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contributors

Nancy Hiller (*"Built-ins That Blend In"*) designs and builds furniture and cabinetry inspired by late 19th- and early 20th-century designs at her shop in Bloomington, Ind. When she was 12, she moved with her family to England, where she later trained in traditional furniture making at Isle of Ely College, got her first job working for Roy Griffiths at Crosskeys Joinery, and went on to work at two other shops outside London. Hiller returned to the United States at age 28 and went back to school, earning bachelor's and master's degrees in religious studies at Indiana University. After those academic pursuits, she returned to woodworking. More examples of her work can be seen at www.nrhillerdesign.com.



Ed Welch (*Master Class*) got his serious start in furniture making after 15 years in residential construction, taking a class taught by Ross Day at a local community college. Inspired by Day's work and the writings of James Krenov, Welch continued his studies at the College of the Redwoods. He is working his way from concrete to furniture as he builds and furnishes a home in Nevada City, Calif., for his family.

Carol Koebbeman (*"Cut Matching Curves"*) grew up among lathes and milling machines in her parents' basement manufacturing company. A stint as a carpenter's assistant, coupled with a pressing need for a dining-room table, drew her to woodworking. Since then, she has been honing her skills, along with her chisels, and slowly but surely the cars have been crowded out of the garage in favor of a tablesaw, planer, and other woodworking paraphernalia.



Cliff Colley (*"Honing Guides"*), a woodworking instructor at Plymouth South High School in Massachusetts, learned the craft from his father. He's a graduate of the cabinet- and furniture-making program at North Bennet Street School and has work published in *Design Book Seven* (The Taunton Press, 1996).



Tom Schrunk's (*"Finish Line"*) first woodworking project was an 8-ft. sailboat he used as a boys' club project while in the Peace Corps in India; later he was an archaeological photographer in the Mediterranean before becoming a stained-glass artist. A professional woodworker for 25 years, he describes himself as an artist in lustrous materials because wood is only one of his mediums. His favorite projects have been three custom pianos for Steinway & Sons; he's working on a book-matched burl-veneer piano.

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Spotlight

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THE "TRUTH" ABOUT TRIED & TRUE

I think it is irresponsible the way Tried & True Varnish Oil was condemned in the article "Wipe-On Finish Test." You can't use a product so completely outside of its recommended application procedure and expect good results. I have used this product for years on old reclaimed wood with outstanding results. Would you insult heart pine salvaged from an 1888 courthouse with polyurethane in the name of "ease of use"? Tried & True gives a truly antique, hand-rubbed finish. I swear by it.

—STEVEN HARRISON, Cartersville, Ga.

My sincere gratitude for the wipe-on finish test. Many years ago my wife persuaded me to build a wenge dining-room table. Upon a woodworking-store employee's recommendation, I used Tried & True to finish the entire project. Two months later the table was finally dry enough to bring into the house, but continued to cure (read: stink) for an additional six months.

I used Tried & True again on a pair of mahogany bedside tables and suffered the same experience. I tried heating it, applying it with a squeegee, anything to get a reasonable finish in a reasonable amount of time, but nothing seemed to help. I figured the expert advice I'd received was valid and that somehow I was the problem.

After reading your article, I bought satin and gloss Minwax Wipe-On Poly for a bed I built to go between the mahogany tables. As Kramer from *Seinfeld* would say, "I'm loving every minute of it!" By mixing the two Minwax products, I've been able to duplicate the sheen of the Tried & True finish so that all the pieces in the room match.

—MATT SPAUGH, Clarkston, Ga.

I have been using Tried & True products for a number of years. The secret lies in the application. The instructions say that thin coats should be applied. This is done by thinning the product with heat, which I accomplish by using a heat gun (hair dryer) for a minute or less after wiping on the finish. Consequently, the finish penetrates well and enhances any kind of wood (especially figured woods). Chris Minick's article was very thorough, well researched, and well intentioned; however, on this point I feel his conclusion was incorrect. All of the products tested have their applications, have their followers, and are excellent in their own right, but I've found that Tried & True gives me the finish I find most desirable for the best possible price.

—WILLIAM GIBBS, Philadelphia, Pa.



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"Old Geezer" not seeing red

As a longtime subscriber, I've had minor complaints from time to time but never voiced them because, well, they were always minor.

No longer.

Lately, it seems that you are getting to be more interested in prettifying the magazine, such as using red ink on small type. Aye, there's the rub. Not a minor complaint; this time a major. And here's why:

All my life I have been partially color-blind to shades of red and green. Not bad; I could always tell a can of Coke from a 7-Up, and a red stop light from a green go light.

But I have a hard time with red type. There's not a lot of it used in the magazine, just enough to be irritating. I have to take the magazine out into the bright sunlight in order to read it. This didn't used to be a problem with me, but then, I didn't used to be this old either. Now, I really don't see where an occasional red paragraph is of any benefit to anyone. So, how about it? Can you accommodate an old geezer like me?

—BOB BERLES, Mena, Ark.

Editor replies: The latest scientific research tells us that some sunlight is good because it allows the body to produce natural vitamin D, which seems to help fight a number of illnesses. But we don't mean to force you out of your easy chair. I have asked our art director to look into how we can make the

magazine easier to read for all of us geezers.

Hone your hand-tool skills

I truly appreciate the "Hone Your Hand-Tool Skills" article (*FWW* #178, pp. 78-85) by Michael Pekovich. After accumulating the major power tools, I recently purchased high-quality hand tools and started to refine my hand-tool skills. Not having any training, I realized that I needed to get my hand on the tricks (or secrets) of the trade. The article had some very helpful tips in this regard.

—MIKE WOLLOWSKI, via email

Perfecting the tapering jig

In general, I like Richard Beebe's taper-cutting jig in the July/August issue (*FWW* #178, pp. 46-49). I think, however, it would be better if the hold-down clamp were altered somewhat.

When a workpiece is clamped down by one fastener through a long clamping finger, you will get more downward pressure on the workpiece if the hold-down bolt is located as close to the workpiece as possible. The more flex there is in the clamping finger, the more this rule will be true. Two clamping fingers, one at each end of the work, would be even better.

—GUY LAUTARD, West Vancouver, B.C., Canada

Soup up your mortiser

With regard to the General International 75-050T mortiser that was just reviewed ("Benchtop Mortisers," *FWW* #178, pp. 68-72), I have some suggestions. As an owner of one of these machines, I suggest the following to further improve on a good benchtop mortiser:

1. Replace the mortising chisels provided by General with the HHS Japanese chisels from Star-M that are being sold by Woodworker's Supply of New Mexico;
2. Replace the hold-down handle with a bolt so that it doesn't interfere with the handle that locks the fence;
3. Deepen the slots in the fence with a round file or a rotary file in a die grinder so as to make it easier to mortise small stock.

4. For most jobs, remove the front vise, which slows the mortising process.

—JOHN GREW SHERIDAN, San Francisco, Calif.

A suggestion for future covers

I have been purchasing your magazine for a number of years. I look forward to every issue and usually read it from cover to cover as soon as I get it home. It is an excellent reference, and my next project probably will be a bookcase in which to store them.

Just one last thing: Please get back to the good-quality photographed covers that you have used in the past, and don't do illustrated covers as seen on the May/June 2005 issue (*FWW* #177).

—GLENN VIDLER, Murwillumbah, NSW, Australia

An idea to improve the FWW logo

The word "Wood" in the magazine title rests on a graphic that depicts a dovetail joint. Something about it has always bothered me. I think the graphic should have half-pins at both ends, just like a typical wood joint. That said, the publication is fantastic.

—CASEY A. BLAZE, via email

Clarifications

The prices of a few products in "Wipe-On Finish Test" (*FWW* #178, pp. 32-37) were incorrect. The current typical retail prices for the Minwax products are as follows:

- Minwax Fast-Drying Polyurethane Varnish: \$10.99
- Minwax Antique Oil Finish: \$10.99
- Minwax Wipe-On Poly: \$10.99

We incorrectly described the finish on a table by Nathan Kushner, published in the Readers Gallery of *FWW* #178. The table base is finished with an oil/varnish mix, and the tabletop is sprayed with lacquer.

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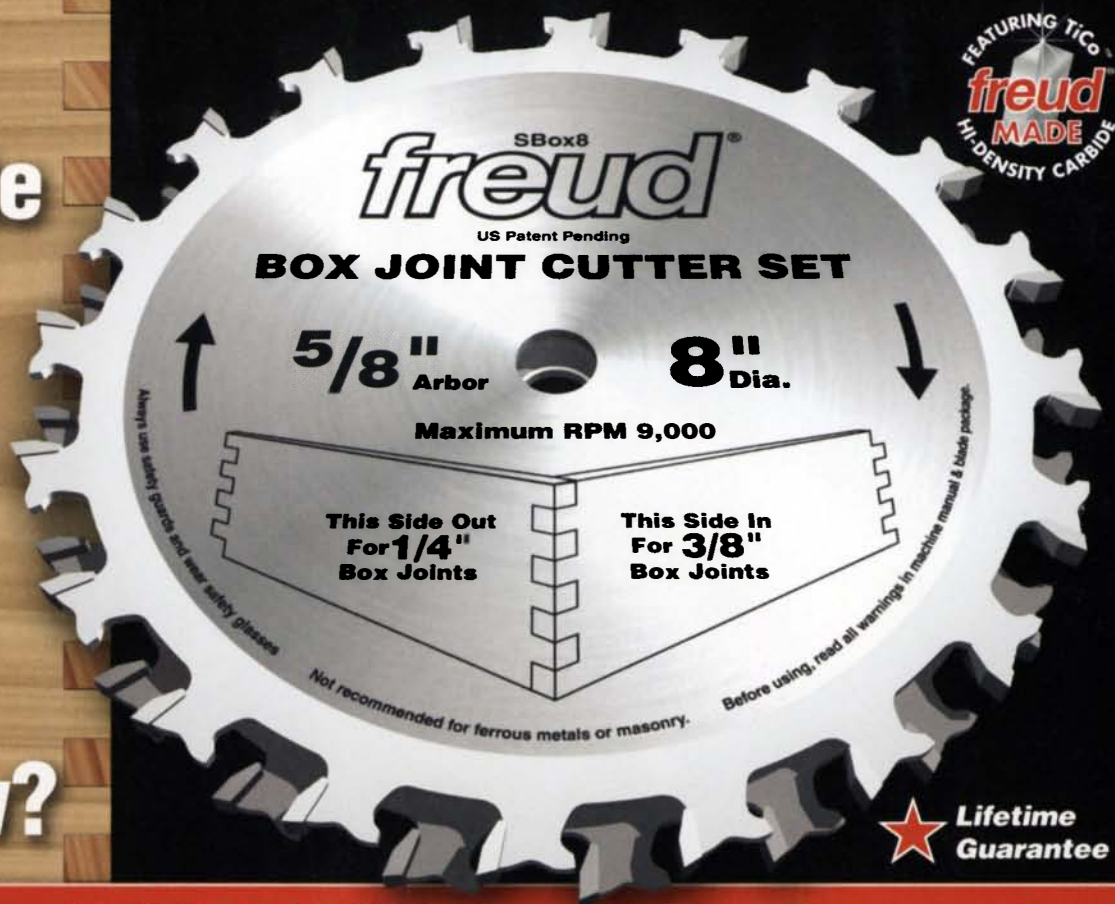
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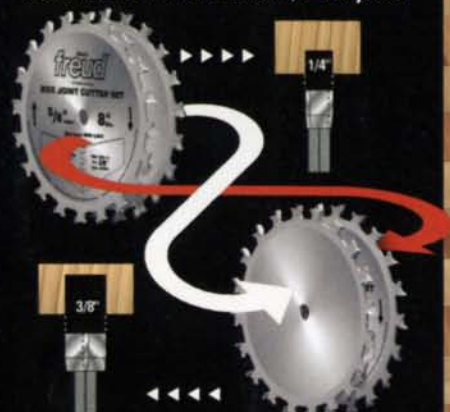
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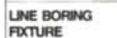


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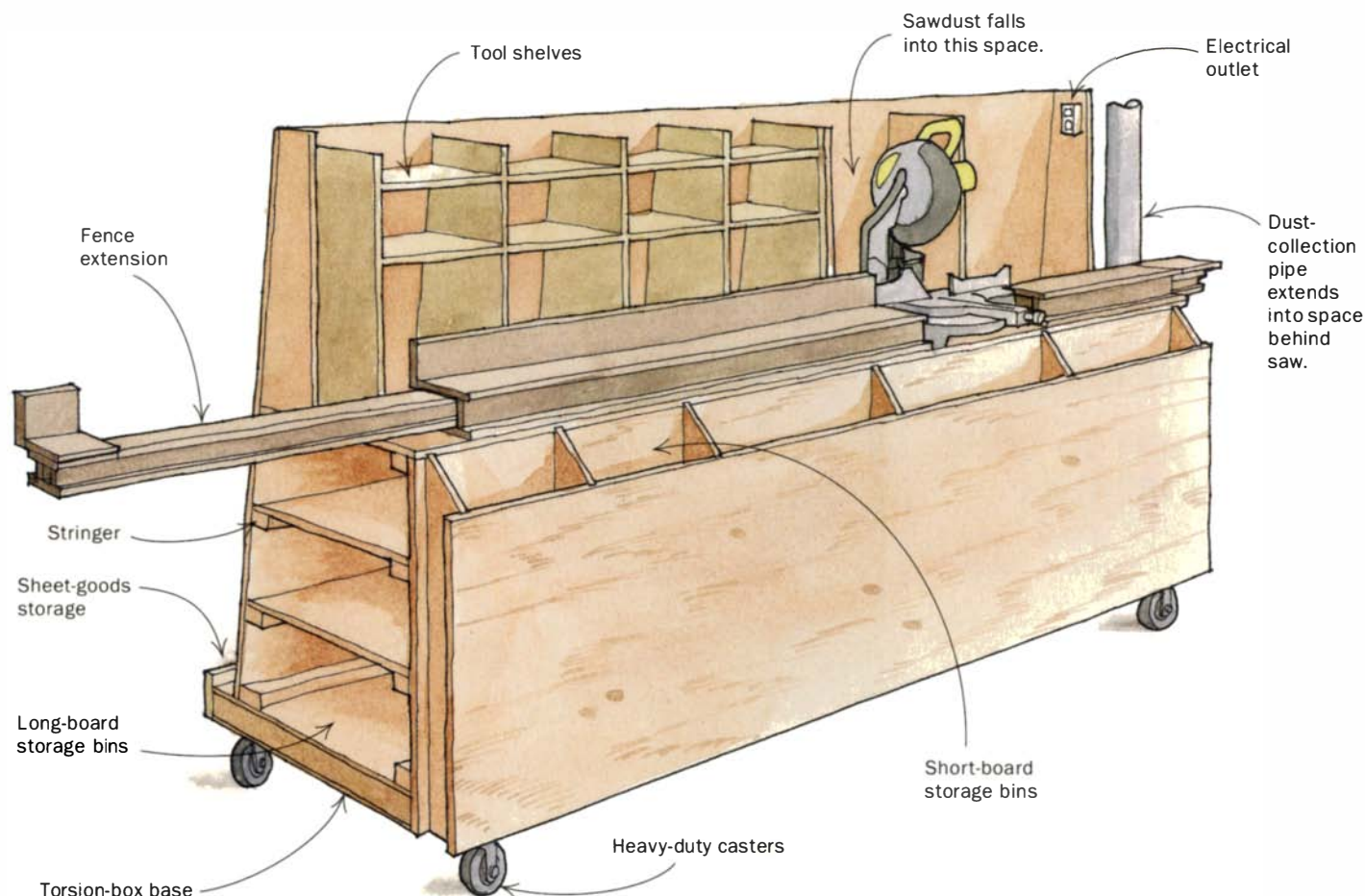
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READER SERVICE NO. 65



Best Tip All-in-one wood storage and saw station



As a way to make efficient use of his limited shop space, Mark Guglielmana designed and built this portable unit that combines wood storage with a miter-saw station.

While looking for a way to store sheet goods, I came up with the idea for a roll-around A-frame storage unit. But I had room for the storage unit only if I could relocate my compound-miter saw. Then it hit me—what if I combined the two? After a little design tinkering I realized I could have not only wood storage but also a stand to hold my saw, a long fence, dust collection, and room to store more tools.

A key design element is the torsion-box construction at the station's base. A gridwork of 1/2-in.-thick by 2-in.-wide plywood encased by two layers of 1/2-in.-thick by 30-in.-wide by 96-in.-long plywood, it serves as a light but strong foundation for the entire assembly. I used a dado blade, an air nailer, and lots of glue to speed its construction. The short-board storage bins were made by dadoing a full sheet, then splitting it in two so that the dados were perfectly aligned. The fence extensions are basically plywood I-beams that slide into the boxed saw-table platform.

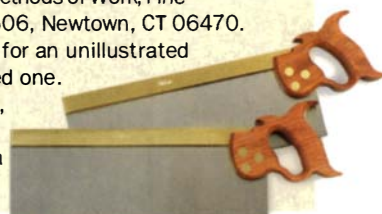
Because the power cord on my miter saw is short, I added a two-outlet receptacle to the station with a 12-ga. extension cord hardwired to the outlet box.

As you might expect, the station is heavy when fully loaded. Each of the four, 4-in. casters (www.woodcraft.com; 800-225-1153) must be rated to carry a minimum of 300 lb.

—MARK GUGLIELMANA, Redwood City, Calif.

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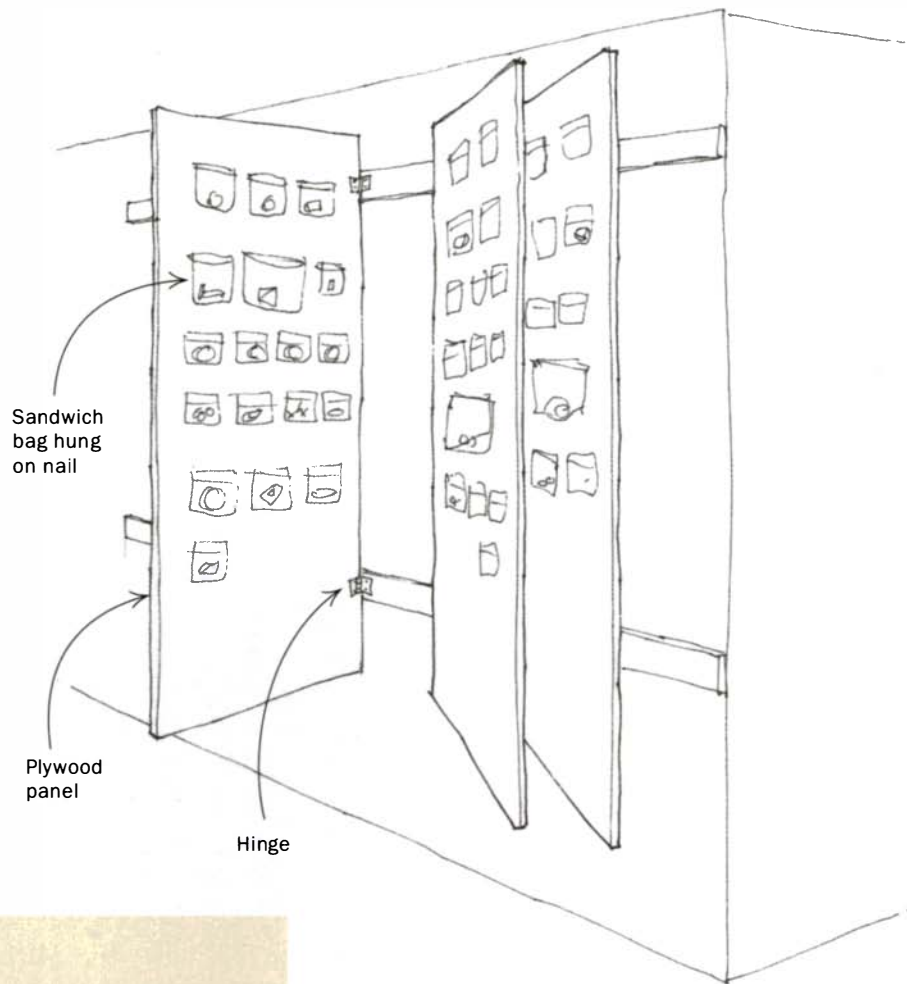
READER SERVICE NO. 118

Hinged rack for small parts

My shop had a less-than-perfect system for storing small parts. For too long, I relied on a disorganized collection of boxes, cans, jars, and drawers to contain my collection of hinges, knobs, catches, and other odds and ends. When I needed a part from one of those containers, I could never find it. I'd end up going out and buying a duplicate of something that was already in my shop.

My answer was fast, easy, and inexpensive, and it has worked like a charm. Using hinges, I hung three pieces of 1/2-in.-thick plywood on the wall, spacing the plywood 6 in. apart. Then I added rows of nails to each plywood panel and hung a sealable sandwich bag on each one. The bags are flexible, so they accept odd shapes very well. Plus, they are transparent, so I can see what's inside. All my odds and ends are on display, and I can find what I want in seconds.

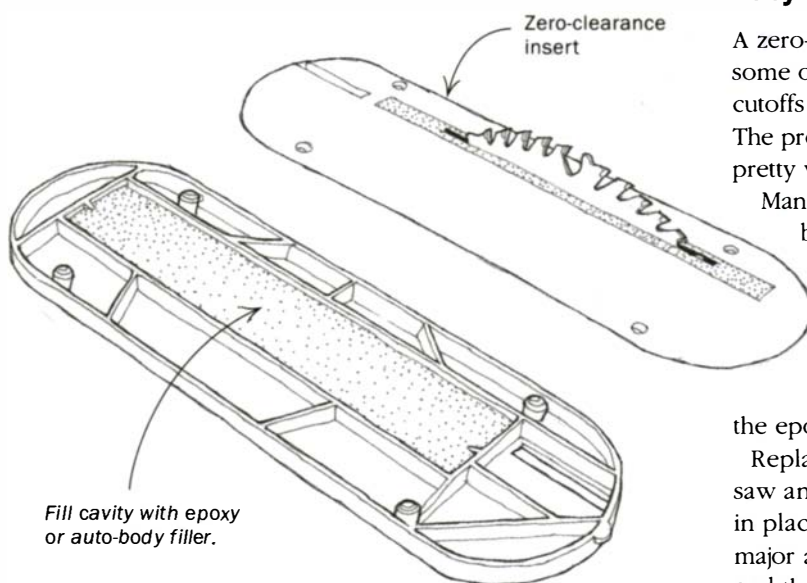
—RAY SPIERS, Salt Spring Island, B.C., Canada



Quick Tip

Biscuits can swell in the summer due to humidity and thus become difficult to push into the slots. I solved this problem by throwing a couple of those little silica-gel desiccant packets into my biscuit-storage jars. The packets are commonly found in mail-order shipments.

—CHARLES T. JAMES, Williston Park, N.Y.



Easy-to-make zero-clearance insert

A zero-clearance insert on a tablesaw helps prevent tearout, confines some of the sawdust, and makes work safer by preventing small cutoffs from becoming jammed between the blade and the insert. The problem is that most factory inserts fit the opening in the table pretty well, but have a sloppy blade opening.

Many woodworkers make or buy zero-clearance insert blanks, but I have devised an easier method. I fix a piece of common packing tape over the top of the blade opening in the stock cast insert. Put the tape on smoothly and make sure the insert is clean and in good shape. Turn the insert over and pour some epoxy or Bondo in the webbing of the cast insert. Set it aside on a dead-flat surface, and wait for the epoxy to set before you peel off the tape.

Replace the insert in the saw with the blade lowered, start the saw and, with a block of wood clamped over the insert to hold it in place, raise the blade to cut your new zero-clearance slot. The major advantage here is that you get to keep the leveling screws and the little nib that stops the back of the insert from flipping up.

—KEITH PRICE, Campbell River, B.C., Canada

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Furniture makers swap inspiration at society's annual gathering



Student work shines. Among pieces in the student exhibition was a pearwood book box (above) by College of the Redwoods student Jennifer Jew. Ryan Pfrommer, a student at Herron School of Art in Indianapolis, submitted a hall table (top right) with trapped-rock base and bent-laminated supports.



FURNITURE MAKERS ARE NOT A gregarious lot; most of us prefer the creative solitude of our shops. Gatherings like the annual Furniture Society conference fill a not-so-obvious need in our working lives—to share and learn from like-minded souls.

The 9th annual conference, at San Diego State University in June, drew more than 400 furniture makers, collectors, curators, gallery owners, and others. We talked shop, of course, and networked. But we also shared stories about where we live, what inspires us, and how working with wood fits into our lives.

The day before the conference, some of us bused up the coast to visit Sam Maloof, to see his shop and amazing handmade house full of

furniture and beautiful objects. Later, the tour took us inside the rarely open Blacker House, a Greene & Greene gem in Pasadena. To feel the aura of the place and the sheer unity of the overall design, to see the quality of the craftsmanship up close—that alone was worth my trip west.

At every conference, I'm most inspired during the slide talks by established makers. You can see 20 or 30 years of their unique styles unfold and hear what influenced them.

I see as many demonstrations as I can. Fitting this year's theme of alternative materials and technology, the offerings were eclectic. One was on patinating metal leaves applied to wood and another on forming metal on the English wheel. There were about a dozen; I wanted far more.

Every conference has a unique feel. In San Diego, a youthful energy lit up the atmosphere (students showed some of the best work). There was a freewheeling spirit, thanks in part to the university's dynamic art and studio program. I'll especially remember an evening firing of the metal studio's blast furnace, with artists pouring molten iron while friends watched from balconies and enjoyed the cool air.

—Garrett Hack, contributing editor



McKie wins annual Award of Distinction

BOSTON-AREA FURNITURE MAKER Judy Kensley McKie has been awarded the Furniture Society's 2005 Award of Distinction. The award, presented

in June at the society's annual conference, recognizes makers whose work has had a "profound impact" on studio furniture.

McKie received the award from friend and colleague Michael Hurwitz. Her work, which often features elegantly carved animal forms, appears in museum collections across the country.

