

Shop Safety: 10 Finger-saving setups you need to know (page 68)

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(page 38)



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October
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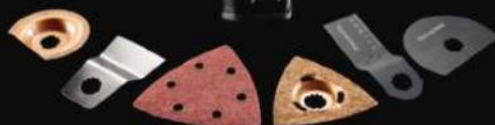
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Page 38

34 Customizing Your Band Saw

By A.J. Hamler

A pile of products designed to perk up your band saw's performance.

38 Envelope Table

By Ralph Bagnall

Mahogany elegance in a distinctive "envelope" shape combines with a fold-out game table to give a workout to your woodworking skills.

48 Classic Finger Plane

By Doc Crawford

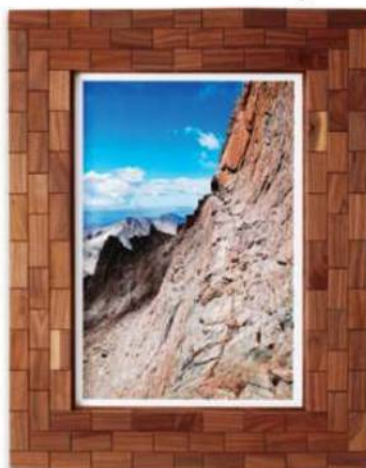
High quality iron, scrap bin hardwood and careful hand work allow you to build your own indispensable finger plane.

52 Mosaic Tiled Picture Frame

By Robert Rockler

Mother Nature helps create a stunning mosaic of wooden tiles in this stylish picture frame.

Departments



Page 52



Page 30



Page 26

6 Editor's Note and Letters

Readers say their piece — in letters and woodworking bromides.

12 Questions & Answers

Do biscuits strengthen glue joints?

14 Stumpers

A mystery tool on the cutting edge.

18 Tricks of the Trade

Quick, safe setups in the shop.

20 Shop Talk

Stunning student woodworking.

26 Jigs & Fixtures

Storage for 12 table saw blades.

30 Woodturning

Jam chuck turning is the solution to tight-fitting pieces.

56 Tool Review

A level look at benchtop planers.

68 Today's Shop

Ten ways to use featherboards.

76 What's In Store

Reissued classics to new tech.

80 Finishing Hotline

The best way to finish blocks.

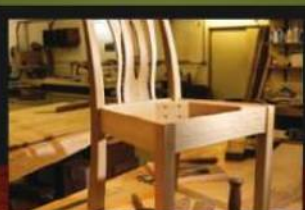
82 Skill Builder

Essential measuring tools.



Page 48

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Letters

Readers Who Never, Ever Write ... Write!

OUR eZine's BROMIDE BONANZA

Way back in June, I asked readers of the *Woodworker's Journal*



eZine to send me the bits of woodworking wisdom that they find repeating in their heads — bidden or unbidden. They responded with a wealth of pithy sayings that encapsulated much woodworking wisdom. Consider these gems:

"Putty is my buddy." "Do your best and caulk the rest!" "The toughest things to make in the workshop are time, space and money." It now seems clear to me that these woodworking sayings are the hard-won combination of knowledge and experience boiled down to the heart of the matter. For example, there is this well considered bromide that we all can benefit from: "Slow down and take a breath before you start wacking the woopy out of it!"

—Rob Johnstone

To Enjoy More
of our eZine readers'

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www.woodworking.com/bromides



Is This a Kit Magazine?

I never, ever write to complain about an article in a magazine ... until today! I was blown away about the kitchen island "plans" in the June 2010 issue ["Build a Kitchen Island"]. Since when did woodworkers start spending \$2,000-plus for parts to build something like this? This isn't a kit magazine, it is a woodworking magazine. Show us how to build it with detailed drawings and cut

lists, not a list of parts costing \$2,000 to buy, and then show us how to glue them all together! Please!

Joe B. Oates
Little Rock, Arkansas

WJ Responds: The goal of this article was to offer another way to "skin a cat." Specifically, to demonstrate that a fairly advanced piece of cabinetry can be created by a woodworker of moderate skill level. While we provide more than enough measurements for a builder to complete the project without purchasing a pre-made part, you certainly make a valid point ... we could have easily included drawings and dimensions for the doors and panels. (Note: the rest of the pieces are included in the material list and shown in the technical drawings.) For those readers interested in building this piece completely from scratch, you'll now find a material list for the doors and panel parts and a couple of new drawings in the "More on the Web" link at our website — thanks to Joe!

Comparing Jaguars to Volkswagens

I have never, in my 58 years, written to a magazine before, but I feel compelled to respond this time. David Bartle of Scottsburg, Indiana, expressed his opinion [*Letters*, June] that your table saw review in the February 2010 issue was like comparing Jaguars to VWs.

My response is, apparently David has never truly compared a Jag to a VW and is basing his opinion on price alone. As an owner of

a Jaguar, a Hyundai Sonata and an F-150 (all fairly new vehicles), I can give you a comparison of expensive and inexpensive, which is why your table saw review was a merited review.

My wife's Jaguar, which cost three times either the Sonata or the F-150, is a nice car; however, when we travel, we much prefer the Sonata. Why? Because when I am doing 70 per on the interstate in the Sonata, I can hear my wife whisper, "Dear Lord, he's going to kill us." In the Jag at the same speed, she would have to yell for me to hear. This is a bit of overkill, but you get my drift. The Sonata and the 150 are both much quieter than the Jag, much smoother riding than the Jag, much roomier than the Jag. The Sonata handles just as sporty and responsively as the Jag.

My point is this: you should continue to review and compare highs to lows, for, many times, you will find that the lows are just as good ... maybe better. High cost is not always indicative of better quality.

Sorry, but just had to put in my two cents here. You're talking to a lifelong woodworker and retired woodworking instructor turned restaurant entrepreneur.

You guys at *Woodworker's Journal*, keep up the excellent work — I enjoy reading your articles and reviews. This is a craft that should never die, and it is up to us to see that it doesn't. Thanks for all you do.

Kent Phillips
Loudon, Tennessee

Letters continues on page 8 ...



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I am dumbfounded at some of your readers' opinions [Letters, June] regarding the February issue reviewing table saws ["Cabinet Saw (R)Evolution"]. I have owned a mid-range saw for years. It has served me well, but the little things that are lacking become magnified over the years, so I am now in the market for a premiere quality saw. Kitchens and built-ins are my bread and butter, but when I am commissioned to do a four-poster bed with matching end tables, I feel like all my efforts have paid off.

I'm not sure if your reader has ever built a 36" x 90" pantry or a 49" x 36" upper cabinet, but I'm sure if he would he would quickly realize the need for a table extension.

My saw not only has an extension, I also have a 4' x 8' outfeed table and a 4' x 8' left hand extension/outfeed. These also serve as assembly tables and have proven to not only be convenient, but safe.

Which leads me to the other reader's comment regarding pricing. I was always under the assumption that the SawStop table saw was pricey mostly because of its proprietary safety feature; boy was I wrong! I now know I

don't have to sacrifice quality to get a finger-saving feature in my next purchase. I'm not sure why people write in and complain about things that don't pertain to them; your mag is for everyone at every level, otherwise you would have to have 100 specialty publications, and people would still complain!

Marty Farrell
Cobourg, Ontario, Canada

In Defense of CNC

I'm writing in response to the "Ch-Ch-Changes" Letters in the June 2010 issue. In particular, the letter from David L. Allen. I hope Dave doesn't take offense here, as that is not my intent. His comment about making a drawer shows how confused folks are about CNC machines. I am retired now, but I taught high school and jr. high school woodworking for 35 years. For the last five years, we had a CNC router in the school shop. We never abandoned traditional woodworking methods — the CNC machine was there to enhance our capabilities. My woodworking skills did not include carving, but the CNC router allowed me to

Letters continues on page 10 ...

OCTOBER 2010

Volume 34, Number 5

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WOODWORKER'S JOURNAL

WJ staff is planning to end our summer at woodworkers' favorite summer event, the big **International Woodworking Fair** in Atlanta, Georgia. Visit woodworkersjournal.com to find our reporting — complete with videos — of all the cool new tools being introduced at the Fair.

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add carving to my students' repertoire. A whole new level of creativity became possible. My students loved it. They still used the scroll saw, table saw, sander, etc. They still applied stain and finish. There was just a new, special machine in the shop.

I now have a CNC machine in my home shop. I still make my drawers with a table saw and a router. However, I am also creating wonderful carved plaques, jewelry boxes with beautiful carvings and signs. I have a website (woodcarver.weebly.com) that showcases my CNC work.

Phil O'Rourke
Pittsfield, Massachusetts

How New is New (and How Hot is Hot)?

Having just read the June issue, I find that I have to express my frustration with your magazine. Specifically your article [headlined on the cover] "4 Hot New Tools for Perfect Joinery" ["Loose Tenon Joinery Options"]. The newest tool in this review, the Freud FDW710K, was introduced in December, '08. The dates go backwards from there to around eight or 10 years for the Porter-Cable 557 Biscuit Joiner. I am not real sure what reference you use for the qualifier "new" tools, but nothing in your article comes remotely close to being new. Thank you.

Mark Klosky
Denver, Colorado

WJ Responds: The biscuit joiner was not one of the four "hot new" tools; it was presented as a 'representative'

Our reader offers his own version of a Stickley finish. He used it on this clock.

of traditional loose tenon technology (which might also include old-style doweling jigs or even mortising chisels). The loose tenon joinery tools covered were Rockler's latest version of the beadLOCK system, JessEm's Zip Slot Mortise Mill, Festool's Domino and Freud's FDW710K. While some of these have been around for a few years, they do indeed represent the latest technology when it comes to their type of joinery.

Stickley Finish

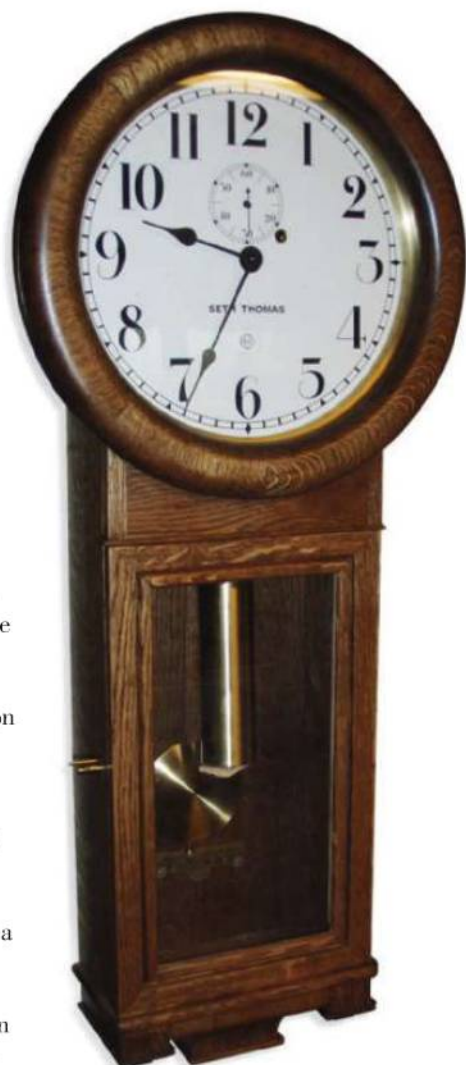
[A response to our article, "Approaching a Stickley Finish," *April 2010*.] I find with quartersawn white oak, that with two coats of Watco Danish Oil (Dark Walnut) and a couple coats of Minwax Tung Oil, the same finish can be achieved. After the first coat of Danish Oil has dried for 24 hours, apply the second coat with 3M 240 Wetordry™ Tri-M-ite™ paper. This produces a gum-like substance that fills in all the open pores and imperfections. Let it dry for another 24 hours and buff and polish. Then apply the Tung Oil with 600 Wetordry and buff and polish when dry. This process gives a deep luster sheen — almost a wet look. Shown above right is my latest project with this finish.

John Muxlow
Dartmouth, Nova Scotia

Walnut: Light and Dark

Hi gang. I just received my August 2010 issue and was reading one of the questions [Questions and Answers] submitted from a reader about light-colored walnut furniture. I use sliced walnut veneers and many of the slices are profiles of the entire tree. When the slice is close to the outer edge of the tree, it is very light-colored, and you would swear it is not even walnut. I also have slices that have the edges very light and then graduate to what would normally look like walnut. Maybe this is what the furniture Dave was looking at used. If so, he may not need to bleach the walnut — he might just need to find some nice, light-colored walnut.

Paul Frauenhoffer
Clermont, Florida



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Questions & Answers

Alignment and Indexing

THIS ISSUE'S EXPERTS

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

Ralph Bagnall, a former CNC salesman, installer and trainer, is a woodworker and shop consultant based in Murfreesboro, Tennessee.

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

Tim Inman has worked in the field of furniture restoration for over 45 years. He is currently the owner of Historic Interiors, doing restoration and reproduction work.

Q I have been using biscuits to edge join stock when making the panels for my projects. With the excellent glues available today, I wonder if the extra step of using biscuits is necessary. My question, then: When is it necessary to use biscuits in edge joining and when is regular gluing sufficient?

John P. Cirelli
Barre, Massachusetts

A While you can almost never go wrong adding a biscuit to a joint, I've found from talking to woodworkers in my classes that biscuits are often overused. In an edge-to-edge glue-up, such as for a raised panel or tabletop, two well-jointed edges with adequate glue will create a joint stronger than the surrounding material, even without a biscuit. When I taught woodworking with the Peace Corps in Africa, the kids would hand plane edges, apply glue and, because we didn't have bar clamps, simply rub the two edges together and lean the assembly gently against a wall. By the next morning, the glue-up was rock-solid: a great testimony to nice straight edges and good glue.

My number one reason for adding biscuits to an edge-to-edge glue-up is registration. Biscuits keep the faces of the boards aligned as you close the clamps — helpful on a large glue-up.

It's also a huge benefit when working with a solid-wood to plywood combination,



While biscuits might not improve the strength of a joint, their role as alignment guides is most helpful, especially with large panel glue-ups.

such as when a solid-wood band is used to cover the edge of a plywood shelf. Good alignment means less sanding, which means less chance of sanding through veneer.

— George Vondriska

Q I would like someone to explain to me how I can create fluting on a circular or round wooden column. I read someplace that one way this can be accomplished is on a lathe that has indexing capabilities, but I could never understand how. I do not have an indexing lathe but would be interested in knowing if that is possible. I have routers, a router table and chisels.

Robert G. Goodrich
Manitou Beach, Michigan

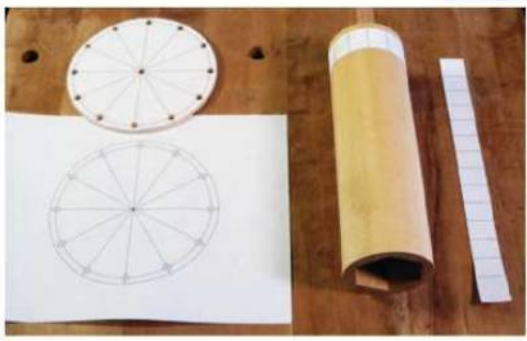
A There are two options for accurately laying out flutes or reeds on a column. You can create your own indexing wheel, or lay out your spacing flat and wrap it

around your part. The first step in either case is to decide on the number of flutes. With the wrap method, mark the circumference of your column on a strip of paper, then divide that length into equal parts, and tape it to the cylinder. This is excellent for hand cutting reeds and flutes (see right side of inset photo, next page).

The wheel is great for indexing your column when mounted in a jig (see left side of inset photo). Draw out a circle on a piece of 1/4" ply, and use a compass (or a CAD program on your computer) to divide the circle by the number of flutes (360 degrees divided by 12 in this case is 30 degrees per index). This wheel can then be attached to your column to align it accurately for each flute.

This photo on the right side of the next page shows the





An index wheel (above left) locates flutes or grooves on a circular column when using a jig or lathe. The manual method (above right) transfers locations from a strip of paper.



Winner!

For simply sending in his question on a final clear coat, Steve Hansen of Madison, Wisconsin, wins an Osborne Miter Gage by Excalibur (from General International).

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

index wheel attached to the router jig from the "Multi-Sleeve Rolling Pin" article in our April 2010 issue. A 1/4" bolt locks the wheel in place as each flute is cut.

— Ralph Bagnall

Q I am working on a kitchen cabinet to match another sample. The finish is a primer coat, base paint coat, and a glaze for an antiqued

look. This part I have worked out and matched. The issue is the final clear coat. It is very flat and has a silky feel to it. The sample I have is very evenly finished and durable. What are my options for a final clear coat?

Steve Hansen
Madison, Wisconsin

A That depends on what you mean by very flat. If we are talking about the level of sheen, you are somewhat limited, because while almost all finishes are sold in gloss through satin sheens, it's hard to find anything but lacquer

Continues on page 14 ...

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Stumpers

Scissor Sharpening Tales



WJ readers stay on the cutting edge as they solve another mystery tool.

"I know exactly what it is," said **Burt Truman** of Hallowell, Maine, of the June issue's mystery tool. Others also knew that the tool submitted by **Fred Steffens** of Eau Claire, Wisconsin, "is a scissors/shear sharpening jig," as **Rick Koenigs** of Mankato, Minnesota, said.

Deane Dennis of Ames, Iowa, gave a detailed description of its use: "Each scissors blade is clamped one at a time in the jaws on which the two stones are resting in the picture. The jaws are adjusted to the proper angle. The two stones are held between the handle on one end and a rod which serves as a guide on the other end. The rod slides back and forth through the guide as the stone is passed across the blade by pushing and pulling on the handle. The handle is rotated so the coarse stone is used first then rotated so the fine stone on the other side is used to finish."

Thomas Lunsford of Magnolia, Texas, added, "The flat base of the tool can be mounted to the surface of a workbench."

Jerry Hay of Elkhart, Indiana, learned from his wife's uncle, a barber, that

Winner! Lou Lambert of Los Angeles, California, wins a **DELTA 13" Portable Thickness Planer**. We toss all the Stumpers letters into a hat to select a winner.

"The fixture can also hold a file (tang removed) which results in the scissors having small grooves along the cutting edges, perfect for cutting hair."

Other uses? **Scott Mintier** of Clifton Park, New York, said, "As a young man, I watched the ladies in the blueprint reproduction department using one to sharpen their scissors, which could cut across a 36" drawing in about two seconds." Boat builder **LeRoy Fautch** of Otis Orchards, Washington, said, "We used them for everything from sharpening heavy-duty shears for cutting fiberglass matting to fine scissors used in upholstery. You could adjust the angle of the cutting edge by raising or lowering the blade holder."

And, from **Lyle Howell** of Copper Canyon, Texas: "I spent 26 years repairing industrial sewing machines and equipment and sharpening scissors. I've spent many hours sharpening this way and prefer it over any grinder method."

—Joanna Werch Takes



Questions & Answers continued



Rubbing out a finish removes inconsistencies and makes a surface feel great to the touch.

sold in matte and dead flat. On the other hand, if by flat you mean perfectly smooth, that's much easier. Choose whatever clear coat you like; for durability I would lean toward polyurethane. Once the finish is cured, rub it. The rubbing process leaves a perfectly smooth and very silky feeling surface. Here's how to do it.

Wait until the finish cures completely. For shellac and lacquer, two or three days will do; for oil-based varnish and polyurethane, try to wait at least a week, and longer if you can spare the time. For water-based, wait a month. Remove any dust nibs or application marks by sanding lightly with 400-grit self-lubricated sandpaper. Sand only as much as you need to make it smooth, and don't sand through the topcoat. Dip a pad of 0000 steel wool into paste wax and carefully rub with the grain in very straight lines, adding more wax as needed for lubrication. Avoid rounding the steel wool over the edges, which might cause you to rub through the finish. Overlap your strokes and cover the entire surface with several passes back and forth to guarantee a uniform fine scratch pattern from the steel wool. The finish should look like brushed brass. When you are done, immediately wipe off all the wax with a soft cloth.

—Michael Dresdner

Continues on page 16 ...

What's This?



Roger Webster of Arlington, Vermont, found this stumper (and the padlock on its fastener) in his father-in-law's garage after his death. Roger doesn't know what it is. Do you? Send your answer to stumpers@woodworkersjournal.com for a chance to win a prize!



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Questions & Answers continued

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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.

Q I'm just starting to get into lathe turning. With the multiple speeds on the lathe, at which speed is it best to finish sand the project? It seems to me that at the lower speeds, the sandpaper doesn't clog up as fast.

Robert Cornelisse
Ozark, Missouri

A Turning has had a special place in my heart since I was a 10-year-old boy, and I'm still fascinated with it. It's truly one of the "ancient" crafts and so there are lots of "rules" and many experts. One of the best rules I was ever taught came to me from a man in England who is the best turner I ever met, and probably the dean of turners



Our expert recommends that personal experience should guide your choice of which sanding speed, grit and abrasive type to use on a lathe.

in the world today, Bill Jones. When asked which tool he used to do a certain job, he replied, "The one that cuts." Take that lesson from the master, and use it to answer your own question. In other words, use the speed that works best for your sanding job. I generally prefer to err on the slower side when I work at my lathes. Many others prefer higher rpms. In the end, it is the quality of the

work that tells the tale, and discussions about rpm should follow, not lead. Different wood species, sizes, abrasives, even operators — all make a difference. In the end, use the speed you like and the one that seems to work best. Just remember that more speed means more heat, and heat is often the enemy, especially of sanding.

— Tim Inman

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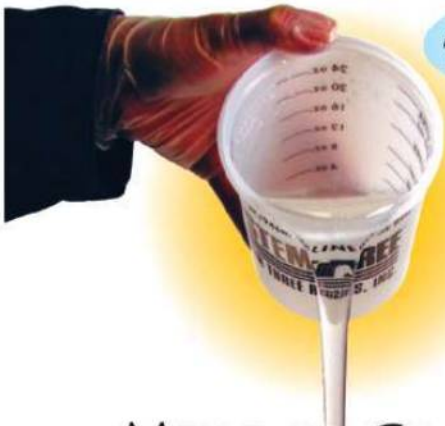
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Tricks of the Trade

Simplify Those Tricky Cuts



Short-term memory aid for your tape measure.

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.

Scratch Pad Tape

Do you ever forget a tape measurement you just took? Here's a trick I've been using for over 40 years to avoid that problem. Attach a piece of white vinyl or plastic laminate to the side of your tape measure with hot glue or silicone caulk to create a scratch pad that goes wherever your tape does. Pencil notes rub off easily for the next measurement.

Larry Stephenson
Rockford, Ohio

Clearing the Air

The exhaust air from my ceiling air filtration unit used to just blow dust around the shop, defeating its purpose. So, I had ductwork attached to it to vent the exhaust air outside the shop. It solved my dust problem, and it also helps clear finishing fumes. Just make sure you've got a good fresh air supply.

Dennis DiRienzo
East Liverpool, Ohio



A saw table and miter slot make handy layout aids for marking PVC pipe.

Straight Lines on Round Pieces

I've found that 1½"-diameter PVC pipe, split lengthwise on my band saw, makes handy organizers in a shop drawer for my scroll saw blades. Drawing a straight cutting line on the curved pipe was difficult until I figured out this simple method: I set the pipe section in my table saw's miter slot to hold it stationary, then drag a pencil across the saw table and the pipe. It gives me a perfectly straight line that's also parallel to the pipe walls.

