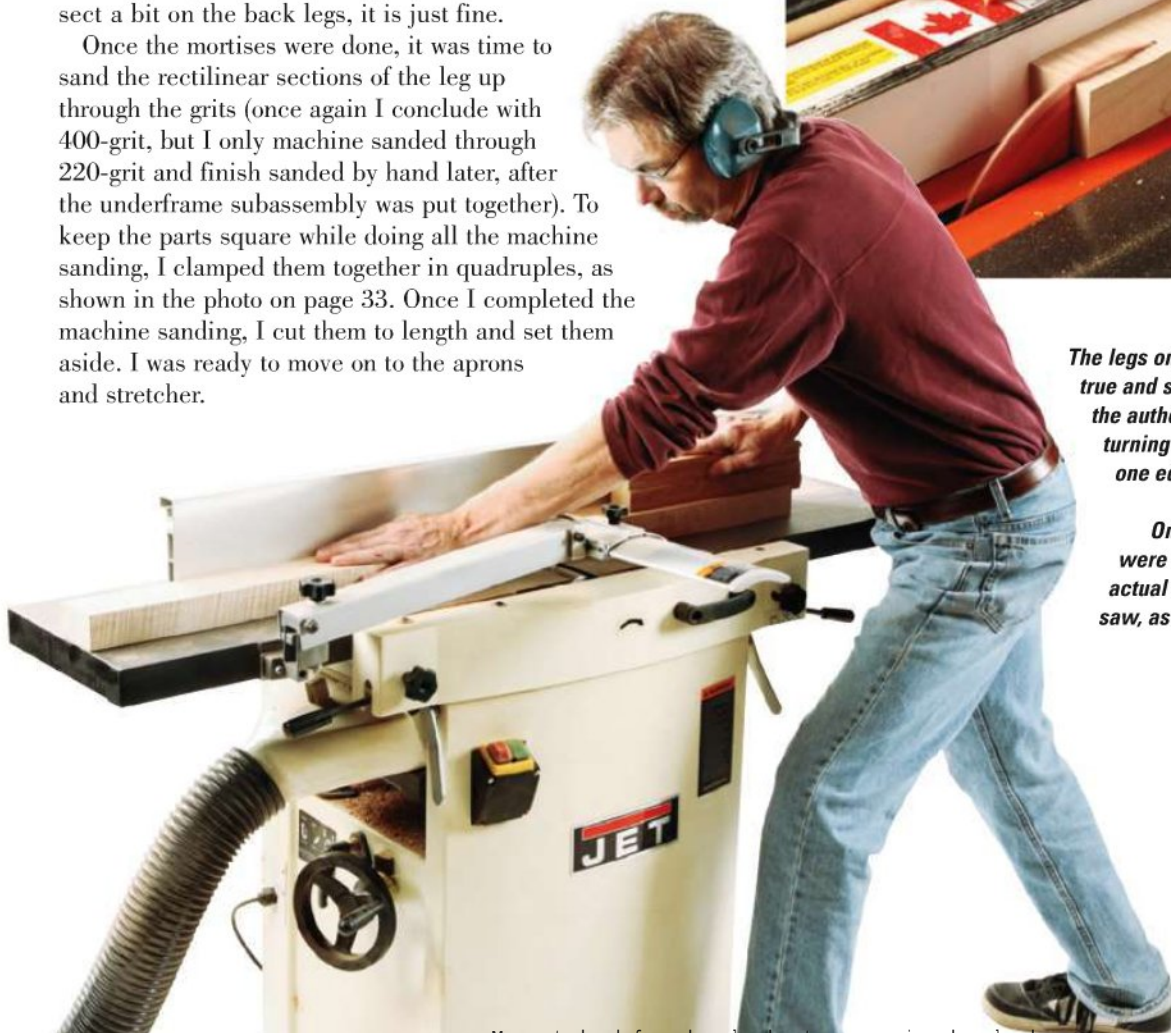
Machining the Aprons and Stretcher

Once again, it's important to harvest parts with grain pattern and color as the primary goal. The aprons and the stretcher (pieces 2, 3 and 4) all have tenons raised on their ends. One face of each of these pieces is flush to the outside faces of the legs. I used a shop-made tenoning jig on the table saw to form all of these tenons (although you can use the method of your choice). I took my time here, marking them out carefully, noting which face would be the "show" face. The construction details are shown in the *Drawings*. Note that on the tenons inserted into the back legs, the ends are mitered (because of those intersecting mortises).



The legs on these tables needed to be true and straight. To achieve that end, the author face-jointed the roughed-out turning blanks and then squared up one edge (photo at left).

Once the roughed-out blanks were trued up, the author cut out the actual turning blanks on the table saw, as shown above.



“The sanding effort on these tables, to get the results I was after, was measured in hours, not minutes.”

A Mid-course Correction

Once the tenons were formed, it was time to dry-assemble the underframes. There was a bit of adjustment to be made and, when I looked at the clamped-up units, I knew that I needed to add drawer supports (pieces 5) for the drawers to rest on as they slide. I made the supports and glued them in place, aligned with the stretcher. I also made the decision to attach the tops to the underframe with metal tabletop fasteners. This turned out to be a big mistake: unfortunately, when I looked closely at the dry-fit subassembly, I could see that the fasteners would be in the way of the drawers. The solution? Tabletop cleats (pieces 6) that run the length of each side apron. I drilled elongated holes in the cleats (see the *Drawings*) and glued them 1/16" below the top edge of the aprons. They also had the added benefit of guiding the drawers accurately within the drawer cavity. I wish I could say that I had reasoned this out from the beginning, but that is not the case. Although I can't be certain, the simplicity and elegance of these solutions cause me to think that they were likely a part of the original table's construction.

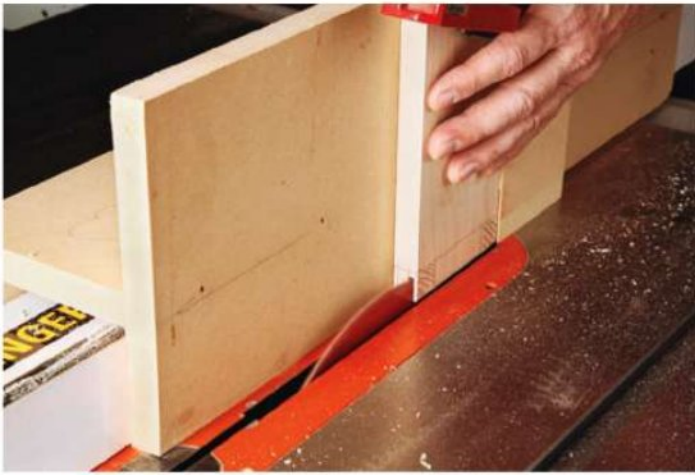
With the dry-fitting and additional details completed, it was time to glue up the underframe. I used a brace in the drawer opening to help keep the parts square and true during this process. Once they were in clamps, I set them aside and moved onto the tabletops (piece 7).

The remarkable figure in the lumber was both beautiful and challenging to work with. I would need to laminate the tops using butt joints, so selecting and arranging the various pieces to look their best was fairly involved. The tops have a finished thickness of 1/2", but my material was 3/4" thick. I had intended to resaw the pieces to save some thin slices of the wood, but after face-jointing them, I felt there was simply not enough material remaining — so I ended up just planing them to thickness. It was frustrating to turn such lovely wood into chips!

After I glued up each top (slightly oversized in length and width), I used my old 4 x 24 belt sander to flatten each piece by sanding on diagonals until all of the glue joints were level with the face of the top. At that point, I cut the tops down to their exact size and then routed the soft bullnose on their edges. Because the grain was so wild, I shaped the end grain first,



After turning the legs (at left), the next machining step was to chop their mortises (top photo). Once all the mortising was done, the author machine sanded all the legs clamped together.



Each of the aprons and the stretcher have tenons raised on their ends. The author used a shop-built tenoning jig for this task, but the means of how these tenons are formed is up to the builder.

using a climb cut to avoid tearout. After routing, I hand-sanded the edges from 80-grit all the way through to 400-grit. Then I resumed sanding the tops up through 400-grit paper. When they were done, I took the underframes out of their clamps and, after taking a few minutes to lay out, drill and insert the tenon pins (pieces 8), I got busy sanding on the aprons. Just as an aside, the sanding effort on these tables, to get the results I was after, was measured in hours, not minutes.

Dovetailed Drawers and the Finish

The drawers, in true Shaker fashion, are both simple and sophisticated, with half-lap dovetails at the front and through dovetails at the back. There is nothing out of the ordinary about these drawers other than, once again, I used some really lovely wood for the fronts. I chose to make the dovetails by hand, but jig-cut dovetails would look just fine. After I had cut out and machined the drawer parts (pieces 9 through 13), I dry-fit them and then moved on to assembly. Once the glue cured, the drawers needed little fitting and, with the exception of the tabletop hardware false start, everything went really well. (Oh ... did I mention that I sanded the dickens out of them?)

As indicated earlier, I had the finish well conceived before I started the project. But a challenge arose when it became clear that, even though all the various parts of the table were made from soft maple, there were distinct color differences in the legs, aprons and the tops. By putting a finish on scrap wood pieces from the various parts, I found that the tops, with a clear finish applied, presented a rich honey color. The legs, on the other hand, had a slight grey cast to them. The aprons, drawer fronts and stretchers had a pure, paper-white hue. It is my personal preference in most cases to simply let the natural colors of the wood come through, and if there is a range of colors, so be it. But in this case, I found the difference to be too extreme, so I worked to at least reduce the range of variation. I tried an oil stain alone on the underframe stock, but the result looked blotchy. I tried it again with a wash coat of shellac thinned 50 percent ... better, but I was still unhappy with the results. In the end, I applied a coat of Natural Watco® Oil to the underframe and allowed it to cure. Then I applied a coat of amber shellac, thinned 25 percent with denatured alcohol. I followed with three spray coats of lacquer, de-nibbing with 0000 steel wool between coats. On the tops, I applied three coats of sprayed-on shellac (again de-nibbing between coats) and then a final coat of lacquer. These tables were small enough that I had no problem achieving really good results using aerosol spray cans to apply



If all the parts are properly prepared, the table's assembly is very straightforward. As glue-up is a step that is nearly impossible to reverse, always check to see that your subassembly is square and true.



Once the slightly oversized tabletop blanks were removed from their clamps, the author used a 4 x 24 belt sander, working on the diagonal, to flatten and smooth the tops. When flat, the tops were cut to size.



In order to moderate the color variations of the legs, aprons and the top, the author used a few different finishing products. The small size of these tables allowed him to use spray cans of finish, with great results.

the finish. And, while there is still a visible difference in the color of the various parts, I think they look fine together. After allowing two weeks for the finish to fully cure, I rubbed it out with paste wax, and the job was completed.

These tables were my first effort at historic reproductions and I have to say that I truly enjoyed the experience. And, while the tables may not be 100 percent as the Shakers would have built them, I think they evoke their spirit very well indeed.

Rob Johnstone is the Editor in Chief of Woodworker's Journal.

Table Saw Dovetail Sled

By Sandor Nagyszalanczy

In many ways, dovetails evoke the essence of woodworking. There are several avenues available to form dovetails, by hand and with a variety of manufactured jigs. Here is an ingenious shop-made jig for the table saw.



If you like the look of hand-cut dovetails, but don't have time (or patience) for all the meticulous work it takes to create them, then try this table saw method which uses a sliding dovetail sled to cut 90 percent of each joint. The jig cuts dovetails far faster than you can cut them by hand, and you can size the pins and tails and customize their spacing to suit just about any project — join drawer sides, build a box or small chest, etc.

With care and a bit of practice, you can produce large or medium sized, “furniture grade” 8° dovetails in both hard and soft woods. However, I think the jig is best for quickly cutting workmanlike joints that are serviceable for jobs like joining parts for tool chests and totes, drawers for kitchen or shop cabinets, and so on.

The drawing on page 36 shows the basic dimensions and construction of the dovetail sled, which you can make from either MDF or a high quality plywood, such as Baltic birch. Most of the jig is made from 1/2"-thick stock. As shown, this jig is capable of handling stock up to about 12" wide (you can build a jig to handle larger work: simply increase all dimensions proportionally to build a bigger jig — just keep all the angles the same).

Making the Jig

Start by cutting out the jig base (piece 1) and a pair of 1/2" pin fences (pieces 2) that align and support the pin boards. Bevel the inside-facing end of each pin fence at 82°. Glue and nail two triangular braces (pieces 3), cut at 45°, to the inside face of each pin fence, then attach them to the baseplate, as shown in Figure 1. Position each at an 8° slant relative to the front edge of the base.

Using a taper jig on the table saw, cut two pairs of 8° wedges out of 3/4" stock. Glue each pair together to form the wide ramps (pieces 4) that will support the tail boards at an 8° angle. Glue and nail each ramp flush with the long edge of the base, as shown in Figure 2 (don't drive nails in the area around the middle section of the ramps, where the table saw blade passes during use). Butt the tail fence (piece 5) up to the inside of the ramps and fasten it in place, using three more triangular braces to keep it perpendicular to the base, as shown in Figure 3. Set the jig aside to let the glued parts dry overnight.

To guide the jig, I fastened an adjustable miter bar (piece 6) to the underside of the jig's base with short washerhead screws, as shown in Figure 4. Center the bar and use a large try square or framing square to set it dead square to the base's long edges. Set the finished sled's bar into one of your table saw's miter slots and adjust the bar so it's free of side play, yet slides smoothly. With a regular, not thin-kerf, blade fitted, start the saw and carefully “cut in” a registration slot on the pin fence as shown in Figure 5 on the following page. Move the bar to the other miter slot and cut in the second slot, then flip the sled around and cut in both registration slots on the tail fence side. To make the jig safer to use, glue square 2x4 exit blocks (pieces 7) to the base at the back of each slot, directly over the saw kerfs you just cut. To keep the jig from sliding beyond the point where the saw blade passes through the exit blocks, clamp a stop block into both of the saw's miter slots (see the lead photo, opposite page).



Figure 1: Attach the pin fences to the base at an 8° angle.



