

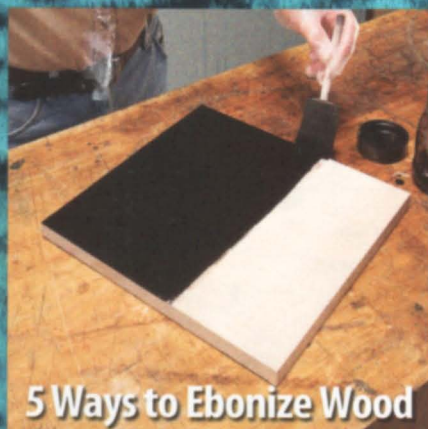
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WOOD FINISHING SPECIAL

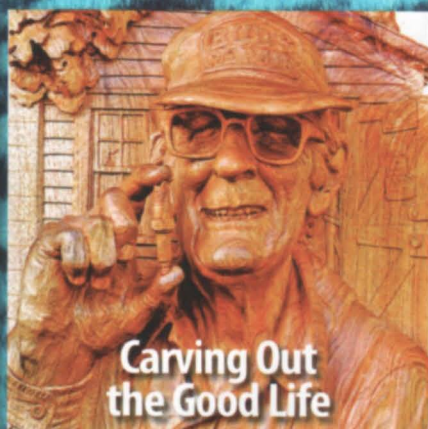
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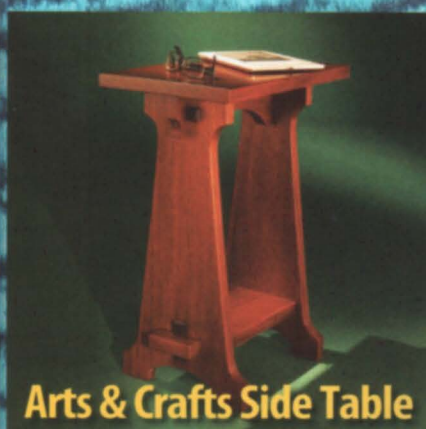
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5 Ways to Ebonize Wood



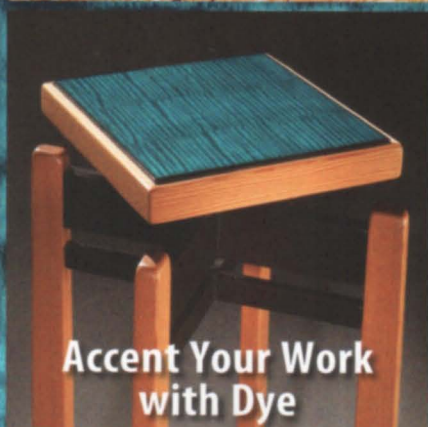
**Carving Out
the Good Life**



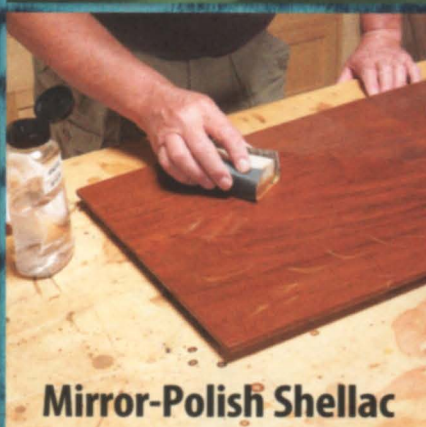
Arts & Crafts Side Table



**10 Must-Know
Sanding Tricks**



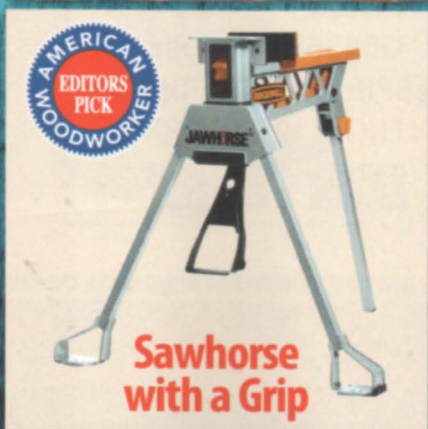
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WOOD FINISHING SPECIAL

American Woodworker

#150, October/November 2010

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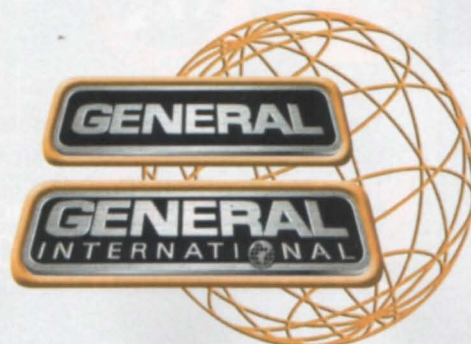


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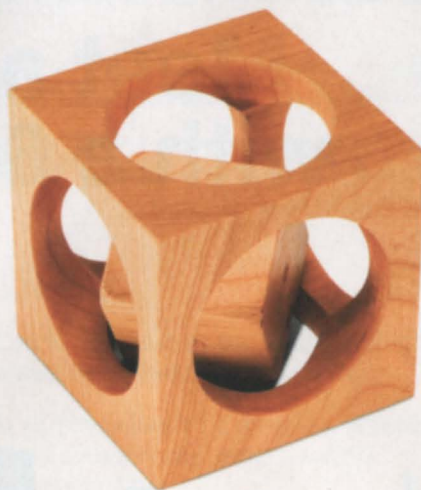
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From the Editor's Desk

Finely Finished

WE CALL OURSELVES WOODWORKERS because we're good at *working wood*. But sometimes the other details can prove a little more challenging; that's probably why I hear so many "Oops" stories from woodworkers about finishing. It often involves a project that took many hours to build. The builder wants the finish to be special—and decides that it might be a good time to try out a new finish. So try he does and that's when I get the S.O.S. phone call or e-mail.

One of my most memorable calls came from a very sincere fellow who started out with a simple question about how to remove stain from wood. I queried him: What kind of stain? How fresh? Since it was oil-based and only a couple days old, I suggested rubbing it with mineral spirits or lacquer thinner. But I cautioned him that it's tough to remove most stains and that if he really wanted to get down to bare wood he might have to sand it away. Even that's no guarantee.

After a bit more conversation he somewhat sheepishly admitted that he'd used a combination stain-varnish product and it had turned out blotchy. I told him that's a common problem with that type of finish. He also admitted he should've practiced first. Then I asked about the type of wood.

"Mahogany," he replied.

"Ouch," I thought.

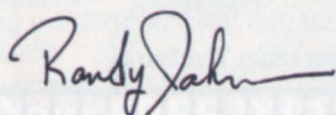
The project? A restored antique wooden boat.

"Double ouch!" I thought.

I had probably asked enough questions, but my curiosity was piqued, so I asked, "How much of the boat did you finish?" His response was a triple ouch! Yes, he'd finished the entire boat. I never heard from him again, but he seemed like the persistent type, so I suspect he managed to rescue the finish and his boat.

As a teenager, one of my first jobs was helping my dad stain and varnish the trim work in new homes. I got pretty good at wiping the stain on and off without getting much on the walls or the floors, but it took me a long time to match my dad's speed with the varnish brush. He was a good teacher, I learned a lot, and I still enjoy finishing. But as the story of the boat guy illustrates, perhaps the single most important thing to remember about finishing is printed right on the can: *Test on a scrap board or in an inconspicuous location*. Remember that, and you'll greatly improve your chances at being able to claim that your project is *finely finished*.

Happy woodworking and finishing,



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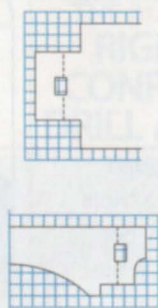
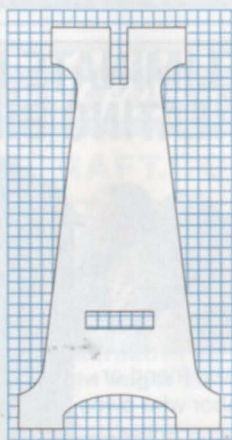


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Terrific Tip!

Vacuum Upgrade

I OFTEN USE MY SHOP VACUUM for dust collection on hand-held power tools. Two things annoy me about most vacs, though. First, they're really noisy. Second, when the vac gets full—and that can happen before you know it—the filter clogs up and airflow drops.

I solved both problems at once. I put my vac in a cabinet, connected it to a small cyclone separator, and ran PVC pipe from the separator to a flexible drop over my bench. Essentially, I've built a mini central dust-collection system.

The cabinet, lined with 1" thick foam, muffles the noise quite well. The separator collects the bulk of the dust and chips. The vac now takes much longer to fill, since it only collects the finest of dust particles. I'll empty the separator's bucket many times before I have to check the vac.

I used rigid pipe for the runs, but you could use flex hose, too. I put a couple of loose 2x4s under the separator's bucket so I can lower the bucket in order to remove and empty it.

Alan Schaffter

Miter Gauge Grip

TO KEEP STOCK FROM SLIPPING when using my miter gauge, I rely on this simple jig. Screw a 3/4" x 2" fence to your miter gauge. Make it whatever length you need. Use a continuous hinge to fasten a section of 2x4 to the fence. Glue a piece of sandpaper to the inside bottom edge of the 2x4 where it contacts the workpiece. This fence height works for stock from 1/2" to 1-1/2" thick. For thicker stock, just unscrew the hinge and make a taller fence. The jig holds the workpiece firmly against the table and the miter gauge.

Serge Duclos



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Adjustable Push Shoe

A PUSH STICK IS A FAMILIAR DEVICE to prevent kickback while ripping a board, but I prefer to use a "push shoe." It's shaped like a shoe with a handle, and has a heel, just like a boot. The heel pushes the work through the saw. I'm more comfortable using a push shoe because the entire sole of the shoe is in contact with the board, unlike a push stick.

I've modified my push shoe's heel to accommodate boards of different thicknesses. Rather than cut a simple notch to form the heel, I added a 3/8" dowel to do the pushing. The dowel fits quite snug through a hole near the shoe's back end. I just adjust the dowel's protrusion to match the stock's thickness.

Charles Mak

Improved Push Pad

ORDINARY PUSH PADS TEND TO SLIP, I've found, when face-jointing a board. I modified one of mine by cutting 1/2" of the rubber padding off its back end and then screwing on a 1/2" x 1/2" cleat. Now the rear push pad hooks the back end of the board. No more slipping!

Mike Cyr



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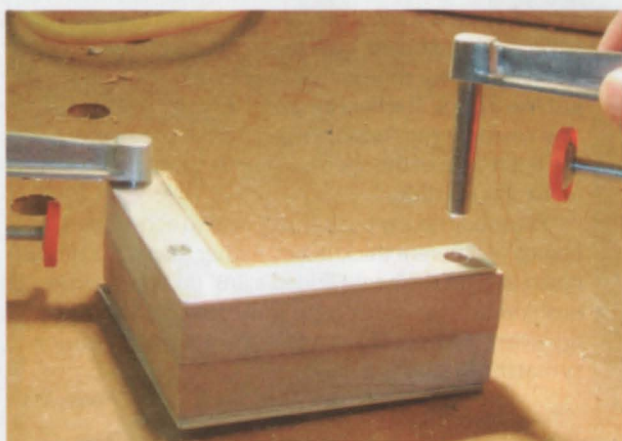
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Corner-Clamping Jigs

TO AID IN GLUING SMALL BOXES, I made a set of 90° corner-clamping jigs from scrap MDF and flat corner braces. (Corner braces are available at hardware stores and home centers.) Each jig costs about \$4.

I use Bessey TK6 fence clamps to fasten the jigs to the inside faces of the box. These clamps keep one hand free for positioning the joints. Small C-clamps would work OK, but of course you need two hands to tighten a C-clamp.

To make each jig, I glued together two L-shaped pieces of 3/4" MDF and cut the assembly perfectly square. I sandwiched the assembly between two corner braces, using epoxy. I drilled holes through the jig to accommodate the clamps.

Bob Enderle

SOURCE

McFeely's, www.mcfeelys.com, (800) 443-7937, Bessey TK6 fence clamps, #WS-1003, \$7/pr.



Drill Press Sharpening System

HERE'S A FAST, INEXPENSIVE WAY to keep your edge tools razor sharp. First, cut out a few 5" x 3/4" MDF discs. Drill a 1/4" hole in the center of each disc. Next, glue different grits of sandpaper to each side of the discs, ranging from 50 to 2000 grit. While 50 grit makes quick work of re-grinding a bevel, 2000 grit brings the tool to a mirror finish.

Next, make an arbor using a 1/4" x 3" bolt, a fender washer and a 1/4" coupler nut. You'll need a jig to hold your tools at the proper angle—I built a ramp that creates a 30° bevel.

Set your drill press to its slowest speed to prevent your tool from overheating, but keep a cup of water handy to quench the tool in case it gets too hot.

David W. Bartemes

Tape Cord to Hose

TRAILING ALONG A POWER CORD when I'm routing can really be awkward. All too often, my cord hangs up on a corner of the project or gets tangled around my legs. Adding a dust collection hose, which can run off in a different direction, just makes matters worse. One day I got so balled up that I taped the cord to the hose, and I've been using tape ever since.

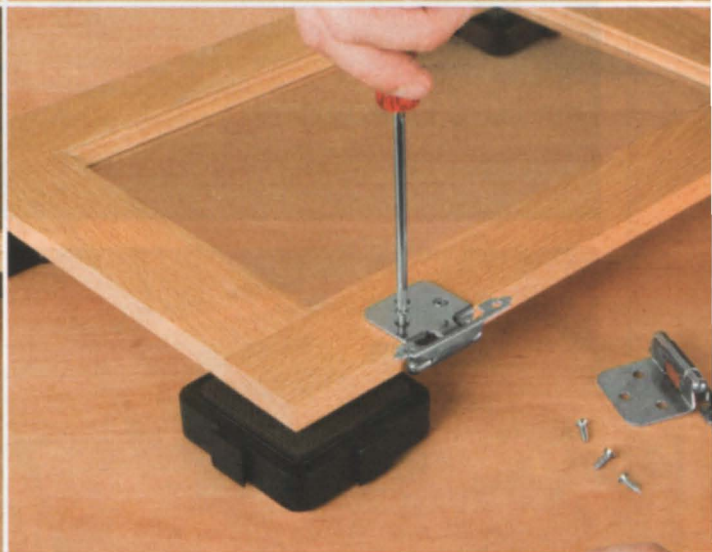
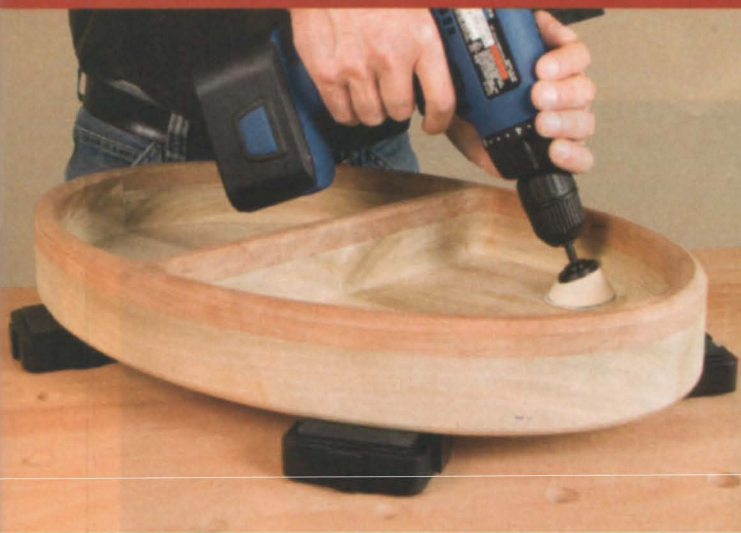
Almost any kind of tape will work, but I've found that heavy-duty duct tape is best. I cut three or four 8" long pieces and rip them in half lengthwise. When I wrap them around the cord and hose, I overlap the ends, sticky side to sticky side. I also leave some of the sticky side exposed, which makes it easier to pull the tape apart when I'm done. I've found that each piece of tape can be re-used four or five times.

Tom Caspar



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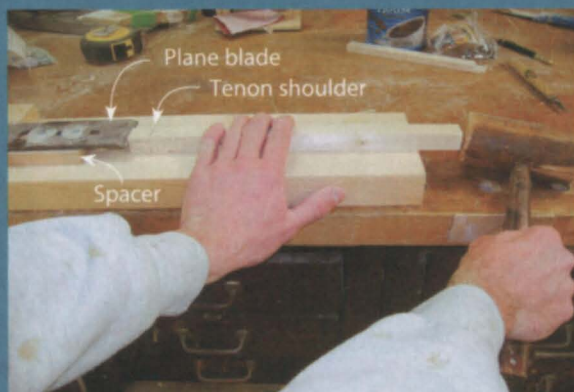
(patent pending)

Hand-Split Tenon Jig

HERE'S A TIME-TESTED METHOD for making small tenons on straight-grained stock. It's quick and effective, but not super precise, so I use it when I'm after a simple, rustic look.

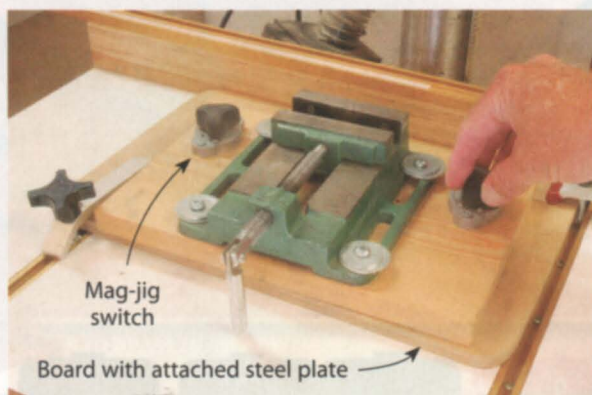
Attach a hand plane blade, bevel-side up, to a suitably sized spacer board. Note that the blade splits the waste off the top side of the stock. The thickness of the spacer under the blade is the sum of the thickness of the tenon plus the thickness of the shoulder underneath the tenon.

Screw the spacer to a flat board and clamp the board to your bench. Screw a block of wood behind the blade to keep it from sliding. Saw the tenon shoulders first. Then place the workpiece against the



blade and split the waste with a tap from a mallet. Flip the stock over and split the other side to complete the tenon.

Chad Stanton



Quick-Change Vises

I USE TWO VISES mounted to separate boards when I drill pen blanks. I frequently switch the vises, but clamping and re-clamping the vise boards to the drill press table was a pain. Now I use Mag-Jigs, powerful magnets that can be switched on or off with the twist of a knob. I mounted two Mag-Jigs on each board.

If you use a standard cast-iron drill press table, you're all set. The Mag-Jigs will stick directly to it. My drill press setup is a bit fancier, though, as I've installed a large melamine table equipped with a fence. So, I mounted a steel plate on a third board. I clamp that board to the table and place the vise board on top of the steel plate.

Doug Green

SOURCE: Lee Valley Tools, www.leevalley.com, (800) 871-8158, 20mm Mag-Jig, #03J75.95, \$27.



Adjustable Support

I FREQUENTLY NEED AN OUTFEED TABLE or work support for long pieces, so I built this T-shaped assembly to use in conjunction with my Black & Decker Workmate.