—STEVE SCOTT, associate editor



Where the antelope play. The carved pearwood details in McKie's Antelope Bed show her mastery of stylized animal designs.

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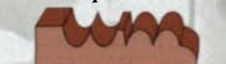
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READER SERVICE NO. 147

Collectors' club a hunting ground for used hand tools

GARAGE SALES AND FLEA MARKETS HAVE LONG attracted—and frustrated—woodworkers seeking bargains on used hand tools. The good deals are out there, but eager buyers often search in vain through heaps of old junk without a handplane in sight.

Joining a tool collectors' club might offer a better bet. The Mid-West Tool Collectors Association, which holds national meetings twice each year, is a case in point. Despite its name, the group “really is the ultimate ‘user’ organization,” said member Ralph Brendler of Chicago. “For every super-rare piece that a collector finds, he gets hundreds of common pieces.” Many are resold at club meetings.

Club officials want to keep the focus on tool collecting and not on

bargain hunting, but many members are woodworkers who use old tools.

Last fall's meeting brought more than 400 collectors to the Airport Marriott in St. Louis for three days of exhibits, demonstrations, and tool trading. The main event, a two-day sale that packed the hotel's ballroom, was preceded by a highly popular parking-lot sale and several days of informal trading.

This fall's national meeting takes place Oct. 20-22 in St. Charles, Ill. For membership and other information, see the group's Web site at www.mwtca.org. The site also contains a list of links to similar organizations around the country.

—Kevin Brennan is a hand-tool maker and freelance writer in Kansas City, Mo.



N.H. school puts classes, working furniture shop under one roof

A NEW WOODWORKING SCHOOL IN rural New Hampshire lets students learn in part by watching professional furniture makers at work.

The McLaughlin Woods woodworking school, which opened this spring in Canterbury, N.H., shares a roof with owner Tom McLaughlin's custom furniture shop. After class or on breaks, students can watch craftsmen at work and ask questions. That atmosphere takes the school “beyond just a basic academic enterprise,” McLaughlin said. “I want this place to feel alive with activity, with real present-day craftsmanship.”

McLaughlin, a furniture maker, has taught for about seven years at the nearby Canterbury Shaker Village.

The teaching area in his new facility comprises about 3,600 sq. ft. Each student has his or her own bench and access to separate machine and finishing rooms.

The first season's faculty features furniture-making heavyweights such as Jere Osgood, Garrett Hack, and Terry Moore.

Courses at the school continue through mid-November. For more information or to register, visit www.mclaughlinwoods.com.

—S.S.



Hiding in plane sight. Tool collectors' shows, like this one in St. Louis last fall, provide great opportunities to hunt for, and actually find, user-grade hand tools.

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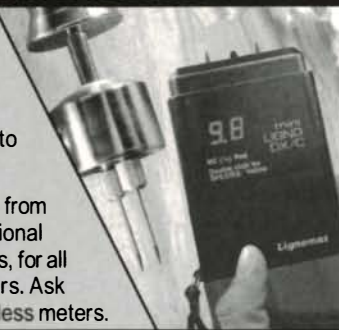
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Head to Head

New laminate trimmers from Bosch and Ridgid

THE NEW BOSCH LAMINATE TRIMMER (available in October) is a beautifully designed tool. This router is not just for laminate work. I think that the tool's light weight, adjustability, and ergonomics will make it the new standard in small routers for both furniture and cabinetmaking. The motor is wrapped in a rubber collar for a positive, comfortable grip.

Height adjustment is excellent. The variable-speed motor has a soft start and is relatively quiet. Changing bits is easy once you get used to the sequence that releases the base from the housing. The model I tested

(PR20EVSNK) includes the variable-speed trimmer and the additional bases for \$200. You can buy just the trimmer with a fixed base (PR20EVSK) for \$120, or a single-speed version (PR10E) for \$99. For information, go to www.boschtools.com.

RIDGID R2400

Ridgid's new R2400 laminate trimmer has several nice features and one glaring liability. The tool feels good in the hand, and height adjustments are easy. The variable-speed motor has a soft start and is quiet even at high speed. Bit changes, however, are awkward. Instructions suggest removing the base first, but that's easier said than done. If you leave the base on, there is barely enough clearance to work a pair of wrenches on the collet.

This laminate trimmer is listed on www.homedepot.com for \$99.

—Kim Carleton Graves builds furniture and cabinets in Brooklyn, N.Y.

A great little tool with one glitch. Ridgid's new laminate trimmer is sturdy and well-made. But bit changes are awkward due to the tool's design.



A new standard for small routers. The Bosch engineers did their homework when they designed the Colt Palm Router.

ACCESSORIES

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In my shop, small screwdriver bits disappear like socks in the laundry. DeWalt tackles that problem with its new 6-in-1 driver sets designed to keep assorted driver bits in one place. The sets come with a hex-head holder that grasps a double-ended hex-head sleeve housing the collection of double-ended bit and nut drivers for various screw heads. You can buy 7-piece or 4-piece sets for \$16 and \$11 respectively, at Sears and Lowe's stores.

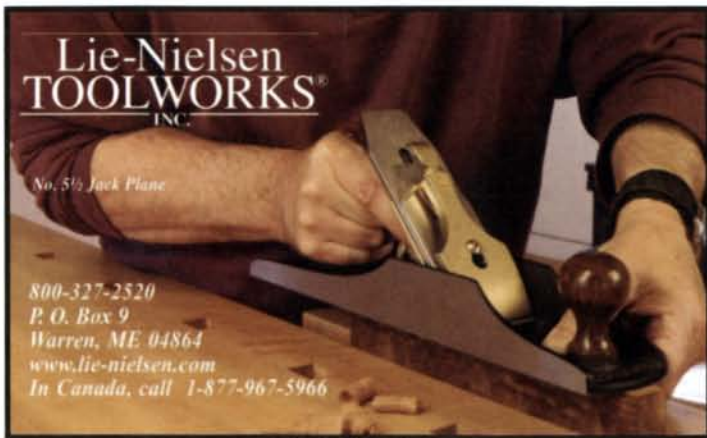
—WILLIAM DUCKWORTH is a contributing editor.



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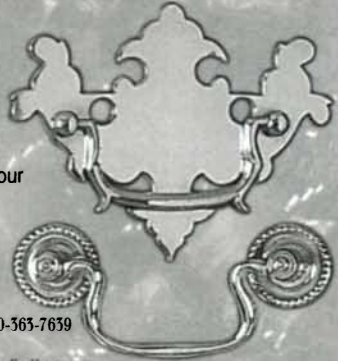
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■ SANDING

DRILL-PRESS JIG SANDS THIN MATERIALS

If you need to shape narrow, thin stock for projects that require inlays or bent laminations, the Luthier's Friend, mounted on a drill press, is a relatively low-cost way to do so. The sanding drum comes with a bearing, so it can be used for template sanding. The jig is well-made, and the setup is straightforward as long as your drill-press table is perpendicular to the spindle. The dust shroud supplied with a 2½-in. port did an excellent job. Using the adjustable fence, I could easily sand inlays as thin as 1/32 in. The jig comes with three sanding-drum sleeves. Use the coarsest grit for rapid stock removal, and switch to the finer sleeves for the final passes.

The Luthier's Friend costs \$159 (plus shipping), and \$18 for a small-parts vise (which I recommend). It's available at some woodworking-supply stores, or at www.luthiersfriend.com.

—ROB MILLARD builds reproductions of 18th-century furniture in Dayton, Ohio.



The fence is adjustable. By pivoting the fence, you fine-tune the thickness to which you can sand extremely delicate pieces of wood.

■ HAND TOOLS

Dovetail chisels fit easily in tight spaces

WOODWORKING TEACHER AND AUTHOR TOSHIO ODATE has put his extensive knowledge of woodworking tools to use in designing a set of dovetail chisels. Three characteristics define these chisels and add to their functionality. First, the sides of the chisels are ground almost to a knife edge in a triangular profile, making it easy to clean out the corners of dovetail joints without marring the walls. Second, the handles are cranked to provide clearance for the relatively short blades. And third, the chisels are available in widths as narrow as



Offset paring chisels. Toshio Odate, woodworking teacher and author, designed these paring chisels for getting into hard-to-reach spaces, such as the corners of dovetail joints.

3mm, which allow you to cut very fine dovetail pins. The iron-hooped oak handles are typical of Japanese tools, and the laminated steel blades take a razor-sharp edge easily and hold it for a long time. I found that the tools performed well. Because the sides of the chisels are sharp, care must be taken when gripping them. I especially like the narrow widths that reach areas my regular chisels don't. The chisels range in width from 3mm to 15mm and are sold individually or in sets, starting at \$58 per chisel. They are available at www.toolsforworkingwood.com or 800-426-4613.

—Michael Pekovich is the art director.



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■ POWER TOOLS

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Sand into tight corners. The Mega Mouse's attachments will fit between narrow slats and into square corners.

For \$58, Black & Decker's 1.4-amp Mega Mouse sander/polisher comes in a carrying case with three attachments.

The most useful for woodworkers is a 5-in.-dia. circular hook-and-loop pad for random-orbit sanding, which accepts sanding disks of any hole pattern. Faced with a different task, you can use the hex wrench to switch to a narrow finger attachment for detail work, or a clothes-iron-shaped pad for orbital sanding. Both of these options, however, require Black & Decker specialty sandpaper.

The Mega Mouse can't compete with high-end machines for continuous, heavy-duty work, but if you want these options without spending a lot of money—and you don't expect good dust collection—this tool is worth a try.

—ANDY BEASLEY is a retired U.S. Air Force instructor pilot who now spends his time working on his house near Hillside, Colo.



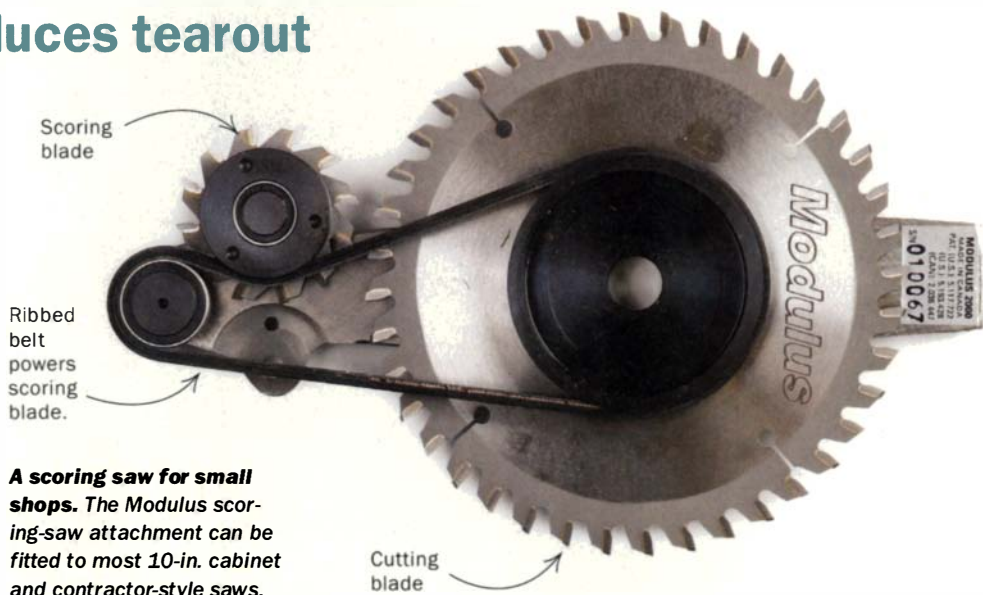
■ TABLESAWS

Sheet-goods blade reduces tearout

SCORING SAWS ARE IDEALLY SUITED FOR cutting veneered plywood or melamine sheet goods without tearout, especially on the lower face. They perform this trick by incorporating a small, counter-rotating sawblade mounted in front of the cutting blade. The small blade makes a shallow climb-cut in the bottom face, and the larger blade cuts through the material. The result is a perfectly clean cut. The problem has been that scoring saws were available only on very expensive, industrial-grade tablesaws.

The Modulus SS-10 scoring-saw attachment will fit most 10-in. cabinet and contractor-style tablesaws. The assembly mounts on the tablesaw arbor like a conventional blade with the arbor directly driving the 6-in. blade, while the 2-in. blade is powered by a ribbed belt off the 6-in. blade. Cutting capacity is 1 in. at 90° and ¾ in. at 45°. The SS-100 allows you to use your splitter assembly.

Installing the unit for the first time will require about an hour. After the initial setup, it takes no more time to install or remove the SS-100 than it does a regular sawblade. The two-piece, 2-in. scoring blade can be adjusted easily for width and alignment,



A scoring saw for small shops. The Modulus scoring-saw attachment can be fitted to most 10-in. cabinet and contractor-style saws.

although the one I tested was set up perfectly out of the box. I ripped and crosscut cherry veneer-core plywood, red-oak veneered MDF, and melamine panels without a hint of tearout.

The Modulus SS-100 costs \$400 (plus shipping) and is available directly from the manufacturer (800-633-8587; www.modulus2000.com).

—Roland Johnson is a contributing editor.



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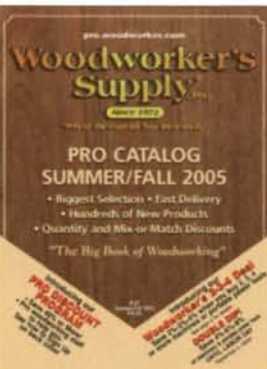
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A Classic Case

Floating-tenon joinery and curly cherry update a traditional Arts and Crafts design

BY GREGORY PAOLINI



Anyone familiar with American furniture would immediately identify this bookcase as an Arts and Crafts design. However, it differs from traditional pieces in two important ways. Arts and Crafts furniture usually is made from quartersawn white oak, but I built this bookcase from curly cherry. Traditional Arts and Crafts pieces are joined with mortises and tenons, while I use a modern variation—the floating tenon (*FWW* #158, pp. 36-39).

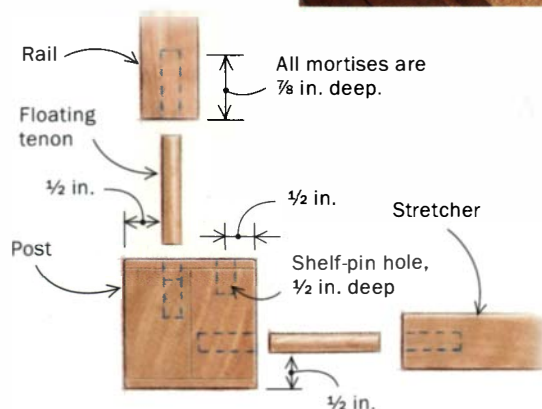
In floating-tenon joinery, a wooden spline (the floating tenon) joins mortises routed in both pieces (see photo, facing page). I find floating-tenon joinery to be much faster than traditional mortise-and-tenon, and plenty strong.

I spent time choosing highly figured boards for the front rails and the side panels, which will be most visible. The back is of shiplapped cherry, resawn (sliced in half to produce two thinner boards) from 4/4 stock. Shiplapping is a method of slightly overlapping boards by rabbetting the opposite edge of each side. Shiplapped boards rarely end up sitting exactly flush with each other. Those who don't like that look might substitute plywood or tongue-and-groove boards for the back.

Prepare the stock before you begin

As with all projects, I make sure the lumber is dried properly, and acclimate it to my shop for a couple of weeks. After that, I

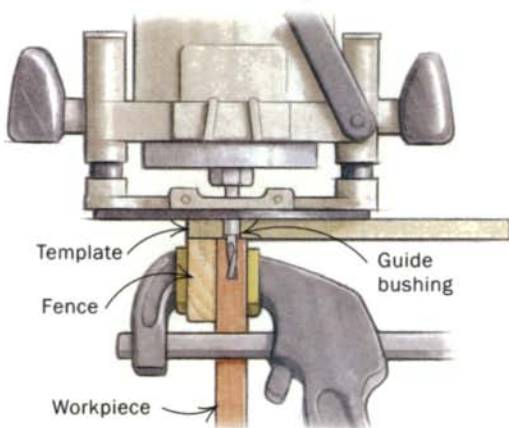
Built from cherry and joined with floating tenons, this case is a modern take on an Arts and Crafts classic. The tenons provide rigidity so that the sides and back can float within the rails and stretchers. The side panels are book-matched and the back is shiplapped.



Routing the rail mortises

A SIMPLE MORTISING JIG

Fitted with a guide bushing the same diameter as the slot, a plunge router easily mortises the ends of the rails and stretchers.



Slot the jig on a router table. The jig's hardwood fence rides along the router table's fence, accurately slotting the jig's MDF base.



Mark centerlines on both the jig's slot and the workpiece. Line up the centerlines and clamp the stock in the jig.



rough-cut all of the boards slightly oversize, and let them sit for an extra day or two in case the wood still wants to shift a bit.

Face-jointing is a critical, but often overlooked, step in dressing lumber. Jointing one face flattens the board, removing flaws such as cupping or mild twisting. To keep track of it as a reference surface, I mark the jointed face with chalk. After face-jointing, I square one edge of each board, being sure to feed it through the jointer with the flattened face against the fence. When I plane the stock to thickness, the jointed face rides across the bed of the planer, ensuring a flat board.

Like the shiplapped back, the side panels are resawn from 4/4 stock. I leave the stock destined for resawing as thick as possible, planing it only to remove the rough face.

My bandsaw is a basic 14-in. model with a 6-in. riser block to add capacity. It's not terribly powerful, so to help it

out while resawing wide stock, I start by kerfing both edges of the boards on the tablesaw. This leaves less wood in the center of the board to bandsaw, and the kerfs help guide the bandsaw blade to ensure a straighter cut.

The boards resawn for the back are planed to finished thickness, and then weighted down in a stack to keep them flat. These boards can vary in width, which adds a little character to the bookcase, and should be left a little oversize for fitting to the back of the case.

The side panels are book-matched (resawn panels are glued edge to edge so that the grain of each mirrors the other). When the glue has cured, scrape away the excess, and plane the sides to their final thickness. As with the back, I leave the side panels oversize and fit them to the case later.

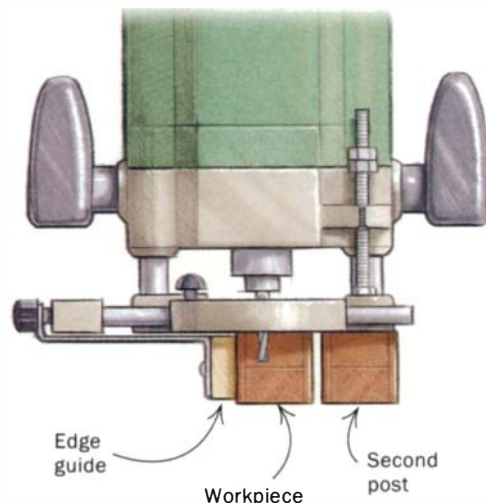
I couldn't find any 8/4 stock for the posts, so I glued each one from two pieces of



Routing the post mortises

SUPPORTING THE ROUTER

When mortising the posts, there's not much surface area to support the router. A second post laid beside the workpiece adds support.



4/4 stock planed to $\frac{7}{8}$ in. To give the illusion that these posts came from one piece of wood, I ripped some cherry to about $\frac{1}{8}$ in. thick, and used it as a thick veneer on the sides of the posts that showed the glue-line. Although this technique also results in glue-lines, they're so close to the corners of the posts that they're barely noticeable.

Floating tenons speed construction

As with traditional mortise-and-tenon joints, floating tenons should be about one-third the thickness of the stock. In this case, the finished thickness of the bookcase rails is $\frac{3}{4}$ in.; the tenons are $\frac{1}{4}$ in. thick. Accordingly, I cut the mortises with a $\frac{1}{4}$ -in. spiral upcutting bit on a plunge router using a simple jig (see photos, facing page).

I make the tenons by ripping and planing lengths of stock to fit the mortises. The tenon edges are bullnosed on a router table. The tenons should be thick enough to slip into the mortises with hand pressure, and a little undersize in width to give air and excess glue somewhere to go. The mortises are just over $\frac{3}{4}$ in. deep; I cut the tenon stock into 1½-in.-long pieces.

Mortise and groove the frame

I mortise the posts using a plunge router and a fence. The bit is the same $\frac{1}{4}$ -in. spiral upcutting bit used to mortise the rails and stretchers. I have to set up the router and fence anyway to groove the posts

for the side panels and shiplapped back, and the panels are the same thickness as the tenons. So, cutting the mortises at the same time is only a matter of deepening the groove at the top and bottom of the post. To provide additional support for the router, I place a second post alongside the one being routed (see drawing, right). So as not to strain the router bit, it's important

Grooves for the back and side panels



Mill the grooves in the rails and stretchers on the tablesaw. This method is a safer, easier alternative to routing the thin edges of these pieces.



A plunge router fitted with a fence mills the grooves in the posts. Use the same router setup used to cut the mortises in the posts.

Assemble the bookcase in stages



Prefinishing saves hours of time cleaning glue squeeze-out. Shop towels shoved into the mortises keep them finish free to ensure glue adhesion. Glue-up starts with the sides (right). Allow them to dry overnight before removing the clamps.

to make several light passes instead of one heavy pass. When a router bit spinning at 20,000 rpm breaks, bad things happen. Before putting the router away, I cut small grooves in the upper rails and stretchers. Later on, I will use them to secure the top with button blocks (see drawing, p. 33).

Bookcases get loaded with hundreds of pounds of books, and it's tough on the joints if the piece is not level. I like to add adjustable levelers to the bottoms of the posts. I use common metal pad levelers available at most hardware stores, and screw them into threaded inserts that I install in the base of each post.

The next operation on the posts is to drill an array of holes for the adjustable shelf pins. To keep them out of view, I locate the bores for these pins on the inner faces of the posts. I use a jig that I made, with holes drilled at the cabinetmaker's standard 32-mm spacing. These holes are drilled to accept a $\frac{3}{8}$ -in. router bushing. With my plunge router so equipped, I "drill" the holes with a $\frac{1}{4}$ -in. spiral upcutting bit.



Finally, I ease the bottoms of the posts by holding them at an angle and spinning the bottoms against a sander.

Dry-assemble to check final dimensions

With all the joints cut, I dry-assemble the bookcase and measure for the back and side panels. Both the side panels and the back will expand and contract due to seasonal humidity—about $\frac{1}{8}$ in. per foot of width. How you size the panels depends on the season. For example, if it's humid, the panels should fit snugly because they'll dry and shrink when the season changes. If your shop is very dry, keep the fit looser (to allow some expansion).

Now is also the time to measure the final length and depth of the shelves, and lay out the notches at the corners where the shelves will fit around the posts. I cut these notches on a bandsaw, but you could just as well use a handsaw or jigsaw. Leave a $\frac{1}{16}$ -in. space between each post and its corresponding notch to accommodate seasonal movement.

After I have sized the side panels, back, and shelves, I do one last dry-fit and make any required adjustments. When I know everything will fit together, I sand all the pieces to 220 grit.

Making and attaching the corbels is the final step before finishing. I bandsaw



Next come the stretchers and the back. You may want to enlist a helper when putting together the shiplapped back.



Top off the assembly with the final side. Use pine blocks on each side of the corbels to transfer clamping pressure to the posts.

them, then smooth the sawn surfaces with a spokeshave and a little sanding. Because the corbels are only ornamental, they can be attached with brads and glue.

Finished—but not done

To minimize the problems glue squeeze-out can cause, I finish all the parts before assembly. Prefinishing takes discipline; after all this time, you just want to see the bookcase take shape. But finishing the parts first means you won't have to spend tedious hours trying to clean up glue squeeze-out later.

I apply a coat of Zinsser Bullseye Seal-Coat sanding sealer over the raw wood to minimize grain raising. The sealer also adds a nice amber hue typical of traditional oil-based finishes, but lacking in the water-based ones I use. I let it dry overnight, then apply several coats of Minwax Polycrylic. Be sure to apply the same number of coats to all sides of the pieces to minimize the chance of the wood warping.

Putting it all together

I assemble the bookcase in stages, starting with the sides. The best way I've found

to glue the mortises and tenons together is to apply a thin bead of glue along the top of the mortise, and let gravity pull it down. As soon as I've clamped the assembly, I check it with a carpenter's framing square.

After the sides have cured, I move on to assembling the front and the back (see photos, above). You might want to use polyurethane glue for assembling the back; it has a longer open time than yellow glue.

While clamping the bottom is straightforward, the top with its corbels causes a problem. The solution is to use small pine blocks on each side of the corbels to transmit clamping pressure to the posts. Once the glue has cured, I can easily remove any squeeze-out, which doesn't bond to the topcoat very well. Then I attach the top with button blocks to allow for wood movement, and install the shelves. I finish up with a quick coat of wax for its tactile benefit. □

Gregory Paolini is a Roycroft Renaissance Artisan who builds furniture part time in his Depew, N.Y., basement shop.



Add the top and shelves, and this new heirloom is ready. The shelves are all removable, resting on shelf pins or the bottom stretchers, and notched to fit around the posts.

Honing Guides

A good sharpening jig
makes it easy
to get a fine edge
on chisels and irons

BY CLIFF COLLEY

One of the first woodworking skills I learned from my father was the art of sharpening plane blades and chisels by hand. I became convinced that freehand sharpening was the only way to put a keen edge on a tool. It wasn't until I started my first job in a cabinet shop at 15 that I learned otherwise. One day, my boss saw me honing a 1/2-in. chisel by hand. He tossed me a honing guide and said, "Use this. It's consistent and faster."

He was right. In minutes, I was back at the workbench, putting a perfectly honed tool to wood.

Unlike sharpening by hand, a honing guide guarantees a consistent angle as you work your way up through the various grits, which makes sharpening faster and more efficient. A typical honing guide consists of a body, a clamping mechanism to hold a blade, and a roller or set of rollers that rides on the stone or on a surface adjacent to the stone.

Using one of these tools is straightforward. After lapping the back of the chisel or plane iron flat and grinding a bevel on a bench grinder, mount the blade in the honing guide, set the bevel angle, clamp down the blade, and roll it across whatever sharpening medium you prefer (waterstones, oilstones, diamond plates, or sandpaper on glass).