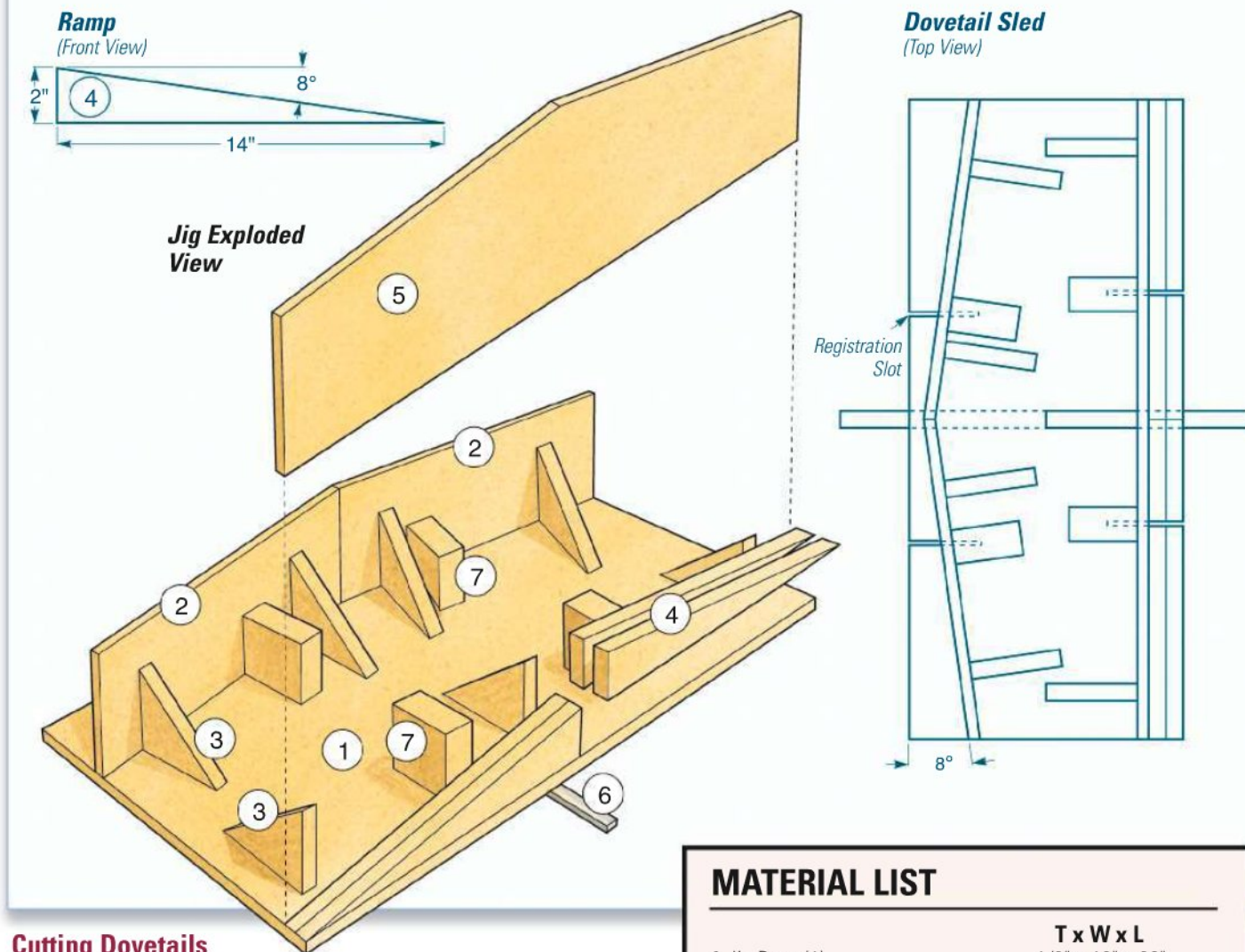
Figure 2: The 8° wedge ramp is formed from two 3/4" pieces.



Figure 3: Braces keep the tail fence perpendicular to the base.



Figure 4: Attach an 18"-long miter bar to the bottom of the jig.



Cutting Dovetails

To use the jig, start by marking out the width and spacing of the dovetail pins on the outside-facing side of all your project's pin boards (label the outside face, to help you orient the board for cutting later). Remember, you're drawing the "narrow" side of the pins. Figure 6 on the next page shows the angle of the pins in red for illustration; no need to mark pin angles on your boards, since those are set by the fence angles. Draw an "X" to indicate the waste areas between the pins. Use a square to draw a line across the end of each pin board to indicate pin depth — just a thin hair deeper than the thickness of the tailboards.

MATERIAL LIST

	T x W x L
1 Jig Base (1)	1/2" x 12" x 28"
2 Pin Fences (2)	1/2" x 5 1/2" x 14 1/4"
3 Triangular Braces (7)	1/2" x 4" x 4"
4 Ramps (4)	3/4" x 2" x 14"
5 Tail Fence (1)	1/2" x 7 1/2" x 28"
6 Adjustable Miter Bar (1)	Rockler #22987
7 Exit Blocks (4)	1 1/2" x 4" x 4"

Now set the jig in the table saw's right-hand slot. Hold the stock firmly against the left-hand pin fence, with the pin board's inside face against the fence. Set your table saw's depth of cut to just reach the depth line on the pin board. Now cut on the waste side of each mark that delineates the right-hand edge of the pin (Figure 7). For accuracy, use the saw kerf in the jig to line up your cuts. When all the right-hand cuts are done, move the jig to the saw's left-hand slot and repeat the process, this time cutting on the waste side of the left-hand edge of each pin. (If you have trouble keeping your lefts and rights straight, try labeling each pin mark "right" or "left.") You can remove the remainder of pin waste by taking multiple closely spaced saw passes, as shown in Figure 8.



Figure 5. "Cutting in" a registration slot on all four of the jig's fences is essential for locating your dovetail cuts. Note the freshly glued-in blocks of wood: these cover the saw blade's exit points and protect your fingers.

www.woodworkersjournal.com
MORE ON THE WEB

Visit our homepage and click on this icon to find a short instructional video of Sandor demonstrating the jig.



Figure 6: Here the angles of the pins are marked in red simply to illustrate the pin shape. Remember that you must mark out the "narrow" sides of the pins on the board's outside face. The "X"s indicate the waste areas.

Once pin boards are cut, use the pins themselves to transfer the dovetail layout to the inside face of each corresponding tail board (Figure 9). Label the inside face of each tailboard and mark the waste side of each line. Then, draw a square line across each joint to indicate tail depth.

Now flip the jig around front to back and use the tail-cutting ramps to saw out the tails (Figure 10). First, reset the saw's depth of cut so that the blade just nicks the joint depth line. Use the left- and right-hand ramps to cut along the right- and left-hand tail marks just as you did with the pins, moving the jig from one miter slot to the other as necessary. Hold the outside face of each tailboard against the fence and make sure to cut on the waste side of each line.

Rather than chopping out the waste between tails by hand, it's quicker and neater to saw the waste out using a band saw (or scrollsaw). I use a 1/8" wide, 14 TPI blade in my band saw, setting the saw's fence to guide the stock so that the blade cuts just shy of the joint depth line (Figure 11). Use a chisel and/or knife to clean up the inside corners of the tails and pins, as necessary, and to trim them for a tight, clean fit.



Figure 7: Start the process by carefully cutting the right side of each pin.



Figure 8: After establishing the left side of the pins, you can take multiple passes to remove the waste.



Figure 9: Mark out the tails on the tail board using the pin board as shown in the photo. Use a square to mark the depth of the tails. The process is similar to marking out for hand-cut dovetails.



Figure 10: Spin the jig around front to back and cut the tails, using the ramps on each side of the jig to make the right- and left-hand cuts.



Figure 11: An efficient way to remove the waste between tails is to use your band saw equipped with a narrow saw blade. Set the fence to the proper distance and carefully saw away the waste.

Sandor Nagyszalanczy is a furniture designer/craftsman, writer/photographer and regular contributor to *Woodworker's Journal*. For more great jigs and fixtures, check out his book *The Complete Illustrated Guide to Jigs and Fixtures* available at www.sandorsworkshop.com or at rockler.com.

Make Your Own Screen Door

By Frank Grant

Made from Lyptus® and designed in the Arts & Crafts style, this screen door is a great way to put your woodworking skills to work for your home.



“Like a mythical portal into summer, screen doors allow you to experience the outdoors while protecting you from its extremes.”

Screen doors are, in my opinion, one of the best inventions of modern times. I mean, think about it ... they allow lovely summer breezes to blow through your home, let you hear the birds and the sounds of your neighborhood, all while keeping those nasty biting bugs outside. Like a mythical portal into summer, screen doors allow you to experience the outdoors while protecting you from its extremes. But one problem with many screen doors, especially the bargain types you find at large home centers, is that they are a bit — well, let's just say it: they're ugly.

This project not only serves all the important tasks of a typical screen door, but does it with a degree of style that will make any woodworker proud and their loved ones happy. That's because it is a true woodworking project. With classic mortise and tenon joinery, it is within the skill level of most woodworkers ... but this door is not exactly a weekend project. It will keep you in the shop for a few days — but it's well worth the effort.

The Arts & Crafts style of the door would work well with white oak lumber, a good exterior-use wood species, but we thought that a mahogany look would be perfect. So to play the part of mahogany, we chose Lyptus®, a plantation-grown hardwood. Rockler.com sells it in 1 1/8" thickness, perfect for our screen door.

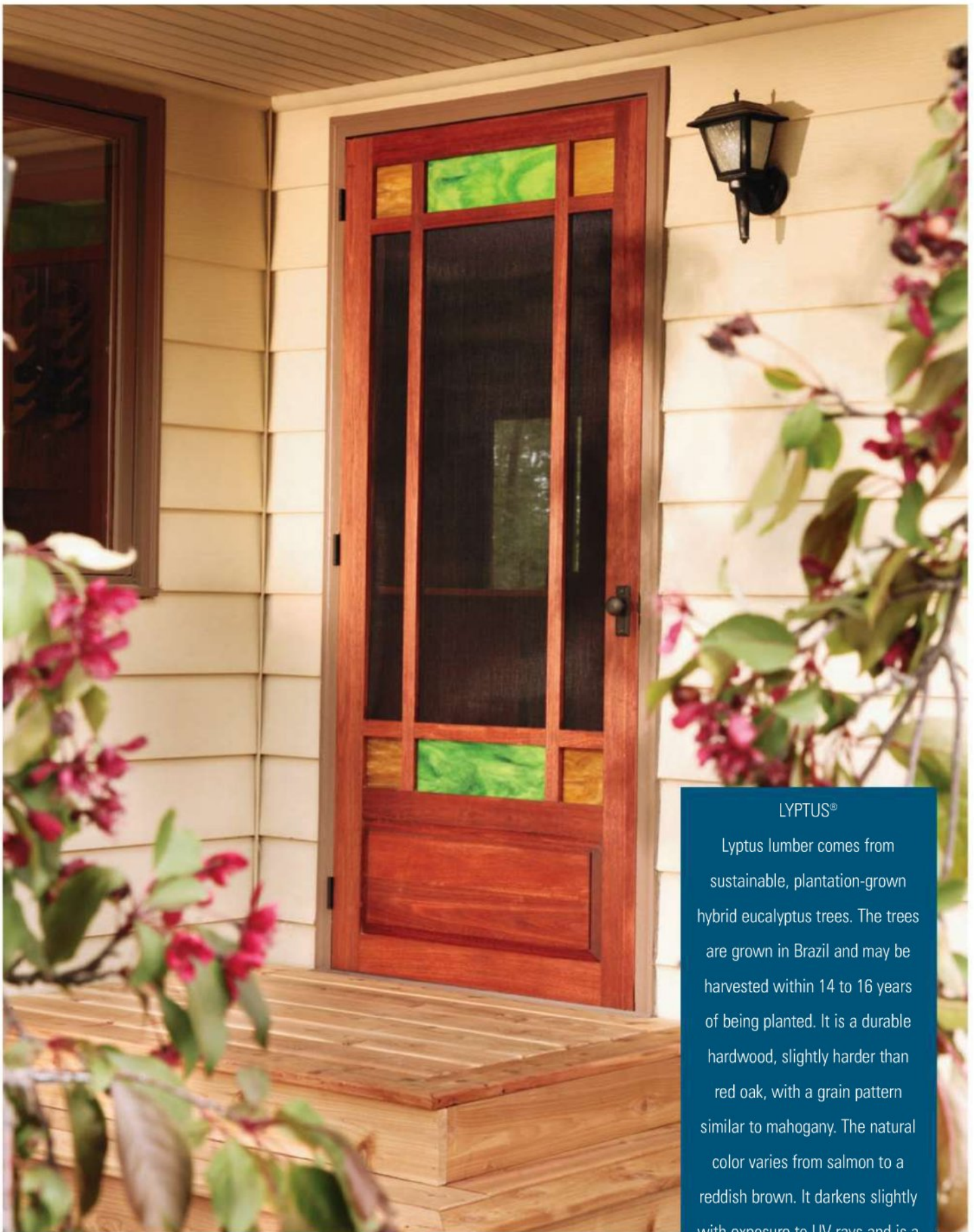
Here are a couple of other important points as you consider building a door for your house. While door openings are pretty standard these days, take the time to carefully measure yours. Our door is 36" wide as we built it. Don't buy your glass pieces until you have built your door and measured its openings. Also, our art glass was provided to us by the

nice folks at Gaytee Glass in Minneapolis, Minnesota. It's a standard Kokomo glass that you can purchase from most any quality stained glass company. There are many hues to choose from, but ours are classic Arts & Crafts colors. Some local building codes may require a safety film made by 3M to be applied to the glass. Check your local codes.

Building from the Outside In

Think of this project as a series of frames constructed from mortise and tenon and half-lap joinery. Although there are some really fine door-making router sets on the market (which I highly recommend), as I often do, I decided to go “old school” on this project.

Start by cutting out the large door stiles and the bottom, middle and top large rails (pieces 1 through 4). You can find the *Material List* on page 41. These pieces form the main “superstructure” of the door to which all the other parts are attached. My old school intentions had me reaching for my mortise chisel to chop out the through mortises on the large door stiles, but my first test mortise taught me a couple of things: first, Lyptus is really, really hard and second, if I was going to get this project done in time to use it this year, I was going to need to use my mortising machine. (Hey, if William Morris had had a mortising machine, he would have used it!) Look to the *Drawings* on page 40 and 41 for the mortise and groove locations on the stiles. I always form my mortises first and then cut the tenons to fit. After I completed all the mortises (large and small) in the large door stiles and rails, I stepped over to the router table to plow the stopped grooves for the raised panel



A stylish facelift for an old entryway, this shop-made screen door offers a large screen area for excellent air movement, and classic styling to boot. Elegant lines, colored glass and environmentally sustainable lumber all combine to enhance this fine summer project.

LYPTUS®

Lyptus lumber comes from sustainable, plantation-grown hybrid eucalyptus trees. The trees are grown in Brazil and may be harvested within 14 to 16 years of being planted. It is a durable hardwood, slightly harder than red oak, with a grain pattern similar to mahogany. The natural color varies from salmon to a reddish brown. It darkens slightly with exposure to UV rays and is a durable outdoor wood if properly finished with exterior products.

Available at rockler.com.



Lyptus is a dense hardwood that machines well. Our author found that a dedicated mortising machine was a real time and effort saver while making this screen door project.



The author formed the large tenons for this project using a shop-made jig for the table saw. Test fit the tenons to the mortises.



After the initial cuts on the table saw, the author stepped to the band saw to extend and complete the door's variously shaped tenons.

Screen Door Specialty Parts

The following supplies are available from Woodworker's Journal.

Threaded Brass Inserts (4) #33183 \$7.29 pk.

Brass Knobs (4) #70003 \$6.99 pk.

Threaded Insert Driver (1) #30174 \$10.49 ea.

To purchase products online, visit www.woodworkersjournal.com and click on the "WWJ Store" tab. Or, to order by phone, call 800-610-0883 and mention code WE082.

The lockset is available at <http://www.screendoors.com/>

(piece 5). As long as you have it set up, go ahead and slice the corresponding grooves on the lower and middle rails.

