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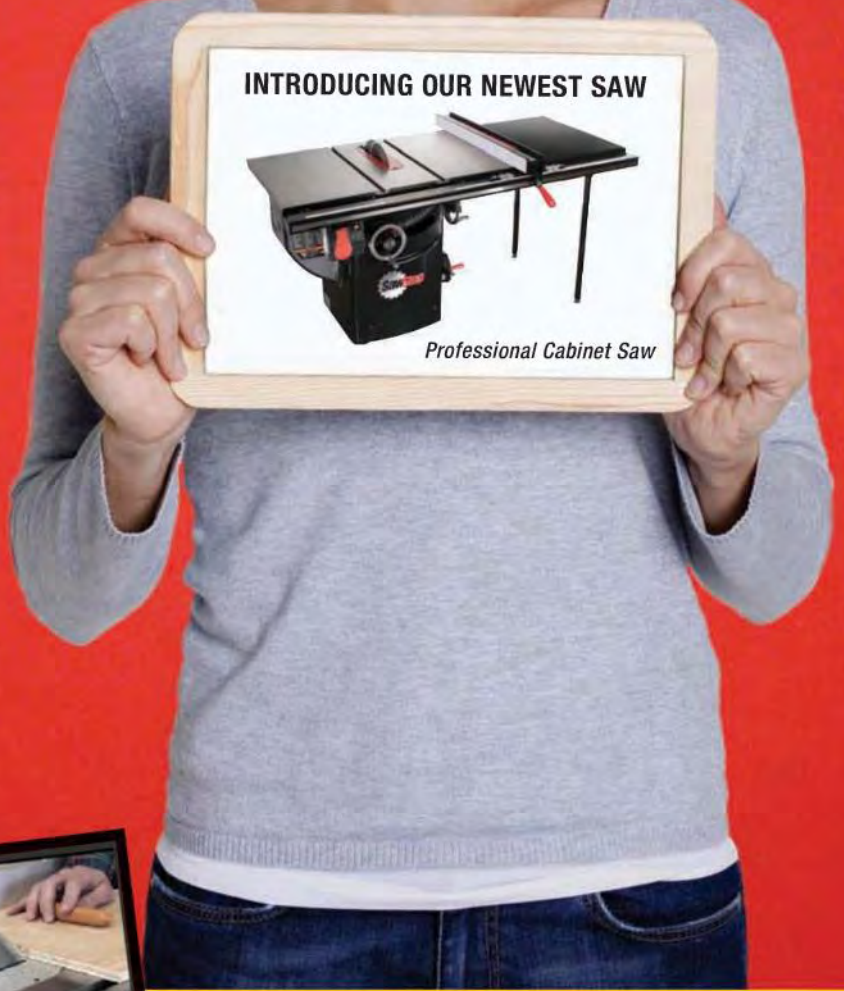
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Woodworker's Journal

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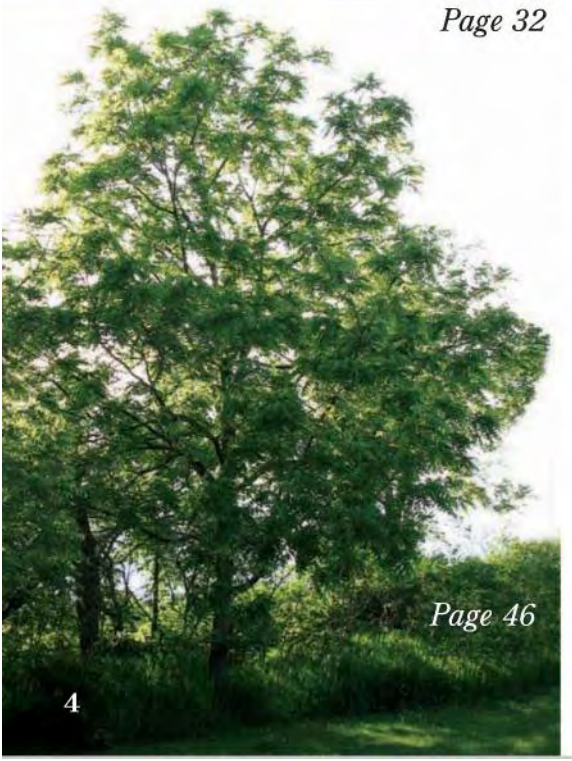
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Building Along the Continuum

I remember when I actually became a woodworker. I had been working in a woodshop for years — even been getting paid for it — but I had not made the transition to being a true woodworker. That is, until a green-eyed girl asked me if I could build her a bookcase. That woman, who would later become my wife, had some 2 x 10 Douglas fir lying around and just needed someone with the skill to convert it into a piece of furniture, and she asked me if I was that guy. Eager to please, I quickly said yes — which, thankfully, at the end of the day turned out not to be a lie.





Woodworking covers a wide range of styles and various levels of skill. The projects in this issue follow suit.

It was not a fancy bookcase, but it was nicely made: common wood with tight joints and an adequate finish. It was, in fact, stylish and useful, and it perfectly fufilled a need. I developed a love for woodworking through that project, and have never looked back.

That experience and others have given me cause, from time to time, to consider how broadly descriptive the term woodworker really is — how skilled must a craftsperson be to be properly identified as a woodworker? And in a similar vein, must a piece of furniture be complicated to construct simply to be thought of as a "real" woodworking project?

As a good example of two opposite ends of woodworking, consider the projects in this issue of the magazine. I must confess to feeling some concern when I decided to publish the project featured on our cover. But somehow the project and the green-eyed young woman in the photo reminded me of a bookcase and girl from long ago, and I decided that it was just a fine piece indeed.

Compare it to Kerry Pierce's Queen Anne highboy (page 38), and I think you will agree that the projects in this issue span the entire woodworking continuum. His highboy's carved cabriole legs, dovetailed drawers, exquisite walnut lumber and cleverly crafted secret compartments stand in stark contrast to Lars Dalsgaard's painted plywood combination bed and table (page 32). Yet in my mind, both are excellent examples of woodworking: projects that are stylish and useful, properly fufilling a need.

So, I have to ask, where do you fall along the continuum? Are you a great woodworker who likes to play around with simple plywood projects every now and then or an absolute beginner with highboy aspirations? Let me know!



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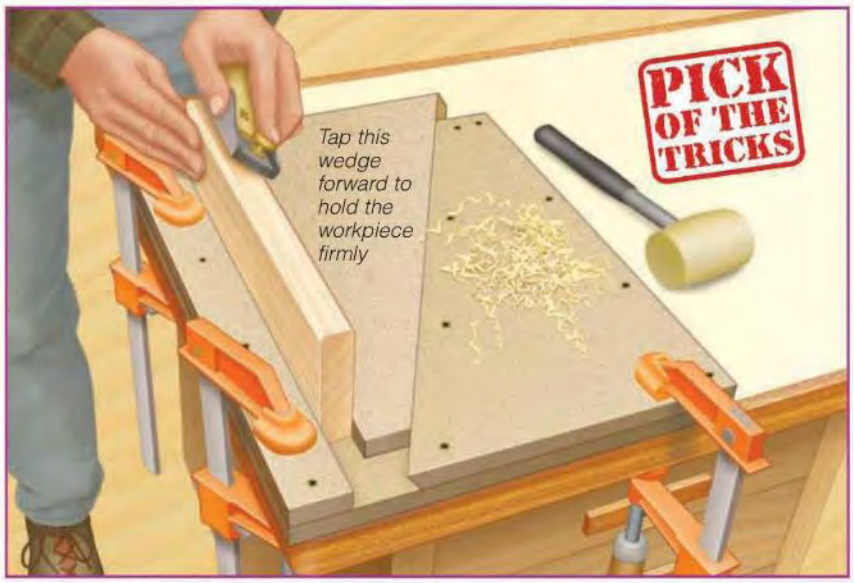
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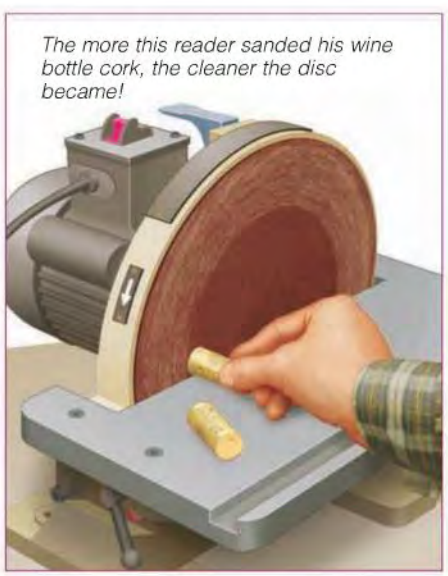
Corks, Nuts and Magnets in the Shop



Wedge-style Bench Vise

If your workbench doesn't have a vise, here's a simple jig that can take its place for holding workpieces on-edge. Start with a piece of 3/4" scrap MDF or plywood, measuring 14" x 36". Crosscut it into two 18"-long pieces. Use one for the jig's base. Rip a 2"-wide strip off the other piece, and glue and screw it along the edge of the base to create a fixed fence. Take the remaining rectangle and rip it diagonally, a couple of inches in from the opposite corners, to form two matching trapezoidal "wedges." Tip your saw blade to 30° when making this diagonal bevel cut. Now attach the trapezoid with the outward-facing beveled edge to the opposite edge of the base. To use the jig, clamp it to your bench. Set a workpiece against the narrow fence and tap the loose wedge against the fixed one to lock things in place. To unclamp, just tap the other end of the wedge to release it.

Michael Gaule
Carriere, Mississippi



The more this reader sanded his wine bottle cork, the cleaner the disc became!

Wine Cork Cleans Abrasives

Cleaning residue off your sanding discs, belts or drums will extend their useful lives, but you don't have to buy a cleaning stick to do it. A synthetic or natural wine cork does the job for free. I discovered this trick by accident while sanding down a cork for a project. The more I worked on it, the cleaner my sanding disc became.

Travis Poruchny
White House, Tennessee

Arbor Nut Saver

The dust port on my contractor's saw is below the blade arbor, and more than once I've dropped the arbor nut down inside the hole when changing blades. It was really frustrating until I devised a simple fix: I place a piece of stiff wire hardcloth over the dust port before I remove the nut. The edges are covered with duct tape to protect my hands. When it's in place, the nut has nowhere to hide! Once it's threaded back on the arbor, I pull out the wire "trap" and store it with my blade-changing wrenches.

Serge Duclos
Delson, Quebec

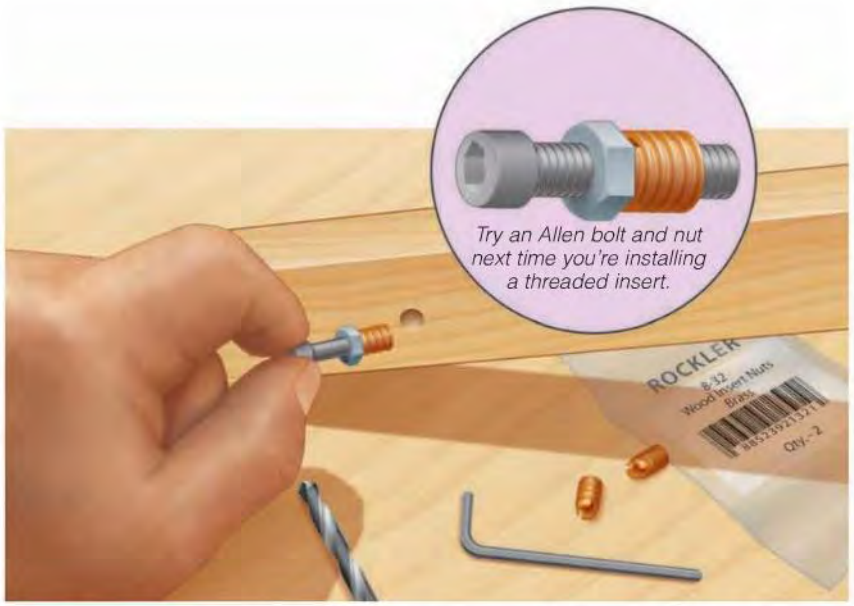


This nut-catcher takes the stress out of blade changing.

Magnet Helps a Tight Squeeze

Recently, while assembling my new band saw, I needed to install four sets of washers, lock washers and nuts up inside the base where I couldn't see or reach them easily. The task seemed difficult until a quarter-sized rare-earth magnet came to my rescue. I put it on the head of each bolt to magnetize it. That way, the washers and nut clung to it, which made their installation a cinch.

Jim Westbrooks
Canal Fulton, Ohio



Jamb Nuts for Threaded Inserts
Instead of using a screwdriver to install threaded brass inserts — which often breaks them — I use an Allen bolt and nut. Thread the nut onto the bolt, and run the bolt through the insert. Tighten the nut against the insert, then just screw the insert into the pilot hole with an Allen wrench. Once the insert is seated at the correct depth, back off the nut and remove the bolt. This little trick works every time.

Jim Forney
Brick, New Jersey



WINNER!
In addition to our standard payment (below) Michael Gaule of Carriere, Mississippi, 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 of the Trade 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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Reflections on Woodworking

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Preserving the Past

Thank you, thank you, for the wonderful article by Ian Kirby *(June 2009)* on "The Arts and Crafts Movement." We badly need this kind of *historical reflection* on where our various endeavors have come from, where they are going and what they mean in our lives.

There is a *philosophy* of woodworking, centuries old, that needs to be given a voice in today's speed-driven world. We need to be exposed more to the wisdom of older and accomplished craftsmen like Kirby — lest we get lost in the blur of technology and the whirl of change.

I commend your editors for recognizing and including it in your journal.

Merlin Bradley
Hudson, Wisconsin

Once again I've had the pleasure of enjoying an excellent article by Ian Kirby. Your readers might be interested in knowing that [William] Morris, in addition to being a furniture designer, was also a textile designer, artist and writer.

As a furniture designer, he has been honored by having the Morris Chair named after him, and as a writer, he is recognized for having been the inspiration for [J.R.R.] Tolkien's *Lord of the Rings*. I've especially enjoyed his translation of the Icelandic Sagas and often find reading his works a "meditative way" of preparing myself to work with wood.

Rich Donahue
Huachuca City, Arizona

Air for the Shop

I just received my first magazine and was impressed to read ["Air Tools in the Woodshop," *June 2009*]. I worked for a private school for more than 20 years. Over the years, I was asked to do some woodworking. My boss never knew you could use air tools on wood. I myself am lost without my air tools. He knew I got a lot done in a short span of time, and now he knows why. Thanks for letting others know that it can be done.

Roger Worley
Glen Burnie, Maryland

Outdoor Table, with Shade

I just completed fabricating the "Elegant Outdoor Table" described in the *[June 2009]* issue. Since we wanted to add an umbrella to it, I needed to make a few changes to provide the hole



for the umbrella post. My finished table is 32" wide, 84" long and 30" high.

The information you provided was great, and I enjoyed figuring out how to make the changes to meet our needs.

Gerry Bradie
Franklin, Massachusetts

Variation on a Router Lift

I had just finished my router table and this article ["Clamp-on Router Table," *June 2009*] appeared. Talk about a day late and a dollar short!

Letters continues on page 14 ...

Our reader added a couple of nice twists, including an umbrella, to the outdoor table from our June issue.



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.

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LETTERS



Reader Carl Vella used a different approach, but he still appreciates the ingenuity of Guido Henn's router lift mechanism from our last issue.

I, too, mounted my plunge router and needed to come up with a lift mechanism. Then it dawned on me. I bought a car scissor jack, ground the lift plate flat and boxed it in under the router. The precision and ease of use is remarkable. Your article is still terrific, and Guido Henn should be commended for his ingenuity.

Dr. Carl Vella
St. Petersburg, Florida



Endangered Wood

It is truly sickening to learn that yet another of our valuable hardwoods — this time ash — is in great danger due to another imported pest from China ["An Ash Lumber Legacy," *June 2009*]. Let's see, so far we've lost hundreds of billions of board feet of our beloved American chestnuts and American elms to viruses from China, and maple is under attack by the Asian longhorn beetle. And let's not forget the woolly adelgid that is now destroying vast areas of hemlocks in the U.S. and Canada, while the Formosan termite devours our housing.

In addition to trees, China, in full cooperation with American business leaders, has also managed to destroy our light manufacturing industry and much of our furniture-making industry. What's next?

What a sucker Uncle Sam has been! In 1973, when president Nixon touted his "opening" of China, it was among the poorest nations in the world, and WE were going to sell everything to THEM. Thirty-five years later, they are sitting on a mountain of dollars and we are beggars on the world stage. So I ask, what is wrong with this picture?

William Cowan
Livingston, New Jersey

Quicker Way to Wax String

Just to "dovetail" on Barron, Wisconsin's Dick Ayers's neat trick with wax string in the *June 2009* magazine ["Tricks of the Trade"]: You don't really need to make your own wax string; it can be purchased at any store like Graybar that sells electrical and telephone supplies and, unless you're using it on a commercial scale, one roll will last you a lifetime.

Mike Kandziora
Oak Creek, Wisconsin

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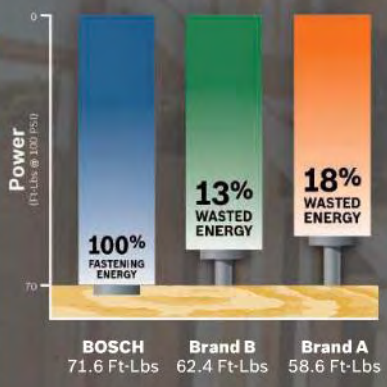
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A Sticky Situation

THIS ISSUE'S EXPERTS

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

Ian Kirby *is the author of several books on woodworking and a frequent contributor to* Woodworker's Journal.

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

Contact us by writing to "Q&A," Woodworker's Journal, 4365 Willow Drive, Medina, MN 55340, by faxing us at (763) 478-8396 or by emailing us at: QandA@woodworkersjournal.com Please include your home address, phone number and email address (if you have one) with your question.

Q Many plans and articles call for adhering a paper pattern to the workpiece with "spray adhesive." The adhesive is never identified further. The spray adhesives I have found work fine for gluing the pattern to the wood, but you need solvent to remove the pattern, which leaves the workpiece stained.

What spray adhesive do you use and what solvent removes the pattern?

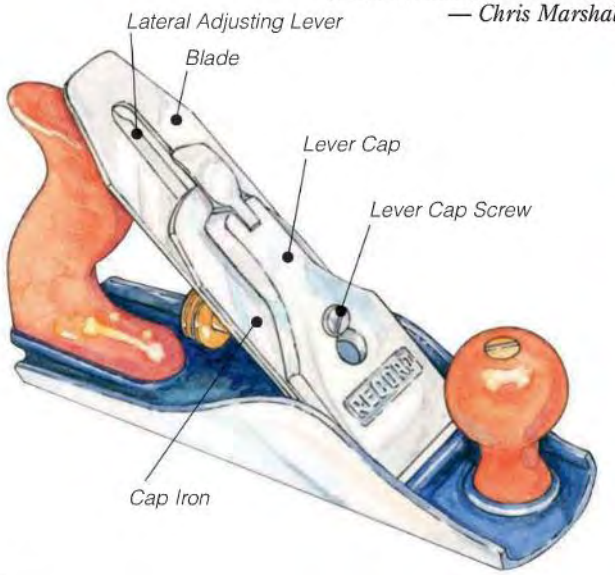
Bob Hoffman
McMinnville, Oregon



Our reader claims that how-to articles are less than forthcoming when it comes to giving good advice on spray adhesive and its use.

A I use 3M's General Purpose 45 Spray Adhesive in a light-blue can. I've found that you can actually peel off the paper if you remove it within a couple of hours of applying the adhesive. If you wait longer than that, just soak the paper with mineral spirits, let it set for a few minutes, and then peel it up. Wipe off the glue residue with more mineral spirits. Scrape or sand to take off any remaining adhesive that might still be there. I haven't had staining problems using this method.

— Chris Marshall



Q I am a novice woodworker just learning the craft. I purchased a couple of planes and am having difficulty adjusting the blades after sharpening. Could someone give me some insight into the proper method to adjust a blade? Also, one of my planes has a screw and the other has a lever: what are they for? As you see, I know almost nothing about planes.

