

WOODWORKER'S JOURNAL

"America's leading woodworking authority"™



(page 38)



(page 26)



(page 32)

- A Woodworker's Dog Bed
- Make a Croquet Set
- Build a Custom Hobby Desk
- Shop Vacuum Roundup
- 23-gauge Pin Nailer Review

August 2014

\$5.99



7 33175 56841 8



ROCK SOLID PERFORMANCE



INTRODUCING THE NEW 14" BANDSAW

13-1/2"

RESAW CAPACITY

VERSATILE

FENCE SYSTEM

QUICK RELEASE

HEAVY-DUTY TENSIONING

FOUR-SIDED

BLADE GUARD



SEE THE VIDEO AT
JETTOOLS.COM/14BANDSAW



STAND BEHIND YOUR WORK™



350+ SERVICE CENTERS NATIONWIDE

INDUSTRY-LEADING WARRANTIES

EXPERT TECHNICAL SERVICE

© 2014 JPW Industries. All Rights Reserved.

Meet the new CNC Shark HD 2.0



CNC Shark HD 2.0
(54900) \$3999.99
Made in the USA

The CNC Shark HD 2.0 features a new interlocking rigid aluminum table, as well as smoother movements, more power and up to 50% more speed. With the new easy-to-use Vectric 7.5 software, you'll be up and running in no time. It's another way you can expand your capabilities and *Create with Confidence.*

Visit www.rockler.com/power-tools/cnc-machines or your local Rockler store today to learn more!



For a store near you or free catalog:

Rockler.com | 1-877-ROCKLER

Materials code 577

TORMEK

**SHARPENING
INNOVATION**



MY CHOICE OF SHARPENER.

"With Tormek, I can finally teach students to efficiently sharpen their tools. Anyone can learn how to achieve a superb cutting edge in 10 seconds! Fantastic system."

Glenn Lucas

Professional Woodturner
County Carlow, Ireland



See the video from Glenn's workshop at www.tormek.com!

23 Gauge Pin AND Brad Nailer

The finest tools on the planet



*Awesomness not shown to scale

More features:

- Shoots 1/2 inch – 2 inch nails
- Built in blow gun
- Case included

CadexTools.com



604 876 9909

info@cadextools.com



Woodworker's Journal

Contents

August 2014

Volume 38, Number 4



Page 32



26 Dog Bed

By Kimberly McNeelan

A woodworker's best friend deserves a custom-made bed, complete with pegged accents and a self-closing, dovetailed drawer.

32 Croquet Set

By Ernie Conover

Make a high-grade croquet set without breaking the bank.



56 Hobby Desk

By Sandor Nagyszalanczy

A fall-front desktop and ample storage space make this portable organizer a perfect enhancement for your hobbies.



Turn a perfect sphere

Departments



Page 26



6 Editor's Note and Letters

Have some fun in the shop.

12 Tricks of the Trade

Suction cup handle aids in finishing small parts.

14 Questions & Answers

When to change cutterhead inserts?
How to cut plywood veneer?

16 Stumpers

This "revolutionary" tool's identity clicked with some readers.

18 Shop Talk

Coconut wood from the South Seas.

22 Woodturning

It's time for the humble scraper to get the respect it deserves.



38 Tool Review

One of these 23-gauge pin nailers is the best bet for your shop.

46 Today's Shop

Basic or beyond? Find the right shop vacuum for your needs.

52 What's In Store

A roundup of new tools.

62 Finishing Thoughts

Fixes for six common spraying mistakes.

66 Hey ... Did You Know?

Woodworking as an ancient art?



Page 56

**YOU TAKE PRIDE IN
MAKING SOMETHING THAT
LASTS. SO DO WE.**

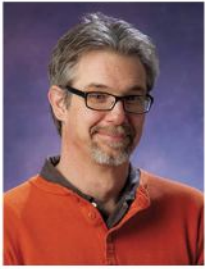


You're all about building things that stand the test of time. So you'll appreciate the left-tilt 10" Cabinet Saw (50-270KDL) with precision ground cast-iron table and the Deluxe Excalibur multi-position rip fence. Custom safety features include quick-release riving-style splitter with quick-remove blade guard and anti-kickback pawls, and stand-alone European style riving knife. Add the easy to install Excalibur Blade Cover that removes sawdust from above, immediately as it comes off the blade. To learn more about our entire line of woodworking tools, visit your nearest dealer or www.general.ca.



General® International USA Inc., 760 Jessica St., Murfreesboro, TN 37130

Woodworking for Fun!



WE ALL KNOW WOODWORKING IS FUNCTIONAL.

When you (or your spouse) need an end table, shelves for the pantry, a boot rack for the closet . . . you get out in your shop and get busy — and you enjoy it. Some projects, though, seem to skew even more toward the “fun” end of “functional.” You might be making a game, like the Croquet Set you’ll find on page 32. Or perhaps building something whimsical, like the Douglas fir Dog Bed on page 26. In this issue, you’ll find some really fun projects: they provide a useful item, but they’re also likely to tickle your fancy. Even our very practical Hobby Desk (page 56) is a project designed (by Sandor Nagyszalanczy) to hold stuff for your (or your spouse’s) other hobbies — which, if you think of it, is fun plus fun! I know that for most of us, any time in the shop is a pleasure, but if you are like me, making a game for the family or a puzzle for a grandchild just ups the ante. So with that in mind, I hope that you’ll find all our projects fun to plan for, fun to build, and fun to use.

— Rob Johnstone

Heating Up the Shop

Thought the article on workspace heating [“Heating a Woodshop,” April 2014] very informative, and necessary for us here in Montana. In my garage shop, I opted for a gas-fired forced-air ceiling unit. It has provided good service for the past 10 years.

My installer suggested a low-temperature thermostat, allowing the garage temp to be maintained at much lower temps during periods of no occupancy, and protecting from freezing. Manually adjusting the “stat” upon entering quickly brings the temperatures to the comfort zone.

R.B. King
Billings, Montana

I noticed you had an article on shop heating in your April 2014 issue and thought I’d throw in my two cents’ worth. I have a wood stove in my shop and save all my scraps and useless offcuts (they have to be



pretty small to be useless around me), then burn them up on cold days to take the chill off. Two birds with one stone, so to speak. Warm the shop and get rid of the scraps.

J. M. “Mike” Jeffries
Avinger, Texas

Great article; however, there are a few issues with the insulation installation. If the insulation is not making contact with the sheetrock and the outer wall, the R-value is almost zero. The insulation should not be compressed. Also, rather than using fiberglass I’d suggest using denim insulation. The vapor barrier is missing. The installer

Letters continues on page 8 ...

ROCKLER PRESS

THE VOICE OF THE WOODWORKING COMMUNITY

AUGUST 2014

Volume 38, Number 4

ROB JOHNSTONE *Publisher*

JOANNA WERCH TAKES *Editor*

CHRIS MARSHALL *Senior Editor*

JEFF JACOBSON *Senior Art Director*

JOE FAHEY *Associate Art Director*

DAN CARY *Senior Web Producer*

MATTHEW HOCKING *Internet Production Coordinator*

MARY TZIMOKAS *Circulation Director*

KELLY ROSAEN *Circulation Manager*

LAURA WHITE *Fulfillment Manager*

Founder

ANN ROCKLER JACKSON

Publisher Emeritus

LARRY N. STOIAKEN

Contributing Editors

NORTON ROCKLER

SANDOR NAGYSZALANCZY

ERNIE CONOVER

Advertising Sales

ALYSSA TAUER *Advertising Director*
atauer@woodworkersjournal.com

DAVID BECKLER *National Sales Representative*
dbeckler@woodworkersjournal.com
(469) 766-8842

Editorial Inquiries

JOANNA WERCH TAKES
jtakes@woodworkersjournal.com

Subscription Inquiries

(800) 765-4119 or
www.woodworkersjournal.com
Write Woodworker's Journal, P.O. Box 6211,
Harlan, IA 51593-1711

email: WWJcustserv@cdfsfulfillment.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 6211, Harlan, IA 51593-1711. Subscription Rates: One-year, \$19.95 (U.S.); \$28.95 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.

©2014 Rockler Press Inc. Printed in USA.



MIRKA

Innovative Solutions for Wood Finishing

www.mirka woodworking.us



White Wood Finishing



High Gloss Finishing



Solid Surface Finishing

The Portable Dust-Free Solution



Abranet®
Mesh Abrasives



Mirka® CEROS Sanders

3" - MIM32520US
5" - MIM55020CAUS
6" - MIM65020CAUS/MIM68020CAUS



MIN6519411 Vacuum Hose



MV-912 Dust Extractor

Mirka's Abranet® mesh abrasive offers unparalleled dust extraction across the entire abrasive surface and virtually dust-free sanding when used with Mirka® CEROS sanders and the MV-912 portable dust extractor!



Insulation was one option in our shop heating article. Readers have also shared other methods that work for them.

is using a breathing mask but has no protection for the hands. OK, so I'm a bit anal; however if you are going to do something, why not do it right?

John Terdik
Prescott, Arizona



Click through Quik-Link on our website to find information on the tools featured in these articles:

Tool Review (page 38)

Today's Shop (page 46)

What's In Store (page 52)

I was quite surprised that there was no mention of floor heating in your latest shop test. I believe it to be very efficient and probably the most comfortable of all heating systems. I use a 50 gallon gas hot water tank for my shop, which is 16'x32' in a very cold climate.

Paul Rabidoux
Bay City, Michigan

Your April 2014 edition Shop Test article on heating your shop really hit home for me as

I live in Buffalo, New York, and have had to plan for or address all of the topics you discussed. One thing I really like in my shop is the glass block windows. The sunlight is welcome company during the short days, the glass block is a much better insulator than regular windows and more secure from a security standpoint, and should I have a kickback or accidentally hit the window with a piece of lumber, the block is just about impossible to break.

Jason Betz
Buffalo, New York

Mystery Chair: Solved!

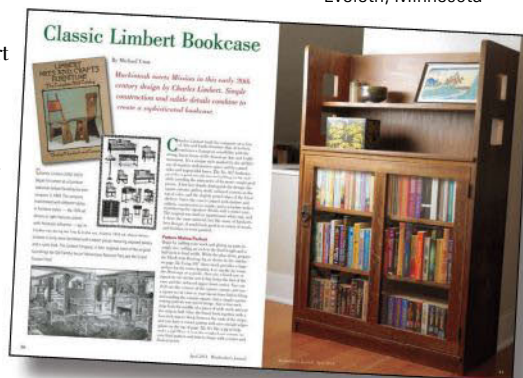
Many thank yous for answering a question I've had for many years. In the April 2014 issue, when I got to page 30 ["Classic Limbert Bookcase"], there was a picture of a chair my mother bought at a secondhand store in Glenwood, Minnesota, the year she graduated from high school, which was about 1926. It is the one on the right of the 1903 cata-



Reader's chair: no longer a mystery!

log picture. When she passed away, I got the chair and tried for many years to find out what style or type of furniture it was. Now I finally know what I have.

Joe Wobbema
Eveleth, Minnesota



Letters continues on page 10 ...

A Special Offer Exclusively for our Readers



With the summer heating up, it's a great time to get some outdoor projects in place. We've compiled 25 project choices that are fun to make and fun to build onto one CD: pick from easy to advanced plans to suit your summer lifestyle!

25 Outdoor Projects CD (item # 54864) \$14.99

Includes plans for these, and 21 more, outdoor projects ...



Westport Chair



Garden Cart



Craftsman-style
Outdoor Lantern



Portable
Gazebo

To order this DVD, visit:

www.woodworkersjournal.com and click on the "Store" tab

EDGE BANDING THE EASY WAY!

PORTABLE EDGE BANDERS



A TRADITION OF INNOVATION™



- For PVC, Veneer, Melamine and ABS applications
- For both straight or contoured panels
- Beveled edges from 90 ~ 75 °
- Automatic glue application without pre-adhesive needed
- Maximum width to 45mm
- Up to 25mm minimum inside radius.



IWF
ATLANTA
BOOTH #6769
8/20-8/23 2014

OPTIONAL
ACCESSORIES



Power Trimmer



Vacuum Clamp Kit



Dual End Cutter

AS SEEN ON
WOODCRAFT.COM
HOMEDEPOT.COM
& AMAZON.COM!!

WWW.OLIVERMACHINERY.NET | INFO@OLIVERMACHINERY.NET | 800-559-5065

Visit new customer forum: www.olivermachinery.boards.net

OLIVERMACHINERY

WWW.FACEBOOK.COM/OLIVERMACHINERY

WWW.YOUTUBE.COM/OLIVERMACHINERY

SAVE up to 50%

25-YEAR STEEL MILL BACKED WARRANTY

Garages Workshops Commercial Industrial

800-891-6733

MADE IN THE USA

www.steelspan.com ext 019

NEW

ARBORTECH mini TURBO™

Available Online Now
at www.arbortechusa.com

WWW.ARBORTECHUSA.COM ARBORTECH

Live Edge Slabs



North American Hardwood
Kiln Dried
Perfect for Bars, Islands, & Tables
Unfinished
Same Day Shipping



1.866.963.5601

www.woodencomponents.com



We heard from some experienced readers about their preferred ways to repair chairs.

There's more online at
woodworkersjournal.com

MORE ON THE WEB

Check online for more content covering the articles below:

Woodturning (page 22):

Different types of scrapers and their uses (video)

Dog Bed (page 26):

Additional material lists tailored to standard sizes of dog mattresses (PDF file)

Croquet Set (page 32):

Instructions for turning balls in a jam chuck (PDF file)
• Demonstration of turning balls using Carter Products Perfect Sphere™ Tool (video)

Small Shop Journal (page 56):

Overview of Hobby Desk assembly (video)

Better Fix for Chair Legs

I'm replying about the question and answer regarding fixing loose chair legs [Questions & Answers, April 2014]. My wife and I have owned a successful Furniture Medic® franchise since 1994. A large part of our business has to do with repairing chairs and casework with loose joints. We don't re-glue cheap chairs from discount stores. They just aren't worth the trouble.

I never use any of the products that swell the fibers. I have found that this is only a temporary fix. In most cases, I use brown Titebond® III Wood Glue. If there is any glue line, it blends in with the finish that is already on the chair. Some purists would say that one should only use hide glue; however, most of the chairs I re-glue weren't originally glued up with hide glue. I have been doing this for 20 years and very few chairs I have re-glued have made it back to my shop.

Steve Healy
Huntsville, Alabama

I remove the loose leg(s), and clean the hole and end of the leg with a scraper (old hacksaw blade with a wrap of duct tape for a handle). Then, using a thin kerf hacksaw, I cut a vertical slot in the leg, about 3/4 of the depth of the leg. I then cut a piece of a wood shingle to the length of the depth of cut. Depending on how loose the leg fits after scraping, I use the shingle thickness to try to fill the gap. I then use Gorilla Glue® (because it expands and foams, to fill crevices), and then assemble the joint(s). I clamp the legs using pipe clamp(s). I use some newspaper and painter's tape, in case any glue leaks. When I am finished, the chair is solid. If the chair rocks slightly, you



Ernie Conover's tips on bowl gouges and their bevels were helpful — and a little surprising — to Bruce Melton.

can sand the bottom of the two low (longer) legs with coarse sandpaper on a wood block.

Brian G. French
Assonet, Massachusetts

Thankful for Third Bevel

A big thank you to *Woodworker's Journal* and Ernie Conover for the article on bowl gouges, bevels and turning deeper bowls ["Additional Bevels for Turning Deeper Bowls," April 2014].

Granted, I have not read every book on turning, but this article spelled out a whole lot in a short time. The illustrations were hugely beneficial and clarified, at least for me, a subject that needed to be in print for a wide audience. The addition of the new third bevel was a welcome surprise.

Bruce Melton
Rolling Prairie, Indiana

Accordion Lamp Correx

In the April 2014 edition, there is an article on building an "Accordion Wall Lamp."

I liked this design, so I carefully read the article and the drawings provided. The struts are 1 1/8" wide, which makes the diameter of the ends also 1 1/8" inches. There are many locations where the plans state that the diameter is 9/16".



These locations should either state that the diameter is 1 1/8" or that the radius is 9/16".

Joe Grasso
St. Johnsbury, Vermont

WJ Responds: You are right, Joe. The drawings for the Lower Sliding Block, Struts and Bulb Base Sides of the Accordion Lamp should indicate that the 9/16" dimension is the radius. We apologize for the error.



Screen Door Adapted

I'm just about finished with a Screen Door project that Frank Grant wrote in August 2010 ["Make Your Own Screen Door"]. I made mine out of white oak. I'm waiting on some quotes for a custom stained glass piece in a Frank Lloyd Wright style.

I've attached a photo with it just in place. Still needs more finish, etc. I made the bottom panel larger since I have a dog in the house and I'm hoping he won't jump up and hit the screen.

Kevin McDonnell
Sammamish, Washington

JUST SPRAY IT!!

Mini-Mite 3 T-Series™

- ▶ Powerful 3-Stage Turbine Motor
- ▶ Produces a High Quality Finish
- ▶ Sleek Ergonomic Design
- ▶ Equipped with T-Series™ Spray Gun
- ▶ Portable System for All Fine-Finishing
- ▶ 24 Month Limited Warranty



www.fujispray.com or 1-800-650-0930

STOP BUYING LUMBER

Saw and produce lumber on site



G555B Mini Mill
\$126



G777 Small Log Mill
\$170

www.granberg.com
Call for a Free Catalog 800-233-6499

ELIMINATE SLOW TIMES

Earn extra \$ making bunk beds



- 19-year proven program
- A+ Rank with the BBB

Visit our website
for more information

Limited
Territories
ACT NOW!

1800bunkbed.com/wj

1800BunkBed

It's Your Business!™

Looking for Moisture Meters

Lignomat offers
pin and pinless meters

Avoid
Shrinking
Warping
Cracking
Cupping

Buy Quality, Accuracy, Reliability
and Professional Customer Service.



2-Year
Warranty!

??? Check out the new info Web-site
www.moistureproblems.info

lignomat.com 800-227-2105



MOLDERS

7 YEAR WARRANTY

APPLICATIONS

Straight • Curve • Elliptical

Why Settle?
Get the
BEST.



PROUDLY MADE IN THE USA
SINCE 1954

IN-STOCK & CUSTOM KNIVES

www.williamsnhussey.com

Toll Free 800.258.1380

70 Powers Street • Milford, NH 03055

TOUGH Dries Natural Color, No Foam GLUE



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



**For the Toughest Jobs
on Planet Earth®**

www.gorillatough.com

©2014 The Gorilla Glue Company

Tricks of the Trade

Hold (Almost) Everything in Your Shop

Tested and photographed by Chris Marshall



Clamps Left Holding the Bag

Once you empty most dust collectors, it's hard to hold the bag in position around the rim while installing the strap clamp again. Usually, the bag slips off just when you're ready to snap the clamp closed. Frustrating! Well, here's a simple solution to the problem: hold the bag in place with three or four small plastic spring clamps while you position and close the strap clamp. It makes the job quick and easy.

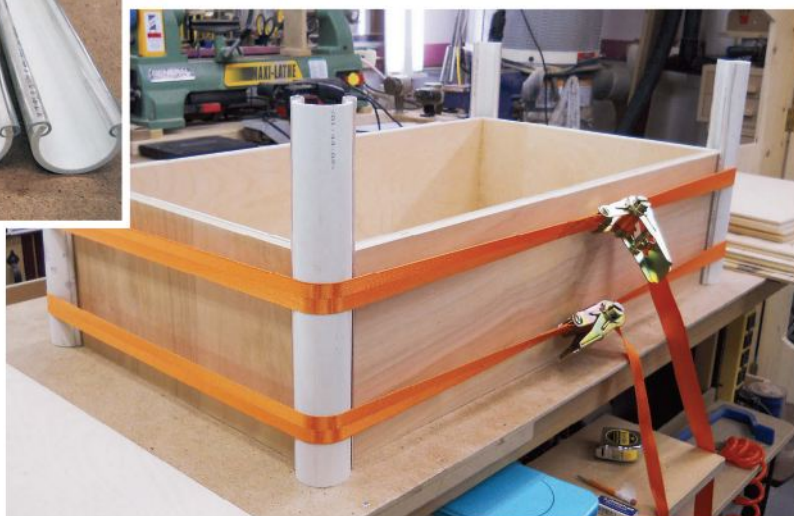
Bruce Barker
Cedar City, Utah

PVC Corner Cauls

Strap-type web clamps are a handy way to close the four corners of a box during glue-ups. A caul at each corner can help direct the clamping pressure even better without smearing the glue.

I make mine from thick-walled, 2"-diameter PVC pipe. I first rip-cut pieces of pipe on the table saw to remove about a 35 percent section of their circumference. After sanding the cut edges smooth, I cover them with 3/8" vinyl tubing, slitted lengthwise to slip over the pipe edges. The combination makes sturdy, nonstick cauls that stand up well under clamping pressure.

Serge Duclos
Delson, Quebec



Keep Those Reply Cards!

The first thing I used to do with a new magazine was to throw away those loose reply cards inside, but then it occurred to me that I was wasting a good shop resource. These cards are handy for holding puddles of glue. I put them under freshly stained items or use them to mask off areas during finishing. They also make great shims. Keep the cards in an envelope in the shop, because their myriad uses are only limited by your imagination. And, they're free!

A.J. Hamler
Williamstown, West Virginia



Onboard Tool Article Archive

I subscribe to several woodworking magazines that are a constant source of helpful tool articles and tips. For those I wish to save for future reference, I photocopy or clip them out of the magazine and store them in a closable plastic envelope that you can find at office supply stores. Then, I attach the envelope directly to the applicable tool for a convenient reference library whenever I need it.

James P. Hanna
Franklin, Pennsylvania



PICK OF THE TRICKS

Suction Cup Parts Holder

Finishing all sides of small parts is a lot easier if you don't have to hold them by hand. Here's a little helper I use: I attached a suction cup to the end of a large dowel that's long enough to serve as a handle. After you've applied finish to one part face and the finish cures, the suction cup will stick to that surface. Now you can finish the rest of the surfaces of the workpiece without getting finish on your fingers — or fingerprints in the finish! Works great.

Jim Moorehead
Barrigada, Guam



In addition to our standard payment (below), Jim Moorehead of Barrigada, Guam, will also receive a **RIDGID 3-piece 18V Hyper Lithium-Ion Combo Kit (Drill, Impact Driver & Radio)** 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

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.

Clamping Technology | Cutting Technology | Precision Steel

125 YEARS **BESSEY**



If you know clamps, you know BESSEY®.

You know our reputation for quality and reliability; you know we're 125 years of German engineering backed by the strength of our product and reputation.

BESSEY®. Simply better.

Available at The Home Depot.



www.besseytools.com

Questions & Answers

Change One, Change All?

THIS ISSUE'S EXPERTS

Rod Burrow is
lead technician for RIKON
Power Tools, Inc.

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

Rob Johnstone is
publisher of
Woodworker's Journal.