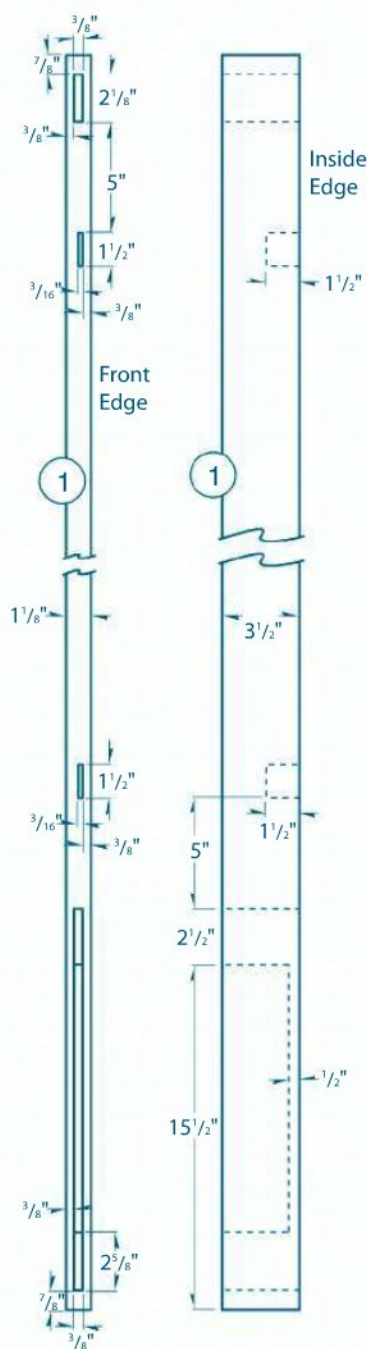
Raising the tenons on the large rails was the next step on the agenda. I used a shop-made tenoning jig on my table saw for this task and finished up on the band saw, but you could use a router table or any other means that you prefer. Take the time to fit these joints well. A door puts a good deal of stress on its joinery.

Somewhere in this time frame, you should glue up the blank for the raised panel, and this brings up an important point. A screen door is an outdoor project and is subjected to the weather year after year. For that reason, I recommend using a highly water-resistant glue, such as Titebond® III or a polyurethane glue of some sort. Once you have the panel in clamps, set it aside and let the glue cure.

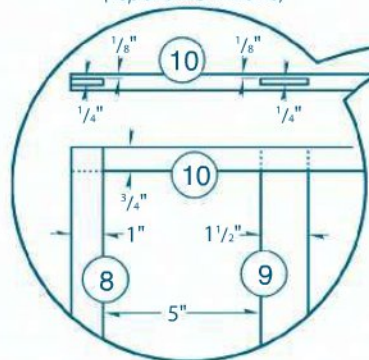
The narrow stiles and rails (pieces 6 and 7) are next up on the machining agenda. Rip these four pieces to size on the table saw, cut them to length, and then go ahead and raise the tenons on their ends. These narrow stiles and rails have half-lap joints that must be marked out and cut. The way I marked out the joints was to dry-fit all the door parts together except the narrow rails. After checking that everything was square and true, I put the narrow rails directly over their mortises, then I marked the joint locations right on the stiles and rails. Again, how you form these half laps is up to you, but I chose to do it on my router table using a miter gauge to push the stock across the bit.

At first blush, you might think that you were done machining these narrow stiles and rails ... but you would be wrong. First, I used my router table and a straight bit to start the rabbets that hold the art glass. Second, the inside section of the narrow stiles needs to be reduced to 1/2" in thickness to accommodate the

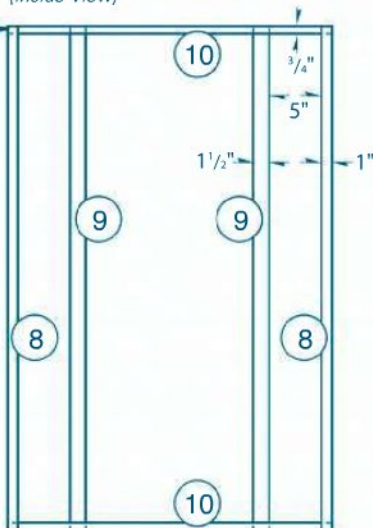
Large Door Stiles (Inside and Front Views)



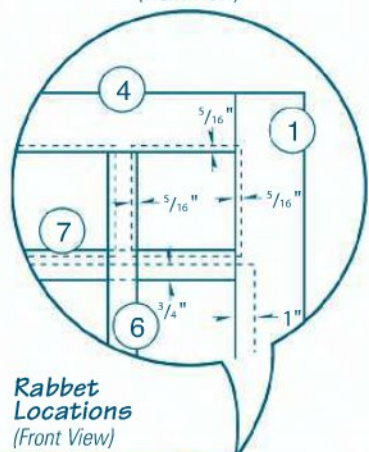
Screen Panel Details
(Top and Front Views)



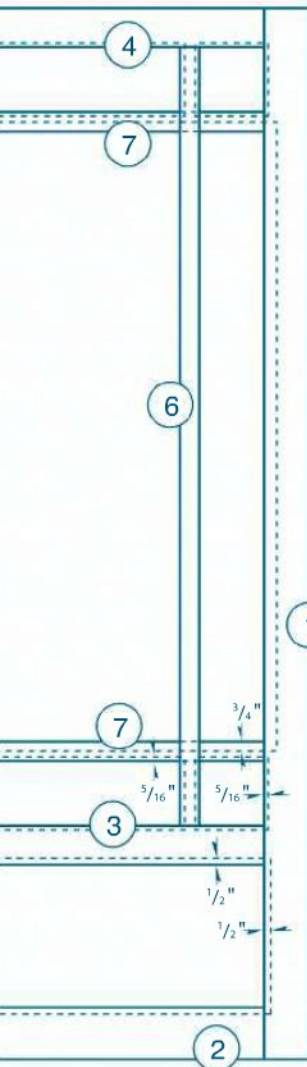
Screen Panel Elevation
(Inside View)



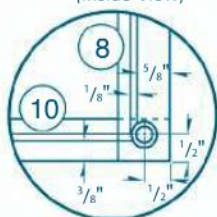
Rabbit Detail
(Front View)



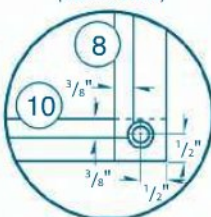
Rabbit Locations
(Front View)



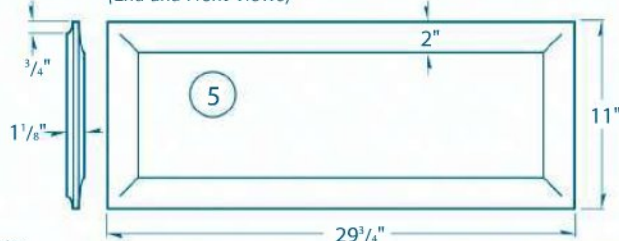
Screen Door Corner Detail
(Inside View)



Storm Door Corner Detail
(Inside View)

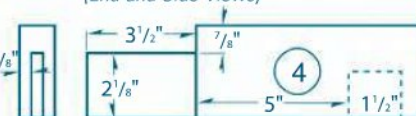


Raised Panel
(End and Front Views)

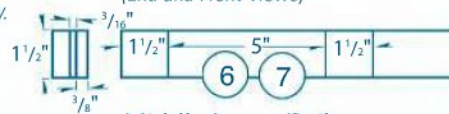


Note:
Rabbets for
the art glass
panels and
screen
panel are
1/2" deep
and are
machined
after
assembly.

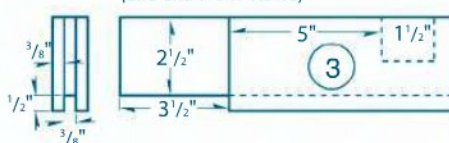
Top Large Rail
(End and Side Views)



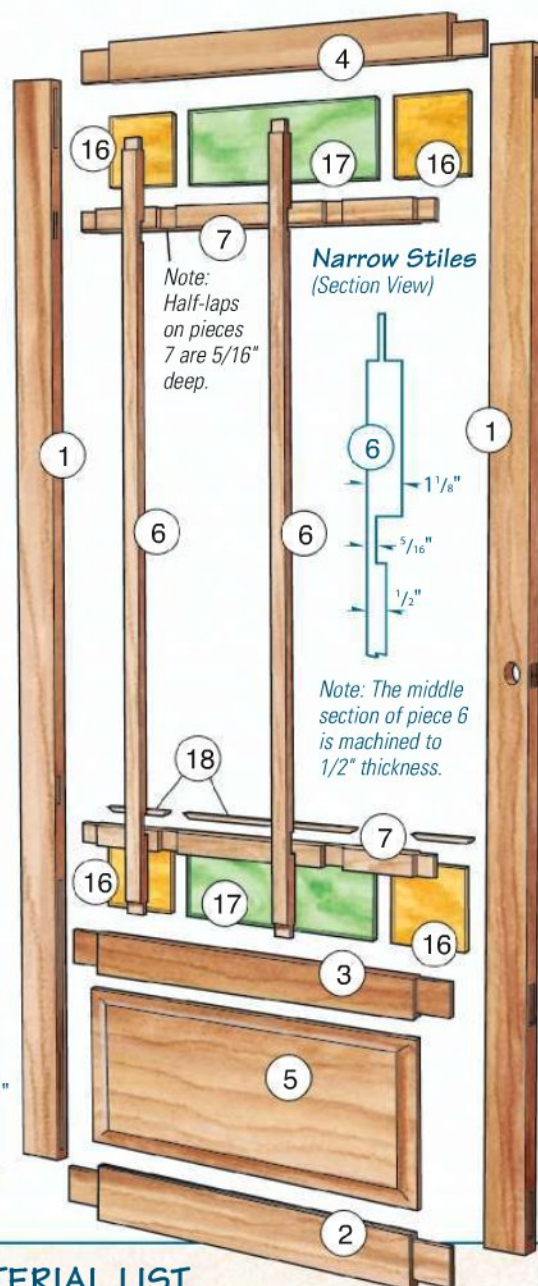
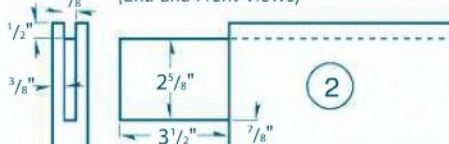
Narrow Stiles/Rails
(End and Front Views)



Middle Large Rail
(End and Front Views)



Bottom Large Rail
(End and Front Views)



MATERIAL LIST

	T x W x L
1 Large Door Stiles (2)	1 1/8" x 3 1/2" x 81"
2 Bottom Large Rail (1)	1 1/8" x 4" x 36"
3 Middle Large Rail (1)	1 1/8" x 3" x 36"
4 Top Large Rail (1)	1 1/8" x 3" x 36"
5 Raised Panel (1)	1 1/8" x 11 3/4" x 29 3/4"
6 Narrow Stiles (2)	1 1/8" x 1 1/2" x 63"
7 Narrow Rails (2)	1 1/8" x 1 1/2" x 32"
8 Screen Outer Stiles (2)	1/2" x 1" x 48 3/8"
9 Screen Inner Stiles (2)	1/2" x 1 1/2" x 48 3/8"
10 Screen Rails (2)	1/2" x 3/4" x 30 3/4"
11 Lockset (1)	Oil Rubbed Bronze
12 Threaded Inserts (4)	Brass 1/4"-20
13 Brass Knurled Knobs (4)	Brass 1/4"-20
14 Screen (1)	36" x 50"
15 Retaining Cord (1)	144"
16 Small Art Glass (4)	Sized to Fit
17 Large Art Glass (2)	Sized to Fit
18 Glass Retainer Strip (1)	3/8" x 5/16" x 124"

“At first blush, you might think that you were done machining these narrow stiles and rails ... but you would be wrong.”



On the narrow stiles and rails, the author used a straight bit in his router table to form a rabbet that will later accept the art glass. Using the bit opening in the fence as a reference, the glass retaining rabbets were stopped. Later, after the door was assembled, they were completed.



Screening It Off

Once I removed the clamps, there was a bit more machining to do on the main door section. With a router and a bearing-guided bit, finish routing the rabbets on the glass openings. You will need to square up the corners with a sharp chisel. When that task is done, get yourself a straightedge and chuck a straight bit into your router, so you can form all the rabbets on the edges of the screen panel area (see *Drawings*). Once again, there will be some squaring up to do with your chisel. Now you are ready to make the screen panel.

The screen panel is made up of two outer stiles, two inner stiles (pieces 8 and 9) and two rails (pieces 10). All these pieces are made from 1/2" stock. Go ahead

and cut them to length and width and then step over to the mortising machine again to chop the mortises on the rails. When that is done, I move to the table saw to form tenons on the ends of the inner stiles and the screen rails. Finally, shape the open mortises on the ends of the outer stiles. See the *Drawing* for all of these construction details. When everything is fitting well, you're ready to glue up the subassembly. While the glue cured, I went back to the main door section and chopped hinge mortises. (Have your hinges in hand before you do this!) I also installed the door handle and lockset (piece 11). Once it fit well, I took it off and set it aside until later.

I went back to the screen door panel and took it out of the clamps. After a bit of cleanup with a scraper and a hand plane, I grabbed a 1/2" Forstner bit and drilled little round mortises on the inside face of the panel. (See the *Drawing* for locations.) Then I drilled 5/16" holes through the stock at the center of those little mortises. With the panel subassembly complete, I was ready to test fit it in the main door (I suggest using a block plane to help with the fit), and mark the locations for the threaded inserts (pieces 12).



In addition to their half-lap joints, the middle section of the narrow stiles must be routed to about 1/2" thick. The author used a router and a basic jig to guide his machining.

screen panel. I did this with a handheld router guided by a jig that controlled the cutting depth (photo at left). Once that material is removed, you can return to your clamped-up raised panel blank.

Take the blank out of the clamps and scrape off any excess glue. I ran the piece through my planer to skin it down and get two parallel faces. Next, I cut it to size and stepped to my router table to raise the panel.

I used a Freud large dimension bit to raise the panel because it has a back cutting function. It sized my panel lip and provided a nice shadow line around the back of the panel, all in one operation. With that done, it was time to dry-fit all of the parts together, and, for me, a pleasant surprise: everything fit exceptionally well on the first try. Hey, sometimes you get lucky!

The final step before I put the main door section together was to stain the raised panel. After the stain was dry, I went ahead and assembled this main door section, using Titebond III. I clamped it together, checked it for square, and left it overnight.

Taking the screen panel to my work table, I secured it with blocks on its inside corners. Then, with a straight bit and an edge guide mounted to my router, I cut a groove around the perimeter of the panel for the screen retaining cord (see photo at right).

At this point, I needed to mount the threaded inserts. So I drilled a pilot hole for them and used a special little tool to drive them home (see photo). Be careful drilling the holes for these inserts (don't drill through!): the inserts must sit just a little proud of the wood.

I needed to grind down the brass knurled knobs (pieces 13) to the proper length, and I was ready to try to put the whole door together. Well, as you can imagine, there were a couple of minor tweaks to do, and then it was time to sand, stain and finish the door parts. I used three coats of spar varnish for the top coat.