The table is just a horizontal board that's dadoed, glued and screwed to a vertical board. Not all my tools are the same height, though, so I devised an adjustment to the support that's quick and easy to use. Just drill different pairs of 1" holes for each tool in the vertical board. Set the height by inserting 1" dowels into the holes. Slide the table into the Workmate's jaws and clamp.

James E. Rohen

Hole-Saw Helper

HOLE SAWS CAN BE FRUSTRATING TOOLS. They stop cutting when their teeth fill with sawdust, and that causes the teeth to heat up and dull. If this happens to you, too, try this trick. Drill down just far enough with the hole saw to scribe a shallow circle. Then drill a few 3/8" holes around the circle's circumference. When you return to cutting with the hole saw, sawdust will exit out these holes, allowing the saw to cut cooler and more efficiently.

Joe Sarchioto



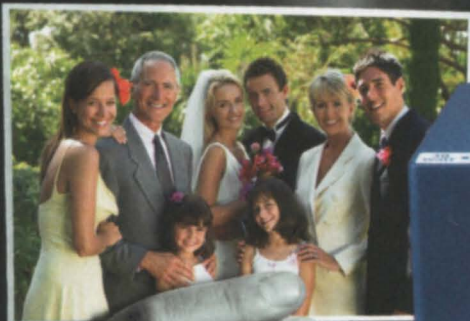
\$2 Square

I MADE MY OWN TRY SQUARE using a 1" x 4" corner mending plate and a couple scrap pieces of hardwood. To make one yourself, first check the mending plate to be sure it's square. If it's off, true it up with a file. Epoxy wood blocks to both faces of one leg, and you're ready to go. Mending plates come in many sizes, so you can make a full set for only a few bucks!

Brad Holden



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Conflicted Bandsaw

I BOUGHT THIS 18" BANDSAW FOR \$80 AT AUCTION, not knowing exactly who made it. It had a Delta-Rockwell badge on the upper door, but the saw didn't look like any Delta I'd seen before. It had been repainted green, the same color as General machinery, but it clearly wasn't a General. Inside the machine, under the paint, a plate read "Sears, Roebuck and Co." Sears obviously wasn't the manufacturer—they put their brand on equipment made by other folks. So, who made it?

There were two clues to the saw's identity: a Sears part number and the saw's beautiful Art Deco-style cabinet. Turning to the website Old Wood-Working Machines (www.owwm.com), I learned that my saw was made in the late '50s by Parks Woodworking Machine Co. Sold by Sears as a Craftsman tool, it was originally painted gray.

Parks was famous for its planers, but it also made a serious bandsaw. This saw's frame is heavy-gauge steel, its massive thrust bearings are 2" dia., it has a resaw capacity of 12-1/2", and it's powered by a surprisingly gutsy 1 hp Delco motor wired for 230 V.

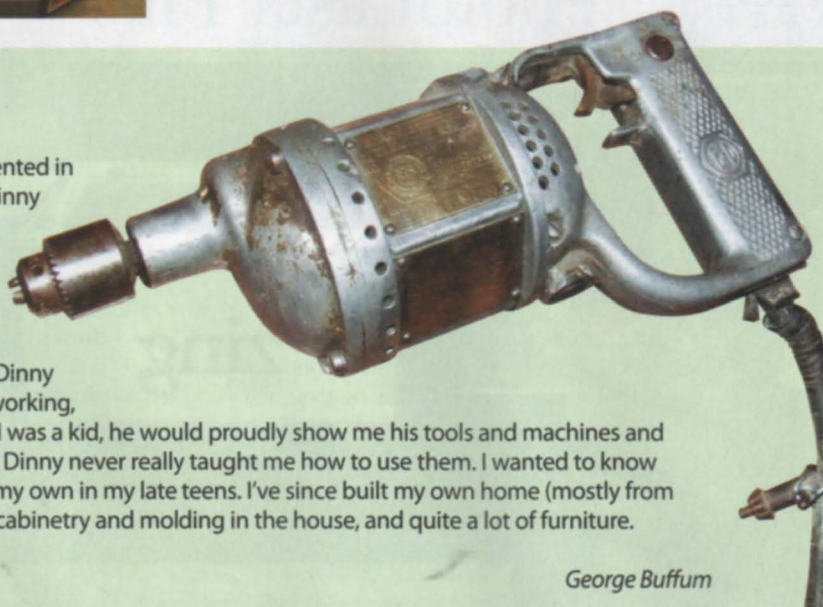
Although I've spent about ten hours repairing and tuning the saw, I don't plan on restoring it to its proper identity just yet. I'll leave it conflicted a while longer as I debate the aesthetic merits of returning my new favorite tool to an industrial gray!

John Hough

Dignified Drill

THIS BLACK & DECKER 1/4" DRILL, patented in 1917, once belonged to my uncle, Dinny Sowyer, who passed away over 40 years ago. He was a hard-working carpenter in Pennsylvania. His drill, which still works, has all the dings and bruises of an equally tough life.

I've kept the drill because Uncle Dinny awakened my first interest in woodworking, in a backhanded kind of way. When I was a kid, he would proudly show me his tools and machines and explain to me how they worked. But Dinny never really taught me how to use them. I wanted to know more, so I started woodworking on my own in my late teens. I've since built my own home (mostly from trees harvested on our land), all the cabinetry and molding in the house, and quite a lot of furniture. Thanks, Uncle Dinny!



George Buffum

We'll pay you \$100 to share your favorite tools, new or old, with fellow readers. Contact us by e-mail at toolnut@americanwoodworker.com, or mail us at American Woodworker, 1285 Corporate Center Drive, Suite 180, Eagan, MN 55121. If possible, please include digital photos of your tools.

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Luthier's Shop

MY SHOP GREW out of my love of wood, woodworking and music. I build mostly mandolins, along with guitars, banjos and an occasional fiddle. Now that I've retired from teaching, I can devote the time it takes to build an heirloom-quality instrument from scratch (usually about three months), without feeling pressured to finish the job quickly to pay the bills.

Although my shop is located in the basement, large glass entry doors flood natural light into the front of the shop, where I assemble and finish my instruments. My tool cabinets and benches are stationed there, including my pride and joy, a workbench inspired by one that I saw in the movie "The Red Violin." I've carved the leaves of native trees into

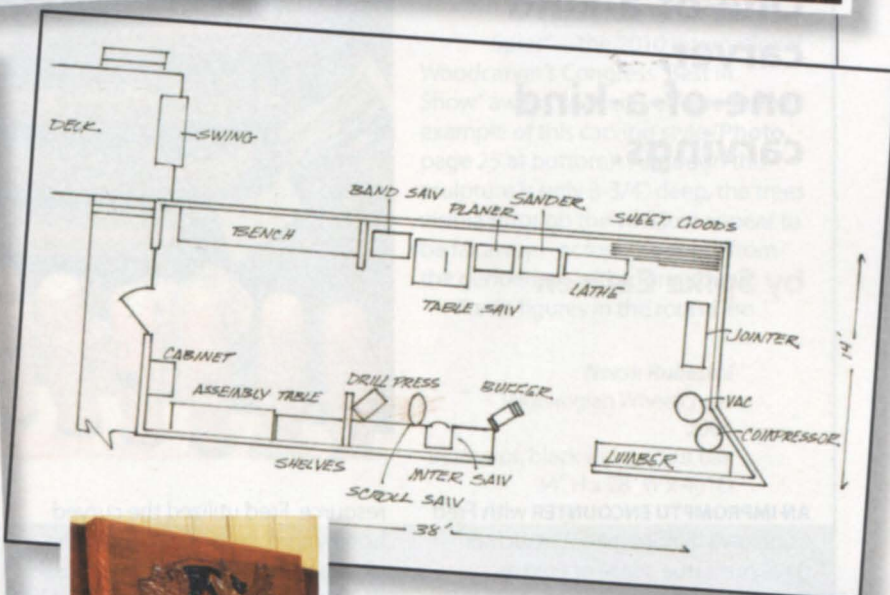
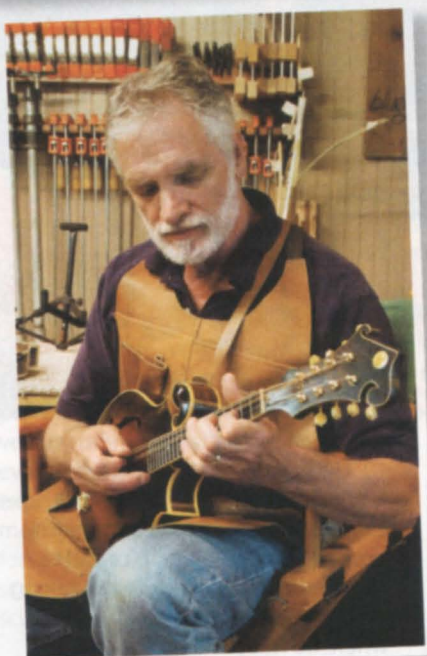
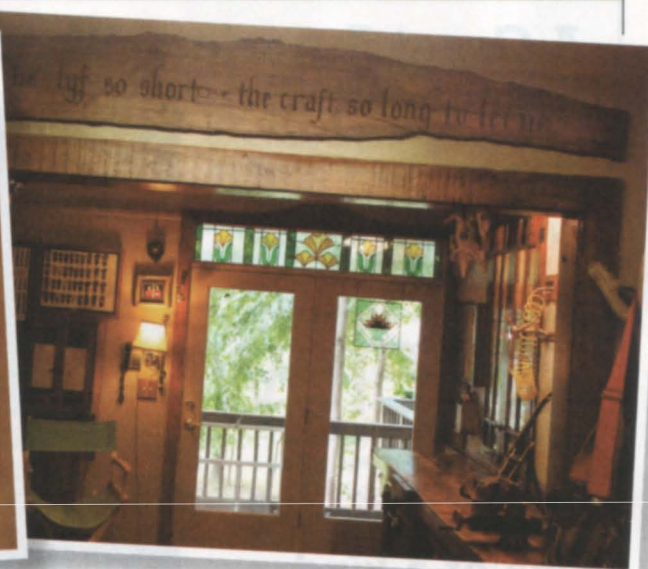


small blocks that adorn the doorways and cabinets in this part of the shop. I've also added bits of stained glass to embellish the front windows.

My stationary tools and fabrication



stations line the walls in the back portion of the shop. These tools are all connected to a dust collector. This part of the shop is also plumbed for



compressed air. My stationary tools are easy to pull into position for use, because none of them are large industrial models—they're all sized for the type of work that I do.

A CNC shaper/carver might expedite some of the less interesting tasks, such as roughing out shapes. But I must confess that I have a real love for old hand tools, which I collect, refurbish, and frequently use.

The summers can get quite hot and humid here in Georgia, but my shop stays comfortable all year long,

thanks to its basement location. In fact, it's hard to get me out of my sanctuary—with a little music playing in the background, it's easy to lose track of time. My wife jokes that the reason I spend so much time here is to be with my girlfriend, "Amanda Lynn!" She's right, of course—I hope that the pleasure I derive from working in this little shop is reflected in the instruments that I make.

Scott Bennett
Newnan, Georgia

Tell Us About Your Shop

Send us photos of your shop, a layout drawing, and a description of what makes your shop interesting. Tell us what you make in it and what makes your shop important to you. If "My Shop" features your shop, you'll receive \$100.

E-mail your entry to myshop@AmericanWoodworker.com with digital photos attached. Or mail your description with digital photos on a disc to My Shop, American Woodworker, 1285 Corporate Center Drive, Suite 180, Eagan, MN 55121. Please include your phone number. Submissions cannot be returned and become our property upon acceptance and payment. We may edit submissions and use them in all print and electronic media.

Fred Cogelow

One-of-a-kind carver, one-of-a-kind carvings.

by Spike Carlsen



AN IMPROMPTU ENCOUNTER with Fred Cogelow's "Norwegian Wheelchair" gave me a true sense of Fred as both an artist and a person. The chair itself is a thing of rare beauty, adorned with mythical Scandinavian figures, interwoven acanthus forms and intricate faces (**Photo**, page 23, at bottom). It incorporates a swivel mechanism, reclaimed cast iron wheels and a chunky seat that caresses you. Obviously, Fred is an imaginative artist with enormous talent.

He's also infatuated with trees and wood. The wood for the wheelchair came from an ancient butternut tree near Fred's hometown of Willmar Minnesota. He prefers not cutting down live trees for his sculptures, so he'd kept his eye on this tree for years. When it died, Fred got permission to harvest the wood. But when he went after the old tree with a chainsaw, he discovered that most of it was hollow. Not wanting to waste a beautiful

resource, Fred utilized the curved hollow shell as the backrest of the chair and other parts for the chassis.

I hesitated when Fred asked if he could give me a ride in his fantastic chariot. But I realized something as I was gliding across his living room floor: Fred loves to have a good time in whatever he does.

Carving out a living

When asked what he'd do for a living if he weren't a wood sculptor, Fred stares blankly. The thought hasn't occurred to him—at least not in the last 30 years. Though deemed "hopeless" by a third grade teacher that had watched him break a leg off the Ivory soap scotty dog he was carving with a butter knife, Fred persisted. He first tried carving wood when he was 17, working six hours with dull carpenters' chisels and a propane torch on a fir house-moving beam that his father (who died when Fred was six) had left behind.

Fred's artistic endeavors were waylaid for several years while he earned a degree in political science from the University of Chicago. He resumed woodcarving while working at an adolescent treatment facility, where he was periodically assigned to night-watch shifts. "The only requirements were to make rounds every hour and stay awake the rest of the time," Fred explains. "Carving kept me awake." His first creation was a dollar bill-size carving of Albert, the Pogo comic strip character. He tried his hand at furniture restoration and construction for a while, but tired of it. Though his formal art training consisted of only 7th and 8th grade art classes, he turned to woodcarving full time at the age of 29.

Fred likes to concentrate on one sculpture at a time and completes four or five large pieces and 15 to 20 smaller pieces in a year. His sculptures generally sell for \$400 to \$20,000; large

SPIKE CARLSEN

A Great American Woodworker



Joyride

(Honoring astronaut George "Pinky" Nelson)

Basswood

1999

96" H x 96" W x 26" D

and complex projects bring more. He prefers working on his own designs versus commissions. "I try to make everything a little experimental," he explains. "And commissions usually make you go backwards instead of forwards. Plus you never know if the sculpture in your head matches the sculpture in the client's head."

Versatile and driven

Fred, now 60 years young, is versatile in many respects. The subjects he carves range from cowboy caricatures to superbly realistic religious figures. He's carved local farmers and hung-over gargoyles. Some works, like the sculpture honoring hometown astronaut Pinky Nelson (**Photo**, above), are nearly life-size. Others are as small as a fist—"Applebee's sliders," Fred calls them.

Fred works in numerous carving styles, but he's particularly interested in what he calls "mezzo-relief" carving. "In between low-relief and high-relief carving is a realm where

there are few absolute rights and a good many wrongs," he says. "When working in this style, a carver weighs numerous options of how best to create the illusion of greater depth. These options include warped planes, distorted forms, enhanced or compressed elements, judicious undercutting and the use and re-use of the actual (available) depth. Of course, these options are employed in conjunction with conventional perspective techniques of converging lines, foreshortening and overlapping. Fred's sculpture titled "Betty's Spies"—the 2010 International Woodcarver's Congress "Best in Show" award winner—offers a prime example of this carving style (**Photo**, page 25 at bottom). Although this sculpture is only 3-3/4" deep, the trees visible through the window appear to be far away—across the street from the gentleman in the foreground. Fred's figures in the round are

Norsk Rullestol

(Norwegian Wheelchair)

2004

Butternut, black walnut, bur oak

34" H x 28" W x 40" D



A Great American Woodworker

equally exemplary. In his book, *Sculptor in Wood*, Fred explains. "The greatest problem in carving these figures—especially from a limb or from a log—is to create a product which comes across as something more than a decorated fencepost." There's no mistaking Fred's work for a fencepost. Whether it's a bemused mechanic grasping a spark plug (**Photo**, page 25, at top) or an astronaut riding a

horse, his sculptures brim with personality. In Fred's sculpture of a wizened gentleman seated on a pair of boxes (**Photo**, left), the figure appears to be paused in the midst of a heart-rending story. His sculpture, "Peter Accused" (**Photo**, bottom right) has such realism and emotion that one hesitates to turn away from it. "Rest Easy Tonight" (**Photo**, top right) is fully political.

Fred's fellow woodcarvers agree that he is one of the best. Among other honors, Fred has won "Best of Show" nearly a dozen times at the annual International Woodcarver Congress competition.

Yet the world of carving is not without its slivers. A few years back Fred broke his arm while hollowing out the back of a statue. The bit stuck, but the drill—and Fred's wrist—kept turning. And in his office sit two gorgeous carvings in need of repair. One, a fabulous mezzo relief, fell victim to a tainted finish. The other, a figure in the round, is missing two fingers and a hat brim, due to rough handling by a shipper.

For the love of wood and tools

Fred uses butternut for 80% of his carvings, with basswood coming in a distant second and walnut an even more distant third. He loves butternut because of its straight grain, moderate hardness and coloration.

"It's easier to read the grain in butternut than in basswood, because it has more color," he explains.

"My customers like it too. If I carve something out of another wood, it invariably sells for less."

"I think I have enough wood for several lifetimes," laughs Fred, who knows the exact provenience of the wood used in most of his sculptures. "But that doesn't stop me from hoarding more." Most of Fred's wood



BOB MISCHKA

Aint Indolence (... If You're Minding Other's Business)

1995

Butternut

30" H x 14-1/4" W x 17-3/4" D



MARC FEATHERLY

Rest Easy Tonight

(A Salute to the Department of Homeland Security)

2004

Butternut; walnut base

19" H x 9" W x 14" D

Peter Accused (a.k.a. Peter Meets His Principle ...Fred Ditto ...)

2003

Basswood

44" H x 26" W x 28" D



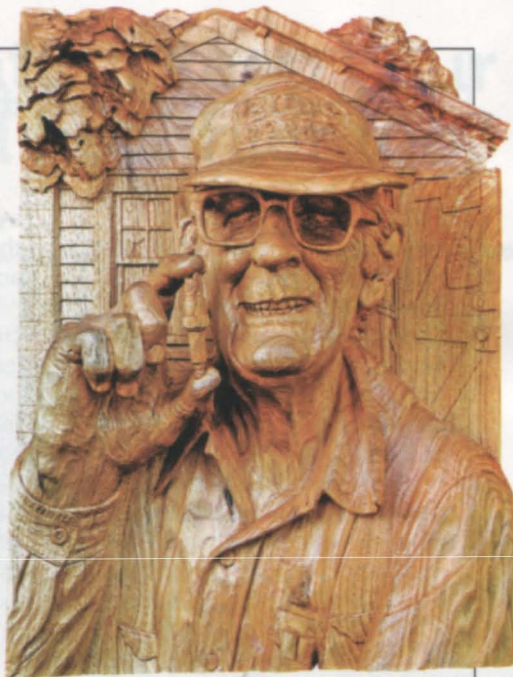
SPIKE CARLSEN

A Great American Woodworker

is stored in his late mother-in-law's barn. This stash is primarily the result of a friendship with a DNR forester, who occasionally informed Fred of fallen trees in need of removal. The stack of apricot wood in Fred's storeroom, though, came from a tree in his own back yard.