For this review, I tested eight honing guides, ranging in price from \$9 to \$70 (for the rundown on each tool, see pp. 40-41). In general, most of the guides I looked at are easy to use, and



all can hold typical blade sizes, from 1/8 in. wide to 2 7/8 in. wide.

From the tests, I found that guides with convenient features made a lasting impression. For instance, a few of the honing guides have adjustment mechanisms that allow you to put a secondary bevel (also called a microbevel) on a blade. Without this feature, you'd have to unclamp and slide the blade back about 1/8 in. A secondary bevel is steeper than the primary bevel and makes for a beefier edge that is easier to touch up later.

Some of the guides also come with angle-setting gauges either built in or as separate components. Finally, honing creates a burr on the back of the blade, which should be removed before you put the blade to use. A few guides allow you to remove this burr while the blade is mounted in them.

Of the guides I tested, my choice for best overall is the Veritas Mk.II. It's well engineered, has a hefty feel, handles a wide range of sharpening angles, and comes with a revolutionary angle-setting jig. What's more, you can adjust for a secondary bevel with the turn of a knob.

A close runner-up to the Veritas is the extra-wide honing guide from Kell.

For best value, I chose the Stanley guide. For \$20 you get a versatile guide that rolls smoothly, is comfortable to hold, and fits a range of blade sizes. □

Cliff Colley is a high-school woodworking instructor in Plymouth, Mass.



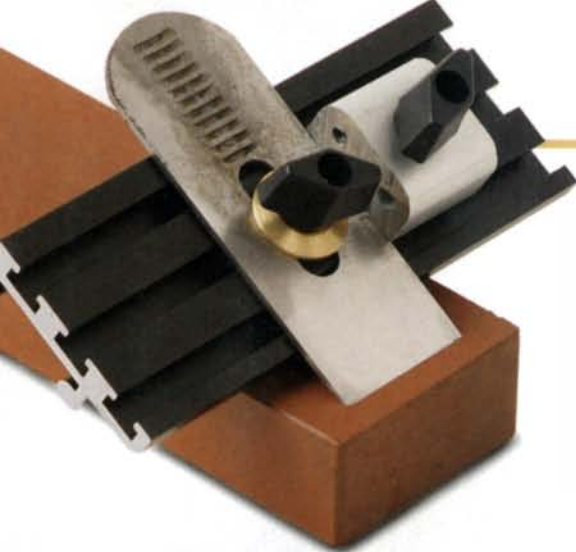
TWO WAYS TO HOLD A BLADE

Blades are held in the honing guides with clamping mechanisms that are horizontal or vertical. In general, clamping mechanisms that grip the blade horizontally between two jaws (left) hold tools more securely than most vertical mechanisms (above) and ensure that the cutting edge is always set perpendicular to the stone.



TWO WAYS TO ROLL

Most honing guides roll on top of the stone (above), allowing you to sharpen on stones of varying thicknesses without having to reset the blade. Guides designed to roll off the stone (left) must ride on a surface that's smooth and free of debris.



FastTrak

Price: \$55 (includes carriage, 30° roller, clamp, and depth gauge); \$13 for the 27° roller

Source: www.prairieriverwoodworking.com

Comments: With the FastTrak, you can achieve a 3° secondary bevel by honing first with the 27° roller, then switching to the 30° roller. The guide holds blades securely and perpendicular to the stone, and rolls smoothly. Unfortunately, the wide carriage has sharp edges and protruding attachments that make the FastTrak cumbersome to use. Also, the guide is a bit tippy, especially when honing chisels. I would purchase the FastTrak honing guide only if I planned to use the complete FastTrak system (see *FWW* #174, p. 73), which allows you to go directly from grinding on a wheel to honing on a stone with one setup.



HONING GUIDES

Honing guides are simple tools designed to make sharpening easier and more precise. Of the eight guides tested, the Veritas Mk.II is the best overall. It offers versatility, precision, stability, and comfort at a moderate price. On top of all that, the guide features a revolutionary blade-setting jig that's accurate and easy to use.

The Stanley guide is the author's choice for best value.

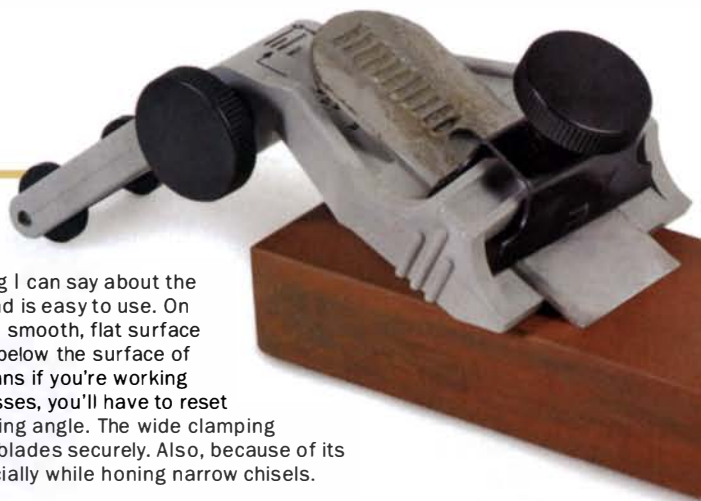


General 809

Price: \$27

Source: www.woodcraft.com

Comments: Perhaps the best thing I can say about the General is that it rolls smoothly and is easy to use. On the downside, the rollers require a smooth, flat surface that's free of debris, level with or below the surface of the sharpening medium. That means if you're working through stones of varying thicknesses, you'll have to reset the blade to ensure the same honing angle. The wide clamping mechanism does not hold narrow blades securely. Also, because of its height, the tool tends to tip, especially while honing narrow chisels.



Kell guide

Price: \$65, extrawide; \$57, standard

Source: www.hartvilletool.com

Comments: The Kell honing guide is an exquisite tool made from brass and stainless steel, with smooth-gliding rollers. The horizontal clamping mechanism automatically registers a blade perpendicular to the stone, and the knob is easy to grasp. The guide is very stable, even with narrow chisels, and allows you to lap the back of a blade while it's clamped in place. The extrawide guide accepts blades up to 2½ in. wide; the standard guide accepts blades up to 1½ in. wide. For wide blades or narrow stones, a supplemental support surface may be necessary (right).



Sharpening Sled SS1

Price: \$70 **Source:** www.alisam.com

Comments: With its four-wheeled design, the SS1 is the most stable of the guides I looked at. The adjustable alignment pin makes it easy to keep a blade square to the stone during clamping. The SS1 works only with stones up to 1 in. thick, but you can purchase accessory side supports (\$33) to increase this capacity (according to the manufacturer, shorter side supports will be available soon for use with sandpaper on glass). On the downside, if you're working through stones of varying thicknesses, you'll have to reset the blade to ensure the same angle. Also, the guide does not fit over stones wider than 3 in.



Single-roller guide

Price: \$9-\$15, depending on source

Sources: www.garrettwade.com, www.grizzly.com, www.leevalley.com, www.rockler.com, www.woodworker.com

Comments: The low price is a big plus with this generic honing guide. Sold under different brand names and from a variety of sources, the guide is easy to use. It allows you to lap the back of a blade easily. The horizontal clamping mechanism sets most wide blades perpendicular to the stone. However, one jaw of the clamping mechanism is slightly convex, which caused my 1/4-in. stubby chisel to twist in the jaws and my 1/8-in. chisel to pop out repeatedly.



Stanley

Price: \$20

Source: www.garrettwade.com

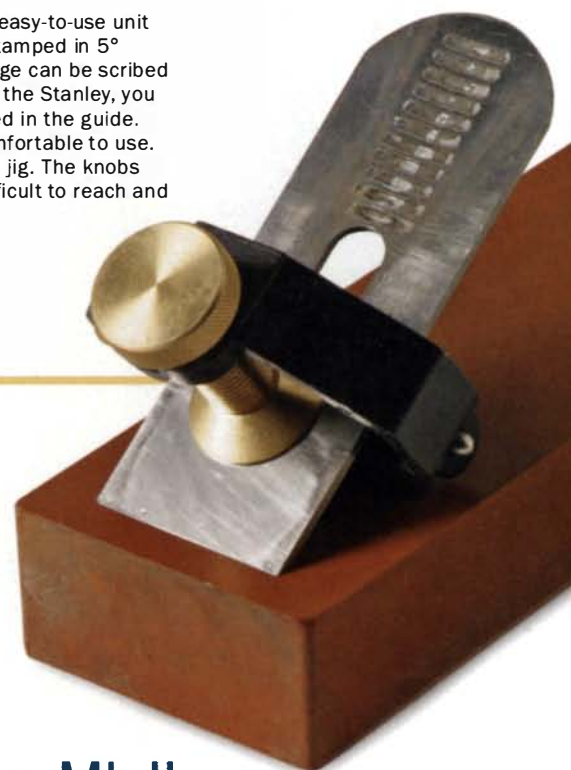
Comments: The Stanley is a smooth-rolling, easy-to-use unit with a built-in bevel-setting gauge. Though stamped in 5° increments, from 25° to 35°, the plastic gauge can be scribed to mark at your preferred bevel setting. With the Stanley, you can lap the back of a blade while it's clamped in the guide. With plane irons, the guide is stable and comfortable to use. But chisels are more difficult to clamp in the jig. The knobs that adjust the clamping mechanism are difficult to reach and roughly milled.

Veritas

Price: \$36.50

Source: www.leevalley.com

Comments: The Veritas is a well-made, versatile tool at a reasonable price. The package includes a jig that helps set the blade for one of five common bevel angles: 15°, 20°, 25°, 30°, and 35°. You also can add a secondary bevel simply by turning a knob on the side of the guide. Unfortunately, I was unable to tighten the clamp enough to prevent chisel blades under 3/4 in. wide from pivoting during honing; the problem was solved simply by holding the tool with both hands.



Veritas Mk.II

Price: \$48.50

Source: www.leevalley.com

Comments: The Veritas Mk.II is an impressive tool. With its smooth, rounded edges and strategically placed indents for fingers, the jig is comfortable to use and is very stable because of its 2-in.-long single roller. You can achieve a secondary bevel with the turn of a knob on the side of the jig. The revolutionary color-coded blade-registration jig engages a slot on the front of the jig body and makes it easy to set a blade not only to the desired honing angle (from 10° to 54°) but also square to the stone. The instructions are well written and easy to comprehend.



A Durable Exterior Finish



Epoxy sealer and marine varnish protect wood against the weather

BY SEAN CLARKE

On any piece of wood exposed to the elements, whether it is your front door or the patio furniture, a durable finish is of utmost importance. For maximum protection, I use a two-step process that greatly improves the resilience of my exterior finishes. It consists of a primer and a varnish topcoat used in the boat business, where they know all about protecting wood from the elements. The primer is a two-part resin epoxy that impregnates the wood, making it resistant to fungi and water damage. It also chemically bonds to the varnish, which has ultraviolet (UV) inhibitors to protect the wood and the primer.

Prep the wood and apply the primer

Sand all of the surfaces with P220-grit sandpaper, removing the dust with a vacuum, compressed air, or a tack cloth. If desired, brush, spray, or wipe on a pigment-based oil stain, but avoid dyes





Prime with the epoxy

The epoxy penetrates the wood, making it resistant to water damage and giving a firm base to the varnish.



Mix the primer.
The epoxy comes in two parts that are blended in equal measure.

because they will fade faster when used outdoors. Let the stain dry for 12 to 24 hours.

For several years, I've had great results using MultiWoodPrime (also called Clear Penetrating Epoxy Sealer) made by Smith & Company. Originally developed to stabilize decaying outdoor wood structures, it comes in a cold-weather formula for when the temperature is 28° to 65°F, and a warm-weather version for above 50°F. Both consist of two parts combined equally, with a working time of about 20 minutes.

Use a synthetic-bristle brush to apply the thin liquid generously, allowing it to soak into the wood. Re-apply to drier areas. The idea is to thoroughly saturate the fibers until all the porosity of the wood has been eliminated, so pay particular attention to joints and to end grain on legs and arms. When the surface will not absorb any more epoxy, wipe off the excess with a rag soaked in lacquer thinner. Let this coat dry for 24 to 48 hours.

Following the cure time, if the surface feels rough, gently scuff it with P320-grit no-load sandpaper. Try not to sand through to the bare wood on edges and corners. Apply a second coat of



Apply the primer. Once the two-part epoxy is combined, you have about 20 minutes to apply it generously to the surface, letting it saturate the wood. Pay attention to the end grain as this is where weather damage is most likely. Re-coat these areas as the epoxy is absorbed into the wood.



Smooth the surface. Between coats of epoxy and before applying the varnish, lightly sand the surface with P320-grit sandpaper.

epoxy in exactly the same manner. If the epoxy is still being absorbed, let this coat cure for 24 to 48 hours and apply a third coat. Once there is no absorption, evenly wipe the surface with a rag dampened with lacquer thinner and let the epoxy rest for 8 to 12 hours. Lightly sand the surface with P320-grit paper and remove the dust. This half-cured surface will create a very strong chemical bond with the subsequent coat of varnish. If you can't apply the varnish within the 8-to-12-hour window, let the epoxy fully cure, then apply another coat and allow that to cure for only 8 to 12 hours.

A good marine varnish protects the primer

Any type of spar varnish can be used, but I use a marine varnish called Epifanes, which has a high percentage of solids and UV blockers. Reduce the varnish for the first coat by 50% by blending it with equal parts mineral spirits. This will help it flow into any crevices. Brush it on and allow it to cure for 12 to 24 hours before

FINDING SUPPLIES

Smith & Co.'s MultiWoodPrime (Clear Penetrating Epoxy Sealer) and Epifanes varnish are available at:

Jamestown Distributors
www.jamestowndistributors.com
800-423-0030

lightly sanding with P320-grit, no-load paper. The sanding is not for adhesion, because as long as the second coat of varnish is applied within 36 hours, the two coats will chemically bond. Rather, it is to create a flat, consistent surface. Other brands may have different rules, so follow the manufacturer's recommendation. Reduce the second coat with 25% mineral spirits, and repeat the process, allowing it to cure 12 to 24 hours before applying a third coat, reduced by 15%. You can add subsequent coats at full strength, particularly

if heavy sanding has resulted in a lower build of material.

All exterior coatings eventually need refurbishing, but you shouldn't have to touch this chair for several seasons. When you do, only the varnish will need sanding as the epoxy primer should keep the wood in fine shape. □

Sean Clarke runs Clarke Company, a furniture-finishing and -restoration business in Columbus, Ohio.

Coat with the marine varnish

Developed to protect the woodwork on boats, marine varnish gives the wood more protection than standard spar varnish.



Thin the varnish. To promote better absorption, thin the first three coats of varnish with mineral spirits. When applying, take care to cover all the surfaces.





Tablesaw Tune-up

Make the shop workhorse run like a champ

BY ROLAND JOHNSON

Ask woodworkers to name the busiest tool in their shop, and it's a safe bet many will point to the tablesaw. A machine that can rip sheet goods down to size, cut boards to length, and create a variety of joints is bound to carry part of the workload in almost any project.

Yet in many woodshops, tablesaw maintenance consists of little more than changing blades, cleaning the tabletop, and squaring fences. Only when the blade-tilt or -raise mechanism starts to screech in protest does anything beneath the table get attention.

Our shop workhorse deserves better. A yearly inspection and tune-up should be a basic requirement; saws kept in damp or unheated conditions should be cleaned and lubricated more often. The comprehensive tune-up presented here is basically the same for all tablesaws. Check your owner's manual for any details that might differ. □

Roland Johnson is a contributing editor.

Assemble a tune-up kit

A well-stocked shop already should have many of the basic tools and supplies needed to perform tablesaw maintenance, but you might need to add a few.

 DIAL INDICATOR This device is crucial for the very fine measurements needed in checking the blade for runout and the miter slot for parallel.	 DEGREASER A grease-cutting solvent and a stiff wire brush remove caked-on pitch and sawdust from the saw's inner workings. Aerosol brake cleaner or carburetor cleaner also works well.	 LUBRICANTS To keep the blade-tilt and -raise mechanisms working smoothly, the author recommends quick-drying aerosols instead of grease, which tends to attract sawdust.
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COMMON TABLESAW PROBLEMS

Tablesaws are so sturdy and powerful that they seem not to need any special attention. But like any complex tool, they can develop a variety of problems that erode performance. Keeping your saw clean, lubricated, and properly adjusted will make the machine safer, more accurate, and easier to use.

STOCK CATCHES ON TABLE

If the extension wings and throat plate aren't flush, lumber can hang up or bind as you feed it into the blade, possibly causing kickback. See p. 52.

WOBBLING BLADE

A wobbling blade runs hotter, cuts less precisely and smoothly, and can cause kickback. See p. 50.

BURN MARKS WHILE RIPPING

A rip fence that's out of parallel can push stock into the side of the blade, scorching the wood, causing the blade to bind, and possibly causing kickback. See p. 53.

INACCURATE ANGLES

Poorly set blade-tilt stops can result in cuts that aren't square and miters that don't fit. See p. 53.

ROUGH CROSSCUTS

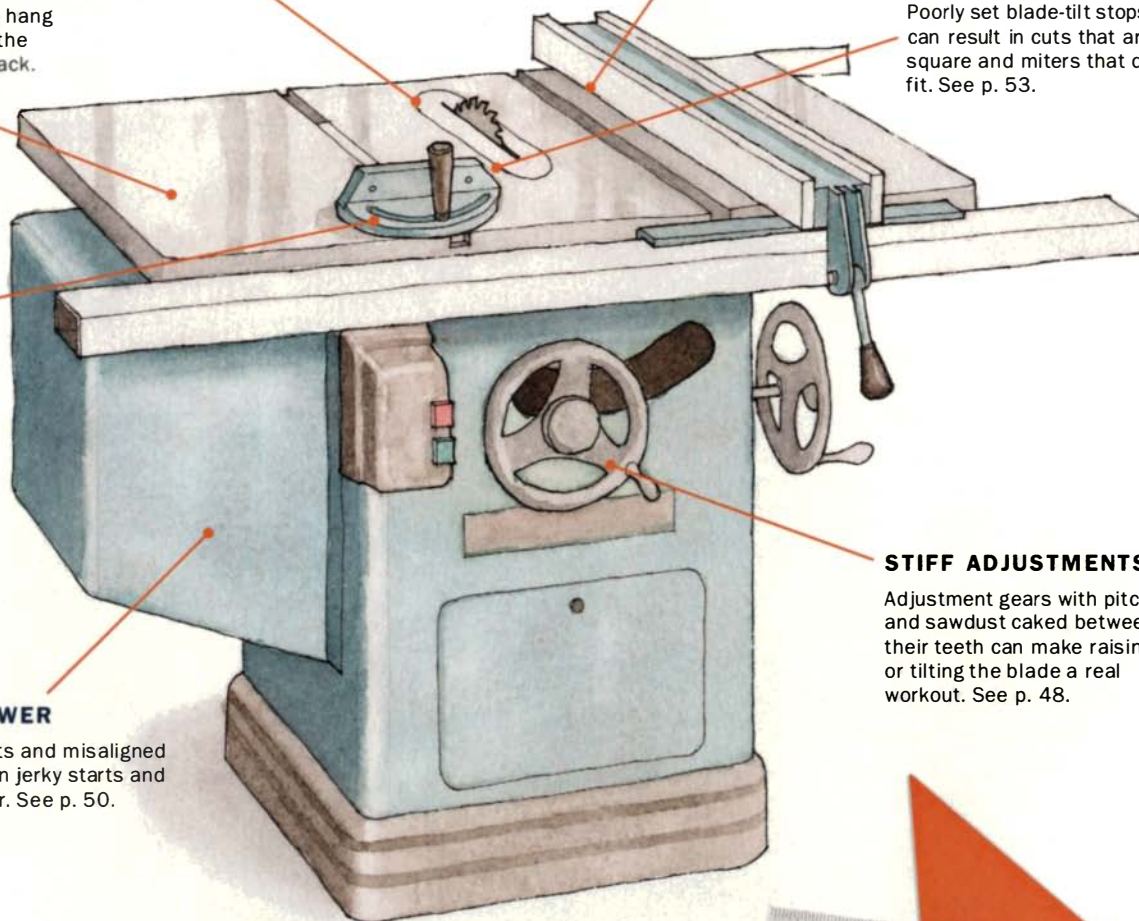
If the miter-gauge slot isn't parallel with the blade, you can't make accurate 90° crosscuts. Tilting the blade to 45° also can throw it out of parallel. See p. 51.

LOSS OF POWER

Worn or stiff belts and misaligned pulleys can mean jerky starts and decreased power. See p. 50.

STIFF ADJUSTMENTS

Adjustment gears with pitch and sawdust caked between their teeth can make raising or tilting the blade a real workout. See p. 48.



TOPCOAT

There are several spray-on products designed to protect the tabletop from rust and to reduce friction. Paste wax is also effective.



SHIM STOCK

For leveling a tabletop or extension wings, brass shim stock is available in different thicknesses from hobby and machine-supply stores.



MEASURING

You'll need a variety of measuring implements, most of which you probably have on hand. They include a drafting triangle with 45° and 90° angles, a combination square, and a long level or straightedge.



Clean and lubricate the inner workings

On most cabinet saws, removing the tabletop exposes the inner workings and makes a tune-up much easier.

First, unplug the saw, then remove the throat plate and the blade to avoid damaging the blade or yourself. Measure and record the distance from the left-hand miter slot to the blade. You'll need this measurement to reassemble the saw accurately.

Now undo the bolts that hold the top to the base and remove any extension tables or fence rails. If a strong friend is helping, you might be able to lift the top with all of its accessories, but it will be awkward and heavy.

The inside of a tablesaw is a grimy, dusty place. Without regular cleaning, wood resin and sawdust can cake up and stiffen a saw's inner workings, especially the blade-height and -angle adjustments.

Use a shop vacuum and compressed air to get rid of the sawdust, then attack the gears and pivoting parts with grease-cutting solvent and a wire brush. I like to use LPS-brand solvents because they cut grease aggressively and don't leave an oily residue (available at National Supply Source, www.nolansupply.com; call LPS at 800-241-8334 for retailers near you). Aerosol brake cleaner or carburetor cleaner also will work. Although the bearings in a tablesaw are sealed, avoid getting solvent directly on them. Some of these products also can damage paint, so buy and apply them carefully. In any case, buy a high-quality solvent that will evaporate quickly.

Remember, when using volatile solvents, make sure you have an adequate fresh-air supply and wear a vapor mask.

Finish the cleaning process with a compressed-air blowdown to speed drying and remove crud softened by the solvent. The overall goal in all of these steps is to clear away as much dust and pitch as possible, leaving clean, dry surfaces for an effective lube job. Be sure the solvent is completely cleaned out or dry before applying new lube to the contact surfaces.

Before moving on, give some attention to the motor. Blow compressed air through the housing until the exhaust air is clean.



Mark your place before removing the top. Measure the distance between the blade and the left-hand miter slot. Realigning the slot to this measurement during reassembly will ensure that jigs, such as a crosscut sled, will still fit.

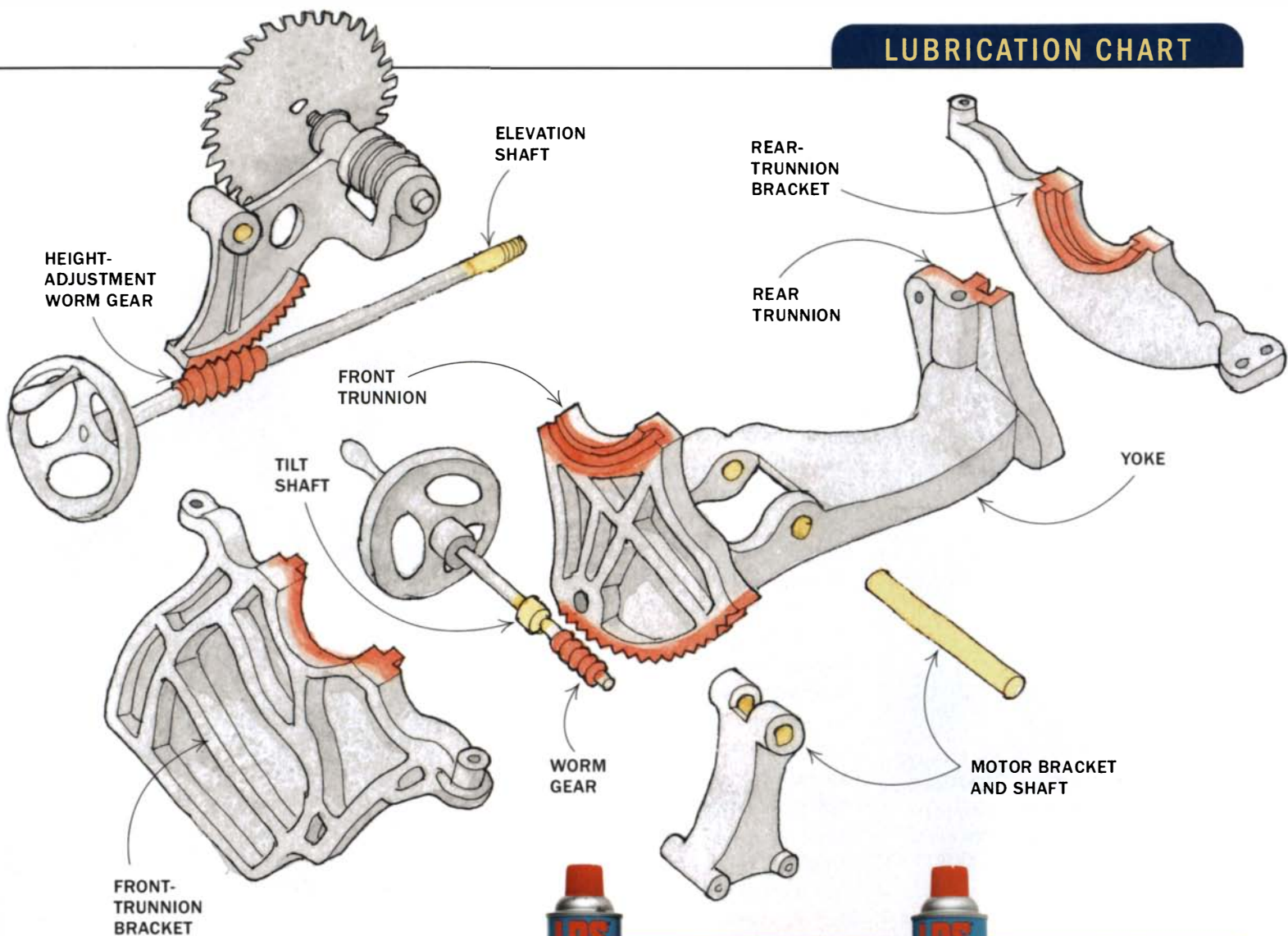


Remove loose sawdust. Two good vacuumings, with a blast of compressed air in between, should eliminate loose sawdust inside the cabinet. Clean the motor and/or fan thoroughly with compressed air to ensure cooling efficiency.