When that was completed, all I had left to do was mount the screen with its retainer strips (pieces 14 and 15) and install the art glass and its retainer strips (pieces 16, 17 and 18) — plus a bead of clear silicone adhesive. The door was now ready to be hung on its hinges, and the strike plate installed.

Final Thoughts

For those of you who, like me, live in a climate that needs a storm door panel in addition to a screen panel, here's what you will need to do. Cut out the parts for a second screen panel. Once you have all the mortises and tenons formed, take the two inner stiles to your planer and take 1/8" off of one face. Then assemble the panel. Proceed as you did on the screen door panel, but instead of routing out a groove for the screen, form a 1/8" deep x 3/8" wide rabbet all around the inner edge of the frame. Square out the corners and measure for your 1/8"-thick safety glass. When you have ordered and picked up that glass panel, mount it in the frame with clear silicone adhesive. Now you will be ready when the weather begins to cool.

Well, that is it. Now all you have to do is get busy mowing that lawn you have been ignoring while you built the screen door ... well, you knew it had to happen!

Frank Grant, a professional woodworker from Minneapolis, Minnesota is a regular contributor to Woodworker's Journal.



The black nylon screen was secured in a 1/8" groove formed by a router with its edge guide. Standard retaining cord, found at any hardware store, is tucked into the groove with a tool made just for that task. The screen panel is secured to the door using threaded inserts and brass knurled knobs. The threaded insert is installed with a tool that is designed to drive it home without damage. Note: the insert sits a bit proud of the top surface of the rabbet.

Kubb: The Perfect Lawn Game

By Brad Becker

Pronounced kūb, this ancient lawn game is enjoying a resurgence. On top of being fun to play, its parts are fun and easy to make.



When *Woodworker's Journal* publisher Larry Stoiaken came back to work after a lovely spring weekend talking about playing an entertaining lawn game that was new to him, the conversation turned just a little confusing.

"I played this really fun lawn game this weekend ... it's called Kubb — it was invented by the Vikings," said Larry.

"Coop?"

"No, Kubb ..."

"Coot? Never heard of it ..."

"NO, Kubb, k-u-b-b, Kubb."

"Cub? huh?"

Anyway, once we got the name straightened out, the discussion switched to the

game's heritage and why Larry liked it so much. While Kubb's origins are obscured by the passing of years — a lot of years — it seems most likely it was invented in Scandinavia more than a thousand years ago. Because the Vikings were such, um ... "travelers," it spread throughout much of northern Europe. Originally the playing pieces were likely firewood. As with many such folk traditions, the rules (see page 46) varied with the region and the period of time. It can be played with anywhere from one to six on a team.

Larry said he liked it because it requires some interesting strategy and a bit of skill, but even if you lack both of those characteristics, you can still enjoy the game fully. We think he favors it because, like horseshoes and bocce, it can be played with one hand left open for a tasty beverage.

Getting Started

We agreed that this game would make a great summer woodworking project, so we read up on dimensions and shapes

Our author collected a group of Kubb players at work to give the game an initial test run. Sarah Jewett (below) clearly understood the importance of handling her refreshment while correctly (end-over-end) tossing her kastpinnar. The more competitive editor-in-chief Rob Johnstone (right), on the other hand, quickly left his drink behind.



and I headed for the shop to get started. Any scrap wood will work, but we felt that heavier, denser wood is a better call for a variety of reasons. We had some padauk and white oak available, both of which seemed to be good choices. You could use any hardwood that you have available locally, and I'm guessing you have enough scrap in your shop right now to build a set or two. We used the white oak for the six casting pins and the rectangular base of the king piece. The four corner stakes and the hammer handle are simple white oak dowels. I used the padauk to make the kubbs, hammer head and crown of the king.

Get your game pieces off to a quick start by gluing up blanks for the casting pins and kubbs. I sped the process along by gluing and clamping my laminations all at once between long clamps.

Making the Ripping Jig

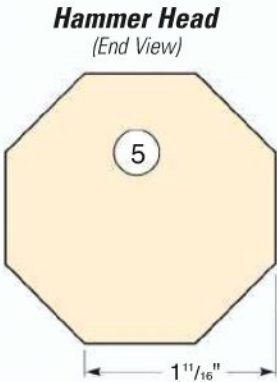
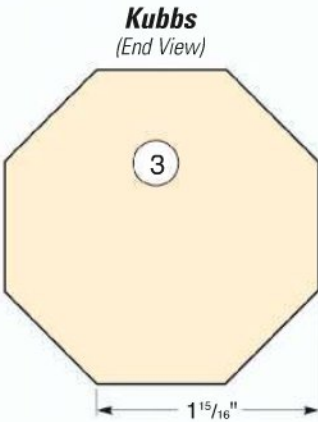
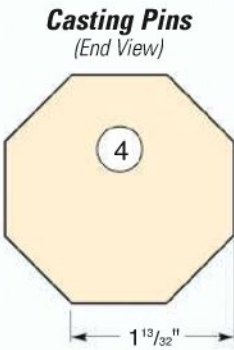
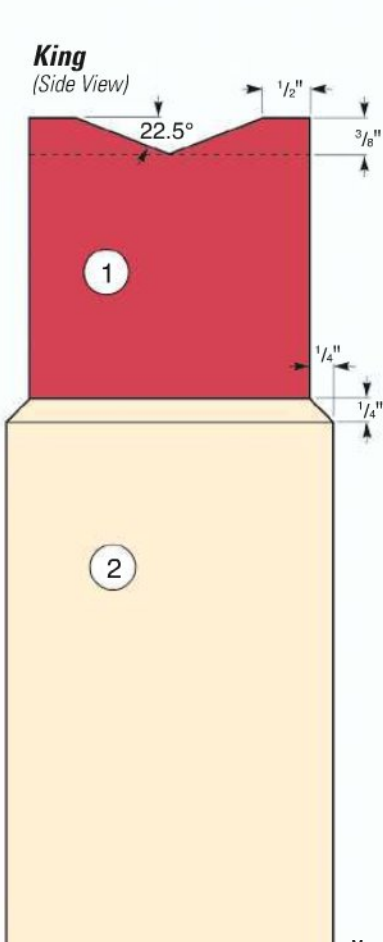
The casting pins, kubbs and hammer head all have octagonal profiles. Since the workpieces are short, I decided that the safest way to bevel-rip them to shape was to build a ripping jig that rides along my saw's fence (see photos at right). It



You can speed the process of laminating blanks for the casting pins and kubbs by gluing and clamping them all at once between several long bar or pipe clamps.

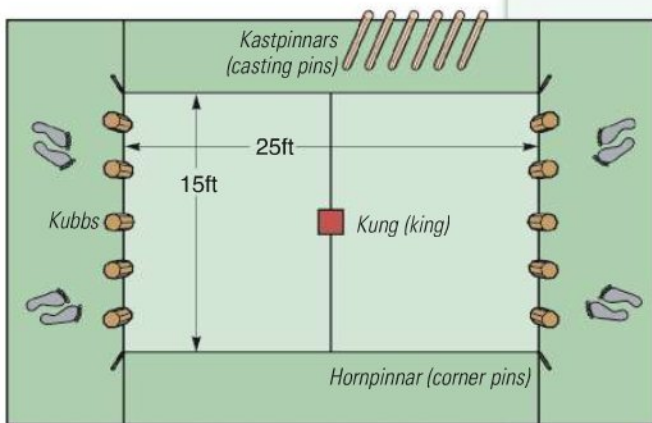


The same bevel-ripping jig and rip fence setting can form both the kubbs (left) and the casting pins (right). Set up the jig to cut the kubbs first. Four 45° rip cuts will turn them into octagons. Then slip a 11/32"-thick spacer next to the casting pin blanks before ripping them to shape.



MATERIAL LIST

	T x W x L
1 King Crown (1)	3" x 3" x 3"
2 King Bottom (1)	3 1/2" x 3 1/2" x 9"
3 Kubbs (10)	2 3/4" x 6"
4 Casting Pins (6)	2" x 11 3/4"
5 Hammer Head (1)	2 3/8" x 5"
6 Stakes/Handle (5)	1"-Dia. x 9" Dowel



Rules of Engagement

1. Define your playing field by placing the corner pins, king and kubbs, as shown at left. You can have from one to six players on a side. The more players there are on each side, the more time there is to drink beer while playing.
2. Play starts with players standing at their base line and the first team tossing their six casting pins, attempting to topple all five of the other team's kubbs (underhand tosses only, with vertical, end-over-end rotation). Once that occurs, the king can be attacked and a winner declared.
3. Unless all five kubbs and the king are toppled during the first team's first turn (an indication that they are not taking the beer drinking aspect of the game seriously enough), the opposing team takes their turn. Play alternates until one team has knocked down all the kubbs and the king. If the king is toppled prematurely, the game is over and the opposing team wins.
4. There are many variations on the game (just Google "Kubb"), featuring increasingly involved and interesting rules. For example, in one variation, when a team has successfully toppled all of the other team's kubbs but fails to topple the king, the opposing team can bypass attacking the kubbs and go directly for the king, winning the game if they're successful. When playing this variation, a team with only one casting pin left can choose to forfeit their toss rather than risk toppling the last kubb, which would leave the king vulnerable to their opponent's attack.

To determine which team goes first, one member of each team tosses their kastpinnar toward the Kung. The team that gets the closest without touching the Kung goes first.

has a toggle clamp on top that holds the wood securely against the jig base, and a stop at back to prevent workpieces from shifting backward when you push the jig through each cut. Fashion a similar jig to fit your saw's rip fence, making sure it's tall enough so the toggle clamp can reach over the larger kubb workpieces.

Notice that the base of the jig supports each workpiece and, when bevel-ripped,

also shows you exactly where the blade will contact the wood. To set up your jig the first time, start with a rectangular base that's wide enough to support the kubb blanks. Tilt your saw blade to 45° and adjust the rip fence so the blade trims the base to 1 1/2" wide, measured across its top edge.

Bevel-ripping the Octagons

Now that the jig base is trimmed, you can leave the fence in this position for bevel-ripping all of the kubbs and casting pins. Bevel-rip the four corners off of each kubb to form the octagon shapes. Then set a 11/32"-thick spacer board against the jig, and you can proceed to rip the narrower casting pins. Switch to a 1/4"-thick spacer to bevel-rip the hammer head, after first drilling a 1"-diameter, 1 1/4"-deep hole for the hammer handle dowel.

Ease the sharp edges of your kubbs, casting pins and hammer head with a chamfering bit on the router table, set for a light cut (see photo, above left).

The crown for the king piece began as a cube. Our author clamped it against a stop block and a scrap fence on his miter gauge to complete his machining. Four cuts later the crown's inner profile was ready for sanding.

Making the King

To make the crown for my king piece, I started with a square blank measuring 3" x 3". I shaped the crown by raising my saw blade to 1 1/2" and tilting it to 22.5°. I clamped the blank to a longer scrap fence and a stop block attached to the saw's miter gauge. Position and clamp the stop block to the scrap fence so the blade will cut into the closest face of the crown blank to a depth of 1 1/2". I tested this setup on a scrap first to dial in my stop block and blade settings. Four cuts later, I had my crown whipped into shape. Mount the crown on its base however you like, but I suggest using dowels or biscuits to increase your glue surface area.

Wrapping Up

You'll be able to pound your stakes into the ground more easily if you sharpen their tips. Once you've done that, cut the hammer handle to length and glue it into the hammer head.

Give your game pieces a thorough sanding up through the grits. You have many options for finishing outdoor woods (see page 68), but I settled on General Finishes Outdoor Oil and applied three coats to protect the pieces.

Brad Becker is a professional woodworker and a regular contributor to the Journal. Recently, he became a rookie Kubbster.



You can prevent your game pieces from chipping during play, and make them more hand-friendly, by easing their edges with a chamfering bit on the router table.





HOW WE FORMULATE OUR STAINS IS STRONGLY INFLUENCED BY THE POWERS ABOVE. NAMELY RAIN, SNOW AND SUN.

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



OUR PERFORMANCE IS LEGENDARY.™

cabotstain.com
1.800.US-STAIN

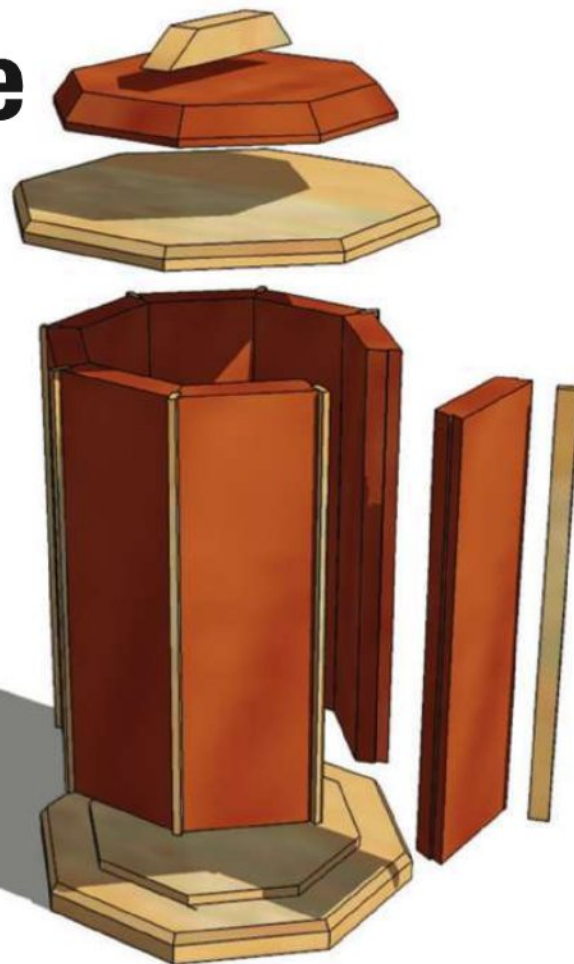
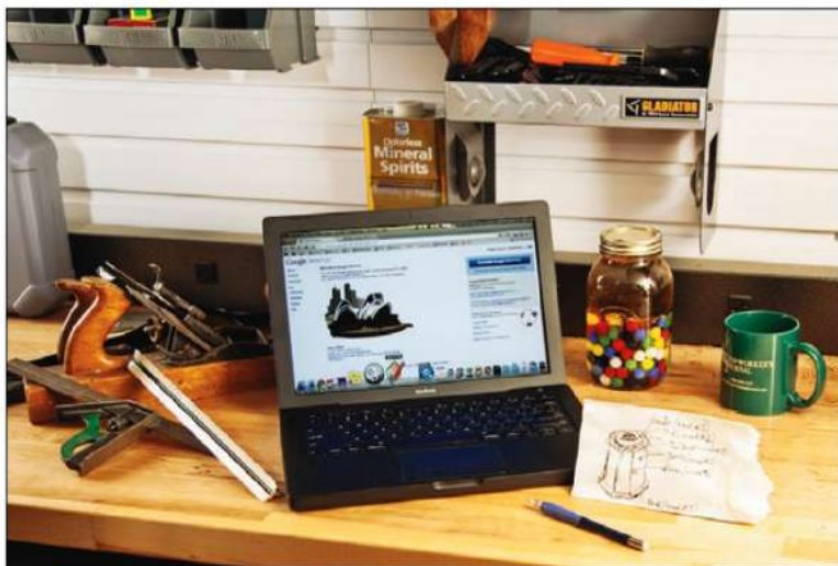
(Circle No. 45 on PRODUCT INFORMATION form)

Today's Shop

3D Design, for Free

By Jeff Jacobson

Have you ever wanted to design your own project on your computer? Our art director checked out a free computer program designed to help you do just that.