Richard Lumley
Copperopolis, California

A You don't describe the planes, but I'm assuming they are bench planes. The visible screw on the top of the plane is used to adjust the tightness of the lever cap. The lever cap keeps the blade assembly — blade and cap iron — firmly in place. The lateral adjusting lever is used to make the blade parallel to the sole by moving it left and right.

By your admission, you are a novice woodworker struggling with a plane. It is not an intuitive tool by way of sharpening, adjusting the blade or using the tool. I'm not in the habit of self-promotion, but you might look at a DVD (available from Rockler) I made on the subject entitled *Tuning, Setting the Blade, and Planing Techniques.*

— Ian Kirby

RECALL NOTICE!

A recall is in effect involving model numbers 0414248 Wagner Control Spray Plus paint sprayer with date codes Y182R through Y365R, Z001R through Z366R and A001R through A021R. The on/off switch can dislodge from the casing, exposing electric connections. For more information, visit *wagnerspraytech.com* or call 888-925-6244.



Calculating finish coverage is an equation that includes a few variables.

Q I want to coat some bunk beds, and need to know how much finish to buy. When finish makers state that the coverage is X square feet per gallon, and that one should use at least three coats, does this mean that the gallon will cover X square feet three times or just once?

David Minehart
San Jose, California

A Just once. A claim of 400 square feet of coverage per gallon means there's enough to cover 400 square feet once. For three coats of 400-square-feet coverage, you will need three gallons. However, coverage numbers are only average guidelines, and the amount of coverage you get can vary greatly, depending on three major factors.

The first is the substrate. A very porous piece of wood will absorb, and consequently use up, more finish than a coat applied to a denser wood or to an already sealed surface. Thus, when working with porous woods, odds are good that on the first coat, you will use more finish and get a lower area coverage rate than on the second coat.

The second variable is your application method. Brushing wastes almost no finish: nearly 100 percent of the coating in the can will end up on the wood. However, spraying wastes anywhere from 35 percent to 75 percent of the finish, resulting in far lower coverage rates. The third variable is you. What you call "one coat" may be much thinner or thicker than what the next guy calls "one coat." Thus, your coverage per gallon may be much more or less than the company estimates on its can.

— Michael Dresdner

Continues on page 18 with Stumpers ...



WINNER! *For simply sending in his question on planes, Richard Lumley of Copperopolis, California, wins a* ***Steel City Bench Mortiser (Model 25200).*** *Each issue we toss new questions into a hat and draw a winner.*

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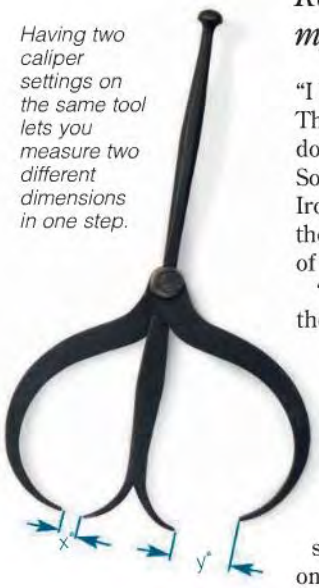
STUMPERS



What's This?

The Gebharts of Arlington, Virginia inherited four of these things, in different sizes, from her grandfather. Know what they are? Send your answer to: Stumpers, c/o Woodworker's Journal, P.O. Box 261, Medina, Minnesota 55340. Or email stumpers@woodworkersjournal.com

Readers forge ahead in identifying our last mystery tool and its uses, old and new.



Having two caliper settings on the same tool lets you measure two different dimensions in one step.

"I have the answer to the 'What's This' in the *June* issue. It is a double-sided blacksmith caliper." So said **Billy Joe Kimbrell** of Irondale, Alabama, as he identified the tool sent in by **Bob Corbett** of Sturgeon Lake, Minnesota.

"This tool is used for checking the dimensions of a hot piece of iron while forging it to a specific size and shape," said **David Jensen** of Bellevue, Nebraska.

Wilbern K. Tipton of Acton, Georgia, clarified that the blacksmith "could make two measurements at once such as a shaft with more than one diameter or a gear blank." **Fred Homich** of Thousand Oaks, California, added, "The length of the handle kept the user from getting toasty hands."

Le Volberding of Dayton, Nevada, wonders, "Why are these not made today?"

In fact, as **Mark Beall** of Havelock, North Carolina, notes when he says they're "used for the same reason as our modern double-ended calipers," they are. Their function today is more likely "'for checking the size of two different turning diameters," says **Walter Lees** of Phoenix, Arizona.

— Joanna Werch Takes

WINNER! *Gerard Waters of Key West, Florida, wins a* ***Porter-Cable Low Profile Sander (Model 390K).*** *We toss all the Stumpers letters into a hat to select a winner.*

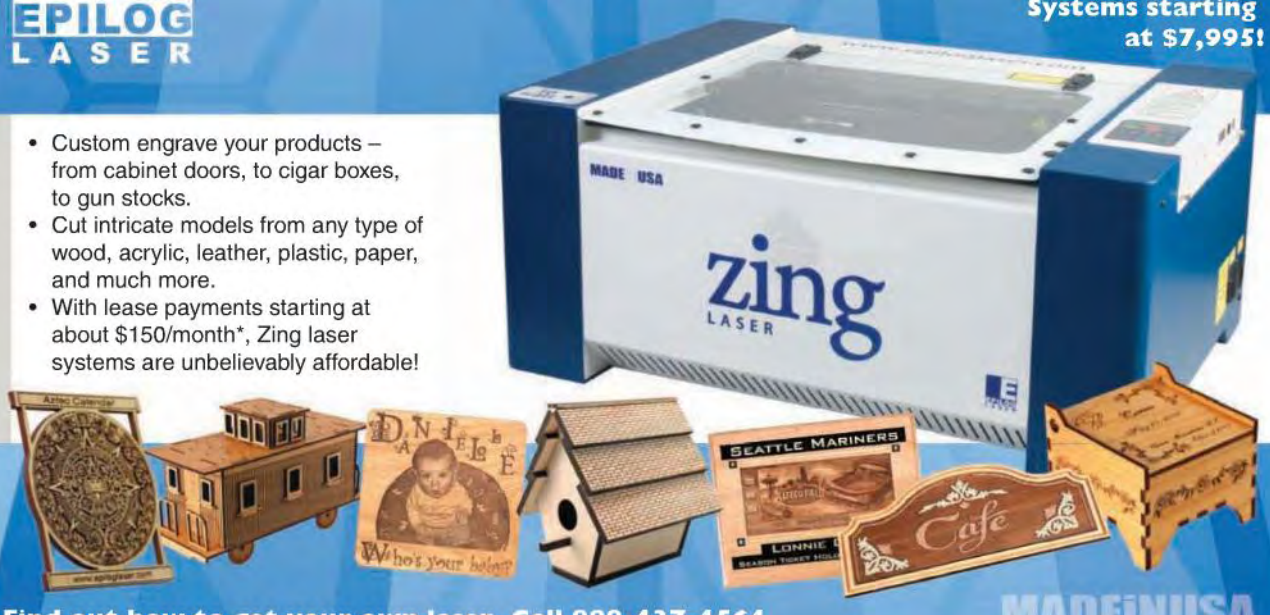


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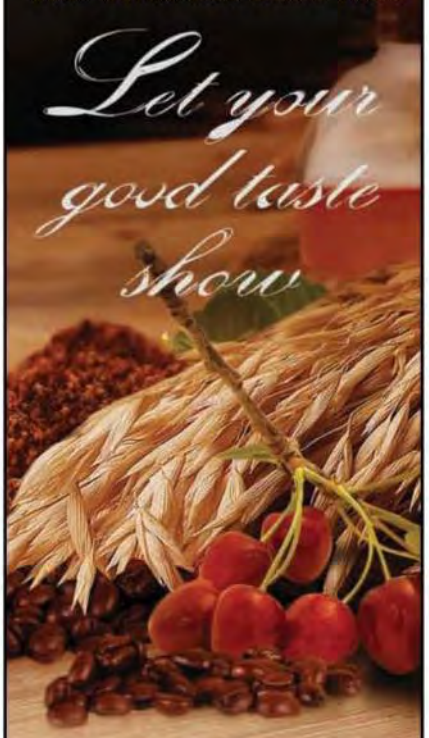
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Contemporary Cuts



"Loretto Chihuahua" by Eric Werkmeister in maple, ash, oak and mahogany

Totally Cool in California

San Diego Wood Winners

Woodworker's Journal continued its sponsorship of the 2009 Design in Wood show and competition put on by the San Diego Fine Woodworkers Association. Once again, the contestants inspired and amazed the judges and attendees with their skill. Pictured here are just a few winners from this year; for show and entry information for 2010, visit *ww.sdfwa.org* or call 858-755-1161.

Photos by Andrew E. Patterson



www.woodworkersjournal.com
MORE ON THE WEB

To look at more images from the San Diego show, just go to www.woodworkersjournal.com and click on "More on the Web."

Classic Tools?

Their Dads Invented Them

A while back in our *Woodworker's Journal eZine*, WJ editor Rob Johnstone reminisced about a frighteningly big ol' radial arm saw back in his dad's shop.

We were particularly pleased with the reminiscences two of our readers shared in response and their close connections with men who didn't just use some of the classic tools of the 20th century — they invented them.

The dad of Mike Schuler of Champaign, Illinois, John Schuler, "was head of purchasing for Skil for 25 years after World War II. His good friend, [Bill] Topolinski, an executive vice president, bought the rights to the radial arm saw from Skil and left the company to produce them on his own. My dad came with him."

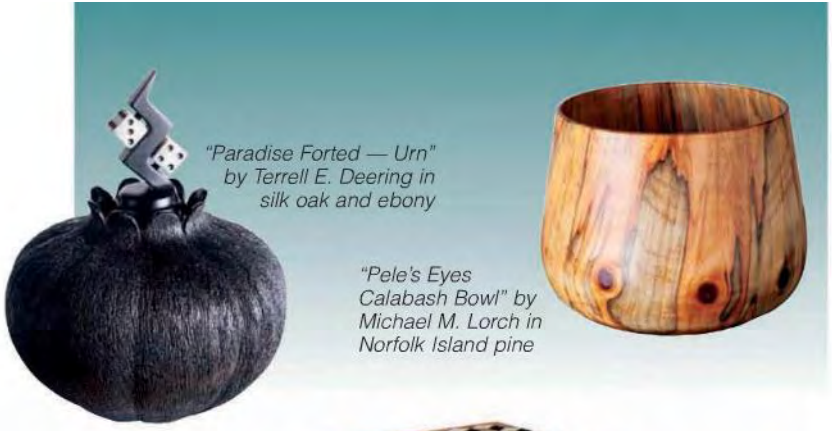


Tom Kernan, at right in the photo above, designed DeWalt's original radial arm saw.

The large RAS, known as the Topp Saw, had its good points, but Mike said its downfall was its configuration as a back arm saw: "The power head was mounted to the end of a substantial arm. Thus the bearing assembly was fixed at the top of the post. The logistical problem is that the saw cannot be positioned with its back right up against a wall; it needs room behind the bearing assembly and post for the entire arm/head assembly to retreat in the ready position before a cut. Depending on the size of the model, this was as much as 36"!

Tom Kernan, Sr. of Lakeland, Florida went even further back in time in his tool recollections. His dad, also Tom Kernan, designed DeWalt's first radial arm saw around 1925. Tom — who sent in pictures of his dad in DeWalt's original Pennsylvania shop — still has the third one of these saws made.

— Joanna Werch Takes



"Paradise Forted — Urn" by Terrell E. Deering in silk oak and ebony

"Pele's Eyes Calabash Bowl" by Michael M. Lorch in Norfolk Island pine



"Louis Falls Coffee Table" by Viki Hennon in sycamore, poplar, cherry and ebony



"Lingerie Dresser" by Thomas A. Christenson in mahogany and ambrosia maple



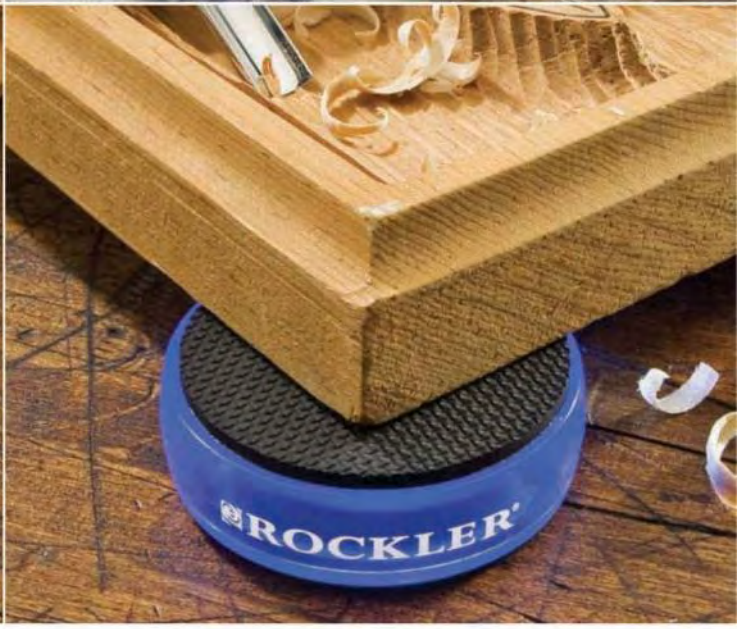
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Adjustable Tenoning Jig

By Chris Marshall



Step-by-step instructions for building this jig are inside!

Cut crisp, clean tenons quickly and safely with this helpful shop jig. Suitable for any table saw, this jig can be built out of plywood, scraps and easy-to-find hardware.

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Screw one guide to the base, then slip a pair of paper shims between the other guide and the carrier plate before attaching the second guide. The shim space will ensure smooth sliding action.

flush with the edge of the base; we'll call this the "front" edge. Extend the bolt hole in the base up through the plate. You've now created a starting point for routing a 2¼"-long slot toward the back of the carrier plate (see photo, below). The slot will house a carriage bolt and hold-down knob (pieces 4 and 5) that lock the carriage in place during tenoning operations. Step to your router table and complete that slot. Then, drill a 3/4"-diameter shallow counterbore into the bottom of the base to recess the carriage bolt head.



Rout a 2¼"-long slot through the carrier plate for the hold-down bolt. Use a 5/16"-diameter straight bit to mill this slot in a series of passes, raising the bit about 1/8" with each pass.

Next, follow the *Drawings* to make and attach two fence braces (pieces 6) to the carrier. Their 7½"-long edges should be flush with its front edge. Slide this carriage assembly back onto the base. Cut and fasten the fence (piece 7) to the fence braces; align its bottom edge with the bottom of the base.



Insert a 15/32" bit through the hole in the support bracket to mark the centerpoint for the bolt that will move the carriage. Drill a 5/16"-diameter hole and bolt-head counterbore in the back block only.

Installing the Carriage on the Base

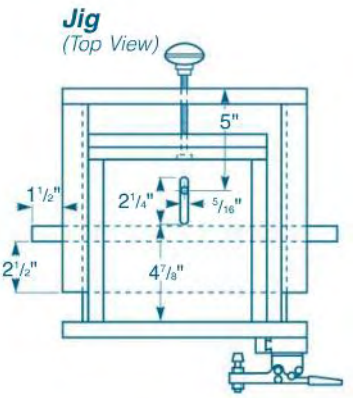
Cut the support bracket (piece 8) to shape, and drill a 15/32" through-hole where it's indicated on the *Drawings*. Fasten the bracket to the top of the base right behind the guides. Now make up two bearing blocks (pieces 9). Slip them between the support bracket and the fence braces. These blocks will capture the head of the carriage bolt (piece 10) that moves the carriage back and forth. Mark the centerpoint for this bolt hole by sticking your 15/32" bit through the hole in the support bracket and pricking the back bearing block. This block receives a 5/16" bolt hole and a counterbore for the bolt head (see *Drawings*). Drill those holes now. The long carriage bolt will spin inside the bearing blocks if you grind or

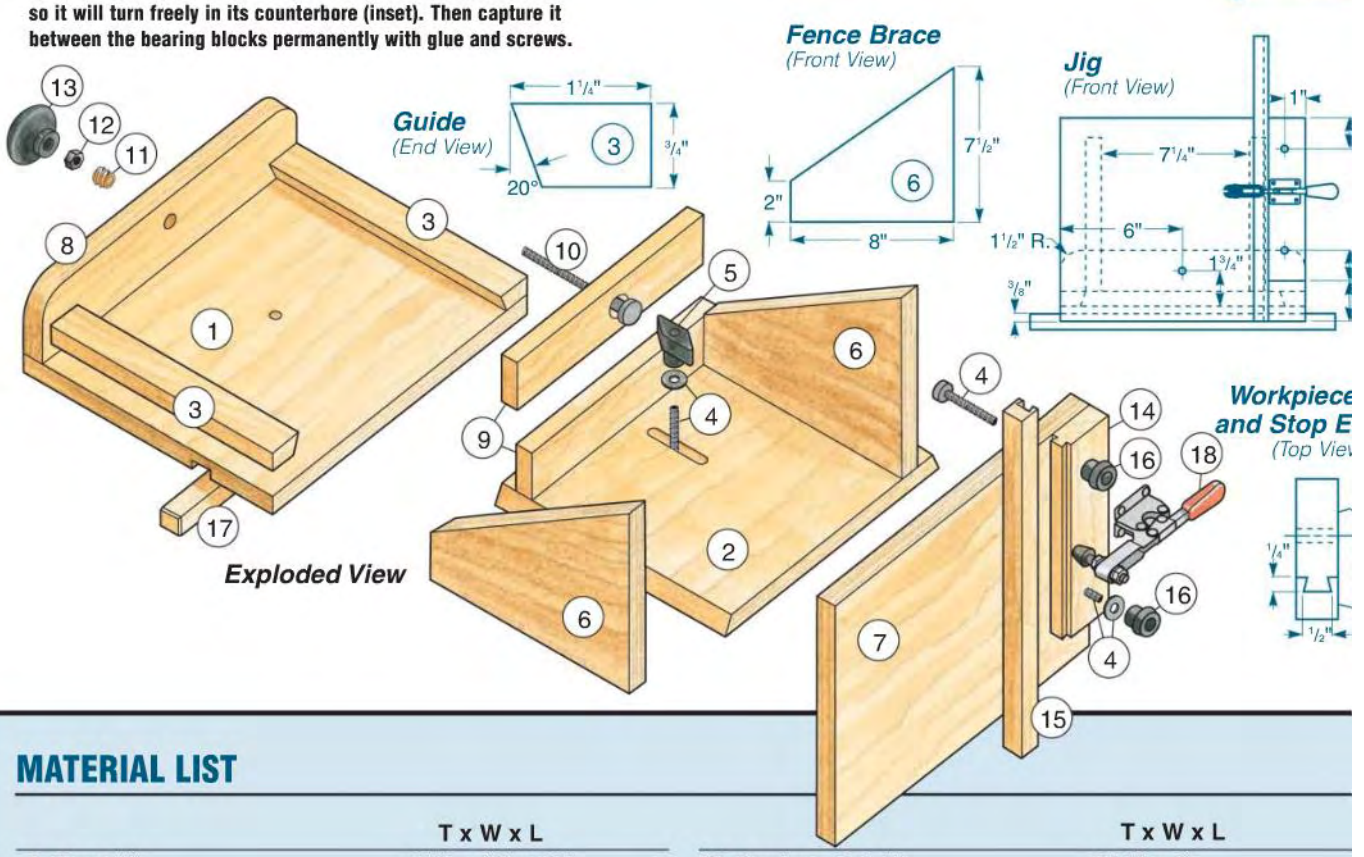


A FENCE ACCURATE TO 1/64".



Grind or file away the flat areas under the carriage bolt head so it will turn freely in its counterbore (inset). Then capture it between the bearing blocks permanently with glue and screws.