Fred is equally enamored with tools. His workspace consists of a padded stool perched in front of a massive carving easel created from the cast iron base of an old mortician's table. "A tool-collector friend sold it to me for \$25," Fred recalls. "He called me up out of the blue one day and announced that he had something I needed. You can crank it up or down, it tilts and it's darn solid—the best carving table I've ever seen. It has saved my back and hence, my career." Fred's work station is surrounded by tool cabinets containing hundreds of gouges, skews and chisels, all within easy reach. Sandpaper is nowhere to be found. "I can't remember using it on more than three or four pieces in the past 30 years."

Fred's shop, perched on the second floor of a reconstituted chicken shed next to his home, is filled with objects that Fred uses as both inspiration and models. He has antlers, skulls and his "Norwegian track-lighting system," an old hay mow trolley that hangs from a wooden track and carries a single candle. "My contribution to cutting-edge technology of which I am most proud," Fred claims. He has weathervane roosters, stained glass windows, Mickey Mouse Club badges, bent bugles, sections of curved choir loft railing, horse stirrups, old tools and things that defy description. Amidst all of this hangs a sign with a quote from Thomas Edison that reads "To invent you need a good imagination and a pile of junk."



The Simple Pleasures of Edifying the College-Educated (It's Your Spark Plug, Dummy!)

2008

Butternut

18-1/2" H x 14" W x 6" D

Betty's Spies (Small Town Busybodies Keeping Busy)

2010

Basswood

21" H x 24-1/4" W x 3-3/4" D



A Great American Woodworker

Advice for rookies

Fred suggests whittling as a way to learn about tools, and splitting firewood as a way to learn about wood's grain. As for subject matter, he says, "Do something you're familiar with. If you like messing around with cars, do cars. If you like bird watching, do birds."

He's hesitant to recommend any particular set of tools. His advice for those interested in testing the waters is to find a carving or casting in a style they'd like to attempt and bring it to

a place that sells carving tools, so that they can ask what tools they'll need and experiment with different types.

"Be mindful that any motion that cuts without use of a prying effort is legitimate, be it straight on, rotational or gliding," Fred explains. "Keep your tools sharp and remember that a cool tool is a happy tool. And think of your tools as an extension of your hands, in the same way figure skaters think of skates as an extension of their

feet." If that's true, Fred Cogelow has won Olympic gold.

Spike Carlsen is the author of *A Splintered History of Wood: Belt Sander Races, Blind Woodworkers and Baseball Bats*, now available through Harper Perennial (\$15.99, ISBN 978-0-06-137357-2).

The Eye of a Master

FRED DESCRIBES CARVING AS both an artistic and logical endeavor, but he's been carving for so long and works so intuitively that he finds it difficult to put the creative process into words. "Part of it is learning how to see," he explains. But since there are tools, materials, specific end results and a coherent way of getting there, "Part of it is engineering the piece, too."

He often works from photographs and is not beyond asking friends to dress in bed sheets to serve as models when he's carving robed religious figures. Interviews sometimes help Fred understand the personalities of his subjects that photos can't convey. With some commissions, he'll create life-size sketches as a guide, but he rarely uses calipers to transfer measurements, since some elements grow and others shrink when they're carved, especially in mezzo-relief.

For the commissioned project shown here, Fred started with two photos—an inspirational shot showing the father and his daughter playing solitaire and a second shot



SPIKE CARLSEN

portraying a good likeness of the father. As Fred generated a full-size drawing from which to work, he had a friend model, so he could get the correct folds in the shirt.

Because carving is a subtractive process, where material is taken away rather than added, Fred is constantly wary of making commitments that can't be modified. "The temptation to round things off or undercut them prematurely is always present. Doing so makes them look correct in the short run, but it dooms them to be mediocre or outright wrong in the end."

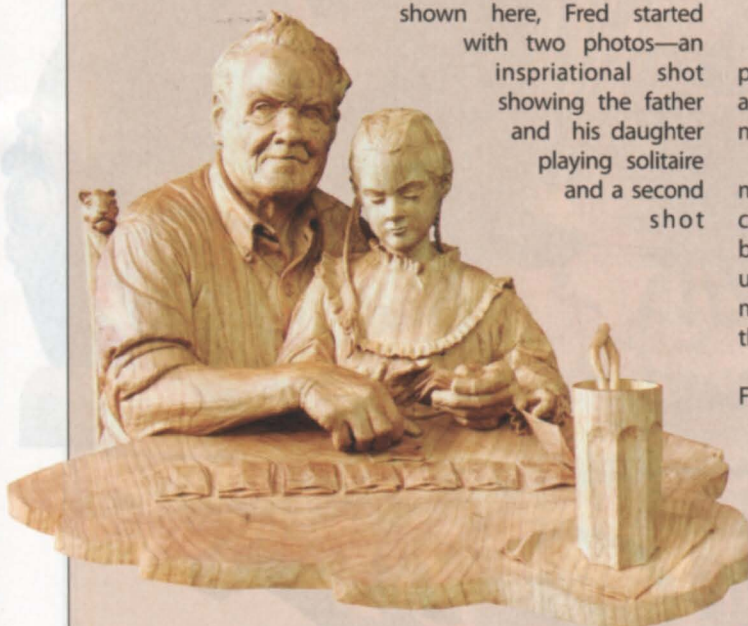
And though parts of the process can be learned, Fred clearly has the eye of a master. Referring to a recent sculpture, Fred explains, "When I'm out there with a chainsaw, I can already see the cowboy in the tree."

Deck of 51

2010

Butternut

15-1/2" H x 17-1/4" W x 5-5/8" D



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12" Glider

THAT'S RIGHT—GLIDER, NOT SLIDER. This innovative new miter saw from Bosch has the same huge capacity as a 12" slider—without the rails. The blade assembly glides on a set of articulated arms rather than sliding on a set of rails. The result is a saw that can be tucked up tight against a wall—ideal for a small workshop.

The Glide Miter Saw has a horizontal cutting capacity of 14" and a vertical cutting capacity of 6-1/2" against the fence. The vertical cutting capacity is 6-1/2" when the blade is tilted to 45°. All of the saw's controls are on the front, including the bevel lock lever. Unlike many sliders, you don't have to reach around back to tilt the blade. The saw tilts 47° left and right, and the bevel scale is large and easy to read. The turntable swings 52° to the left and 60° to the right. Using a front-mounted lever, you can override the detents to finesse an angle.

Pull out the ends of the saw and you have a worktable up to 40" across. The saw has two dust ports that accept 1-1/4" hose, and it weighs 65 lbs.

Source: Bosch, www.boschtools.com, (877) 267-2499, Glide Miter Saw, GCM12SD, \$699.



Two Nail Sets in One

STANLEY'S REVERSIBLE NAIL SET features a double-ended insert that stores inside a handy cartridge. One end of the insert is a 1/32" nail set; the other is a 2/32" nail set. Swapping between the two is simply a matter of removing and flipping the insert, which is secured by a locking collar.

You can also use this tool as a screwdriver, in a pinch. It accepts all hex bits.

Source: Stanley, www.stanleytools.com, (800) 262-2161, FatMax Nail Set, 58-501, \$9.99.

Extra-Long Quick-Action Clamp

HOW DO YOU

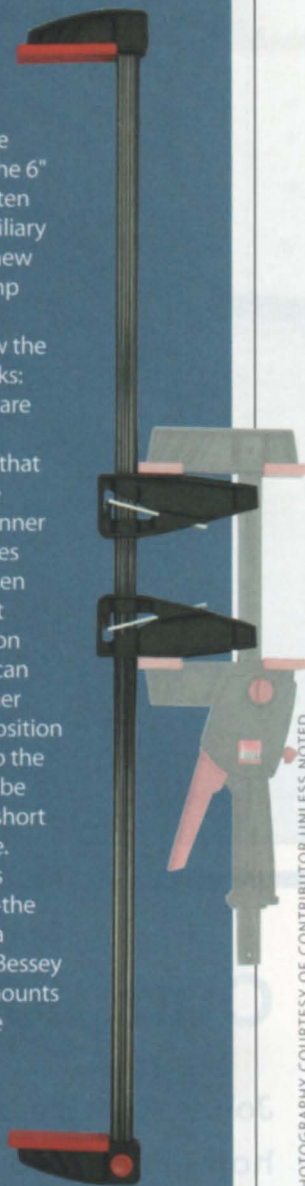
TURN a 6" clamp into a 65" clamp?

Bessey has the answer: Use the 6" clamp to tighten a second, auxiliary clamp—the new DKX DuoKlamp Extender.

Here's how the Extender works: its outer jaws are connected to separate rails that slide past one another. The inner jaws—the ones that you tighten with the short clamp—pull on the rails. You can adjust the inner jaws to any position on the rails, so the Extender can be as long or as short as you require. No extra tools are needed—the short clamp, a quick-action Bessey DuoKlamp, mounts directly to the Extender.

The result is one of the longest quick-action clamps we've seen.

Source: Bessey, www.besseytools.com, (800) 828-1004, DKX DuoKlamp Extender, \$25; DuoKlamp, \$21-\$31.



An Extra Hand

COMBINE A VISE WITH A SAWHORSE and what do you get? Rockwell's Jawhorse—an all-steel, three-legged sawhorse with a built-in 37" capacity vise. To tighten the vise you just push down on a foot pedal. This frees your hands to support and position the work, whether it's a wide plank, a cabinet or an entryway door.

The Jawhorse is basically a compact, portable workbench that folds up for storage. While you might think of it as just a jobsite tool, we can imagine dozens of uses for a Jawhorse right in the shop.

With additional attachments, the Jawhorse can become a miter saw station, a stand for holding logs or a work table. Another accessory expands the Jawhorse's clamping width to 48" for holding sheet goods.

Source: Rockwell Tools, www.rockwelltools.com, (866) 514-7625, Jawhorse, \$159.99; Miter Saw Station, \$79.99; Plywood Jaw, \$49.99; Log Jaw with Chainsaw Vise, \$39.99; Work Table, \$49.99.



Multi-Functional Dremel

DREMEL KEEPS PUSHING THE BOUNDS of what a rotary tool can do. The new Dremel Trio performs three different types of jobs: it plunge-cuts, routs and sands.

The Trio features a telescoping plunge-router-style base. Its handle can be positioned horizontally (as shown above) or vertically (like a trim router). This compact design is particularly useful for the extra control you need for delicate routing and sanding jobs. The Trio has a 2 amp motor and a variable-speed range of 10,000–20,000 rpm. A button latch allows you to lock the Trio in the "on" position so you can use both hands for difficult maneuvers.

The Trio comes with a carbide hardwood/sheet metal bit, a sanding mandrel with six 5/8" dia. sanding drums in three grits and a 1/4" straight bit for routing. The Trio only accepts Dremel 6800 3/16" shank bits.

Available accessories include a dust port adapter (for hooking up a hose), a depth guide and a circle/edge guide.

Source: Dremel, www.dremel.com, (800) 437-3635, Dremel 6800 Trio, \$99.99.



Picture Frame Clamp

IF YOU'D LIKE TO MAKE PICTURE FRAMES—particularly with pre-made moldings—be warned: Aligning those miters can drive you nuts. What you'll need is a special non-marring corner clamp, such as this new one from Rockler. Unlike similar devices that merely hold the pieces in place, this one actually pushes the joint together as you tighten it, guaranteeing a snug fit.

Turning the large black knob on this clamp simultaneously tightens both jaws onto frames from 5/8" to 2-7/8" wide. Turning the white knobs tilts the outer jaws up to 1° to correct joints that are slightly out of square. The open design of the clamp allows easy access to outside corners and back surfaces for quick fastening with brads or staples. The clamp is made from cast aluminum and includes two offset jaws for standard rabbets.

Source: Rockler, www.rockler.com, (800) 279-4441, Miter Tight Picture Frame Clamp, 30108, \$69.99.

3 Subcompacts

SMALL IS IN—AGAIN. A few years ago, drill manufacturers seemed to be in a race to make the biggest, baddest NiCad drill on the market. Now, using lightweight lithium-ion batteries, they're competing in a new field: 12 volt subcompacts. DeWalt has just issued three new ones—their 12V Max* series. (The asterisk is DeWalt's. It indicates that the initial battery pack voltage is 12 volts, but under load, the nominal voltage is 10.8 volts).

For woodworkers, subcompacts are a whole new experience. They deliver more than enough power to drill the holes and drive the screws woodworkers typically use. Thanks to their small size and light weight (about 2 lbs. each), these drills are very easy to aim and hold steady. We think they're really going to catch on.

Our favorites from the new 12V Max* platform include a 3/8" drill/driver, an impact driver and a type of specialized drill called a "screwdriver." The screwdriver caught our attention right away. It has a collet-type chuck that accepts 1/4" hex-shank drivers and bits. Swapping bits is a snap—literally. To remove or install a bit, you just pull the spring-loaded collet sleeve forward, which is far easier than using a standard drill chuck. The screwdriver has just one speed range, from 0–1,050 rpm, which is ideal for driving screws and OK for drilling holes, too. Of course, you'll need a set of hex-shank bits. The screwdriver includes three LED lights arranged around the collet for shadow-free illumination. We've been using a drill similar to this for more than a year now, and we're hooked.

The 12V Max* drill/driver features a sleeveless chuck, a two-speed transmission that delivers 0–400 and 0–1,500 rpm and an LED light for illuminating your work. The 12V Max* impact driver delivers 950 in-lb of torque, and three LED lights arranged around the collet to provide shadow-free illumination.

All three tools come with two lithium-ion batteries, a 40-minute charger and a soft case.

Source: DeWalt, www.dewalt.com, (800) 433-9258, 12V Max* Screwdriver, DCF610S2, \$139; 12V Max* Drill/Driver, DCD710S2, \$159; 12V Max* Impact Driver, DCF815S2, \$159.



Helical-Head Planer

THE LATEST TWIST IN SMALL PLANERS is in the cutterhead—a helical twist. Rather than long, straight knives, this new 13" 15 amp planer from General International has 26 HSS knives arranged in a spiral pattern around the cutterhead. According to the manufacturer, this design creates less tearout and less noise than a standard 3-knife head.

Each of the knives has four edges. When one edge on all the knives gets dull, you just rotate the knives to a fresh edge. Similarly, if a few of the knives get nicked, you just rotate or replace them and you're good to go again.

The cutterhead moves on four widely spaced posts to minimize snipe. Front and rear fold-down extension tables and top-mounted rollers provide support and stability for large pieces. One rotation of the depth-of-cut adjustment handle moves the cutterhead 1/16" (a feature we really like—in some planers, the amount is an awkward 2 mm).

The planer also has a scale that indicates how much you're taking off with each pass.

Source: General International, www.general.ca, (888) 949-1161, 13" Single Surface Planer, 30-005 M1, \$649.99.

Quick Sawhorses

WORKING WITH LARGE PANELS and cabinets often requires lots of sawhorses of different sizes. Which raises two problems: How can you keep enough on hand for every situation? And what do you do with them when you're done? One solution is to go modular, using these new brackets from Taskhorse. With this hardware, you can build or disassemble a complete sawhorse in minutes.

Knockdown sawhorse brackets using 2x4s aren't a new idea, but the Taskhorse brackets are different. First, the top stretcher is horizontal, offering a wider area of support that's easier to clamp to. Second, they use fewer pieces: The legs only require two pieces of wood, not four.

Two versions of Taskhorse brackets are available. The Classic features a two-part base and top brackets, which enable you to build the sawhorse from any 2x material (2x4, 2x6, 2x8, etc.).

The Tradesman features a one-piece base bracket and an adjustable, clamping top bracket that will hold 4x4s and 2x4s in a horizontal or vertical position and pipe up to 2" dia. The Tradesman's base bracket also has pre-drilled holes for securing the sawhorse to the floor so you know you aren't going to knock it over when you're sliding those 4x8 sheets around.

Source: Taskhorse, www.taskhorsebrackets.com, (509) 745-8983, Two Complete Classic Sawhorses, \$125; Two Complete Tradesman Sawhorses, \$150.



120V SawStop

YOU'VE PROBABLY HEARD OF THE HOT DOG SAW BY NOW—you know, the one whose blade stops and drops the instant it contacts a hot dog—or flesh. It's called a SawStop, and there's a new one out that we're pretty excited about: a 120 volt, 15 amp, 1-3/4 hp cabinet saw.

This new model features the same heavy-duty cast-iron table and wings, steel cabinet and cast-iron

trunnions found on SawStop's 3 hp Professional Cabinet Saw. It weighs more than 360 lbs. in its lightest configuration—plenty of mass to dampen vibration.

SawStop also makes a 120 volt contractor's-style saw, but a cabinet-style saw has two big advantages—accuracy and dust collection. First, adjusting the blade to be parallel to the miter slot is much easier on a cabinet saw. In addition, the blade of a cabinet saw will almost certainly stay parallel when it's tilted to 45°. On many contractor's saws with top-mounted trunnions, the blade goes out of parallel when it's tilted. Second, the sealed base of a cabinet saw captures and contains most contractor's saws.

If you don't need a 3 hp motor—and most work doesn't require that much power—this saw would be a great addition to a small shop. It has just about every feature we'd want.

Source: SawStop, www.sawstop.com, (503) 570-3200, 1.75 hp Professional Cabinet Saw, 30" Rails, PCS175, \$2,299.



Skew Block Plane

Hand planes are making a dramatic comeback. Here's the latest: a low-angle block plane that excels at trimming tenons, rabbets and end grain. It's the newest member of Lee Valley's exceptionally well-made family of Veritas planes.

When you pick up this plane, you'll notice that the blade is skewed at 15°, side to side. When using a regular plane, you've probably noted that holding it at a skewed angle to the work makes the plane easier to push. Skewing the blade—as this block plane does—produces the same effect.

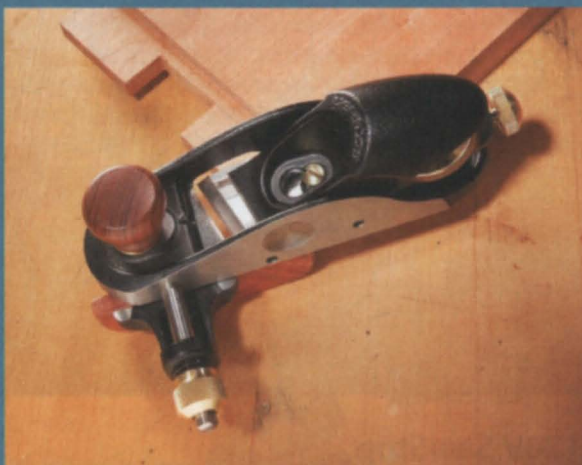
How does that work? Consider this: It's easier to ride a bike up a hill if you go on a slant, right? The lower the angle of attack, the less effort is required. The same is true when planing wood: The lower the blade's angle of attack, the easier it is to push the plane. Skewing the blade, or the plane, essentially lowers the blade's attack angle, just like skewing your bike to the face of that hill.

While this plane can perform all the functions of a standard block plane, such as trimming doors, it will really come in handy for paring tenons, when you only have to take off a shaving or two to make the joint fit. A standard plane won't work, because it can't cut right up to the tenon's shoulder. This block plane *will* work, because it has one open side, like a rabbeting plane. It will take a shaving up to 1-1/2" wide, so you can shave the entire width of most tenons in one pass, unlike a

standard rabbet plane.