Alfred J. De Vries
El Cajon, California

PICK OF THE TRICKS



Sliding guide, clamped to panel being raised.

Fixed Fence



Quick-clamping Panel-raising Fence

In order to raise panels on a table saw safely, you need a tall auxiliary fence secured to your rip fence. You could go to the trouble of making one with a brace that wraps around the fence beam, but my approach is faster and easier. I attached a narrow piece of plywood that matches the height of my rip fence to a wider one to form the new fence face.

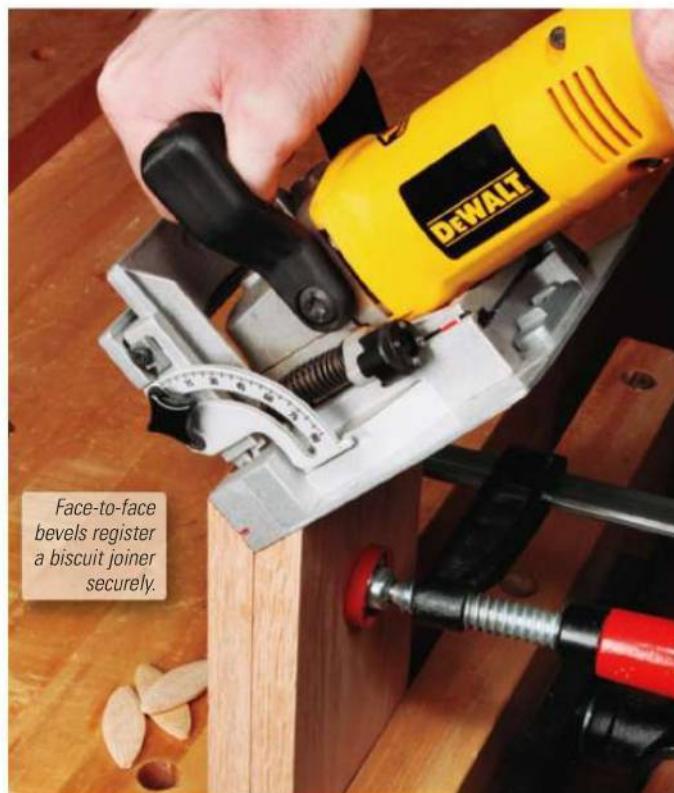
Before fastening the two together, I drilled a pair of holes into the edge of the narrower piece to fit the mounting posts of two fence clamps. These clamps are inexpensive and available from rockler.com and other sources. The project took less than a half hour to make from scrap lumber.

Charles Mak
Calgary, Alberta

Slot-cutting Bevels in V Formation

When I need to cut biscuit slots into the ends of a 45° bevel joint, I clamp the two workpieces together against their inside faces. The beveled ends form a 90° “V,” which creates a secure notch for bracing my biscuit joiner to cut the required slots. This setup also allows me to cut slots into both sides of the joint by simply turning the tool around in the notch. And, if I want to cut a double-slotted joint, I set a spacer against one of the beveled ends to move the cutter up for making the second slot.

Serge Duclos
Delson, Quebec



Winner!

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

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Shop Talk

Mr. Trout's Shop Class



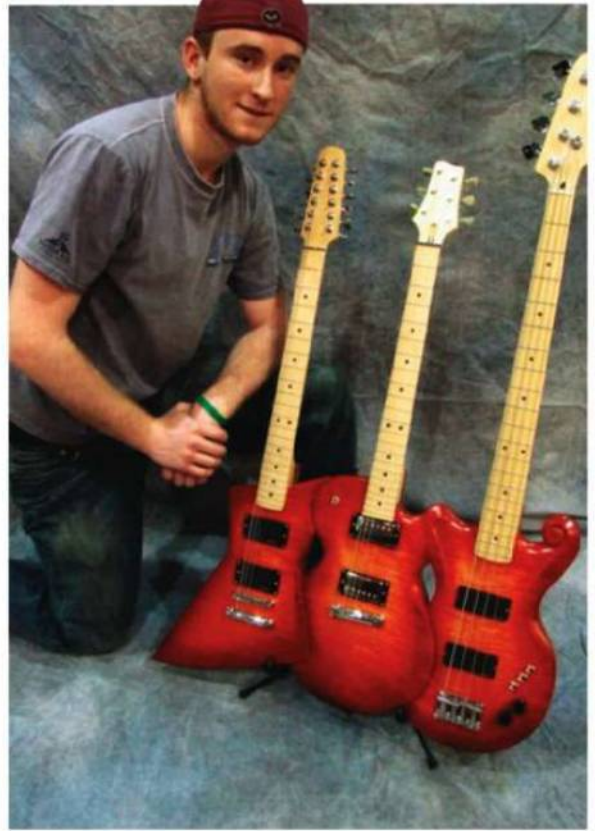
Harpsichord by
Ashley Kaminski

Class Acts

From Young Woodworkers

Over the past few years, *Woodworker's Journal* has occasionally shown some of the woodwork coming out of high school instructor George Trout's classes. With a focus on solving "problems," the students at Springfield [Pennsylvania] High School continue to commence their woodworking with projects that inspire awe in seasoned woodworkers. "I practice not answering questions," George said. "I ask them questions back and spin them in the right direction."

The students — some of whom also participate in a summer enrichment program where they "drink



Guitar by Steve Sugden



Mantel by Billy Naylor



Grandfather Clocks by Rob DeLuca



Chair and Desk by Matt MacDonald



Table and Chairs by Jeremy Lynch



"Swan" Loveseat by Mallory Sminkey

in" art like glassblowing, sculpture and more — choose their projects based on their time available during the school year and their skill level. Since his students use simple joinery and don't have years to master more complex carvings, for some, George said, "instead of doing something

more complicated, we up the ante by doing more than one piece." All the students' pieces, built from their own rough sketches, must be completed by the end of the school year, in time for an annual community show.

Shop Talk continues on page 22 ...

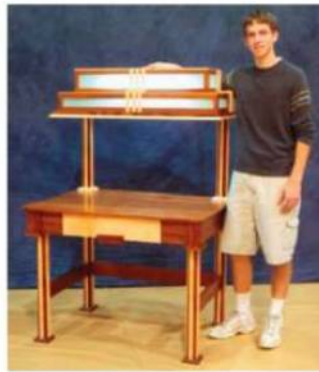


Table by Matt Correnti



Secretary by Billy Naylor

George Trout begins his 25th year of teaching woodworking shop this fall in Springfield, Pennsylvania. The *Journal* is honored to show the amazing work of his students. (See more at www.ssdcougars.org/webpages/gtrout.)



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A Humble Hardwood

Pink Ivory's Cousin?

As a woodturner, my favorite hardwood is cascara buckthorn, *Rhamnus purshiana*, a small nondescript tree native to the Pacific Northwest. The cascara buckthorn tree has long been known for the laxative properties of its bark. Stripped in the spring, dried, bottled, and marketed as Cascara Sagrada, the bark was in such high demand in the early-to-mid 20th century that the small trees were severely overharvested. Sadly, harvesting cascara bark kills the tree, and so throughout much of its native range, primarily the western side of the Cascades in the Pacific Northwest, cascara, never very abundant, became quite scarce. After a 2004 ice storm, several of the larger, more exposed trees on my property were severely damaged, with their branched tops bent 90 degrees with the wood splitting at the bend. I cut these trees into long sections, sealed them, and put them aside to dry. I stored the 4-to-6-foot long pieces in an old leaky barn near a creek, so there was plenty of humidity year-round. Two years later, I found that more than half of the wood had developed some color, and all of it was totally sound and dry enough to turn.

When freshly cut, cascara sapwood is a pale yellow, and the heartwood, which makes up about a third of the diameter of the trunk and larger branches, is almost a pumpkin orange. As the wood dries, the sapwood seems to get paler, and the heartwood color becomes more muted. The wood undergoes color changes that range from a ring of pale blue just under the cambium to pink or purple

streaking through the sapwood. Some pieces will develop bluestain all the way to the heartwood. These color changes seem to be related to having bark and lichens remain on the wood — debarked pieces do not change color, at least in my experience.

Even without the color band, cascara can be very beautiful. The fine-grained sapwood displays a subtle chatoyance, almost like the moire patterns in fine curtains. On one of the larger trees I took down, the cross-section revealed that every growth ring was finely rippled, like the edges of paper cupcake pan liners.

I am most careful not to put my hands near my mouth when working this species. Otherwise, I take only normal precautions against dust and chips when turning cascara, and I have experienced no side effects from the bark, even when turning it green.

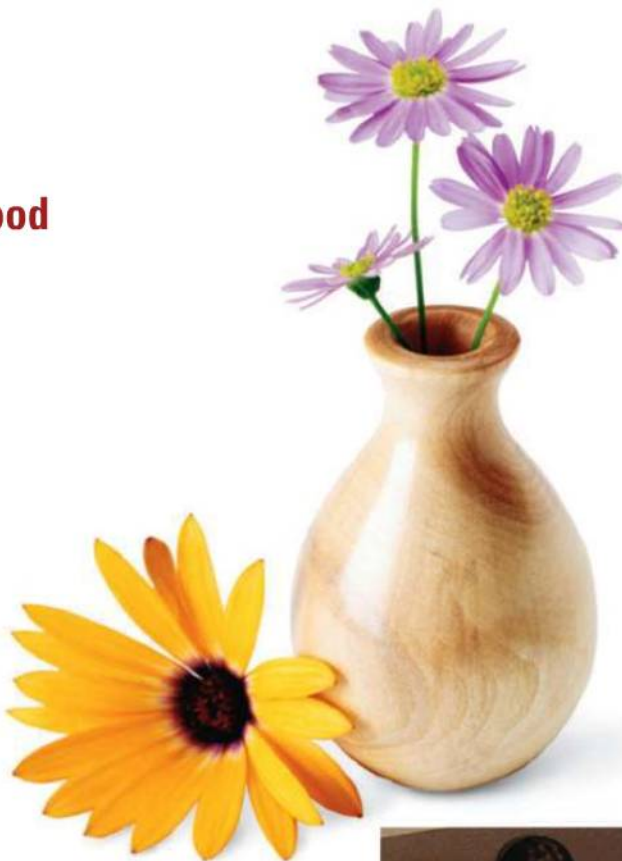
Dry cascara turns easily. The wood is fairly hard, about like big-leaf maple, and shows little tendency to chip. It polishes up beautifully. I have



Cascara

A few months ago, we asked readers of the Woodworker's Journal eZine to tell us their favorite hardwoods. One of the responses came from woodturner Lea Montaire of teaktocks.com, who told us all about her favorite, cascara.

— Editor



The author's first attempt to turn green cascara was disastrous — and she's still not sure if it was due to density variations in the wood, technique issues or poorly sharpened tools.

used only clear shellac or, on the weedpot, just beeswax, to avoid darkening the colors. A fascinating and unexpected fact about cascara, which I only learned recently, is that it is closely related to pink ivory, *Rhamnus zeyheri*. Pink ivory, which grows in southern Africa, is considered one of the most rare, expensive and beautiful woods in the world. In my opinion, cascara, its humble North American relative, is also deserving of some respect.

— Lea Montaire

Shop Talk continues on page 24 ...



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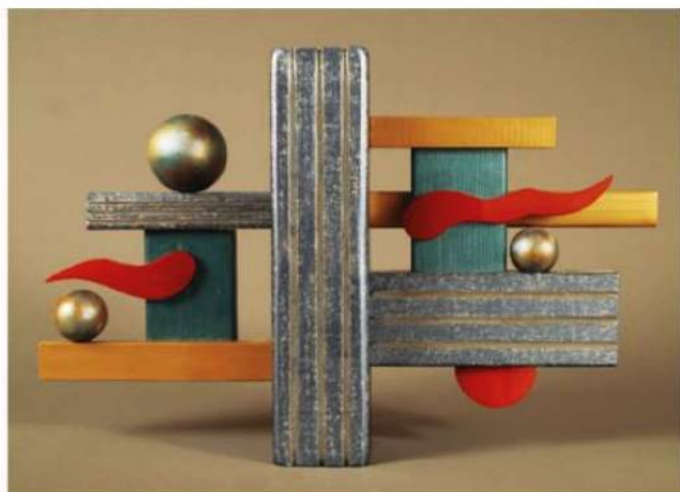


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Work like "Blue Sculpture" has earned Rue Ann Flanders inclusion in the book *Wood Art Today 2* from Schiffer Publishing (ISBN 978-0764334634).

Sculptor Sands Curved Lines

Rue Ann Flanders says she knows it's strange, but, "I really enjoy sanding wood." That's one reason the Indianapolis Rockler store assistant manager feels like she found her niche after taking a wood sculpture class.

"I find grinding and sanding wood to be very therapeutic. It's a little loud and a lot of dust, but you wear a dust mask and go on."

Rue Ann says she is constantly looking at shapes — where she finds inspiration and fun — in glasswork or jewelry, and originally took the sculpture class to add dimensional aspects to her whimsical furniture. She already knew that, "I like curves better than I do straight lines." Her furniture incorporates curved doors with arches, and balls embedded into the piece.

These days, one of Rue Ann's most used tools is an air-filled round pneumatic drum sander, the kind used in



Curves, balls, colorful finishes and painted grain are hallmarks of Rue Ann Flanders's sculpture.

making boat parts and boomerangs. She does not, however, use her table saw: "It makes a good table. I set things on it all the time."

The wood she works with is sometimes maple, for bases and cabinets, but it is more likely to be poplar. "It's easier to shape and sculpt," she said and, "because I do all kinds of finishes — painting, metal leafing — poplar works well. I can make poplar look like any other wood I want." Rue Ann also loves color and has used fuschia, lime green, orange and more in her work. "I just like what I do."

— Joanna Werch Takes

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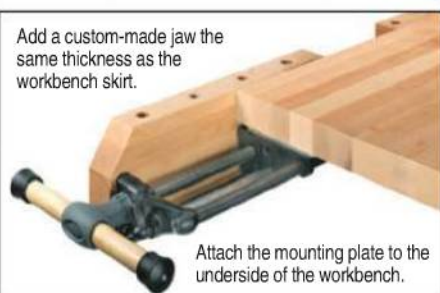
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Jigs & Fixtures

Table Saw Blade Organizer

By Chris Marshall



Built-up blade guards and pairs of rare-earth magnets keep blades protected and secured in their trays for carrying. A release hole makes it easy to pop them free from their magnets.

Name That Blade

In addition to keeping your blades handy, safe and sharp, the trays have a place for a label that allows you to select the exact blade you need on the first try.

MORE ON THE WEB

The author demonstrates the technique for “no-measure” dado cuts he used for this project in a new video at woodworkersjournal.com. Click on the More on the Web tab shown above.

Saw blades don't come cheap, so they deserve better storage between uses than a cardboard sleeve. This project stows 12 blades in pull-out trays. Two magnets hold each blade securely in its tray for transport. I keep four 10" blades and an eight-piece dado set in mine.

Making the Carcass

Get started on your organizer by cutting the side panels (pieces 1) to size. Set up a 1/4"-wide dado blade and raise it to 5/16" to cut the 12 tray dadoes into each side panel. Position the bottom-most tray dado 1 1/2" up from the bottom edges of the sides. Space the dadoes 3/8" apart.

Now re-stack the dado set for a 3/4"-wide cut, and lower it to 1/4" to cut the bottom panel rabbet and the top

panel dado. Position this dado 3/8" above the top tray dado. Wrap up the milling process by raising the dado to 1/2" and cutting 3/4"-wide rabbets for the back panel.

Cut the top, bottom and back panels (pieces 2 and 3) to size. Sand the inside faces of all the carcass parts, and apply finish now. When it cures, assemble the carcass with glue and brad nails.

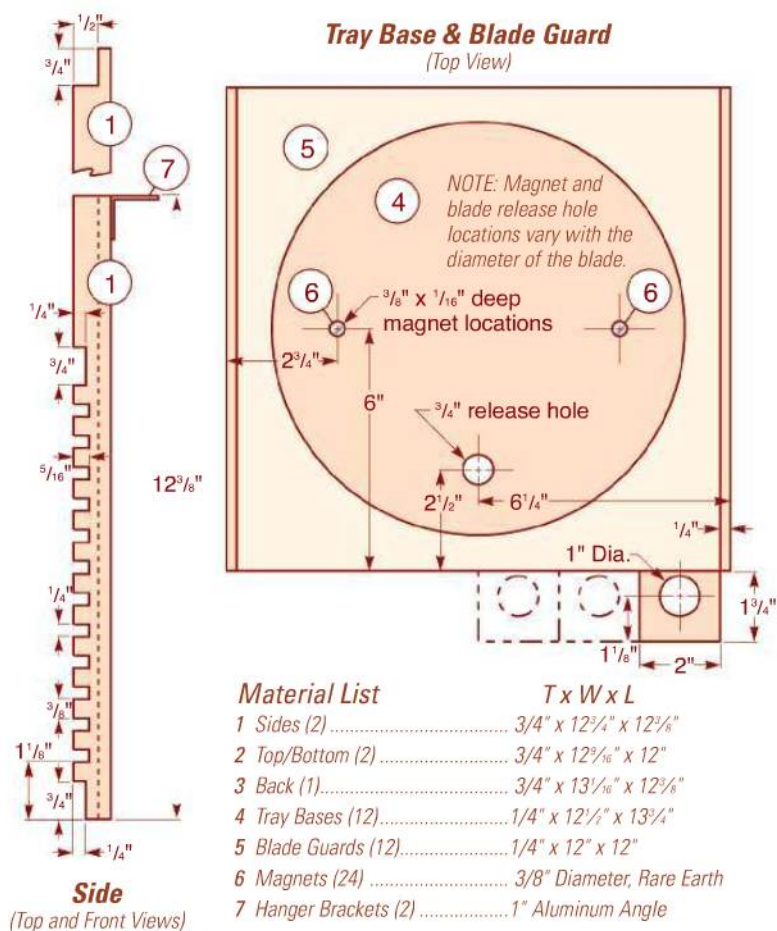
Building the Blade Trays

Each tray consists of a base and a built-up guard that protects the blade teeth. Cut 12 bases (pieces 4) to size. When you study the photos, you'll see that the positions of the finger pulls on these trays are staggered in two rows of six. That means you really only need to lay out three pull positions for trays 1, 2, and 3,

then flip them to suit 4, 5 and 6. The second tier of trays, of course, matches the first. So, I taped the blanks into three groups of four to speed up the machining process. Lay out the three different finger pull positions, one on each group of blanks. Tray positions 1, 6, 7 and 12 make up one group. Trays 2, 5, 8 and 11 form the second group. Trays 3, 4, 9 and 10 round out a third group. Bore the finger pull holes through each of the taped-up groups. Then gang-cut the pulls to shape on the band saw, ease the corners and untape them.

Re-group the trays, one set for 10" blades and another for 8" dado blades. Mark and drill the 3/4"-diameter blade release holes through these two new groupings. Follow the *Drawings* to locate the holes on the 10" blade trays. Move the release holes 1" further in to accommodate the smaller dado blades. Follow the same layout process to mark and drill pairs of 1/16"-deep pockets for the 3/8" magnets.

Set your trays aside and cut 12 blade guard blanks (pieces 5) to size. Use a compass to



draw a blade cutout on each guard. Make these openings 10 1/4" in diameter for 10" blades and 8 1/4" for dado blades. Cut the openings with a jigsaw or on a scroll saw.

Sand the trays and blade guards up through the grits to 180, then glue and tack one guard to each tray, making sure to select the correct guard size for your full-sized blades or dado blade trays.

Once that work is done, you can apply finish to the trays and the outer surfaces of the blade holder. Install two rare-earth magnets (pieces 6) into each tray with dabs of quick-set epoxy. Label each finger pull with the blade type the tray will house. I used laser-printed paper labels glued in place, then sealed them in with a few coats of shellac.

The author bolted his blade holder to the saw's side table frame, but you could also fasten it directly to the extension table board with screws, depending on your saw.

Installing the Fixture

Cut two strips of aluminum angle to length and bore pilot holes for screws to create hanger brackets (pieces 7). Fasten them to the upper edges of the holder with 3/4"-long panhead screws. Install the project on your saw where it's most convenient, fastening the brackets either to the underside of your side table or its framework. Now you've got a proper and convenient "condo" for a big blade collection!

Chris Marshall is Woodworker's Journal's field editor. He lives in Ohio.



Final finishing is much easier on projects like this if you sand and finish the interior carcass surfaces prior to assembly.



Arrange and tape the tray blanks into three groups of four so you can mark and machine the finger pulls "production style."



Glue and tack the correct blade guard size to each tray — the trays' release holes and magnet locations differ, depending on whether they will store 10" blades or 8" dado set parts.



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Woodturning

Jam Chuck Turning

By John Giem

Our author pulls an old technique out of his bag of tricks to solve the challenge presented by this project. Versatile and economical, his technique is the perfect solution for hard to hold pieces.

PVC pipe for this project's plastic cylinder will be easy to find at your local hardware store. The wood for the top and base is probably already lying around your shop.

Whether it is a summer barbecue or a tailgate party in the fall, you need to convert your masterful hamburger mixture into patties to put on the grill. This patty press will help you create perfectly formed patties that stay together better while grilling and fit nicely on those buns. You can make this press in an evening using materials you probably have lying around in your shop. Find and purchase the PVC pipe



While building this simple project you'll learn how to use a jamb chuck — a technique turners have been using for ages.

that makes the plastic cylinder at a local hardware store or a big box type store. It's important to get the PVC before you start turning so you can fit the other wooden parts to it.

Selecting the Wood

Choosing a wood species for this patty press is limited by only a

couple of considerations. Because it will be used in food preparation, it is better to be safe than sorry. Some people have extreme allergies to nuts. These allergies can actually be life-threatening. Although unlikely, nut woods like walnut, hickory or pecan may transfer some oils that could spark an allergic



reaction. I recommend using a close-grained non-nut wood: cherry, maple or even yellow poplar would be good choices. The press you see here was made from alder, another good species choice.

When it comes to finishing the wood for this project, choose a nontoxic, oil-based product like Salad Bowl Finish or even mineral oil. A coat of food-safe paraffin wax will help to seal the wood and keep hamburger from sticking to it. Clean your press with mild soap and hot water after use, and reapply finish if needed. Or, you can leave it without a finish. A curious but important fact to note is that wood has been proven to have a natural resistance to growing bacteria, making it a good material for cutting boards or, in this case, a patty press.

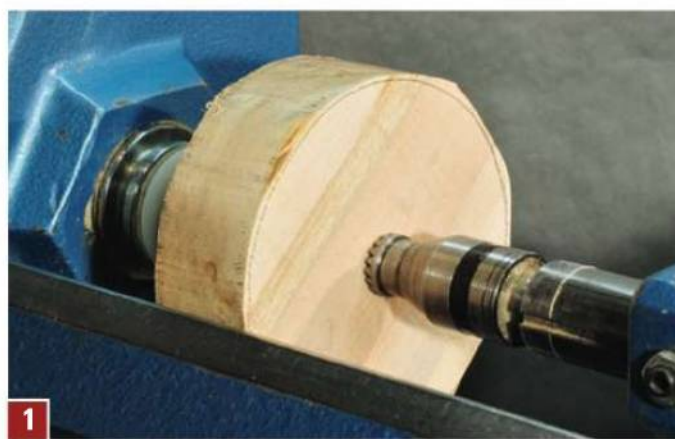
Getting Started

The steps to making your patty press are as follows.