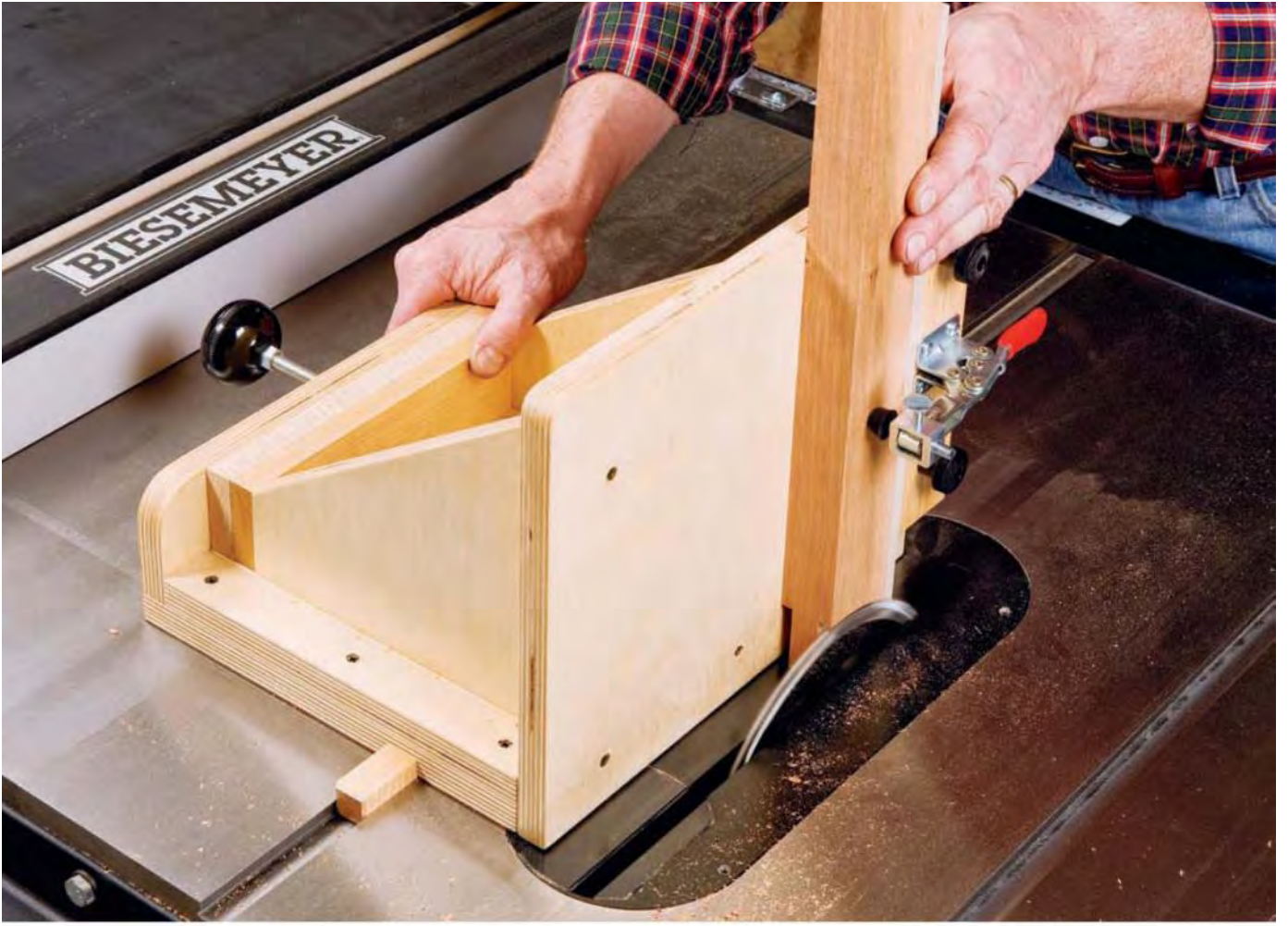
MATERIAL LIST

		T x W x L
1	Base (1)	3/4" x 10" x 12"
2	Carrier Plate (1)	3/4" x 9¼" x 10"
3	Guides (2)	3/4" x 1¼" x 9¼"
4	Carriage Bolts, Washers (3 PR)	5/16" x 2"
5	Hold-down Knob (1)	2", Rockler #71514
6	Fence Braces (2)	3/4" x 7½" x 8
7	Fence (1)	3/4" x 10" x 12"
8	Support Bracket (1)	3/4" x 2¾" x 12"
9	Bearing Blocks (2)	5/8" x 2" x 8¾"

		T x W x L
10	Carriage Bolt (1)	5/16" x 4"
11	Threaded Insert (1)	5/16" x 18
12	Jamb Nut (1)	5/16" x 18
13	Adjustment Knob (1)	2" Dia., Rockler #81498
14	Workpiece Stop (1)	3/4" x 2" x 8"
15	Stop Edging (1)	3/4" x 3/4" x Varies
16	Knobs (2)	1" Dia., Rockler #34121
17	Miter Slot Runner (1)	3/4" x 3/4" x 15"
18	Toggle Clamp (1)	Steel



A GUARD SYSTEM YOU'LL ACTUALLY USE.



Adjustable Tenoning Jig

By Chris Marshall

The cleanest way to cut tenons on a table saw is with workpieces standing vertically. To do it safely, you need a tenoning jig that holds parts upright and securely as you run them through the blade. The jig should also offer precise adjustability so you can cut tenons of many sizes and then trim them for a perfect fit in the mortise.

This jig satisfies both goals in spades. Its upper carriage slides back and forth across the base on a pair of beveled guides, and the lateral travel is simple to fine-tune with a carriage bolt and knob in back. A toggle clamp and backstop anchors the workpiece. To save the backstop from blade carnage, I've added a replaceable strip that fits onto a sliding dovetail. All in all, it's a must-have jig for any shop, so here's how to build one for your saw.

Assembling the Base and Carrier Plate

Cut the base, carrier plate and guide strips (pieces 1 through 3) to size, following the *Material List* at right. Plow a 3/8"-deep dado along the length of the base that matches the width of your saw's miter slots exactly — it will house a runner, later, that guides the jig. Drill a 5/16"-diameter bolt hole through the base at its centerpoint.

Now, switch back to your standard blade, and tilt it to 20°. Bevel-cut the short ends of the carrier plate and one long edge of both guides. The *Drawings* will show you that the complementary bevels on these parts form a big sliding dovetail joint that holds the carrier plate against the base. Screw the guides to the base with the carrier plate in place, then shift the carrier over so one edge is



QUICK, EASY
BLADE CHANGES.



Screw one guide to the base, then slip a pair of paper shims between the other guide and the carrier plate before attaching the second guide. The shim space will ensure smooth sliding action.

flush with the edge of the base; we'll call this the "front" edge. Extend the bolt hole in the base up through the plate. You've now created a starting point for routing a 2¼"-long slot toward the back of the carrier plate (see photo, below). The slot will house a carriage bolt and hold-down knob (pieces 4 and 5) that lock the carriage in place during tenoning operations. Step to your router table and complete that slot. Then, drill a 3/4"-diameter shallow counterbore into the bottom of the base to recess the carriage bolt head.



Rout a 2¼"-long slot through the carrier plate for the hold-down bolt. Use a 5/16"-diameter straight bit to mill this slot in a series of passes, raising the bit about 1/8" with each pass.

Next, follow the *Drawings* to make and attach two fence braces (pieces 6) to the carrier. Their 7½"-long edges should be flush with its front edge. Slide this carriage assembly back onto the base. Cut and fasten the fence (piece 7) to the fence braces; align its bottom edge with the bottom of the base.



Insert a 15/32" bit through the hole in the support bracket to mark the centerpoint for the bolt that will move the carriage. Drill a 5/16"-diameter hole and bolt-head counterbore in the back block only.

Installing the Carriage on the Base

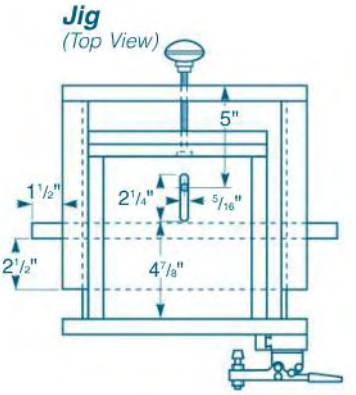
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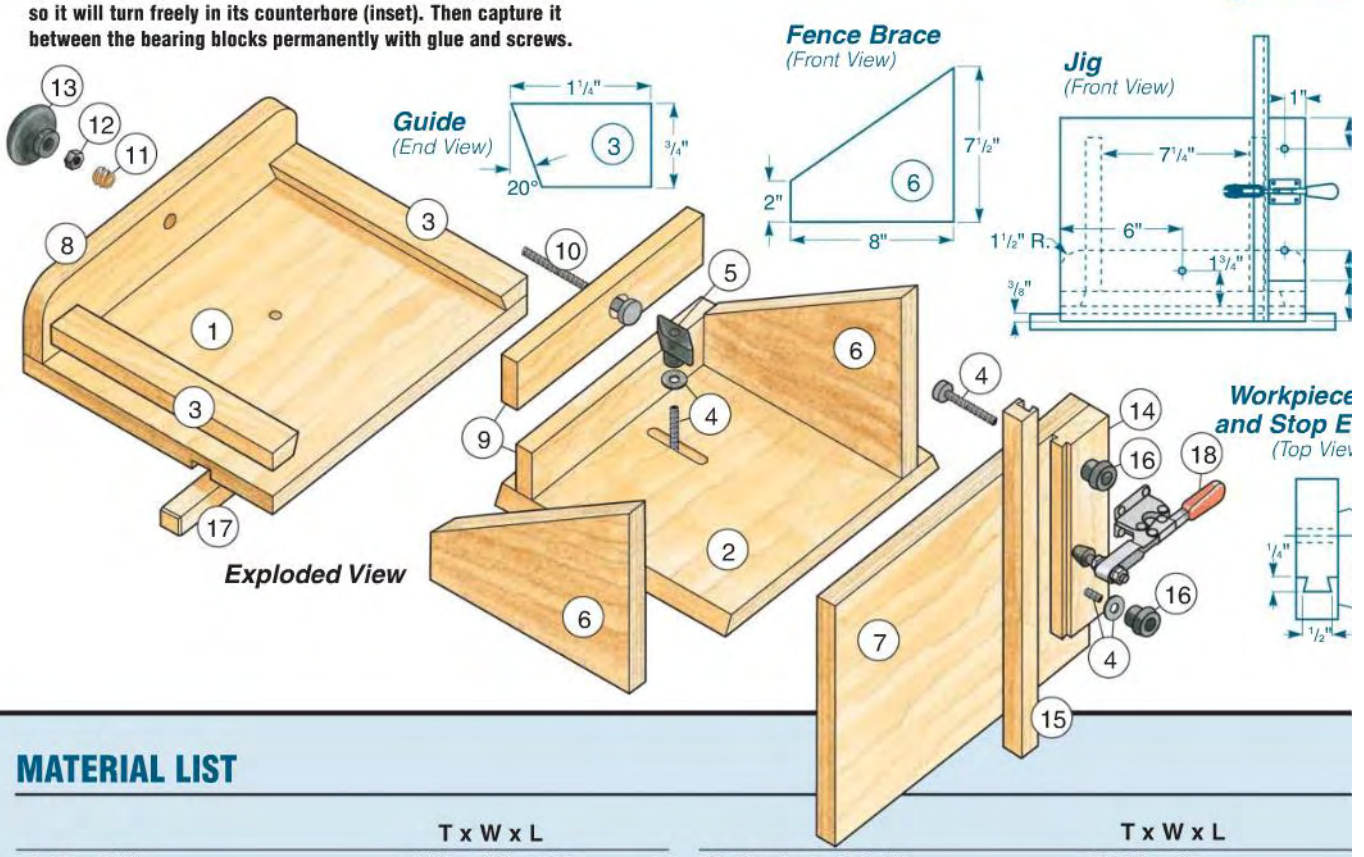


A FENCE ACCURATE TO 1/64".



Grind or file away the flat areas under the carriage bolt head so it will turn freely in its counterbore (inset). Then capture it between the bearing blocks permanently with glue and screws.





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18	Toggle Clamp (1)	Steel



A GUARD SYSTEM YOU'LL ACTUALLY USE.



Connect the edging strips and workpiece stop with a sliding dovetail joint, milled on the router table. Here, the author routs, then rips two edging strips from a wider piece of stock.

file off the "flats" under its head. When that's done, fasten the front bearing block to the fence braces, slip the bolt through the rear block and glue and screw the two blocks together. I smeared a dollop of paste wax into the bolt head counterbore first, to help it twist easily.

Your last step to installing the carriage is to screw a threaded insert (piece 11) into the support bracket hole you drilled earlier. Slide the carrier onto the



A long carriage bolt and threaded insert provide the mechanical action that moves the carriage across the base. Lock the adjustment knob and jamb nut onto the bolt with two-part epoxy.

base, and engage the carriage bolt and insert. Wind the bolt far enough through so you can spin on a jamb nut and the adjustment knob (pieces 12 and 13). Test the action of the carriage by turning the knob in both directions. If things work smoothly, remove the carriage, sand the parts and apply finish.

Finishing Touches

While the finish dries, make up the workpiece stop and edging strip (pieces 14 and 15). I routed a dovetail pin along the front edge of the stop and a corresponding dovetail slot in the edging strip so these parts fit together. Make up a bunch of edging strips while you're at it — they'll get chewed up by the blade during tenoning. You can trim off the damaged portion and reuse the edging several times, sliding it farther down the stop. When it gets too short to work properly, switch to a fresh strip.



Square up the workpiece stop to your saw table and tighten the knobs. Fasten a toggle clamp to it with short panhead screws.

Use a pair of carriage bolts and knobs (pieces 16) to mount the stop on the fence, and slide an edging strip into place. Wrap up your handy new tenoning jig with a hardwood runner (piece 17) for the miter slot — attach it with short screws driven down through the base. I used hard maple because it is so dense that it wears well in this sort of situation. Test the piece in the miter slot to be sure that it slides freely along the length of the slot. The last task that you have is to fasten a toggle clamp (piece 18) to the stop about midway along its length.

Once that work is done, you're ready to start cutting tenons, safely and accurately, with your hands well away from the saw blade.

Chris Marshall is Woodworker's Journal's *field editor.*

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Shellac and Wax Finish

By Ian Kirby



A "green" furniture finish with a long tradition. In Ian's parlance, "cleanup and polish" means getting the surface prepared by planing, sanding or both ("cleanup") and ready to receive the finish ("polish").

As a furniture finish, shellac and wax — beeswax — has much to commend it. I'll offer some of its virtues. First off, it retains both the color and the texture of the wood better than any other finish. It's simple and quick to apply. As well, it can be done a bit at a time as parts are ready without any real interruption to the making process. This is important to my "MO," since all inside faces and edges that can't be planed after a glue-up are cleaned up and polished before the glue-up. Afterwards, inside glue squeeze-out is left to harden as it will come off the waxed face cleanly with no staining of the parts. True, there are finishes which hold up better to food and drink spillage. But I find that handmade furniture is often spared that sort of mistreatment.

Shellac

The purpose of the shellac is to act as a barrier or a base to hold up the wax and prevent it soaking into the wood. All that is needed to form this barrier is a one-coat layer of shellac; however, all shellacs are not equal. They can vary in color and in solids content and they can be applied in different ways, any of which will affect the result. To learn a lot more about shellac, you can read about it in Michael Dresdner's book. The essentials to know about using it are these:

You can buy it in two ways: in a can ready to use or as dried flakes which you mix with denatured alcohol. The can will have on it a date of manufacture — look for it. Beside that will be the maker's choice of color and cut. Read the directions on the can; it will tell you the shelf life from the date of manufacture and the "cut." A one pound cut is a pound of flakes to a gallon of solvent. A five pound cut is five pounds of flakes to the gallon. For our purposes, a two to three pound cut is good. Makers use terms like "clear," "transparent" and "orange" to indicate color — use the most transparent (the one with the least color). If you use flakes, buy the ones which have the least color.



Years ago, you had no choice but to make your own shellac. Today, the ready-made product does the job, but keep an eye on shelf life. It's widely available in clear, white and orange varieties.

Application

Shellac can be brushed or "ragged" on. Ragged on means dipping a rag in the stuff and wiping it on the



Rag the shellac quickly. Cover the whole surface, then "lay it off" altogether. Don't do bits at a time. Because you are following with beeswax, a second coat is neither necessary nor desirable.

workpiece. I usually do that. On large surfaces, I brush it on, then, with a loosely balled-up clean cotton rag, wipe it into the wood and wipe if off. You don't need a second coat. If the work surface was prepared by sanding, the shellac will "raise the grain." Sanding grinds the surface and the liquid swells the torn tissue raising "nibs." You "de-nib" it or smooth it again very easily by sanding with thoroughly used fine sandpaper. Hold the paper between fingers, not round a block. Either way, it will get clogged with shellac. Paper round a block will pick up patches and ride on them. If the surface was prepared straight from a plane, there will be very little "de-nibbing" to do. Simply sand the surface smooth. Laying on a second coat doesn't help at all, and it gets messy because you will immediately dissolve the first coat.

Beeswax

You can buy beeswax as block or pellet and formulate your own paste, or you can buy it ready to go in a can. If the can has a list of ingredients on the label you will find it has additives of various kinds — common ones are paraffin wax and carnauba wax.

The product I use is granulated pure bleached beeswax. To make the paste the granules are dissolved in pure turpentine. Into a small widemouth jar, pour about two inches of turps over half an inch of granules



A variety of waxes are widely available. My preferred, and homemade, version is made from a pure bleached granulated beeswax dissolved in pure turpentine and made as soft as summer butter.

— already you can tell this is not exacting chemistry! Stir occasionally and after a day you will have a paste. For me, the best results are achieved when it's like really soft butter. The consistency in the jar is adjusted by adding one or the other ingredient.

Application

The wax is applied using a cotton rag. A sparing amount rubbed in circles achieves crossgrain and cross area application. Finish by working with the grain. Each successive application will deepen the tone and texture of the surface, but it is best done using a working minimum of wax. After an hour or so, if you buff the surface with a clean, soft cloth you will see the extent of your effort as a luster with some reflection.



Apply a thin film of wax in a circular motion. Polish it off with the grain. This finish has many advantages, not the least of which is the "smooth as silk" feel. It is also quite easy to touch up and repair.

Mixes

Beeswax made in this way can also be mixed with finishing oils. However, there are so many different formulations of proprietary oils — and variations in beeswax — that attempting to offer a recipe is futile. You simply have to give it a try.

A mix I made using General Finishes' Salad Bowl Finish was one that I found very successful. It gave a hard lustrous result and held up very well. Unfortunately, after a few days, even in an airtight can, it skinned over, then after a few more days went into a solid, unusable mass — but it retained the myth, the mystery and the magic of finishing.