Additional features of the plane include an adjustable mouth, a removable fence, a retractable scoring spur, lateral adjustment, and a choice of A2 or O1 blades. It's available in left- or right-hand versions—the right-hand version is shown below.

Source: Lee Valley Tools, www.leevalley.com, (800) 871-8158, Skew Block Plane, Right-Hand, A2 blade, #05P76.01, \$209.



Power in Small Packages

WE'VE REALLY COME TO APPRECIATE SMALL DRILLS.

They're lightweight, easy to maneuver and fit in tight spaces. The latest 12 volt offerings from Craftsman give you almost everything we like in these drills at a good price.

The compact 12V drill/driver delivers 195 in-lb of torque (plenty for most drilling applications). It has two speed ranges: 0–400 rpm for high-torque driving and 0–1300 rpm for fast drilling. The drill also features an 18-position clutch, a 3/8" keyless chuck, a trigger-activated worklight, a 1.3 amp-hr battery and a 30-minute charger. Weighing in at 2.2 lbs., it's easy on your arms.

The 12V compact impact driver is surprisingly powerful for its size. It provides 830 in-lb of torque in both forward and reverse—very handy for those times when you need more power than a standard drill. It weighs 2.1 lbs. Other features include an electric brake, a 1/4" collet, a variable-speed trigger with integrated LED worklight, a 1.3 amp-hr battery and a 30-minute charger.



Source: Craftsman, www.craftsman.com, (800) 377-7414, NEXTEC 12V Lithium-Ion Drill/Driver, #11812, \$89.99; NEXTEC 12V Impact Driver, #17428, \$109.99.

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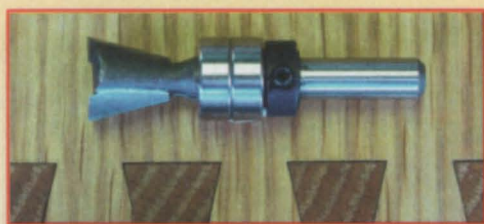


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Eye-Catching Finishes for Small Projects

Take a walk on the wild side of finishing.

by Alan Lacer

I'VE GOT SIX GOOD REASONS to skip the stain and polyurethane on your next small project: bleached, blended, charred, marbled, salt and pepper, and iron and vinegar each name beautiful finishes for wood. These finishes are rarely seen on large pieces of furniture, however, because consistent results are difficult to achieve on large surfaces. But these finishes can produce spectacular results on small projects,

where you can more easily control the consistency of the material (all parts made from the same piece of wood, for example) and the way you apply the finish. I'm a professional woodturner, so all of the projects shown here are turned. But these finishes can be successfully applied on virtually any small woodworking project.



Salt & Pepper



Bleached



Charred



Blended



Iron & Vinegar



Marbled



Salt & Pepper Finish



1

Apply India ink with a rag or brush. India ink is great for ebonizing wood.



2

Wipe on white gel stain to fill the pores. Continue wiping until the stain is completely removed from the surface.

ANY WOOD THAT HAS VISIBLE PORES IS A CANDIDATE for a two-color finish. The basic process is to stain the wood one color and then fill the pores with another color. Using black and white on walnut is one of my favorites. Walnut blackens beautifully and whitening its pores creates delicate, graceful grain patterns. If your project is a lidded box or container, add interest by leaving the inside a natural walnut color.

The technique

Finish-sand the workpiece to 220 grit, making sure that no sanding scratches remain. Then apply coats of India ink (**Photo 1**). India ink (available at www.dickblick.com) is an excellent material for ebonizing wood—it's easy to apply (wear gloves!), dries in less than half an hour and it won't fade. Up to three coats of ink may be required to achieve a uniform black surface. Let the ink dry completely before recoating.

Color the pores with white gel stain (**Photo 2**). Apply the gel stain with a clean white rag. Cover the piece evenly, then immediately wipe across the grain to pack the pores and completely remove the excess stain from the surface. Allow the stain to dry completely. If the pores aren't evenly filled, repeat the staining process.

Pale topcoats such as lacquer and blonde shellac help to preserve the white color in the pores. Do not use finishes that add an amber tone.



Iron & Vinegar Finish

WOODS THAT CONTAIN HIGH AMOUNTS OF TANNIC ACID (such as white and red oak, cherry and walnut) can be ebonized by brushing on an acidic solution of iron and water. Depending on the species, the black color that results is likely to contain shades of brown, red or green. The coloring is usually uniform and consistent, without the blotching that sometimes occurs with oil-based wood stains. On oak and other woods that have large pores, the effect is particularly striking because the pores usually remain light in color.

The technique

In a glass container, immerse a pad of steel wool (steel is mostly iron) in white vinegar from the grocery store. Screw on the lid and allow the steel wool and vinegar to react for at least a day. Shake the solution occasionally.

Finish-sand the piece you want to treat to 180 grit. The iron and vinegar solution contains lots of water, so it's a good idea to preemptively raise the grain. Dampen the sanded piece with water, let it dry and then sand lightly with 180 grit to remove the raised fibers.

Apply the solution with a cloth. There's no need to saturate the wood; a good dampening of the surface will

Bleached Finish



BLEACHING OFTEN MAKES WOOD LOOK LIFELESS, but I find its effect on walnut to be striking. I bleach walnut until it's nearly white and then lightly sand the surface to bring back the ghost of the original color.

The technique

Two-part wood bleach from the paint or hardware store works the best. The two components are hydrogen peroxide and sodium hydroxide (lye), so be careful. Wear rubber gloves and eye protection and strictly follow the instructions.

Finish-sand the piece you want to bleach to 180 grit. Bleaching solutions contain lots of water, so it's a good idea to preemptively raise the grain. Dampen the sanded piece with water, let it dry and then sand lightly with 180 grit to remove the raised fibers.

Don your protective gear and follow the manufacturer's directions to apply the bleach. Some tell you to apply Part A, wait a few minutes, and then apply Part B; others tell you to mix the two parts together and apply the mixture. Wipe on a light coat of the solution (**Photo 1**). There's no need to saturate the wood; just dampen the surface. Let the piece dry. Then repeat the process—it usually takes seven or eight applications to bleach walnut white. When you're satisfied with the white color, wipe the piece with a damp cloth to remove any bleach residue. Then let it dry.

Sand lightly with 320 to 400 grit to gently ghost back the walnut color (**Photo 2**). Then apply lacquer, wax or a clear water-based finish to preserve the bleached look.



1 Remove the wood's natural color with two-part wood bleach. Several applications may be necessary.



2 Sand lightly to ghost back the walnut color. Then apply lacquer, wax or a clear water-based finish.

do. On tannin-rich woods, the reaction can be instantaneous (**Photo at right**). Let the piece dry and then repeat the process. If the surface starts to feel rough, lightly sand between applications. Eventually the color will become uniformly dark; you can stop whenever you like, though. Sometimes a lighter shade of black looks great, so you may want to call it quits after one or two applications. When you're satisfied with the color, wipe down the wood with a damp cloth to remove any residue from the solution. Let the wood dry before applying a finish. Oil finishes, wiping varnishes and oil/varnish finishes enhance this coloring process.



Wiping a solution created by immersing steel wool in household vinegar onto woods that contain high amounts of tannic acid causes a chemical reaction that turns the wood black.



Charred Finish



1

Lightly scorch the wood with a torch. Move the flame continuously and quickly so the wood doesn't overheat.



2

Brush off the loose debris with a soft bristle brush. Repeat the process, if necessary, to create a consistent black color. Then apply an oil finish to intensify the black.

EBONIZED WOOD OFTEN ISN'T PURE BLACK. Depending on the method used, the color usually includes shades of brown, red, purple or blue. A rich, deep, pure black is hard to achieve—unless you char the wood with a torch. This method works on any wood, although the results will look distinctively different from one species to another, depending on the character of the wood. Also, a uniform appearance is easier to achieve on face and edge grain than on end grain.

This finish is tricky because it's fairly easy to overheat the wood and cause it to crack or ignite. End grain surfaces and thin pieces (less than 3/8" thick) are especially vulnerable. It's a good idea to develop your charring technique by practicing on pieces that aren't "keepers."

The technique

Finish-sand the piece you intend to char the same as for a clear finish—charring doesn't cover sanding marks or torn grain as well as you might think. Work in an area free of combustible materials. Wear a heavy protective glove to hold the piece while charring its surface, and use a propane torch with an adjustable flame so you can control the heat level.

The best approach is to char the wood to a uniform appearance in stages, stopping to brush off the burned debris between applications of heat. Start by lightly skimming the wood's surface with the flame (**Photo 1**). Make slightly overlapping passes and move the torch continuously. If the wood ignites, simply blow out the flame and let the wood cool before resuming.

After lightly charring the entire surface, let the piece cool, and then go over it with a soft metal brush to remove the ash and other completely burned debris (**Photo 2**). Brushing often accentuates the latewood, which is usually harder and more resistant to the flame than the earlywood. Torch and brush the entire surface a second time to make the charred color as uniform as possible.

The last step really brings out the rich, carbon-black color. After the piece has cooled, apply a coat of oil finish. I usually use boiled linseed oil or pure tung oil (both thinned by one-third with mineral spirits). Rags soaked with boiled linseed oil are flammable, so dispose of them properly.

Blended Finish



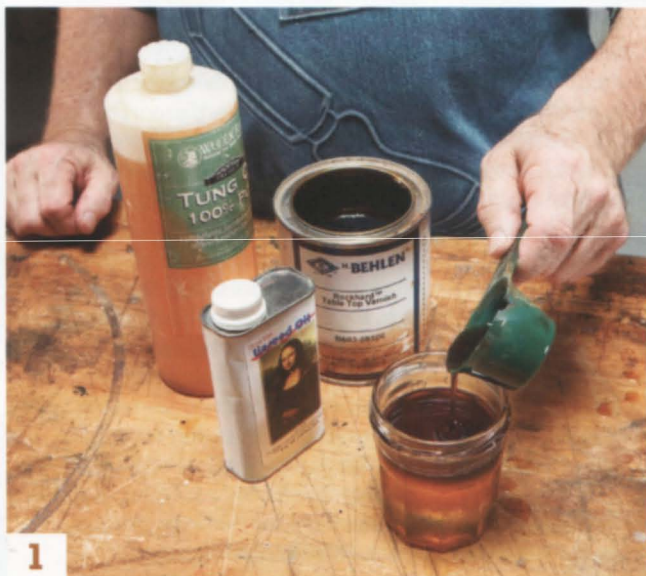
ONE OF MY ALL-TIME FAVORITE FINISHES for dark woods is a blend of high-quality oils and varnish—it's very similar to the finish espoused by master furniture maker Sam Maloof. This "hybrid" finish enriches the color of the wood, highlights the grain and gives the surface a beautiful luster without ever looking like built-up film finish. For my taste, however, its rather dark amber color adds too much yellow tone to light woods such as maple, holly and pine. This finish also dries very slowly—but I'm willing to wait for the rich, luxurious appearance it provides.

The technique

Premium ingredients are the key to this finish, which consists of equal parts 100% pure tung oil, boiled linseed oil and gloss varnish with a high resin content, such as Behlen Rockhard Table Top Varnish. This finish has a relatively short shelf life—it thickens with exposure to air (even the air inside a closed, half-filled container), and eventually becomes unusable. So mix the three ingredients in small batches (**Photo 1**). To make this finish easier to use on large surfaces, add small amounts of mineral spirits, naphtha or turpentine to reduce its syrupy consistency.

Finish-sand the workpiece to 220 grit. Then wipe on the finish with a lint-free cloth (**Photo 2**). As soon as the piece is evenly coated, use a clean cloth to wipe the surface dry. After 30 minutes, wipe down the surface again to make absolutely sure that no residue remains. Move the piece to a dust-free area to dry. Note: The finish-soaked rags are likely to spontaneously combust, so dispose of them immediately and properly.

After two or three days, gently rub the piece with very fine abrasive wool (steel or synthetic) to remove any roughness, dust or residue from the surface. Then apply additional coats of finish, following the same procedure. The first few coats add little sheen—they look pretty much like an oil finish. But eventually the finish will build and the luster will develop. The more coats you apply, the higher the sheen. I normally stop when the finish has a soft, warm glow. Let the finish cure for several weeks before buffing to brighten the sheen, or rubbing to dull it. I usually buff my pieces with a soft towel or rub them with abrasive wool.



1

Mix equal parts pure tung oil, boiled linseed oil and gloss varnish. Premium ingredients are the key to this finish.



2

Apply an even coat of finish and then wipe the surface dry. The lustrous appearance develops as additional coats are applied.



Marbled Finish

THE PROCESS OF FLOATING COLORS ON WATER, creating patterns and then capturing those patterns on paper or fabric probably originated somewhere in the Orient. Called "marbling," this process traveled westward through India, Persia and Turkey before arriving in Europe in the 17th century.

Marbling three-dimensional objects is less common, although it has appeared on vases, bowls, boxes and even fishing lures. Learning how to marble flat and rounded surfaces offers unique coloring opportunities for wood.

A variety of variables affects the process and its success, so it's best to learn the basics using sheets of 4" x 6" paper. Chemical contaminants, air pockets, dust, improperly mixed colors, temperature and humidity are all factors that can frustrate the marbling process.

Liquid acrylic paints, carrageenan, alum and other marbling supplies are available at art supply vendors such as www.wetpaintart.com. You'll need a blender to mix the carrageenan solution (it's food-safe, so no worries if you borrow Mom's), distilled water to thin the acrylic paints and glass jars (a pint jar for the alum solution and a gallon jar for the carrageenan solution). You'll also need a palette, a shallow tray, foam brushes, measuring spoons, rubber gloves, eyedroppers (one for each color, plus one for the distilled water), toothpicks, foam board, a bunch of 2" wide newspaper strips and practice paper (65 lb. to 75 lb. weight, and not too slick).

The technique

Mix the carrageenan solution the day before you plan to marble (**Photo 1**). Follow directions on the bag, usually 2 tablespoons per gallon of distilled water. The solution has a two to three day shelf life, so prepare only as much as you'll need. Mix the solution in a blender for at least one minute. Then set it aside.

Finish-sand the pieces you plan to marble to 180 grit and preemptively raise the grain. Dampen the sanded pieces with water, let them dry and then sand lightly with 180 grit to remove the raised fibers.

The next day, mix the alum solution in very hot tap water, according to the package directions (usually 2 teaspoons per pint). Allow this mixture to cool before using it. In fact, make sure that everything you'll use (the solutions, the paints, the water, the pieces you plan to marble, etc.) is at the same (room) temperature. Find a dust-free area for marbling. Pour the carrageenan solution into the marbling tray to within about 1/4" of the top. Use the foam brush to coat the paper (one side only) or the pieces that you plan to marble (completely) with the alum solution (**Photo 2**). The alum solution works like a paint primer to help the acrylic colors stick

Create a solution that's thick enough to float the acrylic paint used for marbling. Mix carrageenan and water in a blender. Let this solution sit overnight. Then pour it into a large shallow tray.



Coat the piece you plan to marble with a solution of alum to prime it for marbling. Don't touch the primed surface.



Thin acrylic paint with distilled water so it will float on the surface of the carrageenan solution.



4 Clean the surface of the carrageenan solution just before adding the paint by skimming it with newspaper strips.



5 Gently squeeze drops of acrylic colors onto the carrageenan solution. The colors disperse across surface, forming rings.



6 Use a patterning tool to comb the layers of paint into interesting patterns. This tool is made from toothpicks and foam board.

to the surface. It's a good idea to wear rubber gloves for this step because you should never touch the alum-treated surfaces with your bare hands—touching may affect the adhesion of the paint. Set the primed pieces aside to dry for about an hour.

Choose the acrylic colors you plan to use and thin them with distilled water to the consistency of whole milk so they'll float on the surface of the carrageenan solution. It's best to limit the number of colors for your first marbling attempts. One of my favorite combinations is simply black and white. An inexpensive plastic palette is great for mixing the paints (**Photo 3**). Shake the bottles to mix the paint and squeeze some of each color that you've chosen onto the palette. Then use eyedroppers to add the distilled water. Mix the thinned paint by stirring with a clean toothpick. Just before you drop the paint onto the carrageenan solution, skim its surface with a strip of newspaper (**Photo 4**). Skimming removes dust and other floating imperfections that can cause "bald spots" on the marbled surface.

Dropping the paint onto the carrageenan solution is one of the most critical—and unpredictable—steps in marbling. Using an eyedropper, gently squeeze a drop of color onto the center of the solution. Avoid creating bubbles when you squeeze. The drop should immediately disperse across the surface. If it sinks to the bottom of the tray, the paint is too thick—thin it further and try again. (Paint drops on the bottom will cause no harm, as marbling occurs on the surface.)

Using a different eyedropper, gently squeeze a drop of the next color onto the dispersed color. As each drop disperses, it creates a ring where it meets the previous drop. Alternate squeezing drops of different colors until the surface is covered with rings (**Photo 5**). You'll learn that some colors disperse more aggressively than others—experimenting with different colors is one good reason to practice on sheets of paper.

Creating patterns in the floating colors is, perhaps, the most mesmerizing step in the process. You simply pull patterning tools slowly and gently through the paint (**Photo 6**). Effective patterning tools can be made from nothing more than toothpicks and foam board. Varying the spacing between toothpicks is one simple way to modify the patterns you create.

Pull the tool straight across or move in waves, loops or zig-zags. Make separate passes that overlap. Use a stylus such as a cat's whisker or a hatpin to create delicate patterns and swirls that are more spontaneous and free-form. Once again, experimenting is important because you'll learn how to make and recognize patterns in the paint that will create interesting marbled effects on your projects.

Transferring a pattern that you like onto the



Marbled Finish *continued from page 41*

workpiece is the pivotal step (**Photos 7-10**). Starting at one corner (or edge), barely dip the piece into the paint pattern. Then gently and continuously roll it across the painted surface to transfer the pattern. This sounds easy, but it's tricky, because it's easy to miss an area or submerge the piece too far. The goals are to stay on the surface and move fluidly. A two-dimensional object (paper or a flat board) is often much easier to successfully dip and roll than a three-dimensional one.

Pull the marbled piece from the tray and examine it to see what you've achieved. This is the moment of truth, when you learn if everything came together. I can say from experience that each success is thrilling—when I teach marbling wood to my friends, there's always lots of celebratory yelping at each "reveal."

Immediately dunk the marbled surface in a clean pail of water to rinse off any carrageenan and paint that didn't adhere. You can also hold the piece under a trickling faucet—just don't smack the surface with a high-pressure water stream.

What you see now is the permanent pattern. Don't touch the marbled surface at this point—it's far too tender. Set the piece aside to dry for at least an hour. If you intend to put a finish on top of the marbled surface, wait at least a week to allow the paint to cure. I've successfully used a variety of topcoats, including wax, shellac, water-based polyurethane and epoxy.

You can usually marble several items from the same batch of colors, but eventually the patterns will start to break down. When this happens, simply skim the surface three or four times with newspaper strips to remove the paint (use a fresh strip for each pass), and the carrageenan solution is ready for another round of marbling. When you're done for the day, thoroughly clean all of your equipment. I use only hot water for cleaning, as soap residue may cause problems in future marbling sessions.



Alan Lacer is a woodturner, writer and instructor who lives near River Falls WI. To see more of Alan's work, visit: www.alanlacer.com



To see marbling, visit AmericanWoodworker.com/WebExtras



7

Position the workpiece over a paint pattern that you like.