Find and then mark the centers of two 6" x 6" x 1½" blanks. Mark the centers on both sides. These will become the top and base pieces of your press.

Cut one blank — the base — to a circle about 5½" in diameter. Cut the other — the top — to about 4½" in diameter. If your plastic cylinder pipe has an inner diameter other than 4", you will have to adjust the blank sizes accordingly.

Mount the base blank between centers (Figure 1). If you use a serrated Stebcenter



for the drive and live center, there will be less damage to the surfaces that will need fixing later. Using a bowl gouge, rough the blank down to round (Figure 2). Remember, this is not spindle

turning. You will need to cut in from the sides just like turning a bowl.

Smooth the surface toward the tailstock and make a dovetail tenon (Figure 3) sized to fit in your scroll



Base

Using the Patty Press

1. Prepare your ground meat mixture using your favorite recipe.
2. Place the cylinder loosely onto the tenon on the base.
3. Spoon meat mixture into cylinder. You may need to adjust the amount to achieve desired patty thickness.
4. Using a twisting motion with the top, compress the meat into the press.
5. Using a twisting motion to break surface tension, lift and remove the top.
6. Remove the cylinder from the base, leaving the patty in place.
7. The patty will usually adhere to the base, which will allow you to move it to the platter. Turn the base over and use a knife to break the tension, thereby dropping the patty.
8. Use wax paper or equivalent to separate the patties.
9. Repeat steps 2 through 8 until the meat mixture is gone.
10. Put 'em on the grill and enjoy.



Cylinder

chunk. Reverse the blank and mount it into your scroll chuck, grasping the dovetail tenon. Move the tailstock out of the way. Turn the face of the blank flat and smooth (Figure 4, previous page).

Measure the inside diameter of your plastic cylinder (inset photo, Figure 5 above) using a pair of dividers. Transfer this measurement onto the face of the base blank, marking it. This circle should be exactly the same diameter as the inside of your PVC cylinder.

Cutting in from the edge of the blank, form a tenon slightly larger than the marked circle (Figure 6). The height of the tenon should be about 1/4". Leave the side of the tenon very slightly tapered. By trial and error, carefully reduce the diameter of the tenon until the cylinder fits tightly onto the tenon (Figure 7). In effect, you are using the base as a jam chuck to mount the cylinder for shaping. The tenon must fit tightly in order to securely hold the cylinder.

Note: a jam chuck is a piece of wood attached to a faceplate. The wood is machined to allow a friction fit on another piece of wood (or, in this case, the PVC cylinder) that will hold the workpiece tightly enough to turn. You "jam" the workpiece into or onto the wooden chuck — hence, the term, jam chuck.

If you overshoot the mark and make your tenon just a little too small, place one or two layers of paper towel over the tenon and then mount (jam) the cylinder onto the tenon.

Now that the cylinder is held securely by the base, use a scraper to smooth and round over the exposed end. Reverse the cylinder and reduce its height to about 1/4". Shape the exposed end as you did before. Scrape a small cove into the side of the cylinder so it will be easier to handle when in use (Figure 8); the cove acts as finger grip.

Next, remove the cylinder and trim the tenon on the base to achieve just a light friction fit when the cylinder is placed over it. Shape the outside edge of the base as desired (Figure 9). Sand the base up to 320-grit, then set the base and cylinder aside for now.

Starting the Top

Grab the top blank you marked earlier and mount and turn it between centers as you did with the base blank. After you raise the dovetailed tenon, mount the top in your scroll chuck. Now turn the top down so it fits smoothly within the cylinder (Figure 10, next page). It should move freely. Sand the face and sides of the top and set it aside for the moment.

Mount some wood to be used as a jam chuck onto your



Top

scroll chuck or on a faceplate and turn its face flat. With your calipers, measure the diameter of the top and mark the face of the jam chuck. Cut a recess in the jam chuck so that the top fits tightly in place (Figure 11, far right, and Figure 12).

With the top mounted in the jam chuck, turn a tenon, forming it into a shape that can be easily grasped and handled (Figure 13). Do the final finish sanding and set the top aside.

Take a moment to carefully enlarge the recess in the jam chuck to fit the tenon on the face of the base that you had set aside earlier (Figure 14). Turn off the dovetail tenon that was used for mounting in the scroll chuck, leaving the surface flat (Figure 15). Finish sand the base and unmount it from the chuck.

You can leave the surface of the wood bare or use an oil finish as mentioned earlier. Don't use vegetable or salad oil since they will likely turn rancid with time.

Now that you have mastered using a jam chuck by making this simple project, you can take your turning to the next level by using the technique in a variety of turning situations. Happy turning!

John Giem is a long-time woodworker living in Fort Collins, Colorado.



Learning to tightly fit these parts to one another is a skill that will serve when fitting lids, stoppers or other turned components.



Customizing Your Band Saw

By A.J. Hamler

Make an already great machine even better with this roundup of performance-enhancing upgrades and easy-to-add accessories for your band saw.



The common 14" band saw is one of the most versatile shop machines. You can crosscut and rip on it, do circles and complicated curves, even scrollwork with the right blade. It easily resaws expensive stock up to 6" wide and turns that waste into additional projects.

The best part is that a band saw is all this, and more, right out of the box. Imagine what it would be like with just a few simple improvements. Fortunately, there are more than just a few ways to make a band saw better. While some are a bit pricey, most are less expensive than you might think, and just about all are easy to add to your machine. Sometimes a few minutes is all you need to make a vast improvement to saw performance.

Upgrade or Accessorize?

Band saw improvements fall into two categories: upgrades and accessories. For the context of this article, I've grouped items that involve permanently replacing stock parts or machine structures — that is, whatever came as standard equipment with the machine is never used again — as an upgrade. Parts normally replaced due to wear, I've placed in the accessory category. Same thing for easy-to-swap non-wearing parts, and separate add-ons that enhance what's already on the saw.

Upgrade Time: Four Biggies

Ready to turn your workhorse band saw into a thoroughbred? Here's a quick roundup of four popular upgrades.

An auxiliary table like this one from Rockler more than doubles your cutting surface, while inset T-tracks enable the use of a variety of jigs and guides.

1. Riser block: Resawing on the table saw gives varying results and can be dangerous, but the band saw is a natural at the task. Most 14" band saws are limited to resawing boards up to a maximum of 6" wide. However, because band saws consist of upper and lower castings joined in the middle to form the machine's support column, it's possible to unbolt the castings, separate them, and add a cast-iron spacer called a riser block between the two castings.

Riser blocks can increase resaw capacity to a full 12". The original blade



Replace your standard rubber tires with a urethane version for better and quieter performance (left photo). Updating your saw with a crank handle makes tension adjustment faster and easier (center photo). If you're not ready to step up to a roller-bearing guide, consider replacing your saw's guide blocks with Cool Blocks. The graphite-impregnated phenolic laminate blocks reduce blade wear and friction for a cooler, quieter saw (right photo).

guard and guide post will no longer fit, so risers come in kits with a new guard and post of the proper size. And don't forget you'll have to replace your current blade with a longer one.

Just about all band saw manufacturers make riser block kits for their 14" machines; they cost around \$70 to \$125.

2. Tension-release lever: Releasing tension on a band saw, especially if you change blades frequently, can be a hassle. A tension-release lever disengages a blade instantly. To install, you must remove the top wheel, housing and the existing tensioning assembly. The lever's gearing mechanism is then inserted onto the upper casting and bolted into place (some drilling of the casting is required).

Reassembled, the existing tension rod now rests atop a piston on the gearing mechanism. You still adjust the

tension with the knob, but you can then engage and release full tension quickly by pulling the lever. A tension-release kit costs about \$160.

3. Bearing-style guides: Those metal guide blocks in your saw's guide assembly create friction and heat, which can prematurely wear the blade. Constant rubbing, especially when the blade flexes, can also be on the noisy side.

Guide assemblies with roller bearings replace your existing guide. They feature adjustable wheels that ride the blade smoothly, resulting in lower friction and noise, with improved blade tracking and handling. Assemblies are sold both individually and in upper/lower sets and come in both machine-specific and universal-fit versions.

Installation is very simple and, with the exception of removing existing guides, requires no machine disassembly. Typical pricing for an upper and lower set is \$80 to \$150, depending on the manufacturer.

4. Saw table: Let's face it, the stock tables on just about every band saw are tiny. For resawing lengthy stock or cutting curves in tabletops and other furniture components, you're faced with a constant balancing act keeping the work flat on the table.

A replacement table, such as the one sold by Rockler, bolts or clamps right on top of your existing table, and has a smooth laminate top for low friction (and no rust!). It comes with inset miter slots and T-tracks for miter gauges and other accessories. Rockler's version includes a T-track on the front edge that accepts an included rip fence. It measures a roomy 24" x 24", nearly tripling the real estate of the typical stock table on most band saws.

Mounting it is easy and requires no machine disassembly, but keep in mind that the thickness of the table means you'll lose about 1½" of your saw's vertical cutting capacity. It sells for about \$169.



Don't Discard Your Spare Parts

When upgrading your saw, keep the future in mind. Even if you never plan to use it again, do not dispose of any original part or assembly. Label and seal it in a bag for future reference, and store it where you can find it easily later. If an upgrade fails for any reason, you may need to get your machine back up and running quickly, and having your original parts on hand for fast reinstallation means you can get back to work right

away. Later, when time and finances allow, you can repair or replace your broken upgrade with a new one if you wish. Also, you may get a new saw someday, and if you've saved your original parts you can move your upgrades and accessories over to your new machine, and reinstall the original parts on the old one. This will return your old machine to working condition for possible resale.



Any rip fence can guide stock; find one that's adjustable to compensate for drift. The Kreg fence adjusts to tweak the fence angle for a true feed.



A stand-alone resaw fence can be used without being attached to a rip fence. This MagJig resaw fence from Australian manufacturer Magswitch features inset rollers for smooth stock feeding.

Quick, Easy Accessories

Not all improvements to your band saw involve altering the machine. The following ways to make your saw better are simply a matter of replacing the old with the new or just adding on.

Urethane tires: The tires that came on your saw are a rubber compound that tends to harden and crack over time. Blades don't seat or track well on hard tires, so they must be replaced periodically. Urethane tires, however, stay supple and flexible for ages, and I've noticed that my saw runs quieter with them. Installing them is a matter of prying off the old rubber tires (you may need to scrape a bit if your tires were installed with an adhesive, as some are). Soften the new urethane tires in some hot water, dry them off, stretch them into place on the wheels, and you're done. They cost about \$30 to \$50 a pair, depending on size.

Cool Blocks: A roller-bearing guide is the best way to control your blade, but if you lack the funds for those somewhat expensive items, you can still improve blade handling by simply replacing your stock metal guide blocks with Cool Blocks. These replacement guide blocks from Olson are made of graphite-impregnated phenolic and slip right into place where the old ones were; installation literally takes less than a minute. The blocks lubricate the blade for low-friction blade handling and tracking, reducing heat buildup and extending blade life. Depending on the style your saw requires, they sell for around \$15 to \$20.

Tension crank: Even if you upgrade your saw with a quick-release lever, you still have to set the tension with your machine's stock adjustment knob/rod assembly. Twisting that knob can be a

pain, sometimes literally. If the knob is mounted low on the housing or you have large hands, scraped knuckles are common. Further, because of the high-angle location of the knob, it's not always easy to use. Tension cranks reposition the action above the upper blade housing, cost about \$15 and have a universal fit for most 14" saws.

Rip fences: Getting straight cuts on a saw is easier with a fence, and the band saw is no exception. There's a wide range of fences available for band saws, either from your saw's manufacturer or third party suppliers. Most require drilling to mount but are otherwise easy to install.

Any fence you consider should be adjustable for drift, a phenomenon common to virtually every band saw where the blade doesn't track exactly parallel to the direction of feed. Adjusting the fence angle slightly compensates for this; adjustment is by means of a setscrew, knob, or wrench. Check fence alignment frequently — especially after changing blades — because the actual amount of drift may, well, drift from blade to blade. Prices for rip fences are all over the board, but expect to pay \$40 to \$60 for a basic fence; a precision fence like the Kreg model shown above goes for about \$115.

Resaw guides: It's impossible to do a good job of resawing without proper support and guidance for the workpiece. Even a good rip fence isn't always the best solution, since you can't adjust feed angle on the fly as needed while resawing. A resaw fence works by offering a single point of contact for the

Digital Gauges Deliver Accuracy



Not intended specifically for the band saw, a digital angle guide (left) ensures perfectly set table angles on any machine. A digital tension readout (right), like Carter Products', gives an accurate tension reading for optimum blade performance.



The Rockler duplicating pin allows fast and accurate template cutting on your hand saw — a process that not everyone associates with the band saw, but one that is quite handy.

workpiece, ensuring perfect verticality but allowing the feed angle to be adjusted from side-to-side slightly to keep the blade right on the cut line. Resaw fences are designed to either attach to a rip fence, or function independently mounted on the table. The Maglig resaw fence (top right, facing page) features a pair of easy-release rare-earth magnets that securely grip your saw's iron table. It sells for about \$35.

Tension gauges: Proper tension must be applied to band saw blades for optimal performance. However, the tension scales on most saws are not only difficult to read correctly, but only offer a general

representation of a blade's tension based on blade width. Set a blade's tension too loose, and you get a wobbly blade with tracking issues. Tension the blade too much, especially thin blades of 1/8" and 1/16", and you'll be snapping blades in use — never a pleasant experience. Over-tensioning may also pull the saw out of alignment and can weaken tension springs.

Gauges designed for band saws give dead-on tension measurements for enhanced performance and blade protection. Analog style gauges clip onto the blade to measure tautness, while digital gauges install beneath the tension knob/rod assembly. Both kinds sell for \$150 to \$200, but analog types, because they're not mounted permanently to the machine, may be used on multiple saws if you have more than one.

Digital angle guide: Although not specifically a band saw accessory — a digital angle gauge can be used on any machine with a table — I wouldn't set my band saw's table without one. Built-in angle scales on most machines are notoriously inaccurate, and I never trust them. These digital gauges have a magnetic base, and setting the table is a two-step process. First, zero the gauge against the blade. Then place it on the table and adjust to the desired angle. Easy. Several brands are available — all of them nearly identical — selling for \$30 to \$40.

Duplicating pin: If your project involves cutting several duplicate curved components, a duplicating pin like the one shown from Rockler (above left) allows you to use cutting templates with



When space is an issue, a mobile base like the Shop Fox model shown here makes altering your shop layout a breeze.

your workpieces. The pin mounts easily to your saw's guide assembly and, with a template attached to your workpieces, turns out identical components one after another. It costs less than \$10.

Task light: Like the digital angle gauge, here's another accessory that can be beneficial almost anywhere in the shop. However, because so much cutting on the band saw is done freehand by following a cut line, extra light really helps visibility, especially on dark-colored stock where lines are hard to see anyway. Some lights come with a clip-on or magnetic base (or both), and prices vary widely. I got the light I'm using in the photo at left at a local hardware store for \$19.

Mobile base: Last, but not least, is another general shop accessory that's perfect for band saws: a mobile base. I find that for 90 percent of the cuts I make on the band saw, I can keep it nestled in the corner of my shop. But for larger workpieces, having my machine on wheels lets me roll it out onto the shop floor for lots of extra cutting clearance. Cutting done, it rolls back to its usual out-of-the-way spot.



Even in well-lighted shops, cast shadows can make it difficult to follow cutting lines. A magnetic task light easily solves this problem.

A.J. Hamler is the former editor of Woodshop News and the author of Civil War Woodworking. His last article with the Journal was in our August issue.



Envelope Table

By Ralph Bagnall

Whether you are playing whist, bridge or chutes and ladders, this table brings a stylish twist to your game playing pleasure.



Card games have long been a source of social entertaining, and the current popularity of poker continues that trend. There are many plans available for poker tables, but a dedicated poker table might not fit your home's space or design. That is why I wanted to build this Edwardian Envelope Table.

When not hosting a card game, it is an elegant side table of modest size, just 22" square. But turn the top 45 degrees, open up the leaves, and it becomes a 31" square game table complete with felt playing field and pockets for the chips.

As you may have guessed, creating a table that will go through this transition involves a bit more work than a traditional table. There is the fairly standard apron, but it houses a captured "sub-top" that provides the structure and strength to support the spinnable tabletop as well as its folding leaves. When they're closed, the table's leaves resemble an old-style folded envelope, giving the table both its name and its unique look.

Mahogany is the traditional material of choice for this project. Look for rich color and consistent grain. The material that is used for the folding leaves should be selected carefully to match when folded closed. The hidden elements such as drawer sides and runners can be made of whatever secondary wood you have available.

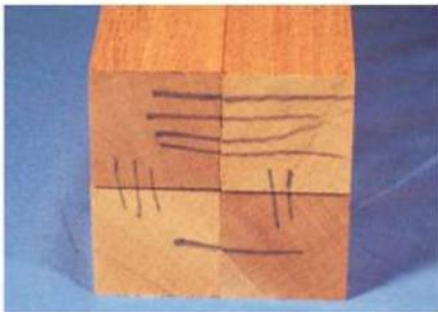
The inlay strips that surround the table leaves should be 3/8" wide for proper proportion, and the stringing should be 1/8" wide or less. It is important to have the stringing (and the leaf inlay) on hand prior to milling their respective grooves to be certain of a tight fit. They can be bought pre-made (from Constantine's Woodcenter, among other places), but are not that hard to make for yourself.

Making the Legs

To begin prepping the legs, select straight grained stock and, after preparing it on the jointer and planer, mill them to 1 1/4" square. Arrange the pieces to present their best faces outward, and mark them (bottom left photo). This will help ensure that the faces get mortised in the proper locations. Cut the mortises according to the plan — none for the top stretcher across the front, which will be secured using a dovetail (see the *Drawings*).

As you can see in the lead image and the *Drawings*, there is a small molding detail just below the apron. To locate and mount the molding, a shallow dado is milled around the leg to receive it. My dado blade and miter gauge made short work of this task.

The first step in forming the spade foot shape at the bottom of the leg is done by a point-cutting roundover bit. See the photo on the following page for details. Following that, I stepped to the table saw and used a tapering jig to complete the



Select the best-looking faces of the stock that will become the legs. Mark the 1/4" squared-up legs to help keep them properly orientated.



The author chopped mortises using a Forstner bit to remove the waste, followed up with a sharp bench chisel to pare the walls and ends.



Plowing a shallow dado that extends all the way around the leg, the author prepares to miter and attach a decorative molding.



Stringing Along

The author used a hand beader to form the long grooves (with the grain) which accepted the stringing (top left photo). A sharp bench chisel was used to cut the stringing groove across the grain (bottom left photo). The stringing must fit tightly into the grooves to look good (top right photo). After the stringing is glued in place and the glue had cured, the author used a random-orbit sander to sand the stringing flush (bottom right photo).



spade foot form. Now you are ready to make the longer tapers on all four sides of the legs. Mark them from just below the molding dado to the top of the foot, and carefully cut them on the band saw. Then sand or scrape them smooth.

With the legs properly shaped, you can add the stringing. The outside two faces of each leg get these string details. I used a hand beader, but a scratch stock or trim router with an edge guide would be equally effective to make the shallow grooves along the length of the tapered leg section and at the square top segment of the leg. The cross grooves are easy to cut with a sharp chisel. Obviously, these grooves must be carefully cut to the width and thickness of the stringing to look good. While this process does take time, it really lifts this project to the next level. When you are done with this task, sand the legs and the stringing up through the grits. Set the legs aside for now and move on to the aprons and stretchers.

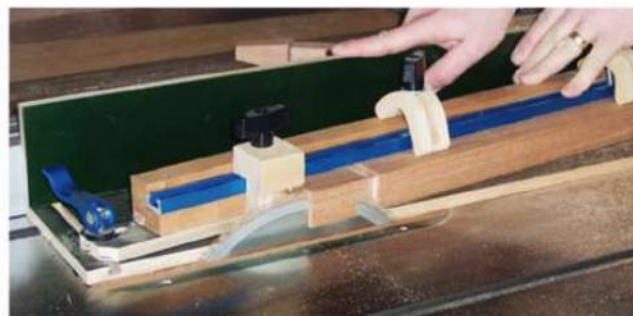
Milling the Apron Details

The three aprons and two stretchers are next on the agenda (pieces 3 and 4). The stretchers and the drawer front are all cut from one slightly oversized blank (see the note on the next page). This is done to ensure a consistent grain pattern running through the drawer front and the stretchers. A nice touch.

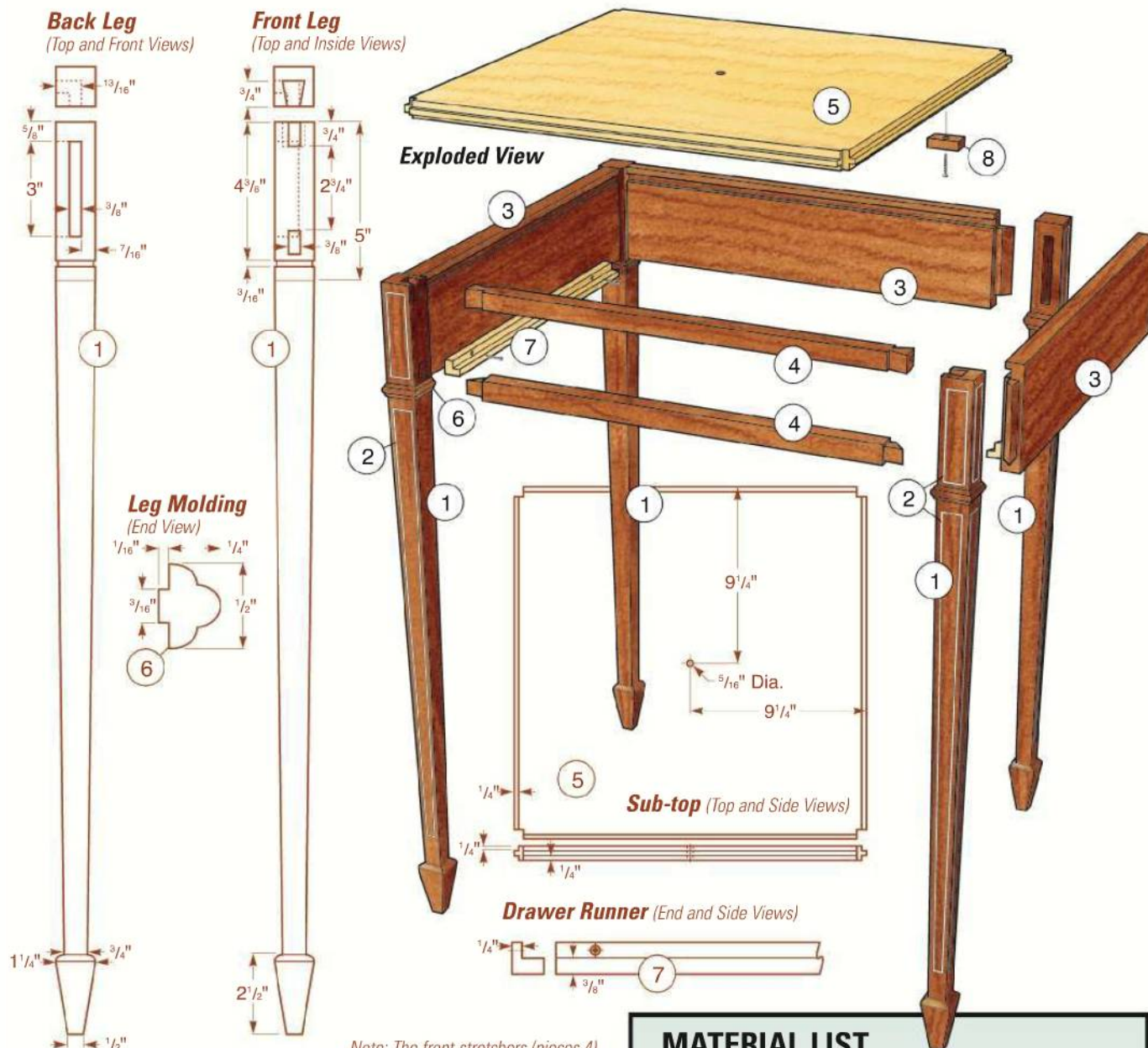
Start out by ripping the top stretcher from the blank, then reset the fence to rip the drawer front, then set the saw one more time to rip off the bottom stretcher. Go ahead and cut the stretchers and drawer front to their final lengths. The other three aprons can be cut and ripped to their proper size.