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:

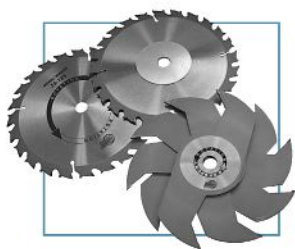
QandA@woodworkersjournal.com

Please include your home

address, phone number and

email address (if you have one)

with your question.



Winner!

For simply sending in his
question on replacing spiral
cutterhead inserts, John
Mahoney of West Burlington,
Iowa, wins a **General
International 7-piece
Deluxe 8" Dado Blade Set**
(item 55-185).

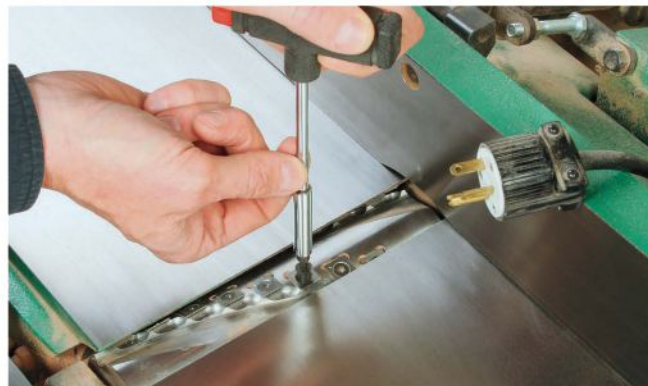
Each issue we toss new
questions into a hat and
draw a winner.

Q After reading about spiral
cutterheads on jointers
and planers, I understand the
advantage of being able to just
turn the cutter insert for a new
edge. My question is: when
you change one of the cutter
inserts to a new edge, should
you change just the one insert
or should you change all of
the inserts? Could there be an
uneven, though slight, cut on
the surface?

John Mahoney
West Burlington, Iowa

A If you find that one edge
of a carbide insert is
worn, it is certain that others
in the cutterhead are not
that far behind. It would be
recommended to change all
at once, especially if you
constantly work with hard or
exotic woods. If you have a
new machine or just rotated
inserts and find one to be
damaged, you can rotate just
the one and run a test. At most,
you may see a difference of
.001" in depth, which can be
easily sanded out.

— Rod Burrow



Is changing carbide inserts on a spiral cutterhead an all-or-nothing deal?

Q I'm making the "Veneer
Paneled Blanket Chest"
from the October 2013 issue
of *Woodworker's Journal*. I
substituted oak-faced MDF
paneling for the veneer layup
work. Should I glue the panel
sections and the stiles to the
rails? I know on kitchen cabinet
doors, gluing the panel insert
to the frame is a "no-no,"
but that's because the center
panel is usually solid wood,
subject to seasonal expansion.

Tom Stephan
Toccoa, Georgia

A You could certainly
glue the panels; as you
point out, seasonal expan-
sion and contraction won't
be an issue for your MDF
panels here.

I didn't glue them in, and
here's why: with five panels,
two legs, top and bottom rails
and all those intermediate stiles
going together at basically the
same time, you're going to
have a lot of wet glue joints
to deal with. If the glue starts
setting up, it could make
alignment and clamping all
the parts together squarely
more difficult than it needs to
be. That's why I pinned these
panels in place with 5/8"
brads from the inside. The
brads fix the panels in place
but without "open time" issues
to complicate things.

If your leg/rail mortise-and-
tenon joints are nice and snug,
and the stub tenons on the
ends of the intermediate stiles
seat in those grooves with a
good friction fit, you'll have all
the strength you really need.
But if you are more of a gam-
bler than I tend to be, feel free
to glue the panels in place.

— Chris Marshall



*To glue or not to glue? For this project, seasonal expansion is not a
factor — but it does make a difference in alignment during assembly.*

Q How do I stop my saw
blade from ripping out
veneer when I'm cutting along
the saw line of my project? I'm
using 1/2" and 1/4" birch, and
I can only get a clean cut on
one edge of the board.

Fred Hoehn
Mount Forest, Ontario

Continues on page 16 ...



Introducing Our New Fusion 40 with a Large 40"x 28" Engraving Area

It will change what you expect from a laser.

- Engrave items up to 13.25" in material height
- Our highest engraving and cutting speeds
- Large viewing door with LED lighting
- Laser tube wattages up to 120 watts
- Create intricate inlays with a laser



Desktop systems starting at \$7,995

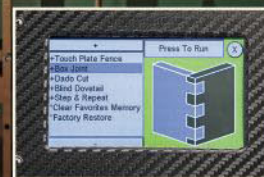
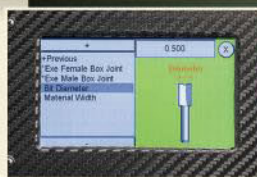
To request a brochure, DVD, and samples, contact us at:
epiloglaser.com/wwj • sales@epiloglaser.com • 888-437-4564



NEW SYSTEM

Need joinery? We have an app for that!

No more worrying about accuracy in your router table measurements! Complete your project in a fraction of the time with precise repeatable routing in seconds. The Ready2Route can now save 11 custom fence settings. Apps include half-blind dovetails, box joints, fluting, and dados made quickly and easily. Set your router bit position instantly and accurately when using the included touch plate.



Ready2Route Router Table Fence (44999) \$~99.99
Made in the USA

See it in action!



For a store near you or free catalog:

Rockler.com

1-877-ROCKLER

Materials code 578

Stumpers

Measure for Measure

Measuring wheel? Obvious. What kind and what for? Not so much.

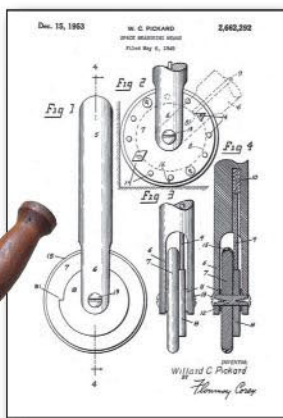


What's This?

This tool was donated to historic Harriton House in Bryn Mawr, Pennsylvania. Do you know what it is? Send your answer to stumpers@woodworkersjournal.com or write to "Stumpers," Woodworker's Journal, 4365 Willow Drive, Medina, MN 55340 for a chance to win a prize!



Woodworker's Journal editor Joanna Werch Takes compiles each issue's Stumpers responses — and reads every one.



Patent drawing

In surveying the answers submitted for the mystery tool belonging to **Ray Elish** of Brecksville, Ohio, that appeared in our April issue, two things became clear: 1) Stumpers readers eat a lot of pizza. 2) Every other person's grandfather was either a blacksmith or a wheelwright.

Readers offered such suggestions as **Mike Runge** of Waterloo, Iowa's, note that it could be "a fancy Weight Watchers pizza cutter where you can measure out the exact slice." And several people thought it was a wheelwright's traveler.

While that classic tool is among those referenced in the patent for Ray's tool, it's called, in Patent 2,662,292, a "Space Measuring Means." Or, according to **Steve Steenburgh** of Gahanna, Ohio, it was also known as a "Wooden Distance Measuring Tool, made by the Pix Products Co. in Cedar Rapids, Iowa."

"It makes a loud click every revolution that you have to count," added

Ardean "Butch" Kort of Rothschild, Wisconsin. In his patent application, filed in 1949 and granted in 1953, Willard C. Pickard of Cedar Rapids mentioned those audible "snaps" at every 12" revolution, and also included "markers 1 inch apart ... with four markers of distinctive form" to allow measuring by sight or by touch.

What's it for? When **Jerry Porter** of Raymond, Washington, began working for the assessor's office in 1973, "I was given an 'appraisal box' which contained a clipboard and one measuring wheel. It was rolled down the wall of a structure and the number of clicks were counted for the length of that wall."

According to the patent, "contractors, mortgage loan officials, surveyors, appraisers and others oftentimes must measure the interior and exterior of buildings, rooms therein, or parts thereof."

Remember the ongoing mystery of October 2013's tool (it kept us baffled in February)? Bill Eviston of Huntertown, Indiana, has ID'd it as a candy cutter. Culinarycuriosity.org says it dates to 1890, when it was used to cut hot ribbons of candy that were then threaded onto rollers.

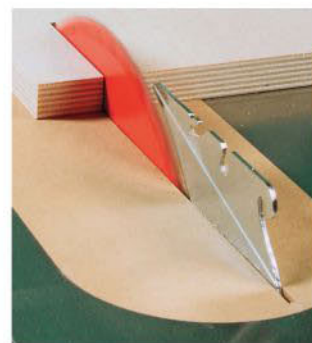


Winner! Bill Eviston of Huntertown, Indiana, who successfully identified the October 2013 lingering mystery tool, wins a **DeWALT Cordless Framing Nailer**.



Questions & Answers continued

A First off, there are saw blades that are specifically made for cutting plywood without chipping out the veneer. They are not cheap, but if you cut a lot of plywood, they are worth the cost, in my opinion. The next thing to do is to check the alignment of your fence to your saw blade. Your blade needs to be perfectly parallel to the fence. (Some folks think the fence should "toe in": it should not.) It's important to use a zero-clearance insert on your table saw. Shop-made or storebought are both equally good, but the tighter it fits to the saw blade, the better to avoid tearout.



Specialized blades and zero-clearance inserts help to cut plywood veneer without chipping.

My next advice is something that some woodworkers do not agree with, but it is how I do my work. When cutting plywood with fragile veneer, I raise the saw blade up rather high, so the teeth slice nearly straight down as they cut through the stock. Keep your guard on the saw and your fingers far away from the blade.

If all that sounds like too much fuss and bother, you can always get at least one perfect edge on the plywood if you take the time to score the cut using a straightedge and sharp knife. Align the blade so the teeth are perfectly in line with the cut fibers, and there will be no tearout.

— Rob Johnstone



ROCKLER®
WOODWORKING AND HARDWARE

Create with Confidence™

FREE



Make straight, square cuts easily! Plus SAVE \$60 on this Three Clamp Guide Set!

The most complete catalog for woodworkers

- Featuring over 10,000 items
- Innovative jigs and tools
- Router accessories
- Rare hardwood
- Turning supplies

Get your FREE catalog today at www.rockler.com/go/574 or call 1-800-279-4441 (Code 574).

GO VERTICAL

Panel Cutting Made Easy

Horizontal Cuts

Limited Time Offer Only **\$899**

Vertical Cuts



- One Person Sawing
- Requires Little Floor Space
- Very Safe To Use
- Portable To The Job Site
- Quick and Easy Set Up

www.panelpro.com • 800-599-1655

BADGER HARDWOODS
of Wisconsin, Ltd.

Great selection of premium hardwoods and plywoods, custom mouldings, bulk packs, and more!

Call Badger Bob Today!
(800) 252-2373

WWW.BADGERWOOD.COM
badgerwood@badgerwood.com

Est. 1986
Walworth, WI



UNIQUE SOLUTIONS

Our Filters Feature

- Optimum Performance
- 1-Micron Filtration
- Custom Designs
- Cleaner Air
- Proudly Made In USA

Visit us at Booth 1873

IWFA ATLANTA
August 20-23 2014

Free Design Assistance for All Custom Made Dust Bags

AMERICAN FABRIC FILTER CO.
www.americanfabricfilter.com 800-367-3591




We Fix Dust Collection Problems!

BALTIC BIRCH

Shipped to You!

100% Satisfaction Guarantee Every Order

- ☒ High grade Baltic Birch
- ☒ Any size you want
- ☒ Friendly service
- ☒ Free shipping packs

Easy online ordering with Woodworkers Source

www.101woods.com

VISA PayPal 800-423-2450




EPILOG LASER FUSION
MADE IN USA

EPILOG LASER

Introducing THE ALL NEW FUSION LASER SYSTEM BY EPILOG LASER



Desktop systems starting at \$7,995
epiloglaser.com/wwwj • sales@epiloglaser.com

IX COLLETS

Internal Expanding Collets

... used with a Beall Collet Chuck or a drill chuck, they expand inside your work to clamp it securely. Set of 8 Internal expanding collets sized from 1/2" to 1-1/2" in a handsome cherry block.

THE BEALL TOOL CO.
541 Swans Road N.E. Newark Ohio 43055
1-800-331-4718 www.bealltool.com Dpt. WJ




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 waist-high grass and weeds.

TRACTOR OWNERS
3-Point Hitch, tractor-mounted model available.



Call for a FREE DVD and Catalog!

TOLL-FREE
888-212-2548
DRtrimmer.com



0% MONTHLY INTEREST & FREE 36 MONTHS SHIPPING
LIMITED TIME OFFER

Self-Feeding DR® CHIPPER

Just load a DR® RAPID-FEED™ Chipper, step back, and watch it chew up 5 1/2" thick branches!

Try a DR® at Home for 6 Months!
Call for details.



SELF-FEEDING
Most branches will self-feed, instead of you force-feeding.

CHIP 5-1/2" BRANCHES
with engines up to 18 HP.

BIG FLYWHEELS generate tremendous inertia to devour branches by taking 40 "bites" per second!

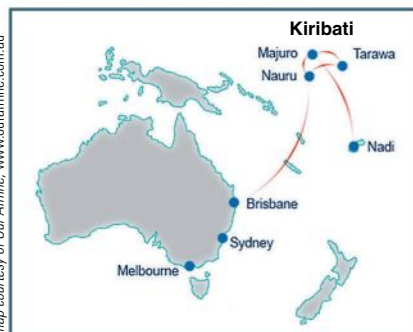
TRACTOR OWNERS
3-Point Hitch model.

Call for a FREE DVD and Catalog!

TOLL-FREE
888-212-2548
DRchipper.com



New Era for South Pacific Coconut Wood?



map courtesy of Our Airline, www.ourairline.com.au

The country of Kiribati consists of 32 atolls and one coral island. The capital is located in the Tarawa atoll.

Ron Davison first encountered the Pacific island country of Kiribati as a missionary teacher training adults for their secondary teaching certification. The father of one of his physics students happened to be the chief agricultural officer of the country and told Ron in 2004 that 95 percent of his coconut forest

was close to its 65-year life expectancy and would need to be replaced to support the island's only export.

The planting of many of those coconut trees dates to the latter years of World War II, when the islands

were occupied by Japan. Following an Allied victory in battle, the U.S. forces buried the casualties in deep trenches, with coconut seedlings planted atop them.

"We returned to Utah from Tarawa in October 2005, but my wife tells me that I have not returned home yet, because not a day goes by without me talking about coconuts!" said Ron.

In fact, he has big plans for the coconut trees, and their wood. "I want to turn the beautiful old, useless trees into furniture

pieces for export to high-end homes through eBay auctions," Ron said. In particular, he's thinking that the freckled grain of the trees would create attractive spiral balusters.

Of course, there are a few challenges to this plan. Some come from the wood itself: in the lower portion of the trees, it has a high silicate (glass) content, which makes it hard to cut and mill. In the upper portion of the old, hollow trees, the wood has a very low density.

Ron, who is retired from 32 years of teaching physics, chemistry and math to high school students, plans to address this problem by treat-

ing the upper portions of the logs with sodium silicate, or "liquid glass." "The wood has a pH of 6, or is slightly acidic, while the silicate has a pH of 12," he said. "This means that the liquid glass has to penetrate quickly, before it is neutralized. Once the silicate's pH drops to 7, it turns to glass.



Ron Davison's dreams for Kiribati's coconut wood mean the South Pacific country is constantly in his thoughts.



Coconut wood
salt and pepper shakers



Coconut
wood mug



Ron Davison believes the freckled grain — shown in items at left — of coconut wood makes it a good choice for export from Kiribati.

Any further milling will be done by grinding, just as a ‘rock hound’ does with petrified wood.”

The most difficult part of the ordeal, Ron said, is the two-month drying process to avoid warping. “There is sugar water in the cells and between the cells that has to be removed without creating stress. The natives have been doing this for thousands of years by anchoring the cut wood in the lagoon shade for two months, but it doesn’t slow down the termites.”



Ron, shown here with a stick of coconut wood, says some of the wood’s properties are challenging.

Ron plans to control the water removal rate from the wood with heat and a dehumidifier inside a sealed 20’ metal cargo container, surrounded by 4’x8’ reflective sheets to catch overhead rays of the sun during the day and fitted to the top and side at night to retain heat from the previous day. “I expect the liquid glass to deter even the termites and to make the wood fire-retardant,” he said.

“I am going to need a lot of help with the drying process,” and with other aspects of his plan, Ron said. “I am not an artist, and I am only a wannabe woodworker. I would like

to find a few woodworkers who love the South Pacific and would be willing to help” with milling, running a CNC router and solar kiln drying.

Also, “the coconut tree truly is the ‘tree of life,’ so it is important that our project not interfere with the domestic

supply of the few nuts left,” Ron said. “I plan to cut only 10 percent of each island and plant more trees than we cut. With a sustainable 10-year cutting cycle to cover the five-year regrowth cycle, that will take me to age 85, and I may slow down to where I could use a little reforestation help.”

For further info, contact Ron Davison at smartestinc@gmail.com or 801-400-4529.



Saltwater lagoons are prevalent in the country of Kiribati and are the traditional site for curing coconut wood.



Some of Ron’s former college students have agreed to handle clerical and administrative tasks for his coconut wood project.

500 Stores
Nationwide

HARBOR FREIGHT

QUALITY TOOLS AT RIDICULOUSLY LOW PRICES

LIFETIME
WARRANTY
ON ALL HAND TOOLS

Why a FREE GIFT with NO PURCHASE REQUIRED and NO STRINGS ATTACHED?
Because once you see our GREAT QUALITY and RIDICULOUSLY LOW PRICES,
YOU'LL NEVER BUY TOOLS ANYWHERE ELSE!

SCISSOR SUPER COUPON!

\$6.99
VALUE

NO PURCHASE REQUIRED

FREE

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

ITEM 65020
69052/69111
Item 65020 shown

LIMIT 1 - Cannot be used with other discount coupon. Coupon good at our retail stores only. Offer good while supplies last. Non-transferable. Original coupon must be presented. Valid through 11/1/14. Limit one FREE GIFT coupon per customer per day.

10573167

SCISSOR SUPER COUPON!

\$6.99
VALUE

NO PURCHASE REQUIRED

FREE

PITTSBURGH 1" x 25 FT. TAPE MEASURE

ITEM 47737/69080
69030/69031
Item 47737 shown

LIMIT 1 - Cannot be used with other discount coupon. Coupon good at our retail stores only. Offer good while supplies last. Non-transferable. Original coupon must be presented. Valid through 11/1/14. Limit one FREE GIFT coupon per customer per day.

10064357

SCISSOR SUPER COUPON!

\$4.99
VALUE

NO PURCHASE REQUIRED

FREE

PITTSBURGH 6 PIECE SCREWDRIVER SET

ITEM 47770/61313
Item 47770 shown

LIMIT 1 - Cannot be used with other discount coupon. Coupon good at our retail stores only. Offer good while supplies last. Non-transferable. Original coupon must be presented. Valid through 11/1/14. Limit one FREE GIFT coupon per customer per day.

33197023

SAVE \$70

2.5 HP, 21 GALLON 125 PSI VERTICAL AIR COMPRESSOR

CENTRAL PNEUMATIC

LOT NO. 67847
61454/61693
Item 67847 shown

\$149.99 REG. PRICE \$219.99

LIMIT 4 - Good at our stores or Harbor Freight.com or by calling 800-423-2567. Cannot be used with other discount or coupon or prior purchases after 30 days from original purchase with original receipt. Offer good while supplies last. Non-transferable. Original coupon must be presented. Valid through 11/1/14. Limit one coupon per customer per day.

02070507

SCISSOR SUPER COUPON!

20% OFF

ANY SINGLE ITEM

LIMIT 1 - Save 20% on any one item purchased at our stores or Harbor Freight.com or by calling 800-423-2567. Cannot be used with other discount, coupon, gift card, trade show membership, extended service plan or on any of the following: compressors, generators, tool storage or carts, welders, floor jacks, Swivel Shop De Sander (Item 69052), open trencher, trencher or parking lot sale items. Not valid on prior purchases after 30 days from original purchase date with original receipt. Non-transferable. Original coupon must be presented. Valid through 11/1/14. Limit one coupon per customer per day.

10064357

SAVE \$60

14" OSCILLATING SPINDLE SANDER

CENTRAL MACHINERY

LOT NO. 69257
95088/62146
Item 69257 shown

\$89.99 REG. PRICE \$149.99

LIMIT 4 - Good at our stores or Harbor Freight.com or by calling 800-423-2567. Cannot be used with other discount or coupon or prior purchases after 30 days from original purchase with original receipt. Offer good while supplies last. Non-transferable. Original coupon must be presented. Valid through 11/1/14. Limit one coupon per customer per day.

596601118

Customers and Experts Agree Harbor Freight WINS in QUALITY and PRICE

SAVE \$110

60" WORKBENCH WITH FOUR DRAWERS

WINDSOR DESIGN

LOT NO. 93454
69054
Item 93454 shown

\$139.99 REG. PRICE \$249.99

LIMIT 4 - Good at our stores or Harbor Freight.com or by calling 800-423-2567. Cannot be used with other discount or coupon or prior purchases after 30 days from original purchase with original receipt. Offer good while supplies last. Non-transferable. Original coupon must be presented. Valid through 11/1/14. Limit one coupon per customer per day.

52848883

SAVE \$115

10" SLIDING COMPOUND MITER SAW

CHICAGO ELECTRIC

LOT NO. 98199/61307
61971/61972
Item 98199 shown

\$84.99 REG. PRICE \$199.99

LIMIT 3 - Good at our stores or Harbor Freight.com or by calling 800-423-2567. Cannot be used with other discount or coupon or prior purchases after 30 days from original purchase with original receipt. Offer good while supplies last. Non-transferable. Original coupon must be presented. Valid through 11/1/14. Limit one coupon per customer per day.

35108591

SAVE 42%

1/4" TRIM ROUTER

drillmaster

LOT NO. 44914/61626
Item 44914 shown

\$19.99 REG. PRICE \$39.99

LIMIT 4 - Good at our stores or Harbor Freight.com or by calling 800-423-2567. Cannot be used with other discount or coupon or prior purchases after 30 days from original purchase with original receipt. Offer good while supplies last. Non-transferable. Original coupon must be presented. Valid through 11/1/14. Limit one coupon per customer per day.

64735654

SAVE \$80

2 HP INDUSTRIAL 5 MICRON DUST COLLECTOR

CENTRAL MACHINERY

LOT NO. 97869/61790
Item 97869 shown

\$169.99 REG. PRICE \$249.99

LIMIT 3 - Good at our stores or Harbor Freight.com or by calling 800-423-2567. Cannot be used with other discount or coupon or prior purchases after 30 days from original purchase with original receipt. Offer good while supplies last. Non-transferable. Original coupon must be presented. Valid through 11/1/14. Limit one coupon per customer per day.

62488038

SAVE \$40

4" x 36" BELT/6" DISC SANDER

CENTRAL MACHINERY

LOT NO. 97181/93981
Item 97181 shown

\$59.99 REG. PRICE \$99.99

LIMIT 3 - Good at our stores or Harbor Freight.com or by calling 800-423-2567. Cannot be used with other discount or coupon or prior purchases after 30 days from original purchase with original receipt. Offer good while supplies last. Non-transferable. Original coupon must be presented. Valid through 11/1/14. Limit one coupon per customer per day.