Five tips to get started

1. Watch the tutorials on YouTube, which allows you to stop the video and practice along with the lesson.
2. Keep the built-in instructor window open at first. It's very helpful.
3. Learn the key commands for zoom, pan and orbit right away. This will save you time.
4. Remember this program is based on pushing and pulling 2D objects to create 3D objects.
5. Understand the way the program snaps-to objects while creating surfaces. This is called snap inferences.

A few years ago, author Bill Hylton wrote a review of CAD (computer assisted drawing) software programs for the *Journal*. His top choice among the free options was SketchUp by Google. “Free” sounds like a good option in today’s economy, so editor-in-chief Rob Johnstone thought we should take another look at the program — this time from an art director’s perspective.

I design and draw woodworking projects as part of my daily job, so I had a pretty good idea of what a good program might include. My overall impressions? If you like designing your own projects, this can be a very fun and useful tool — as long as you don’t mind putting in some time to climb the learning curve, and acquiring a few gray hairs in the process.

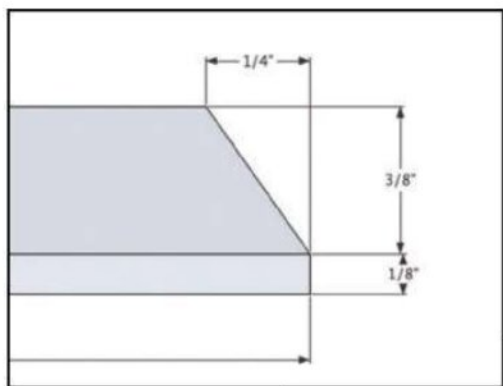
Learning Curve

It’s pretty obvious that, before you can actually design anything in SketchUp, you have to learn how to draw and navigate within the program first. Luckily, SketchUp has done a good job with their tutorial information.

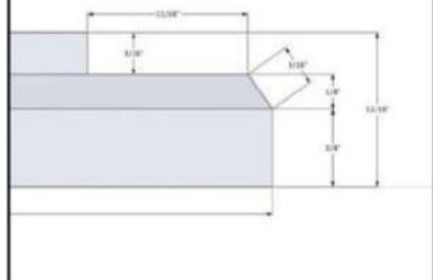
Downloading SketchUp (<http://sketchup.google.com>) is free, and it’s easy. So far, so good. You will also find video tutorials at the startup of the program or on YouTube. I found watching them on YouTube, where I could stop the video and practice the skill that had just been demonstrated, to be extremely useful.

I also found it helpful to keep the “instructor” window open as I began using SketchUp. It helped as I got used to the program and began the process of learning to “think” the way it does.

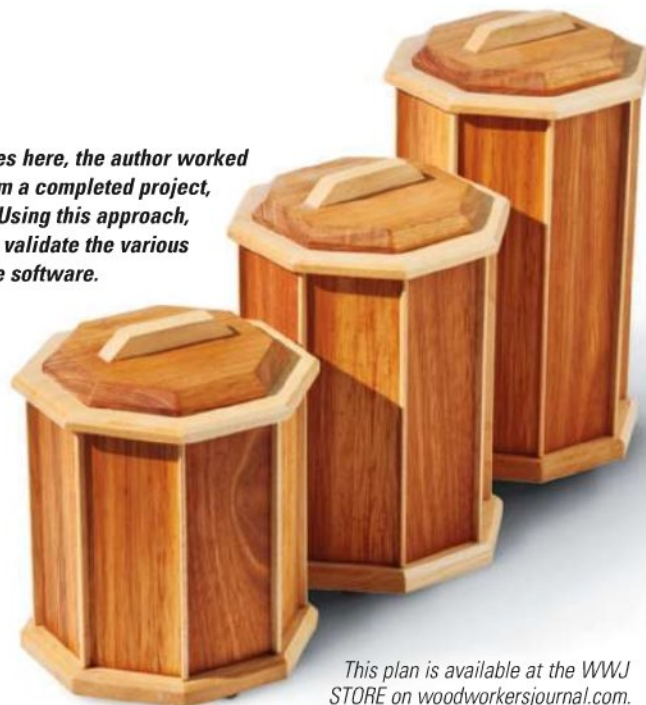
As someone who has been drawing woodworking projects for over 20 years, I like to think I know what I’m doing — but, in SketchUp, methods that seem to be the obvious way to draw don’t always work. For example, to create a cube, you start with a 2D flat surface in perspective — the program’s default setting — then, with the patented Push/Pull tool, you extrude the flat surface into a three-dimensional form, as I’ve shown in the sequence of drawings at right. It’s a simple matter of clicking to start extruding, moving your mouse, and clicking again to stop. You can Push/Pull a rectangle into a box or even draw the outline of a staircase and Push/Pull it into 3D. In essence, the main reason that SketchUp is known for being easy to use is the patented Push/Pull feature.



After you've drawn your project in 2D and used the Push/Pull tool to extrude it into 3D, the program has the ability to create "views" so you can drop in your measurements and head to the shop with detailed drawings in hand.



For our purposes here, the author worked backwards from a completed project, shown below. Using this approach, he was able to validate the various functions of the software.



This plan is available at the WWJ STORE on woodworkersjournal.com. Select "downloadable plans" and search for "canister."

Free Version Limitations

Once you have learned to draw and design your project, you'll find that there are some drawbacks to the free version: some things, you just can't do without paying for the upgrade. For instance, the graphics don't export very well into other programs, and printouts appear rough.

Also — and this was a big drawback for me — there is no way to make a material list of the parts.

Test Project (Canisters)

To give the free version of SketchUp a good test, I used it to redraw a project we featured a few years back in *Woodworker's Journal* — our Classic Kitchen Canisters. That project originally started

out with a "napkin sketch" from an editor, went through a professionally rendered (by me) pen and ink artist's sketch, got tweaked a little bit, and then had the final version drawn in Adobe Illustrator (me, again) and the color shadings painted by hand (yep, yours truly).

This time around, because of all the work I'd done earlier, I didn't need to redesign the project and was able to draw parts right away.

This project provided a good demonstration of the power of CAD programs. For instance, our canisters have eight sides, but I drew one side and used its duplicating features to create the other seven sides. If I wanted to change the dimensions of the

side, making the change on one side would automatically apply it to the other seven, too. This can be achieved by adding one measurement for the dimension you want to change.

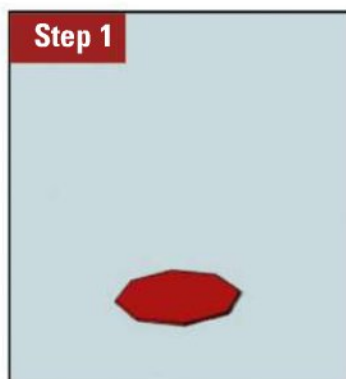
Applications

So, what would I use SketchUp for? Well, it does have some very handy features for project design. And I have to say that it can be very helpful if your drawing skills are not that advanced. It would also work well for anything from kitchen remodels to laying out a deck or fence project right up to adding a room to your home.

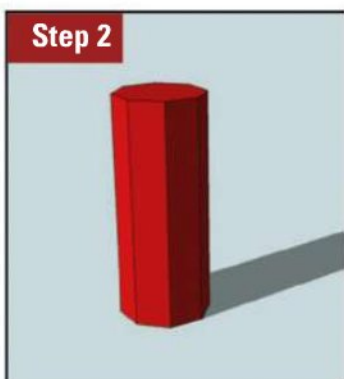
Jeff Jacobson is Woodworker's Journal's Senior Art Director.

SketchUp Highlights

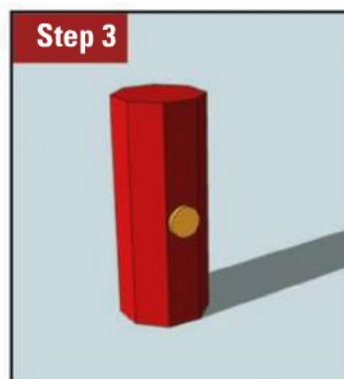
- Precise dimensions
- Changes to one item automatically applied to others
- Get a first-person view from "inside" your drawing
- Add Dimensions and Labels to your design
- Import 3D models from Google Warehouse
- Use Sections for cutaway views of a design to see inside
- Follow Me tool extrudes 2D shapes along 3D paths
- Paint Bucket for colors/textures
- Import image files and use on surfaces to create photo-realistic design.



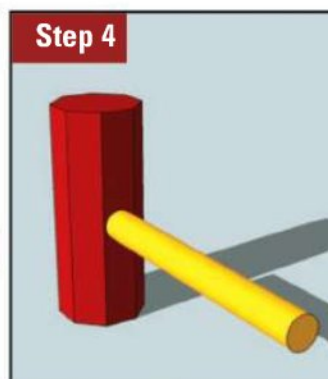
Step 1



Step 2



Step 3



Step 4

In Step 1, the author "draws" his mallet head by using the polygon tool set to 8 sides. Then, in Step 2, he uses the software's unique Push/Pull tool to extend the mallet head to its correct length.

Adding the mallet handle is as simple as placing a circle in the proper location, as shown in Step 3. Once again, as demonstrated in Step 4, the Push/Pull tool is used to extend the handle to its proper length.

Refinish Your Future.



Own your own business.

Let your passion for furniture lead you into a new business with a Furniture Medic franchise. We're a complete on-site repair and restoration-refinishing business servicing homes and companies as well as handling moving and insurance claims. We offer extensive training and support with a low initial investment and manageable overhead. Financing is available to qualified candidates and franchises are offered nationwide. Call today to brush up on the details.

FURNITURE MEDIC
"the professionals in damaged furniture"

www.furnituremedicfranchise.com 1-800-RUN YOURS

(Circle No. 19 on PRODUCT INFORMATION form)

STEEL BUILDINGS

Summer Sale!

up to **50% savings!**

25 YEARS

Made in the **USA**

800-891-6733

www.steelspan.com

AMERICAN STEEL SPAN

(Circle No. 2 on PRODUCT INFORMATION form)

When it's more than just a Hobby.

Saw Lumber for your own:

- Home • Gazebo • Furniture • Picnic
- Barns • Fencing • Flooring • Tables
- Stables • Decking • Tree Forts and more...

Easy to Use & Affordable!

Call or email for your **FREE** Catalog!

COOK'S SAW MFG.
1-800-473-4804
WWW.COOKSSAW.COM

(Circle No. 8 on PRODUCT INFORMATION form)



We wanted to give mom and dad something back... Their independence.

As Seen On TV!

Mom and dad have done a lot for us, that's why we wanted to do something for them in return.

So, we talked to Premier Care about their extensive range of Walk-In Baths which have helped improve the lives of thousands of people.

Low entry, a built-in seat and temperature control are some of the benefits their baths offer.

Call or send for a **FREE** brochure.



Please send me a FREE Premier Care brochure today!

Name _____

Telephone () _____

Address _____

City _____

State _____ Zip _____

Send to:
Premier Care in Bathing Inc.
2330 South Nova Road,
South Daytona,
Florida 32119

1601070

Premier Care
in Bathing

CALL NOW TOLL FREE 1-800-578-2899

SOURCE CODE 1601070

(Circle No. 31 on PRODUCT INFORMATION form)



Introducing the

POLAR BEAR SERIES™

New!

**DAZZLING
WHITE
MACHINES!**

THESE MACHINES ARE OF THE SAME HIGH QUALITY AS OUR REGULAR GRIZZLY VERSIONS!



G0555P
ULTIMATE 14" BANDSAW
INTRODUCTORY PRICE
\$398⁰⁰



G0715P
10" HYBRID TABLE SAW
WITH RIVING KNIFE
INTRODUCTORY PRICE
\$758⁰⁰



G1035P
1 1/2 HP SHAPER
INTRODUCTORY PRICE
\$498⁰⁰
\$69⁰⁰ ANYWHERE IN LOWER 48 STATES
(SHOWN WITH OPTIONAL WING)



G0452P
6" JOINTER WITH
BUILT-IN MOBILE BASE
INTRODUCTORY PRICE
\$398⁰⁰
\$69⁰⁰ ANYWHERE IN LOWER 48 STATES



G0459P
12" BABY DRUM SANDER
INTRODUCTORY PRICE
\$528⁰⁰
\$69⁰⁰ ANYWHERE IN LOWER 48 STATES



G0513P
17" HEAVY-DUTY BANDSAW
INTRODUCTORY PRICE
\$698⁰⁰
\$89⁰⁰ ANYWHERE IN LOWER 48 STATES



G0656P
8" JOINTER
INTRODUCTORY PRICE
\$728⁰⁰
\$139⁰⁰ ANYWHERE IN LOWER 48 STATES

G0656PX
8" JOINTER WITH
SPIRAL CUTTERHEAD
INTRODUCTORY PRICE
\$998⁰⁰
\$139⁰⁰ ANYWHERE IN LOWER 48 STATES
WITH BUILT-IN MOBILE BASE (BOTH MODELS)



G0453P
15" PLANER
INTRODUCTORY PRICE
\$898⁰⁰
\$139⁰⁰ ANYWHERE IN LOWER 48 STATES

G0453PX
15" PLANER WITH
SPIRAL CUTTERHEAD
INTRODUCTORY PRICE
\$1398⁰⁰
\$139⁰⁰ ANYWHERE IN LOWER 48 STATES
WITH BUILT-IN MOBILE BASE

GET MORE DETAILS ABOUT THESE MACHINES ON OUR WEBSITE.

(Circle No. 51 on PRODUCT INFORMATION form)



Grizzly Industrial®

1-800-523-4777 grizzly.com®

12862

TECHNICAL SERVICE: 570-546-9663

FAX: 800-438-5901

PRICING CODE
10WWJ
MENTION THIS CODE
WHEN PLACING YOUR ORDER



Tool Review

Benchtop Mortisers: Head to Head

By Chris Marshall

These “one-task” wonders chop mortises quickly and efficiently. But, it pays to shop carefully: our author’s “Best Bet” pick is versatile, powerful and budget-friendly.

Sure, there’s more than one way to cut a mortise; you don’t *have* to buy a dedicated machine to do it. Still, I think a mortiser is the fastest way to get the job done. Unlike a router or chisel, a mortiser hogs out all the waste and squares the cut in one operation. If you build lots of tables, chairs, doors and face frames, you’ll appreciate this efficiency.

Are you planning to buy a new mortiser? If so, there are some nice benchtop options. I’ve rounded up seven here and cut mortises until my arm was sore. (Grizzly Industrial was also invited to participate but could not provide a mortiser in time for testing.) You can read more about the testing process on page 56. While all of these tools cut square holes well, one still bested the rest; it was a solid performer with an unbeatable price. Here are some thoughts about each model and a tip of the hat to my category winner.