The three apron pieces and bottom front stretcher need to have mitered tenons raised on their ends to match the mortises you've chopped. (The top front stretcher gets dovetails formed later.) Look to the *Drawings* to find the details regarding the tenons. Test fit them to their respective mortises as you go.

The sub-top mounts inside the aprons employing a tongue and groove joint, and the grooves need to be cut at this stage. Set the dado blade up for a 1/4"-wide cut, 3/8" deep, and set the rip fence to groove the parts 1/4" down from the top edge. All three aprons and the top stretcher need to be grooved.



Making the spade foot is a two-step operation. Shape the top of the foot with a point-cutting roundover bit (above) in the router table. Then complete its basic shape by using a tapering jig on the table saw.



Note: The front stretchers (pieces 4) and the drawer front (piece 18) are formed from a 3/4" x 4 1/4" x 19" blank.

MATERIAL LIST

	T x W x L
1 Legs (4)	1 1/4" x 1 1/4" x 28 3/4"
2 Stringing (1)	1/32" x 3/32" x 50ft.
3 Aprons (3)	3/4" x 4 1/4" x 19"
4 Stretchers (2)	3/4" x 3/4" x 19"
5 Sub-top (1)	3/4" x 18 1/2" x 18 1/2"
6 Leg Molding (1)	5/16" x 1/2" x 36"
7 Drawer Runners (2)	3/4" x 3/4" x 18"
8 Drawer Stops (2)	3/4" x 3/4" x 2"

Envelope Table Specialty Parts

The following supplies are available from Woodworker's Journal.

Narrow Sewing Machine Hinges (4 pr.) #30897. . . \$11.99 pr.

Brusso Solid Brass Recessed Pull (1) #24618 . . . \$25.49 ea.

Provincial Edge Bit (1) #64033 . . . \$54.99 ea.

To purchase products online, visit www.woodworkersjournal.com and click on the "WWJ Store" tab. Or, to order by phone, call 800-610-0883 and mention code WE102.



After the aprons and stretchers have been cut to length, the author raised tenons to match the mortises that had previously been chopped into the legs.



Using a very traditional bit of table joinery, I chose to dovetail the top stretcher

into the legs rather than using a mortise and tenon. Since there are only two small joints, they can be easily marked out with a knife and hand cut to fit. See the *Drawings* for details.

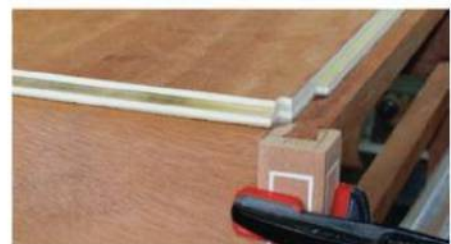
The table frame can now be dry-fitted, and the sub-top dimensions confirmed. Clamp the assembly together, ensure it is square, and measure the inside dimensions. Ideally, the sub-top should be 18½" square including the tongues, but adjust as needed to fit snugly inside the dry fit you've made. My sub-top was cut from ¾" mahogany veneered plywood I had left over, but any good quality ply can be used since the sub-top is only glimpsed when opening the leaves.

As you can see in the *Drawings*, cut a ¼"-thick x 3/8"-long tongue around the edge of the sub-top. The corners of the sub-top will need to be notched to fit around the legs. Flip the dry-clamped subassembly over, center it on the sub-top, and mark out the notches as shown in the photo at right, center.

The tabletop pivots on the sub-top around a 5/16" carriage bolt, so the sub-top requires a 5/16" pivot hole and counterbore marked out in the exact center of the sub-top. The hole and counterbore should be sized to contain a 5/16" fender washer and nylon lock nut. Be very sure to test the fit of the frame and sub-top, ensuring that they are snug and square. Once everything is set, glue



The sub-top is made from good quality plywood. The author forms a tongue around the edge of the sub-top using a dado head in his table saw.



With the dry-clamped leg and apron sub-assembly centered upside down on the sub-top, the author marks out for the notches that he will cut at the corners.



The top stretcher is joined to the leg using a dovetail rather than a mortise. The author formed the tail on the stretcher first, then transferred the shape to the top of the leg.



A final dry-fit of the joinery is essential before glue-up and assembly. You can't reverse the glue-and-clamp process once it's cured.



Here's the Safe Way to Form Those Small Moldings

Small details can make a big difference in your projects ... but sometimes small can be dangerous.

the frame and sub-top together.

With the base assembled, the trim molding can be wrapped around the legs. The trim molding was milled on the router table from a wide piece of clear maple for safety. See the *Drawings* for the molding profile and dimensions. The profile for your molding just needs to be close to the one illustrated — it does not need to match perfectly. Key to the process is a kerf that is cut top and bottom on the maple board which will form a boss (a small raised section almost like a tenon or a tongue), fitting the dado in the table legs you made earlier. See the sidebar at right for more information. Once the moldings were cut from the blank, I dyed them black. Then I mitered the pieces and applied them to all four of the legs with glue, clamping them securely.

Making the Fold-open Top

The hinged top of this project really provides a “wow factor,” and not just because it rotates and opens. When opened up for play, the top shows a mitered mahogany frame with quarter-round corner blocks surrounding a felt playing surface. As mentioned earlier, select the stock for these parts with an eye to matching grain and attractive figure. Start by milling the frame parts to thickness and width, but go ahead and crosscut them a little over-long. Miter the four frame parts to size, testing their fit. Next, glue and clamp them together. While the glue is drying, make the corner blocks. Their grain runs diagonally into the corners. To achieve this, I made an MDF template with a trued-up curve. The corner blocks are cut square, and then the curve was rough-cut on the band saw. To make them identical, I pattern-routed the corner blocks using the MDF template. The problem was, these parts are too small to safely flush-trim on the router table. My solution was to do the task with a handheld router instead. I mounted the template

The small molding details on the legs of the game table are made from maple stock — so you may ask why they look like ebony. The answer is simple: India ink. It creates a jet black color.

To make the molding, plane a piece of approximately 3"-wide maple lumber to 1/2" thickness. Next, set up your router table with a profile cutting bit; our author used a Provincial edge bit for the task. Test your setup on scrap lumber before you make the actual cuts, and then form the molded shape on both edges of the prepared maple lumber. With that done, move to your table saw and form a small saw kerf on both faces of the stock, just behind the molded edge, as shown in the inset photo above. This will create a boss — a small raised section — on the back of the molding, which will fit into the dado on the leg. Now rip the molding off of the lumber and apply the India ink as a dye. Allow it to dry completely before you miter the molding to fit.



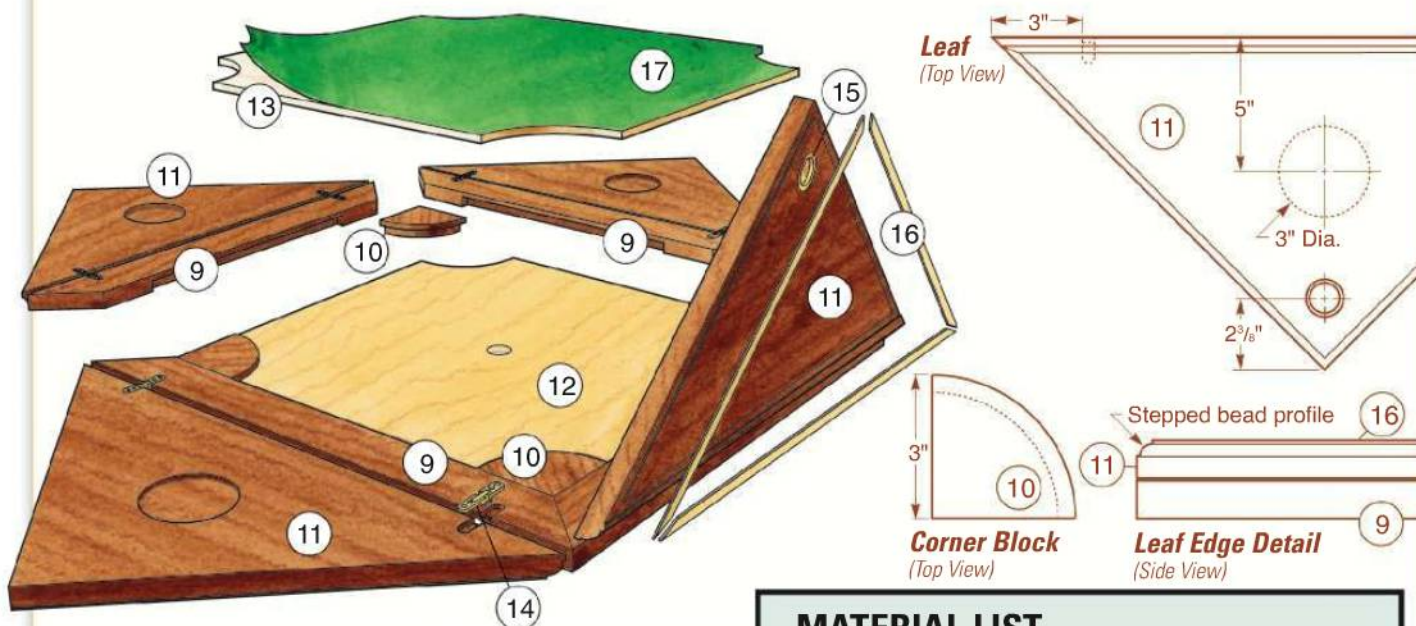
Machining these moldings on narrow strips is too dangerous. Instead, use a wide piece of stock and shape the edges. Also, use a reliable push block to move the wood across the router bit and keep your hands clear.



Rip off the moldings using a zero-clearance insert on your table saw.



The ebonized maple moldings get mitered and wrapped around the table's legs.



MATERIAL LIST

	T x W x L
9 Frame Pieces (4)	3/4" x 2 1/4" x 22"
10 Corner Blocks (4)	3/4" x 3" x 3"
11 Leaves (4)	3/4" x 11" x 22"
12 Base (1)	1/2" x 18 1/4" x 18 1/4"
13 Felt Substrate (1)	1/4" x 17 1/2" x 17 1/2"
14 Hinges (8)	1/2" x 3"
15 Recessed Pull (1)	Solid Brass
16 Inlay	1/8" x 3/8" x 252"
17 Felt (1)	1 square yard



Care was taken to match the grain of the triangular fold-out leaves. The mahogany stock that frames the felt center of the table was chosen to have a more dramatic figure. The hinges are high quality solid brass and inset flush to the table top. Note the quarter-round corner blocks inside the frame: a nice visual detail, their grain runs diagonally into the mitered corner of the frame.

to a block with glue and a screw, then clamped it into my bench vise. Next, I attached the corner blocks to the template with double-sided carpet tape and trimmed the blocks with a hand router and a pattern-routing bit — to ensure uniform size, fair curves and square corners. The corner blocks are clamped in place (with glue) using notched scraps to protect the frame corners. When the glue had cured, I took it out of the clamps and sanded it smooth. As shown in the *Drawings*, the frame gets a 1/2"-deep, 3/8"-wide rabbet milled all around the underside to accept the field base.

When completed, the top frame will capture two layers of plywood (or MDF) that combine to support and form the playing surface. One is a 1/2" thick layer that forms the base, and the other is a 1/4" sheet that is the substrate for the felt playing surface. Use the frame opening to mark their shapes by tracing right onto the sheetstock. Carefully cut the felt substrate shape, using a table saw and band saw: it must fit the opening very closely, so it will likely require some sanding or rasp-work to fit it properly. After you are done fitting it, go ahead and set it aside until later. Next, trace the base layer shape (onto your 1/2"-thick sheetstock) using the frame opening as a guide. You will need to add 3/8" all around so it fits inside the frame rabbet. Cut out the piece on your band saw and then sand the edges smooth so the base fits snugly, and pocket-screw in place. While your pride may drive you to shape this piece with precision, a perfect fit is not necessary, as it will not be seen by anyone but you. Lastly, measure and mark the exact center of the subassembly and drill a 5/16" hole and counterbore for the carriage bolt pivot.

“After building and assembling all of those parts, you’d think that you should be done about now. Well, not quite ...”

Creating the Triangular Leaves

After building and assembling all of those parts, you’d think that you should be done about now. Well, not quite ...

The four leaves that form the top of the table need to be quite accurately made, so once again I decided to use a template routing technique to ensure the required uniformity. Because it is inexpensive and exceptionally stable, I used plywood as the template material. To create the leaf shape, first cut a perfectly straight edge onto an appropriately sized piece of plywood and mark a 22" line on the prepared edge. Then, find the exact center of that line and extend a vertical center line at 90° that is 11" long. Connect the ends of the lines to form the triangle as shown in the photo above, right. This layout must be exceedingly accurate. If the template is not symmetrical, the leaves will not fit well when the table is folded. Take care when cutting out the template and, when you have finished, lay out and cut a circular hole where indicated for the chip pocket (see the *Drawings* for details).

With template in hand, use it to lay out the leaves. Ideally, all four should be cut from the same board, but if not, take care to keep the color and grain consistent. Rough-cut the parts slightly oversized with a band saw or jigsaw. Then, once again taking advantage of double-sided carpet tape, secure the pieces to the template you just made and flush trim them to final size on the router table. Before you take the template off the leaf, set up a handheld router with a dish-carving bit or core box bit to mill out the shallow depression in the underside of the leaf for the chip pocket. As you can see in the photo at right, I mounted a small piece of plywood to the base of my router, to add stability and control during this cut. When you are done with that step, it is time to flip the leaves over and start to add some classic decorative touches.

Hinges and Decorative Touches

The outer edge of the closed table has a 5/16"-radius stepped bead profile that I cut on the router table. To achieve that, each of the leaves gets milled along the base leg (the long edge) of the triangle. Before plowing the grooves and adding the inlay, you need to take some time to mill the hinge mortises. Fitting the hinges and leaves at this stage makes it possible to refine the fit of the leaves, trimming a little from the edges if needed, without damaging the inlay.

Mark out the hinge locations 3" in from the corners as shown in the *Drawings*. Set the leaf 1/16" off of the top frame and screw the hinge in place, but upside down. Now, carefully trace the mortise location with a sharp knife, then remove the hinge and, using those marks, clean out the mortise with a router or chisels as you prefer. Note that it is a stepped mortise, and a small clearance section is needed for the connecting bar of the hinge. Mortise all eight hinges in the leaves and frame, and then temporarily mount the hinges to the table. Fold the leaves in and



The key to perfectly fitting the leaves is creating an accurate leaf template. Test your template to be certain it is symmetrical.



Using your template, mark out four leaves for the table. The author recommends that all four pieces come from the same piece of stock.



After rough-cutting the pieces to size (cut 1/16" from the line), attach your template with double-sided tape and cut the leaf to exact size.



The chip depression is routed using a dish-carving or a bearing-guided core box bit inside a circular cutout in the template. The router has an auxiliary base attached to it to improve stability.



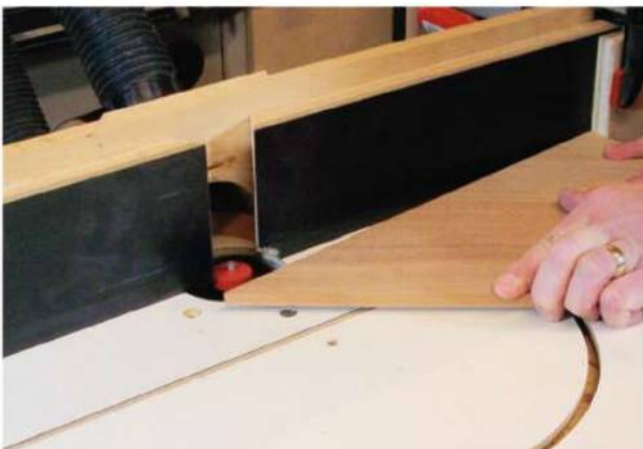
“One of the aprons is used to form the drawer front and the two stretchers, ensuring continuity of grain.”



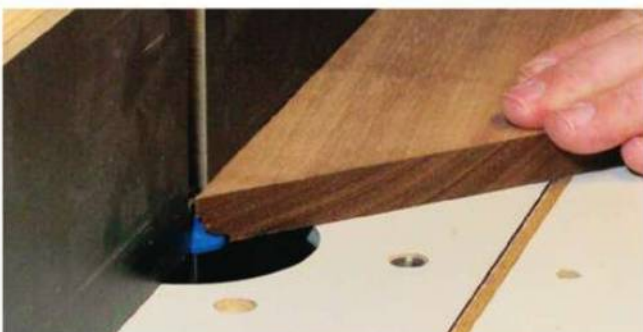
The author used maple runners to guide the drawer in the drawer opening. Note the scrap stop block mounted to align the closed drawer.



Laying out and mounting the hinges is done before any additional machining on the leaves. This allows for a bit of fitting with the leaves.



Begin machining the leaves by forming a roundover and bead on the outside edge using your router table.



Form a rabbet for the inlay strips on the face of the leaf. There are two setups: one for the beaded edge and one for the others.

ensure they meet in the center without binding. As you will notice, there is just a bit of play in these hinges. Check the fit and, if needed, this is the time to shave a little off an edge for a proper fit.

Once the hinges are fitted properly and the leaves adjusted, remove the hinges and begin milling the leaves to accept the inlay. A 3/8"-wide rabbet is milled around the edges of the top of the leaves to receive the cross-grained inlay strip. Along the outer edge of the leaf, the rabbet starts at the edge of the roundover milled in earlier, but on the other two sides the rabbets are right out at the edges. The depth of the rabbet should be the same as the thickness of the inlay, or just a hair less so that you can sand it flush.

Carefully cut the inlay strip to meet at the corners. A nice trick to help cut the corners easily is to use the leaf template: first as a setup piece for the rabbets (testing the cuts), then as a cutting guide for the strips (see the photo below). After you have properly fit the inlay strips, glue the trimmed inlay strips in place, being careful about the alignment of the corners. I used blue painter's masking tape as "clamps" in this process.

Another detail to attend to is the brass pull. With the top folded, one of the leaves needs a pull for opening the table up. Many antique examples have some type of spring-loaded mechanism, but others have a visible pull. I couldn't find any detail regarding how the spring mechanism worked, so I opted for a single brass pull. The pull requires drilling a shallow 1 1/4" counter-bore and a 1" diameter hole 5/8" deep for the body. This is located near the tip of the triangle, so don't force the fit. Widen the hole if needed to avoid breaking the tip. (Please don't ask how I know this!)



Use the template made earlier to test the inlay rabbet setup. Then use it to help cut the inlay strips to fit, as shown above. Use masking tape to hold the inlay when gluing it in place.

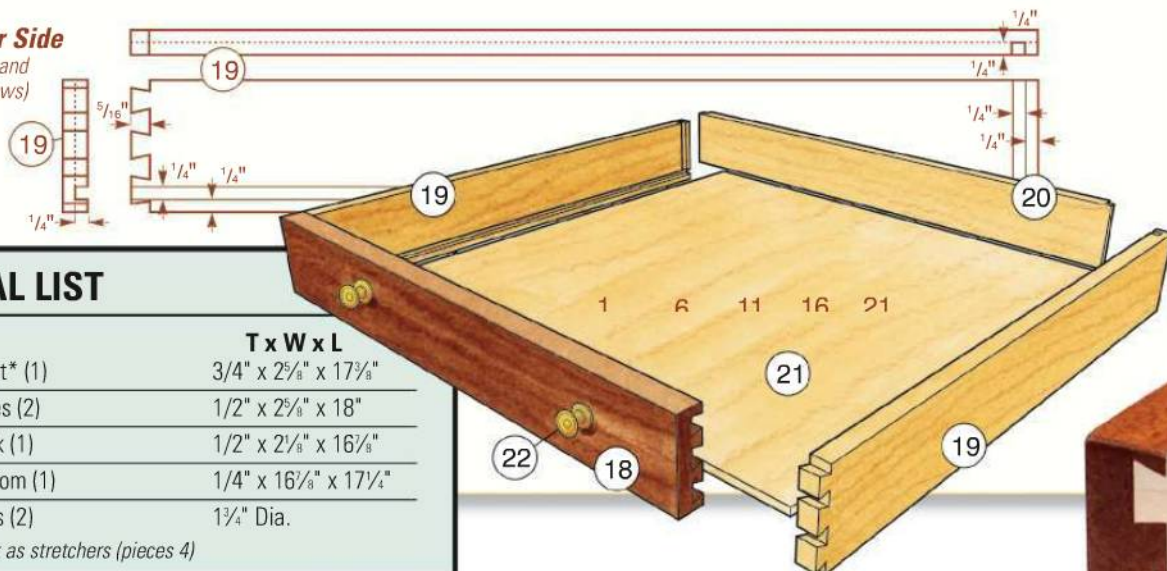


Drawer & Runners

No game table would be complete without a drawer for storing cards and chips. The drawer front, which you set aside earlier, can now be cut to final size. Measure the finished

Drawer Side

(End, Top and Inside Views)



MATERIAL LIST

	T x W x L
18 Drawer Front* (1)	3/4" x 2 5/8" x 17 3/8"
19 Drawer Sides (2)	1/2" x 2 5/8" x 18"
20 Drawer Back (1)	1/2" x 2 5/8" x 16 5/8"
21 Drawer Bottom (1)	1/4" x 16 5/8" x 17 1/4"
22 Drawer Pulls (2)	1 3/4" Dia.

*From same blank as stretchers (pieces 4)

opening and allow space on all sides for a reveal. I chose to dovetail the front to the drawer sides. The front and sides are grooved to accept a bottom, and the back fixed between the sides using simple groove and tongue joint. Poplar was my secondary wood for the drawers, but whatever is on hand in your shop will be fine.

Runners that guide the drawer should be rabbeted to fit closely between the apron sides and the drawer, about 3/8", depending on how much gap your drawer has. See the *Drawings* for all the drawer construction details. Drill and screw the runners to the apron sides. Maple or another close-grained hardwood is a good choice. Wax them well after finishing to ensure smooth drawer operation. Stop blocks (in this case made from mahogany scrap) are added to the underside of the sub-top as drawer stops.