38579745

SAVE \$85

RAPID PUMP® 3 TON HEAVY DUTY STEEL FLOOR JACK

PITTSBURGH

LOT NO. 68048/69227/62116
Item 68048 shown

\$74.99 REG. PRICE \$159.99

LIMIT 3 - Good at our stores or Harbor Freight.com or by calling 800-423-2567. Cannot be used with other discount or coupon or prior purchases after 30 days from original purchase with original receipt. Offer good while supplies last. Non-transferable. Original coupon must be presented. Valid through 11/1/14. Limit one coupon per customer per day.

75118041

SAVE \$330

44", 13 DRAWER INDUSTRIAL QUALITY ROLLER CABINET

NEW!

LOT NO. 68784
69387
62270
Item 68784 shown

\$369.99 REG. PRICE \$699.99

LIMIT 1 - Good at our stores or Harbor Freight.com or by calling 800-423-2567. Cannot be used with other discount or coupon or prior purchases after 30 days from original purchase with original receipt. Offer good while supplies last. Non-transferable. Original coupon must be presented. Valid through 11/1/14. Limit one coupon per customer per day.

84576575

SAVE 46%

24" CLAMP AND CUT EDGE GUIDE

PITTSBURGH

LOT NO. 68126
Item 68126 shown

\$6.99 REG. PRICE \$12.99

LIMIT 3 - Good at our stores or Harbor Freight.com or by calling 800-423-2567. Cannot be used with other discount or coupon or prior purchases after 30 days from original purchase with original receipt. Offer good while supplies last. Non-transferable. Original coupon must be presented. Valid through 11/1/14. Limit one coupon per customer per day.

74334813

Customers and Experts Agree Harbor Freight WINS in QUALITY and PRICE

SUPER COUPON!

500 LB. CAPACITY STEEL CARGO CARRIER
 Item 60983 shown
\$499.99
 REG. PRICE \$99.99

SAVE \$50

LOT NO. 69983/69623

27243522

LIMIT 2 - Good at our stores or HarborFreight.com or by calling 800-423-2567. Cannot be used with other discount or coupon or prior purchases after 30 days from original purchase with original receipt. Other good while supplies last. Non-transferable. Original coupon must be presented. Valid through 11/1/14. Limit one coupon per customer per day.

SUPER COUPON!

12" x 33-3/8" WOOD LATHE WITH REVERSIBLE HEAD
 Item 34706 shown
\$199.99
 REG. PRICE \$349.99

SAVE \$150

LOT NO. 34706

82744297

LIMIT 4 - Good at our stores or HarborFreight.com or by calling 800-423-2567. Cannot be used with other discount or coupon or prior purchases after 30 days from original purchase with original receipt. Other good while supplies last. Non-transferable. Original coupon must be presented. Valid through 11/1/14. Limit one coupon per customer per day.

SUPER COUPON!

16" VARIABLE SPEED SCROLL SAW
 Item 34706 shown
\$59.99
 REG. PRICE \$79.99

SAVE 25%

LOT NO. 34706

76231950

LIMIT 3 - Good at our stores or HarborFreight.com or by calling 800-423-2567. Cannot be used with other discount or coupon or prior purchases after 30 days from original purchase with original receipt. Other good while supplies last. Non-transferable. Original coupon must be presented. Valid through 11/1/14. Limit one coupon per customer per day.

SUPER COUPON!

6" DIGITAL CALIPER PITTSBURGH
 Item 47257 shown
\$11.99
 REG. PRICE \$29.99

SAVE 60%

LOT NO. 47257/61585

24912594

LIMIT 6 - Good at our stores or HarborFreight.com or by calling 800-423-2567. Cannot be used with other discount or coupon or prior purchases after 30 days from original purchase with original receipt. Other good while supplies last. Non-transferable. Original coupon must be presented. Valid through 11/1/14. Limit one coupon per customer per day.

SUPER COUPON!

1.5 CUBIC FT. SOLID STEEL DIGITAL FLOOR SAFE
 Item 91005 shown
\$109.99
 REG. PRICE \$149.99

SAVE \$40

LOT NO. 91005/61565

31963550

LIMIT 1 - Good at our stores or HarborFreight.com or by calling 800-423-2567. Cannot be used with other discount or coupon or prior purchases after 30 days from original purchase with original receipt. Other good while supplies last. Non-transferable. Original coupon must be presented. Valid through 11/1/14. Limit one coupon per customer per day.

SUPER COUPON!

80 PIECE ROTARY TOOL KIT
 Item 97626 shown
\$7.99
 REG. PRICE \$24.99

SAVE 68%

LOT NO. 88986/97626/69451

96079461

LIMIT 3 - Good at our stores or HarborFreight.com or by calling 800-423-2567. Cannot be used with other discount or coupon or prior purchases after 30 days from original purchase with original receipt. Other good while supplies last. Non-transferable. Original coupon must be presented. Valid through 11/1/14. Limit one coupon per customer per day.

SUPER COUPON!

4000 PEAK/3200 RUNNING WATTS 6.5 HP (212 CC) GAS GENERATORS
 Item 68528/69676/69729 shown
\$299.99
 REG. PRICE \$499.99

SAVE \$200

LOT NO. 68528/69676/69729

27464125

LIMIT 6 - Good at our stores or HarborFreight.com or by calling 800-423-2567. Cannot be used with other discount or coupon or prior purchases after 30 days from original purchase with original receipt. Other good while supplies last. Non-transferable. Original coupon must be presented. Valid through 11/1/14. Limit one coupon per customer per day.

SUPER COUPON!

12" RATCHET BAR CLAMP/SPREADER PITTSBURGH
 Item 68222 shown
\$1.99
 REG. PRICE \$5.99

SAVE 66%

LOT NO. 46807/68975/69221/69222/62123

67168913

LIMIT 2 - Good at our stores or HarborFreight.com or by calling 800-423-2567. Cannot be used with other discount or coupon or prior purchases after 30 days from original purchase with original receipt. Other good while supplies last. Non-transferable. Original coupon must be presented. Valid through 11/1/14. Limit one coupon per customer per day.

SUPER COUPON!

8" 5 SPEED BENCH MOUNT DRILL PRESS
 Item 60236 shown
\$54.99
 REG. PRICE \$99.99

SAVE \$45

LOT NO. 44506/60238

66932391

LIMIT 3 - Good at our stores or HarborFreight.com or by calling 800-423-2567. Cannot be used with other discount or coupon or prior purchases after 30 days from original purchase with original receipt. Other good while supplies last. Non-transferable. Original coupon must be presented. Valid through 11/1/14. Limit one coupon per customer per day.

SUPER COUPON!

1500 WATT DUAL TEMPERATURE HEAT GUN
 Item 90269 shown
\$8.99
 REG. PRICE \$25.99

SAVE 65%

LOT NO. 90269/62340

60544024

LIMIT 7 - Good at our stores or HarborFreight.com or by calling 800-423-2567. Cannot be used with other discount or coupon or prior purchases after 30 days from original purchase with original receipt. Other good while supplies last. Non-transferable. Original coupon must be presented. Valid through 11/1/14. Limit one coupon per customer per day.

SUPER COUPON!

9" x 72" PIECE STEEL LOADING RAMPS
 Item 44649 shown
\$39.99
 REG. PRICE \$79.99

SAVE 50%

LOT NO. 44649/69646

57437598

LIMIT 4 - Good at our stores or HarborFreight.com or by calling 800-423-2567. Cannot be used with other discount or coupon or prior purchases after 30 days from original purchase with original receipt. Other good while supplies last. Non-transferable. Original coupon must be presented. Valid through 11/1/14. Limit one coupon per customer per day.

SUPER COUPON!

18 GAUGE 2-IN-1 NAILER/STAPLER
 Item 68019 shown
\$15.49
 REG. PRICE \$35.99

SAVE 56%

LOT NO. 68019/61661

62489243

LIMIT 7 - Good at our stores or HarborFreight.com or by calling 800-423-2567. Cannot be used with other discount or coupon or prior purchases after 30 days from original purchase with original receipt. Other good while supplies last. Non-transferable. Original coupon must be presented. Valid through 11/1/14. Limit one coupon per customer per day.

SUPER COUPON!

PACIFIC HYDROSTAR 1500 PSI PRESSURE WASHER
 Item 68333 shown
\$79.99
 REG. PRICE \$129.99

SAVE \$50

LOT NO. 68333/69488

53811478

LIMIT 5 - Good at our stores or HarborFreight.com or by calling 800-423-2567. Cannot be used with other discount or coupon or prior purchases after 30 days from original purchase with original receipt. Other good while supplies last. Non-transferable. Original coupon must be presented. Valid through 11/1/14. Limit one coupon per customer per day.

SUPER COUPON!

11 PIECE WOOD CARVING SET
 Item 4855 shown
\$2.99
 REG. PRICE \$5.99

SAVE 50%

LOT NO. 4855/60655

92362773

LIMIT 2 - Good at our stores or HarborFreight.com or by calling 800-423-2567. Cannot be used with other discount or coupon or prior purchases after 30 days from original purchase with original receipt. Other good while supplies last. Non-transferable. Original coupon must be presented. Valid through 11/1/14. Limit one coupon per customer per day.

SUPER COUPON!

MECHANIC'S GLOVES
 Item 93640 shown
\$3.69
 REG. PRICE \$9.99

SAVE 63%

LOT NO. 93640/60447/93641/60448

74054994

LIMIT 3 - Good at our stores or HarborFreight.com or by calling 800-423-2567. Cannot be used with other discount or coupon or prior purchases after 30 days from original purchase with original receipt. Other good while supplies last. Non-transferable. Original coupon must be presented. Valid through 11/1/14. Limit one coupon per customer per day.

SUPER COUPON!

MULTIFUNCTION POWER TOOL
 Item 60861 shown
\$14.99
 REG. PRICE \$49.99

SAVE 70%

LOT NO. 60861/68303/60428/62279/62302

46777438

LIMIT 6 - Good at our stores or HarborFreight.com or by calling 800-423-2567. Cannot be used with other discount or coupon or prior purchases after 30 days from original purchase with original receipt. Other good while supplies last. Non-transferable. Original coupon must be presented. Valid through 11/1/14. Limit one coupon per customer per day.

SUPER COUPON!

EIGHT DRAWER WOOD TOOL CHEST
 Item 94538 shown
\$59.99
 REG. PRICE \$99.99

SAVE \$40

LOT NO. 94538

78546245

LIMIT 4 - Good at our stores or HarborFreight.com or by calling 800-423-2567. Cannot be used with other discount or coupon or prior purchases after 30 days from original purchase with original receipt. Other good while supplies last. Non-transferable. Original coupon must be presented. Valid through 11/1/14. Limit one coupon per customer per day.

SUPER COUPON!

90 AMP FLUX WIRE WELDER
 Item 68887 shown
\$99.99
 REG. PRICE \$149.99

SAVE \$50

LOT NO. 68887/61849

63331386

LIMIT 3 - Good at our stores or HarborFreight.com or by calling 800-423-2567. Cannot be used with other discount or coupon or prior purchases after 30 days from original purchase with original receipt. Other good while supplies last. Non-transferable. Original coupon must be presented. Valid through 11/1/14. Limit one coupon per customer per day.

Order at HarborFreight.com or 800-423-2567
 We FedEx Most Orders in 24 Hours for \$6.99

If You Buy Tools Anywhere Else,
 You're Throwing Your Money Away

Woodturning

Scrapers: A Simple Tool with Many Uses

By Ernie Conover

Gouges and chisels aren't the only necessities for a woodturner. It's time the simple — and necessary — scraper gets the respect it deserves.



Scrapers come in a variety of forms and have a variety of uses. Part of the author's collection is shown here: it includes, from left to right, a scraper for scraping interiors of hollow forms through a small opening; a large dome scraper; a straight or "boat-tailed" scraper; a diamond or "V" scraper; a form scraper for the interior of boxes; and one of a set of form scrapers for making captive rings.

www.woodworkersjournal.com **MORE ON THE WEB**

For a video of the author discussing different types of scrapers and their uses, please visit woodworkersjournal.com and click on the "More on the Web" tab shown above.

Let's take an in-depth look at a simple tool: the scraper. The street view seems to be that real turners only use gouges and chisels. Nothing could be further from the truth.

The scraper is a necessary tool that continues the journey to places that a gouge or chisel cannot go. Scrapers will make a repetitive shape time and again — a great solution for making small, repetitive coves or beads in hard-to-reach areas.

Scrapers will make an undercut that a gouge cannot, such as captive rings on spindle work and bowls, or hollow forms with interiors turned through a small opening.

Finally, scrapers are the only tool that will machine a perfect fit between parts. For example, for a snap fit box lid, a scraper will turn the mortise on a box and the tenon on the lid perfectly round to the thousandth of an inch, while gouges and chisels will ride up and down with grain, making

an ellipse. The scraper can remove very small amounts to achieve the machined fit, which is near impossible with gouges or chisels.

While some scrapers are made a certain shape that does not change much for the life of the tool, most are shaped to the needs of ever-changing turning situations. They are the epitome of perishable tooling: in daily shaping and sharpening, they are ground down to just shy of the tang and then thrown away.

How a Scraper Cuts

A turning scraper works just the same as a cabinet, or card, scraper. A cabinet scraper is a 1/16"-thick rectangular piece of steel but, rather than being brought to a keen edge, about 15° of relief is filed into the edge. Then a burr is raised on the resulting fine edge with a tool called a burnisher, which is a very hard oval or round tool-steel rod with a wood handle. In use, a cabinet scraper is pushed or pulled with the burr dragging, as you see in the top photo at right. The length of the burr limits the depth of cut to a few thousandths of an inch, which explains why the tool does not tear out in curly grain. Scrapers actually cut very slowly, a feature that makes them an extremely safe and predictable tool for woodturners.

A Woodturning Scraper

A turning scraper is much thicker than a cabinet scraper but has the same burred edge with 15° to 25° of relief under to the cutting edge. You can think of the relief as a bevel, but since a scraper is not used with a rubbing bevel, I prefer to call the ground area "relief" or "clearance." This distinguishes it from a true edged tool such as a gouge or chisel.

Grinding is the easiest way to raise the burr, be it carbon or high-speed steel. Simply set a grinding rest to give you the 15° to 25° of relief, place the scraper flat on the rest, and touch the edge to the wheel. It is important to immediately start moving the edge as you touch. For a straight edge, move it laterally back and forth, and for a curved edge, rotate the tool against the wheel. (Many think the tool has to be upside down

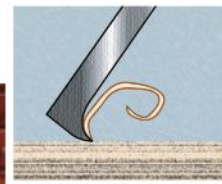
to raise a burr, but this is not the case.)

The burr on a scraper forms in a process known as plastic deformation that is accomplished by either grinding or burnishing. Burnishing is direct force, while grinding is a combination of forces: the direct forward force of pushing the scraper against the wheel and the lateral force of the spinning grinding wheel in concert with the heat generated by the abrasion. Grinding forms a burr at both the top and bottom edges. The plasticity of steel drops as hardness increases, and this is why toolmakers have traditionally tempered turning scrapers to a lower measurement on the Rockwell hardness scale than chisels: about 45 on the Rockwell C (for the hardest of metals) scale.

Veritas Burnisher for HSS

The act of grinding raises a burr that is sufficient for most work. While traditional carbon steel turning scrapers may be burnished like the card scraper, the advent of high-speed steel means that modern commercial scrapers cannot. This is due to the decreased plasticity of the very hard high-speed steel (HSS).

Veritas solves this conundrum with a simple fixture, the Veritas® Scraper Burnisher for Turners, that has a tungsten carbide cone that will burnish high-speed steel. The scraper is ground to the desired shape, and a whetstone is employed to refine the top corner — what will be our burred edge. The tool is now placed in the fixture, and the fulcrum point is used to lever the edge against the carbide cone with sufficient force to roll a burr.



A turning scraper, just like a cabinet scraper (in photo and drawing), has a burred edge that limits the depth of cut to 1/1,000ths of an inch.



Grinding is the easiest way to raise a burr. With a grinding rest set at 15° to 25°, start moving the scraper edge as soon as it touches the wheel.



The tungsten carbide cone in the Veritas Scraper Burnisher is sufficiently hard, and its fulcrum point provides sufficient force, to roll a burr in HSS.

Useful Scrapers, Plus Their Uses



A large dome scraper is excellent for all faceplate work, but especially bowls. The author uses the large size shown here the most, but also finds its smaller brother to be useful. It is often more effective to tilt the scraper on the sidewall of a bowl, as seen in this photo.



The author has designed his straight edge scraper — used for making things flat — into what he calls a boat-tailed scraper. It has a rounded left corner so as to be able to cut to the left and a beveled right corner, which looks like the back of a boat when viewed from the top.



Diamond scrapers are useful for much more than incising lines: their real purpose is for exact fits. Here, the author is using one to fit a jam chuck for a bowl with the aid of an armrest, which eliminates the need to move the tool-rest all the time to check fit.

The carbide cone is sufficiently hard, and the fulcrum pin supplies sufficient leverage, that rolling a burr in HSS is possible. The tool may be oriented up or down; it does not matter. This is fortunate because some scrapers are too thick to be done other than upside down. In practice, I burnish large high-speed and carbon steel scrapers for bowl work and grind all of my small scrapers, especially form scrapers.

Scrapers and Bowl Work

Because a scraper is used downhill with the burr dragging, it is beneficial to raise the tool-rest slightly in any situation; for inside bowl work, this is a necessity rather than a convenience. The tool is tilted downhill, the amount depending on the angle at which the burr is raised. Some immediate experimentation of the tilt angle as you touch the tool to the work becomes intuitive.

The scraper should be used with an extremely light touch, with very little forward force on the tool. I often hold the handle like an ink pen. Both hands work together to manipulate the tool. On inside bowl work, the scraper is often tilted on the rest to keep the burr dragging as you cut up or down the sidewall.

Finally, for bowl work, the heavier a scraper is, the better. Inertia is your friend: a heavy scraper plows through knots and bumps, while a light one goes flying. Thicker, wider and heavier is good.

Types of Scrapers

In the photos at left, I've pictured different types of scrapers and how they are used. For example, I choose a large dome scraper for faceplate work (especially bowls). It works equally well inside and outside. There are many

specially shaped scrapers for bowl work, but I find a full half-round (dome) is the most useful and eliminates the need for all the rest.

A straight edge scraper makes things flat. I like to use a design I call a "boat-tailed" scraper, which has a bevel that prevents the scraper from leaving the line that a sharp corner can leave in its wake.

Diamond scrapers were a staple of a basic turning setup until the 1980s. The street view is that a diamond scraper is for incising lines in work, but its real purpose is to make exact fits in box lids, chucking recesses, jam chucks, tenons and the like. I call it a "chuck making scraper." The edges of this scraper are 90° to each other, which is great for box lids, but they are reground to less than 90° for inside holds for most four-jaw chucks or more than 90° for outside holds.

Another type, form scrapers, are ground from anything available, including many things that people throw away, to meet the needs of emerging turning situations. I make them from such things as old files, plow plane blades, screwdrivers and Allen keys. In the large photo on page 22, you can see an assortment from my work table at the time of writing.

A HSS dome scraper will cost more than \$60 retail, but you can buy a 12" straight chisel for an electric chipping hammer for about \$20. This can be reground to a dome and can be tilted inside a bowl better because of the hex or round shank. So: grab those screwdrivers that you see lying along the roadway!

Ernie Conover is the author of The Lathe Book, Turn a Bowl with Ernie Conover and The Frugal Woodturner.

MEASURE MOISTURE IN THE WOOD NOT ON THE WOOD

MOISTURE METERS
DESIGNED FOR WOODWORKING PROFESSIONALS

www.wagnermeters.com 800.505.1281



IWF
ATLANTA
August 20-23
2014

**VISIT
BOOTH
#2721**

THE TRUSTED PINNERS FOR 15+ YEARS

GREX P6 Series 23 Gauge Headless Pinner

Don't be fooled by look-alikes.
Be a better craftsman with
proven precision built
GREX tools.



P650

Trim carpenter's best friend
3/8" to 2"

P630

No frills workhorse
3/8" to 1-3/16"

P635

The lexus of pinners
3/8" to 1-3/8"

P645

Sophisticated all-rounder
3/8" to 1-3/4"



FIND YOUR DEALER

www.grextools.com

888-447-3926 905-838-4887



A Woodworker's Dog Bed

By Kimberly McNeelan

Here's a sturdy and fun-to-build napping spot for your favorite pooch. It even includes a drawer for all of those special play toys. We've sized this particular bed to fit a large dog.



Sure, it's pet furniture, but our author still gave this solid wood bed real woodworking flair, with a self-closing dovetail drawer and pegged walnut accents. It's beautiful as well as functional.





Careful millwork on the front end of any project can only help ensure success as you build it. Start by jointing and planing the project stock flat and square, then rough-cut it into oversize parts.

Bailey and I particularly enjoyed making this project. She has great intuition, and so she probably knew the bed was for her. You see, my dog Bailey is my shop assistant and faithful cohort, and she is often charged with the task of holding down the couch (which she succeeds at with flying colors). However, she isn't always allowed on the couch. Minnesota's frequently messy weather was partly responsible for the decision that Bailey should have her own special dog bed. And, since she works very hard — at following me around, getting belly rubs from everyone and wagging all the while — she deserves the royal treatment of a custom bed!

I started by deciding on the size for the bed. Then I picked the wood, which is always a joy. Maybe you want to try



A tenoning jig and sharp blade make quick work of cutting accurate, clean tenons on the ends of all the project rails. Even the long front and back rails are easy to clamp up and machine with a sturdy jig like this.

to match the color of your pet, but I think it would be easier to complement the colors. I chose Douglas fir because Bailey is a chocolate lab, and the golden highlights in the fir complement her dark brown fur. Petco® has several sizes of dog “mattresses,” which are essentially 2½"-thick pads for dogs. Bailey weighs 65 lbs., so her size required the extra-large sized mattress. I have supplied the bed dimensions for other sized dogs in a “More on the Web” entry (see page 29). You may want to use a tape measure to see how much space your furry friend takes up when sprawled out, to decide which bed size to build.

Getting Started

To get this bed underway, I started by milling the wood flat, square and to rough dimension. As a general rule, I size parts initially at least 2" longer than my final dimensions. Then I laid the boards out for the platform and matched the figure of the wood as much as possible. The vertical-grain fir didn't have a ton of variation, but I made sure to match the tighter grain at one side of the platform and the wider “stripes” at the other. It is fun to tie in art concepts with woodworking, and I'm sure Bailey, as well as any viewer, appreciates it. At this point, I also glued the slats for the bed end panels together. Since I was using wood that I had first resawn, it was easy to arrange the slats into panels, making a linear design with the matching grain.

Next, I cut all of the rails and legs to final length before raising tenons on the ends of the top, bottom, front and back rails using a tenoning jig on the table saw. From here, I carefully laid



Several passes with a piloted slot cutter formed grooves on both the curved and straight rails, as well as the legs. These grooves house glued-up panels in the end frames.