Contractor-saw tip

To get inside, remove the motor and—with a friend's help—turn the unit upside down on a low bench or short sawhorses. You also might need to remove a bottom panel, as on this saw.





Clean before lubricating



To help remove minor pitch buildup and rid the gears of old grease, use a quick-drying aerosol degreaser and scrub with a wire brush. Surfaces need to be clean and dry before lubricants can adhere well and do their work.



HEAVY-DUTY LUBRICANT

Orange indicates high-wear areas that require a heavy-duty lubricant.



On the worm gears and racks, use a molybdenum-based drying lube. The spray, which withstands heavy pressure, is dense enough to stay in place without running.



PENETRATING LUBRICANT

Yellow indicates hard-to-reach areas that require a penetrating lubricant.



Use a penetrating lubricant on hard-to-reach areas. For the worm-gear shafts on the arbor-pivot and -raising assemblies, Johnson uses a penetrating spray that dries quickly.

Check the arbor and bearings

Use a dial gauge with a magnetic base to check the arbor for runout—imperfections in the straightness of the shaft or the flatness of the blade-mounting flange connected to it. An arbor with excessive runout will cause the blade to wobble. This robs power, heats up the blade, and can increase the chance of kickback.

This check can be done before or after the top is removed, as long as there is a stable surface on which to mount the dial gauge. Start by tilting the arbor to 45°, which makes it easier to reach.

Take and compare several measurements from both the inner face of the arbor flange and from the nonthreaded portion of the arbor shaft. Turn the arbor to get readings from different points. There should be no variation at all in measurements taken from the shaft itself. Acceptable runout on the arbor flange is a maximum of 0.0015 in.



Check for runout. Set the pointer of the dial indicator perpendicular to the rim of the arbor flange. Rotate the flange to check for variations in flatness.

If the arbor shows runout, replacing it is the best option, but check the bearings first to make sure they're not causing the problem. It's a good idea to check them anyway.

With the belts removed, turn the arbor shaft by hand and listen to the bearings. The sound should be smooth and rolling, and the shaft should turn freely. If there is a dry or scraping sound, or even slight roughness in their operation, replace the bearings. Doing so is inexpensive and easy, and will greatly increase the life and performance of your saw.

You can order replacement bearings from the table saw manufacturer or check a local automotive-supply house or machine shop. Once you've removed the arbor assembly, all that's needed to remove the old bearings and install the new ones is an arbor press. Machine shops, electric-motor repair shops, and even most automotive-repair shops will have an arbor press and the expertise to use it.

To replace the arbor, check with the manufacturer for a new part. If the saw is out of production, search old-tool Web sites for a used or old-stock arbor. As an expensive last resort for a saw that's really worth saving, a machine shop could make a replacement arbor.



An old hot-rodder's trick. A long screwdriver, with the tip held firmly on the bearing housing, makes a good listening device for checking the condition of the bearings.

Check belts and pulley alignment



Align the pulleys. Use a length of drill rod or other straightedge to determine whether the motor and arbor pulleys are aligned with one another.

On most cabinet saws, three short belts transfer power from the motor to the arbor. Misalignment can make the belts drag on the pulley, robbing power, building up heat, and wearing out the belts. Replace worn or stiff belts as a matched set to ensure that all three share the load.

To check pulley alignment, I lay a straight-edge across the side of one pulley and check how squarely—if at all—it meets the surface of the other wheel. Make adjustments by first loosening the setscrews that hold the motor pulley to its shaft. Carefully pry the pulley away from the motor or use a deadblow hammer to tap it farther onto the shaft.

Use care: Excessive force could damage the motor's armature bearings. Once alignment is accurate, tighten the setscrews.

Contractor-saw tip

The pulleys on a contractor's saw are much farther apart, increasing the chance of unwanted vibration. On many older saws, performance can be improved by installing a high-quality segmented belt and a good pair of machined and balanced pulleys.



Align the miter slots with the blade

One common tablesaw problem happens when the blade is not running parallel to the miter slots. In such a situation, if the miter gauge is set to 0° for a 90° crosscut, the actual cut won't be accurate.

To check for parallel, I use a dial micrometer mounted on a modified miter gauge or hardwood runner in the left-hand miter slot. This is the time to retrieve that baseline measurement of the miter-slot distance that you made before removing the top. Adjust the table position to set the miter slot to that original measurement.

With the blade at full height, mark a tooth at the front. Measure from this tooth to the miter slot, then rotate the tooth to the back of the throat opening and measure again. Adjust the tabletop (or the trunnions on a contractor's saw) to bring the measurements in line. Repeat the parallel-checking process with the blade set at 45°, shimming the top or trunnions if needed. Then recheck for parallel at 90°. Sometimes this will take a few cycles before both positions are parallel. When you reach nirvana, tighten the bolts and recheck once more.



Adjusting the tabletop. A sandwich of plastic (plywood may be substituted) and steel, screwed to a wooden runner, creates a sliding platform for the micrometer's magnetic base (1). Use the micrometer to measure the distance from the miter slot to the front and rear of the blade (2). Measurements should differ by 0.005 in. or less. Snug the tabletop bolts, then use a dead-blow hammer to make minute adjustments to the top (3).

finewoodworking.com

Visit our Web site to see the author adjust a saw for perfect rips and crosscuts.

Level the tabletop

If the blade is parallel to the miter slot at 90° but not at 45°, it means the table is out of level from front to back. Shim the top (or the trunnions on a contractor's saw) to compensate. I use automotive alignment shims and brass sheet stock. I buy 1/64-in. and 1/32-in. alignment shims and sheets of 0.005-in., 0.010-in., and 0.015-in. brass for a combination that results in very accurate adjustments.



Check again for parallel. After bringing the miter-gauge slot parallel with the blade, tilt the blade to 45° and repeat the process.



Level the wings and throat plate

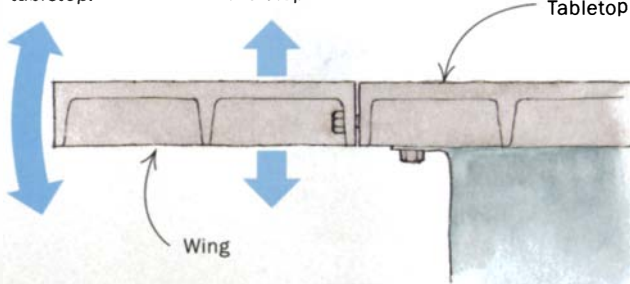
Feeding lumber over the saw is easier and safer when the throat plate and extension wings (and extension table) are flush to the saw table. Lifting a hung-up board to clear the tabletop can cause a jam, possibly resulting in a ruined cut or dangerous kickback.

Some throat plates can be raised or lowered with setscrews, so a straight-edge and Allen wrench are all you need to align the surfaces. A homemade plate can be shimmed with masking tape or trimmed flush with a block plane, if needed.

To adjust an extension wing or table, very slightly loosen the mounting bolts and tap the surfaces flush with a deadblow hammer. Check with a straightedge, tighten the bolts, and check again to make sure everything stayed put.

Shim the wing parallel to the tabletop.

Adjust the wing flush to the tabletop.



Level the wings.

Use a straightedge to check whether the extension wings are flush and parallel with the top (above). If necessary, shim the wing with brass sheet stock (right) until it is parallel with the tabletop.



Clean and coat the tabletop

After all the mechanical components are operating in harmony, it's a good idea to dress the tabletop. Start with a thorough cleaning, using a spray solvent. Then polish with a fine-grit Scotch-Brite nylon pad or 600-grit sandpaper mounted on a wood block. Finish with a coat of nonsilicone wax or one of the topcoatings designed specifically for this purpose. I use Bostik TopCote, applying a couple of coats. I apply another coat whenever I notice the wood starting to drag as I feed it over the table.



PROBLEM: INACCURATE BLADE ANGLES

Adjust the 45° and 90° stops

Virtually all tablesaws have adjustable devices that stop the arbor assembly when the blade is perpendicular to the table and when it's tilted at 45°. Most often these devices consist of a bolt and locknut mounted on the arbor-carriage assembly.

On the saw table we tuned up, the stop bolts are mounted on the front-trunnion assembly. The 45° tilt can be accessed through the slot on the front of the cabinet that is for the blade-lift crank handle. The 90° stop can be reached through the motor opening in the side of the cabinet.

To adjust the stops, set the blade to the desired angle, loosen the locknut, and then retighten it after repositioning the stop bolt. I use a plastic 45° drafting triangle to set the tilt angle and a 6-in. sliding square to set the 90° stop. Always recheck after tightening the locknut to make sure the adjustment stayed accurate.



Setting the blade upright.
The 90° stop is usually easy to reach. Simply loosen the stop bolt and use a square to set the blade to exactly 90°. Then turn the stop bolt snug to the stop, and tighten the locknut on the stop bolt.



Getting properly inclined.
The 45° stop bolt on many saws can't be reached when the arbor is tilted all the way to 45°, so setting it takes some finagling. Loosen the bolt so that the blade stops before 45°. Then tighten it a little, and check the angle with a drafting triangle. Repeat the procedure until you find the exact setting for 45°.



Contractor-saw tip

Some contractor's saws allow adjustment via setscrews on the saw's top. Most saws, however, require you to reach in from underneath (right) to access the stops.



PROBLEM: BURN MARKS WHILE RIPPING

Adjust the rip fence parallel to the blade

One of the last adjustments I perform is to set the rip fence parallel with the miter slot and thus parallel with the blade. Some woodworkers angle the fence a few degrees away from the back of the blade to help avoid binding. I like to keep things parallel and rely on a well-tuned saw and stable, well-dried lumber to keep me out of trouble.

The sides of the fence also should be checked with a reliable square for an accurate 90° to the tabletop. Some fences don't have an easy means of adjustment. One solution is to attach a supplemental wood fence that is beveled or shimmed square to the saw table.

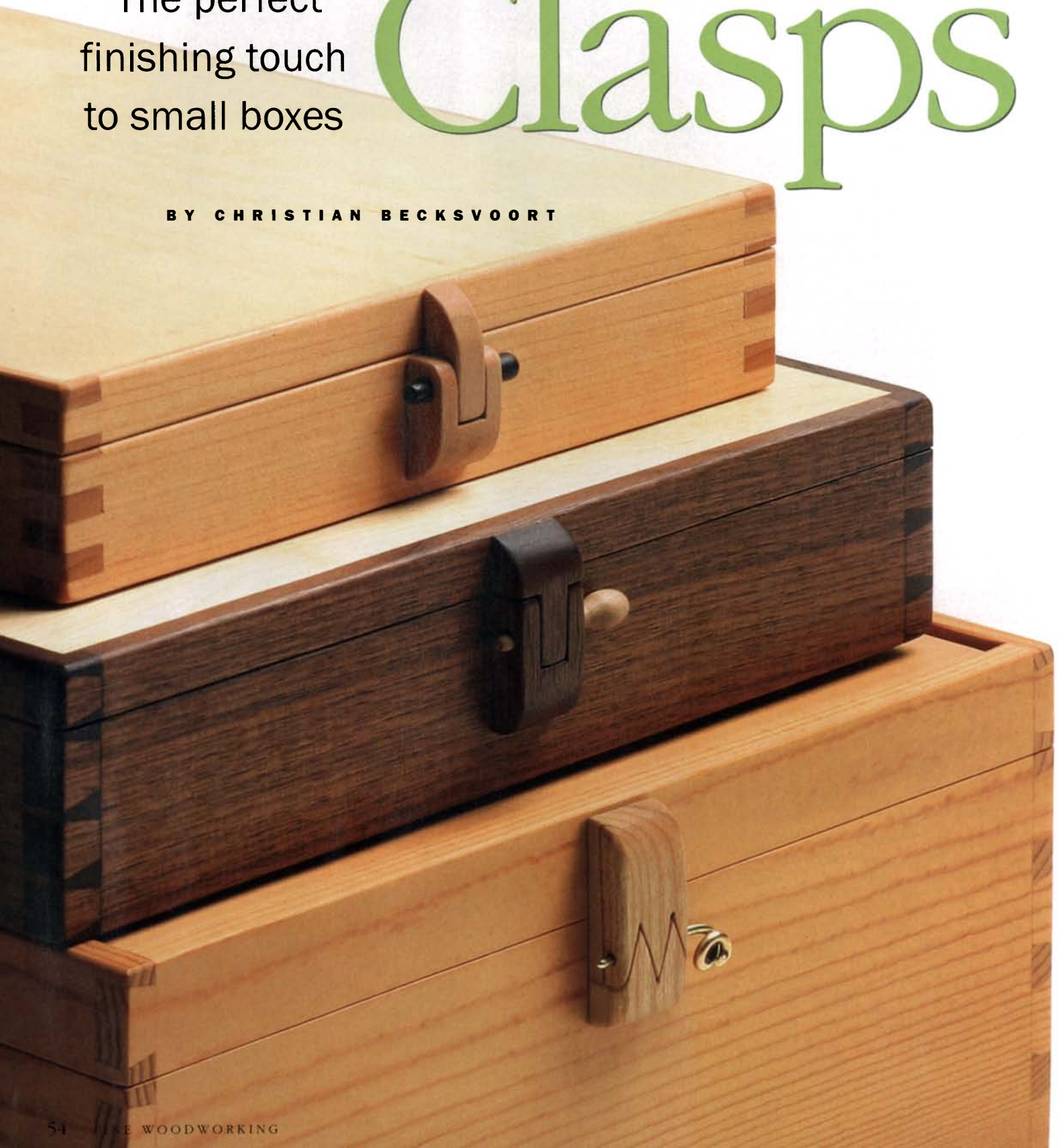


Custom-made

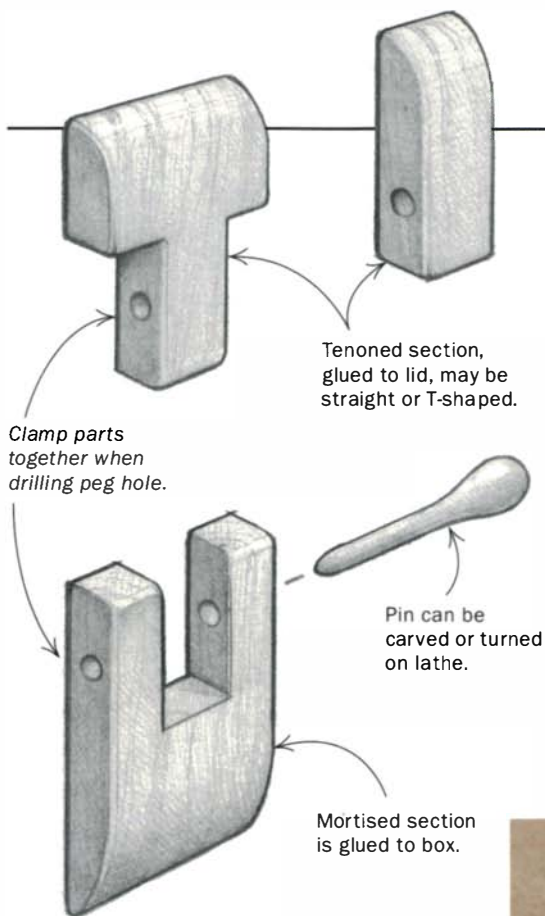
The perfect
finishing touch
to small boxes

Clasps

BY CHRISTIAN BECKSVOORT



Single-prong clasps



1 **Cut the mortised piece first.** Using a block of wood clamped to a miter gauge and the tablesaw fence to support the workpiece, cut the open mortise.



2 **Mark and cut the tenon.** Stack the mortised piece on top of the tenon blank, aligning the edges of both pieces. Use a knife to get accurate marks for the tenon (left). Cut the tenon on the tablesaw (right). Adjust the fit as necessary with a chisel and cut both pieces to length.



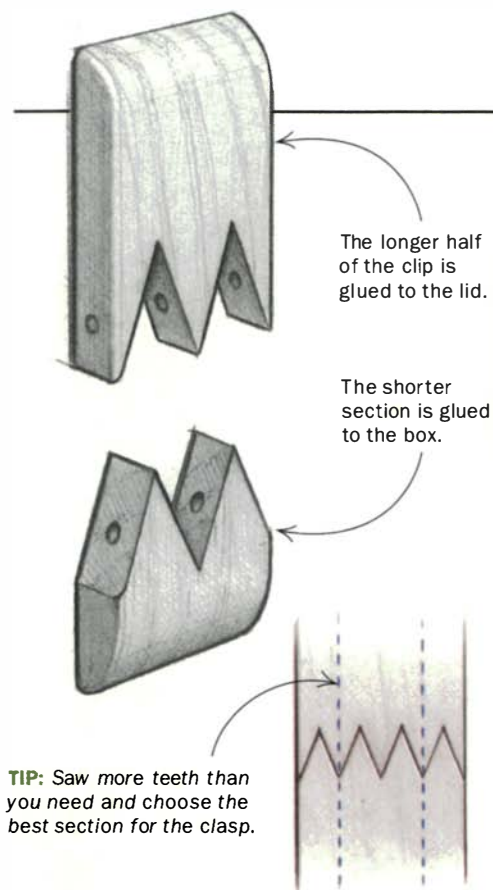
3 **Drill both pieces at once.** Clamp the mating pieces together and use a drill press to bore a hole for the pin.

After spending hours building a dovetailed box, you need a clasp for the finishing touch. A search through your hardware catalogs turns up nothing distinctive. Why not create your own clasp of matching or contrasting wood, with a hand-turned pin? They're easy to make, in whatever wood and size you choose.

The wooden clasps I often make are nothing more than locking finger joints. Start by selecting your wood. I've found that tight-grained woods such as cherry, maple, hornbeam, dogwood, or apple work best. After choosing the wood, decide what size to make the clasp. Remember to keep it in proportion to the box size. For jewelry, keepsake, or presentation boxes, the smaller the better. Most of the clasps I've made have been between 1/4 in. and 3/8 in. thick. For larger, wall-mounted cabinets, you could use 1/2-in. or even 3/4-in. stock. It may help to experiment first with a scrap of pine or some cardboard to see what looks right.

With a little creativity, a simple clasp can take on a variety of appearances. The single-prong clasp, a simple tenon into an open mortise, is the fastest and easiest to

Multiple-prong clasps



1

Mark wider stock than you will need for the finished pieces. Use a bevel gauge to mark a row of triangular teeth, and then cut the teeth with a dovetail saw.



2

Mark the matching teeth. Use the first section as a template for the second, cutting several more teeth than you'll need in the finished clasp.



3

Complete the clasp.

Choose the best-fitting teeth and rip both pieces to width on the tablesaw (top). Then clamp the mating pieces together and use a drill press to bore a hole for the pin (left).

make, but with a little more time and effort, you can customize the design. With a dovetail saw, you can cut triangular teeth that fit together like a finger joint.

Cut the joints in larger pieces

Start by milling the stock to the appropriate thickness. Leave plenty of extra width and length so that you'll have something to hold onto while machining the workpieces. For example, I often start by milling a couple of pieces $\frac{5}{16}$ in. thick by 2 in. wide by 6 in. long.

For simple single-prong clasps, I use the tablesaw to cut the open mortise and the tenon pieces. I cut the open mortise first. Then I butt the second piece against the one just cut, making sure they are flush side to side, and mark the location of the matching tenon with a sharp knife. I use the knife marks to cut the tenon piece. To get a good, tight fit and clean up the table-sawn surfaces, it's sometimes necessary to shave the mating surfaces with a chisel.

For clasps with triangular teeth, use a dovetail saw to cut two pieces of stock into mating rows of teeth, making sure that



Turning small pins

You can turn a variety of pin profiles on the lathe. First turn a piece of stock between centers to make a spindle. Then use a drill chuck to complete the profile.



Taper one end.
Chuck a piece of stock in the lathe and create a gentle taper.

USE YOUR IMAGINATION WHEN DESIGNING THE PIN. IT CAN BE ANYTHING FROM A CARVED TWIG TO TURNED EBONY.

you've cut several more teeth than you'll need in the finished clasp. Then choose the best-fitting ones and rip the parts to their final width.

After you've cut all the parts to size, clamp the two pieces together, and use a drill press to bore a hole for the dowel or the wire pin that holds the two pieces in place when the box lid is closed. Round over sharp edges with rasps, files, or sandpaper.

Glue the top portion of the clasp to the lid of the already assembled box, and the bottom portion to the case. Check for glue squeeze-out between the pieces, or they may end up accidentally glued together.

Use your imagination when designing the pin. It can be anything from a carved twig to turned ebony. I've also used brass brazing rod or stainless-steel bolts, whose threads may be filed off. □

Christian Becksvoort is a contributing editor to Fine Woodworking and the author of The Shaker Legacy (The Taunton Press, 2000).



Round the other. Reverse the workpiece in the chuck and turn the larger end to a rounded shape.



Complete the pin. Fine sandpaper applied to the spinning pin gives it a smooth surface.

Shop Drafting Table

Wall-mounted unit is sturdy, adjustable, and folds away flat

BY DWAYNE INTVELD

SIT OR STAND

Intveld's table is designed to be used when either sitting or standing. The table folds flat against a wall, taking up virtually no space while allowing the drawing to be referenced at any time during the construction of a project.



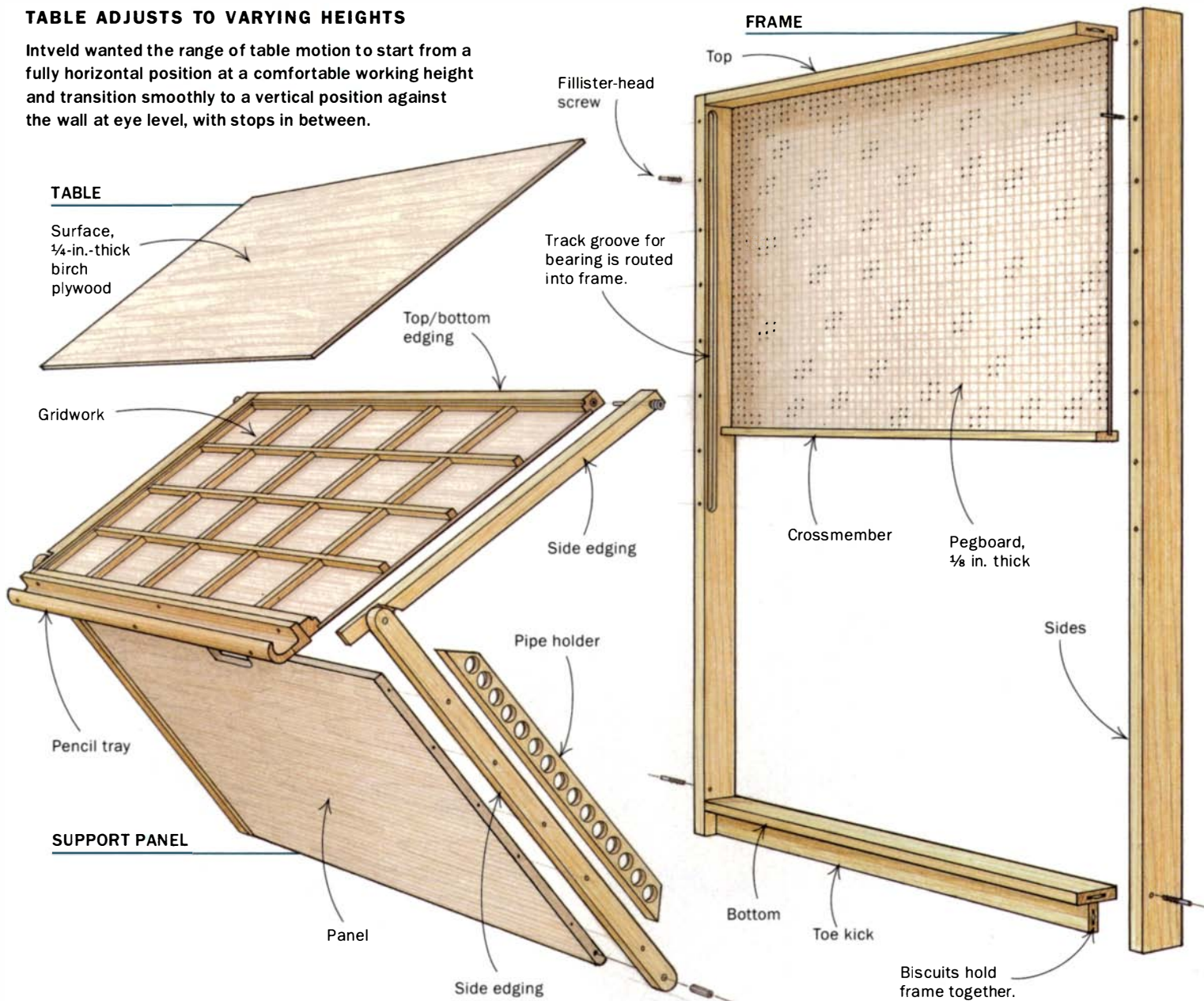
For a long time, my “drafting table” was a small sink cutout propped at an angle on my workbench. It worked okay, but it was far from ideal. So a couple of years ago, I decided to make a convenient and functional table.

The tabletop is hinged to a lower panel, and both parts fit into a surrounding frame. Two pairs of bearings at the top of the table roll in a groove routed inside the frame, permitting me to adjust the table to eight different working positions, depending on whether I want to sit or stand, or how my back is feeling that day.