Ian Kirby is a master woodworker and a regular contributor to Woodworker's Journal *magazine.*

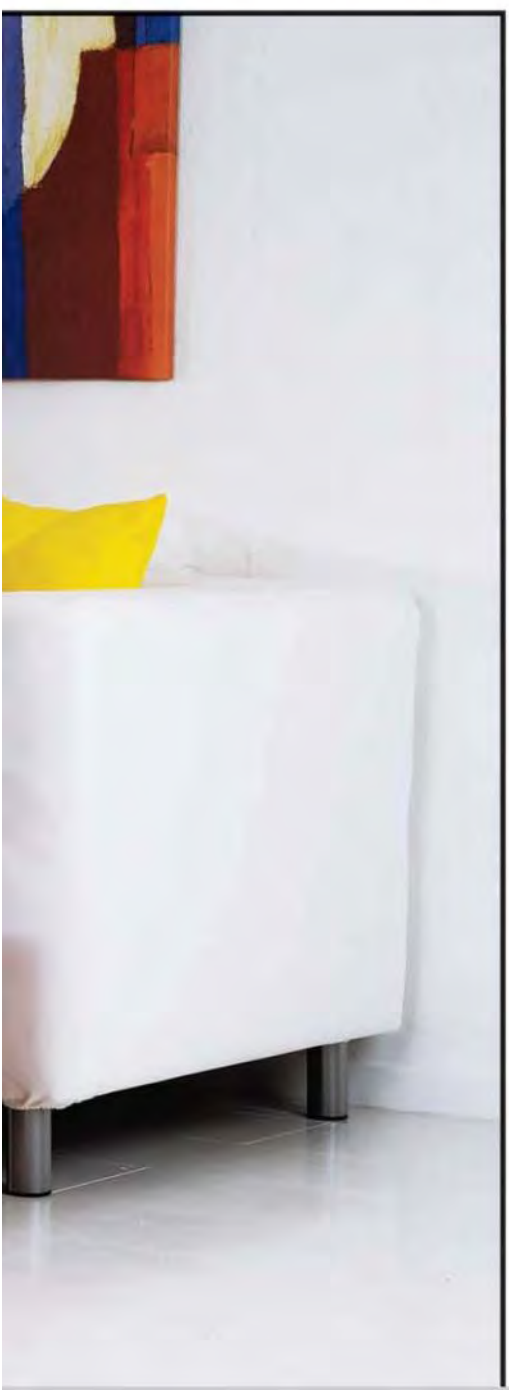
Convertible Coffee Table

By Lars Dalsgaard

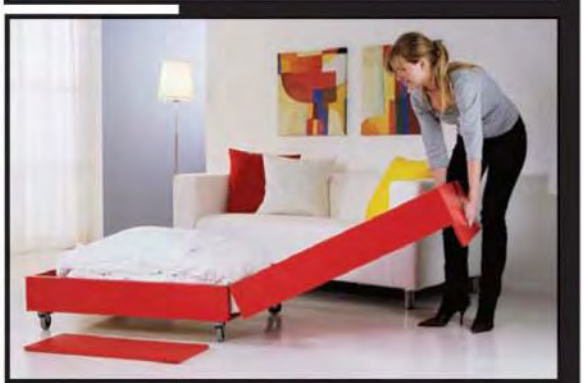
When space is tight, furniture that can serve two purposes can be a big help. A great weekend project, this clever piece gives a whole new meaning to "taking your coffee in bed."

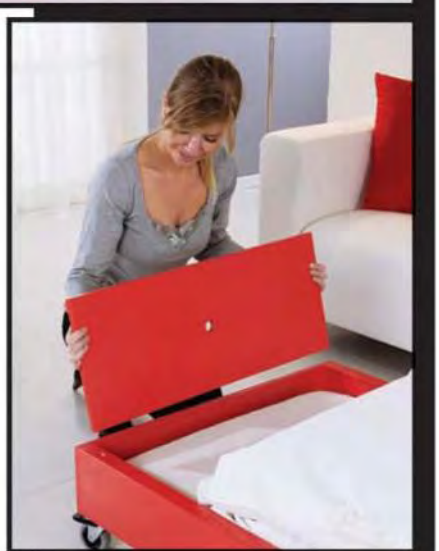


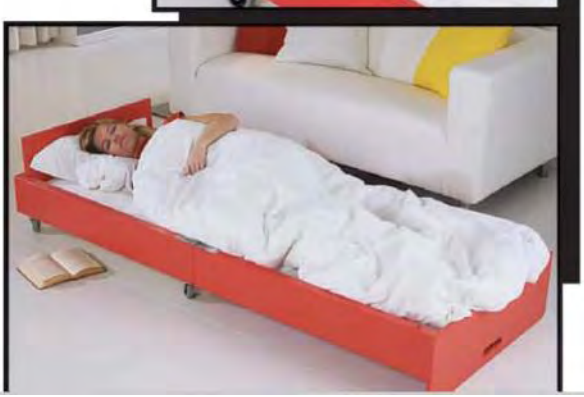
Whether it's a visit from friends or relatives, or a child who wants to host a sleepover, an extra bed can really come in handy. And if space at your house or apartment is at a premium (as it is for most of us), here's a unique way to stow that spare bed. This coffee table conveniently rolls about on casters to wherever you need it. Then, it flips open into a bed that accommodates an average size adult. (If you are over 6' tall, this bed is not for you ... but for the rest of us, it is actually quite cozy.) Conversion is easy. Just hold the handle, swing the top open 180°, and insert the headboard (as shown in the photo sequence at right). The folded-up coffee table "box" contains it all — mattress, sheets, comforter and pillow. You make the mattress from high-density foam rubber, which is readily available from most upholstery shops or can be easily purchased online.











The perfect solution for space-challenged accommodations, this simple-to-build and easy-to-operate table/bed combination is a great weekend project. The mattress and bedding are stored inside the table and are ready to go at a moment's notice.

Making the Table/Bed

Begin work on this project by cutting all the parts to size, as shown in the *Material List* on page 35. Although a fully outfitted workshop will no doubt make the job easier, this entire space-saving project can be made with a



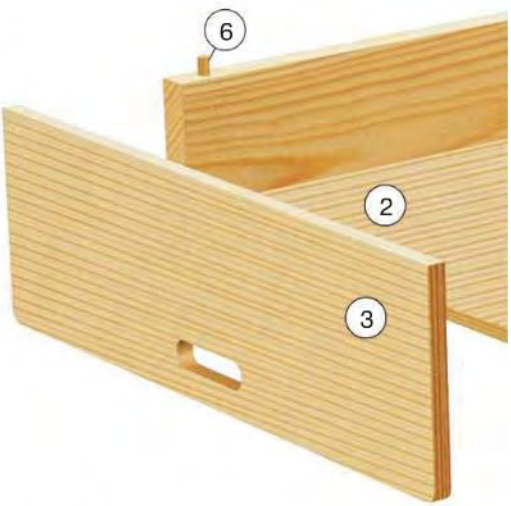
To begin, gather all hardware and cut all parts to size, as shown in the *Material List*. This simple project can be completed in a couple of days. Select a paint color to match your home.

This entire space-saving project can be made with a couple of handheld power tools and a hammer.

couple of handheld power tools and a hammer. I decided on simple lumberyard 2 x 6s for the rails (pieces 1), although standard 5/4 stock would work just as well.

The height of the rails is calculated so there is about an 11"-deep storage area for mattress and bedding when the unit is being used as a coffee table. For the bottom and top (piece 2), footboard end (piece 3), headboard end (piece 4) and headboard panel (piece 5), I chose 5/8"-thick veneer-core plywood. A lower quality plywood can also be used, but be sure to fill any edge voids before finishing.

Before you cut the footboard end to size, buy the casters. (Check the information box next to the *Material List* at left for a number of options. and details on purchasing them.) You'll need to know the exact height of your casters before cutting the footboard to final width. The footboard width equals the caster height plus another 6⅛".

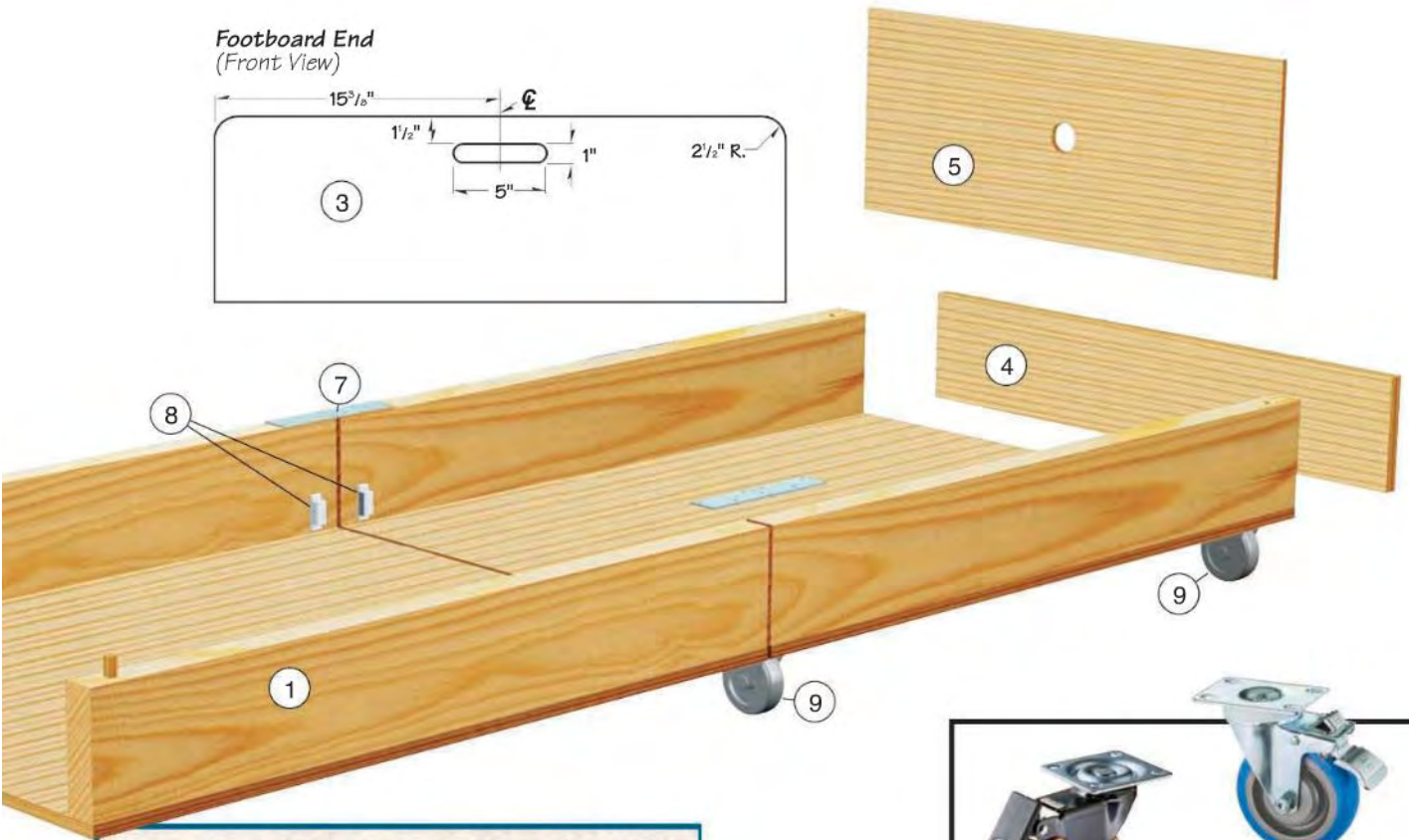


Machining the other details on this table/bed is pretty straightforward. See the photos on page 36 for some tips on cutting the handle and the corner radiuses in the footboard end. I drilled two holes with a spade bit, then used a jigsaw to "connect the dots," thus creating the handle openings. Put together the main





Start nails along the edge of the plywood bottom as shown in the photo at left, and apply glue to the rail edges. Secure the rails to the plywood and allow the glue to cure.



MATERIAL LIST Coffee Table Bed

		T x W x L
1	Rails (2)	1½" x 5½" x 75"
2	Bottom (1)	5/8" x 30¾" x 75"
3	Footboard End* (1)	5/8" x 10"* x 30¾"
4	Headboard End (1)	5/8" x 6⅛" x 30¾"
5	Headboard Panel (1)	5/8" x 11¼" x 27½"
6	Alignment Pins (2)	3/8" Dia. x 1¾"
7	Strap Hinges (2)	1⅜" x 8"
8	Door Catches (4)	Magnetic
9	Casters (4)	Varies by style
10	Mattress** (1)	4" x 27" x 75"

* *Approximate size, depending on caster height*
** *Foam from upholstery shop*

Your choice of casters can greatly influence the look of this piece. Remember that the height of the casters you choose will determine the width of the footboard end (piece 3).



Hard-to-Find Wheels

The wheels above are available from Woodworker's Journal.

To order your supplies, please go to woodworkersjournal.com/Hardware or call 800-610-0883, and mention code WD101.

subassembly with glue, finishing nails and clamps, as shown in the photos at left. While the glue cures, mark a centerline on the assembly in order to cut it in half, later.

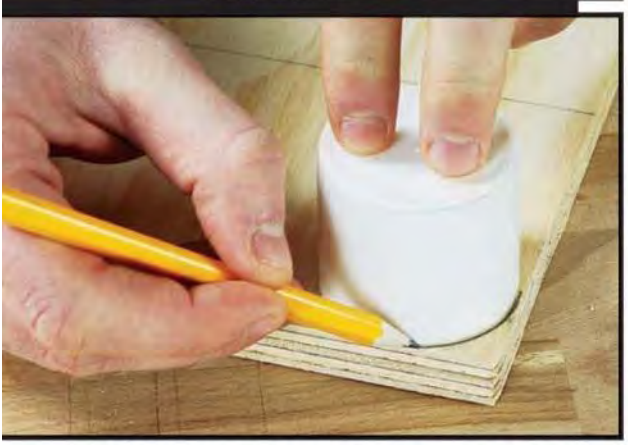
Next, install the casters. Use 2" #8 flathead wood screws to secure the outboard sides of the casters to the bottom and top (piece 2) and rails (pieces 1). You'll have to use 1/2" #8 flathead wood screws to secure the inboard sides of the casters to the plywood, or else these screws would protrude into the bedding area.



Install the casters using #8 x 2" screws where they mount over the rails and #8 x 3/4" screws where the backing is plywood only. File any tip protrusions smooth.







Fashion the handle cutout in the footboard end by boring two 1"-diameter holes (top photo), then use a jigsaw to cut away the remaining waste (middle photo). Use a spray-can cap to trace a radius at the corners of the footboard that will touch the floor (bottom photo).

At this point, the "bed box" is still one piece. The next step is to cut the box in half. I decided to make use of my (just) sharpened handsaw to make this cut, because it's a lot safer than using a circular saw or table saw for a large scale operation like this. The added control also makes splintering and mistakes less likely.

Roll it to the right spot, open and fall asleep . . . so simple!

Stand the unit on one rail and begin the cut. Then you can lay the box on 2 x 4 scraps, open side down, and cut across the plywood base. Finally, stand the unit on the already cut rail and make your final cut through the uncut rail. (See photos, next page.)

Rejoin the two box halves with two strap hinges (pieces 7). It is important that there is something solid to screw the hinges into, which is the main reason the rails are made of thicker stock.

Installing All-important Alignment Pins

Two small but very important parts are the alignment pins (pieces 6). Made from 3/8"-diameter by 1¾" dowels, they serve to keep the rails aligned and parallel when in coffee table mode. They also create a small gap between the rails to prevent the table halves from pinching your fingers when closing up the bed. To install the pins, bore the holes to a depth of 7/8". (See the *Drawings* for these pilot hole locations.) Then add a drop or two of glue to the holes and tap in the pins until they are fully seated. Mark for the opposing holes and bore them to a depth of 7/8" minus the depth of the hinge knuckles.

The removable headboard panel (piece 5) mounts to the folded-up coffee table configuration with magnetic catches (pieces 8). The steel plates are attached to the headboard panel, while the magnetic catches are screwed to the inside faces of the rails (see the photo on the next page). It is a clever way to hold the captured panel securely. You'll also need to drill a 3/4" or 1"-diameter finger hole through the headboard panel. That way, you can grab the piece more easily and pull it free of the table before you open it up into a bed.

To finish the project, sand the assembly until smooth. I started at



Drill pilot holes in the rails for two alignment pins, and install them with a few drops of glue. Bore the receiving holes slightly larger.

80-grit paper and worked my way through the grits until I got to 180-grit. Ease all the sharp edges and corners, too.

Cover any knots with a sealer such as shellac to keep them from bleeding through the paint, and then apply a coat of good quality primer. Allow the primer to dry and, if needed, apply a second coat. Lightly sand again with a fine grit before applying two coats of interior enamel. You can choose whatever method you prefer to apply the paint, but I used a good quality bristle brush. Take your time and be systematic in your approach, and you'll get great results.

Buying the Mattress

While you can use a ready-made camping or cot mattress or a yoga mat for this bed, it will be far more comfortable if you call a local upholstery company and have it cut from latex or polyurethane foam to the required size. Search the Yellow Pages for "upholsterer" and for "foam rubber" to find suppliers near you. Be sure to ask about density and compression when shopping. The higher the density (best is 1.8 rating or above), the more comfortable. Compression ratings determine the degree of softness. You can also order a foam rubber mattress online at *www.efoamstore.com*. For a "greener" option, use a cotton or wool-filled mattress.

Simple but Useful

Whether you use this piece in your home or cabin, or even send it off to college with your children, its simple yet practical design will be useful for years to come.

Lars Dalsgaard is a woodworker and photographer who lives in Denmark.





Place the bed box on scrap lumber and saw it in half along your layout line (right). Then, clamp the box halves in the open position so they align perfectly and install the strap hinges (photo above).



Use four magnetic cabinet door catches to mount the headboard panel inside the open end of the project when it's in "table" mode.



When the project is closed up as a table, the headboard panel cleverly hides the contents of the bed (stowed inside and ready for use).

Queen Anne Highboy (Part 1)

By Kerry Pierce

Every piece of furniture has a story, and the story of this highboy begins three summers ago, with an ad in the local paper offering air-dried walnut and cherry for $1 a foot.

When I arrived at the seller's home, a man in his late 50s directed me to a building 35 yards from his back door. He was rail-thin with patchy gray hair, watery eyes and a quavering, nicotine-stained handshake.

He pointed through the building's overhead door at a stickered pile of wood tucked into a dark corner. He explained there was more out back. Then, with a rasping, expectorant-laden cough, he retreated to the house.

Moving aside battered hand tools, cases of motor oil, bits and pieces of machinery, I unearthed a stickered pile of rough-cut 5/4 cherry and walnut planks. The top layers were scattered with knots and splits and wane, but as I worked my way into the pile, the quality of the material improved. I dug deeper, and suddenly, I was face-to-face with some breathtaking material: boards 16" wide, 10 to 12 feet long, composed entirely of clear, straight-grained walnut heartwood.

In half an hour, I pulled out a dozen planks of the finest American hardwood I've ever seen.

I heard a door slam at the back of the house, and a woman approached the building in which I was working. She, too, was about my age. She was the sister, she explained. Her brother had cancer, and the material he'd cut some years ago with the intent of someday turning it into furniture for his home he now wished to turn into cash because he had no medical insurance. And that's where the story of this highboy begins.



The author's stunning highboy was created out of some truly exceptional walnut lumber. The combination of fine design superbly executed with high quality material results in an heirloom piece worthy of the term.

The Base



Arriving at a Design

I scaled up the measured drawing for this piece from a photo on page 185 of Albert Sack's *The New Fine Points of Furniture*, but like the craftsmen who made the original American Queen Anne pieces, I varied from my source in order to suit the tastes of my customer — in this case, myself.

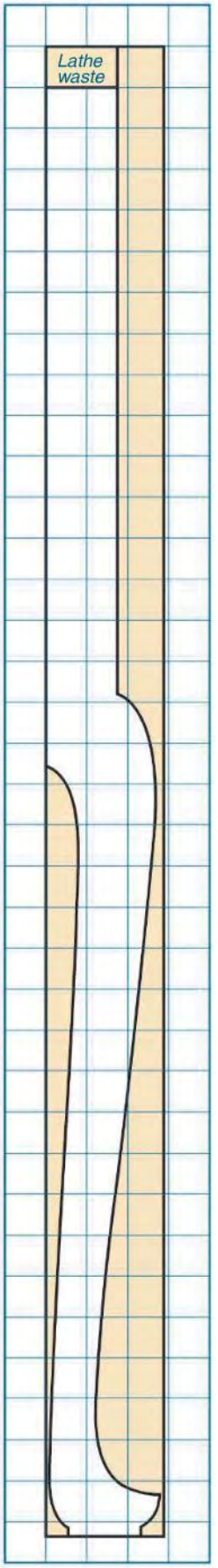
First, although I liked the informal grace of the original I was using as my model — a 1747 highboy built by Moses Bayley and Joshua Morss of Newbury, Massachusetts — I wanted my version to have a more stately posture, so when I drew the leg profile, I reduced the sweep in the leg's cyma curve. I also changed the moldings at both the cornice and the waist. The waist molding on mine extends almost an inch beyond the surface of the lower case, whereas the waist-molding on the original has no overhang at all. Finally, the cornice molding on mine is different than the cornice molding on the original in two respects: First, like Bayley and Morss, I composed mine of elements that could be made with the tools I had on hand. Second, I gave my cornice molding an overall contour that leads down into the upper case in a curving line unlike the essentially straight line that leads the eye down into the piece on the original. I did this hoping to echo the curve in the cabriole legs at the bottom of the piece.