8

Gently dip the workpiece onto the paint and roll it across the pattern.



9

Be careful to stay on the surface as you continue rolling.



10

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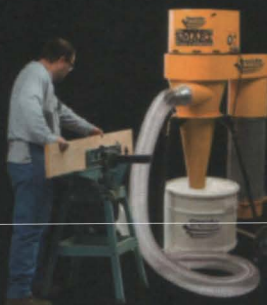
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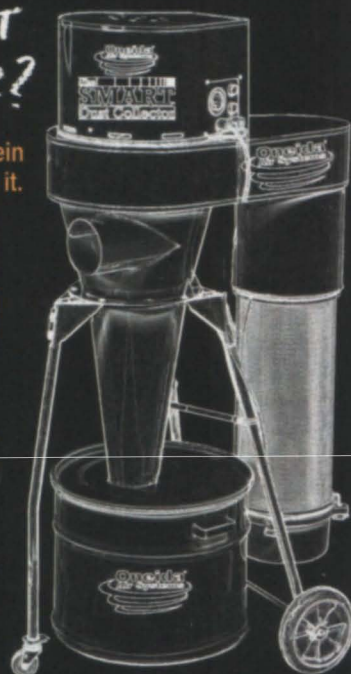
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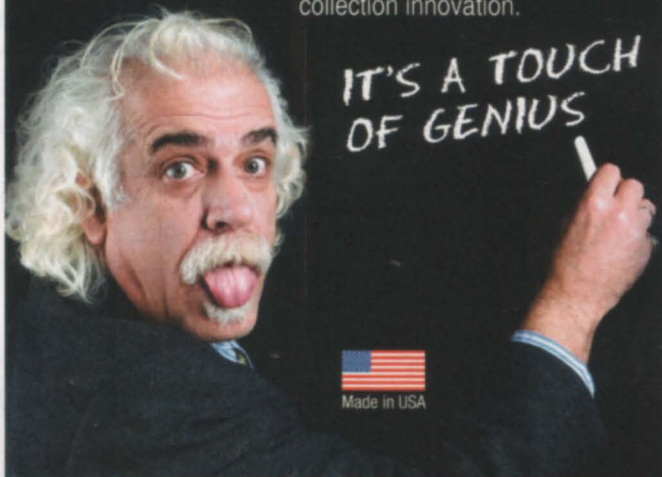


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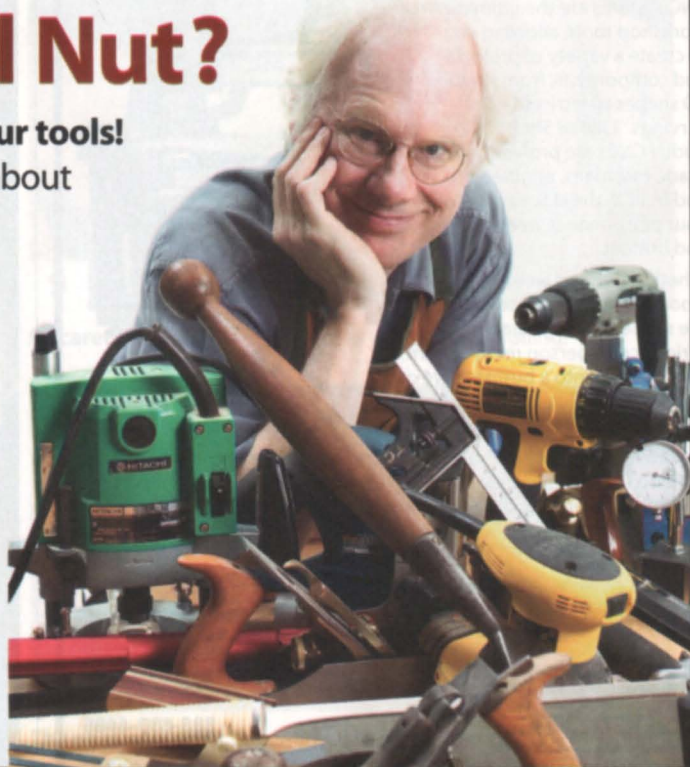
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Guide to Finishing 11 Common Woods



Black Walnut



Hard Maple



White Oak



White Pine

**Improve your results
by understanding
wood characteristics.**

by Kevin Southwick



Red Oak



Poplar



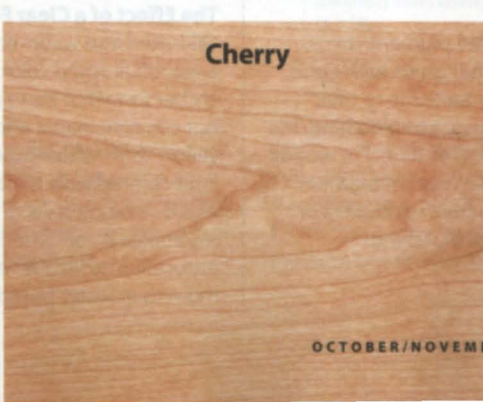
Honduras Mahogany



White Birch



Butternut



Cherry



Ash

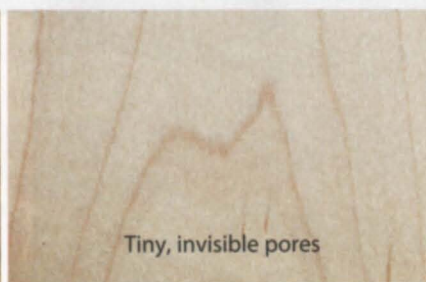
EACH SPECIES OF WOOD has unique finishing characteristics, both positive and negative. To help you determine how to choose the right wood and get the best results when you finish your next project, I'll explain those characteristics and sum them up in a chart that divides 11 commonly used woods into categories that affect their finished appearance. The notations in each category are based on my observations and experiences with these woods as a professional wood finisher over the past 15 years.



Large pores in earlywood



Medium pores throughout



Tiny, invisible pores

Pore Structure

Each species of wood is unique in appearance, thanks mainly to variations between its earlywood and latewood, but also because of the size and distribution of its pores. Pore structure is important when finishing, because most stains accentuate the pores. In ash, pores appear in the earlywood, but not in the latewood, so staining creates a strong contrast between these two elements. In walnut, the pores are evenly distributed across

the earlywood and latewood, so staining creates a more uniform appearance. In maple, the pores are so small they're virtually invisible—until stain is applied. Then they appear as dark specks that cover the surface. Also, in oak, walnut and many other species, the pores are large enough to appear as crevices when a clear finish is applied. If a glass-smooth surface is desired, these woods require extra finishing steps to fill the pores.



Fresh planed cherry

Aged cherry

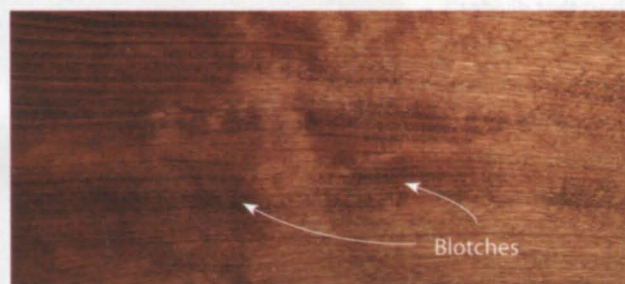
Fresh Planed Color and Natural Color Change

All types of wood, even finished woods, change color over time, as the result of exposure to air and light. Both the color and the rate of change can vary widely. For example, cherry and maple darken relatively quickly; walnut and mahogany slowly become lighter. Knowing what color the wood will eventually become is important for finishing. It may affect whether or not you decide to use stain, for example. And if you want the Morris chair you're building to look authentic, it's important to know what colors to add to make that new quartersawn white oak look like it's 100 years old.



Sandability and Minimum Final Grit

When is it time to stop sanding? The answer depends on the type of wood and the type of finish. Basically, it's as soon as you can no longer see any sanding scratches. Dense, hard woods with smooth texture and small pores require the most effort and sanding to the highest grits. Woods with large or medium size pores allow stopping at lower grits, because the coarse texture helps to disguise the scratches. The chart indicates the minimum grit at which you can quit sanding for a clear varnish finish. Sand more carefully if you plan to stain the wood—scratches that won't show with a clear finish are likely show up when you stain. Many woodworkers sand to finer grits for oil finishes.



Blotches

Stainability

Many types of wood stain well with oil-based pigment stains. The color soaks in readily and evenly and the results look good. However, some woods are difficult to stain dark, due to their density. And some woods are tricky to stain due to blotching, the random, uneven and unattractive absorption of stain. For woods that are difficult to stain dark, apply multiple coats of pigment stain or start with a dark-colored dye stain. Stain controllers or wood conditioners can be used to minimize blotching.



Oil-based



Water-based

The Effect of a Clear Finish

Oil-based and water-based finishes have very different effects on a wood's finished color. Oil-based finishes typically add a slight amber tone that benefits dark colored woods such as cherry, but can give maple and other light colored woods an unwanted yellow tone. Water-based finishes add little to no color, keeping light colored woods looking natural, but leaving dark colored woods looking pale, or even parched. Orange (amber) shellac resembles an oil-based finish. Blonde (clear) shellac and nitrocellulose lacquer add less color than oil-based finishes, but more than water based finishes.

Finishing Characteristics of Common Woods (a)

Species	Pore Structure	Fresh-Planed Color (b)	Natural Color Change (c)	Sandability and Minimum Final Grit (d)	Stainability	Effect of Clear Finish
Ash	Pore size: Large. Location: Earlywood only; creates very strong grain patterns. Glass-smooth finish: Filling required.	Sapwood: Pale tan to very light golden brown. Heartwood: Darker.	Slightly darker and more yellow-gold.	Difficult. Stop at 120 grit. Coarse grain helps to hide sanding scratches.	Good. Challenging to make dark without using a multiple-step staining process.	Oil-based: Adds a warmer golden tone. Water-based: Color remains light.
Butternut	Pore size: Medium. Location: Throughout. Glass-smooth finish: Filling required.	Heartwood: Light greyish, greenish, or pinkish brown. Sapwood: White.	Lighter, to a uniform golden brown, and the pores lose their dark color.	Easy to Medium. Stop at 150 grit. Coarse grain helps to hide sanding scratches. Can contain fuzzy areas.	Excellent. Stains dark easily with pigment stain or dye stain.	Oil-based: Darkens and enriches color. Water-based: Color remains light.
Cherry	Pore size: Small. Location: Throughout, but more prominent in earlywood. Glass-smooth finish: Filling not required.	Heartwood: Light pinkish to medium reddish brown. Sapwood: White.	Darker reddish brown, although the intensity can vary greatly.	Medium to Difficult. Stop at 180 grit. Higher grits are required to hide sanding scratches.	Mediocre. Prone to blotching. (e) Pores appear as dark specks when stained. (e)	Oil-based: Darkens and enriches the color. Water-based: Color becomes pale and washed out.
Hard Maple	Pore size: Very small. Location: Throughout. Glass-smooth finish: Filling not required.	Sapwood: Very pale tan. Heartwood: Dark brown.	Slightly darker and more golden.	Difficult. Stop at 180 grit. Higher grits are required to hide sanding scratches.	Mediocre. Prone to blotching. (e) Pores appear as dark specks when stained. (e)	Oil-based: Adds a warmer golden tone. Water-based: Color remains light.
Mahogany	Pore size: Medium. Location: Throughout. Glass-smooth finish: Filling required.	Heartwood: Light to medium reddish brown. Sapwood: Light to medium reddish brown.	Usually less reddish, lighter, more golden brown.	Easy to Medium. Stop at 150 grit. The grain helps to hide sanding scratches. The density of different types of mahogany can vary widely.	Excellent. Stains dark easily with pigment stain or dye stain.	Oil-based: Darkens and enriches the color. Water-based: Color becomes pale and washed out.
Poplar	Pore size: Small. Location: Throughout. Glass-smooth finish: Filling not required.	Sapwood: White. Heartwood: Green; sometimes includes dark purple or black streaks.	Sapwood: Golden brown. Heartwood: Dark brown.	Easy. Stop 150 grit. Low density makes sanding go faster.	Mediocre. Prone to blotching. (e)	Oil-based: Adds a warmer golden tone to sapwood and darkens the heartwood. Water-based: Sapwood remains light; heartwood looks washed out.
Red Oak	Pore size: Very large. Location: Earlywood only; creates very strong grain patterns. Glass-smooth finish: Filling required.	Heartwood: Tan to slightly pinkish brown. Sapwood: White.	Slightly darker and more golden.	Medium. Stop at 120 grit. Coarse grain helps to hide sanding scratches.	Good. Challenging to make dark without using a multiple-step staining process.	Oil-based: Adds a warmer golden tone. Water-based: color remains light.
Black Walnut	Pore size: Medium. Location: Throughout. Glass-smooth finish: Filling required.	Heartwood: Dark greyish brown with purple highlights. (f) Sapwood: Greyish brown to white.	Lighter and more golden brown.	Medium. Stop at 150 grit. Coarse grain helps to hide sanding scratches.	Excellent. Stains dark easily with pigment stain or dye stain.	Oil-based: Darkens and enriches the color. Water-based: Color becomes pale and washed out.
White Birch	Pore size: Small. Location: Throughout. Glass-smooth finish: Filling not required.	Sapwood: Pale, slightly golden brown. Heartwood: Dark brown.	Slightly darker and more golden.	Medium. Stop at 150 grit.	Mediocre. Prone to blotching. (e) Pores appear as dark specks when stained. (e)	Oil-based: Adds a warmer golden tone. Water-based: Color remains light.
White Oak	Pore size: Large. Location: Earlywood only; creates very strong grain patterns. Glass-smooth finish: Filling required.	Sapwood: Tan to very light greyish brown. Heartwood: Darker.	Slightly darker and more golden.	Very Difficult. Stop at 120 grit. Coarse grain helps to hide sanding scratches.	Good. Challenging to make dark without using a multiple-step staining process.	Oil-based: Adds a warmer golden tone. Water-based: Color becomes pale and washed-out.
White Pine	Pore size: None—coniferous. Location: NA Glass-smooth finish: Filling not required.	Heartwood: Pale tan. Sapwood: Pale tan.	Slightly darker and more golden brown.	Easy. Stop at 150 grit. Low density makes sanding go faster.	Mediocre. Prone to blotching. (c) Earlywood is much more absorbent to stain and finish than latewood.	Oil-based: Adds a warmer golden tone. Water-based: Color remains light.

Notes: **a)** The appearance of virtually any species of wood can vary widely, so exceptions to the notations will surely occur.
b) The preferred choice for color (heartwood or sapwood) is listed first.
c) Long-term exposure to direct sunlight causes many woods to fade.
d) Minimum final sanding grit for a clear varnish finish.

e) Wood conditioner minimizes blotching and specking, but makes the wood difficult to stain dark without using a multiple-step staining process.
f) Describes kiln-dried walnut. Air-dried walnut heartwood is medium brown with red and gold highlights.

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Not-So-French Polishing

A new twist
on an old method
of applying shellac.

by Richard Tendick

YOU'VE SPENT WEEKS, OR MONTHS producing that perfect table from a very special wood, and now it's time to apply the finish. What do you reach for? If it's durability you're after, use poly. But if beauty is more important, I'd recommend shellac.

Lacquer can yield equally stunning results, but it's best applied by spraying. Spraying requires specialized equipment and a lot of cleanup with strong solvents. It may not even be legal in states with tough air-quality standards. Shellac is far simpler. All you need is a good brush to apply it and denatured alcohol for cleaning up.

Traditionally, shellac was applied by a process known as French polishing. In this technique, you use a cloth pad to apply dozens of very thin layers of shellac, without sanding between coats. You achieve a high-gloss finish by gradually thinning the shellac. It's very low-tech, but no matter how well you master the technique—and that can take a while—it's a time-consuming process.

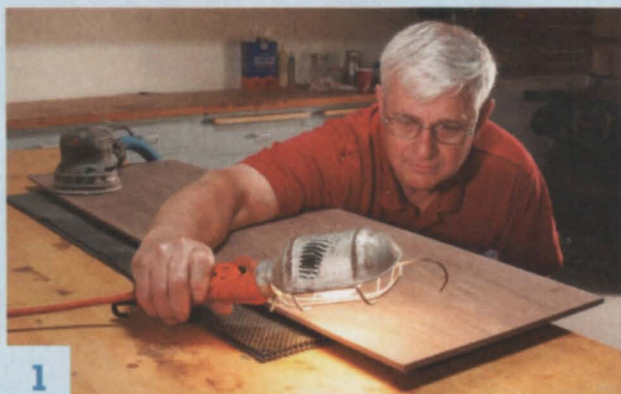
Today, using a synthetic brush, it's possible to achieve that same build much faster, also without sanding between coats. You achieve the final look—satin or gloss—by using modern abrasives. It's still a shellac finish, but I call it Not-So-French polishing.

Prepare the surface

Shellac is almost perfectly transparent. It won't obscure flaws, so the wood's surface should be sanded to near-perfection. Fortunately, this rule doesn't usually apply to a whole piece of furniture. It's really only the horizontal surfaces—a top, for example—that require such special treatment. Vertical surfaces such as legs and rails won't reflect light or catch the eye the way a

gorgeous top does. You don't have to sand them to the same high standard or apply as many coats of finish as you do for a top.

While there are many ways to make a perfectly smooth surface, the same test applies to each method: Look at the surface under a raking light (**Photo 1**). The tiny swirls made by a random-orbit sander may not be apparent this way, though, so I go one step further and use a magnifying glass (**Photo 2**). I figure if it looks good under magnification, it's going to look great without it!



1 Prepare the surface by sanding up to 220 grit with an orbital sander. Make sure the surface is free of mill marks and scratches by examining it under a raking light.



2 Sand by hand using 220 grit paper. With a magnifying glass, look for swirl marks left by the orbital sander. Keep sanding until all the swirls are gone.



3 Thin the shellac with an equal portion of denatured alcohol. On dark woods such as this walnut, use amber shellac.



4 Apply the shellac using a high-quality brush to minimize ridges. This brush—my favorite type—has Taklon bristles.

Build the finish

You can make shellac from flakes and denatured alcohol, but I usually buy cans of premixed Bulls Eye shellac, which is available at most hardware stores. This shellac comes in two shades: clear and amber. I generally use clear shellac on pale woods and amber on dark woods. I've found that thinning premixed shellac with denatured alcohol reduces the size and amount of brush marks so that I don't have to sand between coats. To begin, mix your shellac with an equal amount of alcohol (**Photo 3**). This thinned mix will keep at least one year, so you can make as much as you want.

Now, a word about brushes. Good ones are worth the money—about \$35 for a 2" brush. While you can certainly apply shellac with a cheaper brush, it will leave uneven ridges that require a lot of time to sand out. A good brush leaves a flatter surface. I've used two types of high-quality brushes: badger hair and Taklon (**Photo 4**). While a badger brush can hold more finish, I think the Taklon is better because it leaves a smoother surface.

Back to the tabletop. First, place it top-face up and brush the edges all around. Some shellac will probably dribble underneath the top; wipe that excess with a rag or your finger. On the top itself, start each brush stroke about 2" from the end of the top, then pull the brush toward that end and off the top. Place the brush back where you started and pull it to the other end. Go back over this wet area with quick back-and-forth strokes to cover any spots you missed and to even

out the film. Don't work the shellac too much—it dries very fast. Stop when you start to feel the drag of the drying shellac. Continue this process across the top, overlapping each pass about 1/4".