For smooth operation, the groove should be about $\frac{1}{32}$ in. wider than the diameter of the bearings. I used two light-duty bearings

TABLE ADJUSTS TO VARYING HEIGHTS

Intveld wanted the range of table motion to start from a fully horizontal position at a comfortable working height and transition smoothly to a vertical position against the wall at eye level, with stops in between.



(available from Reid; 800-253-0421) with an inside diameter of $\frac{1}{4}$ in. and an outside diameter of $\frac{3}{4}$ in. Although I chose maple for the frame, you can use any reasonably dense hardwood, mainly so the bearings that ride in the track have a hard surface to bear against.

Drill $\frac{1}{4}$ -in.-dia. cross-holes through the routed groove at 6-in. intervals. Drilling these holes before routing helps prevent chipout from breaking into the groove. Two small fillister-head screws slipped into a pair of these holes act as pegs for the bearings to rest on and establish the position of the drawing table. A cupboard-door catch mounted on the crossmember holds the table in its vertical stored position.

For quick assembly, use a biscuit joiner

on all of the joints in the frame. Then rout a groove in the back of the frame to accept the $\frac{1}{8}$ -in.-thick pegboard panel. Finally, apply a water-based polyurethane finish to protect all exposed wood parts.

Table is light but rigid

The table is made using torsion-box construction. Using half-lap joints, glue together a $\frac{3}{4}$ -in.-thick pine grid and sandwich it between two $\frac{1}{4}$ -in.-thick birch-plywood panels with the edges trimmed in maple. This construction, though only $1\frac{1}{4}$ in. thick, keeps the table flat and light yet rigid and resistant to twisting. The bearings are attached to each upper corner of the table with $\frac{1}{4}$ -in. bolts. The bolts thread first

into nuts epoxied into the table, and then into blind holes drilled and tapped into the table's maple trim.

Mount a pencil tray to the bottom of the table. I shaped the bottom of this tray to capture pencils, erasers, and rules, whether the table is in a horizontal or vertical position. A vinyl drawing-board cover, clamped along the edge of the top, provides an optimum drawing surface. Although I installed a commercial parallel rule that keeps all horizontally drawn lines parallel automatically, a T-square would function fine.

The lower panel consists of a $\frac{3}{4}$ -in.-thick maple-plywood sheet with maple edging screwed on each side. Lengths of $1\frac{1}{2}$ -in.-dia.

Make a drafting table for the shop

plastic pipe store rolled-up drawings behind the lower panel. The PVC pipe sections are held in counterbored holes in three brackets screwed to the back of the lower panel. There is space behind the panel for mailing tubes that store large batches of drawings.

All four pivot points that hinge the table and support panel are made with threaded-rod connectors and T-nuts. Drill the holes $\frac{1}{32}$ in. smaller than the $\frac{5}{16}$ -in. threaded-rod connector bodies, and press and epoxy the connectors into these holes. After the $\frac{5}{16}$ -in. T-nuts are recessed and epoxied into the mating piece, drill out the threads to provide a smooth bearing for the pivots. The pivots themselves are $\frac{5}{16}$ -in. bolts with the hex heads cut off and screwdriver slots hacksawed in the end.

Putting it all together

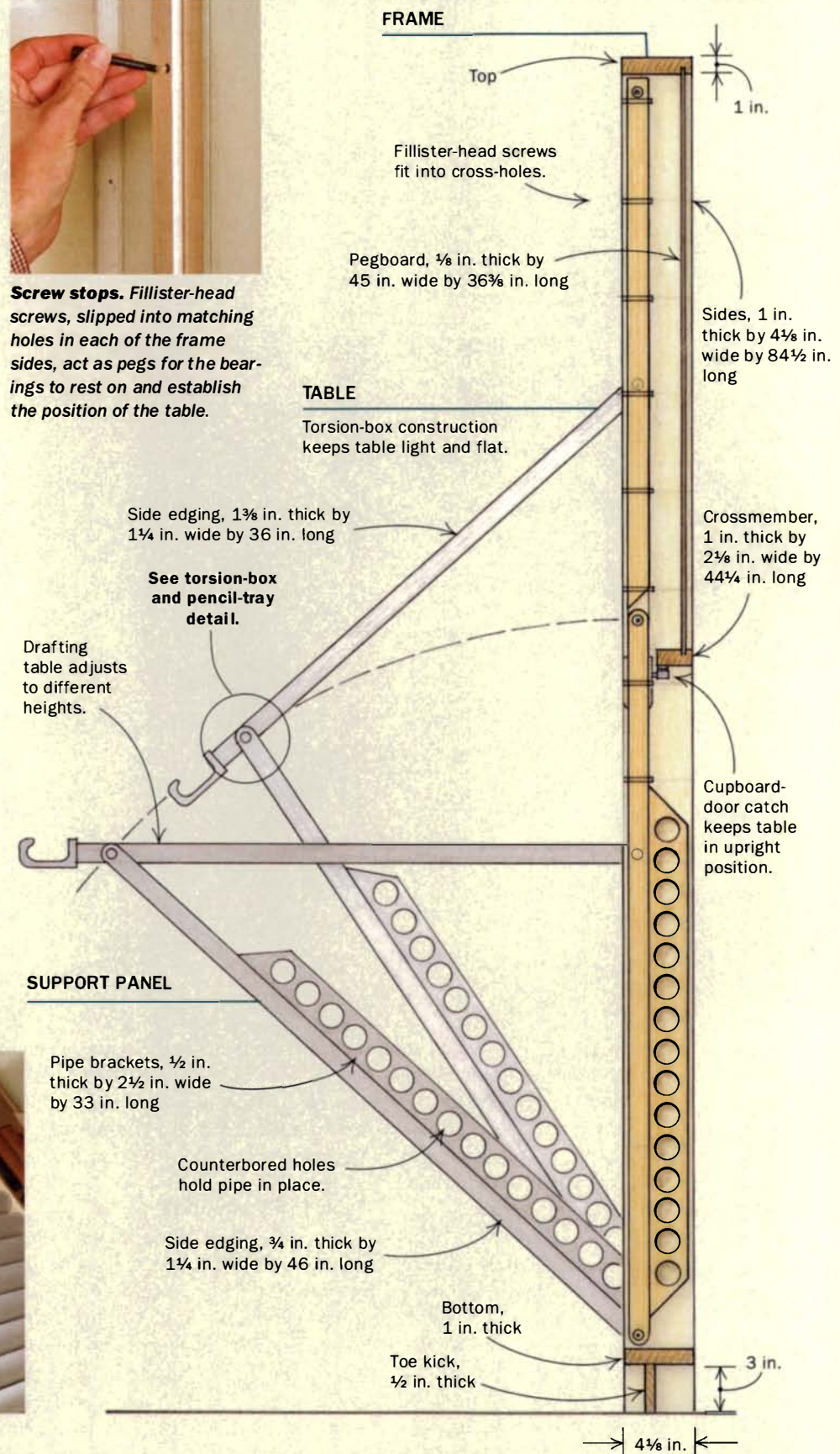
Position the frame against the wall and secure it in place by driving two screws through the center crossmember into the wall studs. Then, with the table positioned horizontally, slip one of the bearings into its track and tip the other end of the table down slightly to engage the opposite bearing. With the table rotated up to a vertical position and lifted to the top of the track, insert two pegs into the top holes to hold the table in its top position.

Next, put the lower panel in place, inserting two pivot screws through the frame sides into the threaded-rod connectors in the bottom of the lower panel. Swing the lower panel up to mate with the drawing table, and install the last pivot screws. □

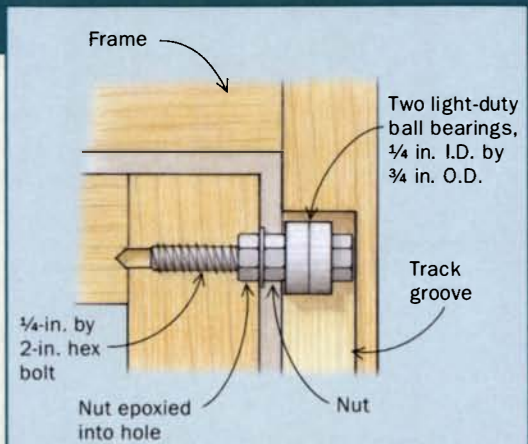
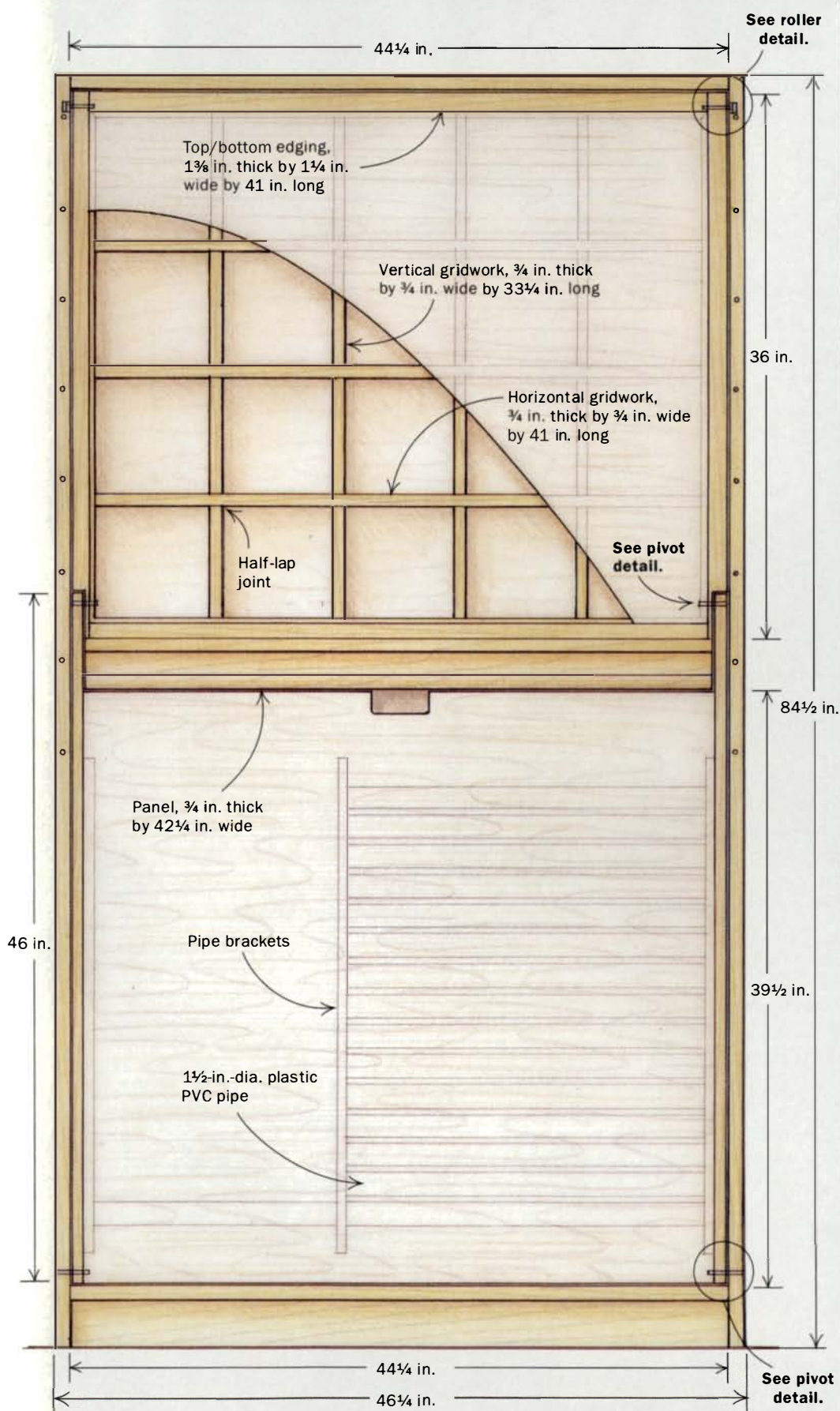
Dwayne Intveld builds custom furniture and cabinets in Hazel Green, Wis.



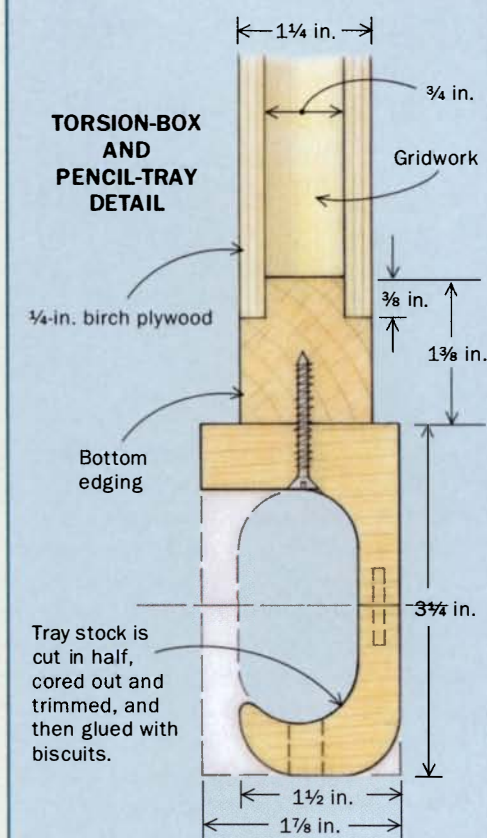
Screw stops. Fillister-head screws, slipped into matching holes in each of the frame sides, act as pegs for the bearings to rest on and establish the position of the table.



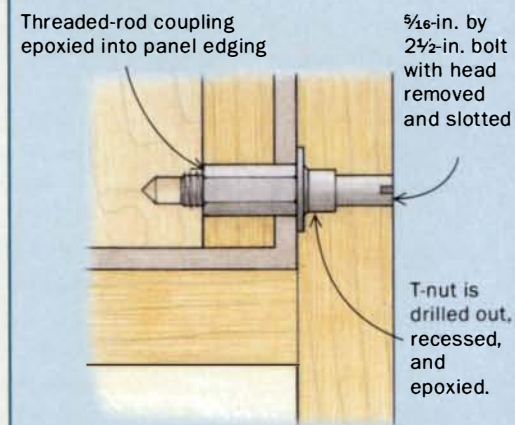
A place to store finished drawings. Completed drawings can be rolled up and stored in PVC tubes mounted behind the support panel.



ROLLER DETAIL



TORSION-BOX AND PENCIL-TRAY DETAIL



PIVOT DETAIL

Built-ins

That Blend In

Design kitchens
that complement older
homes without being
a slave to tradition

BY NANCY HILLER

As a designer of cabinetry for period-style kitchens, I specialize in work for clients with homes built in the late 19th and early to mid-20th centuries. People come to me not for strict reproductions, but because they want their kitchen or other cabinetry to fit harmoniously into an older home. Whether I'm adding to existing cabinetry or designing a kitchen from scratch, it pays to follow some basic guidelines. Although the cabinets shown on these pages were built for 19th- and 20th-century homes, the same principles can be applied to other periods.

When designing cabinetry for an older home, familiarize yourself with the house and its architectural details. Ask yourself: When was the house built? What is the architectural style? How are period elements expressed in the original doors, trim, and built-in cabinets? You may be adding to the original cabinetry rather than replacing cabinets added at a later time, so the trick is to tie in the new with the old. Clients often ask me to design cabinets that will look like the rest of their kitchen but will function more practically.

Consider raising the height of the counters

Old kitchens have counters that would be considered backbreakingly low by contemporary standards—usually 32 in. above the finished floor. While this may be fine for kneading bread dough or rolling pastry, it's terribly uncomfortable for most of us, when washing dishes and preparing food. Even if you leave existing base cabinets at their original height (and sometimes





Arts and Crafts style

The author designed new cabinets with straightforward-looking details and proportions to match the existing details of this early 20th-century Arts and Crafts style kitchen.

DESIGN DETAILS

CASES

Hiller's design uses traditional face-frame construction, with stiles extending to the floor at the end of each cabinet run, and recessed kicks (painted black) in between these ends.

DOORS

Simple frame-and-panel construction, inset in face frames.

DRAWERS

Faces are plain and inset.

COUNTERTOP

The author used unglazed mosaic tile for this kitchen. Other period-appropriate choices would include genuine linoleum with aluminum edges, wood, or stone.

WOOD/FINISH TYPE

Faces are solid poplar, painted with oil-based enamel.

HARDWARE

Surface-mounted, pressed-metal hinges for doors; simple, chrome-plated knobs.

DETAILS

Upper cabinets extend to ceiling with glass panels in upper doors.



Some face-frame stiles extend to the floor. The kick space on the cabinets looks open, but there is another kick slightly recessed, painted black, which prevents debris from collecting underneath.



Salvaged hardware is a close match. Hiller searched local antiques shops to find hinges and pulls that matched existing hardware in the house (top). The hinges she found (bottom) are not an exact match, but they're close.

they are well worth preserving, restoring their tiled or linoleum countertops as needed), consider making new base cabinets with today's standard height of 36 in. or even 38 in. Although it may sound tall, a 38-in.-high countertop feels great for many kitchen tasks.

The upper cabinets in most old kitchens were built right up to the ceiling, not stopped a foot short as often is the case today. This applies as well to rooms with 10-ft. ceilings as to those with ceilings at 8 ft., and it's a great way to maximize storage space. So what if you can't reach up there without a ladder? Tall upper cabinets are wonderful for storing rarely used items such as punch bowls and holiday-ware that might otherwise be consigned to the basement. Particularly in a small kitchen, the extra cubic feet of usable space gained by going to the ceiling can make the difference between a room that works and one that has inadequate cabinet storage.

Study details in face frames, doors, and drawers

One of the most effective ways to get an authentic period look is by attending to the proportions of the original cabinets. Vintage cabinets display enormous variety in such details, and if you rely on a standardized dimension for your rail and stile widths, your cabinets simply will not look authentic. When adding to existing cabinetry, I pay close attention to the widths of frame stock in the original work. Note whether the bottom rail is wider than the top, and subtle details such as bevels on the inside edges of door frames.

Sometimes, when space is tight, it is impractical to use face frame or door stock as wide as the original. In such cases, you may wish to scale down these members proportionately so that you can at least come close to the authentic feel of the original work.

Note also whether the doors are inset or half-overlay. If the latter, note whether the door's outer edge is square, rounded, or shaped in some other way. On many Shaker cabinets, for example, this edge is rounded. Does the face frame have a bead, or is there cock-beading around the outside frame of the door? Is the inside edge of the door frame clean and square, or shaped into a quarter-round (as in some 1930s kitchens)? Are the door panels flat or raised? Pay attention to the same kinds of detail when designing drawer faces.

For several decades it has been conventional to recess fully and conspicuously the area at the base of kitchen cabinets to provide toe space. However, no matter how strictly you apply every other guideline, using fully recessed kicks will betray the period look. If you want your cabinets to look authentic to a period predating the middle of the 20th century, stay away from fully recessed kicks.

There are three main styles of kick



Graduated drawer fronts. To mimic the Shaker style, the author designed the drawer fronts so they get narrower near the top. Note that the top two faces are really one drawer, built to a more useful size for a modern kitchen.



Shaker style

The Shaker style has been aptly described as timeless, and it fits harmoniously into just about any home, such as this classic Cape. In this kitchen, the author used Shaker details such as flat panel doors, simple hardware, and maple countertops to blend in with the architecture.

DESIGN DETAILS

CASES AND MOLDINGS

Hiller's cabinets have traditional face-frame construction that extends to the floor, creating a flush, not recessed, toe kick. Molding profiles are drawn from examples of Shaker furniture.

DOORS

Frame-and-panel construction, inset in face-frame openings. Inside edges of door frames have thumbnail profile.

DRAWERS

Faces are half overlay with a handplaned roundover. Note the graduated drawer fronts.

COUNTERTOP

Solid maple planks, not butcher-block, glued up in tabletop fashion. Bullnose edge, with cherry quarter-round detail below.

WOOD/FINISH TYPE

Cherry or maple with oil-based polyurethane finish.

HARDWARE

Simple butt hinges. Shaker-style knobs are painted with oil-based black enamel.

DETAILS

Peg rack below upper cabinets. Open plate racks above stove.



Upper storage spaces, open and closed. The cabinet above the stove was made deeper than the cabinets on either side to accommodate a range hood. The author added a plate rack for storing large dinner plates.



Molding details—keep it simple. The maple countertop is shaped with a bull-nose. Underneath that is a simple cherry cove molding.

spaces in older cabinetry. Flush kicks are simply an extension of the cabinet's face frame down to the floor. Although flush kicks take getting used to, they are one of the most convincing details you can incorporate into a kitchen, when appropriate, to make it look period-authentic. A variation on the flush kick sometimes used for sink cabinets or Hoosier-type built-ins features a cutout curve. Many kitchens from the 1930s have toe space along the main run of cabinetry, usually painted black, but with the face-frame stiles at the ends of each run extending down to the floor. In cabinetry designed for a more formal, furniture-like appearance, it may be more appropriate to use a full plinth.

Kitchen woodwork needs a durable finish

Many early 20th-century kitchens had painted woodwork and cabinets. If you plan to paint your cabinets, consider using an oil-based enamel, rather than water-based, applied either by brush or spray. Milk paint is an alternative, particularly appropriate if you're going for an authentic Shaker look. One disadvantage with painted woodwork, especially lighter colors, is that it tends to show dirt and grease stains.

On the other hand, you may wish to disguise dirt and signs of wear by using the figure of your chosen wood to distract the eye. Some early 20th-century kitchen cabinets were made of fir and finished with shellac. You can come very close to this look by using amber-colored shellac in the finishing process. I often use a coat of shellac over dye and pigment stain to impart a wonderfully aged look to new wood. After scuff-sanding the shellac, I apply two or three coats of oil-based polyurethane, which is more durable.

For those who want to get deeper into kitchen design, two resources are *Bungalow Kitchens* by Jane Powell (Gibbs Smith, 2000) and *The Elements of Style* by Stephen Calloway et al (Mitchell Beazley, 1996). □

Nancy Hiller designs and builds cabinets and furniture in her shop in Bloomington, Ind.

HARDWARE SOURCES

Acorn Manufacturing

www.acornmfg.com
800-835-0121

Ball and Ball Hardware

www.ballandball-us.com
610-363-7330

Craftsmen Hardware

www.craftsmenhardware.com
660-376-2481

Crown City Hardware

www.crowncityhardware.com
626-794-0234

Horton Brasses

www.horton-brasses.com
800-754-9127

McCoy Millwork

www.mccoymillwork.com
888-236-0995

Rejuvenation

www.rejuvenation.com
888-401-1900

Van Dyke's Restorers

www.vandykes.com
800-787-3355

Whitechapel Hardware

www.whitechapel-ltd.com
800-468-5534



Victorian style

Victorian houses, built in the 19th century, are notable for their embellishments, inside and out. In this home, the author designed a butler's pantry in a small hallway that connects the kitchen to the dining room. Her cabinetry takes some of its inspiration from the client's collection of antiques, and mirrors the profuse detail found in the existing home's cornice moldings, baseboards, stairway, and door and window casings.



DESIGN DETAILS

CASES AND MOLDINGS

Hiller's cases are of kitchen-cabinet construction, with face frames in quartersawn white oak. Flat bracket feet and wide crown molding at the ceiling complete the design.

DOORS

Frame-and-panel construction with raised panels, inset in face frames.

DRAWERS

Inset, without any edge treatments.

COUNTERTOP

Marble with oak edge.

WOOD/FINISH TYPE

Quartersawn white oak, dyed, stained, brushed with one coat of amber shellac, and finished with oil-based polyurethane.

HARDWARE

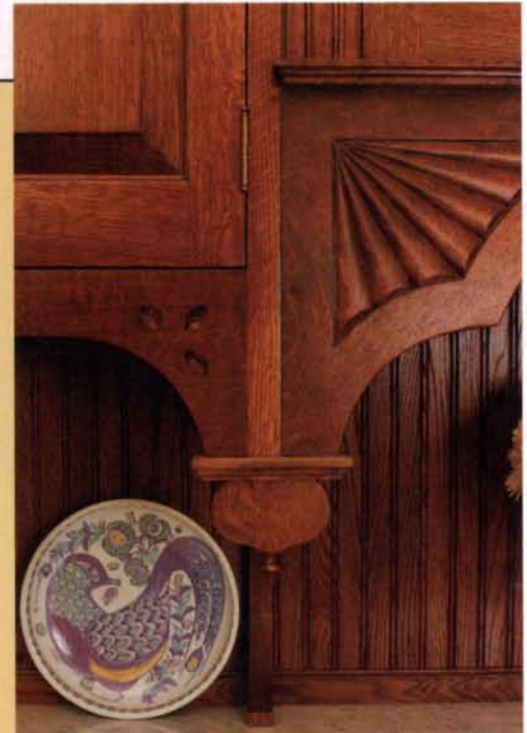
Ball-tip butt hinges. Teardrop pulls match those on an original Victorian sideboard in the house.

DETAILS

Moorish arches, chip-carved "almonds," turned pomegranate finials, carved sunbursts and peacock all express the architectural style of this particular house.



Why the peacock? This carved peacock, flanked by tail feathers, appears on the top center panel in the frieze of the new butler's pantry. It was inspired by the clients' antique stuffed peacock.



Take some details from the house. Hiller used several details from this stairway (left) in the design of the butler's pantry. The turned teardrop shape on the bottom of the landing newel post, the Moorish arches in the balusters, and some of the molding shapes appear as design features in the new cabinetry (above).