Since I didn't have access to the original highboy, I don't know any details about its internal parts, but I suspect it lacks some of the features I added to my version. For example, I installed two layers of sliding

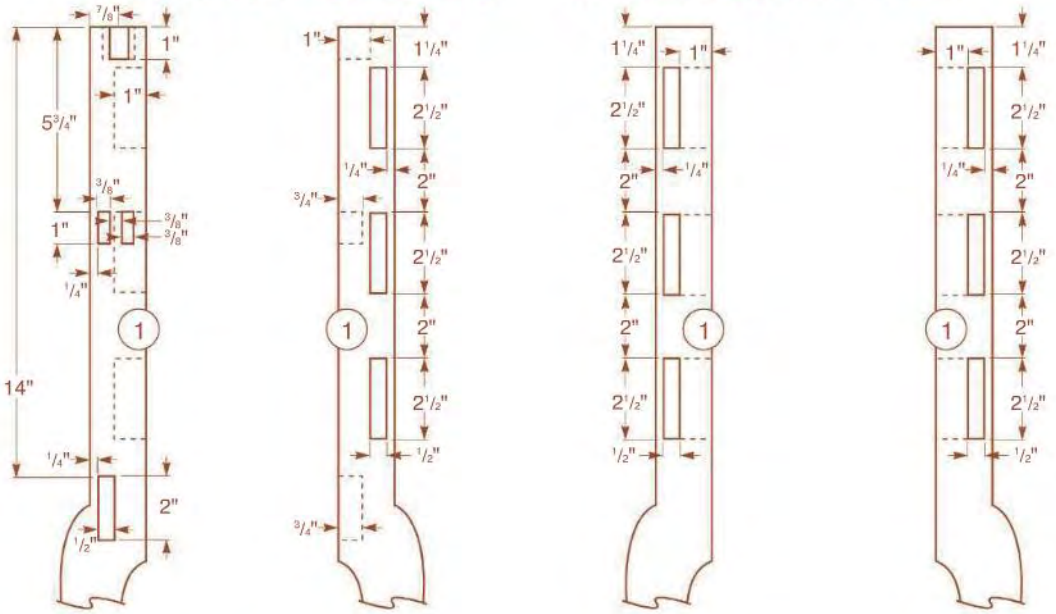


Carefully selecting which furniture part will come from which piece of wood is the first step in any successful woodworking project.

Leg Pattern
Each square = 1"



Highboy Leg Joinery — Mortise Layout Detail



Left Front Leg *(Inside View)* | **Left Front Leg** *(Back View)* | **Left Rear Leg** *(Front View)* | **Left Rear Leg** *(Inside View)*

trays to the top drawer of the lower case. I also added three secret compartments to my edition. One of those will appear in the final installment of this project in the next issue, and the other two are — well, secret.

Starting from the Ground Up

The fabrication of this highboy's four cabriole legs demands a considerable investment of time. If you're a first-timer, please don't be disheartened if, after a week of hard work, you're still working on them.

Begin by squaring up your leg stock. The blanks should finish out at a minimum of 2⅞" on a side with a length of 36⅜". This length includes the finished length of the leg (35⅜"), plus one additional inch which is necessary if you decide to turn the foot on the lathe as I do.



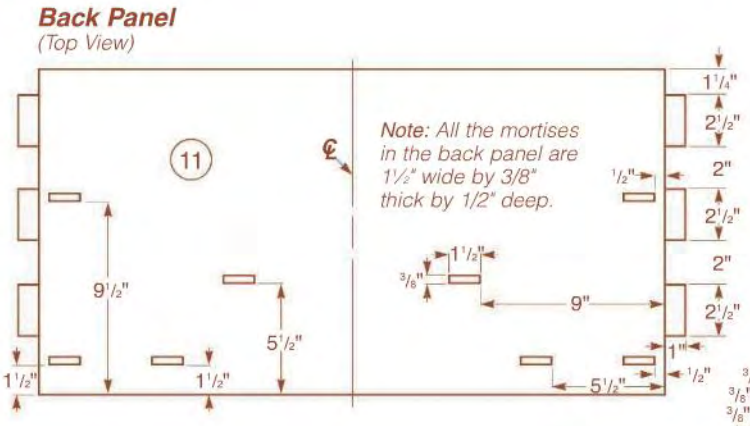


Mark the leg pattern on two adjacent faces of each leg blank, taking care to place the pattern so that the posts at the top of each leg-tracing meet.

Once the leg has been squared up, trace your leg pattern on one face of your blank. Then place the pattern on a face adjacent to the one on which the pattern is marked, making sure the back corner of the post at the top of the leg meets the back corner of the post on the previously marked face. (Please study the photo below left and the one on page 43 before tackling this mark-up.) Once the cabriole shapes have been marked on two adjacent faces, mark the locations of the various mortises each post will require. Remember that no two posts have exactly the same mortise arrangement. There is a right and left front post and a right and left back post, with each of these four requiring a different mortise layout.

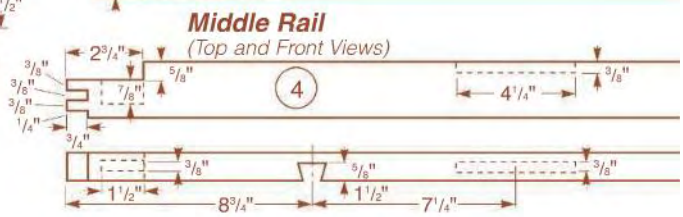
Next, chop each of the mortises. While this can be done after the legs have been shaped, it is much easier to do when the stock is square in cross section. I used a Forstner bit in my drill press to rough in these mortises. I then squared them up with a paring chisel.

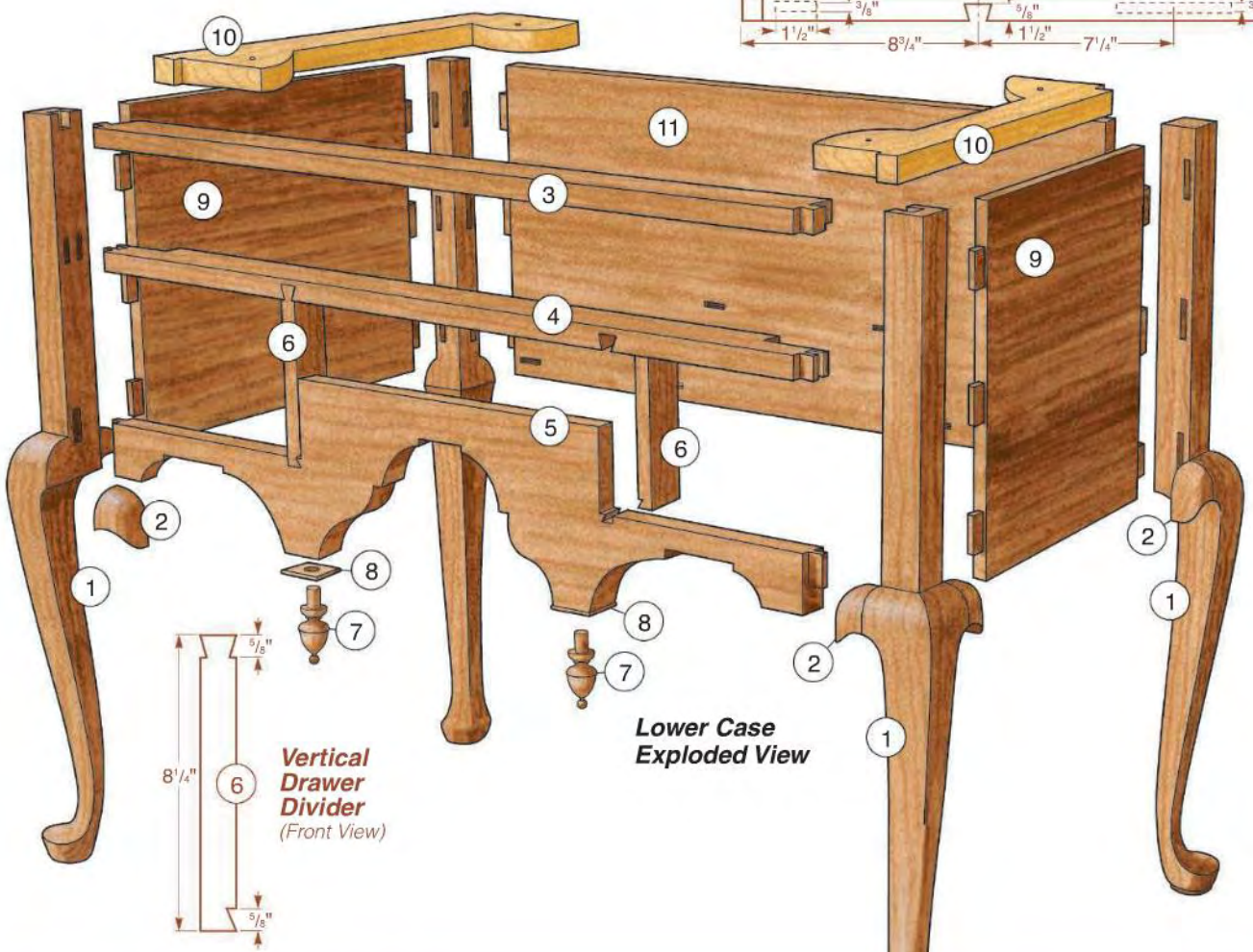
Careful work on the band saw will save you time when you later move











Lower Case Exploded View

MATERIAL LIST LOWER CASE

	T x W x L
1 Legs (4)	2⅞" x 2⅞" x 35⅜"
2 Knee Blocks (6)	1⅛" x 1⅝" x 2⅜"
3 Top Rail (1)	1" x 2" x 32½"
4 Middle Rail (1)	1" x 2" x 32"
5 Apron (1)	1" x 7¼" x 32"
6 Vertical Drawer Dividers (2)	1" x 2" x 8¼"

	T x W x L
7 Turned Drops (2)	1¼" x 3⅜"
8 Turned Drop Base Plates (2)	1/8" x 1⅛" x 2⅛"
9 Side Panels (2)	1" x 16" x 17½"
10 Plates and Kicker Strips (2)	1" x 4¾" x 15⅝"
11 Back Panel (1)	1" x 15⅞" x 32½"



After cutting the leg's shape in one plane, tape the waste material back into place, rotate the blank 90°, and cut the leg's complementary shape in the adjacent plane. This is a typical process for creating cabriole legs.

to hand tools to fair the surfaces of the cabriole legs. (I would recommend that you not use a skip-tooth blade because you want the surfaces to be reasonably smooth.) Plan your cuts so that the pieces will fall from the band saw in large sections, because you're going to need them when you make the next set of cuts.

After making all the cuts on the first face, tape the cut-offs back into place. This way you'll have a square blank to maneuver under the band saw blade when you rotate that blank 90 degrees. (You can discard the very small pieces from under the foot.)

Lay the pattern back into place on the adjacent face, and re-mark any areas that have been concealed by the tape. Then begin sawing the adjacent face. You may need to re-tape some of the pieces as you make the second set of cuts — it's essential that you maintain a square blank throughout the sawing process (photo, above left).



Once the foot has been shaped, work the remaining surfaces of each leg with a drawknife to remove saw marks and to begin fairing the leg shape. (And you're right: the author is using the drawknife upside down.)

There are two ways to shape the round foot and the round pad beneath the foot. You can lay out the foot using a compass to delineate the pad on the end grain at the bottom of the leg and then — using the circle as a reference — shape the pad and foot with carving tools and rasps. This is an effective approach, although it is time-consuming.

I prefer to shape the foot and pad on the lathe because it's quicker and produces feet and pads that are truly round. I should point out, however, that this is not a technique that should be attempted by anyone who lacks experience in lathe work, because it requires you to work against an asymmetrically mounted and unbalanced form in the lathe.

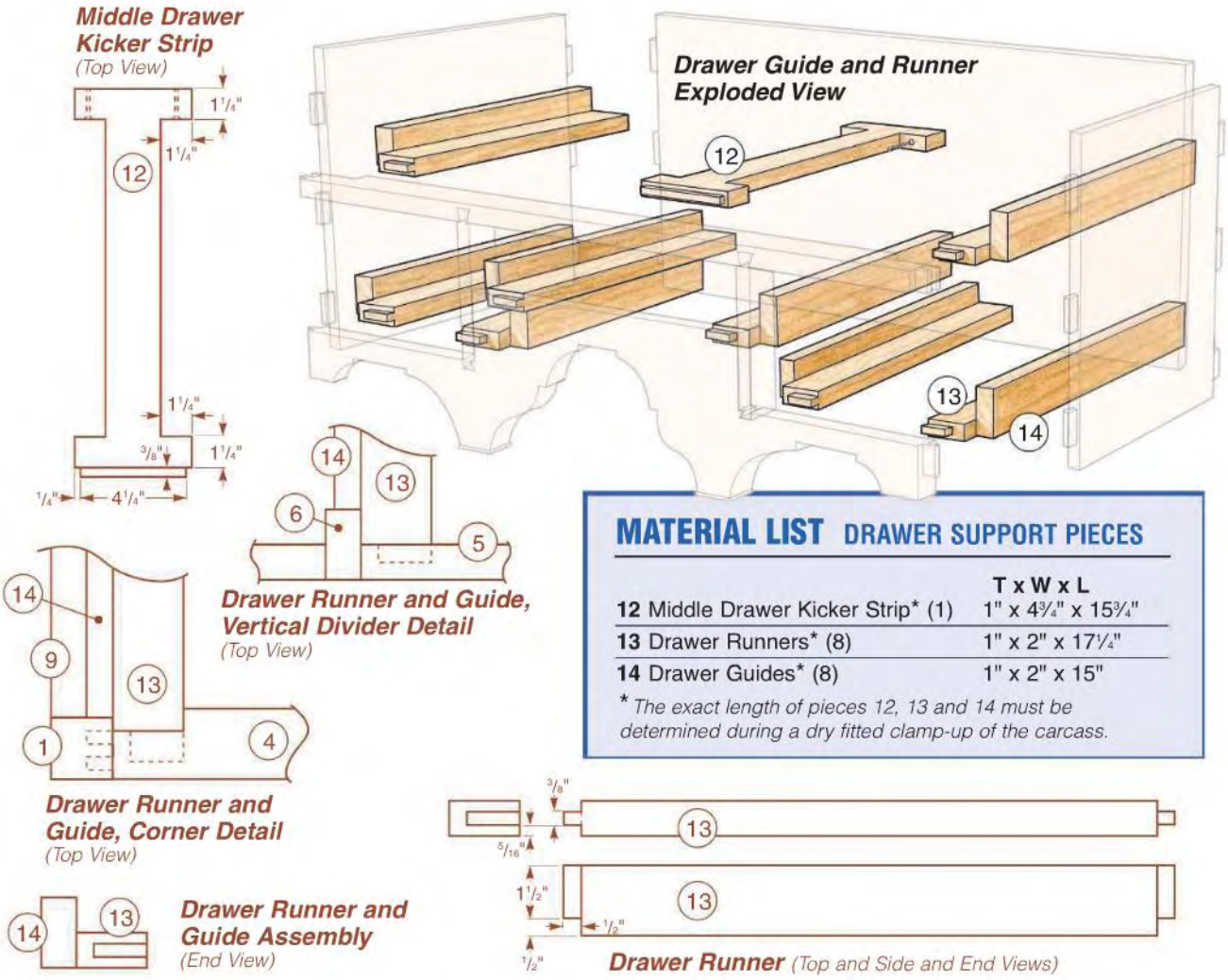
To perform this work on the lathe, you must mount the centered top of the post against the drive center of the lathe and the centered bottom of the pad below the foot against the tailstock of the lathe. Place a tool-rest into position and manually turn the part through several rotations to ensure that this eccentric form misses the rest all the way around. Then — very cautiously — begin to turn the pad and foot with a roughing gouge and scraping tools. I have found that this turning process works best if you periodically remove some of the excess material above the heel of the foot with a drawknife as the foot emerges.

When the pad and foot have been shaped, you're ready to create the finished shape of your cabriole leg. I find this process to be among the most pleasurable of woodshop experiences, in part because it allows me an extended opportunity to put a variety of hand tools through their paces. I typically do this work

Turn Away from Carving



I turned the feet on my legs on the lathe, which very quickly transforms a square foot blank into a perfectly round foot, but — as you can see here — turning this eccentric form on the lathe can be somewhat risky business. Although it is my personal preference to form the feet in this manner, if you're unsure of yourself on the lathe, you can fashion each foot with hand tools, using a circle scribed on the pad at the bottom of the foot as your guide.



MATERIAL LIST DRAWER SUPPORT PIECES

	T x W x L
12 Middle Drawer Kicker Strip* (1)	1" x 4¾" x 15¾"
13 Drawer Runners* (8)	1" x 2" x 17¼"
14 Drawer Guides* (8)	1" x 2" x 15"

* *The exact length of pieces 12, 13 and 14 must be determined during a dry fitted clamp-up of the carcass.*

with the leg still mounted in the lathe, although it can also be done with the leg mounted between V-blocks in a bench vise.



To the left of the pattern is a marked but unmortised leg blank. Moving left again, you see a mortised leg blank. Notice that the mortises on one face are immediately adjacent to the mortises on the next face. Left yet again, you see a bandsawn leg blank. And finally on the extreme left, you see a finished leg.

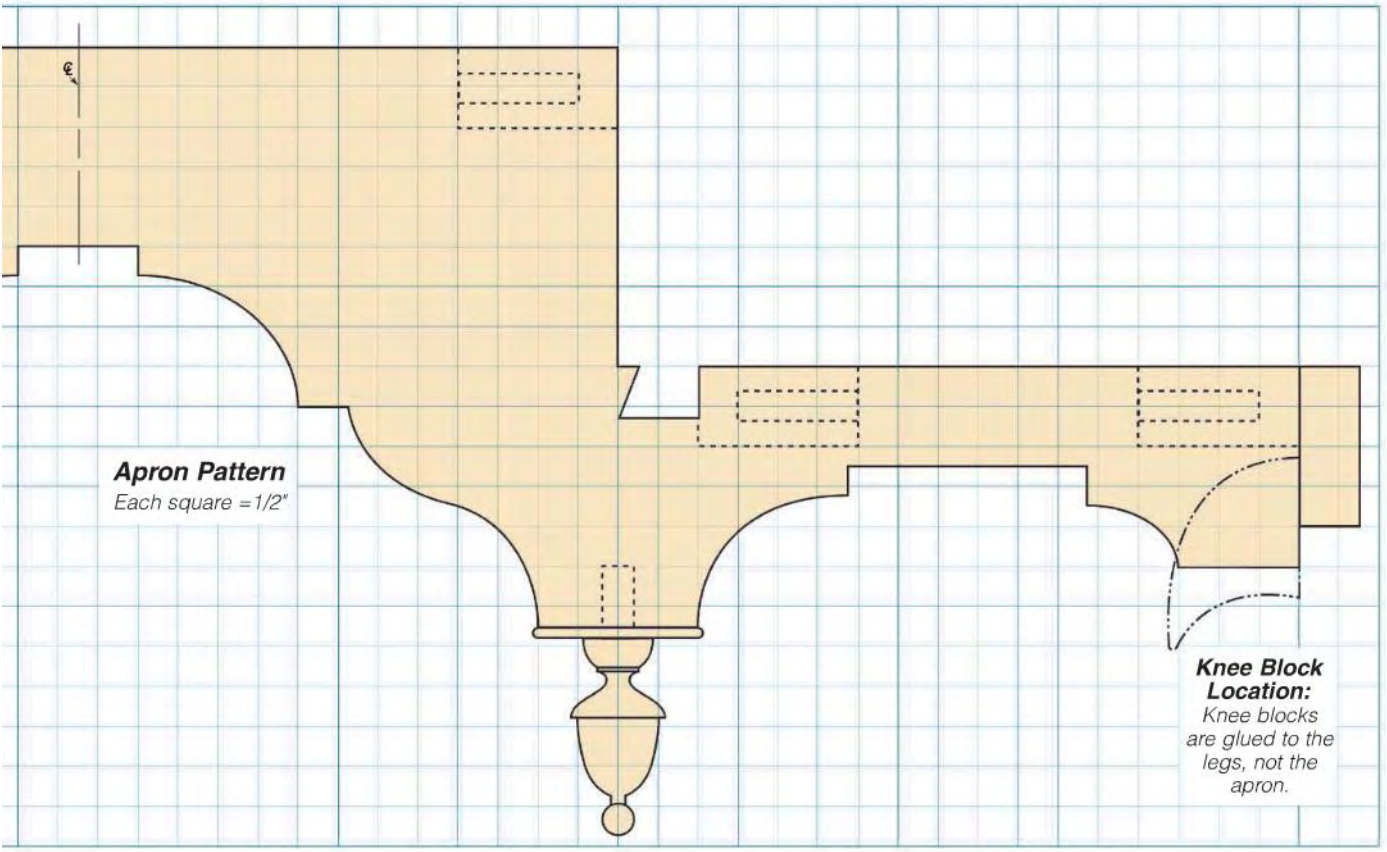
I shape the post at the top of the leg with a block plane, finishing the bottom section of the post (just above the knee) with a wide paring chisel and a scraper. The shaping of the leg itself requires a variety of hand tools: a block plane for the convex work and a drawknife and/or spokeshave for the concave work. Use rasps, card scrapers and sandpaper to clean up any areas of torn-out grain.