You can recoat the top in an hour or so, but you don't have to clean your brush between coats—one of the benefits of using shellac. When you're done with a coat, just suspend your brush in a jar of denatured alcohol. Hang it so the bristles don't rest on the bottom of the jar and use enough alcohol to completely cover the bristles. Before you apply a new coat, shake out the brush and wipe it a few times on a scrap of wood, then go at it.

Recoat the top up to twelve times (**Photo 5**), or until you get the amount of build you desire. You can take your time; there's no need to do it all in one day.

The bottom side of your top should receive an equal number of coats. You can apply these coats as you go, or wait until you've put the final coat on the top side, then flip the work over and start in on the bottom.

Finish the finish

Although shellac dries to the touch very fast, much more time is required for it to harden enough to be sanded with fine paper. If you sand too soon, the paper will clog up and the surface will be very uneven. Wait at least one week before smoothing the finish.

After this period, you can treat the lower parts of a project



5

Apply another coat after an hour or so—you don't have to sand. Put on at least twelve coats. Set the top aside to cure for at least one week.



6

Sand with very fine wet/dry paper, using mineral spirits as a lubricant.



7

Wipe away the slurry and examine the surface. If you see any shiny spots, continue to sand until they're gone.



8

Use automobile polishes to obtain a higher gloss. You can also use steel wool and wax to create a satin finish.

differently than the top, just as in sanding and building up coats. Rub these parts with 3/0 or 4/0 steel wool, then follow with a coat of paste wax and buff it out.

A top requires special care. I've found that the best way to smooth the shellac on a top and achieve the final luster, whether satin or gloss, is to sand with wet/dry paper and a lubricant. I use mineral spirits as the lubricant, which requires good ventilation and a respirator, but I'm still looking for something less obnoxious. In any case, you need only work a small area at a time, to minimize the amount of mineral spirits that evaporate.

Start with 600 grit wet/dry paper, wrapped around a rubber, cork or felt sanding block. Squirt a small puddle of mineral spirits onto the surface and start sanding lightly in a circular motion until you create a slurry (**Photo 6**). Work your way across the surface and apply more mineral spirits as needed. Periodically wipe away the slurry. Let the film of mineral spirits dry, then examine the surface. Sand until the surface has a consistent, dull appearance. If you see any shiny spots (**Photo 7**), continue to sand until they're gone.

Switch to 1000 grit wet/dry sandpaper and repeat the process. When you wipe away this slurry, the surface will be a bit shinier. Switch to 1500 grit and repeat. The surface will now have a rich, satin appearance. If this is what you want, stop here.

If you want a mirror-like finish, move on to automotive polishes, such as Meguiar's Swirl Remover and Show Car Glaze (see Sources, at right). Using a soft cloth, squirt a small

amount of Swirl Remover on the top and polish with a circular motion (**Photo 8**). When the top has a consistent shine, switch to Mirror Glaze and repeat.

Shellac is a brittle finish, and scratches easily. To keep scratches to a minimum—particularly on a mirror finish—apply a coat of paste wax.

SOURCES

- Homestead Finishing Products, www.homesteadfinishing.com, (216) 631-5309, Homestead Golden Taklon 2" brush, #2021, \$31.95.
- Meguiars, www.meguiars.com, (800) 347-5700, Swirl Remover, #SWIRL 16, \$12.49; Show Car Glaze, #SHOW 16, \$11.49.

The beautiful claro walnut used in this article came from Artisan Lumber, located in Lunenburg, Massachusetts (www.artisanlumber.com).



Richard Tendick

is a retired engineer who loves designing projects and working wood.



For more on using shellac, go to **AmericanWoodworker.com/WebExtras**

Sanding for a Stained Finish

10 tips to make stain look great.

by Tim Johnson

YOU'RE IN FOR A SURPRISE if you think that you can go easy on sanding because you're planning to use stain. Sanding for a stained finish is actually more demanding than sanding for a clear finish, because most stains color wood by lodging in crevices in the surface—and sanding

scratches are pretty large crevices. The trick is to eliminate scratches that staining will highlight, such as big scratches from coarse grit, swirls from power sanding or scratches that run across the grain. Here are 10 sanding tips that will make a stained finish look its best.

Go E-Z on the R-O

RANDOM-ORBIT SANDERS employ a dual-action motion (the disc rotates and oscillates) to create a uniform scratch pattern that minimizes visible scratches. Bearing down and moving fast while using this type of sander feels natural, but it's the wrong thing to do because it disrupts the sander's dual-action motion and creates uneven scratch patterns. Noticeable scratch marks are the unfortunate result. To keep scratch marks at bay, random-orbit sander manufacturers recommend moving the sander very slowly, about 5 to 10 seconds to cover 6", and applying only light pressure, about 2 to 4 lbs., which is about the weight of your arm.



Always Sand by Hand

HAND SANDING WITH THE GRAIN should always be your last step before applying stain. Power sanding may be a real time-saver, but it rarely leaves surfaces that are entirely scratch-free. Hand sanding after power sanding aligns all the sanding scratches so that the grain will help to hide them. Bearing down when you sand by hand is OK. In fact, it speeds up the process. Using a cork-faced sanding block helps to evenly distribute the sanding pressure. Start with the same grit size that you used for your last round of power sanding. If visible scratches from power sanding remain after hand sanding, switch to slightly coarser grit and start again.



Know When to Quit

SANDING TO SUPER-FINE GRITS makes wood look great under a clear oil finish, but it can cause problems if you plan to use stain. Most oil-based stains contain pigments, which color wood by lodging in pores and other crevices in the surface—such as sanding scratches. As these crevices decrease in size, the stain becomes less effective. Many stain manufacturers recommend finish sanding to 220 grit at most and stopping at a lower grit for a darker color. The samples at right show the difference in stain penetration on mahogany between stopping at 180 grit (left) and sanding to 320 grit (right).



Don't believe it?

See how sanding affects stain retention at AmericanWoodworker.com/WebExtras



Sand Diagonally

AN OLD-SCHOOL METHOD for eliminating visible scratch marks is to purposefully make them visible by sanding across the grain as you work your way through the grits. After sanding diagonally in one direction, change to finer grit and sand diagonally in the opposite direction until the scratches from the previous grit disappear. Step up another grit and sand with the grain until all the diagonal scratches are gone.

Pre-sand and Pre-stain

WANT TO CREATE A FINISHING TIME BOMB? Just wait to sand and stain frame-and-panel structures after they're assembled. During the heating season, the panel is likely to shrink because of the lower humidity, exposing a strip of unfinished wood at one or both edges. To hide the panel's seasonal movement, sand, stain and finish it before assembling the frame-and-panel structure.

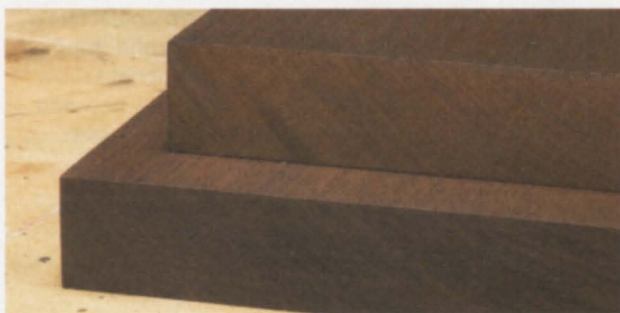


Sand the Stiles Last

BEWARE OF SANDING ACROSS JOINTS on stile-and-rail and face-frame assemblies. The goal of sanding by hand is to hide scratches by aligning them with the grain. But going too far on these joints makes the scratches stand out like a sore thumb. To avoid this problem, simply sand the stiles last—and when you sand the stiles, be careful not to cross the joint line, or you'll leave unsightly cross-grain scratches on the end of the rail. On miter joints, sand to the joint line from each direction.

Know When to Sand Further

ONE WAY TO KEEP END GRAIN FROM GOING DARK when stain is applied is to sand it to finer grit than the face grain. On most woods, the end grain is considerably harder than the face grain, which makes sanding scratches and other crevices harder to remove. As a result, the end grain looks darker when it's stained. On the samples shown here (top), the end grain and face grain on the bottom board have both been sanded to 180 grit, while the top board's end grain has been sanded to 320 grit to completely remove the sanding scratches. When stain is applied (bottom), it's clear that the extra sanding pays off: The end grain's color is much more similar to the face grain. The end grain looks better, too—whether it's stained or under a clear finish—because the annual ring structure shows clearly and distinctly.



Moldings Require Sanding

RESIST THE TEMPTATION to stain moldings without sanding them. Even if they feel smooth, moldings often contain milling marks on the raw wood. These marks can be very hard to see because of the wood's grain and the molding's curved surfaces. But if you don't eliminate them by sanding, they'll show up as bands of parallel lines when you stain.

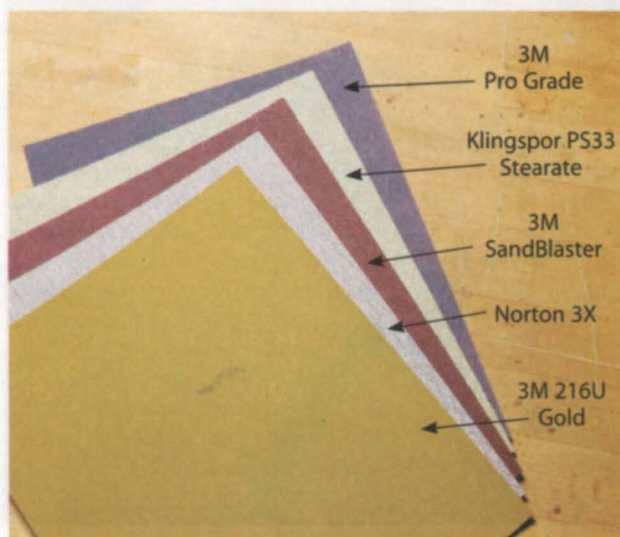


Raise the Grain

WATER-BASED DYES AND STAINS often leave a rough surface because they cause wood fibers bent over by sanding to swell and stand up. The best way to avoid this problem is to preemptively raise and flatten the grain. Then it won't happen when stain is applied. Dampen the wood and let it dry. Then smooth the surface by sanding very lightly with the same grit used for final sanding.

Buy Colored Sandpaper

THE BEST MATERIAL FOR SANDING unfinished wood is made with premium aluminum oxide abrasive that's graded for consistent size, applied in an open coat, resin-bonded to a flexible lightweight backing and covered with an anti-clogging material. So how do you choose the right stuff? Many manufacturers use color to brand their top-quality sheets, so one easy way is to look for paper that's a distinctive color. Norton 3X, Klingspor PS33 Stearate, 3M 216U Gold, 3M SandBlaster, and 3M Pro Grade all fit the bill. Ironically, sandpaper in shades of brown—the color of sand—is often made with garnet abrasive, which dulls much more quickly than aluminum oxide, so it isn't the best choice. This paper isn't likely to be covered with an anti-clogging material, either.



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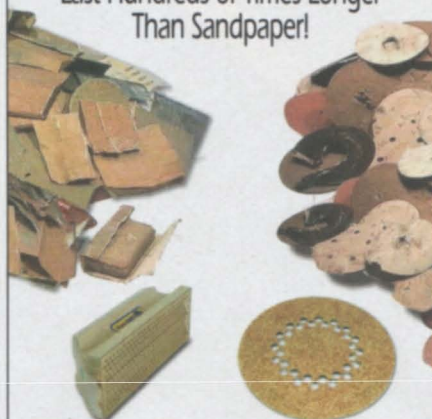
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Coloring Figured Wood

Two dyes and a glaze create a stunning effect.

by Richard Helgeson

FIGURED WOOD IS A FINISHER'S DELIGHT. Take a piece of curly maple, for example, and simply add a good topcoat to it. You'll begin to see a three-dimensional effect, like ripples on a pond. Now, throw in a few simple finishing tricks, using dyes and a glaze, and wow! Suddenly, your maple becomes real, flowing water—a perfect illusion and a beautiful accent.

Start with black

First, mix up a batch of black aniline dye (see Sources, page 58). Apply the dye using a foam brush (**Photo 1**). Let the dye soak in and dry at least 1 hour. Next, sand off most of the dye with 180 grit paper (**Photo 2**). I use an orbital sander for the bulk of the work, then go back and sand areas that look too mottled, using a cork or felt block.

Black dye adds extra depth to the wood's figure. Sanding removes the dye from areas where the dye didn't penetrate very deep, and leaves the dye in areas that are more absorbent. The result is a pattern of dark areas that look like shadows, and this makes the curly grain appear more three-dimensional. Sanding also removes any wood fibers raised by the water in the dye.

Add bright colors

Next, mix up a brightly colored dye and brush it on the panel (**Photo 3**). Let the panel dry overnight, then apply two to three coats of 2 lb. cut dewaxed shellac. I use Bulls Eye SealCoat, which is premixed as a 2 lb. cut (see Sources). Topcoats will adhere better to dewaxed shellac than to standard shellac. I use a simple folded pad to apply the shellac (**Photo 4**), but a brush would work just as well.

Your panel should be looking pretty good at this point, but an additional step of adding a glaze will make it

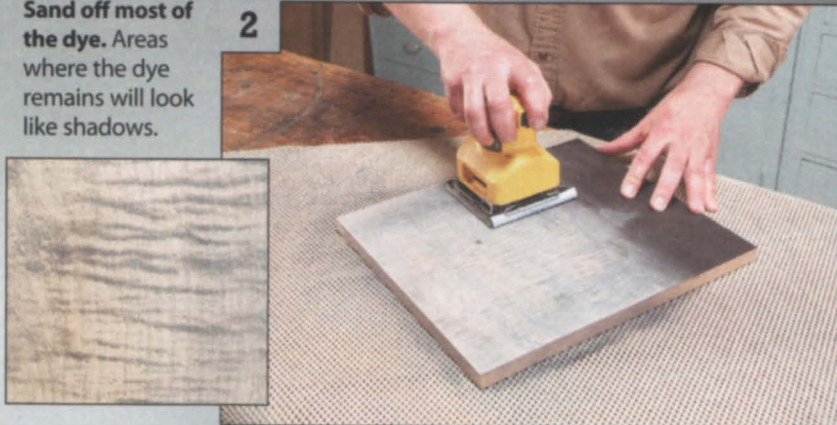
Apply a coat of black dye. Let the panel dry.

1



Sand off most of the dye. Areas where the dye remains will look like shadows.

2

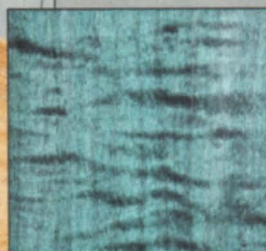




3 Apply a brightly colored dye, such as blue or green.



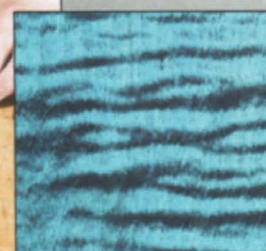
4 Wipe on three coats of super-blondedewaxed shellac.



5 Add depth to the finish by wiping on a thin coat of brightly-colored glaze.



6 Apply gel varnish or any other topcoat.



look much better (**Photo 5**). I often use a glaze that's basically the same color as the dye, but darker. If you're adventurous, try experimenting with different colors. Adding this layer makes the finish look much richer and more complex.

A glaze is simply a pigmented finish that's applied over a sealed surface. (The surface is sealed—with shellac, in this case—to prevent the glaze from penetrating too deeply and unevenly.) You can buy ready-made glazes at an art-supply store, but I prefer a wider choice of colors, so I make my own. The recipe is very simple. I use a tube of artist's oil color for the pigment, mineral spirits to thin the pigment, and a clear gel varnish to bind the pigment to the surface (see Sources). The exact ratios aren't critical. For this small panel, I squirted out about 1" of pigment from the tube and mixed it with about 1/2 capful of mineral spirits, stirring until there were no lumps. Next, I mixed about 1 teaspoon of mineral spirits with 2 teaspoons of gel varnish, and added the thinned pigment.

Wipe on the glaze with a piece of cheesecloth, using a circular motion. Then lightly wipe the panel with the cheesecloth, using a straight motion, to even out the glaze. You can remove or leave as much glaze as you wish, or apply a second coat later on. Let the panel dry overnight, then apply more coats of plain gel varnish, or any other finish (**Photo 6**).

SOURCES

- Rockler, www.rockler.com, (800) 279-4441, Homestead Dry Dyes (water-soluble), \$10.59 per 1 oz. bottle.
- Zinsser, www.rustoleum.com, (800) 323-3584, SealCoat Universal Sanding Sealer (dewaxed shellac), \$8.97 per quart.
- General Finishes, www.generalfinishes.com, (800) 783-6050, Gel Oil Based Urethane Topcoat, \$20 per quart.



Richard Helgeson

makes furniture that is "simple, nuanced and enduring." See more of his work at www.richardhelgeson.com

See how a wood-toned aniline dye can enhance curly maple at AmericanWoodworker.com/WebExtras



Make Poplar Look Pretty

Give this useful but unattractive wood a makeover.

by Kevin Southwick

THE WOOD WE KNOW AS POPLAR has many common names, such as tulip poplar, yellow poplar, tulipwood, yellow tulipwood, tulip tree, whitewood and canoewood. The "tulip" part of these names comes from the tulip-like flower the tree produces in the spring. Where the "poplar" part of these names comes from is a mystery, because the tree is not

even a true poplar—it's a member of the magnolia family. In fact, poplar is known as the "king of the Magnolias." It's also the tallest hardwood tree in North America.

Regardless of what it's called, *Liriodendron tulipifera* Magnoliaceae produces very useful and versatile lumber. The tree grows fast, with a straight trunk and no branches near the ground. That translates to knot-free boards that are available in expansive widths and thicknesses. Poplar is economical, costing considerably less than other hardwoods such as maple and oak, and its finely textured lumber works well with both hand and power tools. These qualities make poplar suitable for many furniture and construction applications.



See how to build this great looking table on page 68.

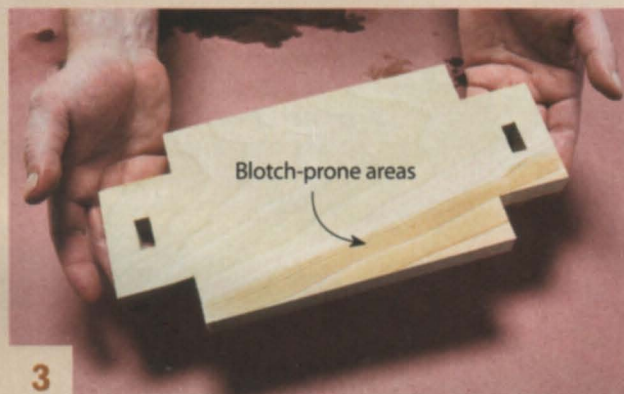




1 Start by wiping on a strong stain controller to keep the poplar from blotching when you apply the dye and stain. Make a strong stain controller by thinning gel varnish with mineral spirits.



2 Wash the sealed surface with soap and water so the dye will soak in, rather than bead up on the surface.



3 Blotch-prone areas will stand out as the water dries, because they're super-absorbent. After the wood has thoroughly dried, apply an additional coat of stain controller to these areas.