Our author was able to achieve excellent grain match for the bed's solid wood panels by first resawing thicker Douglas fir into thinner, book-matched slats. It's easy to do on the band saw.



Pre-finish the panels and the inside edges of the rails and legs before gluing and clamping them into two end frames. Scraps under the clamp heads prevent them from marring the soft fir lumber.

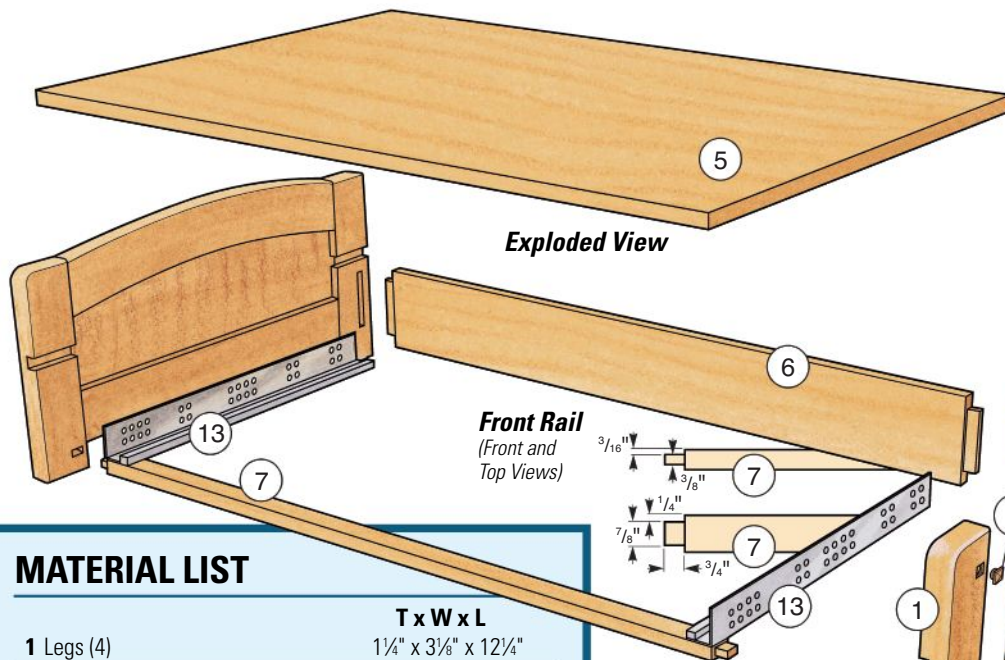
out the mortises on the legs for all of the connecting rails. I had a JET benchtop mortising machine at my disposal to cut the mortises very close to size, and I used a chisel to clean up the mortises from there for a nice friction fit.

Making the End Frames

With the mortise-and-tenon joinery behind me, I could work on more of the end rail details. I laid out the curve for the top rails by measuring and marking the ends and middle of the rail with a consistent width (same width as the legs and bottom rail), and then I aligned a thin, bendable piece of wood with those premeasured marks to draw the right curves. Actually, it helps to have someone else trace the line while you hold the batten on your premeasured marks. After that, I headed over to the hand saw to cut the curves, then smoothed the curves and removed the teeth marks using a belt sander.

Given the curves, I decided to use a router and slot cutter to cut the grooves for the end panels. Carefully, I marked the space the panels would require, just to give myself a starting point. You should have a test piece that you cut first in order to check the fit as you go. Keep in mind that you will want to leave about 1/16" of extra space in the width of the dado to allow for wood movement. On the rails, it's easy to cut the grooves because they run from one end of the parts to the other. However, the legs have stopped grooves (see the *Drawings*). So you will have to carefully feed the legs into the router bit at the starting point, and have a second mark on the leg so you know when to pull the piece away from the bit. After these leg grooves are done, chisel their ends square. Finish up the joinery in the legs by cutting 3/4"-wide, 1/2"-deep dados across their inside faces where the platform will be housed.

The end panels are now ready to be brought to final size and fit, so go ahead and clamp up the legs and upper and lower rails into two end frames. I laid a panel under each clamped-up frame and then traced the insides of the frames onto the panels. From there, I freehanded the arcs 5/16" larger, and I used a ruler to do the

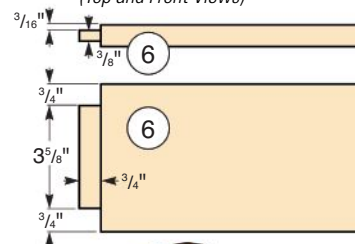


MATERIAL LIST

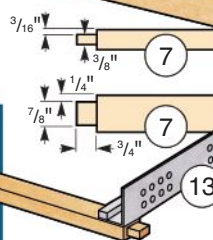
	T x W x L
1 Legs (4)	1 1/4" x 3 1/8" x 12 1/4"
2 Lower End Rails (2)	1 1/4" x 3 1/8" x 23 1/4"
3 Upper End Rails (2)	1 1/4" x 4 1/8" x 23 1/4"
4 End Panels (2)	3/8" x 6 1/8" x 22 1/4"
5 Platform (1)	3/4" x 28" x 41 1/2"
6 Back Rail (1)	3/4" x 5 5/8" x 42"
7 Front Rail (1)	3/4" x 1 3/8" x 42"
8 Decorative Plugs (12)	3/16" x 1/2" x 1/2"
9 Drawer Face (1)	3/4" x 4 3/4" x 40 1/8"
10 Drawer Front and Back (2)	1/2" x 3 1/2" x 39 3/4"
11 Drawer Sides (2)	1/2" x 3 1/2" x 21"
12 Drawer Bottom (1)	3/8" x 20 1/2" x 39 3/4"
13 Drawer Slides (1pr.)	21" King Slides

MORE ON THE WEB For additional *Material Lists* tailored to other standard sizes of dog bed mattresses, please visit woodworkersjournal.com and click on the "More on the Web" tab shown above.

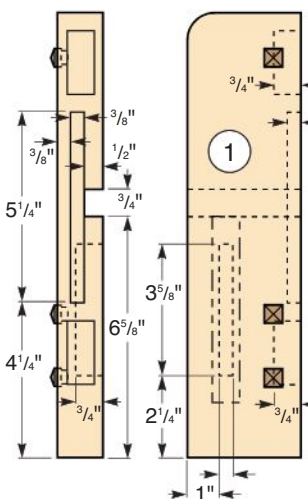
Back Rail (Top and Front Views)



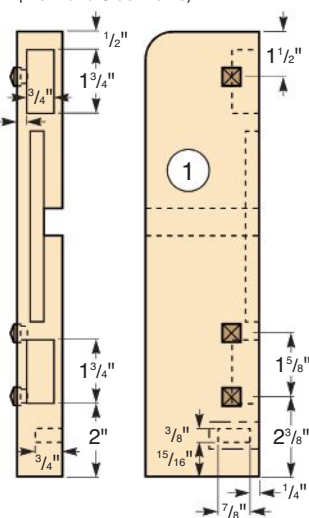
Front Rail (Front and Top Views)



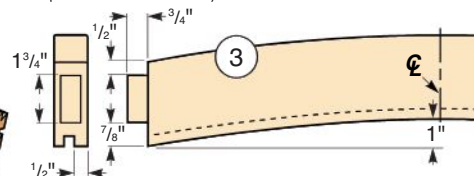
Rear Leg (Front and Side Views)



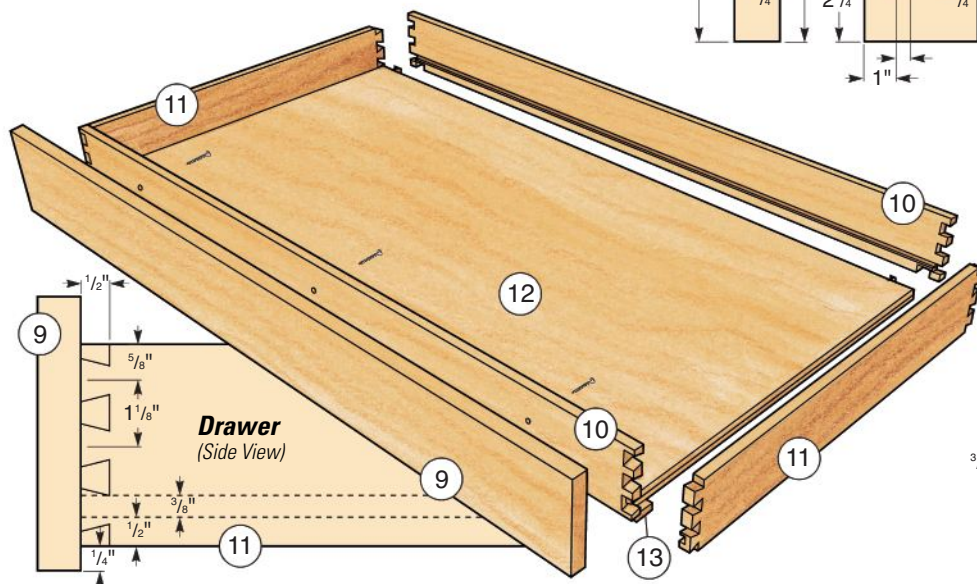
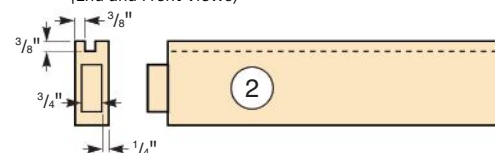
Front Leg (Front and Side Views)

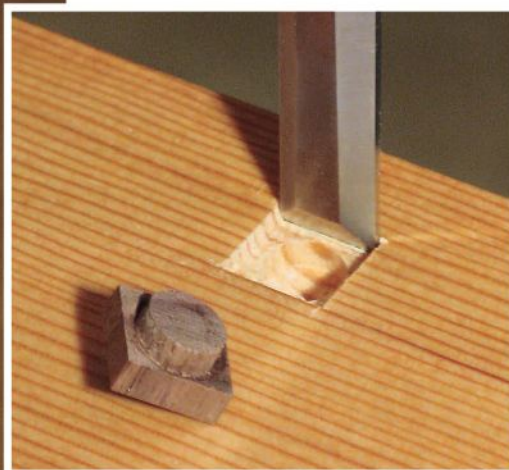


Upper End Rail (End and Front Views)



Lower End Rail (End and Front Views)





Our author installed decorative walnut plugs by first drilling a 3/8"-diameter pilot hole 1/4" deep, then tracing and chiseling a square mortise (inset) to recess the plugs a bit farther. Notice that the bottoms of these plugs are rounded to fit the pilot holes.



same for the straight ends and bottoms of the panels. Since I had made the grooves 3/8" deep to allow for wood movement, the 5/16" enlargement left 1/8" of extra space for the panels to "float" in their grooves. With this done, I walked the panels over to the band saw and cut them to final shape.

Before you can proceed with some big assembly on this project, it's time for

some final sanding and selective finishing. I softened the edges of the platform and front and back rails with small roundovers. To do that, I first set the platform into place between the clamped-up end frames and made tiny tic marks where the platform would meet the leg dados so that I wouldn't round them over where these components intersected.

If you are doing frames and panels in

any project and you aren't going to spray on a finish, it's smart to finish sections of your project as you go for ease of application. For this dog bed, shellac was my choice since it is nontoxic. Sometimes our furry friends choose to sample odd things: shellac is a precaution in case the bed looks good enough to eat!

Go ahead and sand and finish the inside edge of the legs/rails, panels, platform and front and back rails. You might as well do the drawer front while you are at it. When I was sanding the inside edges of the legs and rails, I gently rounded the outer edges with sandpaper just to take the edge off. I stopped the roundovers on the panel at my tic marks. Also, any surface that will be glued should not be finished. I used blue painter's tape to carefully cover the joint surfaces.

When I use shellac, I generally apply four coats. Between coats, I lightly scuff the surfaces with 320-grit sandpaper. After the final coat, I used very fine (0000) steel wool to apply wax, then buffed it out with a soft cloth. It leaves a nice sheen.



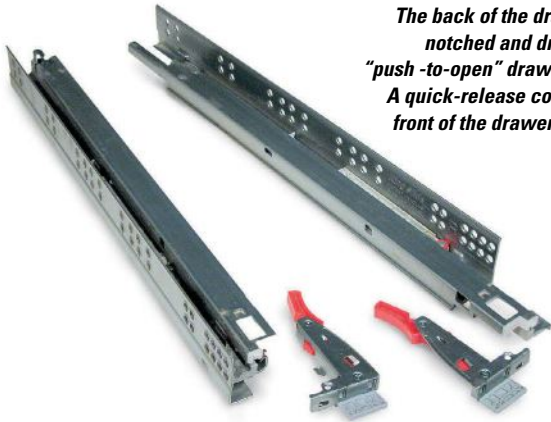
The corners of the drawer box are joined by through dovetails (bottom right) cut in two steps on Rockler's dovetail jig. One setup cuts the tails with a dovetail bit (inset). Changing the jig over to a different template and a straight bit forms the pins (below).



Dog Bed Hard-to-Find Hardware

Craftsman Pyramid-Top Hole Plugs (1 pk.) #47789 \$7.99 pk.
Push-to-Open, Soft-Close Drawer Slides (1 pr.) #47500 \$76.99 pr.

To purchase products online, visit www.woodworkersjournal.com and click on the "Store" tab. Or, call 800-610-0883 (code WJ1441).



The back of the drawer must be both notched and drilled to accept the "push-to-open" drawer slide hardware. A quick-release component locks the front of the drawer box on the slides.



Assembly Time

It's finally time to glue up the end frames with their panels in place. When those come out of the clamps, do any final sanding you need to in order to flatten the leg and rail joints, then round over all remaining sharp edges. I chamfered the bottom ends of the legs, too. Apply finish to the rest of the bare wood surfaces.

At this point, I realized that some Craftsman-style decorative plugs would be a cool detail. I laid out several different arrangements before deciding that one on the top rail joints and two on the bottom rail joints looked best.

To install them, I first drilled a 3/8"-diameter hole 1/4" deep. But, the plugs stuck out a little bit too far this way. So I put the plug in place and scribed a line around it, then chiseled out a 1/16"-deep recess. This made the plugs more discreet and tasteful. Apply finish to the plugs, and glue them on. When all the plugs are installed, glue and clamp the front and back rails and the platform to the end frames to complete the bed.

Making and Hanging the Drawer

Structurally for drawers, you can't get much better than dovetails, and I decided to use Rockler's dovetail jig to cut them. It makes the process quite fast. Scrap mahogany was my choice of material for the drawer sides and plywood for the bottom, but any hardwood would do fine. I cut the drawer box parts to size and used a dado blade to cut a slot for the drawer bottom.

I tried my dovetail jig setup on scrap first to be sure I had it set up properly.

Then I cut the tails, carefully aligning the dados so they'd be hidden. The pin cuts came next. When the corner joints fit properly, glue the drawer box together.

To install the supercool "push-to-open" King Slide® drawer slides that I used, you have to notch out the bottom back of the drawer. The slides line up with the bottom of the lower side rails, and there's a gap in the back because I used 21"-long slides. Mark your screw holes, pre-drill, and then attach the slides to the rails. Set the drawer on the slides and hit it hard enough to find out where exactly to drill the 1/4" holes in the back of the drawer that are a specific part of installing these slides. Drill those shallow holes.

Go ahead and flip the bed over so that you can set the drawer (propped up) on the slides upside down in order to attach the "drawer releases" to the bottom of the drawer and the front edge. Adjust

the slides as needed so the drawer glides in and out of the frame smoothly. When you're satisfied, install the drawer front with countersunk screws driven from inside the drawer box.

The King slides let the drawer open by pushing on it. This way, Bailey can open the drawer to get her toys out herself. I think that is a pretty sweet detail Bailey definitely appreciates! Being the best dog ever, Bailey deserves this custom bed. And, I think she is very proud to have her very own throne, too! I'm sure your special pet will feel likewise.

Kimberly McNeelan is a woodworker, artist and woodworking teacher. Her website is kimswoodfurniture.com.



Making a Croquet Set

By Ernie Conover



Choose your mallet shape, turn (or purchase) balls, create your stakes, pegs and hoops — and you're ready for hours of backyard fun.

A high-grade croquet set is a simple turning project that makes for hours of backyard fun. While officially you need a level, grassy area that is 100' long and 50' wide, you can play croquet with far less real estate — and if the turf is less than manicured, it just adds unpredictable excitement to the game. Discount stores sell inexpensive sets that are suitable for children, but they're puny for adults. The cost of a quality six-player set for adult backyard play can range from \$250 to well over \$1,000.

Fellow woodturners, take heart: building a high-grade set, suitable for serious competition, is a very doable project. The mallets and stakes are well within anyone's ability. The balls are a bit more challenging to turn yourself, but they can be purchased very reasonably. The same goes for the hoops (wickets). I will give you sources as I discuss each item's construction.

The Mallets

A croquet mallet head is 9" to 12" long and can be rectangular or round. Today, most players prefer a rectangular mallet head, as repugnant as that may be to we turners. A standard shaft is 36" long but can be any length comfortable for the player. A standard head is 9" long but



To make a 2 $\frac{5}{8}$ "-high by 2 $\frac{3}{8}$ "-wide rectangular mallet head, the author bought $\frac{3}{4}$ " wood and glued it up. With his glue line centered on the 2 $\frac{3}{8}$ " dimension, he surface planed the blank to final dimension, then milled a groove centered on the glue line for a contrasting sight line inlay. He finished up the mallet head by crosscutting to length and then drilling a hole for the shaft.

can be longer. Good mallets usually have a sight line inlaid into the top to help line up shots during play.

The weight of a mallet includes the shaft and, for the sport variety, is between 2 lb. and 2 lb. 8 oz. I used North American ash for the shaft and white oak for the heads to achieve this weight. Serious tournament players use 3 lb. and heavier mallets. To achieve this, the head has to be weighted or built out of a tropical wood such as katalox (Mexican), purpleheart or lignum vitae (hard to find and expensive). Such a mallet has too much inertia for play with 8 to 13 oz. balls: it needs regulation 1 lb. balls.

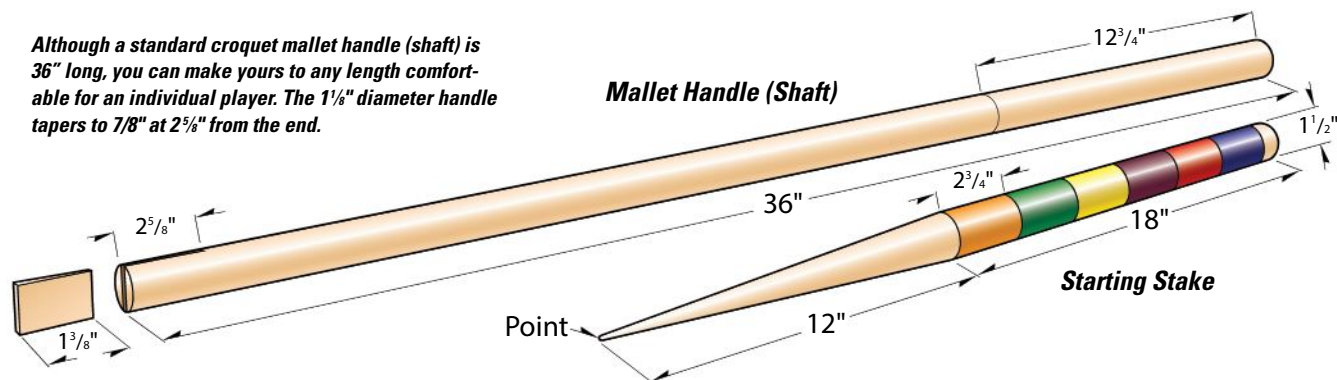
A mallet can be weighted easily by drilling holes into the two faces to equal depths, adding shotgun shot in equal amounts and plugging the hole with a turned plug. It is best to pour some epoxy in with the shot so

that it does not rattle. A good kitchen or postal scale is invaluable.

As to other dimensions, a rectangular mallet head should be about 2 $\frac{5}{8}$ " high by 2 $\frac{3}{8}$ " wide. Finding 10/4 wood is a challenge; I had to buy $\frac{3}{4}$ " wood and glue it up. Although it wastes wood, I center the glue line on the 2 $\frac{3}{8}$ " dimension. Surface plane the blank to final dimension, then mill a groove centered on the glue line for a contrasting sight line inlay. (I used walnut for mine.) Crosscut to length and through-drill $\frac{7}{8}$ " diameter on the center of the 2 $\frac{3}{8}$ " x 9" dimension.

Then hand plane or sand all surfaces smooth and chamfer all the corners. Regulations state that "the two end faces must be parallel, perpendicular to the bottom and have identical playing characteristics." This is easily assured during crosscutting on the table saw. Chamfering

Although a standard croquet mallet handle (shaft) is 36" long, you can make yours to any length comfortable for an individual player. The 1 $\frac{1}{8}$ " diameter handle tapers to $\frac{7}{8}$ " at 2 $\frac{5}{8}$ " from the end.





Croquet mallet heads can be either rectangular or round in shape. If you choose to turn a round mallet head, 1/4"-thick sacrificial blocks affixed to the faces with double-sided tape help you avoid leaving center marks. Simply inlay a 1/4" x 1/8" strip in a 2 5/8"-square by 9"-long blank, drill 7/8" at center, and turn round.

www.woodworkersjournal.com **MORE ON THE WEB**

For a video of the author demonstrating the use of the Carter Products Perfect Sphere Tool to turn a ball, plus a PDF of his article on turning a ball with a jam chuck, please visit woodworkersjournal.com and click on the "More on the Web" tab shown above.

is important to both the look and the durability of the mallet. It can be done with a hand plane, a disc sander or a block of wood with sandpaper glued to it. I cut a 1/8" chamfer on the long grain corners of the rectangle and about 1/16" on the edges of the faces.

If you are a card-carrying turner and cannot stand the thought of a rectangular head, simply mill the blank 2 5/8" square and inlay as previously discussed. Table saw and drill in the same way as a rectangular head. Turn round and chamfer the faces 1/16" for durability. To avoid leaving center marks on the faces, affix 1/4"-thick sacrificial blocks with double-sided tape. This gives you a round head with a sight line.

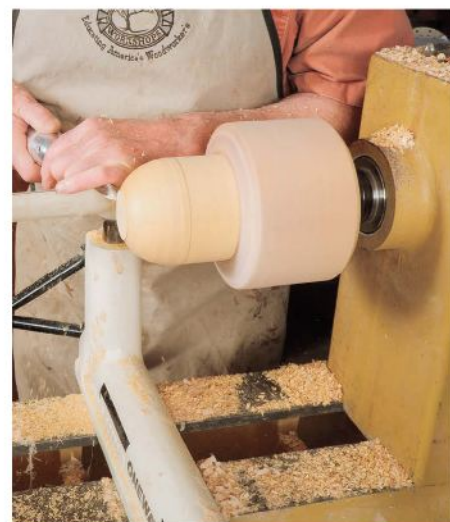


Using the Carter Products Perfect Sphere Tool

Spindle turn all of the balls between centers to a constant 3 3/4" diameter. Partially part them at a distance about 1/8" greater than the diameter.