Finishing and Assembly

With all the subassemblies completed, everything can be cleaned up, given a final sanding and the finish applied. For ease of application, durability in use and low-odor considerations, I chose water-borne polyurethane for this project. I applied three coats on all the subassemblies, with a light sanding between coats.

When the finish completely cured, the sub-top and top were waxed to allow the top to smoothly pivot on the frame. A 1" long carriage bolt was set into the hole in the center of the top, and down through the matching hole in the sub-top. A fender washer and nut attached the top to frame.

Next, reattach the leaves to the frame with the hinges and install the pull on the leaf. I mounted brass pulls to the drawer front — and the project was getting dangerously close to completion. All that remained was to mount the felt onto the playing field.

Applying the Felt Field

To make the playing surface, the felt is cut slightly oversized in comparison to the 1/4" substrate you cut earlier. I used spray-on adhesive to bond the felt to the substrate, and then trimmed the felt, leaving a 1/4" flap all around the substrate. Grab the double-sided carpet tape you've used earlier and apply several pieces, as shown in the photos below. I used thin spacers to center the felt-covered substrate as I mounted it. With the felt-covered substrate in place, I used a thin wedge to tuck the overhanging felt flap into the crack between the frame and the field.

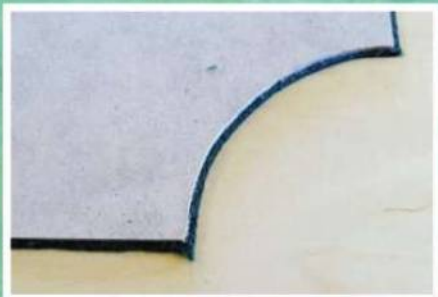
Operation

When not hosting a card game, the table is a mild-mannered end table, quietly gracing a den or family room. But when friends arrive, the top is rotated 45 degrees, exposing the corners of the frame. The leaves are unfolded, exposing a felt playing surface and the expanded table surface. When you're done with the game, simply fold the leaves back in, and rotate the top until it is squared with the base of the table.

Here's one thing to be aware of: the hinges are a two-knuckle design, with a short connector bar between the leaves. This means that the hinges can shift back and forth about 1/16th of an inch when closed. As the leaves are closed over the top, they can shift noticeably from corner to corner. A tap with the palm can align them properly.

Ralph Bagnall is a woodworker and shop consultant based in Tennessee. His website is www.consultingwoodworker.com.

Affixing the Felt



After attaching the felt to the substrate with spray adhesive, the felt is trimmed to within 1/4" of the substrate — leaving a small flap.



Double-sided carpet tape is used to secure the felt playing field to the frame subassembly. Use several pieces, as shown above.



Tuck in the felt flap around the substrate using a thin wedge of some sort. The author used the rounded end of a small metal rule for the task.

Classic Finger Plane

“Building a plane is a bit like cooking biscuits — once you figure out the basics, the finished product becomes a matter of taste and feel.”

By Doc Crawford



Some easy to make components and a few hours in your shop will combine to make a handy tool that will serve you for years to come.

You can build this plane to a level of quality that surpasses many store-bought options. The author contends that finger planes are right up there with shop pencils — “universally useful.”

A good quality finger plane, like a pencil behind my ear, is almost indispensable to me when I am woodworking. It is small enough to carry in my pocket, and to those of us who have discovered them, it's the most universally useful of cutting tools: you may reach for it a dozen times a day — every time a workpiece needs a chamfered corner,

or shaping or trimming — and if it doesn't come easily to hand, I, for one, feel lost. Problem is, every store-bought finger plane I've seen is either cheaply made or outrageously expensive.

However, if you start with a high quality iron, some nice hardwood from your scrap bin and a bit of careful hand work, you can build a finger plane stylish enough to display on the mantelpiece and tough enough to plow its way through the most demanding job in your shop.

Starting with the Iron

Cutting tools are like people: attractive is nice, but a stout heart is more useful. The heart of any plane is a blade — called the iron — which will take and hold a keen edge. Luckily, high quality pocket plane irons are plentiful and inexpensive. There was a time when the United States was the steel manufacturing center of the world. Nowadays, every secondhand store and almost every flea market vendor has a bucketful of made-in-U.S.A. chisels forged in that era, and they are easily converted into plane irons. The iron in this plane is fabricated from a 7/8" "Red Devil" socket chisel of about WWII vintage, which cost one dollar at a flea market. Socket chisels usually make better irons than modern chisels, which may be too hard to drill and tap. I've found that any width from 9/16" to 7/8" makes an appropriate cutter width for a finger plane like this one.

To convert the blade of the socket chisel into a plane iron (piece 1), use a felt-tipped marker to paint the back side, then lay out the cutoff line and clamp screw hole location, using a square and scratch awl. Make the saw cut outside the line, so the finished length, after cleanup, is still at least 2½". Use a file to clean up the sawn edge and file chamfers on the corners. Centerpunch the hole location, so the drill tip doesn't wander; then drill a 5/16" hole, and tap it 3/8-16.

Most old tools are also rusty, so now is a good time to use file, sandpaper and sharpening stone to remove the rust and hone the edge. The frog the iron rides on will be cut at 45

degrees, so the edge bevel should be no steeper than 25 degrees: a cutting edge that addresses the wood at 70 degrees cuts well, but a steeper angle may cause problems.

A Little Metalworking

The clamp screw (piece 2), which holds the iron in the plane body, and the striker plate (piece 3), which the clamp screw tightens against, are fashioned from a pair of 3/8-16 x 1" brass hexhead cap bolts. The finished clamp screw is actually only 1/2" long, but the lower half-inch provides sacrificial material for clamping it in a vise while it is worked. To avoid distorting the upper section of threads while filing, wrap them with masking tape. To shape the screw, clamp it in a vise and use a rattail file to cut half-rounds into each face of the hex head (see the *Drawings*). When that task is completed, saw the screw to 1/2" finished length, cleaning up the rough edges with a file and sandpaper. To shape the striker plate — which is nothing more than the head of the second bolt with the faces cleaned up — saw off the head, then use a file to flatten and true the top and bottom faces.

While your metalworking tools are still at hand, cut the blade stay (piece 4) to size. This is a 1¼" (1/16" oversized) length of brass rod that bisects the plane's body, against which the plane iron is tightened.

Making the Plane Body

Now it's time to rummage through your scrap bin and fish out that block of fancy-grained hardwood that was too

Socket chisels of a certain era abound at garage sales and flea markets. The steel in those tools is perfect to be reconfigured into a plane iron for a finger plane.

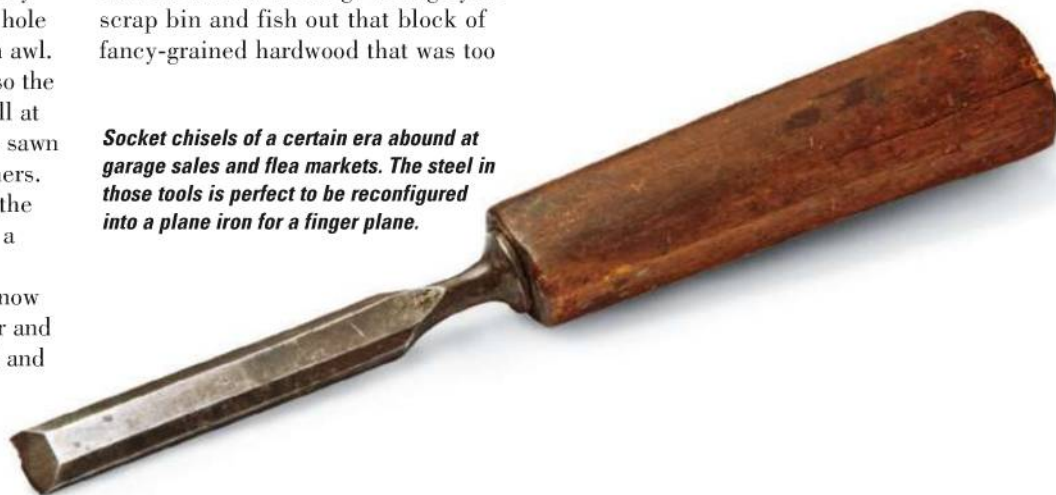
What You'll Need

Constructing this plane requires use of some tools and supplies commonly found in many home workshops:

- Vise
- Band saw or table saw
- Hacksaw
- Masking tape
- Felt-tip marker and scratch awl
- Hammer and center punch
- Miter square
- Mill and rattail files
- Rasps
- Pencil
- 1/4" and 5/16" twist drills
- 9/16" spade or Forstner bit
- Water-resistant glue
- C-clamps
- 2" x 8" sharpening stone
- 120-, 220- and 400-grit sandpaper

Building the plane also requires a few not quite so common items:

- Two 3/8-16 x 1" brass hexhead cap screws
- A 3/8-16NC tap
- A 1¼" length of 1/4" round brass rod
- A perfectly flat surface — for truing up the sole of the plane



small to use and yet too elegant to throw away. My plane is constructed from just such a block of hard maple, but almost any close-grained hardwood will do the job. If possible, use quartersawn wood and position it so the annular rings are parallel to the sole of the plane.

A plane is just one rung up the evolutionary ladder from a chisel — and in its essence is nothing more than a chisel held in a way that makes it easier to control. So, even though the shop drawings are dimensioned, as long as all the parts go together, few of the dimensions except the 45° frog angle and the distance between the blade stay and the plane iron are critical. Building a plane is a bit like cooking biscuits — once you figure out the basics, the finished product becomes a matter of taste and feel.

Cutting all the pieces from a single block of wood is relatively easy, if the cuts are performed in the right order.

Begin with a blank that is at least 1¼" x 1½" by 6" long. The blank must be properly squared up, all opposing faces parallel and adjacent planes at 90° to each other. Start by drilling the 1/4" hole for the blade stay (see the *Drawings* for location). Next, mark up the top of your piece for the sides and middle (nose and frog). In my finger plane they're 7/8" wide, but you can adjust for your own plane blade dimension. Saw on the outside of your layout lines with the band saw to remove the two sides (pieces 5), as shown in the top photo at right. Be sure to use a fine-cutting band saw blade for this operation. (Note: If you don't have a band saw, I suggest that you lap-joint and glue a piece of scrap material to the end of the 7/8" thick slab, to make it safer to handle on a table saw.) If you do use the band saw, be sure to carefully sand down the saw marks on the faces of the sides and center piece. Once that's done, you can cut the frog and nose (pieces 6 and 7) to size. I used a miter gauge on my table saw with an auxiliary fence attached, as shown in the photo at right (middle).

Step over to your drill press, tilt its table to 45° and bore the 9/16" stopped hole in the face of the frog (see *Drawings*). Carefully tap the striker plate into the counterbore. Avoid split-out by clamping the frog between two scrap pieces while tapping the striker plate into



After calculating the frog and nose thickness from your plane iron, slice off the sides of the plane — a band saw is a good tool choice.



The frog is cut at 45° using a miter gauge equipped with an auxiliary fence. The 22.5° angle on the nose is formed in a similar way.



After dry-fitting the various components and adjusting the frog and nose positions, the final glue-up is pretty easy.

place. Now get a couple of small clamps ready to go and set up for gluing the sides to the frog and nose.

The plane body should be assembled on a flat surface, and you'll want to complete the dry-assembly described below to ensure that everything fits as intended.

Start by fitting the blade stay into the pre-drilled holes and carefully position the frog between the sides. Slide the iron between the blade stay and the frog, and adjust the position of the frog so the iron can move freely. Make a witness mark on both sides to mark the position of the frog. Now, move the nose into position so the mouth — the gap between the nose and the iron — is between 1/16" and 3/16"; once again make witness marks so you'll know where to line it up on glue-up. With the dry fit completed, remove the nose, iron and frog, apply glue to the wooden parts, reassemble, and clamp, as shown in the bottom photo. Use a wet cloth or sponge to remove excess glue.

Final Steps

After the glue has hardened, tape a sheet of 100-grit sandpaper to a dead-flat surface, and sand the sole until it is perfectly flat. Now you can shape the completed plane body to your individual taste with rasps, files and sandpaper. Finish the wood with a few coats of hand-rubbed tung oil, and rub a thin coat of paraffin on the sole, for lubrication.

Use typing paper and a flat surface to set the iron to proper cut depth. Typing paper is about .004" thick. Lay two thicknesses of paper on a flat surface, position the plane with the frog end on the paper, slide the blade down into position and tighten the clamp screw. (Note that the edge bevel is the reverse of the usual plane iron orientation — that is, the bevel is to the front — a setup necessitated by the thickness of the chisel blade iron.) Once the blade is clamped, it can be adjusted side-to-side or for a heavier cut with light hammer taps on the top end of the iron.

There you have it, a high quality shop-made finger plane. If you are like me, you will find it extremely useful ... and it will be the first of many!

Doc Crawford is a woodworker, machinist and fishing book author who lives in Oregon. He is new to Woodworker's Journal.

MATERIAL LIST

	T x W x L
1 Iron (1)	1/16" x 7/8" x 2 1/2"
2 Clamp Screw* (1)	3/8-16 x 1" Brass
3 Striker Plate* (1)	3/8-16 x 1" Brass
4 Blade Stay (1)	1/4" Dia. x 1 1/8" Brass
5 Sides (2)	1/4" x 1 3/8" x 5 1/16"
6 Frog (1)	15/16" x 1 3/8" x 3"
7 Nose (1)	15/16" x 1 3/8" x 2 1/2"

* Available from Amazon.com

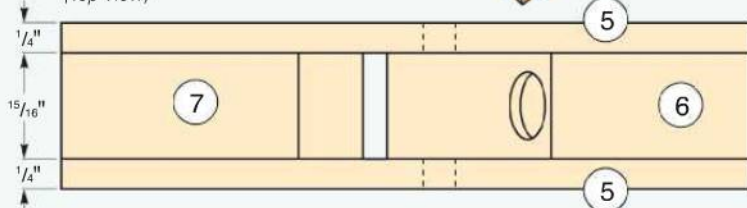
Note: The thickness dimensions of the frog and nose in this plane are based on the 7/8"-wide chisel blade that was formed into the plane iron. If your plane blade is of a different width, adjust the dimensions of pieces 6 and 7 accordingly.

Exploded View

Shape your finger plane using sanders, rasps and files to a form that is comfortable in your hand.

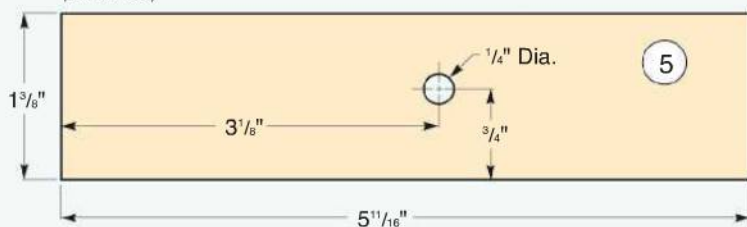
Finger Plane

(Top View)



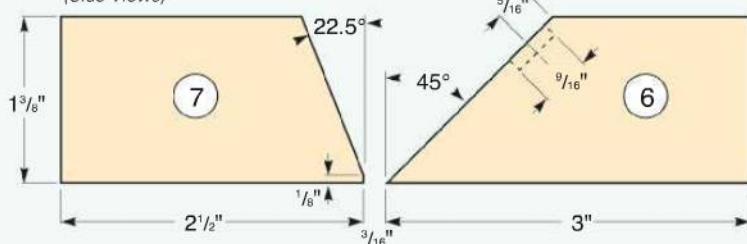
Side

(Side View)



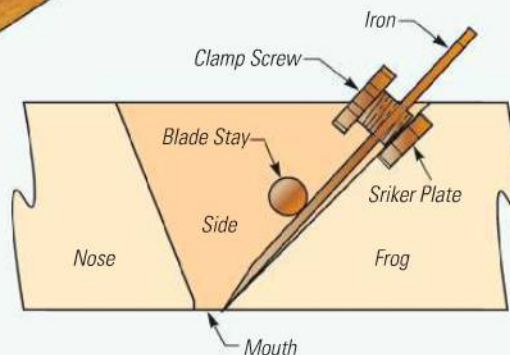
Nose and Frog

(Side Views)



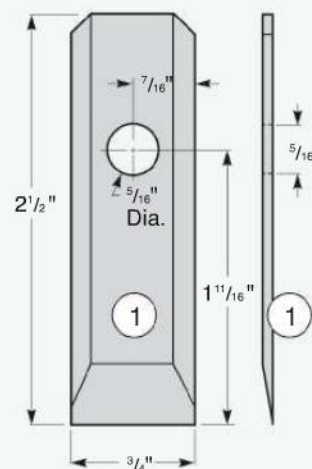
Plane Parts

(Section View)



Iron

(Top and Side Views)



Hardwood Mosaic Frame

By Robert Rockler

A unique technique brings beauty and thriftiness together in a great home shop project.

Professionally made picture frames come in two types: the chintzy-looking cheap ones, or the really great-looking expensive ones. I decided that I would like to build my own and come up with a really great-looking frame that was inexpensive (but definitely not cheap!).

This picture frame makes use of small tiles of hardwood that are glued to a plywood substrate underframe. The beauty of this idea is that the various tiles each have their own grain pattern contained within their border. The accumulation of all those tiles and their differing grain patterns creates a frame that is both geometrically regular, but texturally diverse. The effect is quite attractive. As I place my tiles on the frame, I take time to enhance that feature by looking for subtle changes in hue and figure, and placing them in such a way that it creates interesting patterns. You can think of it as a mosaic, with Mother Nature as the artist. Another thing that I find attractive regarding this design is that by using many little pieces, I can make use of stock that others would have to throw away — and, for that reason, I can buy my materials quite inexpensively.

With all that said, if the prep work of slicing many little pieces from many small blocks of wood is a degree of activity that you might want to cut down on, you can buy 1/4"-thick hardwood stock in bigger pieces, which will make the prep work go a bit faster. Either choice works fine on the frame.

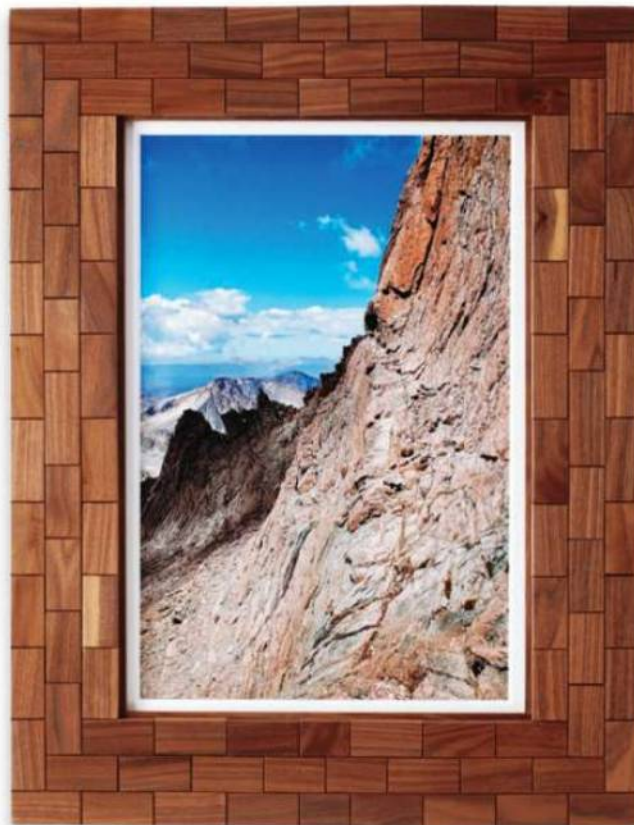


photos within frames courtesy of Keith D. Rickabaugh

Early Design Decisions:

The frame that is built by the dimensions found on the *Material List* on page 55 creates a 16" x 20" opening — a standard size. Proportionally, I decided on a 3"-wide frame, which allowed me to use three rows of 1"-wide tiles. The typical 2" length of the tiles evolved from the corner detail. I wanted the tiles on one row to be bisected by the tile butting in from the next row over (this visual effect is sometimes called bonding). In practice, the tiles are placed from all four corners, working inward. When I got to the middle tile position(s) of each row, the length of those tiles had to be slightly adjusted to fit the opening.

The plywood frame is made of 3/8" Baltic birch overlaid with 1/4" Baltic birch. The combination of butt joints, lap joints, glue and screws makes this underframe basically bulletproof.



The walnut frame shown here is the size of the picture frame you will get using the Material List provided with this project. The frame on the opposite page is made with cherry stock and is a bit larger overall.

Begin with the Plywood

To begin this project, use your table saw to rip the plywood stiles and rails to width and length (pieces 1 through 4). I am sure that any good quality saw blade will work for you, but I use a Freud 80-tooth crosscut blade for all of this work (even the ripping steps). I find that it provides a silky-smooth edge, and that means less sanding for me! Now grab a 1/4"-thick piece of hardwood (I used walnut in this case) and rip enough stock to create the stile and rail edging (pieces 5 and 6). Next, glue and clamp the edging to the front rails and stiles — you'll find that they're the same length. While you are waiting for the glue to dry, go ahead and move back to the table saw to rip sufficient material to make the perimeter trim (pieces 7 and 8). The following construction process is stone simple, but I recommend that you take a bit of time to look at the *Drawings* and to check out the photos — it's very important that you follow the right sequence.

Once the glue has completely cured on the front stiles and rails, take them out of the clamps, scrape away any excess glue, and sand them smooth. I prefer a 3" x 21" belt sander for this task because it levels the hardwood edging perfectly even with the plywood face.

Now it is time to put the plywood frame pieces together. The plywood pieces fit together with the hardwood edging lining the opening in the frame. The back stiles and rails simply butt together as do the front stiles and rails. But the front stiles and rails overlap the butt joints in the lower layer, essentially making a built-up lap joint. If you are confused by this, check out the *Lap Joint Detail Drawing* on page 55. I used screws and glue to secure the plywood pieces one to another. Lay out and pre-drill the through holes in the front stiles and rails, adding a countersink to each location. I used 1/2" x #6 screws and I prefer Titebond® glue. To help me glue and then precisely place the stile and rail pieces together, I used short pin nails fired from a 23-gauge nail gun to tack the pieces together. Then you can drive the screws home, being certain that the heads are seated just a hair below the surface of the front stiles and rails.

Even though I took exceptional care to line everything up accurately, the outside edges did not align perfectly. So, after the

glue had cured, I stepped over to my table saw and trimmed the long edges just a tiny bit.

The only thing left to do to the plywood frame subassembly is to glue a 1/4"-thick border of hardwood all around the perimeter, using the trim that you cut earlier. Glue and clamp the trim in place and allow the glue to cure. Wrap up by using your belt sander one more time and sand the face flat.

I'm betting you'll notice early on that one of the nicer features of this construction plan is that, because the front and back stiles and rails are different widths, when they are put together, this size difference creates a perfect rabbet just behind the front stiles and rails. It is into this rabbet that your picture will eventually be placed.

Tiling Time

However you decide to make your tiles, whether it be from a pile of scrap lumber you have in your shop or from 1/4"-thick lumber that you have specifically ordered for this project, or even shop-made resawn lumber, you need to make a whole bunch of tiles. The number of tiles indicated in the *Material List* (pieces 9) is an approximate number. It is actually a few more than you will need of that specific size, but in this project making those few extra pieces just makes sense. It gives you a better choice of tiles as you select them for placement. The center tiles (pieces 10) will

Thin-sliced hardwood lumber overlays and surrounds a plywood frame. Easy to build and extremely durable, this method of building avoids large miter joints, which can be a challenge to fit perfectly.