4 Apply a coat of medium-brown dye to create a uniform ground color.

An ugly duckling

So why isn't poplar popular with furniture makers? The answer is simple: The wood is just plain homely. Its color ranges from pale yellowish white to an odd shade of green, and boards are often discolored by dark gray or purplish streaks. To top it off, poplar doesn't stain well with traditional wood stains. In fact, it can get ugly really fast because it blotches so easily. About the only time furniture makers use poplar as a primary wood is when the piece is going to be painted.

Transformed

Poplar has too many desirable furniture-making qualities to be limited to "paint-grade" service. Fortunately, by using a special approach, it's possible to make this ugly duckling glow beautifully. This process will transform poplar's odd green color to any brown wood tone you like. However, dark streaks will still show—they'll need to be avoided or placed strategically in the design and called "character."

The key to giving poplar a rich, even stain color is to control its horrible blotching tendencies. This requires starting with a very effective stain controller (also called wood conditioner or pre-stain sealer). The commercial stain controllers I tested didn't provide enough blotch resistance, so I developed a simple recipe to make a controller with the

necessary strength. This recipe and the finishing steps that follow work well on any wood that's prone to blotching.

After applying the stain controller, use a two-step coloring process for better control and color intensity. This coloring method combines the benefits of both dye and pigment stain. The dye provides a ground color as strong and rich as needed, and the pigment ensures that the color doesn't fade and become dull over time. The dye and pigment colors shown here are both a medium-dark "warm" brown. They combine to create a rich chocolaty tone on both the green heartwood and pale sapwood. Your color choices may be different.

How-to

1. Prepare the surfaces by sanding to 180 grit. Be sure to sand by hand after you power sand, to eliminate swirl marks. Pay extra attention to the end grain.

2. To make the stain controller, mix one part General Finishes Clear Gel Varnish with three parts paint thinner. Apply the stain controller with a rag and allow it to soak in (**Photo 1**). Be sure to saturate the wood, especially the end grain. After a couple of minutes, but before the stain controller starts to set up (5-10 minutes), use clean, dry rags to remove any that has not soaked in. Be sure not to leave any wet spots or streaks—they'll show up when you apply



5

Look again for blotching or dark end grain. Seal any areas that have gone extra-dark with a coat of gel varnish just before you apply the gel stain in the next step.



6

Apply a coat of medium-brown gel stain. Gel stain adds richness to the overall color and helps to keep the dye from fading.



7

Apply two coats of amber shellac to add depth and tone, followed by a more protective topcoat, if necessary.

the stain. Let the wood dry overnight. This step is intended to seal the wood approximately 60%-75%, which is usually enough to control blotching and still allow the stain to penetrate.

3. Wash the partially sealed surface with a mixture of dish soap and water to "open" the top layer of wood cells so they'll absorb the dye easily (**Photo 2**). This step won't cause any significant grain-raising because the surface has been treated with the stain controller.

4. Hidden blotches will reveal themselves as the water dries (**Photo 3**). Areas that are extra-porous soak up more water. This means they'll stay wet longer, so they're easy to identify. The longer they stay wet, the worse the blotch will be. Fortunately, even super-absorbent areas can be tamed if they're found and treated with extra stain controller before color is applied.

5. Mix TransFast Medium Brown Water Based Dye following the label instructions and apply it generously, using a rag (**Photo 4**). Allow the dye to saturate the wood, then remove the excess with clean rags. Allow the wood to dry until the water has completely evaporated (2 hours).

6. Check the workpiece and selectively apply clear gel to any blotches or end grain that are already dark enough from the dye step (**Photo 5**). This is your last chance for blotch reducing.

Turn Green to Gold



OXALIC ACID WORKS MIRACLES on poplar's green heartwood. Simply mix a saturated solution of oxalic acid crystals in hot water and brush the solution on the wood. As the solution dries, the green heartwood will turn to a golden brown and the white sapwood will take on a warmer shade of pale. A second application of the solution after the first has thoroughly dried usually helps the results—and it can't hurt. Oxalic acid is poisonous, so let the surface dry completely and then rinse it thoroughly with water to remove any acid that remains. Note that this treatment does nothing to reduce poplar's tendency to blotch, so you'll still need to follow the recipe to end up with a great-looking finish.

Oxalic acid is primarily used to restore the natural color of grayed, weathered, exterior wood—it's the active ingredient in deck-renewing products. Restorers and woodworkers use oxalic acid to remove black water stains from wood. It's available at most hardware stores.

7. Apply a coat of General Finishes Medium Brown Gel Stain (**Photo 6**). Then let the piece dry overnight.

8. Apply two coats of 2 lb. cut amber shellac (**Photo 7**). Although shellac is a durable finish, I know that this table will often be used as a place to rest a coffee cup, so I'll add a coat of oil-based satin polyurethane to prevent water rings.

Kevin Southwick is a professional wood finishing specialist and furniture restorer/conservator in Minneapolis MN.

Chemical Ebonizing

A sure-fire recipe for turning any wood deep black.

by Richard Tendick

REMEMBER THE OLD AD SLOGAN, "better living through chemistry"? When it comes to turning wood black—a process called ebonizing—I prefer the chemical approach, which uses solutions made from vinegar, steel wool and tannic acid. Watching them transform an ordinary wood, such as the yellow poplar I'm using here, is magical.

Other methods of ebonizing (dye, ink and paint) use pigments, which can obscure the wood's grain. The chemical technique leaves an absolutely transparent layer of black. You can still see the wood's figure and character, particularly after you apply a topcoat.

Woodworkers have long known that rusty, acidic water turns some wood black. Woods that are high in tannic acid, such as oak, walnut and mahogany, work best. The technique I'll show you adds tannic acid to the wood, so you can ebonize virtually any species. I can't take credit for this idea, though; it's been a finisher's trick for a long time.

Mixing the chemicals

The two solutions can be stored and used over and over. The first is more or less liquid rust, which you make with white vinegar and steel wool (**Photo 1**). For the best results, use Heinz white vinegar and Liberon 4/0 steel wool (see Sources, page 63). This steel wool works well because it doesn't contain oil, but you could also use regular steel wool and wash out its oil with a detergent. Cover the jar with a lid, then puncture the lid with a small hole to let gas escape. Set the jar aside for a week or so.

Eventually, the pad will dissolve and the formerly clear liquid will turn a dark reddish brown, with a black scum on top. Place a coffee filter in a funnel and pour this gunk through the filter into a new container. Repeat the process two or three times, using new filters, to remove all the solids from the solution.

The second solution, tannic acid, is made with dry powdered tannin (see Sources). It's not expensive, but unfortunately it's not available in a small quantity. Rather than be stuck with a lifetime's supply, I've shared the surplus with a dozen woodworking friends.

To mix the powder, place 1 heaping tablespoon in a disposable container and add a small amount of water (**Photo 2**). Stir until the powder forms a paste, then add 1 pint of hot



1 Dissolve steel wool in vinegar to make the first of two solutions you'll need. The pad should completely dissolve in about one week.



2 Make tannic acid for the second solution. Mix dry powdered tannin with a small amount of water to make a paste, then add more water.



3

Raise the grain before you begin the ebonizing process. Wet the wood's surface with a damp rag or sponge.

tap water. Transfer the solution to a jar or bottle. It can be used right away.

The next step is to raise the wood's grain with plain water (Photo 3). This is important to do now, before applying either solution, because you won't be able to sand the wood during the ebonizing process. After the wood dries, sand off any fuzz you may feel with 280 or 320 grit paper (Photo 4). I usually repeat this process two or three times.

Application

It's clear sailing from here. First, pour a small amount of the tannic acid solution into a shallow container and brush it on your project (Photo 5). Make sure every bit of the surface is covered. Let the wood dry.

Next, pour a small amount of the steel wool and vinegar solution into a separate container. Using a different brush, apply the solution to the wood (Photo 6). Almost immediately, the wood will turn a bluish black. Don't pour the excess solution back into your original container, as it will be contaminated by the tannic acid. Again, let the wood dry. Finally, apply another coat of tannic acid, using a rag to avoid brush marks (Photo 7). Voila! You'll get a rich, deep black.

Dispose the surplus tannic acid (it will be contaminated, too), and let the wood dry a day or two. You're ready to apply a clear finish.



5

Brush on the tannic acid solution and let it dry.



6

Apply the vinegar and steel wool solution. The surface will turn a bluish black right away.



7

Apply more tannic acid with a rag. This turns the wood a deep, transparent black. After it dries, you're ready for a topcoat.



4

Sand with fine paper to remove any fibers sticking up from the wood's surface.

SOURCES

- FinishSupply.com, www.shellac.net, (707) 226-3623, Dry Powdered Tannin, 8 oz. \$9.98.
- Highland Woodworking, highlandwoodworking.com, (800) 241-6748, Liberon 4/0 Steel Wool, 100g, \$9.99.

Green Wall Shelf



by Jeff Corns

Add a touch of color to your hallway.

OUR FRONT HALL is usually a disorganized mess: coats on the floor, keys strewn here and there, and hats—well, I can never find them. I built this wall shelf to provide a place for everything and to display some decorative objects, too. When I was done, my wife thought it would be useful in the kitchen too. Now, I'm making a second one!

Most of the wall shelf is built from 3/4" pine, which you can buy at a home center. Just be sure it's flat and straight. I used some old wood from a house I was remodeling. The boards were mismatched in color and full of nail holes and other flaws, so I painted the wall shelf to blend the parts together. I used green because this color also symbolizes good stewardship of our resources, such as recycling this lumber.

The joinery is pretty simple. Most of the parts are just butted and nailed together. Biscuits reinforce these joints and align the parts, making assembly easier.

Make the parts

1. Start by ripping the sides (A) and bottom shelf (B) to the same width. Also, rip the middle shelf (C) and dividers (D) to the same width. Rip the top (E), peg board (F) and wall cleat (G) to width. Trim all of these pieces to length. Note that the shelves, peg board and cleat are the same length.

2. Lay out the spacing of the drawer dividers on the

middle and lower shelves (Fig. A). Cut biscuit joints in the drawer dividers (**Photo 1**) and shelves (**Photo 2**).

3. Rout a plate groove in the middle shelf (**Photo 3** and Fig. D). Dado or rout a rabbet in the back edge of the bottom shelf to receive the back boards (Fig. C).

4. Temporarily clamp together the two shelves and the drawer dividers. Stand this assembly on one of the sides, in the correct location (Fig. E), and draw lines around the ends of the shelves. Remove and unclamp the assembly. Butt the marked side to the unmarked side and transfer the layout lines. Cut biscuit joints in the sides and the ends of both shelves.

5. Cut and smooth arches in the bottom ends of the sides (Fig. E). Rout a rabbet on the sides for the back boards. Drill holes for the pegs (P) in the peg board.

Assembly

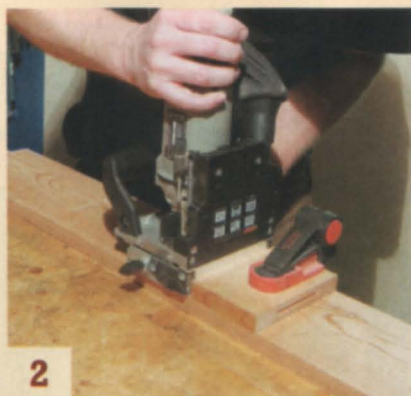
6. Glue and nail the bottom shelf to the peg board (**Photo 4**). Make sure the ends are flush. Add the drawer dividers and middle shelf (**Photo 5**). Make sure the fronts of these pieces are flush.

7. Add the sides (**Photo 6**). Clamp these joints, too.

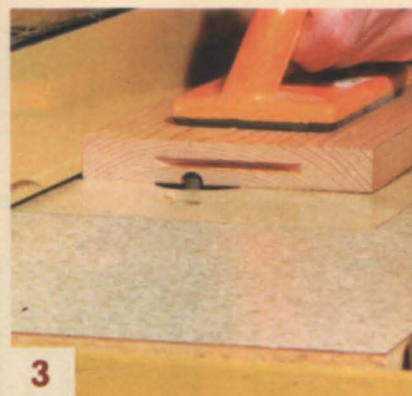
8. Once the glue is dry, stand this assembly upside down on the top piece. Mark around the sides on the top, then cut biscuit slots in the top and ends of the sides. Glue the top to the assembly (**Photo 7**).



1 Cut biscuit joints in the drawer dividers.



2 Cut mating joints in the shelves.



3 Rout a plate groove in the middle shelf using a core box bit.



4 Fasten the bottom shelf to the peg board.



5 Fasten this assembly to the drawer dividers and middle shelf, using biscuits and nails.



6 Fasten the sides. They're joined to the shelves with biscuits, too.



7 Add the top. Using a nail gun makes assembly go fast.



8 Attach the back boards, which are thin pieces of tongue-and-groove paneling.



9 Nail the drawers. The sides are rabbeted into the front and back pieces.

9. Glue the wall cleat to the underside of the top. Then add the back boards (Photo 8 and H). I purchased this material, ready to go, at a home center, but you could make your own. When you install these pieces, leave at least a 1/16" gap between each tongue and the bottom of each groove. This space is necessary to allow these pieces to expand when the humidity is high. Each piece won't move much, but taken as a whole, the width of all the back boards could increase by as much as 1/2".

Build the drawers

10. Rip stock for the drawer fronts (J) and sides (K). Rip stock for the backs (L), which are 3/8" narrower. Trim the fronts to length, about 1/16" less than the actual drawer openings. Trim the backs 1/2" shorter than the fronts.

11. Cut grooves in the drawer fronts and sides for the drawer bottoms (M, Fig. A). Cut rabbets in the drawer fronts and sides. Drill holes for knobs (N) in the drawer fronts.

Fig. A Exploded View

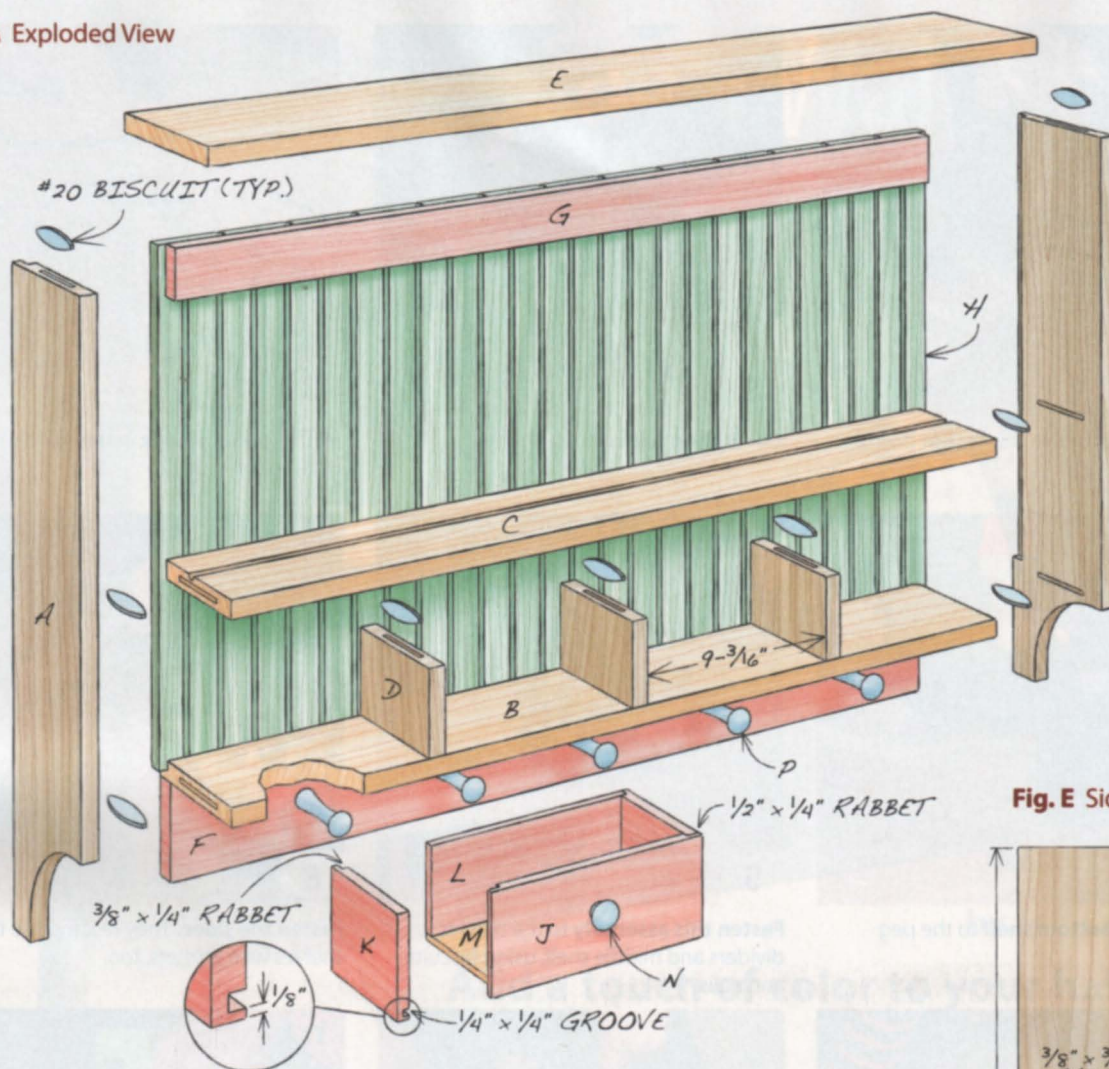


Fig. E Side

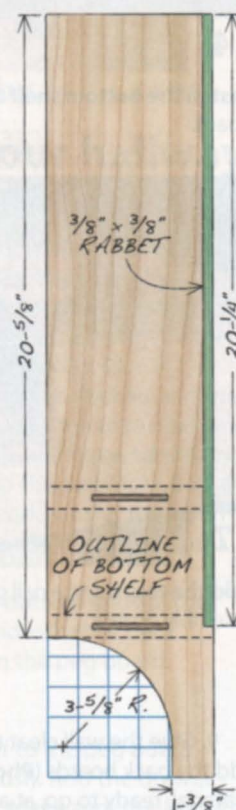


Fig. B Back

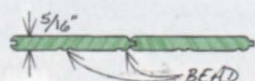


Fig. C Bottom Shelf

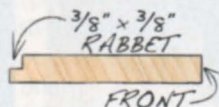
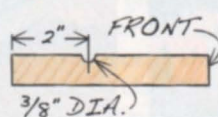


Fig. D Middle Shelf



Cutting List

Overall Dimensions: 26" H x 42" L x 6-1/2" D

Part	Name	Qty.	Material	Th x W x L
A	Side	2	Reclaimed Pine	3/4" x 5-1/2" x 25-1/4"
B	Bottom shelf	1	Reclaimed Pine	3/4" x 5-1/2" x 39"
C	Middle shelf	1	Reclaimed Pine	3/4" x 5-1/8" x 39"
D	Divider	3	Reclaimed Pine	3/4" x 5-1/8" x 3-1/2"
E	Top	1	Reclaimed Pine	3/4" x 6-1/2" x 42"
F	Peg board	1	Reclaimed Pine	3/4" x 3-3/4" x 39"
G	Wall cleat	1	Reclaimed Pine	3/4" x 2" x 39"
H	Back board	14	Pine bead board	5/16" x 3-1/16" x 20-1/4"
J	Drawer front	4	Reclaimed Pine	1/2" x 3-7/16" x 9-1/8"
K	Drawer side	8	Reclaimed Pine	1/2" x 3-7/16" x 4-7/8"
L	Drawer back	4	Reclaimed Pine	3/8" x 3-1/16" x 8-5/8"
M	Drawer bottom	4	Plywood	1/4" x 4-7/8" x 8-5/8"
N	Drawer knob	4		
P	Peg	5		



10
Putty the nail holes, and you're ready to paint!



11
Soften all edges and corners with a power sander and by hand sanding.



12
Imitate nicks and bruises by banging on the wood with a set of keys on a chain.



13
Sponge on a texturing compound to create a slightly rough surface.



14
Paint over the texturing compound after the compound dries.



15
Add brown glaze to imitate wear and handling.

12. Temporarily clamp the drawers together and cut bottoms to fit. Glue and nail the drawers together (**Photo 9**). As you assemble each drawer, insert the bottom to keep the drawer square.