Each blank will be about 3 3/4" long. Jam chuck the first blank and use a compass to draw the equator one radius from the exposed face.



Remove as much wood as possible with a spindle gouge. The trick is to turn an ellipse that lies just outside of your sphere.



The easiest way to paint the starting stake is in the lathe with it going very slow. The author used acrylic paint from an art store.



Four pegs hold the string which marks the course boundaries. The author turned his pegs for a nice look.

The Stakes

You will need two stakes for your croquet set, each 30" long. On both of them, the 18" that is above ground is turned to a constant 1½" diameter, with the last 12" tapered to a point.

The first stake is the starting stake and needs colored bands denoting the order of play: blue, red, black, yellow, green and orange. This is easily accomplished on the lathe by dividing equal width bands on the stake and brushing on acrylic paint from an art store. You can use the rest of the paint for the balls and clips. Apply a clear finish once dry.

The second stake is the turning stake and denotes the halfway point in

the course. I have turned my stakes with a bead at the top to show off some turning, but a regulation stake needs to be 1½" diameter its entire above-ground length, so would just be slightly domed at the top.

The Pegs

If you take your croquet seriously, you will want to set boundaries for your course. The easiest way to do this is to stretch a string around the course, and you will need four pegs to do this. Essentially tent pegs about 8" long, they can be scrap wood you point at the band saw, or a turned, stylized design like I've used.

Weight of Balls Turned from Various Woods

Historically, croquet balls were turned from boxwood, which yields between a 15 and 16 oz. ball, and that is what I used for the article. A 3⅝" ball has a volume of 24.94 cubic inches, so theoretical weights can be calculated by looking up the weight per pound of any wood. To yield a 1 lb. ball, your wood will need to weigh about 68 lb. per cubic foot. Look at the chart for wood weights.

Wood	Weight of 3⅝" ball
Maple	9 oz.
Oak (Red or White)	11 oz.
Boxwood	15 or 16 oz.
Cocobolo (heartwood)	16 oz.



Set up the Carter Products Perfect Sphere Tool base plate exactly under the equator. If this is not positioned exactly, your ball will be too short or too long between the poles.



Remove the rest of the material by swinging the arm of the tool 90°. Make light cuts, removing a few thousandths at a time. The tool works better if you swing from the center to the equator.



When half the ball is finished, rotate it in the jam chuck and adjust equator position. Spindle turn away as much wood as possible and reposition the sphere tool to turn the second half.



The blue band on this completed ball indicates that it's the first ball to be played in a game of croquet (as per the order of the colors on the starting stake, pictured on page 35).

The Balls

A regulation croquet ball is 3 $\frac{5}{8}$ " diameter and weighs 1 lb., give or take 1/4 oz. Balls in discount store sets are 3 $\frac{3}{8}$ " diameter and weigh as little as 8 oz. Better quality recreational balls can be either of these diameters and weigh between 8 and 13 oz. One option is to buy the balls: at The Croquet Store (www.oakleywoods.com; 866-364-8895), a set of 6 Newport Balls, which weigh 10 oz. each, can be purchased for \$30.

On the other hand, croquet balls were traditionally turned from wood, so they "round out" this turning job perfectly. To turn the balls on the lathe, you need to be able to spindle turn without catching very often. I explained the process of turning perfect balls in a jam chuck in the December 2012 *Woodworker's Journal*. (You can find this article in the "More on the Web" section of woodworkersjournal.com.) The only change in the process described in that article is that, for the croquet balls, you have to start out with a 3 $\frac{5}{8}$ "-diameter by 3 $\frac{5}{8}$ "-long blank.

You can also turn your croquet balls using Carter Products' Perfect Sphere™ Tool, as shown in the photos on pages 34 and 35. When purchasing a Perfect Sphere Tool (www.carterproducts.com; 888-622-7837; priced at \$349.90), you need to make sure to order for the center height of your lathe. Setup of this tool is critical. It has to be perfectly centered under the center line of the lathe, brought to right angles to this center line and positioned on the equator of the ball you are turning. If the start is not on the equator, the resulting ball will be short or long between the poles vis-à-vis the equator. My online video (also found at "More on the Web") shows this setup in detail.

After finishing the ball-turning steps as shown in the photos, sand the ball with 60-grit sandpaper to start with. Finer paper will sand face grain faster than end grain and sand the ball out of round. Constantly reposition the ball randomly in the chuck during sanding. This will help to bring it perfectly round. Sand with finer grits, and you are finished. I like to scrape two lines in the ball to create a center band that I can paint.

Hoops, Clips and Storage

While it's not woodturning, it is possible to make your own hoops, often called wickets in the United States. (On the



The author has provided specifications for regulation croquet sets — but friends and family may prefer recreational game rules.



It's easy to embellish purchased hoops with turned or milled elements epoxied to the top.



Painted wooden clothespins work well as clips to mark players' balls in a course.

Continent, "wicket" connotes "cricket.") However, steel rod (from a hardware store or McMaster-Carr, mcmaster.com; 630-833-0300) will cost you more than \$30. You can buy a set of nine Bar Harbor Hoops from The Croquet Store for \$25.

If there are only two or three players, it is common for each player to play two balls. It helps greatly to have clips, color-coded to the balls, that can be clipped to the next hoop at the end of a turn.

To house my croquet set, I made a simple but sturdy wooden box from 1/2" marine plywood put together with drawer joints milled on a router table.

Play Ball

Ready to find the rules of the game? Specifications for several variations are available in the "About the Sport" section of The Croquet Store's website. Special thanks to Don Oakley, owner of The Croquet Store, for his invaluable advice on this article.

Now it is time to go out in the yard, start the barbecue and invite the neighbors for a croquet party.

Ernie Conover is the Woodworker's Journal turning columnist and owner of Conover Workshops.

CherryTree

Woodworking Plans, Kits & Supplies

Order Today!
Or Contact us for your Catalog
1-800-848-4363
www.CherryTreeToys.com

1.888.720.7892
WWW.NAILGUNDEPOT.COM

YOUR SOURCE FOR NAIL GUNS, FASTENERS & MORE!

CHECK OUT OUR LINE OF
PIN NAILERS

**ADDITIONAL BRANDS AVAILABLE
AT NAILGUNDEPOT.COM**

Use promo code: **WWJ2014**
for 5% off your next order

WOODWORKER'S JOURNAL

2013 Complete Collection

Everything from the 2013 issues of **Woodworker's Journal** is on this one CD, wrapped up with a bow. (That would be the wooden bow you'll make for the Gift Box featured on our December cover, at right.) You'll find tons of high quality woodworking projects, tool reviews, techniques and much more (over 450 pages!).

Plus, it's instantly searchable. Find what you need in a hurry or leisurely flip through the digital pages. It's all on the new **Woodworker's Journal 2013 Annual Collection CD**.

Item 48764 (\$35.94 value) \$14.99!

Order now! 1-800-610-0883
(mention code WJ1445)

Order online at www.woodworkersjournal.com/CDs

ANNUAL COLLECTION 2013
www.woodworkersjournal.com

**SIX ISSUES
ON ONE CD!
Save 58%**

JANUARY/FEBRUARY
How to make a round tenon on a square leg
INSIDE: The Best Hammer Drill Drivers
PLUS: 100+ Projects to Build in 2013

MARCH/APRIL
How to make a round tenon on a square leg
INSIDE: The Best Hammer Drill Drivers
PLUS: 100+ Projects to Build in 2013

MAY/JUNE
How to make a round tenon on a square leg
INSIDE: The Best Hammer Drill Drivers
PLUS: 100+ Projects to Build in 2013

JULY/AUGUST
How to make a round tenon on a square leg
INSIDE: The Best Hammer Drill Drivers
PLUS: 100+ Projects to Build in 2013

SEPTEMBER/OCTOBER
How to make a round tenon on a square leg
INSIDE: The Best Hammer Drill Drivers
PLUS: 100+ Projects to Build in 2013

NOVEMBER/DECEMBER
How to make a round tenon on a square leg
INSIDE: The Best Hammer Drill Drivers
PLUS: 100+ Projects to Build in 2013

Tool Review

Mid-priced 23-gauge Pin Nailer Roundup

By Chris Marshall



Around \$100 or less will buy you one of these mid-range 23-gauge pinners that should serve your fine fastening needs well. But who nabs the brass ring in our pin nailer shootout?



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.

While an 18-gauge brad nailer can tackle most of the pneumatic nailing needs for woodworking, a 23-gauge pin nailer is also a really handy tool. It can drive stickpin-thin headless or slight-head brads into delicate moldings and hardly leave a mark. You can

use it for attaching glass retainers to cabinet doors, cross pinning dowels or tacking trim to projects and cabinetry to hold it securely while the glue sets. So it's handy, but you probably won't need a pinner for every project. And, while the market is full of options, I chose a test group

that I thought would meet our occasional needs best: nailers that can drive fasteners long enough to hold 1/2" or 3/4" stock securely while being affordably priced at around \$100 or less. You can spend more for premium models or as little as \$30 for "bargain" brands with a 1" nail length limit, but I think this group of eight is probably your wisest value for all-around use.



Bostitch's steel nailing tip makes it easy to place pins precisely, but it also left dents in the wood.

Bostitch HP118K

Street Price: \$119

Weight: 2.17 lbs. / Exhaust: Rear

Fastener Range: 3/8"-1 1/16"

Pin Type: Headless or slight-head

Accessories: Case, nails, belt hook, oil, air fitting cap

Web/Phone: www.bostitch.com / 800-556-6696



Testing Goals

Pin nailers should be capable of driving the longest nails their magazines will hold into hardwood. To test their mettle, I set my compressor to 90 psi and fired 400 nails per gun (either 1 3/8" or 1 3/4" long, depending on the tool) into 8/4 maple. While it's a tough challenge, all eight tools did the job without a single jam.

But brawn is not where a pin nailer will earn its stripes most of the time: you want it to nail carefully without flawing the work surface, which often happens with brad nailers. So, I drove another 100 pins per gun into soft, quarter-round pine to test for nailing finesse.

Some 4,000 nails later, I've learned a few things about these pinners, and I've got a favorite here. Read on to find out which gun gets top honors.

Bostitch HP118K

Seven years ago, I tested this Bostitch pinner in our first-ever pin nailer review, and it left me with mixed impressions. Aside from the tool now having an adjustable belt clip, it is otherwise unchanged. So, my sentiments are largely the same after trying it out again.

The nailer has a pointed steel tip that makes it easy to locate fasteners exactly where

you want them, but at 90 psi, it left pock marks on both pine and maple around the nails. Not good. There's an adjustable high/low pressure switch above the trigger, but flipping it to the "low" setting didn't help.

Pin nailers typically have two triggers: the rear is a safety to prevent accidental firing. Squeezing it readies the primary trigger for use. On this Bostitch, there's barely enough grip space behind the safety for two fingers. My natural inclination when picking up a nail gun is to grab it with three or four fingers; that deactivates the safety on the HP118K whether you're ready to fire or not. A shorter safety trigger or a longer grip would make this a much safer tool to grasp.

The gun has a solid feel to it, and Bostitch provides many extras, including a hard case, 1,500 nails, oil and an air fitting dust cap. It's priced at the top end for this group at \$119, but it includes a 7-year limited warranty.

Cadex CP23.30

Compared with Bostitch's pinner, the Cadex CP23.30 offers a roomier grip but instead, only one trigger. The safety here amounts to a steel tab that pivots out of the way to free the trigger. Once it's flipped clear, every trigger squeeze fires the gun. Two-trigger styles on other nailers are a safer setup.

This mid-sized, rugged gun will hold two 100-nail clips in its magazine for extended use, unlike some others that are limited to one clip at a time.



Cadex opts for a tab-style safety instead of a second trigger: when it's swiveled clear, the trigger is "live."

Cadex CP23.30

Street Price: \$99.95

Weight: 1.95 lbs. / Exhaust: Front

Fastener Range: 1/2"-1 1/16"

Pin Type: Headless

Accessory: Oil

Web/Phone: www.cadextools.com / 604-876-9909



Two Pin Types



There are two pin nail styles:

"slight-head" brads (center)

offer a tad more holding power than headless pins (right).

Nailers that shoot slight-head will also shoot headless, making them a bit more versatile than guns that only shoot headless.



Hitachi NP35A

Street Price: \$83

Weight: 2 lbs. / Exhaust: Rear

Fastener Range: 5/8"-1 1/8"

Pin Type: Headless

Accessories: Case, oil, safety glasses, air fitting cap, spare nose tip

Web/Phone: www.hitachipowertools.com/ / 800-706-7337



Hitachi's two-trigger system makes firing the pinner a conscious, two-step operation.

Cadex's steel tip is more rounded than that of the Bostitch gun, and that helped reduce the incidence of denting on pine. Marring was harder to see.

The CP23.30 blows exhaust air forward, which could be annoying if you're nailing into a corner, but it was a nonissue for flat-board work.

This gun requires occasional light oiling to lubricate the internal parts, and Cadex stamps an "Oil" indicator into the tool near the hose fitting — it's a helpful reminder.

For \$100, I wish the Cadex came with more extras than it does: you get a bottle of oil and a cardboard storage box.

Hitachi NP35A

Hitachi's pinner has three solid features going for it that attracted my attention right away: first, when I picked the tool up, its overmolded rubber grip fit all four of my fingers without also brushing the safety trigger. Second,

that safety hugs the primary trigger closely and points down, so you have to deliberately reach for it with your index finger — and *thinking* about engaging the trigger means safer nailing in the long run. Third, the orange plastic nose tip ensured blemish-free nailing on both hardwood and softwood. Every pinner should have one of these protective tips.

From the top of its piston housing to the nose, the tool measures 6 1/4", and that compact size could be quite handy for tight-quarters nailing. Once loaded, it will shoot up to 100 nails at a time. A red indicator on the magazine tells you when you're running low.

The NP35A comes with a hard case, oil, safety glasses and a 5-year limited warranty. At around \$83, it's not the cheapest tool here, but I think the extra cost is merited, given its sensible features.

PORTER-CABLE PIN138

While priced on the high end with Bostitch at \$119, P-C's PIN138 is better designed. Its grip is easy to handle, and the two-trigger system offers good precaution against misfires. It delivered decent performance, but some of the fasteners set only flush or slightly proud on both pine and maple.

My favorite feature of this gun is its dry-fire lockout, which prevents the gun from firing when you are within a few pins of emptying the magazine. This way, the tool's driver blade can't damage the workpiece by firing without

Continues on page 42 ...



P-C's red indicator and dry-fire lockout ensure that every trigger squeeze actually drives a fastener.

PORTER-CABLE PIN138

Street Price: \$119

Weight: 2.1 lbs. / Exhaust: Rear

Fastener Range: 5/8"-1 1/8"

Pin Type: Headless or slight-head

Accessories: Case, nails, belt hook, air fitting cap, spare nose tip

Web/Phone: www.portercable.com/ / 888-848-5175



Chicago Doctor Invents Affordable Hearing Aid Outperforms Many Higher Priced Hearing Aids

Reported by J. Page

CHICAGO: A local board-certified Ear, Nose, Throat (ENT) physician, Dr. S. Cherukuri, has just shaken up the hearing aid industry with the invention of a medical-grade, affordable hearing aid. **This revolutionary hearing aid is designed to help millions of people with hearing loss who cannot afford—or do not wish to pay—the much higher cost of traditional hearing aids.**

**“Perhaps the best quality-to-price ratio in the hearing aid industry” – Dr. Babu, M.D.
Board-Certified ENT Physician**

Dr. Cherukuri knew that untreated hearing loss could lead to depression, social isolation, anxiety, and symptoms consistent with Alzheimer’s dementia. **He could not understand why the cost for hearing aids was so high when the prices on so many consumer electronics like TVs, DVD players, cell phones and digital cameras had fallen.**

Since Medicare and most private insurance do not cover the costs of hearing aids, which traditionally run between \$2,000-\$6,000 for a pair, many of the doctor’s patients could not afford the expense. Dr. Cherukuri’s goal was to find a reasonable solution that would help with the most common types of hearing loss at an affordable price, not unlike the **“one-size-fits-most” reading glasses** available at drug stores.

He evaluated numerous hearing devices and sound amplifiers, including those seen on television. Without fail, almost all of these were found to amplify bass/low frequencies (below 1000 Hz) and not useful in amplifying the frequencies related to the human voice.

Inspiration From a Surprising Source

The doctor’s inspiration to defeat the powers-that-be that kept inexpensive hearing aids out of the hands of the public actually came from a new cell phone he had just purchased. **“I felt**

- **Designed By A Board-Certified Ear, Nose and Throat (ENT) Doctor**
- **Doctor-Recommended, Audiologist-Tested**
- **★★★★★ Top rated hearing aid online—thousands of satisfied customers**
- **FDA-Registered**
- **Save Up To 90%**
- **Free Shipping Available**
- **Batteries Included! Comes Ready To Use**
- **100% Money Back Guarantee**



that if someone could devise an affordable device like an iPhone® for about \$200 that could do all sorts of things, I could create a hearing aid at a similar price.”

Affordable Hearing Aid With Superb Performance

The high cost of hearing aids is a result of layers of middlemen and expensive unnecessary features. Dr. Cherukuri concluded that it would be possible to develop a medical grade hearing aid without sacrificing the quality of components. The result is the **MDHearingAid® PRO**, well under \$200 each when buying a pair. **It has been declared to be the best low-cost hearing aid that amplifies the range of sounds associated with the human voice without overly amplifying background noise.**

Tested By Leading Doctors and Audiologists

The **MDHearingAid® PRO** has been rigorously tested by leading ENT physicians and audiologists who have unanimously agreed that the **sound quality and output in many cases exceeds more expensive hearing aids.**

MDHearingAid® PRO



Proudly assembled in the USA
from Domestic & Imported Components.



Doctors and patients agree: “BEST QUALITY SOUND” “LOWEST AFFORDABLE PRICE”

*“I have been wearing hearing aids for over 25 years and these are the best behind-the-ear aids I have tried. **Their sound quality rivals that of my \$3,000 custom pair of Phonak Xtra digital ITE.**” —Gerald Levy*

*“I have a \$2,000 Resound Live hearing aid in my left ear and the **MDHearingAid® PRO** in the right ear. **I am not able to notice a significant difference in sound quality between the two hearing aids.**” —Dr. May, ENT Physician*

*“We ordered two hearing aids for my mother on Sunday, and the following Wednesday they were in our mailbox! Unbelievable! Now for the best part—they work so great, my mother says she hasn’t heard so good for many years, even with her \$2,000 digital! **It was so great to see the joy on her face.** She is 90 years young again.” —Al Peterson*

For the Lowest Price Call Today

1-800-873-0680

**Phone Lines Open 24 Hours
EVERY DAY**

www.MDHearingAid.com/AD76

**Use Offer Code AD76 to get
FREE Batteries for a Full Year!
FREE Shipping Available**

Tool Review continued



RIDGID R138HPA

Street Price: \$99
Weight: 2.1 lbs. / Exhaust: Rear
Fastener Range: 5/8"-1 1/8"
Pin Type: Headless or slight-head
Accessories: Nails, belt hook, oil, swiveling air fitting, spare nose tip, safety glasses
Web/Phone: www.ridgid.com / 800-474-3443

a nail, and you'll never have to guess if a nail has actually been driven into each pinhole or not.

This is the only test gun that features an oil-less, maintenance-free design, and a belt clip and two no-mar tips are other useful goodies. PORTER-CABLE also includes a sturdy plastic carry case, 2,000 nails and safety glasses.

There's a 90-day money back guarantee and a three-year limited warranty with this tool. All in all, if you're willing to spend a bit more on a pin nailer, this complete kit is a good choice.

RIDGID R138HPA

RIDGID also offers a 1 3/8"-maximum nail-length pinner that bears some similarity to Hitachi's gun. From top to bottom and front to back, though, it's smaller and the tiniest gun in this group.

The R138HPA did a fair job of driving long pins into both maple and pine, and its no-mar tip prevented divots. But it didn't countersink them as well as others, and some nails were left slightly proud of the surface. Trouble is, it's impossible to drive these pins in farther and straight by hand.



A fraction of the size of other nailers, RIDGID's compact pinner should be an asset for nailing in tight spaces.

A two-trigger design, nail viewing windows in the magazine and a belt hook round out the accoutrements on this gun. For \$99, there's no plastic carry case, but you do get 1,000 nails, oil and safety glasses. It also includes RIDGID's lifetime service agreement.

Rotek RPN0635

There are numerous, lesser-known pin nailer brands on the market, including Rotek. While you don't get a warranty or even a printed manual with it, this \$89 gun comes with a plastic case and a bottle of oil.

In testing, the RPN0635 drove and set pins consistently and neatly into both maple and pine. It features a no-mar tip plus a spare, a well-designed two-trigger system and a stepped magazine that could help you fit this tool into tighter corners than some others with long, straight magazines.

Continues on page 44 ...



Three Premium Nailers

P in nails up to 2" long are available, but to drive them you'll need a full-size nailer. Currently, there are three premium options: the Cadex CPB23.50 (\$269.95), SENCO's FinishPro 23LXP (\$229) and GREX's P650 (\$288). These guns will also fire all of the shorter pin nail lengths, but having the convenience of full service comes at a steep price.



Rotek RPN0635

Street Price: \$89
Weight: 2.2 lbs. / Exhaust: Rear
Fastener Range: 1/2"-1 1/8"
Pin Type: Headless or slight-head
Accessories: Case, oil, spare nose tip
Web/Phone: www.floydtool.com / 800-882-7060



A no-mar tip prevents Rotek's RPN0635 and some other nailers from denting workpieces.

Build your own Masterpiece with one of our beautiful solid wood furniture kits! From small boxes to Highboys. Kits for every skill level.



www.bartleycollection.com
1-800-787-2800

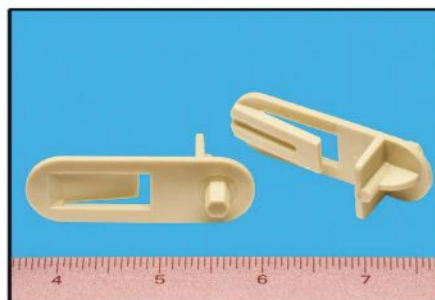


Bainbridge Manufacturing, Inc.
Plastic Hardware for Cabinets, Closets and Furniture
Cabinet Master® Plastic Hardware

2014-30

INJECTION MOLDING SINCE 1960

SHELF SUPPORTS



Over 500 items • Buy online at
www.Bainbridgemfg.com

or call 800-255-4702 actual people answer our phones.



Delivering Excellent Customer Service Since 1960

237 W. 3rd Street • P.O. Box 487 • Waterville, WA 98858
(509) 745-9555 • 1-800-255-4702 • Fax (509) 745-9666

HOWARD



When you want your finish to
FEEL as good as it **LOOKS**

Use Howard Citrus-Shield Paste Wax as the final finish on all types of wood, including antiques, furniture, cabinets, paneling and much more. It enhances the natural beauty of the wood grain and buffs to a brilliant, long-lasting shine.



Available in Neutral, Golden Oak, Walnut,
Mahogany, and Dark Oak

Howard Products, Inc.