Craftsman 21907

Just shy of \$300, Craftsman’s 21907 sells for below the average price for this test group — a good thing — yet it comes with plentiful standard features. Some are nice, and others come up a bit short. First, I’ll address its strengths. Its cast-iron base offers one of the larger working areas of the test group, at 8¼" x 13¾" with the fence pushed all the way back. Extra tabletop is only a

plus when you’re mortising longer or wider workpieces. At 2½" tall, the fence on this tool will also give you sufficient backup support for mortising door stiles or larger legs, and it’s drilled for adding taller fence facings when you need them.

I prefer the horizontal grip orientation on this and other machines here; it’s easier on your wrist for repetitive work. Craftsman allows you to switch the machine’s lever for left- or right-handers. Nice.

Other good standard items include a riser block that increases the chisel travel from 5" to 7½", a tool holder and four chisels.

Setting up and using this machine left me with some mixed reactions, however. All mortisers have a hold-down mounted over the fence to keep workpieces from lifting when withdrawing the chisel. Craftsman’s stayed put, but it requires an Allen wrench to adjust it. Handles or knobs would make this job easier. Keep those wrenches handy; you’ll need them to set the depth stop and lock the chisel in the headstock bushing. There is a handle to lock the fence. The fence’s micro-adjust feature proved to be subpar. Its collar bound on the post when I slid the fence for coarse adjustments.

Installing the chisel’s auger bit in the tool chuck is close-quarter work on the 21907. The pinion gear that moves the headstock nearly touches

Mortising may not be an “every project” task, but a dedicated mortiser can make the job a delight when duty calls. And, there’s a benchtop model to suit nearly any budget.





Tool Review continued

Craftsman 21907

HP/Speed: 1/2; 1725 RPM
Standard Stroke: 5"
Max. Chisel Center to Fence: 3 1/8"
Weight: 64.4 lbs
Price: \$299.99
www.craftsman.com
(800) 349-4358

the back of the chuck. More clearance for fingers would be better.

Once it was set and ready, the machine tested well on oak, maple and cedar, but the chisel jammed three times on sugar pine and stalled the motor. Still, given its extras and overall performance, this mortiser seems a worthy buy.

Delta 14-651

Picking up where Craftsman left off, Delta's 14-651 makes general setup an easier task: the machine has ratcheting levers that enable you to adjust and lock the hold-down, fence and depth stop

rod without wrenches. Even better, most of these handles are metal to improve their durability. You'll still need an Allen wrench for installing the chisel, but Delta provides a T-wrench to do that.

Chucking in the auger bit is a breeze, thanks to a forward-facing and spacious opening in the headstock. The access door swings wide, and it stays closed with a strong magnet.

The fence on my test mortiser was properly flat

and square to the table, and it slid back and forth fluidly with a star knob and rack-and-pinion gear. At 3" high, it ties Steel City for the tallest fence here. An onboard tool rack and four chisels will get you up and mortising quickly with just one purchase.

While the pull-down handle is straight and less ergonomically wrist friendly, the grip is a soft overmold for comfort. And, as with all of these mortisers, you can adjust the feed handle to several start positions by shifting its spring-loaded hub.

Delta performed admirably during my mortising tests on all woods without laboring or stalling. If you want to increase its "bite" for taller work, an included riser block bumps the machine's vertical stroke up to 6 1/2". All in all, this is a user-friendly and solid contender for the buck.

Delta 14-651

HP/Speed: 1/2; 1750 RPM
Standard Stroke: 4 3/4"
Max. Chisel Center to Fence: 3 3/4"
Weight: 81 lbs
Price: \$289
www.deltaportercable.com
(800) 223-7278



An included riser block (left) increases the stroke capacity of Craftsman's mortiser by 2 1/2". If you're a lefty, you'll also like the interchangeable feed handle (right) provisions here.



Fewer wrenches mean faster setups, and Delta speeds the process along with ratcheting handles (left). The headstock also offers excellent chuck access (right).



General International 75-050T M1

HP/Speed: 1/2; 1720 RPM
Standard Stroke: 9"
Max. Chisel Center to Fence: 4"
Weight: 106 lbs
Price: \$499.99
www.general.ca
(888) 949-1161

General International 75-050T M1

General International's 75-050T M1 sets itself apart from other machines here in several big ways. First, the mortiser has a tubular column and telescoping headstock casting. The design enables the head to swivel around on the base so you can do much longer "off-the-table" mortising. You can also extend the machine's stroke to a generous 9" without a riser block by lifting and locking the headstock casting higher on the column. Both the swiveling and stroke adjustments can be done tool-free. Additionally, the column

can be unlocked at the base and tilted left or right up to 30° for cutting beveled mortises; this is the only machine in the group that can

do so. Here's a mortiser that offers convenient and specialized versatility.

General provides a full complement of knobs and levers for carrying out normal

setups. The machine's fence slides and locks in T-slots in the table, which actually made the fence a little harder to move back and forth; the mounting bolt lugs tended to hang up in their slots. Still, the fence was flat, amply tall and locked down tight. A sturdy front clamp will press your work securely

Tool Review continues on page 56 ...



General International expands the range of mortising possibilities by outfitting the 75-050T M1 with a tilting column (left) and a convenient means of rotating the headstock for off-the-table applications (right).

Super Sharp at the Start

Most woodworkers wouldn't use a new bench chisel without sharpening it first. I applied that same logic here. First, I cleaned each hollow-chisel and the auger bit with lacquer thinner to remove oily residue and the clear coating that came on these cutters. Then, I cleaned the inside bore of the chisel and raised a wire burr on the cutting edges using Rockler's Mortise Chisel Sharpening Set (item 24727). I proceeded to remove the wire edge and grinding marks on the chisel backs with 320-, 400- and 600-grit emery wet/dry sandpaper, taped to my cabinet saw's iron table. Finally, I lapped the backs to a mirror finish on my Veritas Mk.II Power Sharpening System. I believe this prep work was worth the effort: the bits cut more cleanly and easily than bits straight from the package, with the exception of a few cases where clogs occurred. Only two of the chisels turned blue after cutting 16 mortises each in four different woods.



Our author used a procedure similar to sharpening a bench chisel to clean and lap the new hollow-chisel bits before beginning his cutting test. The effort seems to have helped. Generally, clogging was minimal, and the bits cut cleanly without laboring the machines. Lapping the chisel backs may also have reduced friction during use, which leads to heat buildup, bluing and eventually dulled edges.

Tool Review continued

Powermatic 701

HP/Speed: 3/4; 1725 RPM
Standard Stroke: 5/2"
Max. Chisel Center to Fence: 4 3/8"
Weight: 93 lbs
Price: \$399.99
www.powermatic.com
(800) 274-6848

against the fence, but I prefer the table rollers on other tools that make it easier to slide the wood laterally.

The fence hold-down on this mortiser is also unusual. It clamps to the column's dovetail ways instead of to a fence post. While it locked firmly in place, its "reach" over a workpiece decreases as you move the fence further out. That could reduce its function in some instances. When making many matching parts, you might appreciate the adjustable workstop and the depth control offered here: General gives you two collars to limit both up and down travel of the headstock.

Other goodies include four chisels and a bushing to suit 3/4" chisel shanks. I wish the

machine came with a rack for storing these supplies.

In testing, the 75-050T M1 chewed into mortises without complaint. All in all, this is a solid tool, albeit spendy. At \$499, the articulating benefits might be harder to justify on an occasional user's budget.



Powermatic ensures that workpieces will stay put by providing two knobs that set the hold-down, plus table feed rollers (left). Onboard spacers swing into place for setting chisel-to-bit clearance (right).

Powermatic 701

Powermatic's engineers did a brilliant job when designing the 701 and turned out a top-notch mortiser, in my opinion. For starters, it comes with a 3/4hp motor that was not only

able to handle the test mortising, but also a round of 3/4"-wide, 1 1/2"-deep mortises in black ash. Hearty torque was definitely available for driving the big auger bit.

Knobs and levers in all the right places make setups virtually a toolless job. The chuck access is spacious and right up front where things are

easy to see. You even get two spacers that swing in or out to help set the clearance space between the chisel and auger bit — an important detail not to be overlooked when using any of these mortisers. And, the 701's feed handle can be mounted left or right.

Powermatic equips this tool with the best workpiece anchoring system of the test group. The hold-down has a threaded post with two knobs to set it for use: the top knob allows you to adjust downward pressure on the

Tool Review continues on page 58 ...

My Mortising Methodology

A mid-sized chisel was my choice for this test. I chucked a new, 3/8" chisel into each machine after carefully sharpening them (see sidebar, page 55). The chisels were obtained from an independent source to level the playing field in terms of chisel quality. I adjusted each cutter to create 1/16" of clearance between the auger bit and chisel; this provided consistency between the test tools and good chip evacuation. The depth stops were set for 1 1/4"-deep cuts. I cut four 6"-long mortises in hard maple, sugar pine, white oak and red cedar, in that order. All of the test pieces came from the same initial planks of stock. I felt they represented a good

variety of hardnesses, densities, potentially tough grain issues and resin contents. In other words, realistic challenges for these mortisers. While I anticipated that hard maple and white oak would test these mortisers' mettle the most, sugar pine actually posed the greatest challenge. Its resins seemed to make the chisels more prone

to clogging and smoking than other woods. If a chisel was going to turn blue, here's where it happened — although that only occurred twice. Still, even blued chisels were able to proceed from pine to oak and then cedar without a noticeable difference in sharpness or chip-clearing performance.





ROCKLER®

WOODWORKING AND HARDWARE

Create with Confidence™



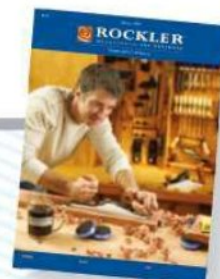
Get a grip on perfect pocket holes.

During pocket hole assembly, face frames tend to separate as the screws are tightened. Our new Pock-It Hole Clamp™ fixes this problem by clamping and surface aligning pocket hole joints in one step. The clamp holds the joint tight with a pin in one pocket hole, leaving the other pocket hole open to be fastened. This eliminates joint separation and guarantees a tight, seamless joint! It's just one of many innovations you can find at Rockler.com, in our FREE catalog and at our retail stores nationwide. Rockler solutions help you *Create with Confidence*.

Take \$10 Off a \$30 Order

Simply place your order at Rockler.com
by entering promotion code V0342 at checkout or call 1-877-ROCKLER.

Or bring coupon to a Rockler store near you. One-time use only. Minimum purchase of \$30 in qualifying merchandise required. Cannot be applied to sales tax or shipping. No cash value. Cannot be combined with other offers or coupons. Not valid at Rockler Partner store locations. Excludes sale items, power tools, Leigh jigs, Porter-Cable dovetail jigs, Shark CNC, Festool and Rockler Gift Cards. Offer expires 10/30/2010.



Materials Code: 186



Materials code: 186



For a store near you or free catalog visit

Rockler.com

1-877-ROCKLER

(Circle No. 34 on PRODUCT INFORMATION form)

Tool Review continued

JET JBM-5

HP/Speed: 1/2; 1725 RPM
Standard Stroke: 4 3/4"
Max. Chisel Center to Fence: 3 1/2"
Weight: 44 lbs
Price: \$299.99
www.jettools.com
(800) 274-6848



JET provides a brass setscrew for installing chisels in the headstock bushing (right). Tighten it carefully. A rod-style depth stop (above left) is easy to set and lock using a ratcheting handle.



wood, and a side knob locks the position. Up front, the table has two rubber wheels that press against the wood, yet still allow it to move sideways.

The 2 3/4"-tall fence slides fore and aft easily on its rack, then locks down with two levers. Table workspace is adequate at 8 3/4" x 12 3/4". My only grumble about features is that the depth stop — a collar mounted to the column — can shift if you bear down too hard or bang the headstock against it.

Powermatic doesn't include a set of chisels to fill its tool rack (too bad!), but you do get a bushing for 3/4" chisels and a diamond sharpening cone to touch them up.

While \$399.99 isn't pocket change these days for a tool that essentially does one thing, this chomper is well-built, powerful and nicely appointed. It's quite tempting.

JET JBM-5

JET's JBM-5 mortiser has been around for a long while without many changes over the years. It's still a no-nonsense machine with some good features. I like the ratcheting handles that control the depth stop rod and fence positions. Chuck access is

Steel City 25200

HP/Speed: 1/2; 1725 RPM
Standard Stroke: 5"
Max. Chisel Center to Fence: 4"
Weight: 81 lbs
Price: \$329.99
www.steelcitytoolworks.com
(877) 724-8665



decent on either side of the headstock, through two spring-loaded doors. The motor moves smoothly on its rack-and-pinion column. Stroke travel is 4 3/4", which matches Delta's without its riser and is just shy of Steel City's. JET includes three chisels and a bushing for 3/4" shanks, but no tool rack.

Still, given its competition, I'd like to see a few updates.

The MDF table is smaller than others, and so is the cast base, considering these are top-heavy machines. Be sure to bolt it down to avoid tipping. A taller fence would be a plus, too; 1 1/16" isn't much vertical support, but you can improve that by screwing a taller facing to it. I'm not a fan of the brass screw that locks the chisel in the headstock bushing: it's flat-blade style and soft. A steel screw or lever



Steel City is the only mortiser in this test that comes with pullout table extensions — a practical feature for long workpieces.



You can adjust Shop Fox's fence incrementally using the threaded micro-adjuster in back (left). A larger motor than most other machines in this category enabled the W1671 to tackle big, tough mortising in ash (right).

would prevent stripping this fitting.

In testing, the JET stalled once when the chisel clogged with pine chips. Otherwise, mortising was on par with the other 1/2hp tools when I applied moderate feed pressure. All in all, this JET isn't a steal at \$299.99 for me, but a few simple shop tweaks will help this machine carry out its tasks quite well.

Steel City 25200

Steel City's mortiser has several standout features. First, I really like the pair of pullout base extensions that provide 35" of left and right support. That'll be handy when mortising longer frame parts, posts or legs. The tool also has a pair of table rollers for keeping wood snug against the fence.

Auger bit installation is a snap, thanks to two clear doors that swing open "gull wing" style to give you plenty of access. You can choose to mount the handle left or right.

The 25200's cast fence is plenty tall, but the one on my test tool was slightly warped at the top and cupped at the bottom — not enough to really influence accuracy, however. A rack-and-pinion gear and ratchet lever made the fence easy to use. The hold-down is

adequate, but setups could be easier with a knob or lever.

This machine had no difficulty mortising both hard- and softwoods, and it comes with four chisels to get that work done, plus a storage rack. Buying a 25200 will set you back about \$40 more than Delta, but I think the table extensions and rollers are worth the extra cash.