Set up a straightedge, as shown above, to help keep your tiles well aligned. Use just a dab of glue and clamp the tile in place, working from the corners in to the center. A couple of minutes of clamping is sufficient.



Because any minute error will be multiplied in this assembly process, you will need to adjust the size of the center tile(s) in each row. The space in the photo above was exaggerated to demonstrate the challenge.



The tiles are offset so that each one bisects the one next to it. This pattern is called bonding and is often seen in masonry and flooring. The offset is created by the corner placement of the tiles.

“You might think of a quicker way to sand the show face of each tile ... if you do, send me a letter as soon as possible!”

need to be adjusted to their proper length after you have put all the tiles of that row in place ... then you will need to measure the opening. (See Note on facing page.)

You may ask: Why can't I just divide up the space of a row and cut all the tiles perfectly sized so there is no variation? Here's the answer: even if you wanted to work that hard, it's extremely difficult to machine pieces that accurately. The detail that will come around to devil you is called accumulated error. Let's say that you make your tiles very uniform, but they are off of their length measurement by 1/64th of an inch. While it's a minute amount, on the 12 tiles that form the outside row, that error will add up to 3/16" in a big hurry! OK, try even harder and get to within 1/128th of an inch ... and you will still miss your mark by almost 1/8" — so you can see why it is better to adjust that middle tiles in each row to fit.

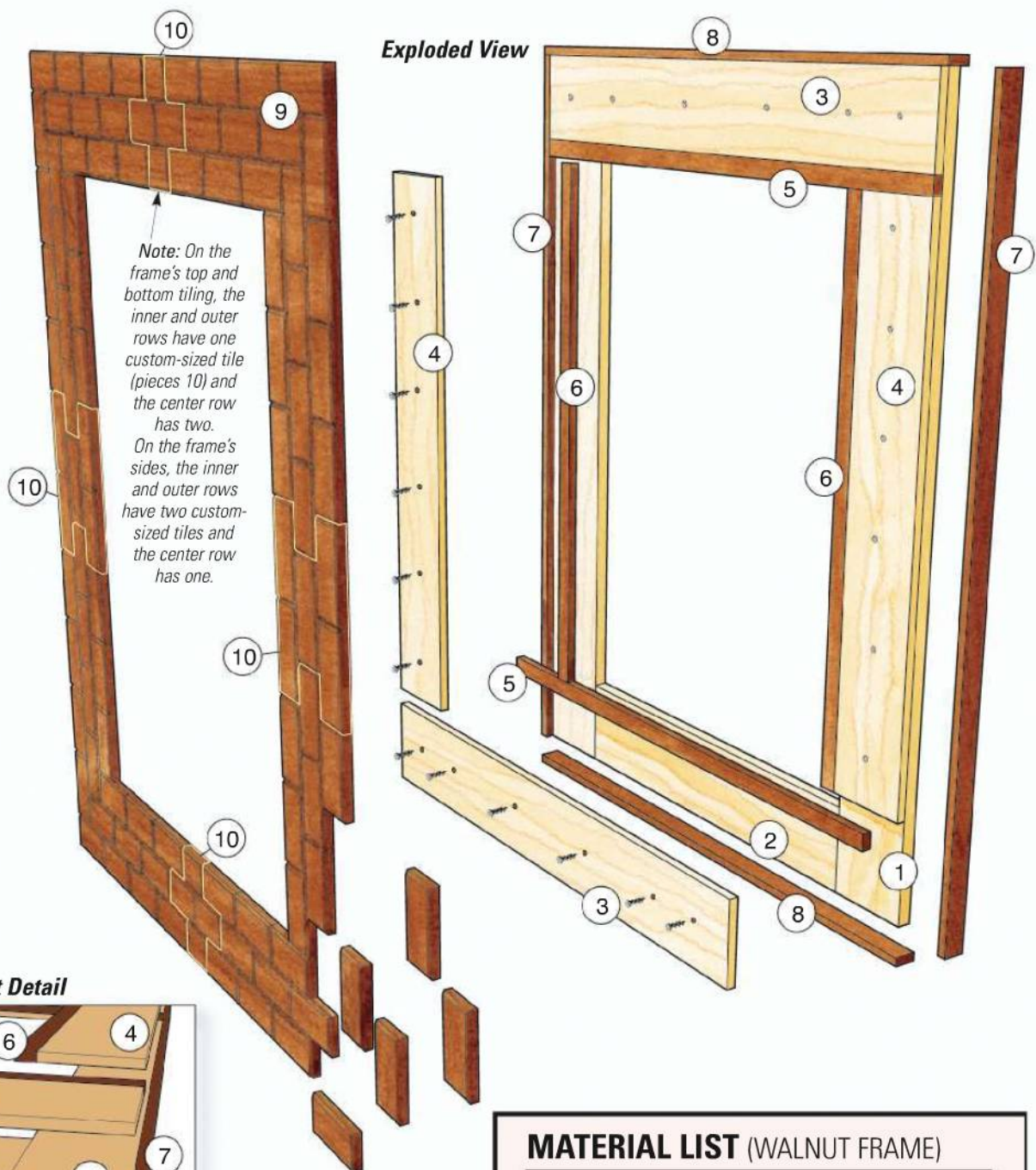
Make certain that your stock is of uniform thickness before you start cutting the tiles — this will save you a major headache later on. Then go ahead and cut your tiles to size. When working with stock this thin, make every effort to be extremely safe in all of your cuts. Use a zero-clearance throatplate, featherboard and push stick when appropriate. Despite trying very hard to avoid it, some of the edges of my tiles became burned during the cutting process. Take note of this discoloration: you can deal with it in the glue-up stage, but you need to be aware of the burned sections.

These next steps are going to take a bit of time. First, sand the show face of each tile. I simply turned a 1/4 sheet sander upside down and held each piece to the platen. You might think of a quicker way ... if you do, send me a letter as soon as possible! The next step is to chamfer the edges of the tiles. I used a 1/8" roundover bit in my router table. I made a special zero-clearance fence for this task, to keep it a safe operation. Use a small push stick, too; I came up with two pencils taped together and used the eraser end to move the tiles. You are now ready to start gluing your tiles in place.

Start by carefully gluing the first few tiles in position, as shown in the top photo at left. Keep filling in, as shown in the next two photos (left), hiding the burned edges as you place them. The exposed inside frame edge should be burn-free. Do a bit of hand sanding, and you are good to go on to the last details.

Adding the back panel (piece 11) and the hangers (pieces 12) are the last steps to making this multi-piece picture frame.

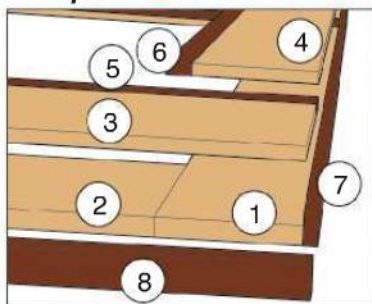




Exploded View

Note: On the frame's top and bottom tiling, the inner and outer rows have one custom-sized tile (pieces 10) and the center row has two. On the frame's sides, the inner and outer rows have two custom-sized tiles and the center row has one.

Lap Joint Detail



The plywood layers overlap to form built-up lap joints at the corners. The joints are secured with glue and screws.

MATERIAL LIST (WALNUT FRAME)

	T x W x L
1 Back Stiles (2)	3/8" x 2 1/2" x 22"
2 Back Rails (2)	3/8" x 2 1/2" x 11 3/4"
3 Front Rails (2)	1/4" x 2 1/2" x 16 3/4"
4 Front Stiles (2)	1/4" x 2 1/2" x 16"
5 Rail Edging (2)	1/4" x 1/2" x 16 3/4"
6 Stile Edging (2)	1/4" x 1/2" x 16"
7 Long Perimeter Trim (2)	5/8" x 1/4" x 22"
8 Short Perimeter Trim (2)	5/8" x 1/4" x 17 1/4"
9 Tiles (102)	1/4" x 1" x 2"
10 Custom-sized Tiles (18)	1/4" x 1" x 2 1/2"*
11 Back Panel (1)	1/4" x 11 3/4" x 17"
12 Hangers (2)	Steel

* The custom tiles are cut to length after measuring their respective openings.

Tile chamfers are formed with a 1/8" roundover bit (Rockler #28429).

The Big Finish

I used a can of spray lacquer to finish the picture frame — be sure to spray from each side to get coverage on the tiny chamfers. I used light coats and de-nibbed with steel wool between applications.

When that is done, cut the back panel (piece 11) to fit, and then mount the hangers (pieces 12), as shown in the photo at left. And that wraps things up. All you need to do now is find a nice photo to go in the frame ... and, in my case, I will try to find someone to buy it!

Depending on the success of his last hobby show, Robert Rockler is either a hobbyist or a professional woodworker.

Tool Review

Affordable Benchtop Portable Planers

By Sandor Nagyszalanczy

Surfacing wood for an affordable price — what sort of features and functions do these sub-\$400 dollar tools deliver?



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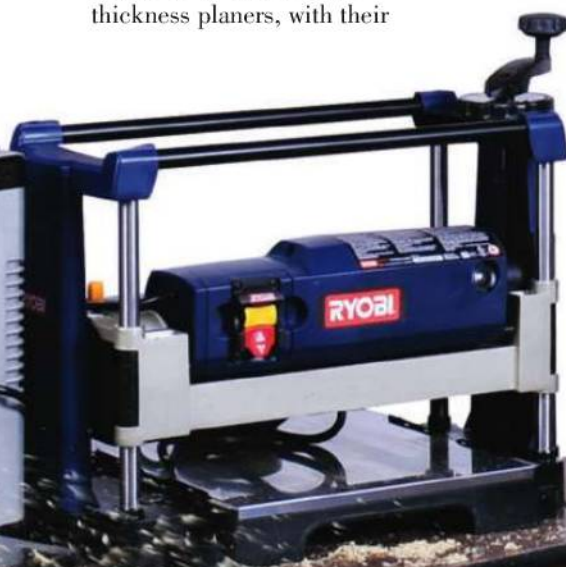
When I reviewed benchtop planers in these pages about a decade ago, they were still fairly new on the scene. Most major manufacturers had just introduced their first- or second-generation machines. At the time, the hottest models boasted then-new features like disposable knives, depth-of-cut indicators and depth-stop presets.

Flash forward to the end of this millennium's first decade and surprisingly little has changed: Benchtop portable planers are still the primary lumber thicknessing tool in the majority of small woodshops. And, save an innovation or two, most models still have roughly the same feature sets they did back in 2000. What's changed more are the economic realities governing our tool purchases. Most woodworkers these days have budgets that are tighter than a heavy-metal rocker's leather pants.

With tool economy in mind, I was curious to see how the current crop of lower-priced planer models compared to one another. I decided to test five popular models that sell for a street price of less than \$400 (sans tax and shipping). They range from the \$229 Ryobi AP1301 (remember, Ryobi was the first to introduce us to affordable thickness planers, with their

10" model AP-10) up to the \$399 DeWalt DW734. In the middle of the price pack are the Delta TP305 (\$255), the Craftsman 21758 (\$266) and the RIDGID R4330 (\$369). (I also wanted to include the \$299 Rockwell RK9010, but Rockwell chose not to participate in the test.)

A quick glance at the five planers, shown at the bottom of these pages, reveals that these models share a very similar DNA: They're all portable units that clamp or mount to a bench or workstand and have folding infeed and outfeed tables (save the Ryobi). Each is powered by a 110-volt universal motor that drives a two- or three-knife cutterhead equipped with double-edged, reversible knives (when one edge wears out, simply turn the blade around for a new sharp edge). They all handle





Craftsman



DeWalt



Ryobi



Delta



RIDGID

stock up to 12½" wide (13" for the RIDGID and Ryobi) and up to 6" thick. None of these lightweight thicknessers is designed to remove more than 1/8" in a single pass; even less on wider boards.

In examining and evaluating these economical models, I kept in mind the qualities I would want in a portable thickness planer. A good machine should be able to produce a smooth, even surface on softwood lumber as well as fine hardwoods, with little or no snipe (a dip in the surface of a board near either end). It should be easy to use, especially when setting the depth of cut to the desired board thickness. A good planer should have enough power to plane wide boards and dense hardwoods without bogging down. Finally (and very important in this age of

better health and safety awareness), a planer should have a dust hood that provides efficient chip capture when connected to a shop vacuum or dust collector.

Craftsman 21758

The silver and black Craftsman 21758 (photos and specs box are on following page) planer is a well appointed machine that's built similarly to other portable planers: Four steel columns support and align the motor and cutterhead assembly and two lead screws move it up and down. The gear train that connects the rotation of Craftsman's twin lead screws uses plastic bevel gears (the DeWalt, RIDGID and Ryobi use chains). The result is a very smooth cranking action that makes it nearly effortless to set the Craftsman's depth of cut: kudos!

While the Craftsman has few of the features found on the more expensive models (save a nice fan-assisted dust collection hood), it does have something none of the others do: a granite bed. The 7/8"-thick slab replaces the slick steel-covered bed found on other models and provides very solid stock support below the feed rollers and cutterhead. During planing, I noticed that the Craftsman produced nearly zero snipe, which leads me to believe that a certain amount of snipe likely results from the deflection of the bed due to changing feed roller pressure as the board passes through the planer. Granite simply doesn't deflect. Surprisingly, the stone bed doesn't add significant weight: The 21758 is only 4 pounds heavier than

Details make the difference.

Developed by different manufacturers and selling at various price points, benchtop thicknessing planers are all designed to do the same job. The details that separate them may be subtle, but if you are spending an hour or so per project surfacing lumber, those details just may determine a significant degree of satisfaction.

Tool Review continues on page 58 ...



Tool Review continued

The Craftsman 21758 (right) is a smooth operating machine that's very easy to crank up and down for depth-of-cut adjustments. A caddy (below) holds the wrench and two magnetic handles used for knife changes.



The Craftsman features a reversible dust hood (right) and a unique granite bed (below) that lends rock-solid support to stock running under the cutterhead.



the Delta TP305. If the Craftsman were used as a jobsite tool, I might worry a little about cracking or breaking the granite if the planer got dropped or tossed around the back of a pickup truck.

Power wise, the Craftsman's motor is rated at only 12 amps; the other four planers sport 15-amp motors. Although it performed adequately when taking light cuts, the lower amperage was noticeable when I pushed the tool harder and took deep cuts on wider boards. The planed surfaces produced by the 21758 weren't too bad, but some boards showed a slight amount of tearout and washboarding (faint ripples in the surface that must be sanded out). The unit includes a motor-fan-assisted dust hood that's very effective. The

removable hood is reversible, so you can locate the 2½" dust port on either side of the machine — very convenient.

The Craftsman has a two-knife cutterhead that locks automatically when the cutterhead guard is removed for knife changes. It comes with a T-handled Allen wrench that stores atop the planer's plastic guard, which has knife change instructions printed on it. A nice touch. There's also a pair of magnetic tools to help you remove and replace the planer's knives — a good thing, as they are narrow, double-edged and very sharp. The knives have holes in them that fit snugly onto small pins in the cutterhead. This makes accurately setting the knives very easy after reversal or replacement. Further, the holes in the knives are slotted, so a knife can be shifted slightly to the side. This allows an old machinist's trick: If the knives get nicked (thus producing a slight raised ridge on the planed board), shifting the knives laterally offsets the nicks so you get a smooth cut again. The Delta, DeWalt and RIDGID also have similar knives with slotted holes.

Craftsman 21758

Capacity: 12½" x 6" max, 3/32" min
Motor Amps: 12
Knives: 2, Bed w/ extensions: 23½"
Feed Rate: 26fpm / 60cpi
Automatic Cutterhead Lock: Yes
Price: \$266, Weight: 66 lbs
Depth Gauge: No, Depth Presets: No
(800) 349-4358

Delta TP305

The Delta TP305 is a model that doesn't possess any of the fancier features of the higher priced DeWalt and RIDGID. But, while it lacks a depth-of-cut indicator or depth stops, the TP305 is a solidly built machine and the only one in the group with an all-metal body (save the plastic motor housing). At about 12" wide and 15" high with its depth crank flipped down, the Delta is also the most compact planer of the five. This would be a real asset if you need to stow your planer in a space-challenged shop, or transport it in the back of an already-stuffed pickup bed or truck box.

Operationally, the Delta wasn't difficult to use. But although its lead screw gear train uses stout metal bevel

Tool Review continues on page 60 ...



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Tool Review continued

Delta's TP305 (right) is a compact machine with sturdy nearly-all-metal construction and a padded top bar that doubles as a carrying handle and a stock return roller. Its depth-setting crank (below) has a solid feel, but can be a little tough to turn.



The Delta's depth-setting cursor (right) is a bit fat for fine adjustments. Fitted with a chip deflector (below), it's the only machine in the group that lacks a dust hood.



gears, its depth adjusting crank turned with a hurky-jerky action that became a bit annoying after a while. It did raise and lower the bed faster than the other planers, taking only 12½ turns per inch of

travel; the other planers required 16 turns. I also didn't care for Delta's depth-of-cut cursor, which is so fat that I found it hard to line up accurately with the lines on its depth scale.

When fired up and fed wood, the TP305 kept up with the other models, not bogging down significantly when taking full-depth passes even on 6"- to 10"-wide hardwood boards. The Delta's short pressed-steel bed extensions make it a necessity to support longer stock ahead and behind the planer, to minimize sniping. The cut

surface produced by the Delta had about the same degree of smoothness as the Craftsman — not too surprising, as the two-knife cutterheads on both of these models produce 60 cuts per inch. Thanks to the TP305's open-topped body design, it's easy to access the knives when reversing them or changing them using the magnetic knife handling tool and Allen wrench that store onboard. But this Delta is the only planer in the group that lacks an automatic cutterhead lock, a feature I missed since it keeps the cutterhead steady and safe during knife changes. I also missed having a dust collection port — the TP305 only has a simple chip deflector that sprays shavings all over the place.

DeWalt DW734

Various versions of this bright yellow benchtop tool have been around for ages, and they've proved themselves to be venerable performers. Aside from a few changes in its body trim, the DW734 isn't significantly different than the model DW733 that preceded it, which brings to mind the saying "if it ain't broke, don't fix it." The highest-priced model in the test, the DeWalt has an extensive feature set

Delta TP305

Capacity: 12½" x 6" max, 3/32" min
Motor Amps: 15
Knives: 2, Bed w/ extensions: 23½"
Feed Rate: 26fpm / 60cpi
Automatic Cutterhead Lock: No
Price: \$255, Weight: 62 lbs
Depth Gauge: No, Depth Presets: No
(800) 223-7278

which includes nearly every bell and whistle mentioned in this article, including a unique-to-the-group carriage head lock which secures the motor/cutterhead assembly to the unit's four posts, for greater stability during planing. At 80 pounds, the DW734 is the heaviest of the five planers and, unfortunately, you feel every ounce when lifting the unit using its slide-out bent steel carrying handles — they're hard on the fingers.

Among the DW734's better features, I really liked the depth-of-cut indicator mounted on the front of the motor unit. Sliding a board under the indicator and lowering the planer's head lets you see exactly how deep a cut the planer will take. This saves the trouble of checking

Tool Review continues on page 64 ...

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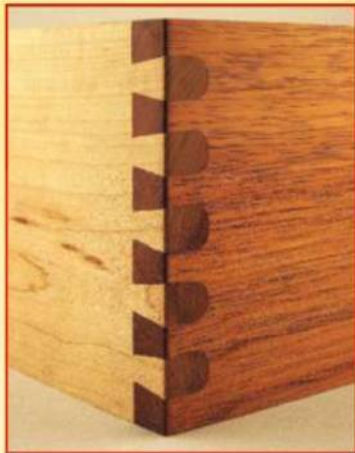
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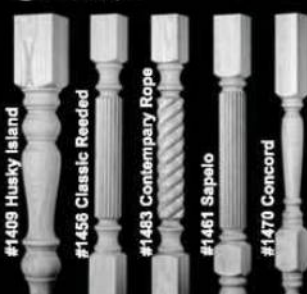
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The Chippendale Int'l. School of Furniture	8	62	www.chippendale.co.uk	Premier Bathrooms, Inc.	35	24	premier-bathrooms.com
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Cook's Saw MFG, L.L.C.	10	79	www.cookssaw.com	Rockler Woodworking and Hardware	38, 40, 42	23, 29, 62	www.rockler.com
Country Home Products		71	www.drpower.com	Routerbits.com, Inc.	43	62	www.routerbits.com
Craftsman Tools	11	2, 3	www.craftsman.com	Samuel Cabot Inc.	52	83	www.cabotstain.com
Dura-GRIT	12	79	www.duragrit.com/wj	SawStop	45	15	www.sawstop.com
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Epilog Laser	14, 15	21, 62	epiloglaser.com/wwwj.htm	Skil Power Tools	47	7	www.skiltools.com
Flock It! Ltd.	16	62	www.flockit.com	Stanley-Bostitch Tools	48	13	www.bostitch.com
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Grex Power Tools	24	67	www.grexusa.com	Woodworker's Journal		29, 59, 67, 79	woodworkersjournal.com
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Tool Review continued



The DeWalt DW734 (right) is a full-featured machine and a solid performer that produced very smooth planed surfaces. The included knife changing tool (below) doubles as a wrench and a magnetic knife handle.



Sliding a board under the DeWalt's depth-of-cut indicator (right) helps you quickly set the depth of cut without measuring the board. A manual carriage head lock (below) stabilizes the motor/cutterhead assembly.



the board's thickness with a tape or caliper, then setting cutting depth via the scale and cursor mounted on the front of the tool. The DeWalt also features a handy rotating turret stop that lets you quickly set 1/4", 1/2" and 3/4" cutting depths. I found them to be pretty accurate, and they can be fine-tuned as necessary.

To see how much power the DeWalt's 15-amp motor had on tap, I ran some passes on a few heavy birch planks. The machine thickened this dense wood without fuss, slowing only very slightly when I dialed in a maximum-depth cut. The DeWalt has a very good motor-fan-assisted dust hood with a 4" port (a 2½" hose adapter is included). Although the hood doesn't

convert to a chip deflector like the hoods on the RIDGID and Ryobi do, the DeWalt's fan had no trouble blowing chips out the port when no vacuum hose was connected.

Like the RIDGID, the DeWalt features a three-knife cutterhead. All five planers in this article feed stock at the same rate of 26 feet per minute, but at this rate, three knives take more cuts per inch than two knives do — 92 for the RIDGID, 96 for the DeWalt. More cuts per inch produce a cleaner surface with less tearout, especially on boards with squirrely, interlocked or highly figured grain. The DeWalt actually produced the smoothest surfaces in the test and, surprisingly, did so even with its carriage head lock disengaged.

For knife changes, the DeWalt's automatic carriage lock functioned well. However, it does take more time to change three knives than it does to change two on the lower priced models (plus, three-knife replacement sets are more expensive). The DW734 comes with a very nice wrench that doubles as a magnetic knife removing tool that stores on board the planer. Just don't lose the tool,

DeWalt DW734

Capacity: 12½" x 6" max, 1/8" min
Motor Amps: 15
Knives: 2, Bed w/ extensions: 33"
Feed Rate: 26fpm / 96cpi
Automatic Cutterhead Lock: Yes
Price: \$399, Weight: 80 lbs
Depth Gauge: Yes, Depth Presets: Yes
(800) 433-9258

as the screws that secure the knives have torque drive heads — not as common as the Allen-head screws used on other planers.