Call 800-266-69545 For A Dealer Near You
Or Visit: www.howardproducts.com

Quickscrews Solves Problems

Over 950 professional woodworking and furniture screws

See our full selection on www.quickscrews.com

Order over \$100? Then **FREE FREIGHT** for you!

Quality Solutions For Your Fastener Needs

Cabinet Installation Screws



Drawer Front, Drawer Slide, Hinge & Edge Screws



Full Lines of Drive Bits & Magnetic Bit Holders



Woodworking and Fastener Experts

Order Online @ www.quickscrews.com

Warehouse Locations: Livermore, CA & Rock Hill, SC



Spotnails SP2340 The Striker

Street Price: \$99.99

Weight: 2.75 lbs. / Exhaust: Front

Fastener Range: 1/2"-1 1/8"

Pin Type: Headless and slight-head

Accessories: Case, oil

Web/Phone: www.spotnails.com / 800-873-2239



A long magazine on Spotnails' "The Striker" gun will hold two full clips for extended nailing jobs.

The gun blows exhaust air out the front, which isn't as user-friendly as rear exhaust styles. It otherwise seems durable and very well-designed. In fact, I happen to own a GREX P635 pinner, which sells for more than twice the Rotek price, yet this RPN0635 visually and functionally could be its crimson-colored twin.

Spotnails SP2340

Another lesser-known brand, Spotnails actually makes several nailer styles, including its SP2340. While the body casting on this tool doesn't have the refined fit and finish of other nailers here, its steel tip surprised me by driving pins into maple without marring the surface. On softwood, tip denting was slight but happened routinely.

The tool's long, straight magazine could make it awkward in tight quarters, but it holds two clips at a time for less reloading. Exhaust air blows out the front — not ideal — and oddly, it lacks an air fitting; you'll need to buy that separately. The grip space is snug, and my fourth finger often scraped the edge of the safety lever, which projects straight back from the trigger.

Spotnails rounds out your \$100 purchase with a plastic carry case and a bottle of oil. The tool also includes a 90-day warranty and a year on its major non-wear components.

Surebonder 9710CB

For an extremely affordable way to get into pin nailing, Surebonder 9710CB offers a no-frills, \$50 solution. The gun has a spacious grip, because there's no safety lever. The safety amounts to a tiny flip-down latch behind the trigger: once it's clear, the gun fires at every squeeze.

During use, you can decide where the exhaust air blows, thanks to a swiveling air port on top. That's a nice detail.

Its straight magazine holds up to two clips, and the gun drove them adequately, although there were occasional fasteners that didn't set below the wood surface. The narrow steel tip left noticeable marring on pine but not on maple.

Out of the box, I had to fix a gasket air leak by tightening the tool's Allen screws, but then it worked normally. Besides oil and a 90-day warranty, there are no other extras with this budget-priced tool.

Who Nailed the Win?

My all-around "Best Bet" pick goes to Hitachi, which offered good performance, is sensibly designed and fairly priced. If Rotek came with a warranty, this affordable dark horse could have stolen the "Best Bet" win here. Still, it earns a close second for an impressive showing in the nailing test.

Chris Marshall is senior editor of Woodworker's Journal.



Without a second safety trigger, Surebonder's grip offers more room for a natural, three-finger grasp.



Surebonder 9710CB

Street Price: \$49.42

Weight: 2.05 lbs. / Exhaust: Swiveling

Fastener Range: 1/2"-1 1/8"

Pin Type: Headless or slight-head

Accessory: Oil

Web/Phone: www.surebonder.com / 800-860-3838

Open up some room with a Murphy Bed



Building a smooth-action folding Murphy bed has never been easier. Our new hardware features a leg rail that is completely invisible when folded away, resulting in a classy, clean look. We also include a plan for the basic cabinet construction and an instructional DVD, all part of a package designed to help you *Create with Confidence*.

Materials code: 572



ROCKLER®
WOODWORKING AND HARDWARE

Create with Confidence™

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

Today's Shop

A Spectrum of Shop Vacuums

By Larry Okrend



There's more to shop vacuums than just sucking up dust. Design and engineering details make each model unique.

Like all dedicated woodworkers, I have no problem generating copious amounts of dust and debris. And while making dust is always more fun than cleaning it up, cleaning doesn't need to be an onerous task. With new shop vacuums, even the most basic models are quite capable, making the dreaded cleanup job much more convenient, effective and enjoyable. Efficient filters and well-sealed tanks are standard with most current models, and design and engineering advances have resulted in vacuums that fit the needs and budget of almost every woodworker and DIYer.

A Model for Every Need

I evaluated eight shop vacuums, from very affordable general-purpose models to high-end dust extractors for professionals and serious (and well-heeled) woodworkers. Whether you need to clean your shop floor, extract dust from a power sander or suck up a small flood in your basement, one of these units has you covered.

For simplicity, I've sorted the featured models into three categories: value-priced *general-purpose vacuums*, *step-up general purpose vacuums*, and *commercial-duty dust extractors*. Because each model is designed for a specific market niche and to provide the appropriate set of features, a head-to-head comparison isn't



A filter access lid on the top of the Bosch VAC090A makes cleaning and replacing the filter a snap.



Bosch provides simple and effective bungee-style retainers for hose storage and a loop for hanging the power cord.



really meaningful — it would be like trying to compare sedans, sports cars and SUVs.

I found that all of the tested vacuums provide more than adequate suction for their intended use. Almost any vacuum will suffer a decrease in performance as it fills with debris, and the finer the dust particles, the more rapid the decline.

Hose diameters and lengths vary considerably, but the short explanation is that a larger-diameter hose moves more air and is good for picking up bigger objects, while a smaller hose increases air velocity and is better for sucking up dust. A long hose gives you more reach for cleaning or collecting dust from a tool without having to move the vacuum.

Most of the vacuums come with a standard-duty pleated filter, but other choices are available, such as filters for heavy-duty applications and HEPA (high-efficiency particle air) filters that trap microscopic dust. Note that installing a HEPA filter does not necessarily mean a vacuum is certified for hazardous material mitigation. The type of filter installed will also have an impact on the vacuum's performance, depending on its airflow resistance.

Models with cylindrical filters that extend into the canister will suffer most quickly as the canister fills and the filter becomes submerged in dust and debris. Empty these

vacuums early and often to maintain performance. Also, cleaning or replacing the filter regularly will help maintain peak performance and extend the life of the motor.

The three dust extractors have an auto-on feature that's triggered by a power tool plugged into it. They also have variable suction control, which allows you to dial in the right amount of power for the tool in use (prevents sanders from sticking to the work, etc.).

There are many other details to consider, such as cord, hose and accessory storage, the accessibility of the power switch and how convenient the motor housing latches are to use.

Bosch VAC090A

The Bosch is a sturdily built *professional-level dust extractor*, priced at \$600, with many well-implemented features. Like the others in this category, it has variable suction control and an auto-on power tool outlet. There's a very convenient hinged filter-access lid on top, and the 1¼" x almost 10' hose attaches to the front port with a twist lock and stores easily with bungee-style straps. Another useful feature is

the retaining system for Bosch's L-Boxx tool and storage boxes, which turns the vacuum into a handy dolly. There's an automatic filter cleaning feature that makes a loud thumping noise every 15 seconds — it's a feature, not a problem. However, auto-clean must be turned off when using paper collection bags or a HEPA filter. The Bosch's narrow, snag-free design makes it easy to use in close quarters.

Craftsman 125.12007

This Craftsman *general-purpose shop vacuum* delivers a lot of value for the money. Priced at \$100, it generates remarkably strong suction, and it has good build quality and an extensive selection of cleaning tools. The onboard storage has a place for everything, and the motor unit's flat top makes a good tray for holding tools and small objects. A simple twist lock secures the 2½" (x 7') hose to both the inlet and blower ports.



Wire retainers on the Craftsman provide simple, yet effective hose storage. The large power switch is well placed, and the flat top makes a good storage tray.



The Craftsman can hold 16 gallons, so a threaded plug on the bottom of the canister makes draining liquid easier and more controlled than dumping the tank.



Today's Shop continued



The DeWALT features many nice touches such as simple hose and cord storage, a telescoping handle and a stable dolly with non-marring wheels and casters.



DeWALT's twin HEPA filters are low-profile to allow plenty of room for debris below them in the canister. These are permanent filters that can be cleaned many times.

Because it's one of the larger units, it might be a challenge to use in a small shop. It also requires some quick and easy assembly. I found the canister latches to be a little balky to use, and it wasn't always clear when or if they engaged properly.

DeWALT DWV012

Among the *dust extractors*, the DeWALT, which costs \$500, is a relative bargain. It's solidly built with high quality materials, and it's impressively powerful. A lot of attention has been paid to ergonomics. Three handles are provided for wrangling the unit, as well as a rear telescoping handle. The canister latches are large and easy to use, and it has convenient hose and cord storage. A ball-bearing twist lock keeps the 1¼" x 15' hose securely attached to the inlet port. This vacuum also has an automatic filter cleaner, which clicks loudly about every 30



Festool's CT 26 has its auto-start tool outlet under a hinged access door. When a power tool plugged into this outlet is turned on, the vacuum starts automatically.



The Festool features a hose and cord garage on top of the unit, and it also has a cord wrap on the back. (It's shown here with the optional handle and tool caddy.)

seconds. The canister accepts accessory paper and fleece filter bags but can be used without them. You can employ this vacuum for any cleaning task, but DeWALT is quick to point out that it's primarily a dust extractor. And like all the other dust extractors, no accessories are included.

Festool CT 26

From its performance to its price of \$625, the Festool leaves no doubt that it's a premium *dust extractor*. This is a system vacuum that's compatible with almost all of the company's power tools — and other brands — and offers a mind-boggling array of accessories. The CT 26 uses a self-cleaning filter bag to maintain its strong performance, and it has a well-designed hose and cord garage on the top as well as a cord wrap on the back. Other nice touches include a standard 1¼" x 11½" anti-static hose and a brake to prevent unwanted movement. I found it to be noticeably quieter than the other models, and its rectangular footprint allows it to maneuver easily in tight quarters. The vacuum can also be used as a mobile cart for Systainer® tool and storage boxes. For more capacity, Festool offers the CT 36 and CT 48 models with larger canisters.

Milwaukee 8955

The Milwaukee is a *step-up general purpose vacuum* that's old school, but in a good way. It may look like it's from the middle of the last century, but its motor and filtration are thoroughly modern. It provides plenty of suction

and, because the canister is tall, it can collect a lot of debris below the filter before it needs to be emptied. I found the two-wheel, one-caster dolly arrangement to be easy to maneuver, but not quite as stable as models with four contact points. The power switch is small and hard to see on the back of the motor. I think it should be “Milwaukee red” to at least make it more visible. Unfortunately, there are no cleaning tools included with this model. With its steel tank and simple construction, this vacuum, with its 1½" x 7' hose and price of \$270, is a workhorse that should last for many years.

RIDGID WD1851

The RIDGID seems to get all the details right. It's a *step-up general purpose model* that's feature-rich and easy on the pocketbook with its price of \$159. Despite its strong performance, it's relatively quiet, due in part to the included muffler. There's a good selection of standard-issue cleaning tools that all fit in the non-fussy fabric tool caddy mounted on the handle. Large wheels and casters provide



Milwaukee's large pleated filter allows plenty of airflow but still leaves a generous space in the canister for debris. The power switch on the motor housing is small and hard to see.

the unit with excellent mobility over rough surfaces. Additional features including a 2½" x 7' locking hose, a bottom-mounted drain for wet pickup and secure canister latching make this a very pleasant vacuum to operate. Some assembly is required, but it doesn't take long and the parts fit well. This is a nicely made vacuum that has few, if any, disadvantages.

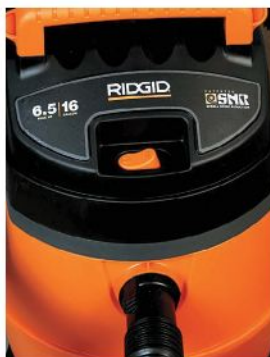
Shop Vac 5873410

The Shop Vac is a *general-purpose model* and the most compact model in this group.

It's versatile and excels in the mobility department. I grew to like this vac because it's a very good performer that's easy to use anywhere. Priced at \$130, it also comes with a generous selection of cleaning tools and even a paper filter bag for collecting fine dust from drywall and concrete. A 1½" x 12' hose with a screw lock gives this vacuum more reach than any of the other general-purpose models. The dolly



The RIDGID is relatively quiet considering its power. Some of that is attributable to the standard muffler that's plugged into the outlet port.



The RIDGID uses a thumb-actuated lever to lock its hose to the inlet port. It also features a well-designed rocker power switch, carrying handle and wraparound hose storage.





The Shop Vac 5873410 uses a screw connector for attaching the swivel end of the hose. Its 12' hose provides exceptional reach for cleaning without having to move the vacuum.



The Shop Vac's jellybean shape makes it easy to maneuver and carry. It also features a convenient top-mounted cord wrap and large rocker-style power switch.

can be removed quickly by pressing a lever, so the vacuum can be converted for handheld use. If space is at a premium and you want a vacuum that's easy to use anywhere in your home, this is a great choice.

WORKSHOP WS1100CA0

If you're the super-organized type, you'll love the WORKSHOP vacuum. With a price of \$250, it's a *general-purpose step-up model* that's designed like a rolling toolbox. There are two slide-out compartments (the top compartment also has a lid) that store the 1½" x 8' hose and cleaning tools with motor, filter and canister positioned below them. There's even a shelf on the back for storing cleaning supplies. Aside from its sleek,

functional design this vacuum is a great performer and a very quiet one, too. Other features include a rear-wheel brake to keep the unit stationary, a cord wrap and a locking hose. It's easy enough to roll the unit but it's very heavy, so lifting it is a chore. The WORKSHOP seems to be a durable, well-made machine that should provide years of service.

Sound and Size

Earlier, I gave you a heads-up on filter and hose size details you should consider in your search for the right shop vacuum. Sound and size are also important considerations.

Although several manufacturers list the decibel level of their vacuums, how and where the measurement is taken makes a difference, as does

the frequency of the sound. Fortunately, none of the vacuums were uncomfortably loud, but I'd still recommend wearing hearing protection.

Finally, unless you intend to use your shop vacuum as a stationary dust collector, you should consider the size of its footprint, its dolly and how the accessories, cord and hose are stored. Large casters and wheels will ease travel over rough and uneven surfaces, and a handle will make maneuvering a vacuum much easier.

Larry Okrend is the former editor of HANDY magazine.



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.



WORKSHOP's motor, canister and filter are on the bottom of the unit. The canister is essentially a slide-out bin and includes a drain for liquids on the bottom.



Designed much like a rolling toolbox, the WORKSHOP has drawers for its hose and accessories. The top drawer also uses a lid for additional accessibility.



25 Outdoor Projects – All on One CD!



Are you in need of a classic picnic table, or a porch swing? You'll find the plans here, on the *Woodworker's Journal* **25 Outdoor Projects CD**. Got a gardener in your family? Our fold-up greenhouse and potting bench plans go great with a green thumb. We haven't left out the critters or the kids, with plans for a birdhouse, a bat house bungalow and a child's Adirondack chair.

Find a season's worth of fun in your shop with all the great plans on the **25 Outdoor Projects CD**.



Item #54864 **\$14.99**

Order now! **800-610-0883** (mention code **WJ1444**) Order online: www.woodworkersjournal.com/CDs

25 OUTDOOR PROJECTS
A collection of our readers' favorite outdoor projects

NEW!

WOODWORKER'S JOURNAL
www.woodworkersjournal.com

BUILT SOLID & READY TO SAW!
EASY TO USE, AFFORDABLE & BUILT TO LAST.

SAW LUMBER FOR:

- HOME
- BARNES
- FLOORING
- FENCING
- STABLES
- GAZEBO

CALL OR EMAIL FOR YOUR FREE CATALOG & DVD!

4 Package Deals to Choose From!

MP-32™ PORTABLE SAWMILL
COOK'S SAW MFG.
PH: 1-800-473-4804 WWW.COOKSSAW.COM

WEST PENN HARDWOODS, INC.

Exotic Wood Wonderland!
The Largest Importer of Exotic Hardwoods From Pen Blanks to the Whole Log!
Check out our HUGE slab inventory!

- Turning Wood • Pen Blanks • Unique Boards • Lumber
- Thin-Dimensioned Lumber • Bottle Stoppers • Bowl Blanks
- Peppermill Stock • Burls • Guitar Sets • Luthier Wood
- Combo Pack Deals • Live Edge Flitches
- ...and much, much more!

Visit our Website:
www.westpennhardwoods.com

230 South Clinton Street, Olean NY 14760 • Phone: 716-373-6434 • Email: support@westpennhardwoods.com

Christian J Hummul Company
Since 1983

WoodCarving Supplies

- Carving Tools
- Knives
- Carving Burs
- Basswood
- Tupelo
- Patterns
- Paints
- Eyes
- Feet
- Woodburning

www.Hummul.com

1-800-762-0235

Christian J Hummul Company • 12446 W State Rd 81 • Beloit, WI 53511

What's In Store

Tools for Your Tasks

Contact Information

Arbortech
866-517-7869

BLACK+DECKER
800-544-6986

DMT
800-666-4368

Makita
800-462-5482

Milwaukee
800-729-3878

Rockler
800-279-4441

SENCO
800-543-4596

Veto Pro Pac
877-847-1443

Black+DECKER's new 20V MAX* Lithium Cordless Drill with AutoSense Technology is the first drill designed to automatically stop when screws are flush with the work surface. The drill does not have a mechanical clutch. Instead, it has an automatic clutch and operates in two modes: drill and drive. Lighted indicators on top of the drill identify which mode is in use. In drive mode, a microprocessor analyzes the rate of change of a screw's torque profile and stops most screws flush with the work surface within three milliseconds. The tool also provides depth control for micro-adjustments. The motor on the drill, model number BDCDE120C, operates at 0 to 800 rpm. It's priced at \$79.99.

Veto Pro Pac has added *Cargo Totes™*, professional grade wide-mouth tote bags, to their tool storage products. The Cargo Totes are made from 1800 Denier body fabric and have leather handle grips and a 3-millimeter-thick

polypropylene waterproof base. Veto's patent-pending design keeps them standing upright and open at all times, for use on the jobsite or as secondary home storage. According to Roger Brouard, founder of Veto Pro Pac, "They are perfect as a catchall bag for the van, a carry-all bag for end-of-day cleanup, or a more efficient way to organize the back of the truck." The Cargo Totes come in two sizes: the CT-XL, priced at \$104.99,

Veto Pro Pac Cargo Totes



BLACK+DECKER 20V MAX* Lithium Cordless Drill with AutoSense Technology

is 16.5" high, 17" long and 9.5" wide; the CT-LC, priced at \$89.99, is 14.5" high, 13.5" long and 9.5" wide. Both feature five tiered pockets.

The *Mini-TURBO™* from **Arbortech** is a smaller version of their *TURBOPlane™*, a wood sculpting tool that can be used either directly on the Arbortech *MiniGrinder™* or directly fitted to an angle grinder with the supplied extension adapter. The *Mini-TURBO* can be used for freehand shaping or with guides and templates for medium sized carving projects. It creates deep internal profiles, and the kit includes replaceable/resharpenable carbide teeth. The Arbortech *Mini-TURBO* has a suggested price of \$159.99.

For those looking for something between an 18-gauge and 23-gauge pin nailer,

SENCO has introduced the new *FinishPro 21LXP*. This 21-gauge pinner is designed to deliver the holding power of a brad nail while leaving a smaller indent that requires little to no filling. The 21LXP accepts headless or slight/medium head fasteners, ranging from 5/8" to 2". It weighs 2.7 pounds and measures less than 9" high by 8" long, plus



Arbortech Mini-TURBO

has a narrow nose, helping the 21LXP to fit into tight spaces. The metal magazine has a capacity of 200 fasteners and automatically adjusts for different fastener lengths to provide quick and easy loading. A last nail lockout feature protects against dry firing, which can ruin delicate material. The



SENCO
FinishPro 21LXP

21LXP can be used for finish and trim work, dowel and joint pinning, mirror and picture frame assembly, and more. Suggested price is \$249.

DMT®'s *DiaSpray*® is a liquid containing a suspension of .5 micron monocrystalline diamond, packaged in a spray bottle. The grit can be applied, via a couple of spritzes, to any stropping material you choose: leather, scrap wood, cardboard, etc. "Serious sharpening enthusiasts are used to sharpening in stages," says Mark Brandon, president of DMT. "Our *DiaSpray* represents the next step in the continuum of sharpening." The pump spray bottle contains .85 ounces of *DiaSpray* and sells for \$19.99.



DMT's *DiaSpray*

The new *T-Track Stops* from **Rockler Woodworking and Hardware** can be used to hold a workpiece while performing tasks like belt sanding, hand planing or scraping dried glue; multiple stops can "sandwich" a board to allow work in different

directions without moving the board or stops. Although specifically designed to work with Rockler's T-Track, the T-Track Stops will work with any T-Track that accepts 5/16" bolts. They have a profile of less than 3/4" when secured on the table. Each stop is made of machined aluminum and features a handle which is used to tighten the stop in place in its upright position, then flips down to be out of the way. The T-Track Stops are available in three varieties: short, inline and long. The short and inline stops are 1 1/2" wide; the long stops are 5" wide. The short (item 47482) and inline (item 43807) stops sell for \$6.99 apiece, and the long (item 46010) stops for \$12.99 each.

Makita's new XSH01X/Z Cordless 7 1/4" Circular Saw is billed as the world's first 7 1/4" circular saw powered by two 18-volt batteries, providing the performance of a corded circular saw. The Makita-built motor delivers 4,800 rpm for cutting and ripping and, in performance testing, this saw made 250 cuts in 2x4 lumber per charge: up to 2.5 times more cuts per charge than Makita's 6 1/2" Cordless Circular Saw. Testing also showed the XSH01X/Z to crosscut a 2x10 in 1.5 seconds, matching the cutting time of a corded saw. The XSH01X/Z's 7 1/4" blade has a cutting capacity of 2 3/8" at 90°. With both batteries



Rockler T-Track Stops



installed, the saw weighs 10.1 lbs. The XSH01X model is a kit including the saw, two 18V LXT® Lithium-Ion batteries, charger, 7/4" framing blade, saw guide, and contractor bag, with suggested price of \$795. The XSH01Z is the tool only, priced at \$435.

Milwaukee Tool's new line of *Inkzall™ Jobsite Markers* are writing tools optimized for jobsite use. The writing instruments in the line have clog-resistant tips and are designed to write through dusty, wet or oily surfaces, for durable use on rough surfaces like OSB and more. The markers have a proprietary ink for faster drying times and a hard-hat clip for storage. The line includes fine and medium point markers, as well as a stylus/marker combination tool designed for use with gloves on touch devices such as iPads and iPhones. Prices range from \$1.99 for a fine-point marker, to \$4.47 for a four-pack, to \$9.99 for the stylus and marker.