If you study Queen Anne legs on period originals, you'll see that this form is articulated in many different ways. Some makers kept hard lines where the sides of the leg meet the front of the leg. Others softened these intersections, and some, in fact, rounded them. I tend to keep these intersections quite crisp up high beneath the knee, softening them as the lines descend to the floor.

Understanding the Jigsaw Puzzle

The back and sides of the highboy are simply glued-up panels tenoned into the posts. Each end of each of these wide panels is triple-tenoned into the post, and I always leave a little bit of shrinkage space on the bottom edge of the top tenon and the top edge of the bottom tenon in order to accommodate shrinkage across the grain. Sometimes I assemble the base with glue on only the middle tenon on each end of each part. At other times, I'll glue all three tenons. It doesn't seem to make much difference. Even though the highboys I've built are all living

Highboy Carcass Joinery — Apron Layout Detail



in homes with forced air heat, none — so far — have developed cracked side or back panels, something quite common in period originals.

The front of the base unit is composed of only five parts, in addition to the legs, but the fabrication of these five parts involves the cutting of quite a bit of complicated joinery, so please take some time to study the *Drawings* before cutting your stock. The rail beneath the top drawer of this section, for example, is double-tenoned on each end. It is cut on its back edge with mortises for two drawer runners and one kicker strip. Plus, its front edge is cut to receive the dovetail at the top of the stiles on either side of the center drawer. And the top rail has a fat dovetail cut on either end which is fit into a dovetail socket chopped into the end grain at the top of each of the two front posts. It's complicated, but if you study the *Drawings*, the parts will begin to make sense.

The lower unit should be assembled in three stages. First, glue up



Carefully saw out the lower case scroll. Clean up band saw marks on the scroll with a variety of chisels, rasps and sandpaper. (Be sure to drill the mortises for the turned drops before you glue this scroll in place.)



Dry-assemble the front and back panels and double-check the lengths of the drawer runners and kicker strips (including tenons where needed) before sawing them out. Remember: "measure twice, cut once."



Each of the drawer runners needs complementary drawer guides to keep the drawers aligned on the runner. In the case of this project, the author chose to add these components after the case was assembled.

the very simple back assembly, taking pains to ensure that the panel is square and that the posts at the top of the back legs lie in the same plane. You can check this by laying the back assembly on a flat surface, like a workbench — and it is essential that you make this check, because a back panel that is not truly flat will impart a twist to the unit of which it will later become a part. Then glue up the front of the lower unit, making the same flatness and squareness checks that you made in the case of the back panel. Gluing up these two subassemblies is a pretty straightforward process. The next one, however, is much more challenging.



The author used full-size turning tools to create the classic drop details on the lower case. He carved the details using a skew.

Before you can join the front and back panels, you must lay out, cut, and fit all the mortises for the drawer runners because these must be glued into place at the same time you glue the end panels into place.

When you glue the two end panels into place, you must — at the same time — glue into place all the drawer runners, as well as the kicker strip for the top drawer. Although I accomplished this glue-up working alone, it was a harrowing process, and I recommend that you have help because there are so many parts to glue up and fit simultaneously.

Once you have glued the front and back panels to the end panels and installed the many drawer runners, carefully check the alignment of the lower case before you allow it to dry. First, check to see that the front panel is exactly perpendicular to each of the side panels. You can do this with a framing square or by measuring diagonals. Then check to see that the four feet all touch the floor at the same time. You can make some corrections by racking the uncured frame, but any racking correction you make will necessarily create some slight gaps in joinery.

Finishing Touches

The drawer guides and knee blocks are the final steps in the construction of the lower case.

The knee blocks — which allow you to complete the lines of the leg knees — are glued to both sides of each leg at the knees, with the exception of the back sides of the two back legs which are left without knee blocks.

Like the cabriole legs to which they're joined, these blocks are bandsawn in two adjacent planes, then finished with hand tools. I do the preliminary hand tool work with the knee block screwed to a bit of vise-held scrap. I then glue and press-fit the knee block into place. After waiting for an hour, I go back to that knee block and fair it into the leg's knee with a paring chisel and sandpaper.



Like the cabriole legs, the knee blocks are bandsawn in two adjacent faces. The block on the left has been sawn and not carved.

The various drawer guides should be glued to the sides of the drawer runners at this time. Because it involves so many clamps, it looks much more complicated than it is.

Once you've got all that done, take a deep breath, because next issue we'll move on to the drawers and the upper section of the highboy.

Kerry Pierce is an Ohio woodworker, wood scrounger, author of several woodworking books and frequent contributor to Woodworker's Journal.

Rich and Well Worth It

By Rob Johnstone with Tim Knight

Highly figured Black Walnut has long held the preeminent place in the pantheon of domestic hardwoods, which is just where it belongs.



One day many years ago, a regular customer — we'll call him "Harvey" to protect the guilty — came into my father's cabinet shop with a production woodworking job. A local bank needed about 60 blocks of black walnut machined to hold brass name plaques for its big muckety-mucks. As I understood the job, it required slicing up 10/4 walnut lumber into a fairly complex geometry, sanding them mirror smooth and then routing a recess for the brass plaque. A good quality sealer, followed by a clear coat (we sprayed nitrocellulous lacquer) would finish up the name plaques. We also needed to glue green felt to the bottoms of the blocks to protect the banker's desks — very classy! For such small pieces, they turned out to be ridiculously expensive, and I held out slim hope of landing the job as I called and gave Harvey our bid. To my surprise, the only question he had was: "How soon can you get them done?"

Times were lean, so my answer was, "Right away," and I proceeded to work straight through the weekend, in order to prevent Harvey from thinking over the price and possibly changing his mind.

I was lucky and the lumber that I ordered was revealed to be exceptionally beautiful as it came out of the planer. On occasion, black walnut can be a bit gray and lack figure — but this stock was richly colored with myriad reds and browns blended together in a curvaceous grain pattern. I could not have been more proud of the finished pieces as I handed them over to Harvey early in the next week. And he was frankly impressed, not a common reaction in the "just get it done" world of production woodworking.

To my surprise, the following morning as I got to work, Harvey was waiting for me and all the name blocks were in boxes by the front door. I felt my stomach go a little queasy.

"Is there a problem with the job," I asked?

"Not really a problem; the customer wants some additional finishing," he said, not making eye contact. "They want them painted chocolate brown ..."



Photo by Norbert Frank, University of West Hungary, Bugwood.org



Black walnut trees grow in fertile soil. When forming, their nuts are encased in a sticky green husk. When the nuts are ripe, handling the husks will stain your fingers purple.



Kerry Pierce's classic highboy (page 38) is constructed from some stunning black walnut lumber.

As Harvey related the long, sad story to me later, it turned out that the designer in charge of the office makeover thought the clear-finished walnut was too old-fashioned looking. So he came up with the brown enamel as a means to "save the day."

Grudgingly, and for an extra couple of hundred dollars (which I think came out of poor Harvey's pocket), I sprayed a nice, smooth coat of brown paint over that stunningly beautiful walnut. But I must say that I was not at all proud of the product as I handed them over for delivery this time around.

Easy and Beautiful

Black walnut is a great wood to work with, so much so that it is hard to know which characteristic to like more — its beauty or its workability. It is fairly common, and good quality black walnut lumber is not hard to find. With that said, there is no getting around the fact that you will pay more for walnut than for other domestic hardwoods. For that reason, some woodworkers treat it more like a rare exotic lumber — saving it for accent pieces or small components in a bigger piece.

I like to finish black walnut with a clear finish, and I think it looks especially good with a rubbed oil finish — like a natural Watco oil. If you run into walnut that has a grayish cast (I find this often in the cathedral grain of plainsawn walnut), try sprucing it up with a bit of thinned cherry-colored oil stain. I find that this adds life to an otherwise dead-looking patch of wood.

If you have never worked with walnut, I'd encourage you to save your money and give it a try — just leave the brown paint in the can!



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Juglans nigra

Black walnut, also known as Eastern black walnut and American walnut, occurs in small groves in well-drained but moist and fertile alluvial soils throughout the Eastern United States. The tree naturally occurs throughout the East and Midwest except in the Mississippi Valley and Delta and the sandy coastal plain of the Southern United States. Since the tree most often occupied fertile soils, early settlers keyed on the walnut groves as indicators of the best soil for farming. Black walnut may grow as tall as 75 to 100 feet and two to four feet in diameter and grows well from planting zones 5 to 8; however, the highest concentration of quality trees are in the Midwestern states. It is intolerant of shade and protects itself from competition by emitting a chemical concentrate known as Juglone which inhibits growth in a number of plants. Juglone is found in all parts of the tree, but the highest concentrations are in the roots. The pollen and sawdust of black walnut is known as a strong allergen and can adversely affect horses and dogs if the sawdust is used as bedding material, so dispose of black walnut sawdust carefully.

The USDA's Silvics of North America calls the black walnut "one of the scarcest and most coveted native hardwoods." Black walnut was the wood of choice for fine furniture manufactured in the United States until the late 18th century. The wood was used extensively for gunstocks and furniture, but with increased demand it is now most often cut into veneer. The popularity of black walnut led to its eventual decline. The best and straightest of trees were harvested, leaving only the short and limb-laden trees to carry on the gene pool. Research was begun in the mid 20th century to select better trees for replanting, and the better quality trees are once again available. The edible nut of black walnut is widely known, but surprisingly, the shells of walnuts are widely used as well. During World War II, airplane pistons were cleaned using ground walnut shell blasted against the pistons using high air pressure.

The tree has been planted in other areas of the country for nut production. However, planting them beyond their native range has led to problems with disease and insects.

—T. C. Knight
Silviculturist
Oden, Arkansas



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The Model 1040VR from Apollo Sprayers is the first in a new class of HVLP Turbines, and offers a variety of exclusive features. An LED readout indicates when optimum pressure for the project is reached. The new Precision Pressure speed control, an internal computer chip that controls motor speed, and a Filter Warning Light are three of the model's precision attributes. This product is also equipped with the Handi-Hold™ Spray Gun Docking Station. The Apollo 1040VR Turbine is priced at $1,499. Info on this product: *www.hvlp.com.*

The new line of DELTA® premium saw blades features blades ranging in diameter from 10 to 12 inches with an additional five blades measuring 220 to 300 millimeters for a variety of materials including hardwoods and synthetic surfaces. The DELTA premium full-kerf woodworking saw blades are precision-engineered for a variety of applications and materials in today's woodshop. The line includes 16 premium saw blade configurations, which range in price from $69 to $125 depending on functionality, tooth count and application. Info on this product: *www.deltaportercable.com.*



R.G. Jig Co.'s improved version of its Mortise Pal includes new features such as increased stock capability, improved chip extraction, more efficient locking knob and all-metal clamping knob. While maintaining the simplicity and ease of the original, the new version includes a two-piece template guide bushing and four mortising templates that can be overlapped and adjusted to any length. The Mortising Jig Kit is sold for $189 and is only available through their website. Info on this product: *www.mortisepal.com.*





Level Best is a unique tool that allows the user to read level and square at the same time! Available in 12" and 6" squares. Perfect for everything from installing windows to hanging the perfect picture! The tools are available in your local Ace or True Value stores for $14.99 and $9.99 respectively. They are also available on their website for $19.95 and $12.95 respectively. Info on this product: *www.levelbest2.com.*

The new RIKON 12" Planer/Jointer Combo Model 25-200 has a 2¼" diameter cutterhead with three knives and spins at 4,700 RPM to deliver 14,100 cuts per minute. Its 3hp induction motor provides plenty of power for the 12" x 8" capacities and a maximum 1/8" depth of cut. Other features include a solid steel cabinet, easy change from jointer to planer, quick lever infeed table height adjustment and compact design. The tool will be available in November, priced at $1,999.99 (with 2-year warranty). Info on this product: *www.rikontools.com.*



The new Clamp Edge WT™ series of Straight Edge Clamps from BORA™ comes in 4 sizes — ideal for all types of woodworking, cabinetmaking, and D.I.Y applications. These multi-purpose straight edge clamps boast many unique features, including increased clamping pressure, more flexibility for the user, and an aircraft grade extruded aluminum body for straight, accurate cuts. The Clamp Edge WT series starts at $48. Info on this product at *www.affinitytool.com.*





Bosch's BNS200-18 Brad Nailer is one of seven new pneumatic fastening tools utilizing Bosch's patented high-efficiency air chamber design. Dubbed Full Force Technology, the innovative system enables engineers to minimize the size of the air chamber and vastly improve line-of-sight and balance while also maximizing performance. The BNS200-18 is priced at $129.99. Info on this product: *www.boschtools.com.*

BESSEY® EZS One Hand Clamp offers high-end clamping force at standard clamp prices. It has been engineered to be user-friendly, with large, lightweight and comfortable handles. These flexible clamps have the strength to manage 445 lbs of force and a strength-to-weight ratio that is arguably the best in the market. Pricing starts at $19.99. Info at *www.besseytools.com.*



Woodworker's Journal Product EXPO Special



The new Oneida Air Systems Super Dust Deputy Cyclonic Retrofit can transform your inefficient single stage or two-stage collector into a high efficiency cyclonic collector using your existing blower. It includes a high efficiency cyclone with a 5" inlet that separates 98% of the wood waste before the filter and collects it in a 30 gallon metal drum with reduced filter maintenance and no dusty bags to empty. It has a compact footprint and is simple to install. The Super Dust Deputy is priced at $289. Info on this product: *www.oneida-air.com.*

The new Stanley®-Bostitch® BT1855K Brad Nailer weighs only 2.7 pounds and accepts standard 18 gauge brad nails between 5/8" and 2⅛" long. The unit's weight and balance maximize comfort and minimize fatigue. The oil-free design eliminates the need for regular maintenance. This product also features Dial-A-Depth® technology for setting nails to precise depths without adjusting compressor settings. The Kit sells for $99, and includes a case, 1,000 brad nails, hex wrench, and manual. Info on this product: *www.bostitch.com.*



PETRI GEL Polyfinish has become a favorite, easy-to-use finish for woodworkers of all kinds. Its gel format lets a hobbyist, cabinetmaker or high-end restoration pro get a hand-rubbed heirloom finish with just a paper towel. Simply rub it on and buff off the excess and your results are a perfect finish without drips or runs and no worries about dust or blemishes – just a beautiful finish that you can be proud of. Info on this product: *www.petripaint.com.*





SUNHEAT® Infra Red heating systems effectively heat your home from floor to ceiling. Units are rated to heat 1,000 square feet as a supplementary heat source. These heaters operate virtually maintenance free! By using individually controlled units, the SUNHEAT system provides heat only where and when it is needed. Since the air mixes at ground level, floors stay warmer longer. This also means the temperatures from floor-to-ceiling and wall-to-wall will never vary more than 2° Fahrenheit. SUNHEAT's unique concept means the infrared heater can be operated without the worry of starting a fire. Despite generating tremendous heat, the cabinet stays cool to the touch. Safe for children and pets. Does not take the oxygen out of the air. Info on this product: *www.sunheat.com.*



Woodline USA's newest product, the DadoMax™, is a device for making perfect fitting dados with a router. Just place the body of the DadoMax over the edge of the board to be inserted and dial the adjustment to desired fit. A unique feature is the adjustable Run Out Compensator™ that allows the device to compensate for under or oversized bits or routers with excessive runout. Adjust it once and it's ready to go! Priced at $109.95, including an industry standard 13/16" brass bushing and deluxe aluminum carrying case. Info on this product: *www.woodline.com.*

Western Dovetail produces custom-made dovetail drawers for woodworkers around the world. Drawers are made to order in any species, size, and with any number of details. Jobs are priced by quotation only once the customer has prepared a list. Drawer prices range from as little as $25 for a basic drawer to as much as $500 for a custom curved drawer. Western Dovetail can produce basic drawers for kitchens or bathrooms, or highly customized drawers dovetailed at different angles. The latest innovations include curved front drawers and automated opening systems such as the Blum Servo drive. Info on this product: *www.westerndovetail.com.*





Rockler's Bench Cookies provide a simple, safe and convenient way to secure and elevate projects without the need for clamps. These unique, non-slip discs draw their holding power from two high-friction rubber pads. One pad grabs the work surface and the other grips the work piece, producing easy access to all edges and a stable base to keep parts from shifting. Rockler Bench Cookies (item 26357) are sold in packs of four at $11.99 and are available at Rockler Woodworking and Hardware stores nationwide, Rockler.com or through the Rockler catalog.
More info on this product is available at *www.rockler.com.*



CHECK OUT MORE JOURNAL COVERAGE OF COOL NEW PRODUCTS FEATURED AT THE AWFS SHOW THIS PAST JULY AT *AWFSBLOG.com*

Mid-sized Benchtop Lathes

By Chris Marshall



Woodturning is a pleasant departure from our usual "straight and square" woodworking. But maybe you're not ready to drop a grand or more into a full-sized lathe to get started. Thanks to these mid-sized benchtop lathes (often called "midis"), you don't have to. All four machines I tested here are capable of turning objects up to about 12" in diameter as well as spindles up to 16" to 20" long. Cast-iron beds and other components, combined with 1/2 to 1 hp motors, make them well suited for most general turning needs.

This small test group represents the "cream" of a much larger crop of benchtop lathes, because they have electronic variable speed control. It's a worthy convenience: you can change the spindle speed instantly at the turn of a dial, within three or six pulley ranges, instead of being limited to a few fixed speeds and frequent belt changes with other entry-level lathes.

These four also have 12- or 24-position indexed heads, intended to lock the spindle incrementally for fluting, routing, drilling or carving with a workpiece mounted in the lathe. Other shared features include #2 Morse taper headstocks that accept universal spur and live centers (both are included). The headstock spindles are threaded 1" x 8 tpi for standard faceplates — a 3" size comes standard — or

www.woodworkersjournal.com QUIK-LINK **Quik-Link takes you directly to the web page on which these products appear! No navigation necessary ... just go to *www.woodworkersjournal.com* and click on the Quik-Link tab.**





Delta provides up-front, easy access to the drive belt and pulleys. Flip a single tension lever, and you're back up and running again.



Tame unruly end-grain sanding by shifting the motor into reverse. It's a feature unique to this machine — and a nice one at that!

aftermarket multi-jaw chucks. All have self-ejecting tailstock quills to make live centers easy to remove.

If you're ready for serious turning without shelling out for a full-sized machine, one of these top-shelf spin meisters could be the perfect fit.