13. Glue knobs in the drawers and pegs in the peg board.

14. Fill the nail holes with putty (**Photo 10**), and you're ready to paint.

Finishing

15. Begin by softening every edge, as if it's been handled for years (**Photo 11**). Then roughen up exposed surfaces a bit with a classic faker's tool: a bunch of keys and other hardware attached to a chain (**Photo 12**).

16. To simulate years of grit, apply an acrylic texturing compound (**Photo 13** and Sources, at right). You can leave it thick or smooth it out with the sponge.

17. Apply your favorite paint (**Photo 14**).

18. Mute the paint's color and add some grime by applying a glaze (**Photo 15** and Sources). Use your brush to work the glaze around until your project looks natural and well-loved.

Installation

19. The wall shelf should be flush to the wall and secured to studs. There are lots of ways to hang it. I used keyhole slots cut in the back of the wall cleat and hung the cabinet on long pan head screws driven into the studs. That's fussy work,

though. It would be easier to just drive screws right through the face of the wall cleat and into the studs

SOURCES

- Amazon.com, www.amazon.com, Folk Art Antiquing Medium (glaze), #819, Apple Butter Brown, 2 oz., \$2.09.
- Dick Blick Art Materials, www.dickblick.com, (800) 828-4548, Winsor & Newton Structure Gel (texturing compound), #02006-2105, 250 ml, \$5.19.
- Knob Gallery, www.knobgallery.com, (866) 920-2991, Wood knob, #AMBP812WD, \$1.08 ea.
- Rockler, www.rockler.com, (800) 279-4441, Mid-size Pegs, \$5.09/pack of 8.



Jeff Corns

is a self-employed finish carpenter who also makes custom furniture and cabinets.



See 8 tips for using a brad nailer at
AmericanWoodworker.com/WebExtras

Little Table

Arts & Crafts style and knockdown design team up for a winning combination.

by Kevin Southwick



IMAGINE THIS ATTRACTIVE LITTLE TABLE residing next to a comfortable chair, holding important items such as a cup of coffee and a book. Its shaped sides and wedged tenons create lots of visual appeal, it has a useful shelf and the construction makes it sturdy enough to support a baby circus elephant. This table consists of only five pieces and all of the joinery is at 90°, so you can probably build it in a weekend. Once you've made the templates, any board 9" wide and a little more than 5' long is all you'll need.

This little gem assembles with wedges and tabletop fasteners, so you won't need any glue or clamps, and its knockdown construction means you can finish all the parts separately. You can also pack the finished pieces in a flat box, IKEA-style, and mail a table or two to your kids in college or dear Aunt Mary in Velva ND.

Build it

1. Cut blanks for the sides, rail and shelf (A–C Fig. A and Cutting List, page 70).

2. If you plan to build only one table, it's easy enough to trace the pattern for the sides (Fig. B) onto the blanks, rough-saw and sand to the lines. But if you're building two or more tables you'll save time by making a routing template.

3. To make the template, trace the pattern on a 9" x 17-3/4" blank of 1/4" MDF. Use the bandsaw and a fence to cut the slot at the top. Bandsaw the edge profiles slightly outside the lines and use a Forstner bit and a jigsaw to rough out the mortise slightly inside the lines. Finish the edge profiles by sanding to the line; square the mortise with a file.

4. Use the template to transfer the profile to the side blanks. Cut the slots and rough-saw the profiles just as you cut the template. Use the drill press to rough out the mortises.

5. Attach the template with double-faced tape. Then rout the profiles with a flush-trim bit (Photo 1). Take care not to blow out short grain created by the curves. To rout the mortise, turn off the router and place the bit in the center of the opening. Start the router, engage the bit and advance the workpiece against the bit's rotation. After routing, square the mortise corners with a chisel.

6. Drill 1/8" deep by 3/4" dia. recesses for the "figure 8" style desktop fasteners in each side, offset 1/4" from the inside face and 1" from each end (Photo 2 and Fig. A). Set your drill press table to the vertical position and use a level to position the side. Clamp the side securely before drilling.

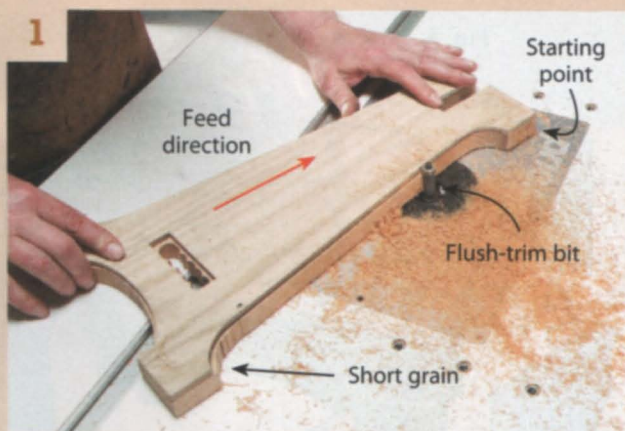
7. Lay out the rail's profile (Fig. C) on the blank. (If you want to make a template for the rail, use a 1/4" MDF blank.) Create the tenons by cutting a 1/2" wide x 2" long notch in each end at the bottom, using the bandsaw and a fence. Use a miter gauge to square the shoulders.

8. Test-fit the rail by sliding it into the slots in the sides. The tops should be flush. Make adjustments if necessary.

9. Rough-saw and sand smooth the arches in the center and on the ends (Photo 3). Use a large sanding drum to smooth the main arch and a smaller drum to smooth the curves on the ends.

10. Use the bandsaw and a fence to

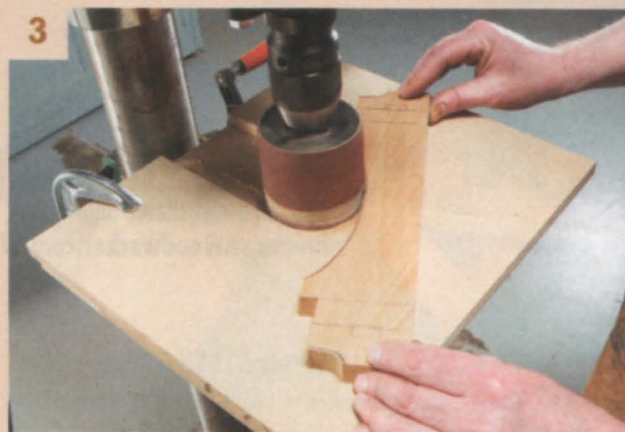
Use a template to rout each side profile after rough-sawing the blank.



Drill offset recesses in the top end of both sides for the "figure 8" style desktop fasteners.



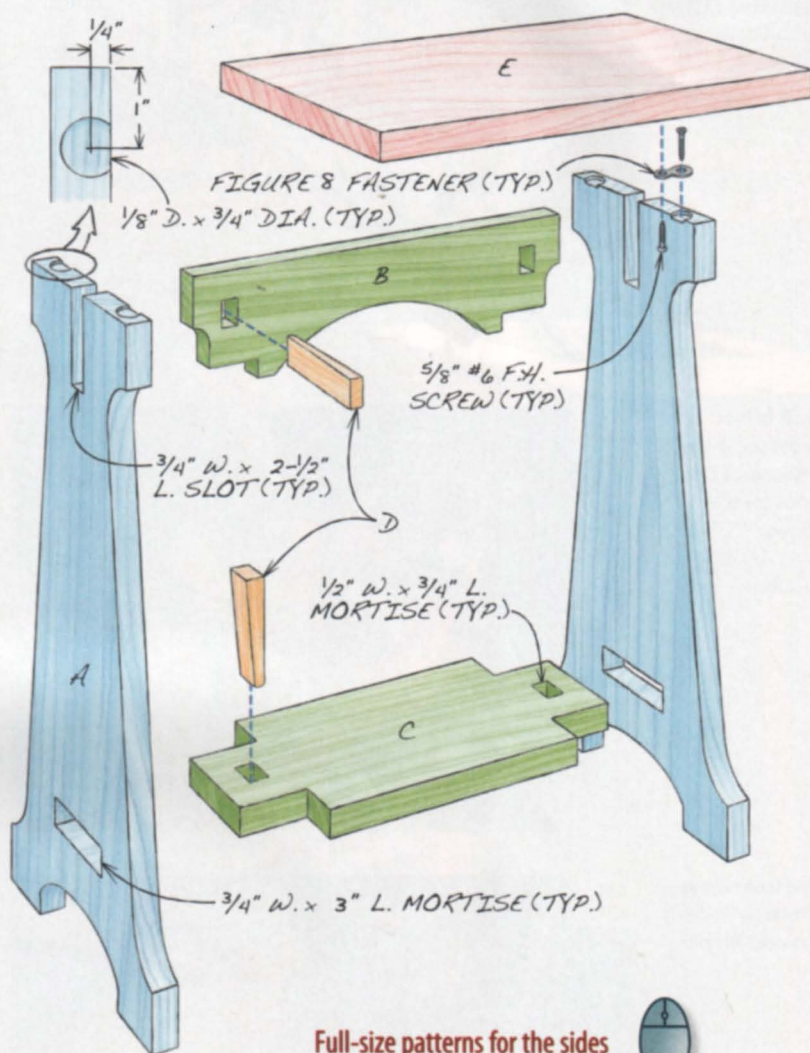
Use a sanding drum to smooth the rail's arches.



Create wide tenons on both ends of the shelf by bandsawing notches in the corners.



Fig. A Exploded View



Full-size patterns for the sides and rail are available online at AmericanWoodworker.com/WebExtras

Fig. B Side Profile

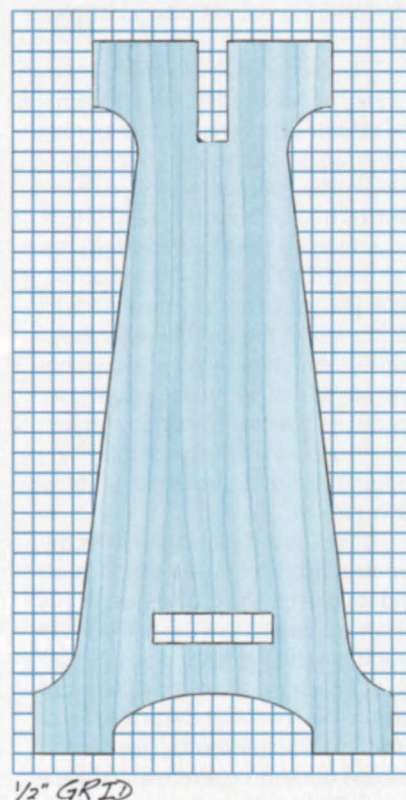
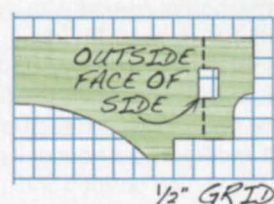


Fig. C Rail Profile



Cutting List

Overall Dimensions: 14" L x 9" W x 18-1/2" H

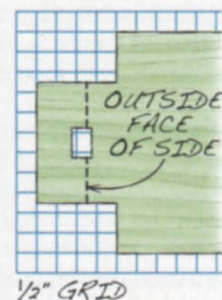
Part Name	Qty	Material	TH x W x L
A Side	2	Mahogany	$\frac{3}{4}$ " x 9" x $17\frac{3}{4}$ "
B Rail	1	Mahogany	$\frac{3}{4}$ " x 3" x 12"
C Shelf	1	Mahogany	$\frac{3}{4}$ " x $5\frac{1}{2}$ " x 12" (a)
D Wedge	4	Mahogany	$\frac{1}{2}$ " x $\frac{3}{4}$ " x 4" (b)
E Top	1	Mahogany	$\frac{3}{4}$ " x 9" x 14"

Hardware: 4 desktop fasteners; 8 $\frac{5}{8}$ " x #6 screws.

Notes: a) Cut $1\frac{1}{4}$ " x 2" notches in all four corners to create 2" x 3" tenons on both ends.

b) Taper one face to $\frac{3}{16}$ " thickness at one end. Cut to final $2\frac{3}{8}$ " length after dry-fitting.

Fig. D Shelf Tenon Profile



cut the tenons on the shelf (**Photo 4**).

11. Lay out the mortises on the rail and shelf. These mortises are located 5/8" from the tenon shoulders, so that when the table is assembled they recess 1/8" into the sides. This guarantees that the wedges will tightly lock the joints. Drill out the mortises (**Photo 5**) and square the corners with a chisel.

12. Cut wedge blanks (D) and lay out the end-to-end taper on each one. Bandsaw the tapers and remove the saw marks with sandpaper (**Photo 6**). The wedges must be smooth on both faces so they won't mar the finish on the sides when they're installed or removed.

13. Cut the top (E) to final dimensions.

14. Finish-sand all of the parts and apply the finish. A wipe-on finish is the easiest. To make the top waterproof, add one coat of satin polyurethane.

15. Fit the wedges. They start out extra-long because tiny variations in their thicknesses make big differences in where they seat. Assemble the finished sides, rail and shelf, and hold all the joints tight. Firmly seat the wedges in the mortises by pressing or tapping. Then measure and cut them to final length, so they extend about 13/16" on both sides of the tenon. (**Photo 7**).

16. Finish the wedges. Staining or dyeing them black creates a nice contrast.

17. Attach the top (**Photo 8**). Assemble the base and install the desktop fasteners. Center the base on the top. Then install 5/8" x #6 flathead screws through the fasteners.



Kevin Southwick

is a wood-finishing specialist and furniture restorer/conservator in Minneapolis MN.

Mark and drill mortises for the wedges in the shelf and rail. Square the corners with a chisel.



Sand each wedge smooth after cutting the taper on the bandsaw.



Cut the wedges to final length after installing them.



Center the base and attach it to the top with screws.



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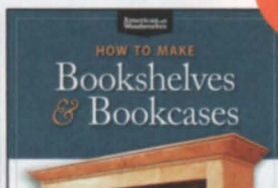
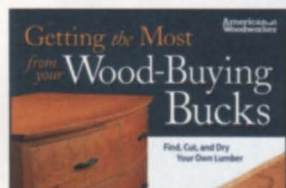
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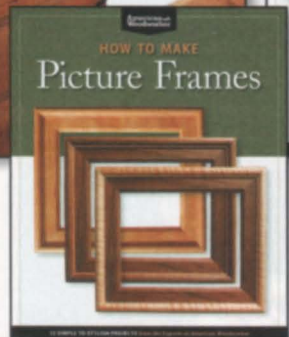
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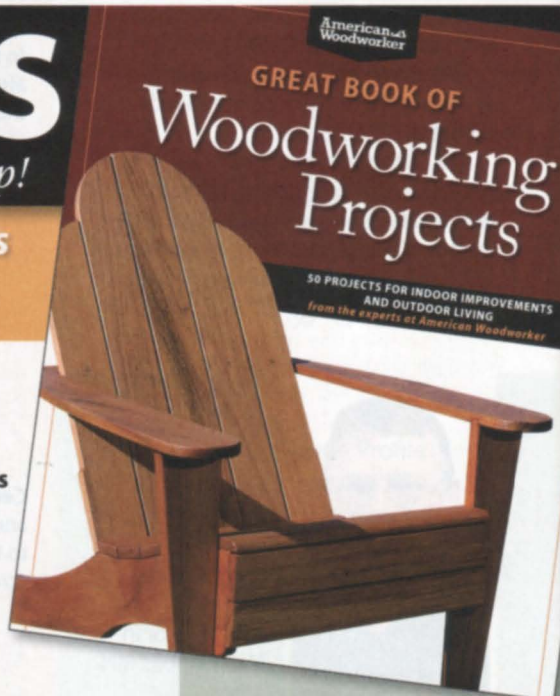
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The Ol' 1-2

I VOLUNTEERED TO DRILL THE HOLES for the halogen light fixtures in the 6' tall display cabinet that my cohorts and I were building at the architectural millwork company where we worked. I chucked a hole saw in my trusty 1/2" electric drill and climbed up on a stepladder, so I could drill the holes from above the cabinet. Standing at eye level with the drill, I carefully positioned the hole saw's pilot bit and started drilling. About halfway through, though, the saw wedged in the cut, causing the drill's handle to swing around and whack the side of my head. Stunned, but undeterred, I reversed the drill to free the bit and pulled the trigger. Whack! The handle swung around the other way, hit the other side of my head, and knocked me to the floor, where my coworkers were already rolling around laughing.

Joe Sarchioto



Pin Problem

THE SHOE RACK THAT I WAS BUILDING HAD FOUR TIERS. This rack was going to occupy a prominent spot in our home, so I wanted it to be a nice piece of furniture. I designed each tier as an open frame, comprised of three rails (front, back and middle) with stiles butted at each end. Mortise-and-tenon joints would secure the rails and stiles, and pins would strengthen the joints and add highlights. Dadoes cut in the rack's two uprights would house the tiers, like shelves.

I cut tenons on the rails and mortises in the stiles and

glued each tier together. I carefully marked the pin-hole locations (24 in all), drilled the holes, and installed the pins. The pins signaled expert craftsmanship, I thought, and they made the tiers look great, so I quit for the night.

Unfortunately, things didn't look so great in the morning, after I realized that the pins were installed in the rails instead of the stiles—on the wrong side of every joint!

John Wetzel



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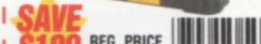
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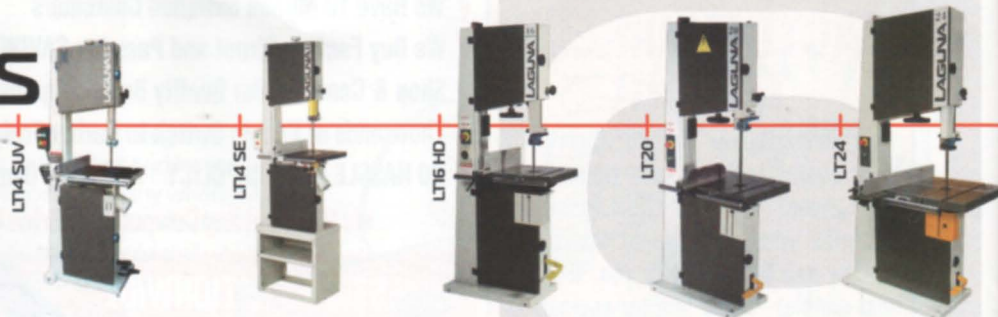
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