Shop Fox W1671

Shop Fox's W1671 was an unexpected surprise, once I had a chance to weigh its versatility and performance against its rock-bottom pricing. It has a twin-tube column for the headstock and, unlike the other mortisers, you have three options for mounting the gas-charged shock. (Note: all of the machines in this article have gas-charged shocks to support the weight of the headstock, but only the Shop Fox allows for different mounting options.) Depending on which lugs you mount the shock to, you can change the stroke from 4½" to an impressive 8½" without a riser. The column's base swings around for off-the-table mortising by loosening two bolts. It's simple to do, if and when that need occurs. The fence mounting block can be set to two positions so the

Shop Fox W1671

HP/Speed: 3/4; 3450 RPM

Standard Stroke: 8½"

Max. Chisel Center to Fence: 4"

Weight: 90 lbs

Price: \$239.99

www.woodstockint.com

(360) 734-3482

chisel will reach the center of an 8" workpiece. All in all, lots of workpiece capacity here and, while the table is a bit narrow at 6", it offers 16" of usable side-to-side width. The fence also has a better micro-adjust than Craftsman's version.

Shop Fox bolsters this machine for rigorous mortising by outfitting it with a 3/4hp motor; Powermatic is the only other 3/4hp tool here. It spins twice as fast as the other mortisers, which created more chisel noise — but doubling the auger speed made for quick, efficient chip clearance. The tool didn't struggle through my battery of mortising tests, and it was up to task on the same torture trial I subjected the

Powermatic to: deep mortises with a 3/4" chisel in ash.

Fit and finish weren't stellar here: its castings and paint job were a bit rough in spots, and the fence was .014 out of flat. The tool could also use levers or knobs for tightening the chisel and hold-down.

Only one chisel comes standard. But, here's the clincher: Shop Fox's W1671 is the *lowest* priced mortiser in this group. And, you get that bigger motor for 40% less than a Powermatic 701.

So, based on motor size, capacity and a thrifty price, Shop Fox seems a workaday value for any tight budget. It earns my "Best Bet" pick.

Chris Marshall is Woodworker's Journal's Field Editor.



CLAMP EDGE

TOOL
GUIDE



AFFINITY TOOL WORKS, LLC
(866) 588-0395
www.affinitytool.com

(Circle No. 1 on PRODUCT INFORMATION form)

WJ woodworkersjournal.com
eZiNE

"It's the most fun you can legally have on the net —
and not get in trouble with your spouse!"

Rob Johnstone, Editor-in-Chief

WOOD HEAT

CENTRAL BOILER
E-CLASSIC®
Outdoor Wood
Gasification Furnace

- Heat your entire home, water and more.*
- Adapts easily to new or existing heating systems.
- EPA Phase 2 qualified. About 90% less emissions than unqualified models.

*Furnace and system must be properly sized and installed.



Central Boiler
Find your nearest dealer at:
centralboiler.com
800-248-4681

©2010 Central Boiler ad5640



Wood-Mizer
razorTIP
STELLITE® BANDSAW BLADES

**Stellite® tip technology
for sawing tough wood**

- Kiln Dried
- Exotic Species
- Resawing

Wood-Mizer Blades

Innovation. Precision. Performance.

1.800.522.5760

www.woodmizerblades.com

(Circle No. 47 on PRODUCT INFORMATION form)

Marketplace

To receive free information on any of the products or services shown in Marketplace, please circle the appropriate reader service number(s) on the enclosed **Product Information Card**.

Banner Hill School Of Fine Woodworking

Woodworking classes
for all skill levels.

For more information contact us at:

(518) 929-7821

www.BannerHillLLC.com



(Circle No. 4)

Turn your **PASSION**
into **BIG PROFITS**
with a proven turn-key program from:

EUREKA
WOODWORKS, INC.™

Be your own boss! Transform your shop
into a furniture factory producing America's
most popular Adirondack-style outdoor furniture!



877-731-9303 www.eureka-business.com

(Circle No. 15)

Professional, 30-week cabinet
making courses in the heart
of Scotland.

Visit www.chippendale.co.uk
for more information.

(Circle No. 7)

RouterBits.com

Over 1,000 Bits
to Choose From

With the right Bit you're almost done

1-800-222-8404

TylerTool.com

www.RouterBits.com is a Division of Tyler Tool Company

(Circle No. 39)

WOOD ENGRAVING AND CUTTING WITH AN EPILOG LASER SYSTEM



Starting at \$7,995

An Epilog Laser system
makes it easy to customize
any wood product with
graphics, text, logos and
much more.



For more information call us at 888-437-4564.

MADEINUSA

sales@epiloglaser.com
epiloglaser.com/wwwj.htm



(Circle No. 13)

U-BILD.COM

Hundreds of full-size woodworking plans
at low prices. Free downloadable mini-plans.
Indoor, outdoor, children's and holiday projects
at all skill levels. Call (800) 828-2453 for free
catalog or visit u-build.com.

(Circle No. 44)

Get Into Wood!
Sawing Lumber Made Easy.

Easily turn your logs into
lumber with the all NEW
HP-26 Hobby Pro Sawmill.
Prices start at only \$3,995.00!

Call or email for your **FREE Catalog!**

1-800-473-4804

WWW.COOKSSAW.COM

(Circle No. 9)

LINE BOXES IN SECONDS...

"Suede-Tex" spray-on suede
No skill required • 30+ colors
800-336-6537 • www.flockit.com



FLOCK IT! Ltd

13142 Murphy Rd.,
Winnebago, IL 61088

Formerly...
DonJer Products
new name, same great
product and service!

(Circle No. 16)

Visit our website to link to any of our advertisers' sites:
www.woodworkersjournal.com/adinfo

Woodworking Tools & Supplies Index

August 2010



To receive information about the products or services featured in the advertisements in this issue, fill in the attached postcard, circling the appropriate number(s). Please allow 4 to 6 weeks for delivery.

For product information in the blink of an eye, visit our website to link to any of our advertisers' sites: www.woodworkersjournal.com/adinfo

ADVERTISER	Reader Service No.	Page No.	Web Address	ADVERTISER	Reader Service No.	Page No.	Web Address
Affinity Tool Works	1	60	www.affinitytool.com	Grex Power Tools	22	69	www.grexusa.com
American Fabric Filter Co.		65	americanfabricfilter.com	Grizzly Industrial, Inc.	51	51	www.grizzly.com
American Steel Span	2	50	www.steelspan.com	Hut Products	23	15	www.hutproducts.com
Apollo Sprayers	3	9	www.hvlp.com	Kreg Tool Company	24	3	www.kregtool.com
Badger Hardwoods of WI, Ltd.	50	65	www.badgerwood.com	Lignomat	25	9	www.lignomat.com
Banner Hill School of Woodworking	4	60	www.bannerhillLLC.com	Loctite	26		www.loctiteproducts.com
Bench Dog Tools	35	13	www.benchdog.com	Old Masters	27	3	www.oldmasters.biz
Berea Hardwoods Co., Inc.	5	19	www.rockler.com	Oneida Air Systems, Inc.	28	15	www.oneida-air.com
Central Boiler		60	www.centralboiler.com	Osborne Wood Products	29, 30	21, 65	woodencomponents.com
Cherry Tree Toys	6	65	www.cherrytreetoys.com	Premier Bathrooms, Inc.	31	50	premier-bathrooms.com
The Chippendale Int'l. School of Furniture	7	60	www.chippendale.co.uk	Rikon Power Tools	32	11	www.rikontools.com
CNC Shark	37	25	www.rockler.com	RockAuto, LLC	33	19	www.rockauto.com
Cook's Saw MFG, L.L.C.	8, 9	50, 60	www.cookssaw.com	Rockler Woodworking and Hardware	36, 34, 38	15, 57, 65	www.rockler.com
Country Home Products		63	www.drpower.com	Routerbits.com, Inc.	39	60	www.routerbits.com
Dura-GRIT	10	3	www.duragrit.com/wj	Samuel Cabot Inc.	45	47	www.cabotstain.com
Ebac Lumber Dryers	11	21	www.ebacusa.com	SawStop	40	2	www.sawstop.com
Epilog Laser	12, 13	7, 60	epiloglaser.com/wvj.htm	ShopBot Tools	41	11	www.shopbottools.com
Eureka Woodworks	14, 15	17, 60	www.eureka-business.com	Stanley Tools	42	11	www.stanleytools.com
Flock It! Ltd.	16	60	www.flockit.com	Steel City Tool Works	43	71	www.steelcitytoolworks.com
Freud	17	72	www.freudtools.com	U-bild Woodworking Plans	44	60	www.u-bild.com
Fuji Spray Equipment	18	21	www.fujispray.com	Wagner Electronics	49	15	www.wagnermeters.com
Furniture Medic	19	50	furnituremedicfranchise.com	Woodfinder		65	www.woodfinder.com
General Tools & Instruments	20	5	www.generaltools.com	Wood-Mizer	46	65	www.sawboards.com
Gorilla Glue	21	21	www.gorillatough.com	Wood-Mizer Blades	47	60	www.woodmizerblades.com
				Woodworkers Source	48	65	www.101woods.com

**WIN
A FREE
TOOL!**

We give away a free tool in every issue of *Woodworker's Journal*! Just circle the reader service numbers of the companies you're interested in and answer the survey questions on the card at left. Send it in for your chance to win ... we even pay the postage!

What's In Store

Industry Firsts

Contact Information

Affinity Tool Works
866-588-0395

Bosch
877-267-2499

Elmer's
614-985-2600

F3 Concepts (3rd Ear™)
402-261-6471

General International
888-949-1161

Rockler
800-279-4441

Sansin
877-726-7461

SENCO
800-543-4596

Starrett
978-249-3551

Total Saw Solutions
800-773-3133

NOTE: See Quik-Link at
woodworkersjournal.com
for web links to these products.

Sometimes in the shop, you might think you need a third hand. A Nebraska woodworker decided he needed a third ear: after creating his own pencil holder to keep his pencil behind his ear — not falling off, not getting the tip broken from repeated dropping — while wearing his safety glasses, he was barraged by requests from other hardware store shoppers to create one for them. And so he did. The patent-pending *3rd Ear™ Magnetic Clip* even went one step further and created a small magnetic ledge on which to store bits, screws, nails and other small metal items. The 3rd Ear attaches to safety, sun or prescription glasses — and when it's not serving as your extra ear, it can be used to store glasses and your pencil, too. It comes in orange, purple and blue and costs \$4.99.

As you might guess from the name, the *Micro-Kerf™ saw blade* leaves a really, really small kerf — in fact, Wisconsin manufacturer **Total Saw Solutions**



Micro-Kerf™
saw blade



3rd Ear™ Magnetic Clip

calls it the thinnest carbide table saw blade in the world. The advantage to making rips and crosscuts as thin as a dime comes in reducing the amount of waste lumber, the electricity used and the amount of sawdust created. The 40-tooth, 10" blade has a built-in dampening system and a tooth grind that can cut through knots. It can be resharpened up to 20 times and is sold exclusively through Rockler Woodworking and Hardware for \$175.

For woodworkers who like to spell things out — in signs, that is — the new *Interlock Signmaker's Template* from **Rockler Woodworking and Hardware** makes things a bit easier. It comes as a series of interchangeable puzzle pieces, in kits featuring both letters and numbers. The pieces snap together and, after securing them with masking tape, you're ready to rout — you can even arrange

them in stacks, circles or other shapes. Letter kits of Signmaker's Templates contain 40 templates — with duplicates of common letters and three spacers — while each numbers kit contains two sets of numerals 0 to 9 plus nine commonly used symbols. Both letter and number kits come in 2¼" and 4" sizes, with the 2¼" sets selling for \$19.99 and the 4" sets for \$29.99.



Rockler's Interlock Signmaker's Template simplifies the signmaking process.

Continues on page 64 ...

THE EASIER WAY TO TRIM AND MOW!

The original, patented DR® TRIMMER/MOWER is both a precision trimmer and a powerful mower!

TRIM within a whisker of houses, trees, fences. Big wheels make it easy for *anyone* to control precisely!

MOW WITHOUT FEAR of hitting rocks or hidden obstacles, because there's no blade to bend or dull.

GUARANTEED NOT TO TANGLE even in thick, waist-high field grass and weeds — thanks to its patented No-Wrap Trimmer Head. Plus, there's no enclosed deck to clog, as with ordinary mowers.

CUT UP TO 3" THICK BRUSH with optional, patented BEAVER BLADE® Attachment.



65616X © 2010



CALL TODAY! Get a FREE DVD and Catalog

TOLL FREE **1-888-212-2548**

www.DRtrimmers.com



Smooth Out Rough Roads with the DR® POWER GRADER!

Here's what makes the DR® POWER GRADER the fastest, easiest, and simply the best do-it-yourself driveway grooming solution ever —

PATENTED DESIGN enables you to loosen and regrade enormous amounts of material with minimal power.

POWERED ACTUATOR allows you to control grading depth from your towing vehicle with a remote control.

CARBIDE-TIPPED SCARIFYING TEETH loosen the hardest composite surfaces.

FILLS IN POTHOLES and wash-outs, and smooths washboard on gravel, limestone, dirt, or sand roads without hauling in new material, shoveling, or raking.



Call for a FREE DVD & Catalog!

TOLL FREE **1-888-212-2548**

www.DRpowergrader.com

69014X © 2010

WORLD'S 1ST SELF-FEEDING HOMEOWNER CHIPPER!

Just load a DR® RAPID-FEED™ CHIPPER, step back, and watch it chip branches up to 5½" thick!

SELF-FEEDING

saves time and energy. Most branches can be dropped into the hopper and will self-feed, instead of you having to force-feed them.

CHIP BRANCHES UP TO 5-1/2" THICK

with powerful engines up to 18 HP.

PRO-SPEC™ CHIPPER

KNIFE is made of forged alloy tool steel, making it exceptionally strong with an excellent edge-holding ability.

TRACTOR OWNERS!

3-Point Hitch, tractor-mounted models also available.



69015X © 2010



Call for a FREE DVD & Catalog!

TOLL FREE **1-888-212-2548**

www.DRchipper.com

What's In Store continued



General International
50-270 M1 table saw



Quik-Link takes you directly to the web page on which these products appear! No navigation necessary ... just go to woodworkersjournal.com and click on the Quik-Link icon shown above.

General International's 50-270 M1 cabinet style table saw has doubled up on the safety features, with both a riving style splitter/blade guard assembly with anti-kickback pawls and a separate European style riving knife included on the 10" left-tilt saw. The blade guard is see-through, with a built-in dust outlet so that you can directly hook up your dust collection



Bosch PS21
Pocket Driver

system. It also has a made-in-Canada T-fence with 50" right rip capacity guide rails and a 42" x 29" full cast-iron table. Polished steel hand wheels enable easy blade height and tilt adjustments on the 3hp saw, which sells for \$2,225.

The new **Bora Clamp Edge™ Wide Track** has added an extra-wide profile, with an integrated T-track, to **Affinity Tool's** line of straightedge clamps. An exclusive swivel head on their clamping pads accommodates clamping up to 22½° left or right — no need to use extra clamps to hold the edge guide in position, whether you're using them on your circ saw, router, biscuit joiner or other tool. The Bora Clamp Edge Wide Track comes in 24", 42", 66" and 100" lengths, with prices of \$48, \$60, \$85 and \$140.