Cut Matching Curves

Router templates ensure a perfect fit between panels and solid-wood edging

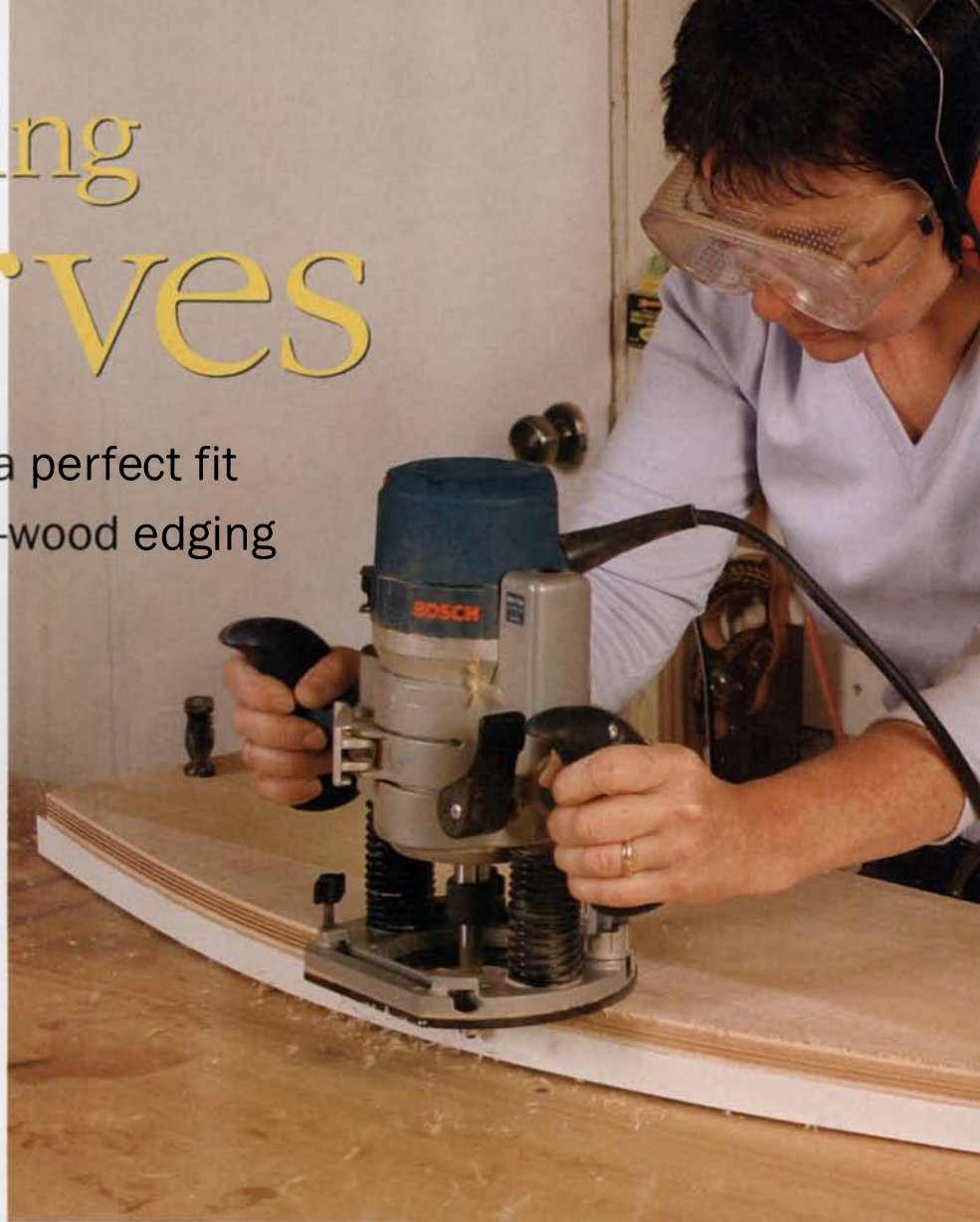
BY CAROL KOEBBEMAN

Designing a table with a veneered plywood center and a solid-wood border, I was confronted with the dilemma of matching the curves on the plywood and the border.

Like all the best solutions, this one came to me in the early hours of the morning: In the same way a thin strip of wood can be bent to a desired arc, I realized I could use a pair of strips to make matching templates, one to shape the plywood center and the second to shape the solid-wood edge. The solution lay in how to stiffen these thin strips to withstand the force of a bearing-guided router bit.

The first template begins on the bandsaw

Begin by cutting a pair of template edge strips out of 1/4-in.-thick plastic-coated medium-density fiberboard (MDF) or Masonite, which gives a smooth surface for the bearing to ride against. I



Make the convex template



A perfect match.

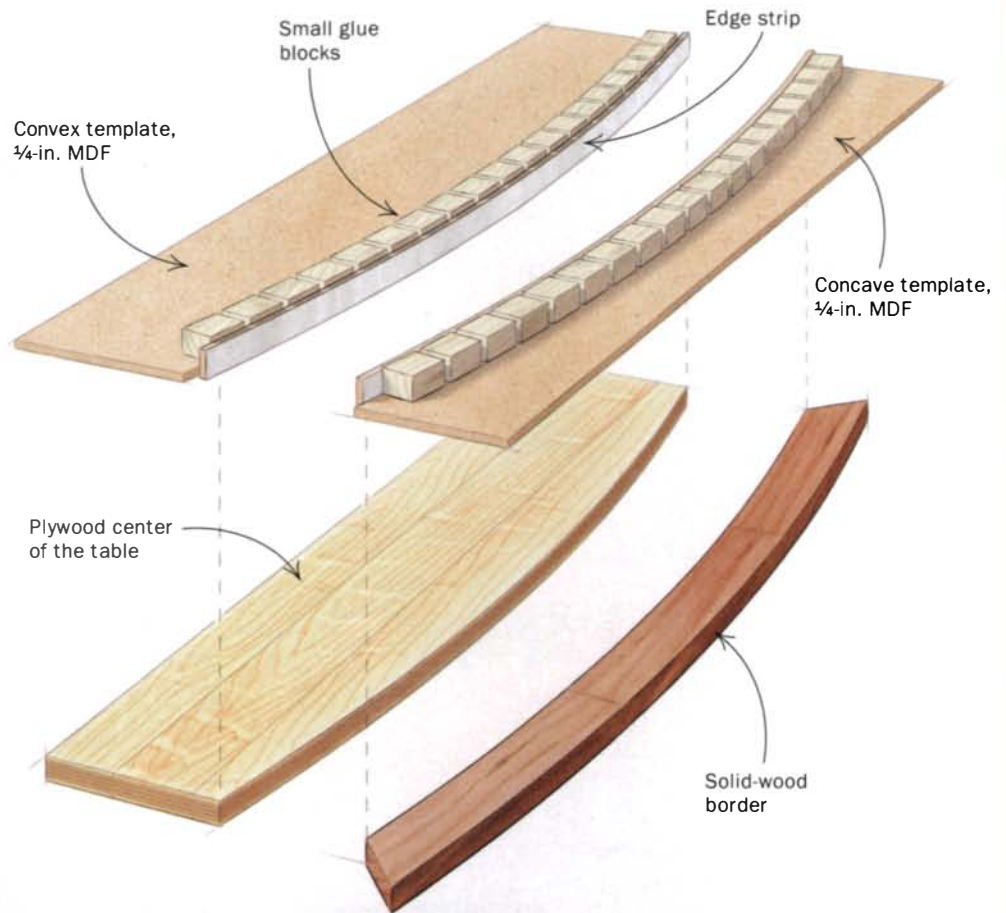
The author solved the problem of how to cut matching curves on the veneered panels of the table and the solid-wood edging.



Bandsaw the two bases. Don't worry about cutting a perfectly smooth curve on the bandsaw (left). Use hot-melt glue to attach wooden blocks to the center and each end of the base. Let the blocks slightly overhang the edge of the base (above).

A PAIR OF TEMPLATES LETS YOU MAKE PERFECTLY MATED PROFILES

Even in the unlikely event that you were able to saw a perfect curve, the width of the sawkerf would prevent you from using the resulting pieces to create perfectly matching concave and convex profiles. To overcome this problem, the author invented a pair of matching templates.



Form the curve. Clamp an edge strip to the three blocks to form a smooth curve.



Use more blocks to stiffen the template. Glue more blocks to the base and the back of the strip. Take care not to alter the curve.



Make the concave template



Create the matching profile. Thoroughly clamp the strip that forms the face of the second template to the first one (left). Slide in the second base until it almost touches the back of the second strip. Attach blocks to the base and the strip using hot-melt glue (above).

made them $\frac{3}{4}$ in. wide, a few inches longer than the curve. For larger, shallow curves, you may need $\frac{3}{8}$ -in.-wide material.

Bend one of the strips to the desired curve and temporarily clamp it to a base of $\frac{1}{4}$ -in.-thick MDF, plywood, or Masonite. The base should be the same length as the strips and slightly wider than the depth of the curve. Mark the curve on the base, remove the clamps, and cut the curve on the bandsaw. There is no need to follow the line perfectly. You now have two bases whose curves roughly match the concave and convex curves on the tabletop.

Place one of the bases on your bench and attach a small block of wood to the center and to each end of the curve using hot-melt glue. The blocks must stand slightly proud of the edge to ensure that irregularities in the bandsawn cut don't interfere with the final curve. Bend one of the strips and clamp it to each of the blocks with the smooth edge facing outward to produce a curved edge. Reinforce this strip by gluing more blocks at about $\frac{1}{4}$ -in. intervals

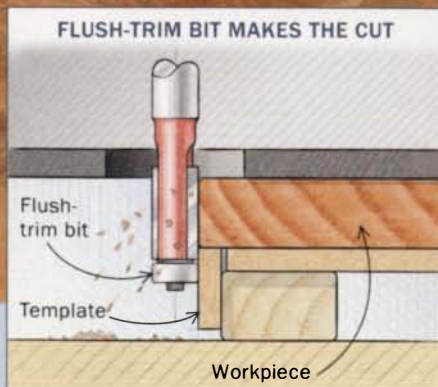
USE THE TEMPLATES FOR LAYOUT AND SHAPING



First, use the templates as a layout tool. With the concave template face down, use it to trace the curve on the solid-wood table edging (left). It is important that the template doesn't move when in use, so after roughing out the curve on the bandsaw, screw the template to waste areas of the workpiece (above).

finewoodworking.com

Visit our Web site to see the author making and using the templates.



Trim the edging. Use the concave template to rout the finished curve on the inside of the table edging.

along its length, taking care not to alter the curve. Finally, remove the clamps and glue the strip to the end blocks.

Use the first template to form a second

The secret to matching curves begins by clamping the second $\frac{3}{4}$ -in.-wide strip to the face of the first template. Make sure you use plenty of clamps to ensure there are no gaps between the strips. Slide the matching base in until it is almost touching the second strip, then repeat the process of gluing blocks to hold this second strip to the second base, gradually replacing the clamps with blocks.

When you are done, flip both templates over. Each should have a graceful curve that matches the other perfectly. If not, fiddle with the fit until no gaps exist.

Use the templates twice for each curve

The first step is to use each template as a layout tool. Use the bandsaw to cut away most of the waste, staying proud of the layout line. Then clamp the workpiece on top of the matching template and use it to guide the bottom-bearing router bit around the curve. Go slowly to ensure a clean cut. If you make a mistake and gouge the workpiece, unclamp the workpiece, slide it slightly forward, and re-cut the profile.

It may be difficult to clamp the concave template to the narrow solid-wood border. If so, screw the template onto parts of the border that will be cut away later.

When finished, you will have two parts whose curves join perfectly. □

Carol Koebbeman lives in Sacramento, Calif.



A perfect match. Using the two templates will shape pieces that match flawlessly over their entire length.



Choosing Door Hinges

Hardware is not an afterthought,
but an important design decision

BY ROBERT J. SETTICH

Building fine furniture and cabinets is exacting and time-consuming work. Even in a shop bursting with machinery and labor-saving gizmos, it's easy to spend dozens, even hundreds, of hours on a project.

After investing all that energy, it doesn't make sense to slap on just any set of door hinges. Treat hardware as an afterthought and that's how it will look. Instead, hinges should be part of a design from the moment you begin to sketch ideas.

Reference books, catalogs, and fine furniture in magazines are all good sources of information. Make a conscious effort to train your eye by critiquing the hardware whenever you look at a piece of furniture: Is it period-appropriate, does it provide the right action, does it draw too much or too little attention to itself?

The right set of hinges will blend seamlessly with form and will maximize function. A mismatch, on the other hand, can muddle your project's personality. Here are some of the most common hinges for hanging doors in fine furniture and cabinets.

Robert J. Settich is a woodworker and writer who lives in Gladstone, Mo.

Butt hinges are versatile

Mortised butt hinges are the simplest and most familiar type—you will find them on entry and passage doors in most homes. Smaller versions swing doors in cabinets, upright jewelry chests, and clock cases. The hinge leaves are set into mortises in the door and carcass.

Butt hinges come in a variety of finishes and styles to match all types of period furniture. Their versatility comes from an unobtrusive design that is just visible enough to be decorative if so desired.

Mechanically speaking, there are two essential points to remember about butt hinges. First, the center of rotation is at the midpoint of the hinge pin. In standard practice, you position the hinge's center-

point slightly past the edge of the door and the edge of the carcass. Second, the diameter of the hinge's barrel determines the maximum combined depth of the mortises for the hinge leaves. Many beginners think the leaf thickness sets the mortise depth, but this approach can lead you astray, especially if your hinge has thin, stamped leaves. It's a good practice to make the mortise slightly shallower than the maximum depth to prevent the hinge from becoming bound, a condition where the hinge edge of the door strikes the carcass, preventing the door from closing fully.

Butt hinges are challenging to fit because a typical installation involves mortising for both leaves. Combine that problem with the need for a consistent reveal around the door's perimeter, and you have a job that demands careful workmanship.

Simple and familiar.
Mortised butt hinges can be showy or literally blend into the woodwork.

Choose your finish.

Polished brass might look best on a formal Colonial piece, while antiqued metals are better suited to more relaxed styles, especially country pieces. Try brushed nickel or chrome for contemporary pieces.

LOCATING HINGES

Align the hinges with the door rails or space them equally inward by any distance that pleases the eye. But keep the hinge's midpoint no more than 3 in. from the door's top or bottom. Position the centerpoint of the hinge pin about $\frac{1}{32}$ in. past the door and case.

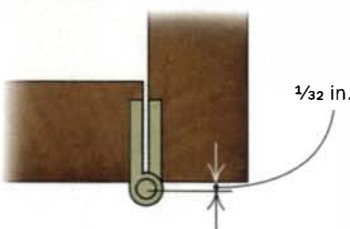
INSTALLATION TIP

Cut mortises in the case first. Then shim the door into place and use a marking knife to transfer the hinge locations to the door.

LOOK FOR QUALITY

A well-made hinge is sturdy and silent. Precisely fit hardware shouldn't rattle when you shake it. Look for hinges that are extruded or milled from solid brass. Thin, stamped hinges cost less but don't meet the same standards for fit and finish.

A few helpful tips. The decorative possibilities for butt hinges range from no ornament at all, to a simple ball tip, to fancier shaped finials. If you're seeking historical accuracy, check museum pieces that have the original hardware or consult drawings—either sketches by the original designer or measured drawings made as part of a preservation project. If you're the designer/builder, choose hardware that will complement the form, not compete for attention.



Surface-mounted hinges install easily

H-L HINGE



BUTTERFLY HINGE



STRAP HINGE



Hand-forged iron hinges are genuinely rustic. In H, H-L, butterfly, and strap styles, they're ideal for colonial reproductions.



Polished or antique brass gives a more refined look. Styles range from simple H hinges to more ornate variations.

Mounted directly to the front face of the cabinet and door, hinges of this type are useful in period reproductions, especially those of rustic early American furniture.

Strap hinges can provide some structural support on large board-and-batten doors by spanning several of the vertical boards and helping to hold them together.

The narrow profile of an H hinge (see photo, top right) makes it especially suitable for doors with narrow stiles or otherwise limited surface area for securing a hinge. An H-L hinge is similar to the H hinge but needs more mounting space and will support more weight.

H-L hinges are sold in pairs, with one mounted near the bottom of the door and the other near the top. The hinge pairs are mirror images of each other, not identical.

Butterfly hinges have a pronounced decorative effect, mimicking a pair of spread wings.

Two great virtues of surface-mounted hinges are easy installation and predictable results. There's no tedious gauging, mortise cutting, or trial fits, so you **eliminate the time and labor associated with all of**

those processes. There's slightly more to the installation process than slapping the hinges onto the wood and drilling pilot

holes, but frankly it's not much more complicated than that.

Eliminating the machining steps also dramatically reduces the possibility of surprises. You directly set the reveal of the door before installing the hinges, so there's virtually no guesswork involved.



A greater emphasis on looks. Highly visible surface-mounted hinges come in a wide range of styles especially suitable for period furniture.



LOOK FOR QUALITY

Scrimp here and you won't be able to hide it. You can easily ruin the authenticity of rustic furniture with hinges that look factory made. Hand-forged hardware is costlier, but it's sturdier and looks right in a way that glossy, stamped-metal hinges from the hardware store can't match.

INSTALLATION TIP

Shims help set the reveal. Use shims to hold the door in place while setting the reveal and locating the hinge placements.



Knife hinges are strong and discreet



Straight knife hinges (top) are almost entirely concealed. Offset hinges show a little bit more metal, but allow a door to open as wide as 270°.

Another popular type of mortised hinge, knife hinges show less metal than a butt hinge and make for a narrow, nearly unbroken reveal around a door. Many makers of contemporary furniture favor them for this reason. They are great for cabinets and for freestanding armoires or entertainment centers.

The hinge gets its name from an action that opens and closes like a jackknife. Because they carry a door's weight at the top and bottom, instead of at the sides like a butt hinge, knife hinges are less likely to sag. But because the mortises must be cut before the piece is assembled, they are trickier to install.

Knife hinges come in a couple of basic types. A straight knife hinge is usually used for doors that overlay the case sides. Offset knife hinges, with L-shaped leaves, can be used to make inset doors swing 180° or allow doors at the edge of a carcass to open 270°, ideal for entertainment centers or other applications where you want the opened door to rest against the side of the case.

The offset designs are sold in handed pairs, meaning that you must specify whether they are meant for a right- or left-hand door.

Low-profile hardware. Unobtrusive and hard-working knife hinges are popular with contemporary furniture makers.

INSTALLATION TIP

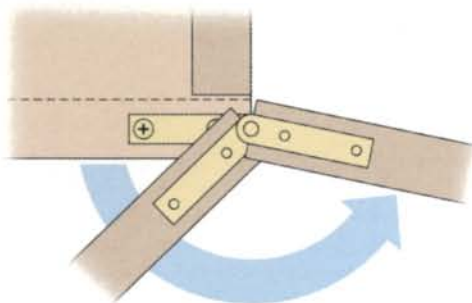


A drill bit makes a handy spacer. To set the hinge's pivot center just beyond the end of the door, use a drill bit that measures slightly larger than one-half of the pin's diameter.

OPENING OPTIONS

STRAIGHT HINGES

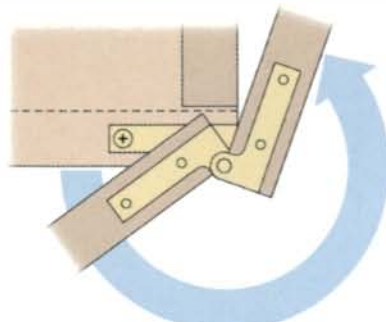
This style is used primarily for doors that overlay the case sides, allowing them to open 180°.



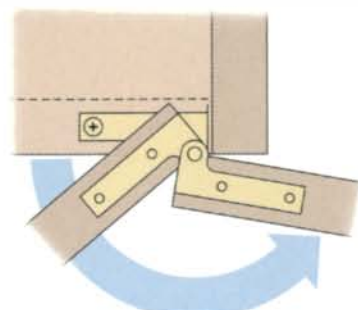
OVERLAY DOOR

OFFSET HINGES

These hinges give overlay doors more freedom, allowing them to swing nearly 270° and rest against the outside of the carcass. They also can be used on inset doors, allowing them to swing 180°.



OVERLAY DOOR



INSET DOOR

Euro hinges simplify door-to-carcase adjustments

For hardware that doesn't show at all from the outside, especially in kitchen cabinetry or other built-ins, Euro-style cup hinges are the high-end. But mention Euro hinges, and many woodworkers will act as though you're speaking a foreign language. Even though this style has been around for a long time, widespread misconceptions prevent many people from enjoying its advantages.

One myth about cup hinges is that you have to build sterile, frameless cabinets in order to use them. In fact, you'll find models that work with virtually any cabinet style, including traditional face-frame construction with inset doors. Another legend states that you'll need to tap your life savings for the drilling and installation equipment. The truth: You can get great results with a drill press or handheld drill, and jig prices start at the cost of a pizza.

Each hinge consists of two parts. Connected to the door is a hinge arm with a cup-shaped mounting plate that sits in a round mortise. The arm's other end attaches to an adjustable mounting bracket screwed to the carcase.

Adjustability is one area where cup hinges really shine. Many models can be aligned to micrometer accuracy in three axes: side/side, up/down, and in/out. Instead of hoping that nobody notices the door alignment in your cabinets, you'll start dragging people off the street to proudly point out the even reveals.



An open-and-shut case. Euro hinges lend a clean look to a cabinet's exterior (top) but can't do the same for the inside. What they lack in looks, they make up for in adjustability.

INSTALLATION TIP

Avoid guesswork with a template. An inexpensive jig makes it easy to locate and seat a cup hinge.



SOURCES OF SUPPLY

Quality cabinet hinges are available from a number of woodworking-supply stores and specialty hardware dealers. Here are some good places to start.

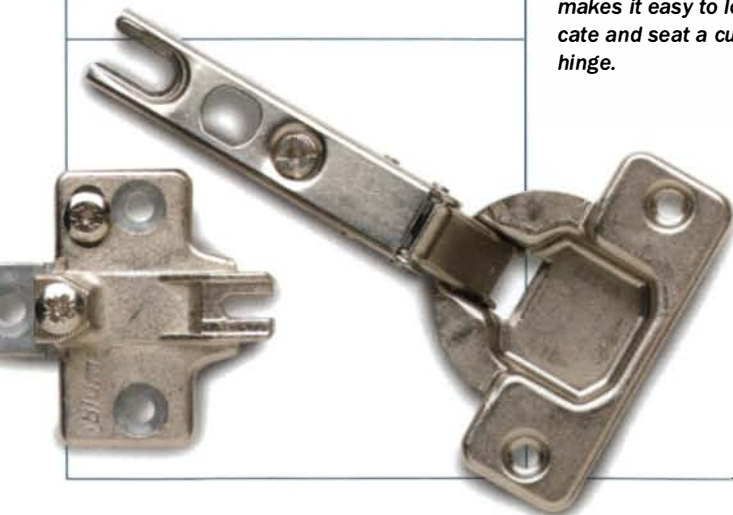
BALL AND BALL www.ballandball-us.com

HORTON BRASSES INC. www.horton-brasses.com

LEE VALLEY www.leevalley.com

ROCKLER WOODWORKING SUPERSTORE www.rockler.com

WHITECHAPEL LTD. www.whitechapel-ltd.com



Specialty hinges

Some hinges simply swing while others—as they say in jazz—really swing. The hinges in this assortment are distinctive for their decorative looks or for their unique mechanisms. Some are appropriate for a specific period or style of furniture. Others serve a special function such as easy door removal or allowing a door to swing open 270°. In choosing any hinge for your own work, consider how you want the piece to look and how it should function. Study the hardware on similar pieces in catalogs and magazines. Above all, begin

thinking about hardware from the outset of your design process for hinges that match your work seamlessly.

FICHE HINGE

Rustic good looks. A fiche hinge requires some tricky mortising, but fits the character of French country furniture.

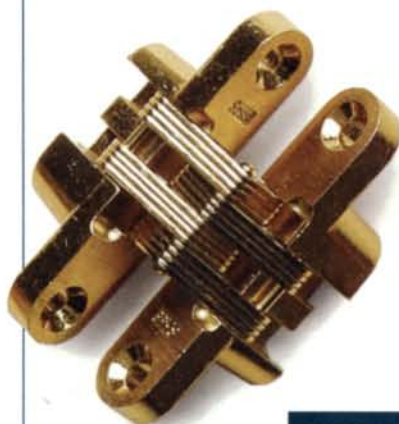
Ready for lift-off. A pair of these hinges allows easy removal of doors for repair or transportation.

LIFT-OFF HINGE



RAT-TAIL HINGE

A unique period look. A rat-tail hinge, in hand-forged iron, is ideal for colonial-style cabinets.



SOSS HINGE

Out of sight. A Soss hinge requires two deep mortises, but disappears when the door is closed.



FOLDBACK HINGE

A smooth, wide swing. Foldback hinges provide a clean look and allow doors to open 270° to rest against the case sides.





“You just have to try, you have to use your imagination.”

Sam Maloof on Design

BY ASA CHRISTIANA

On a cloudless day on his four-acre California compound, 89-year-old Sam Maloof is in constant motion. He spends time on the bandsaw, as he does almost every day, making freehand, curving cuts on sinuous chair parts and table legs. He solves woodworking problems with his three assistants. He walks his sloped property with the agility of a much younger man, stepping lightly over construction debris and walls in progress. When he speaks to his head maintenance man, he switches easily into Spanish.

Around people, he is respectful, even affectionate. But he seems happiest and most focused when he is creating.

Though he is most widely known for his chairs and rockers, Maloof has designed some 500 different pieces of furniture, including many tables and case pieces, as well as two homes. His original house, in a lemon grove in Alta Loma, was displaced

On trusting his eye ...

“I draw with my bandsaw—with no lines or anything. A very well-known blacksmith said, ‘I use my hammer as my pencil; I use my anvil as my table.’ I use my bandsaw as my pencil. When I’m working, I’m looking at both [edges of the cut] and I’m looking at the saw, too. I don’t recommend it to people—I’m afraid they’d cut their fingers off.

“I don’t have any of the parts manufactured by parts makers. I could very easily; it would save me a lot of time. When I make a chair, I make it and evolve it to the very finish. I’ve made it for that individual.”



On the evolution of the rocker ...

"I was making my spindles kind of fat [at the bottom], so they did give me this lower lumbar part. They just came [straight] down. They sat good, but then I started doing them so they actually curve, and I thought, well, this is the way to do it. They're very sensuous, and I still make them this way now.

"I like the combination of hard lines and soft lines very much. It [arose from] an error. My son was working with me and he was daydreaming or something, and he cut too deep. I said, 'Well, let's see what we can do about it.' So I saved it by making a hard line.