Makita Cordless
7 1/4" Circular Saw



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



Milwaukee Tool
Inkzall Jobsite
Markers

Woodworking Tools & Supplies Index



August 2014

For product information in the blink of an eye, visit www.woodworkersjournal.com and click on the *Tools & Supplies* tab.

ADVERTISER	Page No.	Web Address	ADVERTISER	Page No.	Web Address
1-800-BunkBed	11	www.1800bunkbed.com/vj	Granberg International	11	www.granberg.com
American Fabric Filter Co.	17	www.americanfabricfilter.com	Grex Power Tools	25	www.grextools.com
American Steel Span	9	www.steelspan.com	Harbor Freight Tools	20, 21	www.harborfreight.com
Arbortech	9	www.arbortechusa.com	Howard Products, Inc.	43	www.howardproducts.com
Badger Hardwoods of WI, Ltd.	17	www.badgerwood.com	JET Tools	2	www.jettools.com/14bandsaw
Bainbridge Manufacturing, Inc.	43	www.bainbridgemfg.com	Lignomat	11	www.lignomat.com
Bartley Classic Reproductions, Ltd.	43	www.bartleycollection.com			www.moistureproblems.info
Beall Tool Company	17	www.bealltool.com	MDHearingAid	41	www.mdhearingaid.com/AD76
BESSEY Tools North America	13	www.besseytools.com	Mirka Abrasives, Inc.	7	www.mirka-ceros.com
Cabinets Quick	55	www.cabinetsquick.com	Nail Gun Depot	37	www.nailgundepot.com
Cadex	3	www.cadextools.com	Oliver Machinery	9	www.olivermachinery.net
Carter Products Company, Inc.	63	www.carterproducts.com	Osborne Wood Products, Inc.	9, 55	www.woodencomponents.com
Cherry Tree Toys	37	www.cherrytreetoys.com	PanelPro	17	www.panelpro.com
Christian J Hummul Co.	51	www.hummul.com	Quick Screws	43	www.quickscrews.com
CNC Shark	3	www.rockler.com/power-tools	Radarcarve	55	www.radarcarve.net
Cook's Saw MFG, L.L.C.	51	www.cookssaw.com	Ready2Rout	15	www.rockler.com
Country Home Products	17	www.drpower.com	Rockler Woodworking		
Epilog Laser	15, 17	www.epiloglaser.com/wwwj	and Hardware	17, 45	www.rockler.com
Eureka Woodworks, Inc.	63	www.eureka-business.com	Tormek	3	www.tormek.com
Freud	68	www.freudtools.com/quadra-cut	Wagner Meters	25	www.wagnermeters.com
Fuji Spray Equipment	11	www.fujispray.com	West Penn Hardwoods	51	www.westpennhardwoods.com
Gator Finishing	67	www.gatorfinishing.com	Williams & Hussey		
General International	5	www.general.ca	Machine Company	11	www.williamsnhussey.com
Gorilla Glue	11	www.gorillatough.com	Woodworkers Source	17	www.101woods.com

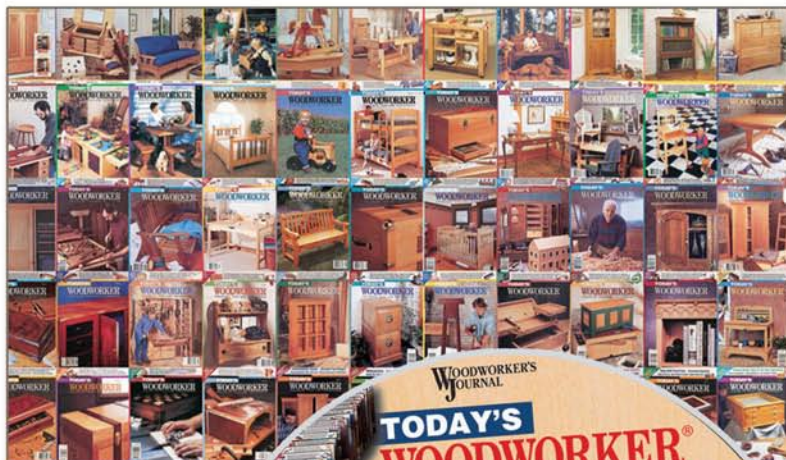
TODAY'S

WOODWORKER®

THE COMPLETE COLLECTION

FINALLY!

Today's Woodworker is back!



This one CD contains
easily searchable
years of *Today's*

- Projects ranging from

**ALL 57
ISSUES ON
ONE CD!**

This brand-new CD includes every single project, technique, trick and finishing article that ever appeared in *Today's Woodworker* magazine — the predecessor to *Woodworker's Journal*.

The ***Today's Woodworker Complete Collection*** features over 200 project plans with complete step-by-step directions, elevation drawings and photos.

Order today and qualify for FREE shipping

Item #48689 ... ~~\$29.99~~ **\$24.99**

Call **800-610-0883** and mention code **WJ1442**
or visit us at **www.TodaysWoodworker.com**

www.RADARCARVE.NET
Wood Carving Duplicators

- Furniture
- Gunstocks
- Millwork
- Decoys
- Musical Instruments
- Propellers
- Carved Figures

Incredibly accurate



Thousands of uses! 505-948-0571

OSBORNE 
Wood Products, Inc.



**Horizontal Keyhole
Brackets**

866.963.5601

www.woodencomponents.com

CABINETS QUICK!  High quality custom cabinets made simple, easy and quick!

CUT TO SIZE **DRILLING & BORING** **CABINET ASSEMBLY** **DOOR TO DOOR DELIVERY**

 Order fully customized cabinets fabricated to your exact size in any material you choose

Drawings & dimensions digitally produced and approved by you for perfect job accuracy 

MADE IN THE USA **Easy Ordering** **Quality Materials** **100% Custom**

Outsource...It's that Simple!
Ph. 714-532-9005 Fx. 714-532-9007
info@cabinetsquick.com www.cabinetsquick.com

WOODWORKER'S JOURNAL eZiNE

FREE!
Three downloadable plans in every issue ...

Sign up at:
www.woodworkersjournal.com

Small Shop Journal

Building a Hobby Desk

By Sandor Nagyszalanczy

A compact, portable desk with built-in storage and features to make working on your hobbies more convenient and comfortable.



I was watching our big screen TV in the family room one evening when I started feeling a bit guilty for not working on an electronics project I have going. But I didn't want to entirely abandon the movie, or leave the comfort of the couch.

The solution came to me: Why not build a simple, portable hobby desk? My project has a fall-front style desktop, built with torsion box construction that flips down to provide a strong, ample work surface. The inside of the cabinet provides storage, and is concealed when the desktop is pivoted closed. A pair of legs keep the cantilevered desktop rock-solid. They can be rotated up to make the cabinet more compact. When it's in use, the feet can slide partially underneath my couch. A pair of handles allow the folded-up desk (about 2' wide, 3' high and 1' deep) to be easily carried. And, to make working at my new hobby desk easier on my aging eyes, I fitted a worklight on the underside of the top.

The inside layout of my desk is designed specifically to fit my needs for small electronic components, but you could rearrange the interior to work well for any number of other hobbies: tying fishing flies, building scale models, making or repairing jewelry, stamp, coin or rock collecting, rubber stamping, scrapbooking, etc.

I built the desk entirely out of Baltic birch plywood joined with plate joinery biscuits and left the ply's edges exposed (a look I actually like), and was able to build the entire piece in just a few days. However, if you have more time and want a more attractive piece, you could build it from solid hardwoods, employ decorative joinery and fancier hardware — as you wish.



Built with torsion box construction, the desk's fold-down top pivots on a pair of hanger bolts. It flips up to conceal the interior and lower shelf/cubby.



After you've loosened the hand screws far enough for clearance, the desk's legs pivot up for easy transport and compact storage.



The desk's interior has storage shelves and cubbies for hobby supplies and features a three-plug power outlet and a built-in LED strip light.

Cutting Out the Parts

All the parts for the hobby desk are cut from a single 60" x 60" sheet of Baltic birch plywood. To get the maximum yield from the sheet, I used a free online panel optimization program (found here: www.optimalon.com/online_cut_optimizer.htm). I input the size of the parts and the plywood sheet, and it gave me a layout diagram that I followed during cutting. As with all cabinet projects, it's not only important to get your part dimensions cut right on the money, but to make sure that all these rectangular parts are all nice and square (it saves a lot of fuss and bother later on).

Once all the parts are cut, there are a few more table saw operations to perform: The back, inner edges of the top and sides receive a 1/4"-wide by 1/4"-deep rabbet, for inseting the desk's 1/4" plywood back. I cut these with a regular dado set. I also cut a 1/8"-wide, 1/4"-deep channel centered on the back edge of the left-hand cubby divider (for routing the wire for

the built-in light). Finally, I set the table saw's blade at 30° to cut the slanted front edge of the lower cubby shelf and both long edges of this cubby's front strip.

Cutting Biscuit Joinery

I used #10 plate joinery biscuits to create strong joints between the cabinet's main plywood components. For the parts to align correctly during final assembly, it's important to locate all the biscuit slots accurately.

To do this, I first clamped both of the cabinet's sides to my benchtop with the inside faces up, ends flush and inner edges touching. I then carefully marked the location of the lower edges of the bottom and lower cubby pieces. I clamped a straight scrap strip atop the sides, with the strip's edge flush with the line, marked the corresponding position of each biscuit slot on the two sides, then plunge-cut them. I then cut the slots into the ends of the corresponding parts, referencing the bottom of the biscuit joiner.

Making the Torsion Box Desktop

The top is basically a torsion box consisting of a top, a bottom, four edges and then a number of internal filler strips. I made the entire thing out of 1/2" Baltic birch plywood, which makes the top incredibly sturdy, but also a bit heavy. I'd have used 3/8" thick plywood, if I'd had any on hand.

The first step is to glue all the edges to the bottom of the desktop, aligning their outer surfaces with the top's edges. I glued on the long edge strips first, using my pneumatic pin nail gun to affix them, then trimmed the length of the short-side edge pieces to fit (necessary because plywood thickness tends to vary slightly). I next glued in all my filler strips: long ones crosswise, with the short ones interspersed between them. I added an extra short filler strip near the front left edge of the top, to reinforce the section where I'll attach my clamp-on vise. I also glued in the two pivot blocks to the inside of the short edges, locating them where the

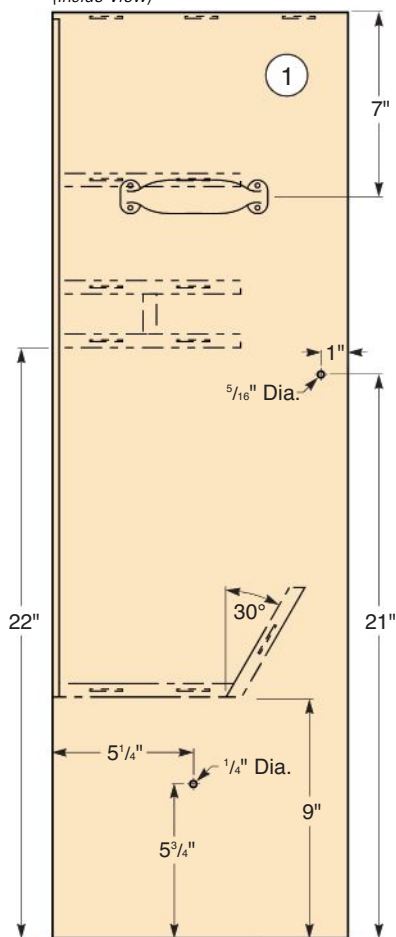


The author used an online panel optimization program to create a layout drawing that allowed all the plywood parts needed for building the hobby desk to be cut from a single 60" by 60" sheet of Baltic birch plywood.



All of the parts are joined with #10 plate joinery biscuits. A straight wood strip clamped across both of the desk's sides acts as a fence to accurately position the biscuit joiner and assure that mating parts will align properly.

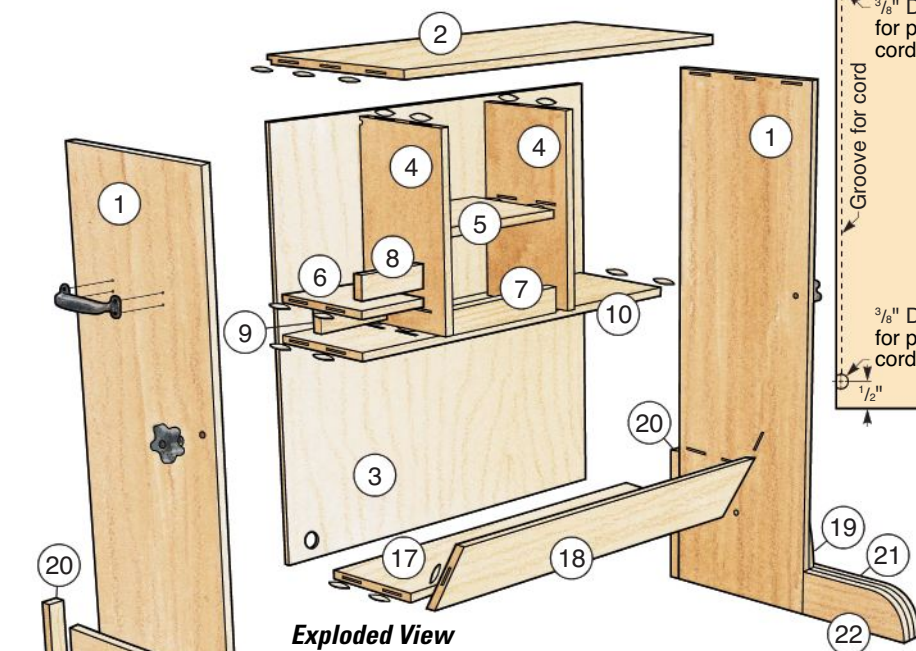
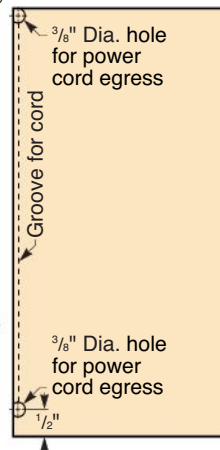
Side
(Inside View)



MORE ON THE WEB

For a video of the author demonstrating the assembly of the Hobby Desk, please visit woodworkersjournal.com and click on the "More on the Web" tab shown above.

Left Vertical Divider
(Rear Edge)

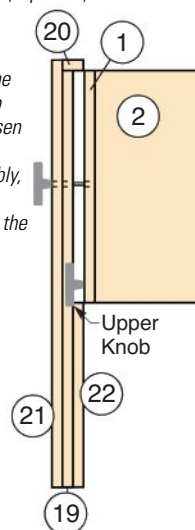


Exploded View

MATERIAL LIST

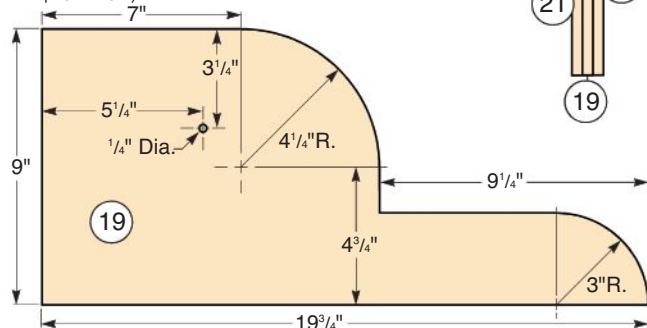
	T x W x L
1 Sides (2)	1/2" x 11" x 34 1/2"
2 Top (1)	1/2" x 11" x 24"
3 Back (1)	1/4" x 24 1/2" x 25 1/4"
4 Vertical Dividers (2)	1/2" x 6 3/4" x 11 1/2"
5 Center Horizontal Divider (1)	1/2" x 6 3/4" x 8"
6 Left Horizontal Divider (1)	1/2" x 6 3/4" x 4 1/2"
7 Center Cubby Front (1)	1/2" x 1 1/2" x 8"
8 Left Cubby Front (1)	1/2" x 1 1/2" x 4 1/2"
9 Cord Capture Strip (1)	1/2" x 1 1/2" x 4 1/2"
10 Divider Bottom (1)	1/2" x 6 3/4" x 24"
11 Desk Top and Bottom (2)	1/2" x 18" x 23 15/16"
12 Desk Front and Back Edges (2)	1/2" x 1" x 23 15/16"
13 Desk Sides and Fillers (4)	1/2" x 1" x 17"
14 Desk Filler Strips (5)	1/2" x 1" x 7 1/4"
15 Desk Filler Strips (2)	1/2" x 1" x 7 7/16"
16 Desk Pivot Blocks (2)	1/2" x 1" x 2"
17 Lower Storage Cubby Bottom (1)	1/2" x 6 1/2" x 24"
18 Lower Storage Cubby Front (1)	1/2" x 5" x 24"
19 Legs (2)	1/2" x 9" x 19 3/4"
20 Leg Stop Strips (2)	1/2" x 1" x 9"
21 Outer Feet (2)	1/2" x 3" x 20 1/4"
22 Inner Feet (2)	1/2" x 3" x 8 3/4"

Cabinet Feet
(Top View)

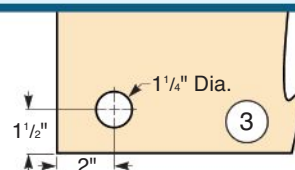


When folding the leg assembly up for storage, loosen the lower knob until the assembly, which includes piece 20, clears the side (piece 1).

Leg
(Front View)



Power Cord Hole Location
(Front View)





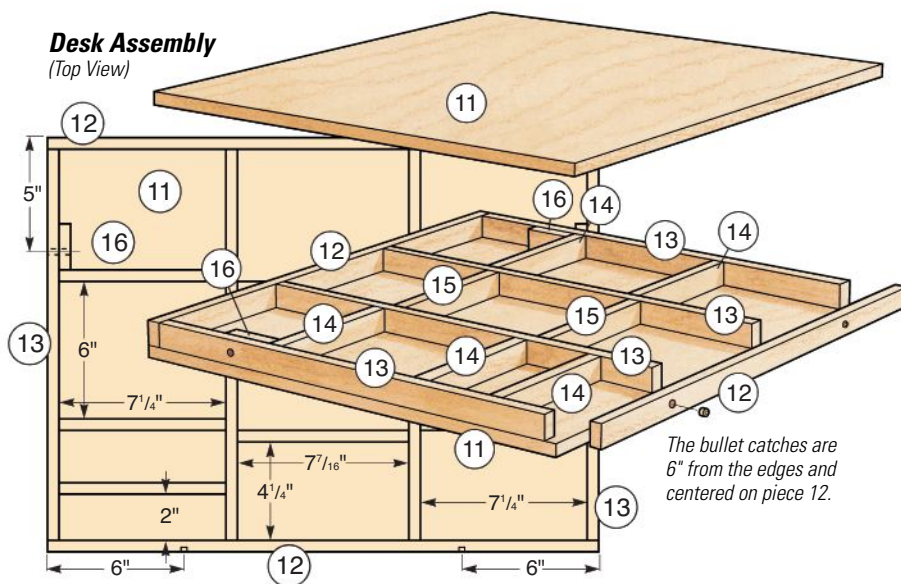
After gluing the edges and filler strips to one side of the desk's torsion box top, the author set the assembly atop the table saw and weighted it down with a small hand saw to keep it flat and true as the glue dried.



After applying glue to all the edge and filler strips, the author tacked the other face of the desk in place with a pneumatic pin gun, then clamped. This provides the desk with a very strong and light work surface.

Desk Assembly

(Top View)



hanger bolts that pivot the desktop will be added later.

Once all the parts were glued in place, I set the entire assembly, bottom down, atop my most reliably flat surface: my cast-iron table saw top. I put a piece of scrap ply atop the assembly, then set the heaviest thing I could easily lift onto the plywood (in this case, that was a 10" benchtop

band saw). After the assembly dried, I applied glue to all the desktop's edges and filler strips, then set the top piece of plywood on and drove a few pin nails to hold it in place. I clamped the entire top all the way around, using some deep-throat clamps to apply pressure closer to the center of the top as well as using regular clamps around the edges.

Constructing the Legs and Feet

The legs were made in a series of steps. I first marked out the necessary cuts on the outsides of both of the larger leg pieces, including the 4 1/2"-radius curve on the upper corner and the 3"-radius curve on the end of the foot. After band sawing out these curves slightly outside the marked lines, I sanded the larger curve on the "knee" of the leg to final shape and size using a benchtop disc sander. I then glued the stop strip to the back edge of each leg piece, with the strip's outside edge flush with the outside surface of the leg.

Next, I drilled the holes for the carriage bolts that join the legs to the sides. First, I assembled the pairs of legs and sides, setting each leg's stop strip against the back edge of the side and the bottoms of the parts flush. After each pair was clamped together, I carefully centered the marked leg mounting hole under a 1/8"-dia. drill bit chucked in my drill press. I bored a hole all the way through both parts, then, without re-clamping them, switched to a 1/4"-dia. drill bit and bored all the way through the leg, but only halfway through the side. After unclamping the parts, I centered a 5/8"-dia. Forstner bit on the 1/8" hole on the inside surface of the



The author uses a compass to mark each leg's curved knee, as well as the ends of the feet, before they're cut to shape with a band saw.



A series of steps on the drill press bores holes for the 1/4" carriage bolts that both secure the desk's legs to the sides and allow them to pivot.



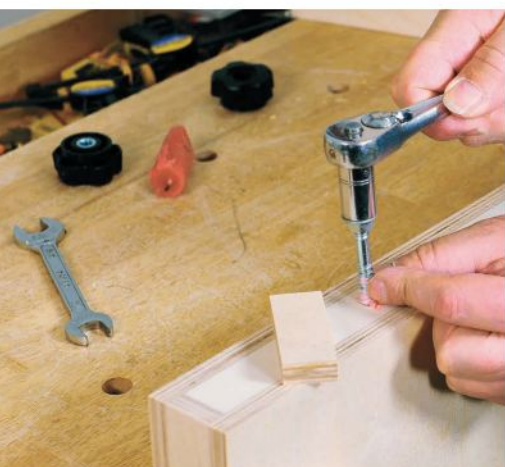
The shorter section of each leg's foot is glued to the inside face of the leg: the back edge of this inner foot is flush to the front of the desk side.



A router fitted with a flush-trim bit trims the leg's feet to final shape. The bit's guide bearing rides on the already cut and sanded longer foot piece.



With the hobby desk's top temporarily clamped in place, the author drills a pilot hole for the 5/16" hanger bolt that it will pivot on.



A ratchet, set on a pair of nuts jammed together on the hanger bolt's threaded portion, drives the bolt's screw into the desk's top.



The hobby desk's upper dividers, shelves and cubbies are first glued together as a subassembly. Biscuits help keep all the parts correctly aligned.

side, and drilled down about 1/8" deep, to create a recess for the carriage bolt's head. Then I flipped the side over, and finished drilling the 1/4" hole from the top. I repeated the process with the other leg/side pair.

As long as I was working at the drill press, I went ahead and drilled the 5/16" holes for the hanger bolts to attach the desktop to the sides. I set one side atop the other with inside surfaces touching, carefully aligned the ends and edges so they were flush, clamped them together, then drilled all the way through both pieces at once. I also bored two 3/8" holes halfway through the inside surface of the left-hand divider for the LED light wiring, and a 1/4" hole through the back for the power cord (all hole locations are shown in the *Drawings*).