It's only been in the last few years that Lithium-Ion battery technology has had tool companies creating compact tools with oversized power —and now, **Bosch** says, we're already in the second generation of this battery technology. That, according to Bosch, means that they could make their **PS21 Pocket Driver** the most compact and lightest driving tool on the market, with a head length of 5.6", height of 7" from base to top and weight of 1.8 pounds. The PS21 also incorporates Bosch's Electronic Cell and Motor Protection program, which protects both tool and battery from overloading, overheating and deep discharging. The PS21, which also features a two-speed drivetrain (0-350 rpm and 0-1,300 rpm) and a 20-plus-one clutch, sells for about \$130.

Continues on page 66 ...



What's In Store continued



Senco 15- and 18-gauge Fusion finish nailers



Quik-Link takes you directly to the web page on which these products appear! No navigation necessary ... just go to woodworkersjournal.com and click on the Quik-Link icon shown above.

SENCO says their new line of *Fusion finish nailers*, currently including 15- (FN65DA) and 18-gauge (FN55AX) models, combines the best of air and cordless technologies. Powered by an 18-volt Lithium-Ion Phosphate battery, the nailers can reach an 80 percent charge in 15 minutes. Between charges, in part due to the patented Reflex Shot design, the nailer can deliver up to 500 drives. It also provides an instant trigger response, with users choosing between sequential or contact activation depending on the job. "The air pressure is pre-set at the factory, permanently sealed and never needs

recharging," says product manager Joe Knueven. The depth of drive is adjustable tool-free on the 1/4" aluminum drive cylinder, which weighs in at six pounds. A nose-mounted LED surface light lets you see what you're doing, while the EZ-Clear removable magazine simplifies fastener removal. Suggested pricing is \$440 for the 15-gauge and \$399 for the 18-gauge nailer.

You might not be in high school math class anymore, but a protractor is still useful to woodworkers who can use it to measure and transfer angles for setting a saw and more. **Starrett's** new 505P-7 has two scales that are easy to read from any angle — including upside-down and backward — with a center arrow pointing to the angle on the

protractor's outer scale and an arrow on the handle pointing to the angle on the inner scale. You can easily transfer angles from your workpiece to your miter saw with the 7" engineered plastic protractor, which costs \$24.75.

First introduced in 1948 as an arts and crafts glue, **Elmer's Glue-All®** has recently been redesigned. The new formula is stronger, meant to bond a variety of materials including

wood, cork, ceramic, leather and fabric — as well as paper. The new formula also adds durability, a longer-lasting hold and clear drying to the iconic glue — which still sells for \$1.99 for a 4 oz. bottle.

In light of new regulations impacting finishes, particularly in California, companies like Sansin Corporation are developing new products — like **Sansin's Purity Interior Zero VOC Penetrating Stain**. Designed for use on both hard and soft woods, it's the

first water-based interior wood stain with a base free from any volatile organic compounds (VOCs). The stain comes in both wipe and spray applications, and does not require any pre-treatment of the piece with a wood

conditioner. The water-borne formula uses water as the vehicle to get oil penetration deep into the wood for a long-lasting stain. Dry time is approximately 15 minutes, with a range of about 80 colors. Sansin offers free 4 oz. samples, with pricing for pigmented stains at \$17.02 for a quart, \$46.49 per gallon and \$218.10 for a 5-gallon container.

— Joanna Werch Takes



Starrett 505P-7 protractor



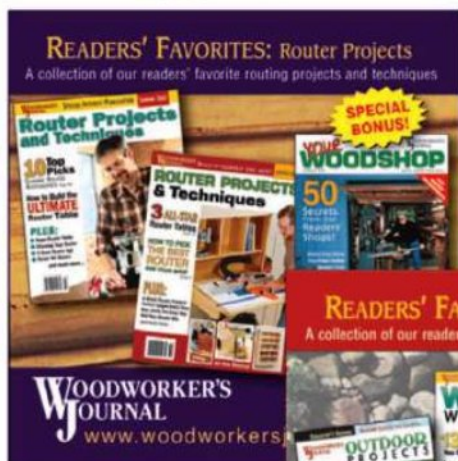
Sansin Purity Interior Zero VOC Penetrating Stain

Elmer's Glue-All®



WOODWORKER'S JOURNAL

READERS' FAVORITES: NOW ON CD!



ROUTER BASICS! Everything you need to know, from the basics to advanced techniques. You get 11 projects, great tips and tricks and helpful tool reviews. **BONUS:** You'll also get "Your Workshop," a special issue featuring over 50 secrets from our readers' shops. All content reader-generated!

Item # 29200 \$11.99



HOME PROJECTS! 30 home projects all on one CD – it's like getting a year's worth of projects to enhance and add value to your home, putting your woodworking skills to work! ... **PLUS**, over 100 useful ideas for your shop, great tips, tricks and much more!

Item # 23828 \$12.99



WORKSHOP PROJECTS! 35 shop projects and over 100 tricks, tips and useful ideas for your shop! A classic, packed with great ideas for the shop!

Item # 32398 \$14.99

**Buy all
5 CDS for 25% off!
Only \$49.95
(Item #25705)**



WOODTURNING! 30 articles, including tools for beginners, green turning, picking the right lathe, safety tips, sharpening basics and 14 great projects. **BONUS:** "20 Great Turning Tricks" and "11 Chucks for Your Lathe" featuring everything you need to know about common (and uncommon) turning chucks!

Item # 23786 \$12.99



CLASSIC PROJECTS! 33 intermediate and advanced projects that will help you take your woodworking to the next level. Classic designs from the Arts & Crafts style plus beautiful Green Bros., Eastlake, Chippendale, Ruhlmann, Shaker, Roycroft and Mackintosh pieces – all on one CD!

Item # 25838 \$14.99

**CALL 800-279-4441 and mention code WE081 or visit us online
at www.woodworkersjournal.com/project_cds**

Finishing Thoughts

Protecting Outdoor Projects



Outdoor oil, like we used on our Kubb game pieces (page 44), is effective and easy to apply.

Here's a collection of 14 tips to help you deal with the elements — at least when it comes to protecting your outdoor woodworking projects!

CONTACT US

with your "Finishing Thoughts" by writing to Woodworker's Journal, 4365 Willow Drive, Medina, MN 55340, or by emailing us at: finishing@wwj.info
Please include your contact information with your thoughts or questions.

Summer is the time for building and finishing outdoor projects. For that reason, we looked to our archives for outdoor finishing tips that have appeared in past articles, in *Tricks of the Trade* and in our *Questions and Answers* departments. Here's our compilation of some of the best — hopefully they'll save you time, money and frustration.

Remember that outdoor finishing, like all finishing, begins well before you open a can of stain or finish. Wood, hardware and glue selections all matter, as does how you ultimately want the piece to look as it weathers. Use these tips to help you make your best choices.

1. The first step in choosing an effective outdoor finish is picking a proper wood species. White oak, red cedar, Spanish cedar, cypress, long leaf pine, teak and true mahoganies are among the best species selections.

2. For many of the species just mentioned, not finishing them at all is a viable option. If you choose to do that, sanding them very smoothly will help keep them from deteriorating by lessening moisture penetration.

3. If you leave an outdoor project as just bare wood, and if it stains or streaks over time, you can refresh its look by giving it a good cleaning and then using oxalic acid as directed on the package. Your project will look brand-new!

4. In some climates, mildew can be a problem on outdoor furniture. Solve it by mixing one quart of laundry bleach in a gallon of water — then give the project a good cleaning with a scrub brush and the solution. Be sure to keep the solution away from plants!

5. Always use non-rusting fasteners and hardware (screws, nails, nuts and bolts and hinges ...) on your outdoor

projects. This step will help prevent unsightly rust stains and streaks.

6. If you do get iron oxide streaking (rust stains), oxalic acid will remove that discoloration, too!

7. Outdoor oil finishes are fast and easy to apply and usually look great. The downside is that they must be reapplied every year. (But then, like we said, they are fast and easy to apply!)

8. Before you reapply or touch up any outdoor finish, be it oil, stain, etc., be sure to give the piece a good cleaning with soap and water. Allow it to dry completely and then apply the finish.

9. When finishing wooden outdoor tables and chairs, seal the end grain with clear epoxy. It will prevent moisture from wicking up the end grain. This is a technique called "packing."



10. Clear finishes like spar varnish and exterior-grade polyurethane will break down in direct sunlight. Keep a close eye on the finish and recoat as soon as you see it starting to fade.

11. True spar varnish, as it is exposed to the elements, will tend to chalk from the top, which allows you to sand and recoat without stripping. Water-based exterior acrylic

may last longer without maintenance but is more likely to delaminate — which requires stripping and refinishing completely.

12. Exterior-grade paint is the most robust exterior finish available. For best effect, pack the appropriate end grain areas with epoxy, apply a good quality exterior-rated primer and follow with a high quality paint or enamel.

13. The new generation “green” exterior-rated clear acrylic waterborne finishes are a sound outdoor finishing choice. But remember, no finish will hold up forever under sun and rain — examine the finish regularly.

14. Keep your outdoor pieces out of direct sunlight whenever possible (especially during the “off” seasons).

Outdoor Options:

The mahogany used for our Arts & Crafts-inspired Adirondack chair is a classic outdoor wood species, as is the reclaimed cypress in our garden bench. As demonstrated in our picnic table, a good paint job is one of the best outdoor finishes.

PRECISION BUILT FOR FINE WOODWORKING



GreX P6 Series 23 Ga. Headless Pinners

The Invisible Fastener.
In the shop & on site.
From fine work to crown & base.
From 3/8" up to 2" pins into Red Oak.



FIND YOUR DEALER

888-447-3926 • info@grexusa.com
905-838-4887 • info@grexcanada.com
www.grexusa.com



FINE WOODWORKING MOULDING TRIMMING FINISHING INTRICATE ASSEMBLY

(Circle No. 22 on PRODUCT INFORMATION form)

Skill Builder



Thin, Smooth and Strong

By Rob Johnstone

The three components of a sharp edge.



While grinding in such a way as to create a plume of sparks makes for a great photo, it is a surefire way to ruin a tool's temper. Grinding should be done with care.



Flattening the chisel's back



Grinding to repair the edge



Honing to smooth the edge

MORE ON THE WEB

For a detailed article on sharpening chisels, go to woodworkersjournal.com and click on the More on the Web tab shown above. Or send a large SASE to Woodworker's Journal, Skill Builder 16, 4365 Willow Drive, Medina, MN 55340.

As Larry Frye, my luthiery instructor, once explained, “The perfect cutting edge would be infinitely thin, infinitely smooth and infinitely strong — anything else is a compromise of one sort or another.” With that as our goal, every cutting edge we use must be an appropriately designed compromise. This isn’t as tricky as it may sound, since most tools will have the manufacturer’s best guess for the optimum cutting edge already ground and polished.

Truth be told, most woodworkers stay out of trouble until they start changing bevels and regrinding willy-nilly. Grinding should be done to repair an edge or to restore a bevel, because for most of us, it’s best to keep the existing bevel.

Grinding

Grinding and honing are the two basic steps in sharpening any knife-edged tool. Grinding removes a significant amount of metal and sets you up for honing success. Improper grinding will generate excessive heat and change the metal’s temper — the term for the strength component of our perfect cutting edge. Using a lubricated grinding wheel and removing the minimum amount of material are keys to keeping your tool’s temper.

The first important detail in any single-beveled edge is that the back of the blade must be perfectly flat. Another general principle is to avoid changing the angle of the existing bevel. The bevel of an edge is the compromise of a steel tool relative to our goal of infinite thinness.

Honing

Honing starts where grinding ends. After you have successfully ground the edge to the proper angle (thinness), while retaining the temper (strength), you must hone the edge to a mirror finish (infinitely smooth). Begin with a coarser stone and start to remove the grinding marks, honing the bevel perfectly smooth.

Move from coarse to ever finer grained stones, making the same number of strokes on both faces of the tool. Don’t skip a grit level as you hone; it will not save you time and will negatively affect your edge. The smoother you hone, the sharper your tool.

Your last polishing step should be with a leather strop. Then you will have reached your goal of a thin, smooth and strong cutting edge.

OUR WORLD IS **VERY** FLAT.



Riving Knife



Seamless Table

TABLE SAW WITH GRANITE TOP
- TABLE FLATNESS WITHIN 0.008" (27" X 44")

TABLE SAW WITH CAST IRON TOP
- TABLE FLATNESS WITHIN 0.01" (27" X 44")

**OUR NEW LINE OF TABLE SAWS FEATURES
THE BEST FLATNESS SPEC IN THE MARKET.**

- Pricing from \$499.99 ~ \$1299.99
Table material in Granite or Cast Iron
- Seamless table surface across
entire table (27" x 44")
- Extremely user friendly assembly
(20~30 minutes)
- For more details, please visit
www.steelcitytoolworks.com

IT'S A HELICAL GOOD PLANER.

**INTRODUCING THE WORLD'S FIRST PORTABLE
PLANER WITH A HELICAL CUTTERHEAD - AND
A PRICE TAG UNDER \$600.**

Steel City's 13" Deluxe Portable Planer 40200H features
a patented helical cutterhead with 2-sided HSS tips
sharpened to perfect wood cutting angle which is not
achievable in the Tungsten Carbide application.

Please come visit us on **August 25-28, 2010**
at the IWF 2010 Show in Atlanta // Booth #5547

SPECIAL OFFER AT \$5XX.00 with limited
quantity. To reveal the actual price, please check with
Steel City dealers at www.steelcitytoolworks.com



How Do You Create Endless Cabinet Door Making Possibilities?



Patented design allows for multiple rail & stile project combinations



Profile Shown:
Round Over
(#99-760)



With Freud's New Premier Adjustable Rail & Stile System

Now with Freud's new, patented Premier Adjustable Rail and Stile router bit system, you are able to build any style of cabinet door in a wide range of door thicknesses and sizes! This extremely easy-to-use solution gives you unlimited creative freedom, and solves the long-standing limitations of existing frame and panel door construction.

This one of a kind solution allows you to create extended tenons for extra door joint strength, adjust groove width for different panel thicknesses and choose from a variety of material thicknesses for your stiles and rails (5/8" to 1-1/4"). Optional add-on cutters increase your bits' capabilities even more, allowing you to create glass panel and double sided profile doors.

Four profiles are available; **Round Over** (#99-760), **Ogee** (#99-761), **Round Over Bead** (#99-763), and **Bevel** (#99-764).



Standard
stub tenons
in regular 3/4"
stock

Extended tenons for strong joints in larger doors

Glass & screen panel capability

Double Sided Profiles in thick stock



freud[®]
Precisely the best.

(Circle No. 17 on PRODUCT INFORMATION form)

To find more information, please go to:

www.freudtools.com/PremierRailandStile

Others



VS

Freud's New Premier Rail & Stile System

 Industry Standard Stub Tenons Joints	+	 Extended Tenons For Extra Strength	+	 Adjustable Grooves For Variable Panel Thickness	+	 Cabinet Doors In Varying Material Thickness	+	 Glass/Screen Panel Doors	+	 Double Sided Profile Doors
---	---	---	---	--	---	--	---	-------------------------------------	---	---------------------------------------

To sign up for Freud's e-mail newsletter or to find a dealer near you visit: www.freudtools.com

Red router bits are a registered trademark of Freud America, Inc. (US) 1-800-472-7307