"I make the rocker [with a reversing curve at the tips] so if a child gets in it, they can't push it back too far.

"Then the horns [at the top of the back posts], they don't mean anything, but when you go to move the rocker, you hold on there. And then the seat is very deep in the back, so when you sit, it automatically just slides you right back to where you get good lumbar support."

Hard lines accentuate the soft curves.

Maloof's earlier rockers (above) are characterized by upholstered seats, round spindles that swell outward to support the back, and a stretcher system for strength. Later (below), he developed a sculpted wood seat; curved, flattened spindles; and an interlocked, screwed joint at the seat rail that allowed him to omit the stretchers for a cleaner look. He also added hard edges to the soft sculpted curves.

by a freeway. The state declared it a historic landmark and moved it in 2001 to a new, larger site a few miles uphill, where it is now open to visitors. At the time, Maloof was dealing with the death of Freda, his wife and lifelong business partner, so he embraced the relocation as a chance for a new start. For one thing, it allowed him to design and build a second house, to live in.

Maloof's new property offered lots of opportunities to create. There was the chance to design cavernous new lumber sheds, which he placed so they frame his view of the San Gabriel Mountains. He also has a spot picked out for a gallery to showcase the work of emerging artists.

Talent is innate, but must be nurtured

As a boy, Maloof already was designing and drawing things, a sketch pad always at hand. His first serious job was as a graphic artist in Los Angeles. When he joined the





On the “Maloof round” ...

“I didn’t want to have an edge on the drawers where it [would have to be] flush. But I could have the round on the outside that made a beautiful detail, and if [the drawers] weren’t quite accurate, they still looked accurate—I’ll be very blunt about it.

“I did it that way before other people did it, and all of a sudden I saw a lot of people up north doing it. And instead of calling it the Maloof round, they called it the California round. I could name people...”

Round edges and inset drawers. One of Maloof’s favorite design elements is rounded case edges with flat doors and drawer fronts set back.



Army during World War II, his superiors discovered his drawing skills and put him to work as a mapmaker. Today, after delivering pieces to the White House and the Smithsonian Institution, after being hailed as a national treasure, he still is sketching and designing, changing his furniture and surroundings, looking forward always.

It’s hard to pin down Maloof on the question of design. Basically, he knows beauty when he sees it. He believes that design can’t be taught—the talent is either there or it is not—but he allows that one’s innate talent can be nurtured.

For woodworkers who wish to improve their design skills, he recommends frequent drawing and sketching. “I still do that. I think of something, and I’ll pick up a piece of paper, and I’ll do a sketch of

it and put it in my pocket. And one idea begets another idea.” He also suggests exposure to art in all forms. Most of all, he recommends designing and making lots of pieces. To those who admire his work but are afraid to design their own, he says: “You just have to try; you have to use your imagination.

“You have to ask yourself, ‘Do I just want to work in wood and copy beautiful objects?’ I see nothing wrong with copying,



On nature ...



"I remember about 1955 we had a horrible rainstorm, and this area was all groves. The water was 2 ft. high, torrents of water, raging rivers. Somebody had some eucalyptus trees, and their roots were showing after the waters had receded a little bit. We made a left turn and Freda said, 'Sam, there's your table legs.' The roots came up like that (he gestures), just absolutely beautiful. And I reeled back and thought, 'Gosh, it does look like one of my pieces.'"



Straight from the shop floor. To preview the final shape of a table pedestal, Maloof traces a half-template on the floor near his bandsaw, trusting his eye as always.

but how much more satisfaction do you get when you know you designed that piece, when it is your piece?"

Maloof also values the experience that blossoming woodworkers can have at schools or in other communities of peers. "I find that students are not selfish; they help one another and critique each other's work. They feed on one another."

However, he warns against domineering teachers: "Some instructors demand

that you work the way they work, and so there become just many little followers of this person or that person. I see a lot of work where I can tell where that person went to school right off the bat.

"I think a good teacher gives the whole rope to the students and lets them do what they want to do. I don't think you should curtail the excitement or the invention or the new direction. Sometimes [the student] falls flat on his face; other times it's great."

Trust your instincts when creating, but put function before form

Maloof had no formal training in art or furniture making, so there is a completely personal quality to his work—polished yet unsophisticated—which strikes a chord in a wide range of people. Throughout his career, Maloof simply did what made sense to him, trusting his own eye and instincts at a time when the concept of the studio furniture maker didn't exist.

Maloof's design philosophy is deceptively simple: to make pieces that function well and are beautiful—or "byoodeeful," as he says, referring to anything from a tree to a pottery vessel to a joinery



On timeless beauty ...

"Elizabeth Gordon, who was the editor of *House Beautiful* for many years, called me one day. She said, 'Mr. Maloof, I saw your [curved bench] in New York and I'd like to feature it in the magazine.' This was the first time anything like this had ever happened to me. And she said, 'Are you Egyptian?'"

I said, 'No.'

'Have you ever been to Egypt?'

'No.'

'Have you ever studied Egyptian history?'

I said, 'No, why do you ask?'

She said, 'Your pieces have a feeling of old Egyptian furniture.'"





On design that spans oceans ...

"I'd never been to Japan, and I didn't have any books on Japanese architecture. I came from a small family, from a small farm town, and we never traveled or went on vacation to any exotic places. And then when I went to Japan—I've been there four times now—I began to notice things that I do that were done in ancient times. It was the same way when I was in the Middle East."



Wide overhangs. On cabinets, chairs, and window trim, Maloof often favors a long projection, reminiscent of Japanese architecture.

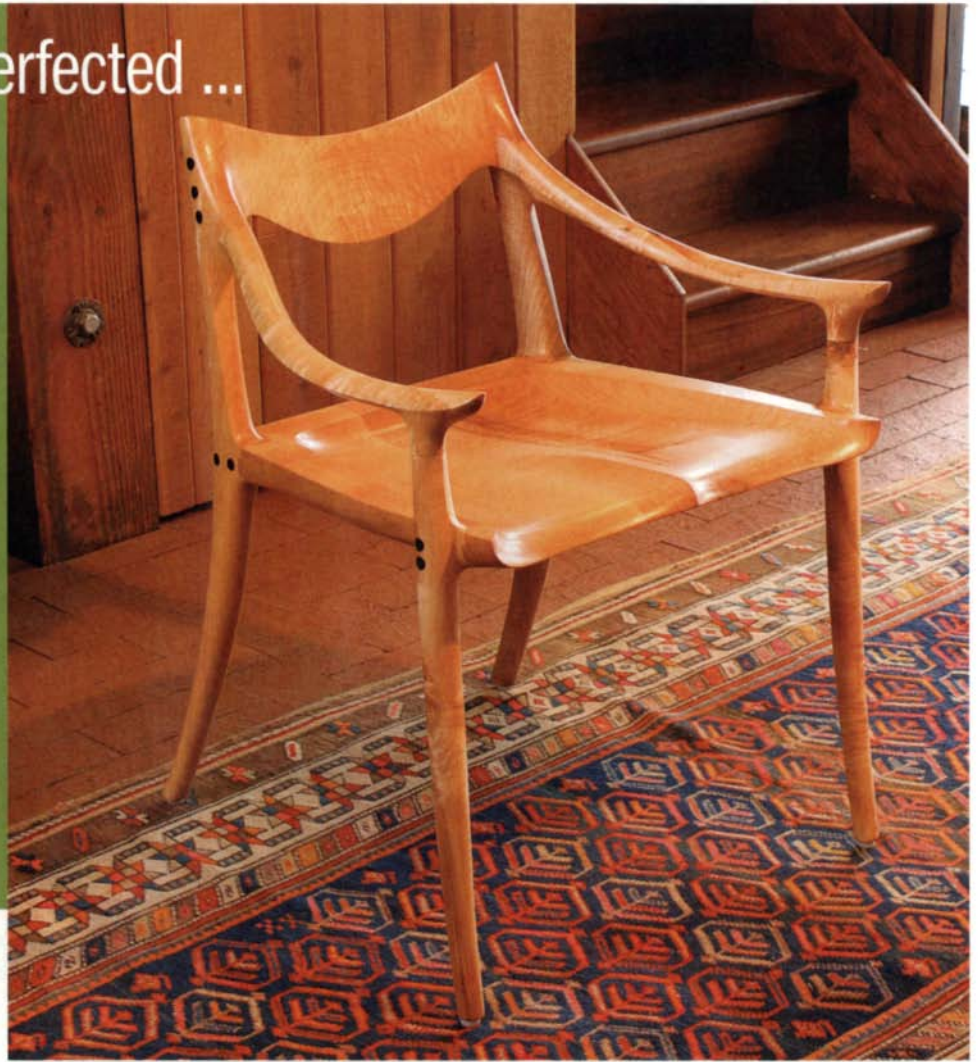


500 pieces, one perfected ...

"I can't say that I've done a piece that is absolutely complete, that I don't want to make a change on it at all. But I must say that my little low-back chair—I think I perfected it. I can't do anything else to it. I think it looks well, it sits well, it's built well.

"Those arms aren't really arms.

When you sit down in a chair, there's nothing to reach for. These are handles. You can raise yourself up, instead of putting your hands on the sides of the chair. And then they are stretchers. Instead of having the stretchers below the seat, I have the stretchers up here. They give it strength, but you don't have to have any stretchers down at the bottom. As for a high arm, well, a lot of times I've seen chairs where the arm hits the edge of a dining table."



detail. But function comes first. "I've seen tables that you couldn't eat off of, chairs you couldn't sit on, cabinets that were so shallow you couldn't put a pair of socks in them," Maloof says. "They were beautifully made and nice to look at, but I felt a piece could be very beautiful and very functional at the same time, and that is really the center of what I do. I want my chairs to invite people to sit on them. This has been my objective since my first commission."

As for designers who consider sculpture or art first and function second, Maloof says, "It's art furniture, and I think some of it is very interesting. I take my hat off to them. But to be different just to be different, though, is just a lot of poppycock.

"Some potters, they have a style and they stay to it. Other potters will continue changing—this direction, that direction. I heard a very well-known potter say, 'I've got to figure out what's going to sell good this next year.' That is for the birds. I've chosen to do what I do and I try to do the best work I can. And every year I add two or three pieces to what I've done." □

Asa Christiana is managing editor.



in his 80s, Maloof rebuilt his life. The new property at the foot of the San Gabriel Mountains holds his new lumber sheds, his old house and workshops, and the new house (above) he recently designed. The new home meant a second chance to design and build a spiral stairway (left). He keeps a carving gouge nearby to work on the surface detailing when he has time.

readers gallery



DENNIS BORK Delafield, Wis.

A client commissioned Bork to make this walnut Chippendale bed. He hand-planed each board and hand-cut the post mortises. Of course, all the carving was done by hand. For the finish, Bork first applied a water-based aniline dye, and then a topcoat of shellac.

PHOTO: GREG GENT



ENRIQUE ARIAS Alachua, Fla.

Influenced by the simplicity of Shaker furniture and benches made by Sam Maloof, Arias made this piece (16½ in. deep by 51½ in. wide by 18½ in. tall) primarily from mahogany and bird's-eye maple. Shaker chair tape provides cushioning for the two seats. The finish is oil. The bench took about 60 hours to complete.

PAUL BOYD

Stuarts Draft, Va.

The influence of Thomas Sheraton is evident in this ladies' writing table. Made from mahogany, with inlays in satinwood, rosewood, and tulipwood, the table measures 18 $\frac{3}{4}$ in. deep by 28 $\frac{3}{4}$ in. wide by 48 in. tall. Including the time it took Boyd to apply the lacquer finish, he needed about 200 hours to complete the piece.

**MICHAEL PARK**

Ellicott City, Md.

Made from mahogany, this cabinet (13 in. deep by 22 in. wide by 60 $\frac{1}{2}$ in. tall) has inspirational roots extending into Scandinavian furniture and Japanese tansu. It took about 80 hours to complete. The finish is tung oil.

**DAREN B. KUNZ**

Preston, Idaho

Looking to build a cheval mirror for his wife, but wanting to avoid the more common rectangular shapes, Kunz designed his rosewood mirror with a graceful oval curve. In addition to the wood, the piece incorporates brass hardware and a beveled mirror. The overall dimensions are 12 in. deep by 32 in. wide by 65 in. tall. For a finish, Kunz used a mix of oil, varnish, and turpentine, followed by paste wax.

Award-winning designs from San Diego

The pieces on this page are only a few of the excellent entries from this year's Design in Wood Exhibition at the San Diego County Fair. Each year, *Fine Woodworking* bestows the Best of Show award on one woodworker. This year, the prizewent to Tom Christensen for his hall table, "Elusive Legend."



TOM CHRISTENSEN

Bakersfield, Calif.

Best of Show, *Fine Woodworking*

Christensen's winning hall table is 21 in. deep by 42 in. long by 34 in. tall. It is made of mahogany and maple burl, and features various dyed veneers and inlay, with gold-leaf gilding on the legs.



ED ZBIK

San Diego, Calif.

First Place, Wood Turning—laminated/segmented turning

Made from maple, bloodwood, walnut, ebony, and pau amarillo, Zbik's Art Deco vase is 12 in. dia. by 18 in. tall.

VIRGIL L. KRUEGER

Oceanside, Calif.

First Place, Wood Carving—marine animals

Krueger's carving of stingrays is 14 in. wide by 20 in. long by 10 in. tall and is made of basswood, manzanita, and black walnut.



STEVEN M. WHITE

Bishop, Calif.

First Place, Art Furniture

This leaning chest of drawers is made of cherry and spalted maple, and all of the drawers are lined with cedar. It is 21 in. deep by 15 in. wide by 50 in. tall.



RUSS FILBECK

San Diego, Calif.

First Place, Furniture

Made of spalted curly maple, this ladderback rocker is 44 in. deep by 26 in. wide by 45 in. tall, with a hickory-bark seat.





JEFFREY GREENE

Doylestown, Pa.

Greene used exploratory freehand drawing to develop the airy, sail-like look of this bench commissioned for the gallery at the James A. Michener Art Museum in Doylestown, Pa. The bench measures 48 in. deep by 96 in. wide by 56 in. tall. All the parts are ash; the finish is linseed oil.

SCOTT GUTIERREZ

Heber City, Utah

A manufacturer of high-end stereo equipment commissioned Gutierrez to build this stereo cabinet. Made from Honduras mahogany, Macassar ebony, and wenge, the cabinet's overall design reflects the look of a shoji screen. It measures 24 in. deep by 84 in. wide by 30 in. tall and weighs 250 lb. For a finish, Gutierrez used Waterlox on the mahogany and wenge, and Danish oil on the ebony.



TED KETTLEWELL

Columbia, Mo.

The inspiration for this walnut étagère (18 in. deep by 38 in. wide by 66 in. tall) came from one in the home of Rep. Kenny Hulshof of Missouri. It took Kettlewell about 250 hours to complete the piece; not surprising when you consider that few of the parts were alike. Clear lacquer serves as the finish.

Submissions

Readers Gallery provides design inspiration by showcasing the work of our readers. For consideration, send entry forms (available at www.finewoodworking.com) and photos (unaltered digital images, prints with negatives, or slides) to Readers Gallery, *Fine Woodworking*, 63 S. Main St., Newtown, CT 06470. If you want materials returned, you must include a self-addressed envelope with appropriate postage.

Layout: pencil vs. knife

FOR ACCURACY AND EFFICIENCY, YOU'LL NEED BOTH

BY CHRISTIAN BECKSVOORT

Pencils

Like any task in woodworking, accurate layout depends on using the right tool at the right time. It's easy to think that if a knife marks more precisely, it's better to always use a knife and never pick up a pencil. This isn't necessarily so.

The lines most critical to tightly mating joinery definitely should be made by a knife edge. But for marks that don't require hair-splitting precision, a pencil is quicker, easier to handle, and makes more visible lines.

The trick to being both accurate and efficient lies in knowing when to reach for each of these tools.

Draw your first lines with a pencil

I use a pencil when I make initial layout lines such as those for cutting case sides to length or

for locating dividers or doors. I also mark with a pencil in the first steps of laying out joinery such as dovetails or mortises. These are all lines to which something else eventually will be fitted, so the need for greatest accuracy will come later. In the meantime, a sharp pencil produces a clean, visible line more quickly and easily than a knife.

Pencil lines are also erasable. If you scribe your initial layout with a knife, you'll have to hit the line exactly when cutting or else spend time paring the waste to make the line disappear. If you miss a pencil line by a whisker, you can erase it and move on.

There are lots of pencils on the market, and you may wonder which to use. Regular pencils come in five degrees of hardness, from a No. 1, which is very soft and dark, to a No. 4, which is very hard and light. The softest pencils dull too quickly—a

From top: A standard No. 2 pencil marks clearly and holds a point well. Avoid mechanical office pencils—the thin lead breaks easily. Mechanical drafting pencils use different grades of lead; look for one graded B or HB. White pencils, found at art-supply stores, are handy for use on dark woods.



Make your first marks with a pencil. Becksvoort cuts tails first when making dovetails, marking for the first cuts with a pencil (left). Pencil lines also are easy to see when locating shelves or dividers (above).

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Marking knives

Use a knife to mark out mating joinery. Becksvoort marks his dovetail pins by scribing the outline of the tails onto the pin board (above). After cutting a mortise in a table leg (right), he transfers the dimensions to the apron for the tenon.



freshly sharpened No. 1 will lose its fine line almost immediately on harder woods, producing a 1/16-in.-wide line after just 6 in. to 10 in. of drawing. In most cases, your best bet for sharpness and visibility is the widely available No. 2, or the No. 2 1/2 pencil.

A wooden pencil's conical point can be modified to fit into a corner or trace along another board. Use 120- or 150-grit sandpaper to flatten the tip of the pencil so that the lead is shaped like a wedge or knife edge, instead of a point. For short distances, this works almost as well as a knife.

Mark with a knife when cutting to fit

Ultimately, the fit of a two-part joint depends on how precisely the second part is cut. Even a fine pencil line can be 1/32 in. or wider. If all of your dovetails have that much slop, you'll have a disaster on your hands. That's why I switch to a knife for marking out the second part of such joints and for fitting dividers, backs, door parts, shelves, drawer parts, and moldings.

These knife lines also can serve to register the final cut with a chisel. However, make sure your first hit with the chisel is very light. A chisel is a wedge, and a very deep hit actually will relocate the line by as much as 1/32 in.

There are a few things to keep in mind when using a knife: First, make your initial scribe mark very light so as not to follow the grain (this goes for end grain as well as face grain). Follow up with a second, heavier scribe mark. Also, be sure to keep

your knife flush against your pattern. When I'm using a square to scribe a line, I like to place my knife into the tick, then slide the square up to the knife blade and make the mark.

The most versatile marking knives can cut on both the right and left sides of a pattern, ruler, or straightedge. Some have spearpoint blades with two cutting edges; others have a single edge that is beveled on both sides. Still other blades have a single edge beveled on only one side.

Any of these edges can yield a tight scribe line. If your knife's edge is beveled on both sides, hold the bevel flat against your pattern or guide. If an edge has only one bevel, hold the back of the blade flat against the guide.

Avoid using knives with narrow bevels as layout tools. A very small bevel doesn't have enough surface area to be held securely against the guide, and if you hold the flat of the blade against the guide, the mark won't be accurate.

It helps to have a variety of layout knives handy, but if you want only one, go for a blade with two bevels. I prefer a straight chip-carving knife. The long bevels let me scribe tightly against either side of the work, and the slender blade reaches into narrow spots. I also can use the knife for its original purpose and save the price of a separate marking knife.

Finally, remember that a dull knife, like a dull pencil, will yield a wider line. Keep your knife as sharp as possible for a thin line, which also will require less physical effort. □

From top: Some single-edged marking knives are beveled on only one side, meaning you'll need a left- and right-handed pair. A knife with two edges cuts in both directions. The author prefers a straight chip-carving knife, available at most woodworking-supply stores.



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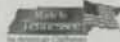
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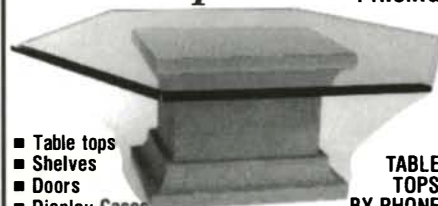
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READER SERVICE NO. 34

How to sand tabletops with breadboard ends

Q: How do I sand the breadboard ends of a tabletop without marring the panel?

—PETER COOLOGEORGEN, Chicago, Ill.

A: FIRST, MAKE SURE THAT THE BREADBOARDS and panel are the same thickness before assembling the tabletop. Once the panel has been glued and pinned to the breadboard ends, sand the top with a belt sander, starting with a P150-grit belt, in the direction of the panel grain. At this point you'll leave cross-grain scratches on the breadboards, but don't fret. After repeating the process with a P180-grit belt, those scratches will be barely perceptible.

Next, sand the entire tabletop with a random-orbit sander. Start with a P220-grit disk and give the breadboards a few extra passes to clean up any leftover scratches from the belt sander.

Now hand-sand the panel in the direction of the grain with P220-grit paper. Then carefully hand-sand the breadboards in the direction of the grain. Repeat with P320 and P400 grits. Finally, burnish the tabletop with 0000 steel wool. This should leave a flawless surface, with no scratches visible on either the panel or the breadboards.

—Christian Becksvoort,
contributing editor

Ask a question

Do you have a question you'd like us to consider for the column? Send it to Q&A, *Fine Woodworking*, 63 S. Main St., Newtown, CT 06470, or email fw@taunton.com.



1 START WITH A BELT SANDER

Use a P150-grit belt first, working in the direction of the panel grain. Repeat with a P180-grit belt.



2 MOVE ON TO A RANDOM-ORBIT SANDER

With a P220-grit disk, work the entire tabletop. Give the breadboards extra attention to remove the belt-sander marks from step 1.



3 HAND-SAND WITH A BLOCK

Using a sanding block, hand-sand the tabletop. Work in the direction of the grain first on the panel, and then on the breadboard ends. Start with P220-grit paper, and work your way up through P320 and P400 grits.

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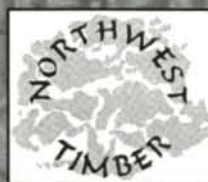
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READER SERVICE NO. 152

Building with 2x4 lumber

Q: Would it be okay to make a bed out of 2x4 pine lumber? I'm concerned about the wood having too much moisture content and warping and twisting after the bed is built.

—NORM WORSHAM,
Hendersonville, N.C.

A: YOU ARE RIGHT TO BE CONCERNED. Construction-grade lumber is a poor choice for furniture making. It has too much moisture and it is too weak.

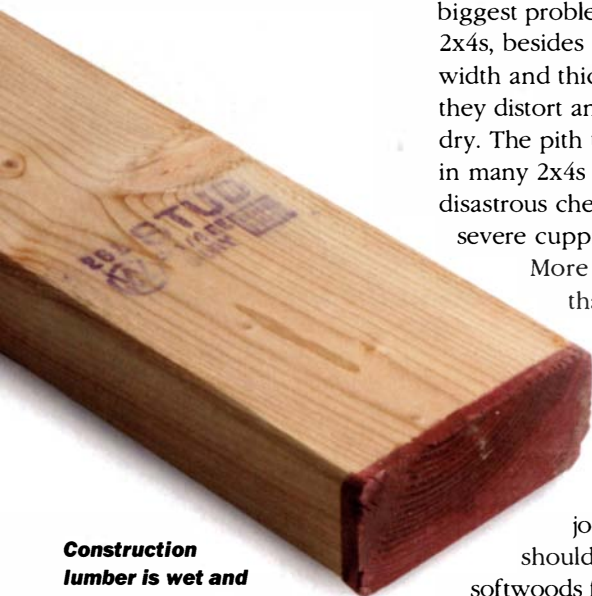
Most construction-grade lumber is partially air dried (PAD), which means that it will be green unless it came from the outside of the pile at the lumberyard. One of the biggest problems with green 2x4s, besides shrinking in width and thickness, is that they distort and check as they dry. The pith that is included in many 2x4s also leads to disastrous checks and very severe cupping.

More important than moisture, however, is the fact that construction lumber is too weak for structural joints. You

should never use softwoods for table legs, chair legs, or bedposts and rails. Instead, consider using an inexpensive, kiln-dried (or fully air-dried) hardwood such as birch, soft maple, beech, or ash. If you prefer pine, use it for the head- and foot boards, but choose it carefully—select straight grain and avoid knots, checks, and pith—and let it dry thoroughly in your shop first.

—Christian Becksvoort,
contributing editor

Construction lumber is wet and weak. Construction-grade softwoods can be used for nonstructural parts of a piece of furniture, but choose clear lumber and let it dry thoroughly.



Keep a square edge while cutting with a jigsaw

Q: When using a handheld jigsaw, my cuts often deviate from perpendicular, especially when cutting curves in thick stock. What do you recommend?

—LARRY ANDERSON,
Seattle, Wash.

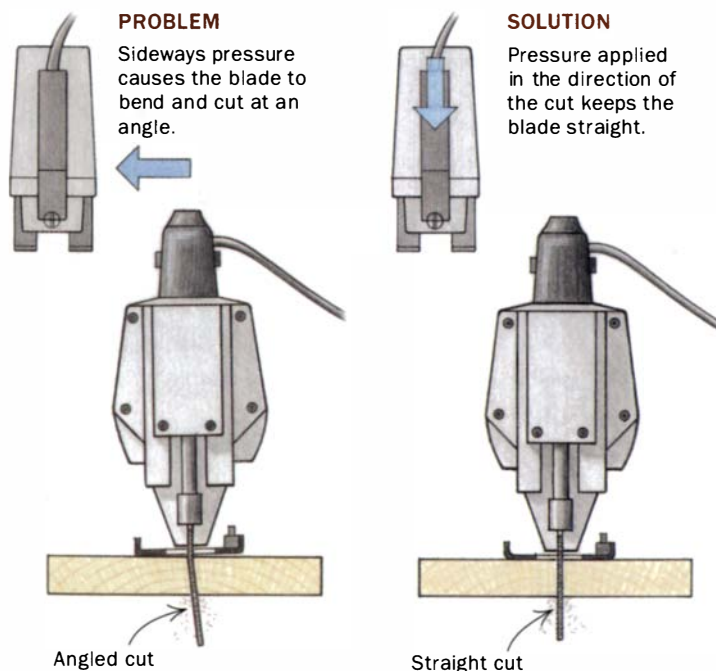
A: CUTTING ACCURATE CURVES with a jigsaw requires the right blade, saw settings, and procedure. Once you've checked that the sole of the jigsaw is adjusted square with the blade, match the width of the blade to the radius of the cut: the tighter the radius, the narrower the blade. The blade I prefer when cutting tight curves in stock as thick as $\frac{3}{4}$ in. is the narrow ($\frac{3}{8}$ in.) Bosch T101AO, which has 20 tpi.