RIDGID R4330

With a slick, slightly industrial looking design, the silver, orange and charcoal colored RIDGID is a big machine that features a unique construction. Instead of four steel columns in the corners, the R4330 has four lead screws that turn in sync to move the motor/cutterhead carriage up and down. A system of gears and chains transmits power from a horizontally mounted hand crank to the columns when changing the depth of cut. Although the four lead screw columns are designed to add stability to the carriage assembly, they add so much



The RIDGID R4330 (below) has many impressive features, including a dust hood (left) that converts to a chip deflector (allowing you to use the planer without hooking up a vacuum) and a sliding depth preset (below left) that has eight different thickness settings.



friction that it takes a lot of effort to crank the RIDGID. This makes setting the planer's cutting depth a tedious task, especially when raising the carriage a great distance when planing a thick plank or beam.

The RIDGID does have a very full feature set, including an easy-to-use depth-of-cut indicator that I liked even better than the DeWalt's, as well as a depth scale and cursor that were precise and highly legible. The R4330 also has a useful sliding preset depth stop mechanism with eight different settings ranging from 1/8" to 1 1/4". Each of the presets were capable of producing planed stock that varies by less than 1/64" of the intended thickness: quite impressive. Like the DeWalt's, the stop setup is adjustable, so you can tweak it as necessary.

One of the RIDGID's most interesting features is its convertible dust hood, which uses a fan-assist to help blow chips toward its 4" dust port (it includes a removable 2 1/2" hose adapter). Rotating the hood's sleeve opens up the underside of the hood so that chips are deflected downward. Although this allows you to plane a few boards without hooking up a shop vacuum or dust collector, the open hood does spray chips everywhere.

The RIDGID's planing performance was on par with the other 15-amp planers in terms of power, and its 13" wide, three-knife cutterhead created surfaces that were only slightly less smooth than those produced by the DeWalt. Even though the R4330 has the longest

infeed/outfeed tables in the group, the planer was still prone to creating a noticeable amount of sniping on the ends of short as well as on long boards. I did try the usual trick of lifting the board slightly at the end of each pass, but I couldn't eliminate the sniping entirely.

When it comes to changing blades, the RIDGID's blade wrench and knife removal tools come packed in a nice kit that stows under the outfeed extension table. The plastic container even has a compartment that holds a set of extra knives (not included).

Ryobi AP1301

The 13" Ryobi AP1301 is the least expensive model in the group that has a sort of "what you see is what you get" design: There are no large side panels or top plate that cover up its standard four-post construction. This isn't necessarily a bad thing, as long as you don't toss the machine around, lest you damage one of the exposed posts. The Ryobi also lacks extension tables. These omissions do contribute to the AP1301's dainty waistline: At 53 1/2 lbs, it's by far the lightest planer in this group.



Despite the Ryobi's Spartan character, it has two very nice features: Below the planer's plastic depth-setting crank, there's a large wheel with very fine index markings that show increments as fine as 1/512 of an inch! By zeroing the wheel relative to a small pointer on the crank, you can gauge very small depth-of-cut

adjustments fairly accurately, without having to bend down and view the planer's regular scale and cursor (the DeWalt has a similar feature, but it's not as well implemented). The AP1301 also includes a nice fan-assisted dust hood that's very similar to the RIDGID (see the photo at top, above) that converts from a vacuum hood with a 2 1/2" dust port to a simple chip deflector with a twist of the wrist.

Powered up, the Ryobi planed boards with about the same amount of gusto as the

Tool Review continues on page 66 ...

RIDGID R4330

Capacity: 13" x 6" max, 1/8" min
Motor Amps: 15
Knives: 3, Bed w/ extensions: 34"
Feed Rate: 26fpm / 92cpi
Automatic Cutterhead Lock: Yes
Price: \$369 Weight: 73 lbs
Depth Gauge: Yes, Depth Presets: Yes
(800) 474-3443



The RIDGID's unusual depth-setting wheel cranks vertically, instead of horizontally like the other planers, and it goes up and down with the motor/cutterhead.

Tool Review continued

The Ryobi AP1301 (right) is the least expensive planer in the group, but it is also the lightest and features a 15-amp motor. The machine does lack folding extension tables, so you have to use outboard supports when planing longer boards (below).



Each of the Ryobi's twin knives fits into a slot in the cylindrical cutterhead and requires a special hook tool to remove them for knife changes (middle). A user-positionable wheel below the crank lets you gauge small changes in cutting depth (bottom photo).

other 15-amp-motored planers — slightly surprising, given this model's low price tag. I was also pleased to find that its depth adjustment crank was very smooth turning when both lifting and lowering the cutterhead assembly. Working around its lack of extension tables forced me to use a pair of auxiliary supports when planing long boards, but I generally use supports when running long stock through any thicknessing planer.

The Ryobi's cutterhead holds a pair of double-edged knives, and it does have an automatic lock that prevents cutterhead movement during knife changes. But, unlike the slot-and-pin knives on the other models, the AP1301's wide knives fit into deep slots in the cylindrical cutterhead and are secured with gibbs and jackscrews, an arrangement common on even large industrial planers. The downside of this setup is that you must turn the jackscrews with an open-end wrench and pry the knives out of their slots with a special tool that's included. This arrangement makes knife changes a bit fussy. However, the Ryobi did produce the smoothest planed surfaces among the three

lowest-priced models, leaving only a very light washboarding and just a touch of snipe on the trailing edge of boards.

Final Passes

After spending some quality shop time with these five portable thicknessers, I'm left with a pretty favorable impression of all of them. When I think back on the days when you had to drop a big pile of cash for a heavy cast-iron planer that took four strong buddies to move, I'm thrilled to live in an age when a mere 230-400 dollars buys you a portable model that can be carried without breaking anyone's back. Budget portables may be limited in terms of planing power and they may not last as long as their cast-iron brethren, but they're still a great purchase for any woodworker, carpenter or serious DIYer.

But the real question is, which one of these five affordable machines should you be considering adding to your benchtop arsenal? If you can live with a planer with basic features, there's no question that the bottom-bracket-priced Ryobi AP1301 is a real bargain. It's very light to carry, and its quality

Ryobi AP1301

Capacity: 13" x 6" max, 1/8" min

Motor Amps: 15

Knives: 2, Bed 14"

Feed Rate: 26fpm / 66cpi

Automatic Cutterhead Lock: Yes

Price: \$229, Weight: 53.5 lbs

Depth Gauge: No, Depth Presets: No

(800) 525-2579

cutterhead makes smooth work of most planing tasks. If you need a planer that's built to take the daily punishment of being tossed into a work truck and knocked around a jobsite, the nearly-all-metal Delta TP305 would be a fine choice. But if you're looking for a planer that offers both top surfacing performance and has all the features that make planing lumber easier, I'd go for the DeWalt DW734. It may be the most expensive model in this group, but the DeWalt is a well-built machine that's a pleasure to use, and so it earns my vote as your "Best Bet" purchase.

Sandor Nagyszalanczy is a furniture designer/craftsman, writer/photographer and a regular contributor to Woodworker's Journal.

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Today's Shop

10 Ways to Use Featherboards

By Chris Marshall

A variety of featherboard products can improve machining accuracy and provide a helpful third hand while keeping your fingers safely out of harm's way.

Whether you are ripping, table routing, band sawing or surfacing stock, featherboards can come to your aid. Features such as magnetized bases, riser blocks and narrow profiles add versatility and improve convenience.

Some safety devices, like shop glasses and hearing protection, are “no brainers.” Noise and flying debris give you good reason to have your head gear in place. But the value of other safety widgets, like featherboards, bears repeating now and again. That’s because at times, it might just seem faster or easier to use your hands to steady a quick cut instead of setting up a featherboard or two. Why bother? Well, deep down we all know the answer: those quick “don’t need to overthink this” operations are exactly where accidents and machining errors happen. Why take chances? That’s the better question, but occasionally we still roll the dice.

Maybe you don’t use featherboards for other reasons. Sometimes the typical featherboard thickness gets in the way of the operation you’re trying to make. Or, you can’t quite figure out how to mount a featherboard to a machine table surface unless there’s a miter- or T-slot close by. I’ve experienced these setup limitations many times. When the design of the featherboard limits its function, we may be inclined to let it sit in the drawer instead of using it for better protection and workpiece control.

Whatever the case, featherboards should be part of machine use. Improved designs can address all of our excuses for not using them, keep us safer and improve accuracy. They aren’t just for table saws either. Here are 10 operations made safer with featherboards.



Springy feathers help reduce the chances for kickback during ripping by preventing workpieces from moving backward.



1 Setting Up Basic Rip Cuts

Typical featherboards are stone-simple devices, really. Most consist of a plastic or wood base with a row of flexible “feathers” along the edge. The springy resistance created by pressing these feathers against a workpiece

allows it to hold wood down against a table or “in” and against a fence. The feathers are angled in one direction to keep workpieces moving through a cut, and they resist backward motion.

These characteristics can benefit you when setting up rip cuts on the table saw. It's the most basic and widely used application of featherboards, so I'll give it first position on the list. A featherboard helps to counteract the rotational force created by a spinning saw blade, not only in a kickback situation but also during any rip cut. At the same time, a featherboard placed on the infeed side of the blade holds stock tight against the rip fence. That way you can use your hands for pushing without also needing to press the workpiece laterally.

Bench Dog's Feather-Loc® (\$20), shown above, is a good representation of the common style. It mounts in the saw's miter slot and has an expanding miter bar that locks the

device in place. Feather-Loc is also designed with one feather a tad shorter than the rest. During setup, once the short feather touches the wood, you know the rest are properly tensioned so you can tighten the lock knobs. It's quite helpful.

2 Ripping Narrow Material Safely

When ripping workpieces narrower than about 8", a push stick is sensible to keep your fingers clear of the blade. As stock gets even narrower and lighter, it's a good idea to install a featherboard over it to keep the wood pressed down firmly. But, what happens when the workpiece becomes too narrow to keep a push stick engaged next to the featherboard? Short of discarding the wood



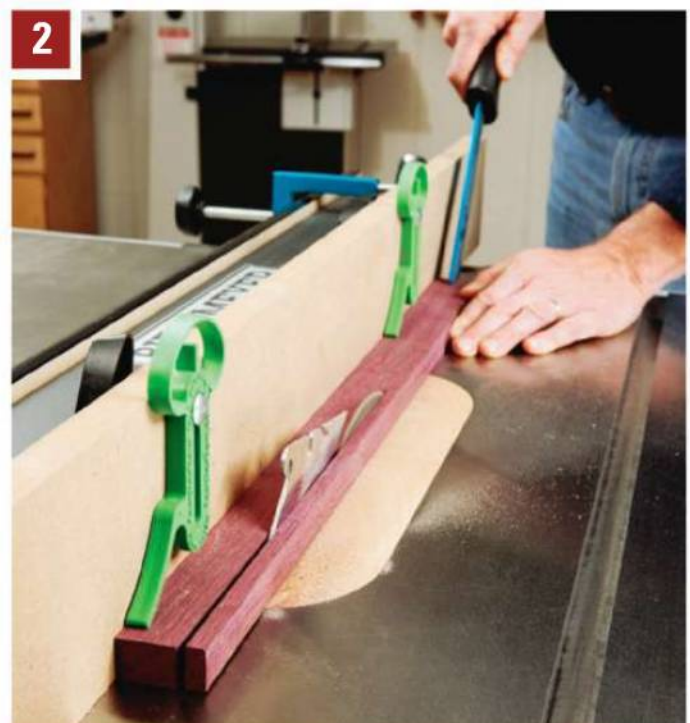
Miter-slot featherboard

for basic rip cuts (above).

Thin featherboards secure stock for ripping narrow strips (below).



Today's Shop continues on page 70 ...



Narrow profile featherboards can help you keep a push stick in control of a narrow rip cut, while pressing the workpiece down securely.



3

Internal magnets allow Grip-Tite featherboards to guide wider workpieces, such as sheet goods, regardless of proximity to miter slots.

not even be feasible to install. Grip-Tite featherboards (\$40 to \$55 ea.) can really come in handy for oversized panel work. Inside the base of these devices are focused magnets that clamp them down to steel or cast-iron worksurfaces with at least 40 pounds of force. You can place Grip-Tites anywhere on a metal machine table independently of miter slots or even vertically on a metal fence facing.

Flexible fins on both sides and a top hold-down act as the pressure feathers here. Grip-Tite also offers a sandpaper-covered Roller Guide™ that fastens behind the left fin to serve as a feed roller. When the Grip-Tite is installed vertically on a fence, the roller directs workpieces against the fence to keep them tracking properly. All in all, magnetic Grip-Tites are very helpful “third hands.”

(sometimes the safer solution), consider installing a pair of FeatherBow Junior® featherboards (around \$7.50 ea.) over your workpiece. Their narrow 3/8" profile can help you keep a push stick in control throughout the cut. FeatherBow Juniors come with bolts and knobs to attach to an auxiliary fence facing. You choose between a single feather or a bow on the other end to create downward force.

Guiding wide sheet goods

(above), these Grip-Tites are particularly well-suited to the task. They can also help keep thin stock pressed down (at right) to prevent fluttering.



3 Guiding Large Sheet Goods

Cutting wide or long sheet stock panels to size can be a tricky operation. They're often heavy, bulky and force you to stand a distance from the saw to begin the cut. These factors compromise your control. Depending on where your cut needs to be, ordinary miter slot-style featherboards may

4 Keeping Flexible Stock from Fluttering

Thin materials, such as hardboard or plastic laminate, present a whole different problem than thicker, heavier sheet goods. While they're relatively lightweight, thin sheets are still bulky and prone to sagging as you are feeding them into a cut. If dealing with the loosey-goosey nature of these flexible materials isn't bad enough, the leading edge can lift off the saw table when it engages the blade. That can lead to a costly mishap and ruined cut.

The challenge is to provide a means of holding the stock down against the table. Any featherboard that can be installed on your saw's rip fence can help prevent fluttering from occurring, provided the fence is within a

Today's Shop continues on page 72 ...



4

An accessory metal fence facing enables Grip-Tites to clamp over a workpiece vertically, offering quick, robust hold-down support.

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A combination of hold-in and hold-down restraint ensures safer operation and more accurate results with a dado blade.

couple of feet or so of the blade. Grip-Tite's RollerGuides could help here, too, by pulling sheetstock against the fence. Whatever featherboard you use, raise the back of the sheet a little higher than the front for even better flutter control.

5

Rabbeting and Dadoing

A spinning saw blade's rotational force resists your effort to feed workpieces through a cut. Dado blades compound that resistance. The wider and taller you set the blade, the more feed pressure you need to apply to remove material. For these operations, you should install a featherboard alongside the cut to keep workpieces secured against the fence and moving forward.

Since rabbeting or dadoing are almost always joint-making tasks, the dimensions of the cutaway area are important. So it's prudent to install a hold-down over the workpiece as well as beside it.



Securing stock when rabbeting

or dadoing (above), the Magwitch Pro provides two-in-one support. Woodhaven's thin featherboards (right) guide narrow workpieces more safely.



A featherboard placed here will ensure a consistent cutting depth all along the workpiece by keeping stock pressed down firmly.

How do you satisfy the need for both hold-in and hold-down support? Well, you could install two individual featherboards, but Magwitch's Pro Featherboard (left, \$59) with Vertical Featherboard Attachment (\$16) provides both in one device. The Pro's base contains a pair of strong 30mm magnets that engage or release a work surface by flipping two rotating knobs. The optional top featherboard fastens to it with extension arms, and it has a second set of knobs that adjust it to the workpiece height (up to about 2½"). This could be particularly helpful if your table saw or router table fence doesn't have a T-slot channel that allows for installing the upper featherboard.

6 Routing Thin Stock Safely

When routing an edge profile to create a narrow strip of molding, the best approach is to mill it on wider stock, then rip the molding free. But, you may not always have that option. If you've only got a narrow strip of stock to begin with, Woodhaven's 240K Hold-down and Hold-in Kit (\$29.99) can help. These featherboards are made of



Push stick control is crucial when profiling narrow strips on the router table. Featherboards should not obstruct the push stick's path.

Featherboard Mounting Options

There's nothing wrong with making your own featherboards from scrap. The challenge is figuring out how to mount them securely to your machine surfaces or router table. Here are two alternatives: Rockler sells a Miter Slot Hardware Kit for \$6.99. You get two expanding bars, bolts and star knobs to install featherboards the conventional way. Another solution is Magwitch's MagJigs. They're self-contained 20mm or 30mm magnets (\$26 to \$38 each) with a mounting bracket and knob that turns the magnet on and off. Attach them to featherboards when needed and then swap them over to any other table-mounted jig you make.



Several aftermarket alternatives are available for attaching shop-made featherboards.



Rockler's Double Featherboard Kit creates a high-rise featherboard to keep panels planted against the fence during panel raising.

to the table as necessary. Cleanup passes fix the problem. That's not the case with some bits, such as dovetails or T-slot cutters. Here, if the workpiece moves either away from the fence or up and off the table, the cut is ruined. That's because the bit is trapped inside the workpiece where its entire profile is impacting the cut.

In these situations, a pair of featherboards is essential — one over the top and one alongside the workpiece. Kreg offers a convenient pairing with its True-FLEX™ Featherboard Twin Pack (\$36.99). One featherboard has T-slot hardware to apply

Today's Shop continues on page 74 ...



Riser blocks

support taller stock when panel raising (left).

Tandem featherboards hold stock when routing with trapped bits (below).



flexible, high-density plastic with three feathers molded at a 4° angle away from the base. Setting the correct operating pressure is easy: just compress the feathers until they're parallel with the workpiece. The narrow profile of the plastic (3/8") can give you the clearance you need to keep a push stick engaged when routing that thin stock. The hold-down featherboard includes an aluminum extrusion with T-slot bolts and knobs for mounting it to a router table fence. The hold-in has an expanding bar and large easy-to-use wing knobs for securing the featherboard in a miter slot.

7 Supporting Tall Stock When Panel Raising

Panel-raising with a vertical bit on the router table is another scenario where featherboards can improve accuracy. You need some means of hold-in pressure to keep the panel pressed fully against the fence. If the panel veers away from the fence, the cutter won't remove all of the material it's supposed to.

The trouble with typical 3/4"-thick featherboards is

that they aren't tall enough to provide adequate support higher on the fence where you really need it. Solution?

Rockler and some other featherboard products come with wide riser blocks or a stack of washers to elevate a featherboard's stance. For instance, Rockler's Table Featherboard (\$18.99), which mounts in a miter slot, is also sold as a Double Featherboard Kit (\$29.99). The kit includes two risers, long bolts and knobs that raise a second featherboard over the main Table Featherboard. The combined height provides two areas of hold-in support to reach to the top of 3"-tall router table fences. Once installed, your hold-in support is assured, and it takes some of the hassle out of the hand-feeding process.

8 Routing with Trapped Bits

With typical profiling router bits such as ogees, coves or chamfers, if a workpiece moves away from the fence, there's no real harm done. You make another pass to remove what you missed. Same goes if you don't get the stock pressed down quite as tightly



Want to mill an accurate sliding dovetail? The optimum setup should involve two featherboards, since this is a trapped bit technique.



Face-jointing

long boards (right) or edge-jointing wide boards (below) is easier with magnetic featherboards.



downward pressure over a router table fence. The other featherboard has a pair of miter bars with a unique wedge lock that expands them for a tight grip. I found these particularly easy to tighten in place when compared with some other miter bar styles.

9 Face-jointing Long Stock

Featherboards may seem unnecessary for surfacing, but think of how handy another set of hands would be when you have to face-joint a board that's 8 or 10 ft. long. It can be challenging to keep a face pressed down flat to the jointer tables when you're also contending with a really long board, especially if it's also heavy. Magswitch's Universal Featherboards (\$49.99 ea.) could be just the shop helper you need. The base has a

narrow profile and features a pair of 20mm magnets that lock securely to a short jointer fence. Once they are switched on, you can back up from the jointer as needed and still keep the stock face pressed down over the cutters. While these are fairly spendy items, they have both left- and right-facing rows of feathers. So you can use them on your band saw, table saw, shaper and other metal-topped machine applications, too.

10



Here's a helpful way to keep wide boards from tipping when edge-jointing: install a tall magnetic featherboard on the infeed table.



9

Magswitch's Universal Featherboards are narrow enough to install on a typical jointer fence, giving you more hold-down control for face jointing.

10 Edge-jointing Wide Stock

Now consider those really wide boards you can't bear to rip into narrower pieces. Jointer fences are short, which doesn't provide much vertical support for a board that's 10" or more wide. How do you know the face is snug against the fence when a wide board is on edge and you're guiding it by hand? It's hard to be sure. I worked through this challenge by using four interlocking riser blocks included in Magswitch's Vertical Featherboard kit to

create a taller featherboard. When double-stacked, they position the top featherboard in line with the top of the jointer fence. It's ideal for this job.

So you may ask, do we need *all* of these featherboard products? Not really, but knowing your options can lead you to particular solutions that will make your machining tasks safer, more accurate and even more enjoyable.

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

FEATHERBOARD SOURCES

Bench Dog: 800-786-8902; www.benchdog.com

FeatherBow: 860-209-5786; www.featherbow.com

Grip-Tite: 800-475-0293; www.grip-tite.com

Kreg: 800-447-8638; www.kregtool.com

Magswitch: 303-468-0662; www.magswitch.com.au

Rockler: 800-279-4441; www.rockler.com

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619-459-7951

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Rockler
800-279-4441

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

Stanley's new line of *Sweetheart*™ socket chisels are based on the classic 750 design, "arguably the best Stanley® chisel ever made," says Chris Woolley of Stanley. Machined from high carbon steel, the new Sweethearts have extra-narrow side bevels for working in tight corners and hornbeam handles for striking and paring. Individual sizes from 1/8" to 1 1/4" are priced at \$29.99 or \$39.99; four-piece (16-791, \$110) and eight-piece (16-793, \$199) sets come with leather pouches. Stanley's new five-piece Bailey® chisel set, machined from carbon-chrome steel with lacquered blades, also comes in a leather pouch. The Bailey kit contains 1/4", 1/2", 3/4", 1" and 1 1/4" chisels and sells for \$79.99.

The new *CarveWright Version C* is a successor to **LHR Technologies, Inc.**'s original CarveWright tabletop carving machine. Responding to customer requests, the Version C utilizes the *CarveTight*® Spindle System of solid ground steel and reduces heat, vibration, noise and runout. The software can import STL and DXF files, allowing the Version C to utilize any 2D vector or 3D graphic design, with an increased computing speed and feed rate. The Version C also features an improved tracking system, reinforced base and vertical guide rod stabilizer feet. It's priced at \$1,599.99; the CarveTight Spindle System is available as an upgrade for older



Stanley's Sweetheart (inset) and Bailey socket chisels

CarveWright or CompuCarve machines for \$159.99.