Delta 46-460

To put the lathes to work, I turned 16"-long hardwood spindles and 9"-diameter bowl blanks. Delta's burly 1 hp motor — the largest of the test group — tackled those challenges easily. A bunch of other good details made testing the 46-460 downright fun! First off, shifting the tool's belt into three speed ranges was easy, using a lever that both tensions and locks the belt. The job requires two levers on other lathes. Both the tailstock and tool-rest bracket handles are long and overmolded with soft rubber, so they're comfortable to lock down securely. Delta provides a 6" tool-rest for tackling tight-quarter operations and a 10" rest for longer work; you'll use them both often. Every lathe should come with these two sizes. Not all do.

Once underway, power delivery was smooth and steady up through the speed ranges, with no noticeable vibration or noise. But the best feature came into play once the chips were done flying: this lathe has a reverse mode that's perfect for sanding. A common problem when sanding a turning is that end grain tends to lie down in the opposite direction. Cleaning up that stubble is a pain, but not with the Delta. Just flip the motor into

DELTA 46-460 $599

Motor size: 1 hp, 110 volts
Swing: 12½" over bed; 9" over rest
Distance between centers: 16½"
Speed range: 250-4,000 rpm
Weight: 97 lbs
www.deltaportercable.com
(800) 223-7278

New Models, Supply Shortages Miss Test

Several brand-new variable-speed midis weren't available for us in time for testing, but they're coming to market in the next few months or even sooner. We're eager to see them when they do! Planning to wait a spell before buying? Then be sure to check out the new Turncrafter 12 Midi Lathe from Penn State Industries (pennstateind.com). It should sell for around $399.95, plus shipping, and be available in late fall. Steel City *(steelcitytoolworks.com)* recently unveiled a new variable-speed midi with a granite bed and headstock — Model 60170G — which sells for $369, plus shipping. Inventory shortages at Grizzly Industrial *(grizzly.com)* prevented their new G0658 12" x 20" lathe from making our test group in mid summer, but that lathe is available now for $375 plus shipping.









Digital readout (above) and a swiveling headstock for outboard turning (below) make General's 25-200 lathe versatile and precise.



GENERAL INTERNATIONAL **25-200 Maxi-Lathe VS+ $719***

Motor size: 3/4 hp, 110 volts
Swing: 12" or 19¼" over beds; 9¼" or 16⅝" over rests
Distance between centers: 17⅝"
Speed range: 400-3,800 rpm
Weight: 146 lbs
www.general.ca (514) 326-1161
*Price at time of testing

reverse to whisk it away. Aside from one minor gripe — the lathe's long plastic belt cover seems flimsy — here's a solid value for the money.

General International 25-200

At the time of testing, General's 25-200 Maxi-Lathe VS+ was priced at $719, the spendiest of these tools. Sources at the company tell me the price may increase some in the future, depending on the value of the dollar. Still, I think the cost is fair, because this lathe has goodies that make it worth its steeper pricetag.

For one, it's at least 50 lbs heavier than others — and extra cast-iron is *always* a benefit for lathes. Mass soaks up vibration, which translates into smoother, steadier cuts. A heavy lathe is also less prone to do the jitterbug across your bench.

Inboard, this lathe offers comparable swing (meaning the largest diameter you can turn) to the competition, but there's a twist: you can unlock the headstock and spin it around to do larger outboard turnings. That function adds another 7" or so of capacity for turning bowls up to 16⅝" round. The lathe comes with a bed extension and longer tool-rest post to accommodate this outboard work. I tried the rig out on a 13"-diameter blank with good results. The tool-rest base was a little tricky to tighten down, but the lathe was stable otherwise and worked fine.

This machine has digital readout, so you can determine precise speed settings. The 3/4 hp motor is located high on the headstock instead of under the bed to enable the swiveling function. That placement also keeps the motor clear of debris, shortens the drive belt for improved power transfer and makes the belt easy to change. All nice plusses. I wish the pulley door had a quality latch instead of a Phillips screw, though.

If you're interested in turning huge bowls, give the 25-200 Maxi-Lathe VS+ a much closer look.

Tool Review continues on page 54 ...

Changing Speeds Manually Saves Bucks

If you're willing to pass on electronic variable speed and trade a few features or inches of swing capacity for a lower sticker price, there are many other mid-sized benchtop lathes from which to choose. A quick count uncovered at least 10 machines from leading manufacturers, including General International, Grizzly, JET, Steel City, Rikon and Rockler. Prices start at around $200. These lathes typically have 1/2 or 3/4 hp motors and offer five or six pulley speeds, but you'll need to move the belt to switch between them. Distance between centers is comparable to the test group.



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JET JWL-1220VS

The manual-speed brother of this lathe has been around for years. It's probably the most popular first lathe for new turners, with good reason: here's a proven tool with sturdy components, two tool-rest sizes and enough power to get modest-sized turnings done right. It's also the only one with carry handles to make the machine reasonably portable. After repeatedly hulking these machines on and off my bench, trust me: the handles are worth their weight in gold. The rest of this test group should come with handles, too.

Adding variable speed control makes this "steady Eddie" lathe even more convenient, and I love the on-board worklight and both 6" and 10" tool-rest sizes. But, I have two concerns about the speed control box. It's hinged to double as the bottom pulley-access door. The steel clip latch was finicky to adjust, so the box either wouldn't stay closed or was too tight to open. It just needs a better latch. Second, lathes can be dangerous, especially to a curious child. The basic toggle switch that powers up this tool has no lockout provision. A safety switch would be a sensible improvement.

All in all, this JET is a respectable tool, but it falls a little short on some important features.

Rikon 70-200EVS

Brand-new to market, Rikon's 70-200EVS lathe seems thoughtfully engineered and ready to take the competition to task with a couple of impressive features. First, it is outfitted with a 1/2 hp AC motor, controlled by a variable frequency drive inverter. Rikon tells me that this sophisticated controller adjusts line frequency to help reduce electrical and mechanical stress at startup. It also provides soft start, monitors torque output and helps the motor run cooler. In testing, the motor purred like a kitten and ran noticeably cooler than the rest. In fact, it barely warmed up to the touch, while the other lathe motors became really toasty. Since heat is a motor's undoing, I imagine this inverter will extend the motor's service life, which means good return on investment over time.

Motor controls aside, the 70-200EVS sports four bearings in the headstock instead of two, to help spread out spindle loads and keep things spinning smoothly. In an effort to combat creeping along the bed, Rikon designed the tailstock's sole several inches longer than the other machines. It locked down like a vise. I appreciated the 8" tool-rest provided here, as well as the push-button kill switch. A safety lock-out would make that even better.

During testing, the lathe powered through my turnings. But, moving the belt's position to different speed ranges would have been easier if the doors had a latch instead of an Allen bolt. I also noticed that chips accumulate on top of the motor and inverter box, and they're tougher to clean out of the narrow bed slot.





Carry handles make it much easier to tote this lathe off-site or on and off your benchtop.

JET JWL-1220VS $599.99

Motor size: 3/4 hp, 110 volts
Swing: 12" over bed; 9⅜" over rest
Distance between centers: 20"
Speed range: 200-4,300 rpm
Weight: 106 lbs
www.wmhtoolgroup.com
(800) 274-6848



When spur and live centers line up, it's a good indication that spindles will turn on one axis. JET's accuracy was spot-on in this regard.



JET (and Delta) provide both 6" and 10" tool-rests — a beneficial combination for working in either tight quarters or on long spindles.





Rikon's tailstock sole (above right) is longer than others to combat creeping. Its indexed head (below) expands your machining options.



RIKON 70-200EVS $699.99

Motor size: 1/2 hp, 110 volts
Swing: 12" over bed; 9½" over rest
Distance between centers: 16"
Speed range: 400-3,850 rpm
Weight: 86 lbs
www.rikontools.com (877) 884-5167

At day's end, I think Rikon has a promising new lathe here, right out of the starting gate. It's top dollar, but the inverter and extra bearings may just help ensure that you eventually will be able to pass this fine tool on to your grandkids.

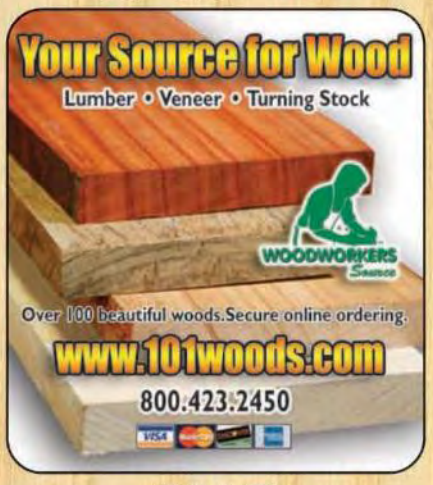
"Best Bet" Honors Deserved

There were no sour lemons in this group: all four lathes would be welcomed shop additions. But there are substantive differences in features and price that set these tools apart for me. My pick for best all-around machine goes to Delta. It's got nice creature comforts, reverse mode and a big motor — all priced modestly for a budget.

Chris Marshall is Woodworker's Journal's *field editor.*

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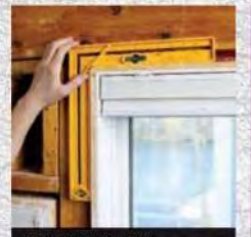
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Green Finishing:

How Green is YOUR Finish?

By Michael Dresdner

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Green is a popular term these days, used to mean any thing or process that is less damaging to our environment, and ultimately to us. In the finishing world, that entails two very different concepts: green finishes, which are those finishing materials deemed to be either personally or environmentally greener, and green finishing, which deals not with the finishes, but the finishing process.

Since either can give us a healthier environment, I'll talk about both, beginning with green finishes. You should know, though, that the second alternative — green finishing — is a much simpler and cheaper way to go green. It allows us to continue using all the finishes we currently like and still make an impact, and quite possibly the largest impact of all.

Green Finishes

The simple definition of a green finish is one that has a more benign chemical profile than the traditional finish it is designed to replace. What makes them green varies with whoever is labeling them as such. Like beauty, green is often in the eye of the beholder.

For instance, one company I spoke with was dedicated to reducing or eliminating formaldehyde in their formulas. Although the EPA does not restrict formaldehyde as either a VOC or a HAP (see *sidebar* on page 59), it is believed to be a sensitizer that can cause allergic reactions similar to flu symptoms in some people. Others seem unaffected by it. Nevertheless, OSHA, which is concerned not with the environment but with the personal safety of factory workers, has put restrictions on how much formaldehyde they may be exposed to. As a result, the coatings industry has been voluntarily reducing it in their formulas.

Finishing continues on page 60 ...

What's a VOC, What's a HAP... and Why Should I Care?

In the alphabet-soup world of finishing, the acronyms VOC and HAP stand for Volatile Organic Compound and Hazardous Air Pollutant respectively. The term "organic" in the chemical world means that it is based on tetravalent carbon. For finishing, organic solvents are those that contain carbon, which is just about everything other than water. Volatile simply means they will evaporate at standard temperature and pressure.

Since not all VOCs are hazardous, and since not all hazardous materials are VOCs, the term HAP picks up those things that fall in that murky area. As far as finishing materials are concerned, the two are typically measured together, and with only a few exceptions, are one and the same.

Why are They a Concern?

Specifically, VOCs were found to be ozone generators. When exposed to sunlight, VOCs in the air form ozone, which is an ingredient of smog. The problem is that not all VOCs are ozone generators. Some are not, and even among those that are, some are very slow or weak ozone formers while some are very fast or strong ones. Thus, not all VOCs are created equal.

Because of that, some volatile organic compounds which do not generate ozone have been declared exempt. That means that even though they are VOCs by definition, they are not legally regarded as VOCs as far as coatings and strippers are concerned. Acetone, methylene chloride, methyl acetate and parachlorobenzotrifluoride (PCBTF), which was originally marketed under the trade name Oxsol 100, are all examples of exempt VOCs. Thus, you can buy zero VOC lacquer that is 75 percent volatile organic compound solvent, yet is legally free of VOCs. In this case, the solvent is usually a mixture of acetone and PCBTF.

How are They Different?

The issue with VOCs, as far as the EPA is concerned, has to do with whether or not they generate ozone. It's that simple and that specific. HAPs, on the other hand, focus on hazard to both humans and the environment. As you can see, it is a much broader term.

That said, there are VOCs which may be hazardous to the environment as ozone generators, but not hazardous to humans, and vice versa. For example, methylene chloride, the main ingredient in many paint removers, is not considered a VOC because it is not an ozone generator. Thus, the EPA allows it in formulations without penalty. However, it is harmful to humans, and if you use it, you must take the appropriate safety precautions. Thus, it is a HAP but not a VOC.

Acetone, on the other hand, is not an ozone generator either, nor is it considered by the EPA to be particularly harmful. It is neither carcinogenic nor does it appear to cause any other serious illness. For that reason, the EPA sees it as neither a VOC nor a HAP.

That does not mean there is no danger connected to it. Acetone, like many other ketones, is very flammable, so it is a fire hazard. In contrast, methylene chloride is nonflammable — so nonflammable, in fact, that you can add it to flammable compounds to make them nonflammable.

Isoparaffins, the ingredients in "odorless" mineral spirits, are a good example of a third category. They are ozone generators, but are not particularly hazardous to humans. Thus, they are restricted by the EPA, but generally do not require extreme handling cautions.



Some finishes, like shellac, are green by their very nature. Others contain varying amounts of VOCs and HAPs — the sidebar above explains what that means to the average woodworker.



Because there is no universal standard, some finish manufacturers, such as UGL, have created their own internal definitions as to what an environmentally sound finish is. This allows consumers to understand exactly what the company means by "green."

Another company formulates their coatings to eliminate anything that might cause any allergic reaction in sensitive people. To that end, they not only reduce VOCs and HAPs, but also other compounds, even inorganic ones, that could cause a reaction. (See *sidebar*, previous page.) Several companies, in fact, insist they make or sell products that have the least adverse effects on human health and the health of the planet: two concepts that sound good but whose meanings are clearly open to debate. Still others use the term green to mean low VOC coatings, while another group of companies use it to mean coatings made from natural materials, irrelevant of the VOC content.

Let's look at a few common coatings and see how they stack up. I've listed them more or less from greenest to least green, but be warned: this is not a simple yardstick but rather a complex equation. In many cases, it is a judgment call as to which is really greener, and in some cases we are reduced to splitting hairs. The good news is that no matter what type of coating you like to use, there is probably a greener version of it.

Traditionally Green Finishes

Some coatings are, and have always been, surprisingly green. Milk paint, for example, contains no VOCs or HAPs and is made of completely natural and sustainable ingredients. Natural oils, such as pure linseed oil and pure tung oil, also fall into this category. Waxes, at least in their solid state, also qualify, since most of the ones we use are either plant waxes, like carnauba and candelilla, or insect waxes, like beeswax and shellac wax. However, most paste waxes, the ones that come in tins, contain some VOC solvent to make them softer and easier to apply.

Finishing continues on page 62 ...

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Just because a finish is called "water-based" does not mean it is solvent free. Are water-based products greener than others?

Shellac is another natural, insect-made product that has a very favorable profile. The resin itself is not only renewable, but so harmless as to be edible. The most common solvent for it is ethanol, or grain alcohol, the same alcohol that appears in beer, wine and hard liquor. While ethanol is technically a VOC, it is a slow enough ozone generator that many contend it should be made exempt. In any case, it is relatively safe for the finisher, who at worst runs the risk of becoming inebriated from huffing too many fumes.

Ultra Low and Zero VOC Coatings

Nitrocellulose lacquer, long the darling of furniture manufacturers, contains about 75% solvent, almost all of which is both a VOC and a HAP. Several strategies have emerged to lower that number, sometimes to zero. You can now buy zero VOC lacquer, which oddly enough still contains about 75% solvent. The difference is that it is formulated with exempt VOCs, meaning those that are not ozone generators. Typically, the solvent package is a mixture of parachlorobenzotrifluoride (PCBTF) and acetone, the latter of which appears less harmful to us than some of the solvents it replaces. Thus, zero VOC lacquer may actually be safer to use, not just less ozone generating.

A totally different approach, and one that works particularly well with two-part cross-linking coatings (a specific chemical formulation), is to raise the solids and lower the solvent level. These so-called ultra-high solids coatings can range from 85% solids to almost 100% solids, the latter containing little or no solvent whatsoever. Typically, these are either chemically cured polyesters or UV cured acrylics and polyesters. Most are designed to be sprayed and are sold only to the industry, not to hobby woodworkers.

Even at that, their safety is a bit of a mixed bag. While they contain almost no VOCs, they carry dangers to the workers indoors. That's because they often emit free monomers that are hazardous. Monomers are resins, not solvents, but the molecule is so small that it can become airborne, and thus can be breathed in. As a result, those who use such coatings generally suit up in hooded coveralls with clean air pumped in to the hood.

Water-based Coatings

Contrary to popular belief, water-based coatings are not water-soluble, nor do they contain water-soluble resins. That's a good thing. If they did, you would be able to remove any evaporative water-based finish with water after it dried. Imagine wiping a counter with a wet sponge and having the finish wipe off. If not water-soluble, then what are they?

Water-based coatings are those in which some of the solvents of a traditional coating have been replaced with water. Almost any type of coating can be made water-based; there are water-based lacquers, shellacs, polyurethanes, one and two-part cross-linking coatings, and even water-based UV cured coatings.

Water-based does not mean that the coating contains no solvents. It merely means some of the solvent has been replaced by water. The majority of clear water-based finishes contain glycol ethers, all of which are considered VOCs. While some are quite harmless, others are hazardous to humans, including a very common one, EB (sold under the trade name Butyl Cellosolve), which is believed to be a teratogen (a substance that can cause birth defects). Water-based polyurethanes typically contain n-methyl-2-pyrollidone (NMP) or gamma butyrolactone (BLO) as well as glycol ethers, both of which are also considered VOCs and HAPs.

Finishing continues on page 64 ...

Formaldehyde in Finish



For the record, formaldehyde shows up in only one group of finishes we woodworkers use: the so-called catalyzed and pre-cat lacquers and conversion varnishes. It is not in shellac, lacquer, oil varnish, water-based lacquers, oil- or water-based polyurethane or even two-part automotive polyurethanes or polyesters.

Cabinetmakers who use catalyzed finishes are justifiably concerned about their workers and generally insist they wear protective gear when spraying these finishes. However, there is little concern about the end-user of the finished product. That's because the formaldehyde dissipates within a month. By the time it comes into your home, it is no longer offgassing formaldehyde.

It's worth noting that some interior plywood offgasses formaldehyde, depending on the type of glue used. Sealing the plywood with a film-forming finish blocks its release. Thus, while one type of finish can release formaldehyde, almost any other finish can block it.

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Another chapter in the green finishing story is the new focus on nontoxic paints. There is an ever-expanding list of products available for both interior and exterior use.

Still, water-based coatings contain far lower amounts of VOCs than their solvent-based counterparts. For example, a typical nitrocellulose lacquer will contain upwards of 75% solvent, most of which is VOCs, while its water-based counterpart will contain only 10% or less. There are even zero VOC water-based coatings.

Pros and Cons

Although water-based coatings are lower in VOCs, clear water-based finishes are also a bit weaker. For instance, water-based polyurethane has about the same abrasion resistance as oil-based, but it has lower solvent, chemical and heat resistance. One could make the argument that if the finish does not hold up as long and you must refinish more often, the extra solvent involved in early refinishing offsets any savings you made initially. Of course, refinishing also means more time and money spent. But there is a way around that. More and more, single-component, self-curing water-based coatings are being offered to kitchen cabinetmakers, and they match oil-based polyurethanes in durability. They've long been offered as floor finishes and are slowly becoming more popular for furniture as well.

While water-based coatings are generally considered greener, there are aspects to them that make them less green, at least in some minds. The resins used in water-based coatings are typically synthesized from petroleum, a nonrenewable resource that has a fairly high carbon footprint, thanks to the energy needed to extract and ship it. By contrast, the resins in oil-based varnish and polyurethane are made from modified linseed, tung or soy oil, all renewable-source plant oils grown right here in the U.S. The tradeoff is natural, renewable, local resins with a higher

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Beeswax, often sold and used as a solid block of wax, is a very green finish. Even mixed paste waxes are fairly green, usually containing limited amounts of VOC solvents.

dose of VOC solvents versus synthetic, foreign imported petroleum-derived resins with a lower dose of VOC solvents. As I said, this is not an easy equation.