If your jigsaw has an oscillating-blade feature, use the lowest setting to cut curves. During the cut, apply pressure to the saw only in the direction of the cut. Side pressure will force the blade to tip or tilt, and the cut will not be square. Moderate to high blade speed and a fairly slow feed rate will help you avoid applying side pressure.

—Roland Johnson,
contributing editor



Choose the right blade. A narrow blade allows for cutting tight curves, and the more teeth per inch, the smoother the cut. The 20-tpi Bosch T101AO (top blade) is designed to cut tight curves in stock up to $\frac{3}{4}$ in. thick.



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READER SERVICE NO. 60

Smoother cuts on the tablesaw

Q: When ripping with a carbide blade and a Biesemeyer fence, I cannot keep the rear of the blade from re-cutting what has already passed through the front of the blade. Is there a solution?

—DENNIS WALSH,
Twin Peaks, Calif.

A: TABLESAWS NEED ACCURATE alignment to perform well. The miter-gauge slots must be adjusted parallel with the blade, and the rip fence should be adjusted slightly out of parallel, which can be done by referencing off the miter slot.

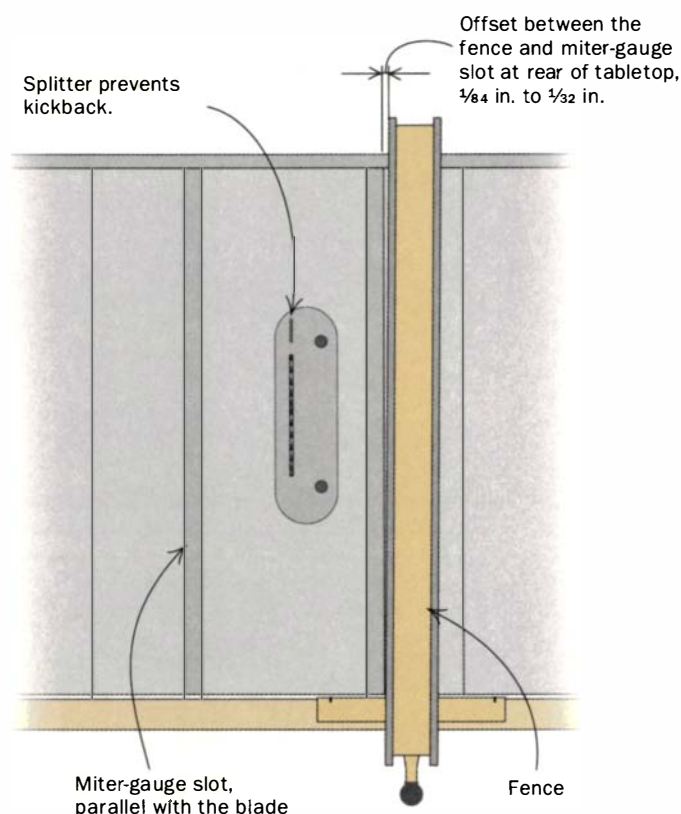
To keep the rear of the blade from re-cutting the stock when ripping, the rip fence needs to be out of parallel by $\frac{1}{64}$ in. to $\frac{1}{32}$ in. over its length. In this way, only the first three or four teeth will be engaged in the actual cutting, and then the good wood will feed freely—no burning and no sawmarks.

In addition, use a splitter in the table insert or attach one to the arbor assembly to prevent the work from coming off the fence and into the blade (causing dangerous kickback) should it decide to bow on you during a cut.

—Gary Rogowski,
contributing editor

OFFSET THE FENCE, AND ADD A SPLITTER

For cuts free of burns and sawmarks, adjust the rip fence so that it is slightly out of parallel with the miter-gauge slot. A splitter attached to the arbor assembly, or integrated into the insert, keeps stock from drifting into the blade and catching.



Don't store flammable liquids in an old fridge

Q: I'm certainly glad I read Bruce Ryden's article "Fire Safety in the Shop" (FWW #174, pp. 55-59). What would Mr. Ryden think about the idea of using a refrigerator as a storage cabinet for flammables?

—ROBERT SWANSON,
Greeley, Colo.

A: OLD HOUSEHOLD REFRIGERATORS are not a good place to store flammable liquids. There are several concerns with using these units for storage cabinets.

First, unlike the cabinet that I constructed for the article, or a commercially available storage cabinet, a refrigerator does not have a lip to prevent spilled solvents from dripping out and finding a source of ignition.

Second, a refrigerator door

does not have a positive latching device nor is it always self-closing, either of which would ensure that the door would stay closed during a fire.

Third, the insulation material inside many refrigerators is a polyurethane foam, which is highly flammable under most conditions. Once heated, the foam can become liquid and run out of its confines, fueling the fire.

Last, there could be a temptation to plug in the old unit to make the light operate when the door opens. The switch could ignite any flammable vapor, causing an explosion.

Take old household refrigerators to the recycling center in your area.

—Bruce Ryden, retired
fire marshal

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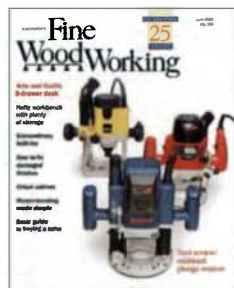
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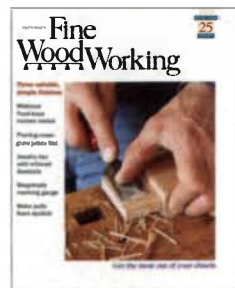
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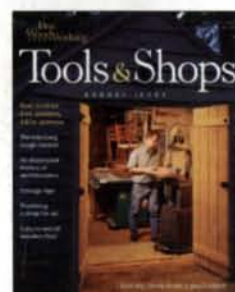
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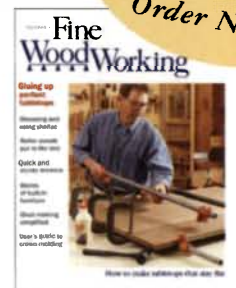
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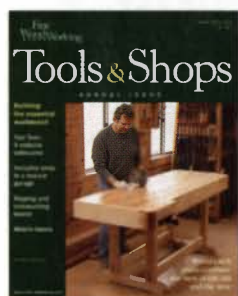
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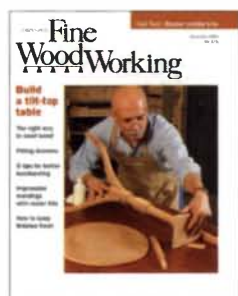
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Cutting dovetails in curved drawers

BY ED WELCH



Introducing curves in furniture can be both exciting and intimidating; the same can be said of hand-cutting dovetails. So surely cutting half-blind dovetails in a concave drawer front must be a real emotional roller-coaster?

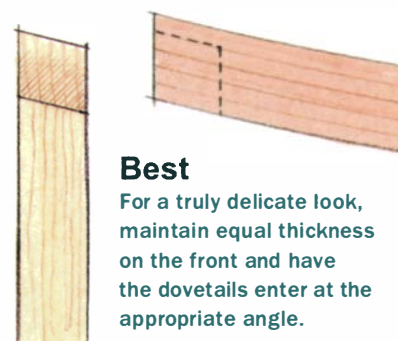
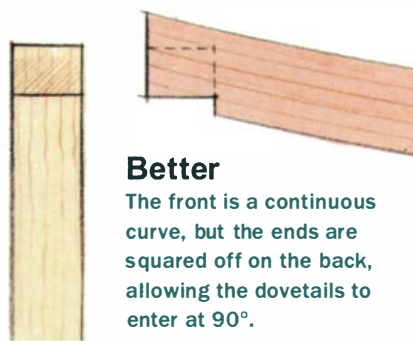
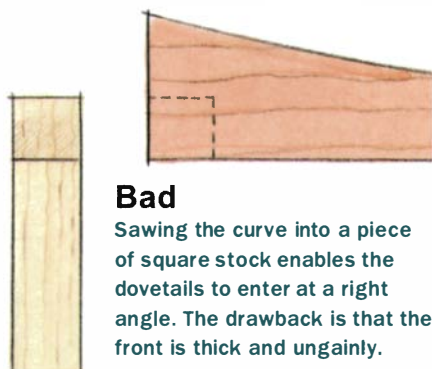
There are three main ways to do this (see drawings, below). My method is the most aesthetically pleasing, and with precise preparation and helpful jigs is easier than you'd think.

An accurate template is vital

When making furniture that includes steam-bent or bent-laminated parts, make these parts first. Then, if they spring back when removed from the form, you can adjust the design to the curve. With the curved parts made and the carcass assembled, make an accurate template of the bottom of the drawer pocket. I use 1/4-in.-thick medium-density fiberboard (MDF). The template, which should fit snugly in the pocket, displays the critical angle of the drawer front to each side. The success of this process will depend upon how closely you can match that angle.

Cut the ends of the curved drawer front on a crosscut sled on the tablesaw, using shims to secure it at the correct angle. Remember to leave the front

Three ways to join the drawer front and sides



Get an angle on the drawer parts



A working template. Create a template from $\frac{1}{4}$ -in. MDF that exactly fits the drawer opening and the profile of the drawer front. This will reveal the angle at which the drawer sides enter the drawer front.



$\frac{1}{16}$ in. oversize; you will plane the drawer to fit the opening after glue-up. Cut the corresponding angle on the drawer sides by tilting the sawblade. Check the cuts by placing the pieces on the template, making sure there is no gap where the side butts against the front. Use a shooting board if necessary to make sure the angles are accurate and clean.

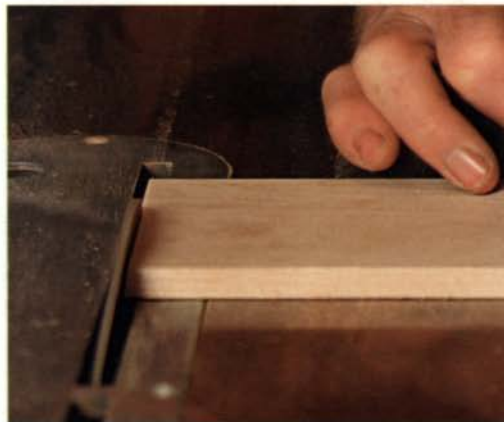
Precise preparation will pay off later

In order to chop pins in the drawer front, you will need a cradle to hold the curved piece in place. The original form used for the laminations works well.

Make a pair of chopping blocks from 2-in.-square pieces of hardwood that each have the critical angle on one corner. Gluing sandpaper on the bottom prevents slipping. Both blocks should be identical except that the block used to clamp the drawer front has an angled top to ensure perpendicular clamping pressure against the curved cradle.

Marking the setbacks—First, decide on a pleasing setback for the pins, in this case about $\frac{1}{8}$ in. for drawer fronts that are $\frac{5}{8}$ in. thick. Plane a piece of hardwood to this thickness and use double-sided tape to attach it to the end of the form. This piece serves as a paring platform for the pins, so make it about an inch wide to support the chisel. The platform angle should reflect the angled ends of the side pieces.

Set a gauge and scribe a line along the ends of the drawer front. Clamp the drawer front to the cradle against the paring platform. Because of minor differences in the thickness of each end of the drawer front, or on multiple fronts, you may need to shim the cradle with masking tape next to the paring platform so that a chisel slid across the platform hits the scribed line. With the same gauge,



Cut the drawer parts to length. Use shims to support the drawer front when cutting it to length using a tablesaw crosscut sled (above). Tilt the sawblade to cut the front ends of the drawer sides to match the angle at which they enter the drawer front (left).



Check the angle. Use the template to see if the drawer front and side meet at the correct angle.

Cut the pins in the drawer front



Lay out and saw the dovetails. Scribe a line that marks how far the dovetails are set back from the front of the drawer face (left). Lay out the pins on the ends of the drawer front (center), and cut as far as possible with a thin-kerf saw (right).



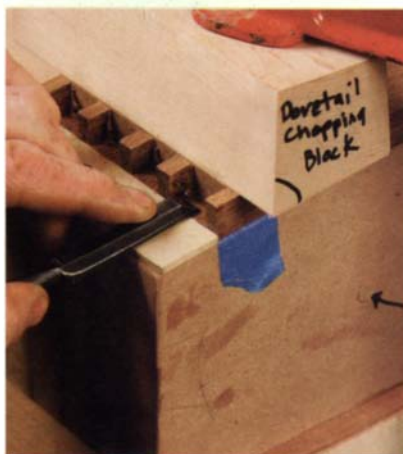
mark the inside of the drawer side, being careful to slant the gauge to the angle on the end of the side. Bring the line around to the top and bottom of the side. The blade on my gauge will not reach the outside of the drawer side, so I simply use a straightedge and a knife to connect the lines.

Gauging for the side's thickness—Set a second gauge to just thicker than the drawer side. That way, the pins will protrude slightly from the sides, which will allow you to file over the fibers to cover slight imperfections. Use this second scribe to mark the inside of the drawer front, but do not mark the top or bottom of the drawer front.

When laying out the pins, remember to leave enough of the half-pins on the top and bottom so that you can plane the drawer to fit later. You may lose up to $\frac{1}{8}$ in. depending on the width of the drawer front, the type of wood, and the seasonal change in humidity where you live.

Well-honed tools are a must

Saw the cheeks of the pins as far as possible, making sure not to go past the scribed lines. You will pare the pins straight and true later, so the cuts do not have to be exact. Re-clamp the front in

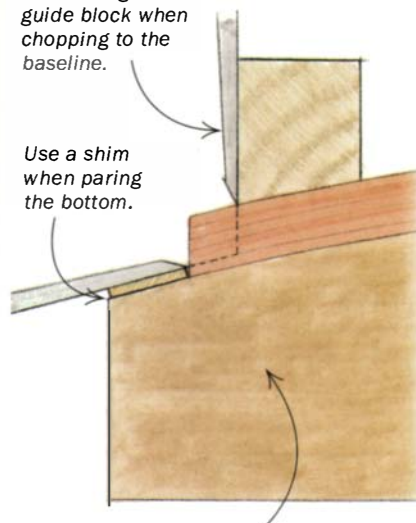


USE A GUIDE BLOCK WHEN CHOPPING OUT THE WASTE

Chop on the line. After removing nearly all the waste, use the chopping block to guide the chisel for the final cuts along the line.

Use an angled guide block when chopping to the baseline.

Use a shim when paring the bottom.



The bending form is used as a support when dovetailing.

Precision paring. The strip of hardwood stuck to the bending form serves as a platform to guide the chisel when making the last paring cuts around the pins.

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Marking the tails. With a drawer side resting on the paring platform and pressed against the drawer front, use a sharp pencil or a knife to mark the location of the tails.

the cradle, this time using the angled chopping block as a rest for your chisels. Chop away most of the waste and make your final cuts on the line using the chopping block and the shim as guides (see photos, p. 104).

Marking and chopping the tails—With the drawer front still on the cradle, place the drawer side on the paring platform against the pins. Use a knife or a very sharp pencil to mark the edges of the tails. After carrying the layout lines onto the end grain, saw the tails and then clamp the second chopping block to the scribed line. Chop halfway through the side, then turn it over, reclamp the block on the opposite line, and finish the job.

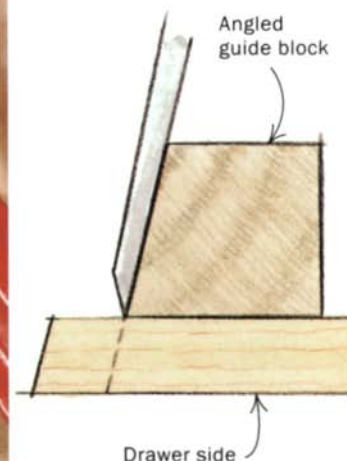
The process for a convex drawer is similar except that you use a concave form. If the radius is not too severe, you can still use a vacuum press because the bag will stretch considerably, but ease all the outside corners to avoid damage to the bag. When starting to remove the air, press the laminations down onto the form so that the bag won't go between the two. You then can use the form as a cradle when cutting the dovetails.

With practice, cutting dovetails on curved surfaces will be no more difficult than on square ones and will add an exciting new dimension to your furniture-making repertoire. □

Cut the tails on the drawer sides



Chopping the tails. Use the second angled chopping block to guide the final cuts on the tails.



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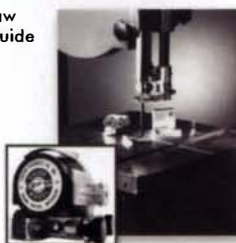
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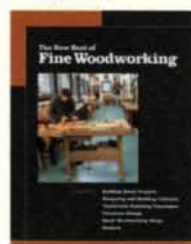
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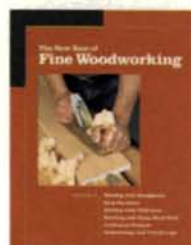
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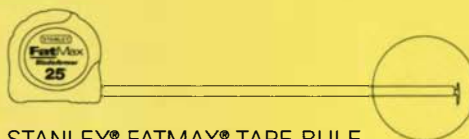


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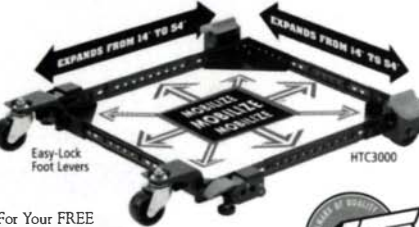
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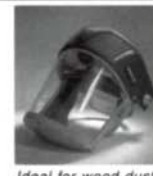
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Get top results with a foam brush

BY THOMAS R. SCHRUNK



There are two ways to obtain the finest brushed-varnish finish: You can pay \$50 or more for a top-quality natural-bristle brush, clean it thoroughly after each use, wrap it carefully to prevent dust buildup, and hang it to prevent bristle damage. Or you can use foam brushes that cost around a dollar, are widely available, and, best of all, do not shed bristles and are discarded after use.

Foam brushes work best with varnishes, both solvent- and water-based. In fact, foam is the brush of choice for water-based finishes because bristle brushes tend to leave more bubbles in the finish. However, avoid using foam brushes to apply solvent-based lacquer or shellac, as lacquer thinner and alcohol can soften and even dissolve the foam. If in doubt, test the brush in the finish you're going to use; if it starts to swell, don't use it.

Before you apply any finish, get properly set up. Begin with a clean, clear wood surface: Sand with up to P180- or P220-grit sandpaper and then vacuum the dust. On open-grained wood such as walnut, mahogany, or oak, it's a good idea to blow the pores clear with compressed air. Finally, lightly run a tack cloth over the wood to pick up any remaining dust. Skip this step if you're using a water-based finish because residue from the tack cloth can interfere with the finish.

One of the best ways to improve the quality of your finishing is to use good lighting that will display problems immediately. Ideally, the light source should be directly in front of the workpiece with the light hitting it at about a 45° angle.

Check the label on the can of finish to ensure that you're within the temperature guidelines. If you have a choice, the ideal situation is to brush on



1
Distinguish one side with a mark. Only one side of the brush should ever touch the surface. This way any dust on the workpiece will collect on the contact side and not flow back onto the surface.

Three steps before brushing



2
Dip, don't dunk. It is easy to overload a foam brush, so submerge it only a quarter of an inch for a second or two.



3
Avoid creating bubbles. Dragging the brush across the rim of the container generates bubbles. Instead, gently press it against the side of the container to release excess finish.

Horizontal surfaces

Do the edges first.

This will prevent uneven penetration later if you accidentally let finish dribble over the edge while working on the top. At the end, come back and even out any runs on the edges.



horizontal surfaces at the lower end of the accepted temperature range, which will give the finish more time to flow out and will help control lap marks. I prefer brushing vertical surfaces at a warmer temperature, because the initial evaporation of the solvent can help prevent sags.

Another essential finishing technique is to work from a smaller container, known as a cutting pot. I transfer some finish to a cutting pot with a turkey baster (buy one dedicated to finishing and keep it out of the kitchen). A cutting pot offers several advantages: You can reseal the can of finish immediately to prevent further evaporation; it prevents dust picked up on the brush from contaminating the finish in the can; and you can add solvent to the finish in the cutting pot without altering the bulk of the finish.

Because solvent begins evaporating as soon as you add finish to the cutting pot, try to work quickly. A larger brush lets you cover ground more rapidly. I normally use a 3-in. foam brush unless I'm doing table legs, where I use a 2-in. brush.

The leading edge of the brush will pick up dust from the surface. Turning the brush over will allow the dust to flow back out of the brush on the next stroke. To avoid this, I mark one side of the handle and make sure that side is face up at all times.

Don't overload the brush

One of the biggest errors when using foam brushes is to overload them with finish. Don't plunge the brush into the varnish; instead, dip in the tip about 1/4 in. and let it drink in the finish. The amount of finish picked up depends on how long you leave in the tip, so vary it according to the length of brush stroke you will use. If you need to add just a small amount of varnish for a touch-up, dip in only a corner. The finish will quickly wick to the entire edge.

If you do load too much finish, never drag the brush over the edge of the cutting pot, as this



Pre-deposit the finish. *Touch the brush to the surface every 3 in., working backward from near where the continuous stroke will end (above). Draw the brush across the surface at an even speed and pressure. The pre-deposited pools of finish will blend into an even coverage (right).*



Troubleshooting problem finishes

There are two things to watch for: bubbles and visible transition lines.

Bubbles on the first and second coats are all but inevitable; as the finish displaces air in the pores of the wood, the air comes up through the freshly applied varnish. If you see bubbles on subsequent coats (below left), they indicate that you're dragging the brush over the edge of the container or going too fast over the surface; check your technique, and ease up a bit. You can eliminate the bubbles by touching them with the corner of your brush.

Visible transition lines between strokes (below right) indicate you don't have enough solvent for the strokes to evenly flow together. Add a bit of solvent to the cutting pot, or increase your work speed.



Vertical surfaces



Finishing board for legs. To hold legs vertical while being finished, screw the tops to a piece of MDF. Keep one corner pointed forward so that you have access to two sides of the leg at a time.



Pre-deposit finish on vertical surfaces, too. Deposit finish working from top to bottom, then apply a continuous stroke in the reverse direction (left).



Drink up any surplus finish. Some finish will collect at the bottom of vertical surfaces. Instead of brushing it away, hold the tip of the empty brush against the surface and let the foam absorb the finish (above).

generates bubbles. Instead, touch the brush gently to the inside edge of the cutting pot.

Tips for brushing horizontal surfaces

Horizontal surfaces are easier to finish, so my best tip is to finish as many parts as possible horizontally before final assembly, carefully taping off glue joints as needed.

If you're finishing a tabletop, do the edges first. If you start with the top, the accidental drips pulled over the edges will dry unevenly. Wet the edges with finish first, and then come back and even them out as the last step.

To achieve an even application, pre-deposit finish along the length of the intended stroke, beginning near the end. Touch the loaded brush to the surface, leaving some finish, then move several inches closer to the start and touch again, repeating three to five times. Using this technique, I can lay down enough varnish to cover a 24-in. stroke. For larger pieces, I pre-deposit two or more times, always working toward the starting point of the stroke.

On the full stroke, maintain an even speed, letting the remaining finish flow from the brush and evenly spreading the pre-deposited finish. Always go in the same direction; back-and-forth motion leaves an inconsistent thickness, generates bubbles, and deposits dust picked up by the brush onto the surface of the workpiece.

Finally, give the edges a final stroke with a fairly dry brush to even out the runs that almost inevitably

occur. Move slowly to soak up excess finish and keep it from building up on the lower side.

Jig makes finishing vertical surfaces easier

Vertical surfaces are tricky because the finish wants to run, but for items such as legs there is no practical alternative. To make the process easier, I use a leg-finishing board. Cut a piece of $\frac{3}{4}$ -in.-thick plywood or medium-density fiberboard 4 in. to 6 in. wide by 24 in. to 30 in. long. Drill four evenly spaced screw holes large enough for the screws to slip through without biting. Countersink the underside of the holes to ensure that the assembly doesn't rock. You'll need a spacer between the board and each leg so that the finish doesn't glue things together. The spacer can be any $\frac{1}{2}$ -in.-thick material, slightly smaller than the top of the leg with a generous hole in the center. Drill smaller holes in the center top of each leg to receive the screws. Tighten the screws with the leg sides at a 45° angle to the sides of the board to allow easy access to two sides of each leg at a time.

Brush on the finish with the same technique as the horizontal application, pre-depositing finish from the foot of the leg downward, then finishing with a full upward stroke, ending at the foot of the leg.

For vertical work, you'll probably want to load the brush with less finish to prevent dripping. Inevitably, some finish will collect at the bottom of the workpiece, but an advantage of foam brushes is that you simply can touch the tip of an empty brush to the finish to soak up the surplus. □



No cleanup. The best part of using foam brushes is that you don't have to clean them. Just throw them away.

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21st-Century Secretary

In the early '70s Rhode Islander Timothy Philbrick apprenticed with Johnny Northup, a seasoned furniture maker who mistrusted anything designed after 1815. Then Philbrick attended Boston University's Program in Artisanry, where the cutting edge was razor sharp. This dual training provided him both a sure knowledge of Newport furniture and the daring to transform it.

With this Cuban-mahogany breakfront, Philbrick has recast an American furniture classic: the Goddard-Townsend secretary. In his version, he captured the sweet and stately proportions while minimizing much of the texture and detail—Philbrick excised everything from flame finials to bracket feet. To give the piece vertical thrust, he used frame-and-panel construction in place of the original dovetailed boxes.

—Jonathan Binzen