DeWalt's new 12-volt MAX* Drill/Driver is the DCD710S2, part of its 12-volt MAX* lithium-ion line. It weighs 2.4 pounds and has a two-speed transmission with 0-400 and



DeWalt's DCD710S2 12-volt MAX* Drill/Driver

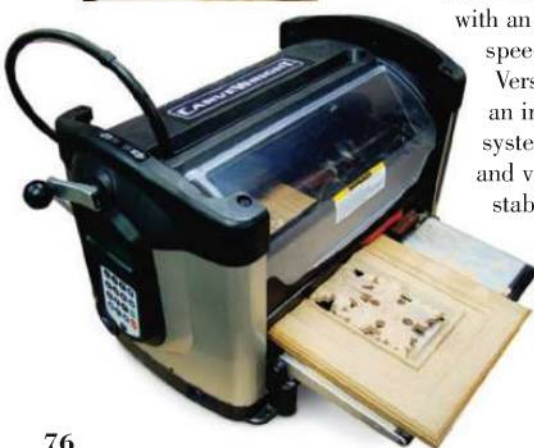
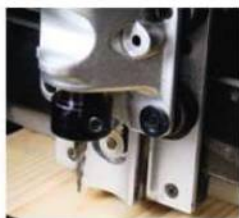
0-1,500 speeds. A 3/8" single-sleeve keyless chuck and an included belt hook offer convenience and portability. "Contractors who have tested the tool say they stick the drill in their pouch

or clip it on their belt and barely know it's there," said Joerg Zellerhoff, a senior product manager at DeWalt. Battery placement at the bottom of the tool allows it to stand up when set down. Sold as part of a kit, the DCD710S2 is expected to cost approximately \$159.

Bosch touts the small tool and head length (7" and 7.04", respectively) of its new *PS31 Ultra-Compact Drill/Driver*, along with the big impact of its 265 inch-pounds of torque. Weight? 2.1 pounds. The PS31 is part of Bosch's lithium-ion 12V Max line, which changes the battery's electronics from analog to digital and integrates an Electronic Cell and Motor Protection System to guard against overloading, overheating and deep discharging. The PS31 has a three-speed, single-sleeve, 20+1 clutch and a two-speed

Continues on page 78 ...

CarveWright Version C with CarveTight Spindle System





Two-Stage Cyclone Dust Collectors



3HP Cyclone

2300 Max CFM!
Self Cleaning 1 Micron Filter
Quick Connect Drum Lever
55 Gallon Drum
Portable!

\$1799.00

With high performance and more features, the JDS 3HP Cyclone is raising the bar for 2-stage dust collectors. The TEFC motor has an aluminum housing that keeps it cooler and helps it run more efficiently. The "Turbo-Fan" impeller produces high amounts of CFM when placed under high amounts of resistance. Removing the steel drum is quick and easy, just lift up the drum lid lever and roll out the drum. The self cleaning 1 micron canister filter has a motor that automatically rotates flappers inside the filter knocking dust down into a collection bag.



2HP Cyclone

1700 Max CFM!
68 inches tall!
Quick Drum Lever
35 Gallon Drum
Portable!

\$1299.00

The JDS 2HP Cyclone is the most powerful and compact 2HP Cyclone in the industry. This unit is 68" tall and has a footprint of 40"x 28". The perfect size for basement shops and shops with limited space. The TEFC motor and "Turbo-Fan" impeller produces high amounts of CFM when placed under high amounts of resistance. Removing the steel drum is quick and easy, just lift up the drum lid lever and roll out the drum. The self cleaning 1 micron canister filter has a motor that automatically rotates flappers inside the filter knocking dust down into a collection bag.



High Efficiency Air Filtration Systems



Air-Tech 750-ER

\$339.00



The JDS Air-Tech 750-ER has received the top awards for over 10-years. Washable electrostatic filter has a 10 year warranty. Traps 91% of 1 micron dust particles. Remote with three speeds and timer function.

The JDS Air-Tech 750-ER is equipped with a convenient LCD remote control with speed and timer functions. It includes a washable electrostatic pre-filter that has a 10 year warranty. The heavy duty 1/4 hp motor produces a class leading 1050 CFM max airflow and provides 350, 550, and 750 CFM of filtered air. This will clean the air in a 30ft x 30ft x 8ft shop once every 10 minutes. The 750ER will remove 99% of dust particles as small as five microns and 91% of particles as small as one micron.

(Circle No. 25 on PRODUCT INFORMATION form)

www.jdstools.com

Single-Stage Dust Collectors

Dust-force

1.5 HP motor
1250 Max CFM
1 Micron Filtration
Portable!
42 Gallon Bag



1 Micron Canister **\$575.00**

1 Micron Bag **\$369.00**

The JDS 1.5 HP Dust-Force is perfect for small shops. The unit can be used with short duct runs or dedicated to a single machine. It is also portable and can be rolled around the shop with ease. The powerful 1.5HP motor produces 1250 CFM maximum airflow. The TEFC motor has an aluminum housing that keeps the motor cool and quiet. The plastic collection bag provides 42 gallons of capacity. The 1 micron bag filters down to 1 micron dust particles preventing fine dust from escaping into your shop. The 1 micron canister has 5 times the surface area of the bag and provides better airflow as well as high filtration.

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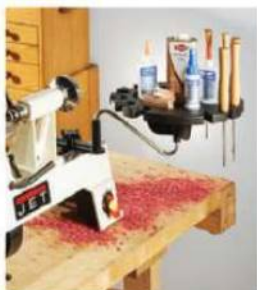
What's In Store continued



Bosch PS31
Ultra-Compact
Drill/Driver



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.



Rockler Lathe Tool Holder



(0-350 rpm or 0-1,300 rpm) drive train. It sells for approximately \$180.

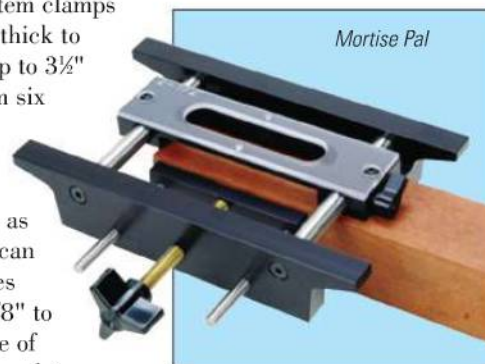
A turntable for turning tools, the **Rockler Lathe Tool Holder** attaches via a swivel arm to any point along your lathe. The swivel arm means you can move it out of your way when needed, and the turntable capacity means you can spin the 12"-diameter Tool Holder to extract whichever one of the 12 turning tools it holds when you need it. The center of the turntable also offers a flat space to contain items like sandpaper, calipers or finishes. The Tool Holder (and all the tools it contains) stays stuck to the lathe when you move your lathe's location. Price on the Rockler Lathe Tool Holder is \$29.99.

The new **50-200R M1 10" Left-Tilt Table Saw** from **General International** includes both a riving style splitter/blade guard assembly with anti-kickback pawls and a European-style riving knife. The cabinet-style saw runs on a 2hp dual-voltage motor and has a 44" x 27" full cast-iron table (including extensions). It comes with an aluminum T-style rip fence with 30" right rip capacity, steel guide rails and a deluxe miter gauge. A 4" dust port on the cabinet is connected to an internal dust hose and dust chute to draw dust directly from below the blade. The 50-200R M1 will be available in early September, when it will sell for \$999.



General International 50-200R M1 10" Left-Tilt Table Saw

Mortise Pal's new patent-pending *Mortise Pal* plunge router mortising jig and loose tenon joinery system clamps to stock up to 3" thick to create mortises up to 3½" long, created from six polycarbonate templates. You can also make mortises as small as 1/4" x 3/4". You can locate the mortises anywhere from 3/8" to 1½" from the edge of your stock, with no shims or spacers. You can also use the Mortise Pal to make angled or compound angle joints. Chip evacuation slots allow for waste removal, and an all-metal clamping knob reduces the likelihood of breakage if the jig tumbles off your workbench. It works with standard 2½hp plunge routers and sells for \$169.

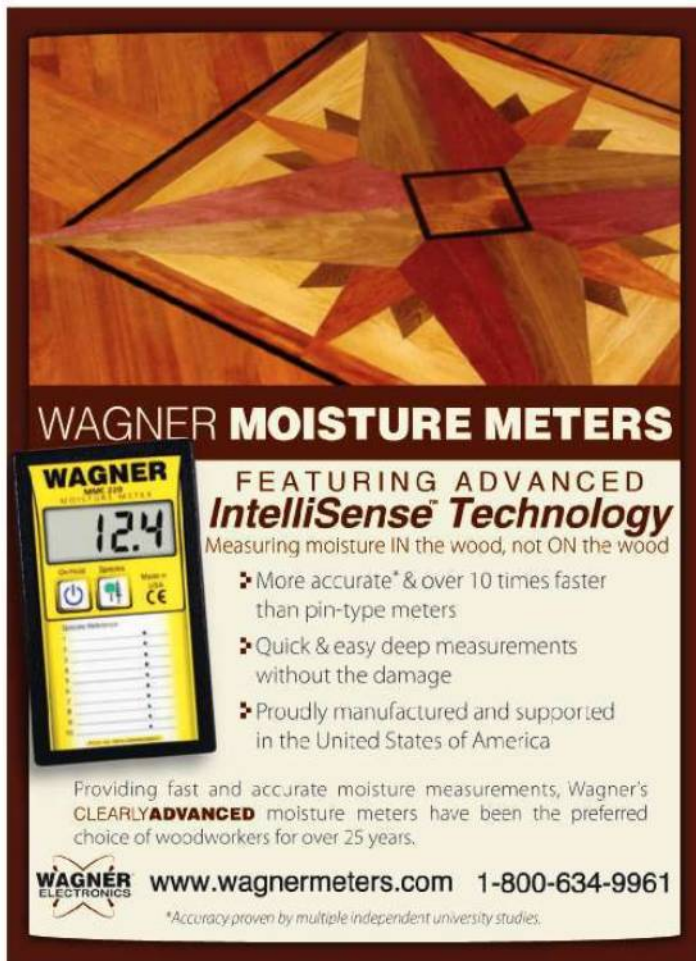


Mortise Pal

the PIN138 from firing when no nails remain in the tool, (no empty nail holes in the work surface). The PIN138 holds 130 pin nails, either headless or slight-headed from 1/2" to 1½" in length, and it can countersink those 1½" nails into hard materials like oak. Its suggested price is \$149.

Porter Cable's PIN138 Pin Nailer Kit





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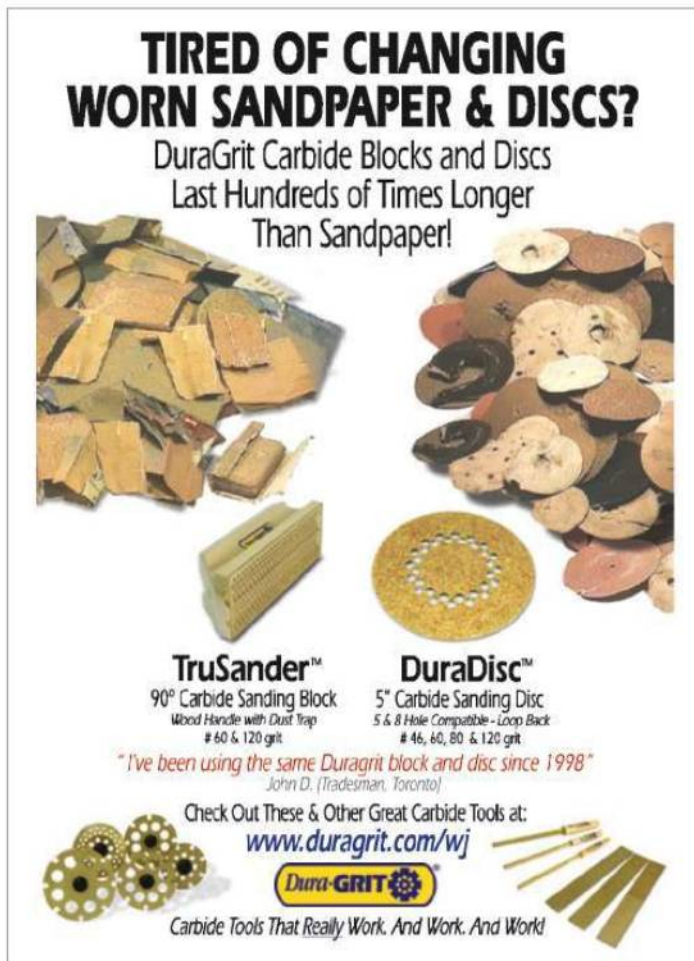
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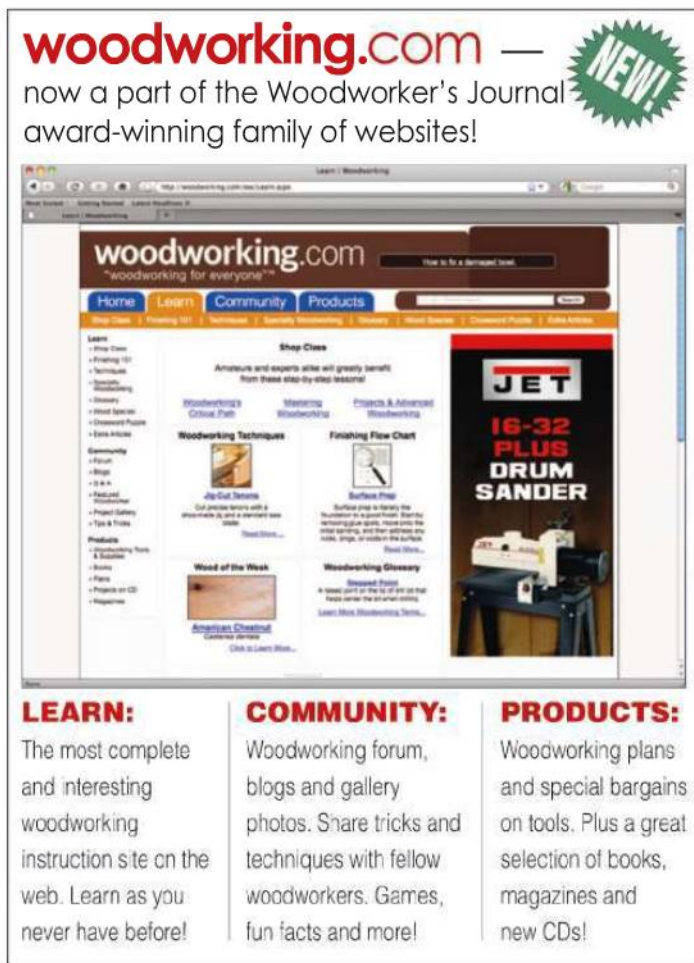
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Finishing Thoughts

Painting Toy Blocks

By Michael Dresdner

Total immersion: A solid-wood sealing strategy



The End Grain

(left face above) absorbs paint and finish differently than the flat grain, and it shows. What is the best technique to deal with the difference? Our author suggests that allowing the end grain to absorb sufficient sealer is the answer.

Toy blocks. Say it fast five times, and it is a tongue twister. Try to paint them at any speed, and it becomes a finishing challenge.

The problem is that blocks, like most small parts made of solid wood, contain both end grain and flat grain. Finish builds quickly on flat grain, but the end grain seems to absorb it indefinitely, making it difficult to get a good, uniform painted surface. Fortunately, there is a simple solution that helps immensely: total immersion sealing.

First, a word about the wood.

Even with the best finishing methods, you will make your life easier if you choose your

wood carefully. If you plan to paint, avoid woods with huge pores, like ash, oak, mahogany and walnut, and opt instead for woods that are tight grained and uniform. Maple, birch, alder, willow, basswood, boxwood, cherry and most fruit woods are good options, as are a host of other woods too numerous to list.

Sealing by Dipping

Before painting, wood must be sealed or primed. That process is designed to make the surface uniform so a coat of paint will behave consistently atop the primed or sealed surface. Since end grain wants to absorb more sealer, the best strategy is to let it do so.

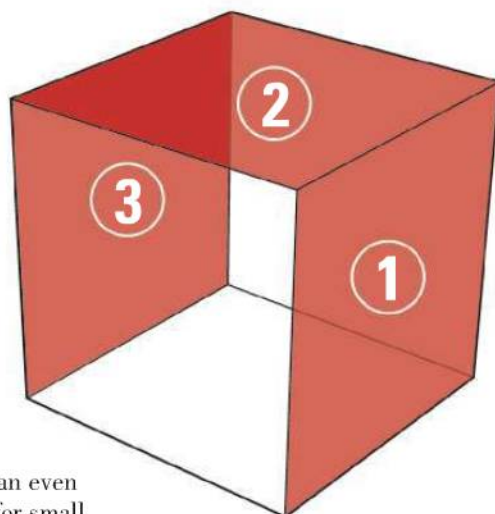
The easiest way for that to happen is to completely immerse the piece in sealer and let it absorb as much as it can. Both the end grain and flat grain will absorb until they are sated. Once that happens, remove the piece and wipe off everything that was not absorbed. Although the end grain will have absorbed a lot more finish, the result will be that both end and flat grain have as much finish as they can absorb, with no excess finish on the surface of either. Let the sealer dry, scuff sand it lightly with 400-grit paper, and you are ready to paint.

Choosing a Sealer

My favorite dipping sealer, one that absorbs quickly, dries fast and is compatible under

The solid-wood blocks that make up the puzzle were immersed in Zinsser® SealCoat™, allowed to dry on the needle board and then painted.





How To Paint a Cube

Painting a cube can be a bit tricky. There are six sides that need uniform coverage, and painting them all at once will just end up a sticky mess.

The easiest way to go about it is to paint three adjacent sides at a time, as shown in the drawing at left, allow the paint to dry, and then paint the other three sides.

any paint, is dewaxed shellac, sold ready-to-use as Zinsser® SealCoat™. Thin your shellac to about a two-pound cut or thinner; SealCoat is fine as it is, right from the can. Just a few minutes of immersion will be enough for the wood to absorb what it needs. Then, remove the parts, wipe them with shop rags or, my favorite, those ubiquitous blue paper shop towels, and set them on an unfinished board to dry.

They should be wiped well enough so they are not dripping and will not stick to the board. If you can, prop them so that only edges or points are touching so that air gets to all sides. A needle board, (a piece of plywood

with many wire brads sticking up through it), makes an even better drying rack for small parts, as the wiped surface remains in contact only with a few tiny brad points.

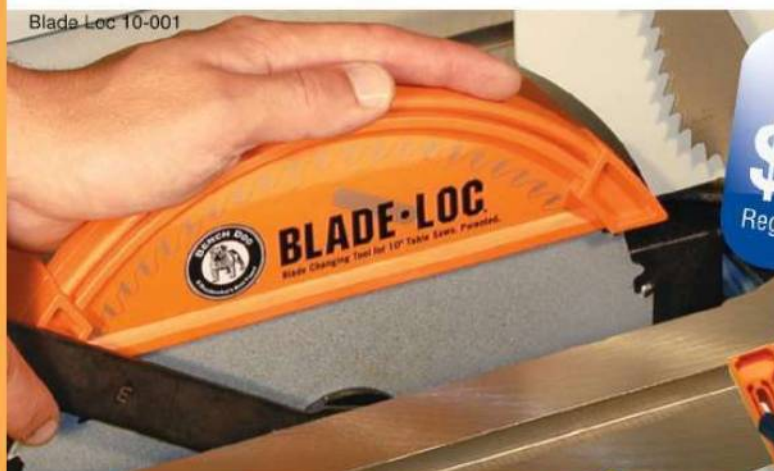
Oil-based varnish or polyurethane will also work as a sealer, and these are fine choices for use under oil-based paints. With oil-based materials, I prefer to soak pieces a bit longer, perhaps 10 to 15 minutes, before removing and wiping. Unlike

shellac, which will dry in an hour or so, oil-based finishes used as sealer should be given at least 24 hours to dry, and two days if possible. Oil-based finish is an excellent choice for both sealer and finish for pieces being left in natural wood color rather than being painted.



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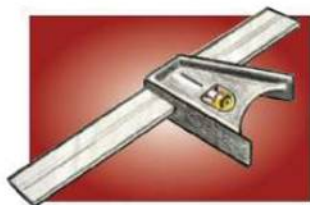
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MORE ON THE WEB

For a detailed article on choosing and using measuring tools, visit woodworkersjournal.com and click on the More on the Web tab shown above. Or send a large SASE to Woodworker's Journal, Skill Builder 17, 4365 Willow Drive, Medina, MN 55340.

Measuring Tools

Four tool categories provide important visual cues to help assess our work

As woodworkers, we need to assess four primary types of measurements. They are: alignment (straightness), planar accuracy (twist), angular accuracy (angles) and linear dimension (length). In order to adequately address them all, every woodworker should have at least one of each of the following tools.

Straightedge

A straightedge assesses straightness or flatness. Originally shop-made, it has been replaced by metal versions. The bevel-edge type is preferable to those with thick edges because the narrower the contact face, the easier it is to see inaccuracies in your work.

Winding Strips

Twist is usually called winding by woodworkers. A board or assembly in winding has

its ends twisted in opposite directions. To check for twist, you need to sight across a pair of winding strips. They are the basis for measuring planar accuracy — there is no alternative. Winding strips are simply a pair of shop-made, parallel-edged straight pieces of wood of the same dimension.

Squares and Gauges

The measuring tools we use to determine angles fall into three sub-groups: try squares, which measure 90°; miter squares, which measure 45°; and sliding bevels, which measure variable angles. A popular alternative to the try square is the combination square borrowed originally from the machinist's toolbox. Combination squares have several features not

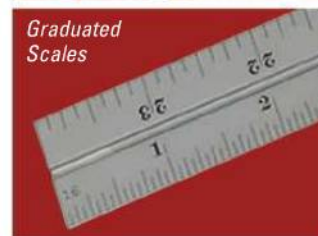
associated with try squares. First, the blade is graduated so that it



Straightedges



Squares and Gauges



Graduated Scales

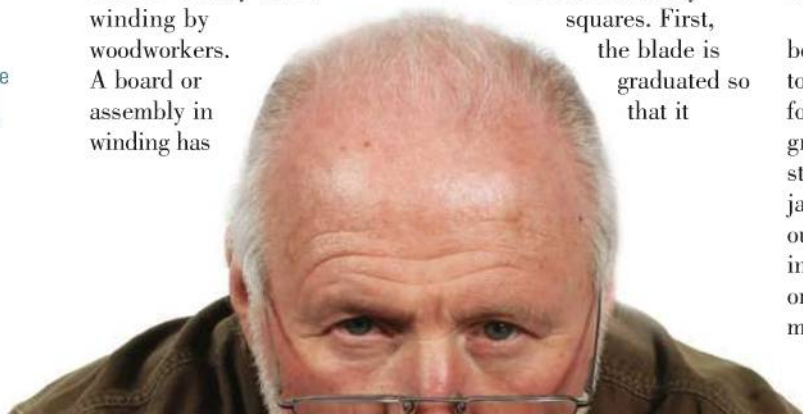
works also as a rule. Second, the blade slides. Finally, the stock measures 45° as well as 90°, or multiple angles if it is the revolving style.

Graduated Scales

Graduated scales, which include metal tapes, rules and calipers, measure linear dimensions. For most bench work in furniture making, the 12" and 24" rules are both useful sizes to own.

The Vernier caliper, also borrowed from the machinist's toolbox, is an excellent gauge for measuring the depth of grooves, stopped holes or stopped mortises. The main jaws can be used to measure outside dimensions as well as inside dimensions of grooves or tenons. It's a highly precise measuring tool.

Winding Strips



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Profile Shown:
Round Over
(#99-760)



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



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