Oil-Based Coatings

Danish oil, teak oil, spar varnish and the whole field of oil-based varnishes and polyurethanes, both liquid and gel, make up the next category. In general, these finishes are relatively safer for us than for the environment. They contain ozone-generating VOC solvents, and thus are not good for the environment. However, the ones they contain, such as mineral spirits, are fairly safe for us, at least in the limited amounts to which we are exposed. Their high solids content, often 45% or so, means what solvents they do contain are in more limited amounts than what you would find in lacquer, for example.

Although the solvents are petroleum-based, the resin portion is made from natural seed oils, usually linseed, soya or tung. Such oils are renewable crops grown here in the U.S., and they require little processing to go from raw oil to resin. What's better is that these coatings are almost never sprayed, but rather are applied either by brush, or by wiping on and off, as in the case of Danish oils and gel polyurethanes. Those application methods have a very high transfer efficiency (see "Waste Not, Want Not" below right), which means very little is wasted and only a minimum of solvent is used.

Traditional Lacquer, Etc.

Traditional lacquer contains lots of VOCs and HAPs, some of which are not only strong ozone generators but are harmful to humans as well. These solvents are also usually quite flammable, providing yet another safety issue. What is worse is that they are typically formulated for spraying, a very wasteful application process that not only wastes coating, but also uses up a lot more solvent in both thinning and cleanup. Catalyzed lacquer, conversion varnish and pre-cat lacquer have all of the above disadvantages and may contain formaldehyde and hazardous acids as well. For that reason, these coatings are considered the least green option.

Steps Toward Green Finishing

I promised you that there is an easier, cheaper alternative that lets you use nearly any finish and still come out greener. It's called green finishing. The good news is that by slightly changing the way you use finishes, you can be greener and save money to boot. Green finishing employs two means to lower VOCs: reducing waste, often through low-tech application, and recycling solvents.

Waste Not, Want Not

The first step in reducing waste is to buy wisely. In other words, try to buy only the amount of finish you need for the job. Too often, leftover finish ends up crusting over or otherwise going bad and gets thrown away. That does neither the environment nor your pocketbook any favors.

A less obvious way to reduce waste is to choose an application method with a high transfer efficiency. Transfer efficiency is the percentage of the finish you buy that actually ends up on the wood. Most standard spray guns have about a 25% transfer efficiency, meaning about 75% of the finish gets wasted, mostly blown out through the spray booth fan or

Finishing continues on page 68 ...

Does My Going Green Really Matter?



If you are not part of the problem, nothing you do differently will make you part of the solution. As far as finishing materials are concerned, most of you are not part of the problem. Most hobby woodworkers go through less than 10 gallons of finish per year. At that rate, switching to water-based finish from solvent or oil-based would be akin to someone who drives only one mile per week trading in his or her car for a hybrid. It's silly and arguably counterproductive as well.

The reality of the situation is that, compared to the big ozone-producing generators, which include our cars, the electricity we use and the agriculture that provides our food, finishing amounts to small potatoes indeed. Some years ago, I was at a meeting of finish chemists being addressed by an EPA representative on the subject of limiting ozone generation from VOCs in coatings. Upon being challenged, the representative admitted that the solvents in clear wood coatings account for less than one percent of the country's total ozone generation problem. In other words, if all wood finishing stopped tomorrow completely, the improvement would barely be measurable and might fall well within a normal margin of error.

With that in mind, it makes little sense for most of us to buy fancy equipment or go through a long learning curve just for the sake of using lower VOC materials. We're far better off adopting green finishing techniques than switching to greener finishes. That strategy not only prevents waste, thus helping our carbon footprint, but saves us money to boot — and in this economy, that's nothing to sneeze at.

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WARRANTY Three year bumper to bumper backed by a fifty-five year old Nebraska Company	Three Year Warranty	Read the warranty. Most parts are limited to one year by some competitors
HEAT 24 oz. copper acting as a heat sync produces more heat than any other 1500 watt infrared heater	More heat	Some have no copper at all. Others only 5.9 to 12 oz. therefore they cannot produce as much heat or hold it as long as the SUNHEAT which makes competitor's models less efficient
FAN Quiet fan with sealed ball bearings with an incredible 80,000 hour life expectancy	Fan twice as quiet as competitor	None twice as quiet - one is 8 decibels quieter, most have a life expectancy of only 20,000 hours
HEAT TUBES 6000 plus hours with heavy duty wiring and a three year guarantee easily replaceable by owner	20,000 hours	Wiring is very thin with life expectancy approx. 5000 hours. Some heaters have only been on the market one year or less.
QUALITY No electronics close to heat exhaust. All high quality heavy duty components and parts. Designed, engineered and guaranteed by a fifty-five year old Nebraska Company. Built in our own factory under watchful eyes and every heater is inspected in the U.S. by trained quality control inspectors	Good Quality	Electronics located close to heat exhaust with light wiring. Contracted out on a low bid basis to factories that do not specialize in building infrared heaters. For most, this is their first season of building infrared heaters and they are not quality controlled inspected in the U.S.

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trapped on the filters. Even those systems that boast higher transfer efficiency, such as HVLP turbine rigs, only reach about 65% transfer efficiency. That's still a lot of waste.

Compare that with a wipe-on gel polyurethane. If you're like me, you apply it with a piece of nylon abrasive pad. One pad will do an entire roomful of furniture without wearing out, and when you are all done, very little remains on the pad to be dried out and thrown away. The waste comes only in how much you wipe off, and with attention, you can keep that to a minimum as well. Since applicators and wiping rags are allowed to dry out, then get thrown away, there is no solvent used for cleanup.

Using a brush to apply finish approaches near 100% transfer efficiency. The only amount of finish that does not make it onto the wood is the tiny bit you must clean out of the brush bristles when you are all done. As for the cleaning solvent, that can be kept to a minimum through recycling.

Recycling Solvents

That brings us to the other way we can be greener no matter what finish and solvent we use. Solvents may not be forever, like diamonds, but they are reusable again and again. The mineral spirits you use to clean your brush or the lacquer thinner you use to clean spray guns can be poured into a lidded container and shelved. Over time, the heavier foreign matter will settle to the bottom. When that happens, decant the clearer liquid atop and reuse it for cleaning the next brush or gun. You will lose some each time to evaporation, but you will be surprised at how much you can reduce your VOC consumption by recycling your cleaning solvents.

By now it should be obvious that by avoiding waste and recycling solvents, you not only reduce your carbon footprint on the earth, but also save money in your wallet. After all, if you are buying fewer cans of finish and solvent, you are coming out ahead in every way.

Michael Dresdner is a nationally known finishing expert and the author of several books on the subject.



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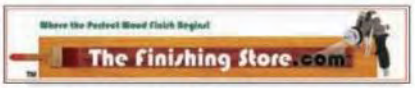
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Cold-Bend™ Lumber

As a woodworker, it's a pretty safe assumption that you work with wood. And you thought you knew it pretty well, right? For instance, you might have a project that would be just perfect if you could twist and bend your wood at just the right angle — but you knew wood just doesn't work that way. Guess what? With *Cold-Bend™ Hardwood Lumber* from **Fluted Beams, LLC**, it does.

Cold-Bend hardwoods are manufactured using an intense thermo-mechanical compression that creates a bellows-like effect at the cellular level, allowing the hardwood to stretch as it bends. This means it can bend into shapes with a thickness up to one-fifth of the board radius (in other words, a 1" board can be bent around a 5" radius circle). It's real hardwood, too, available in 10 domestic species. No chemicals or glues are used in this process, and the Cold-Bend lumber, which comes in thicknesses up to 1¾", looks the same as "regular" versions of maple, walnut, etc. and has the same ability to take finish. Prices vary according to species and dimension selected, with a 15-pound sample pack available in most species for $150.



Rikon's 22" band saw

Once a woodworker has some wood, you'll probably want to machine it. Got a project with large workpieces? **Rikon** has several new band saws out this fall, including the *22" Model 10-380* ready in November. The work surface on this big band saw is 19" x 24⅞", allowing a cutting capacity of 14½" height and 21½" width with the 3hp motor. Guiding those large workpieces is a 5"-tall fence with a resaw bar. The 10-380 also has dual 4" dust ports, a magnetic switch which prevents the saw from turning on until restoration of power in the event of an outage, and cast-iron wheels and trunnion. Its suggested cost is $2,199.99.

Are you ready to rout? If you're working in the kind of shop that sometimes has a car in it — or where you need to put even your big power tools away when you're done — **Skil** has designed some new router tables meant for easy storage, setup and portability. Both the *RAS800 and the RAS900* come pre-assembled with an integrated accessory storage bag and a laminated MDF top. The self-contained structure provides storage for necessary parts like the fence and router bits. Included with the RAS800 are a guard, featherboard, miter gauge and bit inserts; the RAS900 comes with all that plus a tall fence with adjustable laminated MDF faces; dual featherboards, a starter pin and guard for support when routing curved workpieces; a bit height gauge for easier bit setup





Skil's new router tables fold for storage.

and cutting precision, and additional accessory storage compartments. The RAS900 has a quick-release router mount that attaches and detaches in seconds. Suggested price on the RAS800 is $99.99; on the RAS900, it's $150.



Zany Toys *book*

Got kids in your life? *Zany Wooden Toys That Whiz, Spin, Pop and Fly* by Bob Gilsdorf is as fun — maybe more so — for the parents or grandparents as it is for kids with its plans for some traditional and carnival type toys including shooters, launchers, handheld games, a ball-and-socket robot and gumball machines. It's designed in comic book style, with tips for success from the cartoon character toy inventor himself. The book, published by **Fox Chapel**, sells for $19.95.

Dremel, of course, has had rotary tools out before, but they say this fall's *Dremel 4000 rotary tool* is the ultimate in the category. It works with all the accessories for previous incarnations of the Dremel rotary tool, plus the MultiSaw and Planer attachments originally designed for the 400 Series XPR. New attachments will also come out with the 4000 — a Detailer's Grip and a Sanding/Grinding Guide. New motor technology with electronic feedback control adjusts tool speed —variable from 5,000 to 35,000 rpm — to the workload. Prices on the Dremel 4000 range from $79 for the tool alone to $149 for a kit including the two new accessories.



Dremel's 4000 rotary tool



Freud Doweling Jointer

Freud's *Doweling Joiner* is a handheld power tool that functions like a biscuit joiner. With bits spaced exactly 32mm apart, it cuts dowel holes and drills them up to 1⅜" deep for functions like shelf pins, European cabinets and more. It's powered with a 6.5-amp motor. An adjustable fence allows precise setting of any joint; the tool accepts standard 10mm-shank boring bits and works with bits from 3/16" to 1/2" diameter. It sells for $329.99.

Woodworker's Journal author and master woodworker Ian Kirby uses some modern technology to teach about a traditional tool in his video *"Using a Hand Plane with Ian Kirby."* It covers subjects like edge and end plan-

Continues on page 74 ...

With many of your machines, of course, you want to take measurements to guarantee accuracy. The *1-2-3 MicroGage* from **MasterGage** lets you do that in some tight spots. The Dial Indicator Carriage can be mounted with a lock screw to any vertical or horizontal edge of the 2" x 3" 1-2-3 Block. You can use the 3/8" flat-tip to measure round surfaces and blade edges. Use the 1-2-3 Block by itself to square up blades or fences, or put it down and attach the Dial Indicator Carriage to measure and set heights on routers, jointer infeed and outfeed tables, table saw blade heights and more. It's small enough to fit in (formerly) restricted areas, and it costs $119.





1-2-3 MicroGage measures accuracy.

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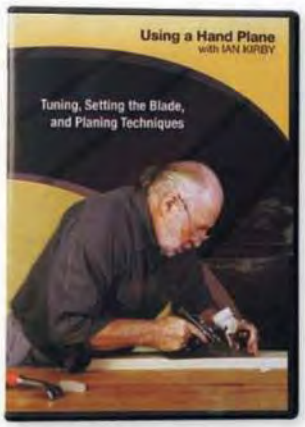
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WJ author Ian Kirby's hand plane video

ing, cross-grain planing, preparation of stock, plane parts and tuning the plane, using the plane against a bench stop and more. There's also content about making a kitchen cutting board. Suggested price of the video, published by **Linden Publishing,** is $21.95.

Rockler's *Bench Cookies*™ won't leave any crumbs, and they'll help you elevate boards off your work surface so you can access every edge during finishing. These round items with high-friction rubber pads on either side can also take the place of clamps for sanding, carving and more. Their small size (about the same size a standard hockey puck) means they don't get in the way like clamps can, letting you complete a task in one continuous step more easily. With your cookie sandwiched between a work surface and a workpiece, that high friction material holds everything stationary. The Bench Cookies (item number 26357) come in packs of four and sell for $11.99 per pack.



Rockler Bench Cookies clamp with friction.





Prazi Paint Brush Storage Lid

Done finishing and ready to clean up a paintbrush? You could just put it in the **Prazi** *Paint Brush Storage Lid*™. It fits on any gallon-size paint can and, well, stores your paintbrush — any size brush, for days or weeks, thereby, they say, saving lots of water that would normally be used for cleaning paintbrushes. The Lid will cost you $7.95.



Bosch SPS10 Professional Super-Compact Screwdriver

Have you ever needed to drive screws into someplace with a teeny access area? That's what **Bosch's** *SPS10 Professional Super-Compact Screwdriver* is for. It weighs barely one pound, but its 4-volt Max Litheon battery has the power to drive up to 110 screws on a charge. It fits into tight spaces to drive those 1/4" screws and hex-shank bits, which can be stored on the magnetic bit holder and illuminated with a built-in LED worklight. The price is around $75.

— Joanna Werch Takes



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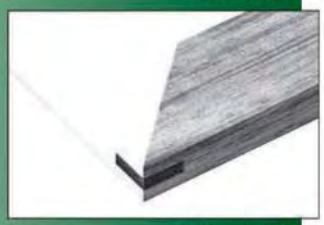
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Defining Dovetails

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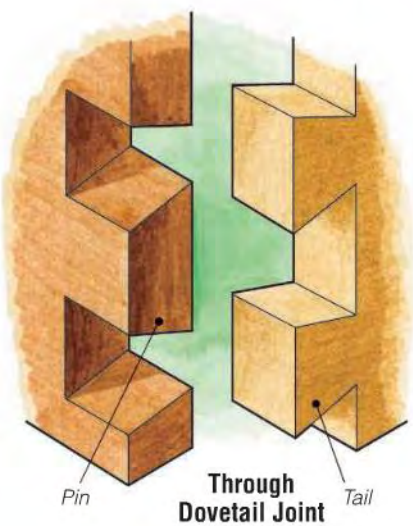


Dovetail Joints



Finger and Lap Joints

Judging from the number of woodworking websites that feature the image of a dovetail joint, this handsome interlocking connection may be *the* most prevalent symbol of fine craftsmanship. As strong as they are beautiful, dovetails are popular in part because of how useful they are for building a wide range of projects — a stereo cabinet carcass, a frame for a cocktail or serving tray, the drawers of a desk, dresser or chest, etc. Even the layout of the joint's basic components — angled pins that mate with bird-like tails — can add a stylish decorative element to practically any project.



Through Dovetail Joint

Dovetail joints come in several flavors: Through dovetails are the classic joint, with both pins and tails showing through on the adjacent surfaces of the joined parts. These are the easiest to cut and are the most useful for a variety of carcass and frame joining applications. Half-blind dovetails feature pins that are not cut all the way through the stock, so they don't show on one side of the joined assembly. Half-blinds are great for drawers and sliding trays, where you want the strength of a dovetail, but you don't want joinery to show on the front of the piece. Full-blind dovetails, as their name implies, are cut so that the joint is completely hidden. Difficult to cut, these joints are most often used for high-style period furniture.







Hand-cutting dovetails involves laying them out, then cutting the pins and tails separately (top two photos). When making dovetails with most router jigs (bottom photo), you machine both the pins and tails at the same time.

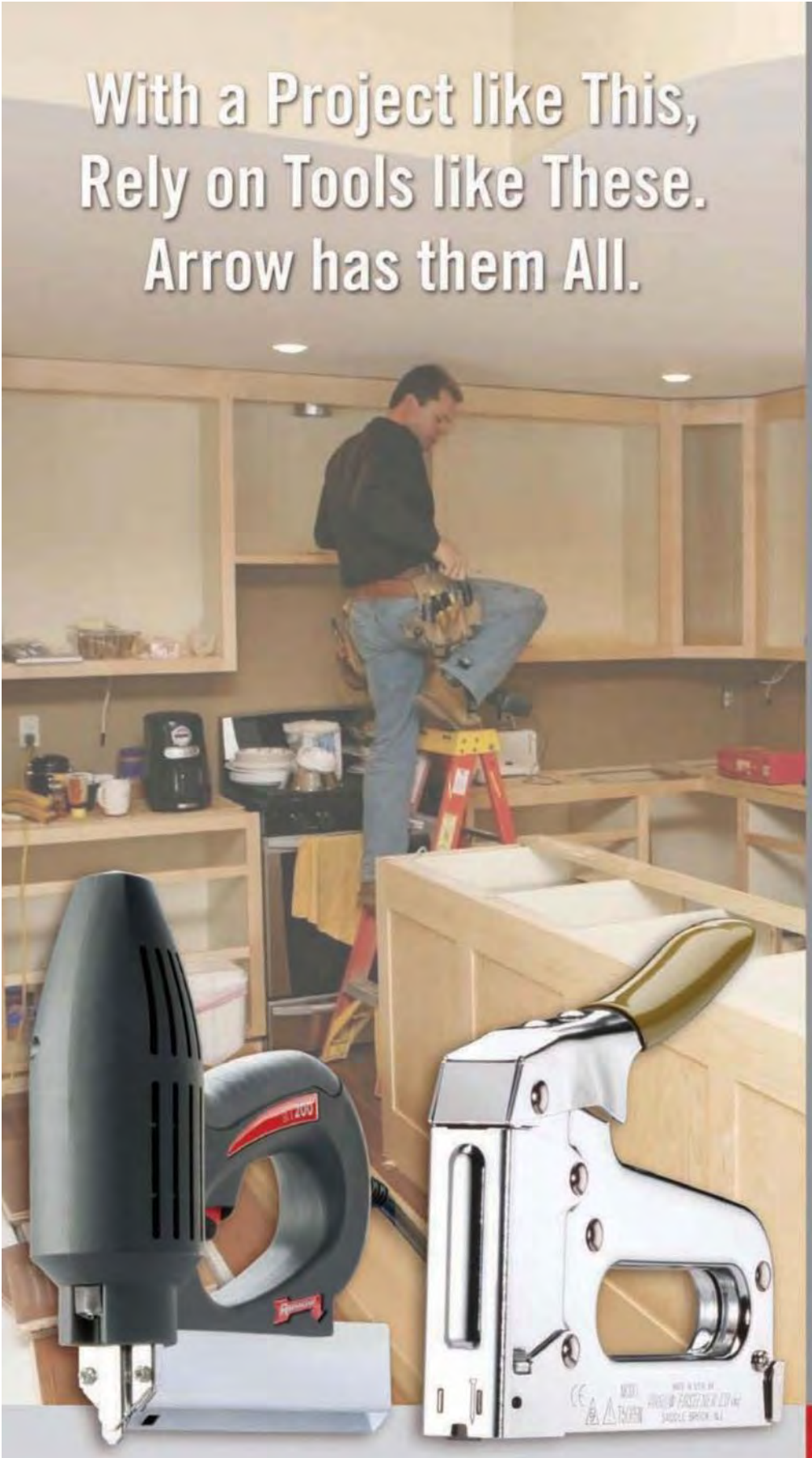
Cutting clean, accurately fitting dovetails with hand tools is a cabinetmaker's rite of passage. Although not easy to accomplish, it's a joint that most any woodworker can create, given sharp tools and lots of practice. Fortunately, hand-cutting isn't the only way to make dovetails — a number of commercially made jigs are designed for creating through and half-blind dovetail joints with a router.

—Sandor Nagyszalanczy

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