Back to the legs and feet: I shaped the curved end of each long foot. This became the template for shaping the other foot, as well as the foot portion of the legs. Once the pieces were sanded and ready, I glued the long foot to the outside surface of the leg, making sure its bottom edge was flush with the bottom of the leg. I then temporarily mounted each leg to its corresponding side, using a 1/4" carriage bolt and threaded hand screw to hold it in place. Then I glued the shorter foot piece to the inside surface of the leg/foot, making sure its back edge was set flush against the front edge of the side.

Once the glue was dry, I trimmed the feet to final shape using a flush-trim bit chucked into my router. I set the height of the bit so that the pilot bearing rode on the long foot piece. I clamped the leg onto my workbench so that the front edge

of the leg was flush with the edge of the bench; this prevents the router bit from cutting into the upper portion of the leg. I then ran the bit along the top of the feet to trim them to final profile.

Fitting the Desktop

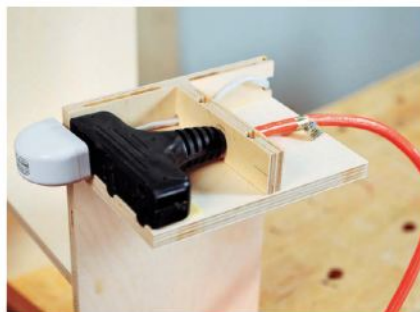
With all the parts sanded and ready for assembly, I needed to fit and mount the desktop into the cabinet before final assembly could commence. I dry-assembled the top, sides, bottom of the cubby and one vertical divider, and the lower cubby, using biscuits to align the parts as they were clamped together. To help align the desktop, I clamped four scrap strips to the sides, setting their ends 2 1/8" shy of the front edge of the sides. I also clamped a strip across the front of the cabinet just high enough to support the desktop's lower edge. I then set the top into the cabinet in its upright position, leaving a slight gap (about 1/16") between its top edge and the cabinet. Once the desktop was aligned, I secured it with a clamp across the width of the cabinet. Then I drilled horizontally into the sides of the top with a 1/4" bit, centering the bit in the hanger bolt holes drilled earlier. After this, I removed the top, clamped it to my workbench and installed the two 5/16" hanger bolts. To drive them, I jammed two nuts against one another on the bolt's regular threaded section, and used a socket wrench to run the screw part of the bolt into the desktop holes.

I reinstalled the desktop into the dry-clamped cabinet, to make sure that it pivoted freely. This is a good time to drill two 3/8" holes into the desk's top edge, and install a pair of bullet catches that help secure the desktop in its closed position.

Glue-up and Finishing

To make gluing up the hobby desk easier, I did it in several steps. The first step was joining all the parts that make up the divided cubbies inside the desk. I started by assembling the central shelf between the two vertical dividers, as well as the shorter shelf to the left-hand vertical divider, making sure to keep all edges flush and square to one another. After about half an hour, I removed the clamps and scraped the rubbery glue residue from all the inside corners of the parts. I used both a regular bench chisel and a short blade removed from a hand plane (to get into the tighter spaces between dividers).

Because I chose to incorporate a power cord and LED light into the upper cubby unit, I then did a little carving using a Dremel tool fitted with a burr. I ground notches into the lower edge at the front of the short shelf to accommodate the three lugs on the top of the plug. I also used the burr to grind a small channel into the divider, so I could pass the wire from the light's transformer past the plug. I then mounted the plug to the underside



The light's power cord is pressed into a groove cut in one of the dividers (left). A notched strip keeps the three-plug power cord in place (above).

of the short shelf with a couple of pieces of mounting tape and screwed on the notched cord capture strip that secures the back of the power cord. With the power cord and light transformer in place, I glued the cabinet's top and bottom to the cubby assembly, once again using plate joinery biscuits and checking the assembly for square after clamping. This is also a good time to glue together the two pieces that form the lower shelf. Once the glue dried and I removed any residue, I sanded smooth all the plywood edges, as well as any surfaces that still needed it.

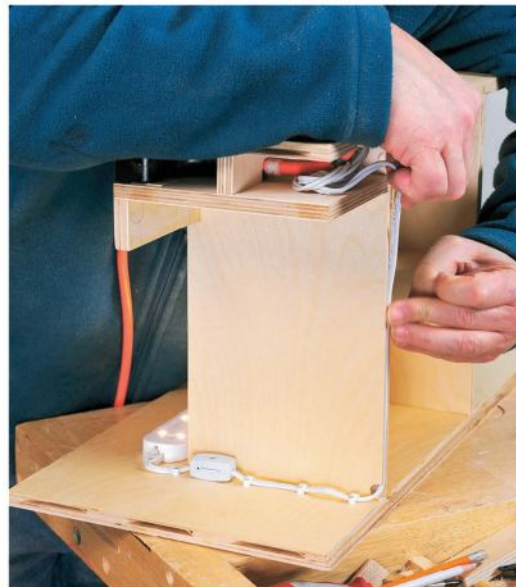
Before gluing up any more parts, it was time to apply finish to the upper and lower cubby assemblies, the legs/feet, the desk's top, and the inside surfaces of the cabinet sides. To keep the finish out of the biscuit slots, I taped over them on the sides and tried to avoid getting finish on the ends of the cubby assemblies. After the finish dried, I removed the tape from the sides, then finished installing the LED light and its wiring in the upper cubby.

Completing the Project

Final assembly also took place in two stages: first, the upper and lower cubbies were glued to only one of the sides; then the desk's top was installed and the second side glued on.

In preparation for the first step, I clamped one

The author glues the desk's sides to the divider subassembly one at a time. After the first side is in place, the desk's top is fitted, and then the second side is glued on.



cabinet side atop my portable work table and laid out all the clamps and clamping blocks I'd need, ready to go. I then glued all the biscuits in and put the cubbies in place. Before the clamps went on, I put dry biscuits into the end of the cubbies and set the other cabinet side on, as this helped to keep the parts aligned. I put clamps in place and tightened them enough to snug things up, then I checked the assembly for square, and tweaked it as necessary.

Once this assembly was dry, I cleaned up the glue residue, then installed the desk's top into its pivot holes before gluing the other cabinet side in place. After that dried and was cleaned up, I final-sanded the cabinet's top corners, then finished them with wipe-on polyurethane.

Before gluing and nailing on the back, I installed the two small rubber bumpers that provide stops for the desktop when it's in the closed position. Last details included screwing on the two side handles, attaching the legs, and, of course, loading the inside of the cubbies with the part bins and trays, as well as small tools and supplies.

When I'm ready to use my hobby desk, I feed the power cord (which stores nicely in the lower cubby) through the hole in the back and plug it in. After lowering the desktop and turning on the light, I'm ready to work on my latest project while simultaneously indulging in my latest televised guilty pleasure.

Sandor Nagyszalanczy is a furniture designer/craftsman, writer/photographer and contributing editor to Woodworker's Journal. His books are available at amazon.com.



Finishing Thoughts

Six Spraying Slip-ups: How to Avoid Them

Train yourself in the proper techniques, materials and equipment to avoid (and fix) mistakes.



Michael Dresdner

is a nationally known finishing expert. He shares his expertise on the DVD *The Way to Woodwork: Step-by-Step to a Perfect Finish*, available through the store at woodworkersjournal.com.

Spraying is quick, easier than brushing and fun. However, there are several things that can go wrong. Here are six common problems, how to avoid them in the future, and the best ways to fix them if they do attack. The first three have more to do with the material, environment and spray equipment, while the last three are more related to your spraying technique.

Orange Peel

As finish flows through the gun, the tip atomizes it into tiny airborne droplets. If those droplets are too large or too thick to flow out during drying, you may end up with a surface that is pebbly, like the surface of an orange peel. Sometimes you can avoid it by using a smaller fluid tip on the gun, but the simplest way to sidestep orange peel is to thin the material.

Fixing orange peel is fairly easy. Wait until the coat is dry, sand it smooth, and spray the next coat with thinner material.

Incidentally, when you first spray water-based coating, it may look like there is orange peel, but when you let it dry overnight, the finish usually will flow out. That's because water-based coating has a high surface tension and will create beads of finish, but the evaporation of the high-surface-tension water in the mix will allow the remaining finish to flow out level during the drying process.



A pebbly surface on your project, with the texture of an orange peel, is the result of finish droplets that are too large or too thick to dry properly.

Foam or Air Bubbles

Though it is not common in other finishes, foam does show up in water-based coatings. Although it may look like blush, foam is actually a cloud of infinitesimal air bubbles trapped in the finish, usually caused by the spray gun agitating the coating. Spraying lighter coats, lowering the air pressure and using a smaller atomizing tip can all help, but in a pinch, you can also eradicate foam chemically. Add an ounce of half-and-half, the cream-and-milk mixture you put in coffee,

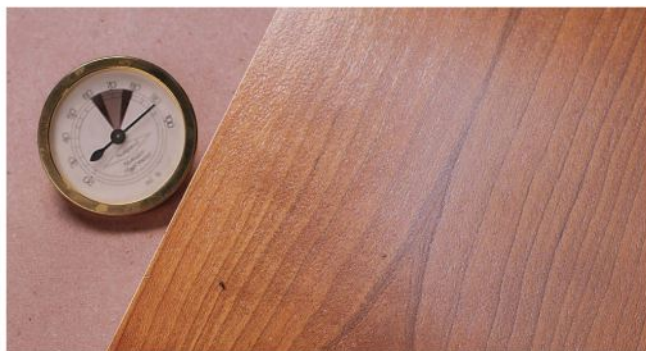
to a quart of water-based coating before spraying. Use real half-and-half, not nonfat or synthetic.

Sadly, once in the finish, foam is not easy to remove. Acrylics can sometimes be dissolved enough with lacquer thinner to flow out the foam, but at other times, especially with water-based polyurethane, you usually have to remove the foam-laden coat and start over.

Lacquer, shellac, and oil varnish/polyurethane won't generally foam, but you might



Adding half-and-half to your water-based coating helps eliminate the foam.



Blush, which looks like a cloud floating in the finish, occurs when moisture from the air gets trapped in the finish. "Foam" looks similar.

Drips can happen when your spray gun is too close to your project. Let them dry, then carefully sand, scrape or chisel them off.



get air bubbles large enough to see with the naked eye. Typically, that means you've sprayed too heavy a coat of finish over wood with open pores, thus trapping air beneath the fast-drying topcoat. Avoid it by spraying lighter coats or thinner material, but once they are in the finish they're not easy to remove, and may require removing the bubble-laden coat.

Blush

When moisture from the air gets trapped in a finish, we call it blush. It looks like a cloud floating in the finish, and usually shows up in

fast-drying lacquers sprayed in very wet environments. You can wait for dry weather to spray, or lower the relative humidity by running a dehumidifier or air conditioner on humid days, or a heater on cold, damp days.

Spraying another coat will remove the blush, though if the same conditions exist, it could attack that coat as well. If you can't alter the environment or wait for a dry day, you can slow down the drying rate of the finish itself by adding blush chasers and retarders, which are usually available wherever you buy your lacquer.

Drips, Sags and Runs

Stopping, moving the gun too slowly or going too close will deposit more finish, and can cause sags, drips or runs.

Avoid them by keeping the gun moving at the right speed and at the right distance from the wood so that the finish flows on evenly: not too wet, and not too dry. When drips happen, let them dry fully, then sand, chisel or scrape them off carefully and recoat.

Continues on page 64 ...

Contact us

with your finishing questions by writing to Woodworker's Journal, 4365 Willow Drive, Medina, MN 55340, or by emailing us at: finishing@woodworkersjournal.com.

Please include your address, phone number and email address (if you have one) with your thoughts or questions.

Turn your shop into a furniture factory with the proven woodworking program from EUREKA Woodworks.

www.eureka-business.com 877-212-1147

INNOVATIONS MADE IN THE USA FOR OVER 85 YEARS

MultiRest®
Vessel Support System
Patents Pending

PERFECT SPHERE™
Sphere Turning System
Patent Pending

Shown with Hollow Roller® Vessel Turning System

Hollow Roller®
Vessel Turning System

Center Master™
Blank Creation System
Shown with Carter Circle Cutting Jig

Hollow Roller XL®
Deep Hollowing System

Band Saw Accessories
Lathe Accessories
Circle Cutter

Carter products

Face-Off™ Face Plates
Magnetic Fences
and More!

Innovative Solutions for all your Woodworking Needs

WWW.CARTERPRODUCTS.COM • Toll Free 888-622-7837

Finishing Thoughts continued



Overspray

Just as drips are from too much finish, overspray is from not depositing enough, usually by being too far away from the surface or moving the gun too fast. In most cases, you merely need to get the gun closer or slow down a bit to avoid overspray. Fix it by sanding lightly to smooth the area, then respray.



Overspray occurs when you spray from too far away (top photo, above): your droplets dry in the air. To fix this problem, move the spray gun closer to the object you're spraying (bottom photo, above) and slow down a bit.

Holidays or Bands

Holidays are areas you missed or under-sprayed. Often, they come from moving the gun in an arc instead of keeping it parallel to the wood surface, or in designing a spray sequence that misses some areas, like the inside of chair legs or cabinets. Picture your pattern of gun movement in advance to ensure you'll hit all areas the same, and keep the gun parallel to and the same distance from the wood at all times.

Alternate wet and dry bands of finish occur when you don't overlap your spray strokes enough on a large, flat surface.

With each pass of the gun, overlap 50 percent of the last pass. Spray each pass lightly enough that the combination of the pass and overlap create one full coat, and don't forget to account for the first and last passes near the edges.

Dry areas are often slightly rough. Smooth them with fine 400-grit paper, and focus on the "hungry" areas when you spray the next coat.

Spray Pattern

Any of these problems can stem from having an irregular spray fan, usually caused by a partially clogged fluid tip or air channel. Check the fan pattern by spraying for a split second onto dry cardboard or wood. You should see a uniform oval of finish, not a "dogbone" or "pear" shaped fan.

In general, good gun setup, correct fluid viscosity, proper triggering, and correct distance, speed, and pattern are all critical, but that's a topic for another day.



If you don't overlap your strokes enough when you're spraying a large, flat surface, you will get alternate wet and dry bands of finish.



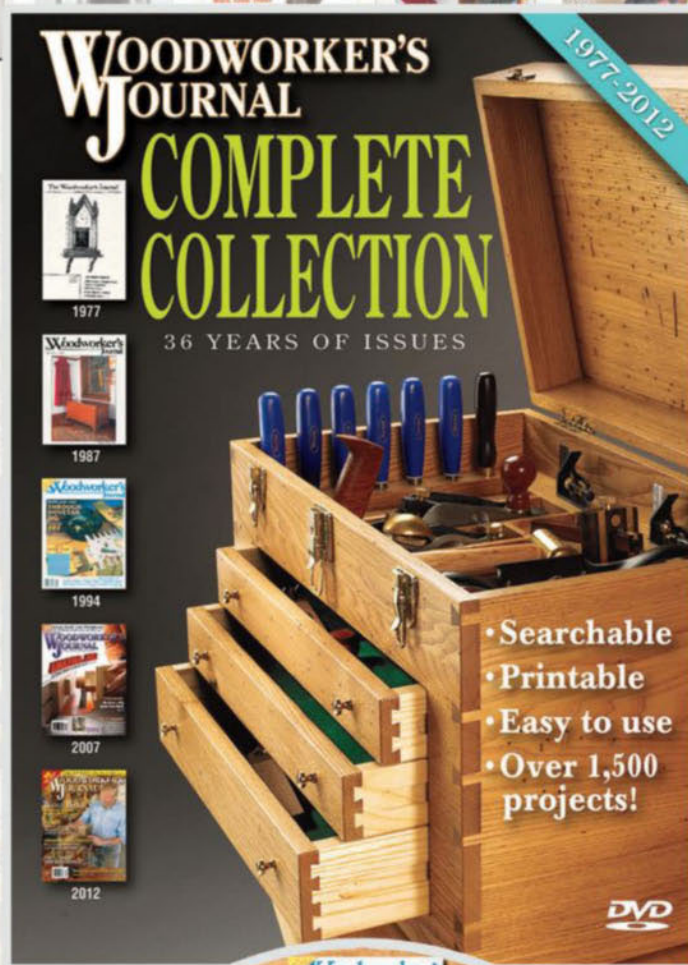
Check the fan pattern of your spray gun to avoid problems. It should be a uniform oval (at far left in photo), not a "dogbone" or "pear" shape.

Woodworker's Journal: The Complete Collection (1977-2012)

Finally! One DVD that includes every back issue (36 years) of Woodworker's Journal magazine!

We've just compiled every issue of our magazine (1977 - 2012) onto one DVD — the Woodworker's Journal Complete Collection!

Now you can get 36 years of great projects in searchable and printable PDF format. With more than 10,000 pages, 1,500 projects, hundreds of technique articles, shop tips, readers' tricks and finishing advice, this DVD has it all! And, it is from the most trusted name in woodworking: **Woodworker's Journal**.



ORDER YOURS TODAY!

Woodworker's Journal Complete Collection
Item #44753 \$89.99

**CALL 800-610-0883 (mention code WJ1443) or
order online: www.woodworkersjournal.com/DVDs**

HEY Did You Know?

Woodworking trivia: clues from the past

Analysis of ancient Neanderthal stone tools indicates they were used to work wood. Thus, woodworking of a sort has been around for more than 30,000 years.



What Does It All Mean?

A quick guide to terms from the world of woodworking.

Brad Point: A wood boring bit similar to a twist drill but with a sharp spur at its point to lead the shaft into the hole



Piano Hinge: A long, narrow hinge with attachment points at short-spaced intervals and a connecting pin running its entire length

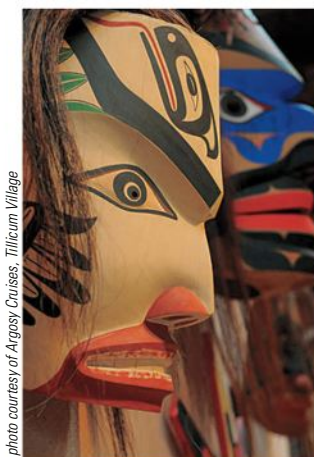
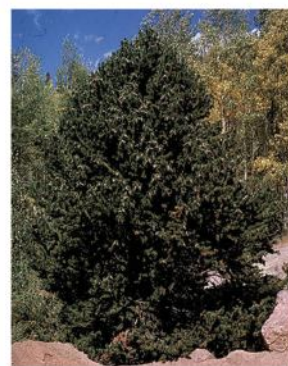


photo courtesy of Argosy Cruises, Tillikum Village

Veiner: A small gouge used to carve thin grooves or lines

Hide glue, made of proteins formed from collagen, is probably the oldest glue still in use today. It shows up in 4,000-year-old tombs of Egyptian pharaohs. The word "collagen" comes from the Greek kolla (glue).

Going back 3,500 years, Pacific Northwest natives made **paint for wood totems, masks and boxes** by mixing spit with crushed salmon eggs and adding charcoal for black, calcium carbonate for white, celadonite for yellow-green to green-blue, oxidized vivianite for blue, and both red and yellow ochre.



USDA Forest Service, Region 2, Rocky Mountain Region Archive, Bugwood.org

Bristlecone pines, which grow in the southwestern United States (California, Nevada, Utah) are some of the oldest trees known. One still-living tree is said to be over 5,000 years old.

Submit your own trivia ...

Send in a curious fact about your favorite topic and ours: woodworking. If it is selected for use, you will win an awesome prize!

Submit your Trivia to Woodworker's Journal, Dept. Trivia, 4365 Willow Drive, Medina, MN 55340. Or send us an email: trivia@woodworkersjournal.com

Your Trivia Test:

QMost woodworkers find that dovetail joints add prestige to a project. Have you ever wondered: how old is the dovetail joint?

Answer
Dovetails show up on furniture found in 3,000-year-old tombs.



Alf Sharp of Woodbury, Tennessee, will receive a Senco FinishPro 23SXP 23-ga. Headless Pinner, 1 Gallon Finish & Trim Air Compressor (model PC1010N) and pack of 23-ga. Pins (item A101009) for having his contribution selected for the Trivia page.

YOU BUILT IT, NOW LETS FINISH IT.



GO WITH THE GATOR...

YOU'LL BE GLAD YOU DID.

Sanding Abrasives

Gator Finishing Products includes everything you need for sanding wood, metal, fiberglass, and painted surfaces.

For more information about Gator products visit us on line at: www.gatorfinishing.com



Available at

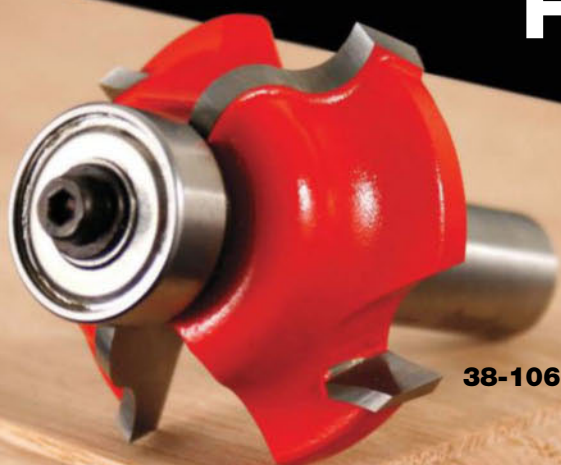
LOWE'S

and Participating Hardware Stores.



What's The Secret To Flawless Edge Profiles With NO REWORK?

Freud's Quadra-Cut™ 4 Cutter Design Router Bits

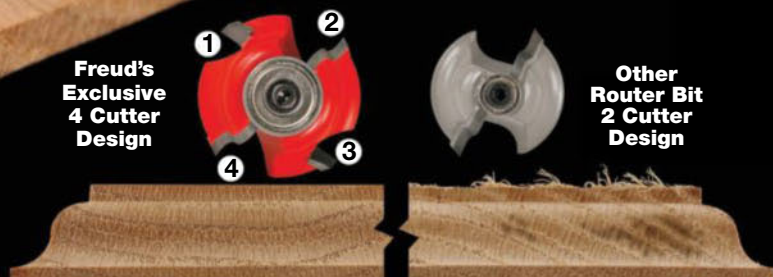


38-106

Freud's
Exclusive
4 Cutter
Design



Other
Router Bit
2 Cutter
Design



Watch Demo Now!



SCAN WITH MOBILE DEVICE

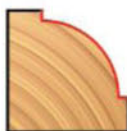
***For A Smooth Sanded Finish...
...Without The Rework!***

Now Quadra-Cut™ 4 Cutter Design is Available in 1/4" Shanks



**Ideal for Any Project that
Requires a Flawless Finish!**

**13 different 1/4" shank router bits available
in the most popular profiles.**



Beading



Round Over



Roman Ogee



Classical Cove & Bead

freud®

For more information visit: www.freudtools.com/Quadra-Cut Red router bits are a registered trademark of Freud America, Inc. (US) 1-800-472-7307